INITIAL SALP REPORT

U.S. NUCLEAR REGULATORY COMMISSION

OFFICE OF NUCLEAR REACTOR REGULATION

COMANCHE PEAK PROJECT DIVISION

SYSTEMATIC ASSESSMENT OF LICENSEE PERFORMANCE

Inspection Report 50-445/88-85 - 50-446/88-81

Texas Utilities Electric Company (TU Electric)

Comanche Peak Steam Electric Station

Dockets 50-445; 50-446 - Units 1 and 2

September 1, 1988 - August 31, 1989

I. INTRODUCTION

The Systematic Assessment of Licensee Performance (SALP) program is an integrated NRC staff effort to collect available observations and data on a periodic basis and to evaluate applicant performance on the basis of this information. The program is supplemental to normal regulatory processes used to ensure compliance with NRC rules and regulations. It is intended to be sufficiently diagnostic to provide a rational basis for allocating NRC resources and to provide meaningful feedback to the applicant's management regarding the NRC's assessment of the facility's performance in each functional area.

A NRC SALP Board, composed of the staff members listed below, met on September 19 to review the observations and data on performance and to assess applicant performance in accordance with NRC Manual Chapter 0516, "Systematic Assessment of Licensee Performance." The guidance and evaluation criteria are summarized in Section III of this report. The Board's findings and recommendations were forwarded to the NRC Associate Director for Special Projects, Office of Nuclear Reactor Regulation, for approval and issuance.

This report is the NRC's assessment of the applicant's safety performance at Comanche Peak for the period September 1, 1988, through August 31, 1989.

The SALP Board for Comanche peak was composed of:

Chairman: C. I. Grimes, Director, Comanche Peak Project Division

Members: T. P. Gwynn, Deputy Director, Division of Reactor Projects, Region IV

J. P. Jaudon, Deputy Director, Division of Reactor Safety, Region IV

H. H. Livermore, Lead Senior Inspector, Comanche Peak Project Division

J. E. Lyons, Assistant Director for Technical Programs, Comanche Peak Project Division

P. F. McKee, Chief, Safeguards Branch, Office of Nuclear Reactor Regulation, (Former Deputy Director, Comanche Peak Project Division)

R. F. Warnick, Assistant Director for Inspection Programs, Comanche Peak Project Division

J. S. Wiebe, Senior Project Inspector, Comanche Peak Project Division

J. H. Wilson, Assistant Director for Projects, Comanche Peak Project Division

L. A. Yandell, Deputy Director, Division of Radiation Safety and Safeguards, Region IV

The following personnel also participated in the SALP Board process.

J. L. Birmingham, RTS Consultant (Quality Control), Comanche Peak Project Division

S. D. Bitter, Resident Inspector (Operations), Comanche Peak Project Division

S. P. Burris, Senior Resident Inspector, Watts Barr, TVA Projects Division (former Senior Resident Inspector, Comanche Peak Project Division)

R. M. Latta, Resident Inspector (Electrical), Comanche Peak Project Division

W. D. Richins, Parameter Consultant (Civil Structural), Comanche Peak Project Division

M. F. Runyan, Resident Inspector (Civil Structural), Comanche Peak Project Division

P. Stanish, Parameter Consultant (Mechanical), Comanche Peak Project Division

R. G. Ramirez, Human Factors Specialist (Attended Only) Division of Licensee Performance and Quality Evaluation

II. Summary of Results

Overview

Applicant management's involvement and control are evident by leadership, support, and monitoring of completion of construction and rework activities. A weakness was noted in management's involvement and control of the identification and resolution of technical issues related to operational events during the Hot Functional Test (HFT). Since the HFT, management has demonstrated increased sensitivity in this area. The applicant's approach to the identification and resolution of technical issues is adequate, but occasionally lacks conservatism, thoroughness, and depth.

Applicant management is usually responsive to NRC initiatives and self-identified concerns. However, occasionally the responses do not address fully the generic implications and root causes. As a result, considerable NRC effort, at the working level, is required to obtain acceptable resolutions. Major violations are rare and minor violations are usually not

repetitive or indicative of programmatic breakdown. In general, the number of violations are very small when contrasted with the large amount of NRC direct inspection effort. The applicant's nuclear management staff has considerable experience and their attitude toward the NRC regulations, safety issues, and concerns raised by employees is generally very good.

The applicant's training programs are generally very good. The maintenance training facility is especially impressive and has the potential to provide the basis for an excellent maintenance organization. The performance of operators on the NRC administered requalification examination was outstanding and indicates that the applicant has improved the training program as recommended by the previous SALP assessment (50-445/87-40; 50-446/87-31).

A summary of the applicant's performance in each functional area is given below along with the performance from the previous SALP assessment.

Functional Area	Performance Category 9/1/87-8/31/88	Performance Category 9/1/88-8/31/89	Performance Trend*
Construction & Corrective Action Programs**		2	None
Cont, maj.struct.& supports	2		
Piping sys. & supports	2		
Auxiliary sys.	2		
Elec. equip. & cables	2		
Eng. & Technical Support	2	2	None
Safety Asses. & Quality Ver.	2	2	None
Plant Operation	2	2	None
Maint. & Surveillance	NR	2	None
Security	1	2	None
Radiological Controls	NR	2	None
Emergency Preparedness	2	2	None

NOTE: NR = Not Rated

* Performance Trend: Any discernible trend in the applicant's performance throughout the assessment period which is determined to be indicative of the applicant's expected performance during the first few months of the next assessment period. It is reserved for those instances when it is necessary to focus NRC and applicant attention on an area with a declining performance trend, or to acknowledge an improving trend in performance.

**This functional area was evaluated in the last SALP report period (9/1/87-8/31/88) as four separate areas. In this SALP period (9/1/88-8/31/89) this functional area includes the four areas evaluated in the last SALP along with all other aspects of the construction and corrective action programs.

III. Criteria

Applicant performance is assessed in selected functional areas, depending on whether the facility is in a construction or operational phase. Functional areas normally represent areas significant to nuclear safety and the environment. Some functional areas may not be assessed because of little or no applicant activities or lack of meaningful NRC observations. Special areas may be added to highlight significant observations.

The following evaluation criteria were used, as applicable, to assess each functional area:

- Assurance of quality, including management involvement and control;
- Approach to the resolution of technical issues from a safety standpoint;
- Responsiveness to NRC initiatives;
- Enforcement history;
- Operational and construction events (including response to, analyses of, reporting of, and corrective actions for);
- Staffing (including management); and
- Effectiveness of training and qualification program.

However, the NRC is not limited to these criteria and others may have been used where appropriate.

On the basis of the NRC assessment, each functional area evaluated is rated according to three performance categories. The definitions of these performance categories are as follows:

A. Category 1

Applicant management attention and involvement are readily evident and place emphasis on superior performance of nuclear safety or safeguards activities, with the resulting performance substantially exceeding regulatory requirements. Applicant resources are ample and effectively used so that a high level of plant and personnel performance is being achieved. Reduced NRC attention may be appropriate.

B. Category 2

Applicant management attention to and involvement in the performance of nuclear safety or safeguards activities are good. The applicant has attained a level of performance above that needed to meet

regulatory requirements. Applicant resources are adequate and reasonably allocated so that good plant and personnel performance is being achieved. NRC attention may be maintained at normal levels.

C. Category 3

Applicant management attention to and involvement in the performance of nuclear safety or safeguards activities are not sufficient. The applicant's performance does not significantly exceed that needed to meet minimal regulatory requirements. Applicant resources appear to be strained or not effectively used. NRC attention should be increased above normal levels.

IV. Performance Analysis

A. Construction and Corrective Action Programs

1. Analyses

This functional area includes all applicant activities associated with the erection of structures and the installation of those systems and equipment required for the operation of the Comanche Peak plant. Further, it addresses the compliance of those activities with design specifications, industry standards, and regulatory requirements. The majority of NRC inspection efforts in this functional area involved the evaluation of TU Electric's Corrective Action Program (CAP), including the Post-Construction Hardware Validation Program (PCHVP), as well as completion of the construction program. The CAP is the applicant initiated program to address and resolve specific Comanche Peak Response Team (CPRT) and other external source issues. The PCHVP is the portion of the CAP which validates the final acceptance attributes for safety-related hardware. The NRC assessment of this functional area included the inspection of electrical equipment, cables, instrumentation, mechanical components, piping and pipe supports, heating, ventilation and air-conditioning (HVAC), structural steel, concrete structures, and other safety-related items.

Fifty NRC inspections of construction and CAP activities, including three team inspections, determined that construction activities were generally well performed with adequate documentation and an appropriate involvement of quality control. Examples of well performed construction activities witnessed or inspected by the NRC staff inspectors included concrete repair and placement activities related to the seismic gap between primary and secondary building walls, replacement of structural steel bolts, and base plate installation. However, occasional minor programmatic breakdowns did occur. For example, a pipe support angularity problem identified by the NRC necessitated a

reinspection by the applicant of over 5,000 pipe supports and resulted in significant rework.

Management involvement in assuring quality for these areas was generally evidenced by prior planning and assignment of priorities in all areas reviewed. Procedures for the control of activities were stated and defined. However, some deficiencies were noted in procedures for structural steel platform inspection, seal welding, and check valve backleakage testing that required revision to address NRC identified concerns. Management involvement was also evident during frequent status meetings with NRC inspectors to provide updates regarding proposed or ongoing plant activities. One example of management involvement was the effective corrective actions taken to address deficiencies in concrete attachment spacing.

In general, engineering evaluations were determined to be technically adequate and complete during team inspections of the CAP. Within the electrical area, the increased emphasis on identifying the root cause of deficiencies and establishing adequate corrective action indicated an improved management commitment to quality. As discussed in Section IV.B of this report, there were problems with the effectiveness of engineering and technical support which affected the construction and Corrective Action Programs. In addition, some design change authorizations (DCA) and nonconformance reports in the civil/structural area initially had inadequate technical evaluations. Corrective actions were implemented by the applicant and evaluated by the NRC.

Records of construction activities were generally complete and adequately maintained; however, in some cases, the retrievability of records could be improved.

Recurring problems of unrepaired damage or unauthorized work resulted in the applicant placing heavy reliance on performing room and area walkdowns to identify remaining deficiencies prior to turnover to operations. An NRC inspection performed late in the SALP period of two rooms, for which the walkdown was complete, identified several deficiencies in the electrical conduit installations as well as two potential mechanical snubber problems which had not been identified by the applicant. In addition, QC inspection errors during the evaluation of structural steel under the CAP program were identified in several NRC inspection reports before action was taken by the applicant to evaluate and resolve the concern. The NRC is continuing to evaluate the applicant's corrective action.

The applicant's resolutions of technical issues including self-identified deficiencies were generally determined to be

effective. Typically, the applicant used worst-case or conservative assumptions when precise loads or conditions could not be determined. In a few instances such as the piping support slugged weld/weld fit-up problem, it was necessary for the NRC to cause additional engineering iterations before an adequate resolution of the full technical issue was demonstrated.

Resolutions of NRC concerns were generally satisfactory but occasionally lacking in thoroughness or depth, such that supplementary responses were required. The applicant was occasionally slow to address fully the generic implications and/or root causes of NRC concerns. This was evident by the applicant's responses to violations for problems with QC inspections of structural steel platforms, QC measurement techniques, service water tube steel supports, and undersized welds on duct supports. Repeated meetings between the NRC and the applicant's representatives were required before acceptable resolutions to these issues were achieved.

The NRC inspections identified several violations involving QC inspection errors; however, these errors appear to have been isolated cases. Other deficiencies identified were for programmatic problems such as, field verification methods (FVMs) failing to provide sufficient instruction for verification of inaccessible attributes and QC measurement techniques being inadequate to correctly identify valve stem angles. These issues have been or are being satisfactorily resolved.

Staffing is adequate as evidenced by the majority of construction activities remaining essentially on schedule. Key management positions are staffed with competent individuals, and the responsibilities of each position are defined.

The applicant's training program for construction related activities appeared to be effective. An active training program for craft and technical personnel was maintained by the applicant. During the assessment period, several training classes were evaluated including those conducted for flexible conduit installation, nondestructive examination training provided to QC personnel, and the training associated with the Unit 2 service water coating removal effort. These training sessions were judged to be effective and thorough. In isolated instances, training deficiencies were identified as the root cause of specific problems.

2. Performance Rating

The applicant's rating is performance Category 2 in this area.

3. Board Recommendations

a. Recommended NRC Action

None.

b. Recommended Applicant Action

- The applicant should review the control of documents to determine methods to improve their retrieval time.
- Management should place additional attention on the room and area turnover process to assure the identification of remaining deficiencies.

B. Engineering and Technical Support

1. Analysis

The purpose of this functional area is to address the adequacy of the technical and engineering support for all plant activities. It includes all applicant activities associated with the design of the plant; engineering and technical support for maintenance, testing, surveillance, procurement, preoperational and startup testing, and operational activities; training; and configuration management (including maintaining design bases and safety margins).

NRC reviews of engineering and technical support activities occurred during performance of NRC inspections of construction/CAP, preoperational testing, and during review of FSAR submittals. The engineering and technical support activities were generally performed well. Examples are the core reload analysis, the TDI diesel generator evaluation, numerous responses to staff requests for additional information, and equipment qualification work. This generally good performance was also evident by the favorable results of the pump and valve operability review team inspection, the seismic qualification review team inspection, and three team inspections of the corrective action program which included review of significant engineering work. However, some engineering evaluations of construction deficiencies and events and some responses to NRC initiatives were lacking in thoroughness and depth. Examples included the failure to adequately disposition the deficiencies in the fuel transfer tube penetration weld and the failure to adequately disposition the lack of NDE on electrical penetrations.

Corporate management was frequently involved in site activities as evidenced by actions showing their interest in and knowledge of technical concerns and their resolution.

During the rating period, the applicant submitted a large number of amendments to the FSAR and responded to a very large number of information requests associated with the NRC's review of that document. For the most part, these submittals and responses were clear, timely, and supported by sound technical justification. However, in the areas of technical specification development and the review of the preoperational testing program, considerable effort was expended by the staff to assure that an adequate technical basis was formally placed on the docket.

The NRC identified three violations that were programmatic in nature and two violations that appeared to be isolated occurrences. The programmatic violations included: engineering inappropriately allowed the use of low-strength bolting (A-307) in snubbers; design reviews failed to identify and correct numerous minor deficiencies found in pipe support calculations; and the applicant inappropriately accepted certain welds based on stress analyses provided by engineering in lieu of required non-destructive examinations. Appropriate corrective actions were subsequently taken for these issues.

Two apparent violations for improper evaluation of deficiencies and lack of post maintenance testing for certain auxiliary feedwater (AFW) check valves were identified as a result of the findings of an NRC Augmented Inspection Team (AIT) and at the close of the assessment period were pending as an enforcement issue. The AIT findings are discussed further in Section IV.D, "Plant Operations."

The quality and responsiveness of the technical support provided in response to the AFW check valve event (discussed in Section IV.D) were marginal during the initial phases of the applicant's investigation. Information exchanged within the AFW task team was often unfocused, misleading, and inaccurate. This resulted in considerable delay in identifying the failure mode of the check valves and in preparing a plan for corrective action. Improvement in the technical support function was clearly evident following a reorganization of the task team and a redefinition of the team's objectives. As a result, an effective corrective plan was ultimately achieved.

The applicant has implemented an effective configuration control program with accurate baseline information and reliable methods for making necessary changes. Only a few minor discrepancies have been identified regarding this program, such as a valve stem that was rotated and left out of angular specification as the result of a seal weld application. Programmatic enhancements have been made to address the identified problems.

In the area of procurement, the applicant had revised the procedural program for procurement to provide increased

accountability and assurance that safety-related services, parts and equipment were of the desired quality. However, evaluations of some events, such as the removal of the Plasite coating from the Service Water System (SWS) piping and the installation of valve internals which were procured as nonsafety related into AFW control valve FC-121, indicated the need for improvements to the procurement process. Corrective actions were being implemented at the end of the assessment period.

Staffing levels for engineering and technical support organizations are ample, although many of the individuals are contractors. Positions and responsibilities for the technical support of operations, preoperational testing, and startup testing are well-defined. During NRC inspections, the qualifications and training of engineering and support personnel were inspected and determined to be satisfactory. NRC inspections of engineering and technical input to the CAP and preoperational testing identified isolated instances where inadequate training was determined to be a cause. When these instances were identified, the applicant took appropriate actions to correct the deficiencies. The NRC concluded that overall training activities were satisfactory.

The training and qualification program for preoperational and startup testing personnel is adequate. The applicant's licensed operator training program has been significantly improved since the last SALP rating period. This was evidenced by a 100% pass rate for the NRC administered requalification examination. The training staff is composed of qualified individuals possessing the necessary skills and expertise. Applicant management displayed a willingness and desire to establish and maintain a highly-motivated training organization.

2. Performance Rating

The applicant's rating is performance Category 2 in this area.

3. Board Recommendations

a. Recommended NRC Action

None.

b. Recommended Applicant Action

The applicant should take action to ensure adequate engineering and technical support for operations exists in order to resolve technical issues such as the AFW check valve failures. Of particular importance is the thoroughness and depth of technical resolutions developed.

C. Safety Assessment and Quality Verification

1. Analysis

This functional area includes all applicant review activities associated with the implementation of applicant safety policies; applicant activities related to amendment, exemption and relief requests; response to generic letters, bulletins, and information notices; and it also includes applicant activities related to the resolution of safety issues, 10 CFR 50.59 reviews, 10 CFR 21 assessments, safety committee and self-assessment activities, analyses of industry's operational experience, root cause analyses of plant events, use of feedback from plant quality assurance and quality control reviews, and participation in self-improvement programs. It includes the effectiveness of the applicant's quality verification function in identifying and correcting substandard or anomalous performance, in identifying precursors of potential problems, and in monitoring the overall performance of the plant.

NRC personnel performed inspection activities which resulted in the issuance of 12 inspection reports of quality programs. Other NRC inspections provided perspective regarding the adequacy of the applicant's performance of safety assessment and quality verification.

The staff determined that management involvement in safety assessment and quality verification was apparent in most activities. Evidence of this involvement was demonstrated by management participation in the Senior QA Overview Committee and in management's involvement in the resolution of technical issues. Additionally, staff review of documents such as applicant audits, corrective action reports (CARs), and SDARs indicated that items with potential generic applicability were addressed by appropriate management personnel.

Evidence of prior planning and the assignment of priorities was apparent in the schedules for audits and surveillances, the performance of preoperational tests, and the completion of construction activities.

Resolutions of deficiencies were, in general, adequate although occasional repetitions of identified deficiencies indicated that root cause assessments and corrective actions were not always effective. An example of this was minor design calculation errors found in the CAP. After the NRC identified the same problem during inspections, held meetings with TU Electric management, and issued a violation for the same issue, the applicant took adequate corrective actions.

The applicant's program for the identification and correction of nonconforming or deficient conditions was effective. An example of an effective self-evaluation and corrective action resulted from audit TSU-89-01 in which the audit team utilized ongoing activities of the HFT to perform real-time assessments of testing activities. The audit identified that the programs for engineering, procurement, and testing failed to prevent unapproved valve internals being installed as permanent plant equipment in flow control valve 1-FCV-121. The audit deficiency resulted in management action in all of the affected departments.

The applicant has many self-evaluation organizations and programs. These include the Quality Assurance Organization, the Quality Control Group, the Station Operations Review Committee (SORC), the Operations Review Committee (ORC), the Independent Safety Engineering Group (ISEG), the Joint Test Group (JTG), the Test Review Group (TRG), the Technical Audit Program (TAP), Engineering Functional Evaluations, Operations Readiness Assessment, Plant Evaluation Group, and Senior QA Overview Committee. Generally, these programs and organizations performed adequately. Specific examples where they did not identify and correct deficiencies are noted in the specific functional areas of this report.

The applicant's responsiveness to NRC Bulletins and Information Notices was generally timely and thorough. Examples of this were responses to NRC Bulletin 88-10 (involving molded case circuit breakers) and NRC Bulletin 88-01 (pertaining to inspections of Westinghouse DS series circuit breakers used in Class 1E applications).

In response to NRC Information Notice 88-89, "Degradation of Kapton Insulation," the applicant performed evaluations of the site uses of Kapton insulation. The evaluations determined that the primary area of concern was the potential that construction activity in the area may have damaged the Kapton insulation. The applicant initiated corrective actions including detailed inspection and cleaning of the insulation prior to the installation of protective cable tray covers. Although incomplete at the end of the SALP period, the applicant's corrective actions were appropriately addressing the concerns identified by the information notice.

Three violations were identified: (1) inadequate performance of preoperational test surveillance, (2) inadequate interpretation of a radiographic indication, and (3) a procedural change resulting in the failure to perform reportability evaluations for certain unsatisfactory QC inspection reports. These violations appeared to be isolated and not indicative of a programmatic problem.

An NRC assessment of the plant evaluation group indicated that the group was adequately structured and staffed to provide evaluation of plant operations and maintenance activities. The group is responsible for reviewing issues such as: industry operating experience reports, emerging regulatory issues, and site performance. The ultimate purpose is to identify precursors to potential problems. The group has taken timely actions to address recent industry issues such as mid-loop operations of the Reactor Coolant System (RCS) and the adequacy of instrument air systems.

The applicant's QA/QC was not always effective. For example, during plant tours, the NRC identified problems with 23 pipe supports previously accepted by the applicant's QC. Also, during an inspection of the applicant's room/area turnover process, the NRC identified several conduit fitting concerns even though both engineering and QA surveillance walkdowns of the rooms had been performed. QA/QC management was not always effective in directing their organizations to perform in-depth inspections and to identify problems as they occurred.

Staffing in this functional area is appropriate. Qualifications of personnel meet requirements and, in general, a high degree of nuclear industry experience is evident. Vacant key positions are filled in a reasonable amount of time. During this assessment period, the applicant's quality accountability program reduced the overall percentage of deficient items resulting from construction activities.

Training and qualification programs have resulted in an understanding and awareness of procedures and procedural requirements. Training needs of staff positions are well-defined and implemented. Training of personnel to new procedures or revisions is usually timely; however, occasional recurrence of deficiencies has necessitated retraining of specific individuals or groups. Management response to identified needs for retraining is usually prompt and effective. In general, procedures and policies are rarely violated.

2. Performance Rating

The applicant's rating is Performance Category 2 in this area.

3. Board Recommendations

a. Recommended NRC Action

None.

b. Recommended Applicant Action

Management should develop ways to improve the effectiveness of the QA/QC organizations in early problem identification.

D. Plant Operation

1. Analysis

This functional area consists chiefly of the control and execution of activities directly related to operating plant systems, primarily preoperational testing and operational readiness activities. It is intended to include activities such as system startup, shutdown, and lineups. Thus, it includes activities such as preoperational testing, monitoring and logging plant conditions, prerequisite test operations, response to off-normal conditions, plant-wide housekeeping, control room professionalism, and interface with activities that support operations.

NRC personnel performed inspections resulting in 14 inspection reports of preoperational testing and operations-related activities. This included team inspections of operational procedures and emergency operating procedures. Other NRC inspections provided additional input to the assessment of plant operations.

Management involvement was apparent in the preplanning and assignment of activities for task completion. This involvement was evident in the development and implementation of a Readiness for Operations program, implementation of the Trip Reduction program, inclusion of the Initial Startup program under the direct control of the operations department, and training, in the requirements of 10 CFR 50.72 and 10 CFR 50.73 using selected events.

Management involvement was not apparent in the initial identification and assessment of AFW check valve failures prior to HFT. As a result a significant check valve backleakage event occurred. Management involvement was also poor in the initial follow-up, assessment, and corrective action for this event. As a result, a second event that was more severe occurred 12 days later.

The NRC team inspection of operations procedures determined that administrative control procedures were not thoroughly understood as evidenced by inconsistencies and contradictions. It appears that the administrative review cycle was not effective in identifying and correcting the large number of deficiencies within the plant operating procedures. Examples of field procedures that were in conflict with the controlling programmatic procedure were found. Once this issue was identified

to plant management, the applicant initiated corrective action to address these concerns.

Operational decisions were generally conservative and made with the emphasis placed on plant safety. Some failures to document operational events or identified preoperational problems were noted. However, when these issues were escalated to senior management attention, the issues were resolved. The applicant was almost always responsive to NRC concerns and questions. In those instances where the response was slow, management took immediate corrective action to resolve the issues.

Three violations were issued in the area of preoperational test performance: one for failure to properly document a deficiency; and two for failure to follow procedures. These two had several examples and appeared to be the result of poor quality preoperational test procedures and hurrying on the part of operators. An apparent violation associated with the AFW system backflow event was identified. An apparent violation is a repetition of the failure to follow procedure violation discussed below and is a pending enforcement issue.

A few instances of a failure to follow procedures by operators and test engineers were noted during the preoperational test program. In one instance, the failure to follow the procedure resulted in initiating hot water backflow from the steam generators into AFW piping because several check valves failed to seat. The applicant's performance relative to this operational event was not satisfactory. The leaking check valves had been identified prior to heat-up for hot functional testing. Operators and management failed to recognize the significance of the leaking check valves. Both vertical communication between operators and their management and horizontal communication between shifts was not adequate to preclude event recurrence. As a result, another failure to follow procedure resulted in an additional more severe backflow from the steam generators into the AFW piping. This additional event was not included in the applicant's deficiency reporting system until more than a week after the event occurred. The problems in this area apparently stem from the operations department not attaining a sensitivity to events which affected the operability of important systems. After the AFW backflow events, the applicant demonstrated an increased sensitivity to events, such as the loss of RHR during mid-loop operations.

The applicant's prestart test group satisfactorily performed numerous system and component level tests. These included major milestone tests, such as Containment Integrated Leak Rate Test, Loss of Offsite Power Test, Integrated Hot Functional Test,

and Engineered Safety Features Actuation Test. Management was generally involved in preplanning and assignment of priorities in test scheduling. Test personnel performed their duties in a professional manner.

The number of available operators and shift supervisors exceeded the minimum number required for single-unit operation and was adequate for two-unit operation. The additional shift personnel were being used to assist in Unit 1 preoperational testing. Although the licensed operators, as a general rule, do not have much power plant operating experience, senior management recognized this weakness and took steps to remedy this condition by obtaining hot operating experience for the Comanche Peak operators at similar facilities.

NRC inspection of the applicant's training program for operations and operation support determined that, in general, training of personnel has been appropriate. A few instances of personnel failure to follow procedures have resulted in retraining.

Operations personnel maintained a professional demeanor in the control room. Lines of authority were clearly established and maintained by the on-shift personnel. Name tags clearly identified each operator by name and position. Preshift briefings and turnovers are performed in a professional manner and contain the necessary detail to assure that an adequate transfer of knowledge is accomplished within the control room.

2. Performance Rating

The applicant's rating is Performance Category 2 in this area.

3. Board Recommendations

a. Recommended NRC Action

None.

b. Recommended Applicant Action

Management should ensure effective implementation of the operational readiness program and related corrective action efforts, such as procedure corrections.

E. Maintenance and Surveillance

1. Analysis

This functional area includes all activities associated with either diagnostic, predictive, preventive or corrective

maintenance of plant structures, systems, and components; procurement, control, and storage of components, including qualification controls; installation of plant modifications; and maintenance of the plant physical condition. It includes conduct of all surveillance (diagnostic) testing activities as well as all in-service inspection and testing activities. Examples of activities included are instrument calibrations; equipment operability tests; post-maintenance, post-modification, and post-outage testing; special tests; in-service inspection and performance tests of pumps and valves; and all other in-service inspection activities. Also included in this assessment are activities associated with lay-up of systems which are not in use.

The input for the assessment of the applicant's performance in this functional area was derived from various NRC inspections including the team inspection of operations and maintenance procedures.

In-depth review of the maintenance QA program determined that the program was adequate. Although maintenance procedures were in use and appeared to be technically adequate, numerous discrepancies in the procedures, their format, and their control were noted. In addition, weak control of in-process Instrumentation and Control work records resulted in a violation for which the applicant was implementing corrective and preventive actions at the end of the SALP period. In another case NRC's inspection of procedures for post-work testing found that the applicant had identified a number of missing post-work test completion reports. The applicant was implementing corrective actions at the end of the SALP period. Another violation in this area concerning the substitution of carbon steel bolts for silicon bronze bolts occurred in 1987 and appeared not to reflect the current maintenance program.

The applicant surveillance test program was complete and was in the process of being implemented. The program adequately addressed the procedures, methods, and rules for scheduling, tracking, statusing, performing, reviewing, and managing the surveillance tests.

Staffing levels for maintenance and surveillance activities appeared to be adequate. Although a backlog of maintenance work orders existed, the applicant has taken effective action to reduce the overall number.

Management has taken an active role in the area of maintenance training. The applicant's maintenance training facility is particularly noteworthy. NRC observation of maintenance activities revealed that maintenance personnel were knowledgeable of procedural requirements and were working to current

procedures. Personnel performing required surveillances were also found to be knowledgeable of requirements and working to current procedures. The satisfactory performance of maintenance and surveillance personnel was indicative of a satisfactory training program.

2. Performance Rating

The applicant's rating is Performance Category 2 in this area.

3. Board Recommendations

(a) Recommended NRC Actions

None.

(b) Recommended Applicant Action

None.

F. Security

1. Analysis

This functional area includes all activities that ensure the security of the plant including all aspects of access control, security background checks, safeguards information protection, and fitness-for-duty activities and controls.

Five preoperational inspections were conducted by physical security inspectors during this assessment period. Several minor problems were identified. The applicant has corrected most of the identified problems and is working on resolution of the remainder.

The applicant's security organization has implemented an aggressive program for the self-identification of security problems to ensure compliance with the requirements of 10 CFR Part 73 and the Physical Security Plan (PSP). Corrective actions initiated as a result of the applicant or NRC identified problems have been technically correct and effective. Plant and corporate management has been supportive and actively involved in providing timely solutions to issues identified by the security staff. The applicant has been responsive to NRC initiatives.

The applicant appears to have a sufficient number of security supervisors, fully qualified security officers, and security support personnel assigned to the security department to implement a proper security program during normal operations during the transition from construction to operation. However,

during the transition from construction to operations overtime use appeared to be excessive and, thus, could have a negative impact on security staff effectiveness. Applicant management has recognized this problem and has initiated actions to hire more security personnel. The lines of authority within the security force are clear and well-understood. Only one minor deficiency was identified with the security training program. A more accurate assessment of the training program will be possible following the completion of lockdown, but it appears that security force personnel have a good understanding of the applicant's policies and procedures. The applicant has established the necessary procedures to provide for the implementation of a proper security program.

The transition to a security organization responsible for safeguarding an operating nuclear power plant from a long-term security organization responsible for industrial protection has not been implemented to a degree that has permitted the inspectors to establish the assurance of acceptable performance in this area. The applicant initiated a three-stage phased lockdown of the protected and vital areas on July 1, 1989. Phase 1 was completed and portions of Phase 2 were accomplished prior to the end of this assessment period. It appears that applicant management did not recognize that the plant was not ready to enter into the final phase (hard lockdown), but has since acknowledged that fact. The applicant has committed to performing an internal security program self-evaluation, to correct any deficiencies identified and to inform the NRC when they consider the plant ready for completion of the pre-operational inspection. Based on the preoperational inspections completed to date, it appears the applicant has established the basis for an acceptable security program.

The applicant's submittals with respect to safeguards matters were technically sound and consistent. These submittals indicate that the applicant has well-developed policies and procedures for control of security related activities. During this assessment period, there was consistent evidence of prior planning and involvement by utility management.

2. Performance Rating

The applicant's rating is Performance Category 2 in this area.

The change in rating from a Category 1 (last SALP period) to a Category 2 does not necessarily reflect a change in applicant's performance. The last SALP rating was based primarily on the acquisition, installation, and activation of state-of-the-art security equipment which demonstrated the applicant's commitments to the security program. The applicant had not yet implemented

the security plan. The final rating for the security program was impacted by the fact that the applicant elected to "lock-down" while there was a substantial amount of construction still ongoing. The present SALP rating is based on additional activities necessary to demonstrate implementation of the physical security plan which was scheduled to occur after the SALP period ended.

3. Board Recommendations

a. Recommended NRC Action

None.

b. Recommended Applicant Action

None.

G. Radiological Controls

1. Analysis

The assessment of this functional area consists of activities directly related to radiological controls, including occupational radiation safety (e.g., occupational radiation protection, radioactive materials and contamination controls, radiation field control, radiological surveys and monitoring, and as-low-as-reasonably-achievable [ALARA] programs), radioactive waste management (i.e., processing and onsite storage of gaseous, liquid, and solid waste), radiological effluent control and monitoring (including gaseous and liquid effluents, offsite dose calculations, radiological environmental monitoring, and confirmatory measurements), water chemistry controls and transportation of radioactive materials (e.g., procurement of packages, preparation for shipment, selection and control of shippers, receipt/acceptance of shipments, periodic maintenance of packagings, and point-of-origin safeguards activities).

The occupational radiation safety program was inspected twice during the assessment period by radiation specialist inspectors. Several open items were identified involving spent fuel transfer tube radiation levels, installation of health physics instrumentation, ALARA personnel involvement with planned work activities, hot particle identification and control, skin exposure from Xenon, and startup shield surveys. The applicant's responsiveness to NRC initiatives and the resolution of technical issues has been good.

The applicant has maintained a stable, experienced radiation protection staff. The personnel turnover rate within the

occupational radiation protection staff during the assessment period was below 15 percent and vacancies were routinely filled in a timely manner. Management involvement and control is evident by the prior planning and assignment of priorities. In order to maintain a proper level of applied experience, the applicant has routinely sent radiation safety personnel to work at operating power reactors during both outage and nonoutage activities.

The applicant's radiochemistry and water chemistry programs were inspected once during the assessment period. Five open items were identified involving corporate technical support for the onsite chemistry group, primary chemistry and secondary sampling system testing, completion of chemistry laboratory facilities, and completion of the testing and operations of the post-accident sampling system.

The applicant's transportation program for radioactive waste management was inspected once during the assessment period. The applicant had the necessary organization, training, and procedures in place to implement a proper radioactive transportation program.

The radioactive waste management program was inspected once during the assessment period. Seven open items were identified concerning the radwaste program. These items involved the organization and staffing of the operations radwaste group; liquid radwaste system preoperational tests; gaseous radwaste preoperational tests and calibration of effluent monitors; solid radwaste spent resin transfer system modification, testing, sampling, and process control program; air cleaning system preoperational tests and system balancing; radiation monitoring instrument calibration and functional tests; and a comprehensive audit of the radwaste program.

The radiological environmental monitoring program was not inspected during this assessment period. This area has been reviewed annually since the early 1980s and all open items and commitments have been completed. The Offsite Dose Calculation Manual, Revision 0, dated March 1989, had been approved by the Office of Nuclear Reactor Regulation (NRR).

Other reviews conducted by NRR staff included several open items, an issue concerning the qualification of the manager of Radiation Protection, and FSAR amendments. These issues were resolved by requests for additional information, teleconferences, meetings, and a plant walkdown.

The applicant's internal audit program for radiological control activities has been in effect for several years. The applicant supplements quality assurance personnel with corporate or vendor

technical specialists. All audits have included a team member with technical experience in the area being audited.

Station procedures have been developed and are in place for most radiological control activities associated with plant operations. Those procedures not yet implemented are in the development stage and are scheduled for completion prior to criticality. The applicant has established good lines of communication between the training department, other station groups, and the radiological control group.

No major problems were identified in the radiological controls area regarding the effectiveness of the training and qualification program. The applicant's staff appears adequate to implement the radiological controls program. The applicant's overall readiness and capability to support plant operations is considered to be adequate.

2. Performance Rating

The applicant's rating is Performance Category 2 in this area.

This SALP rating is based on the evaluation of the applicant's preparation for implementing the radiological protection program which was scheduled to occur after the assessment period.

3. Board Recommendations

a. Recommended NRC Action

None.

b. Recommended Applicant Action

None.

H. Emergency Preparedness

1. Analysis

This functional area includes activities related to the establishment and implementation of the emergency plan and implementing procedures; such as, onsite and offsite plan development and coordination; support and training of onsite and offsite emergency response organizations; applicant performance during exercises and actual events that test emergency plans; administration and implementation of the plan (both during drills and actual events); notification; radiological exposure control; recovery; protective actions; and interactions with onsite and offsite emergency response organizations during exercises and actual events.

Two team inspections were performed during the assessment period involving emergency preparedness. One was an emergency preparedness implementation appraisal and the other was an evaluation of the applicant's performance during an emergency exercise.

A review of the applicant's emergency preparedness staff showed that their qualifications and experience were adequate. The applicant's description of the emergency response organization identified organizational response elements but needs further clarification of its structure regarding the assigned responsibilities. The applicant has the necessary staff in place to support emergency preparedness activities.

An emergency preparedness training program has been established, however, qualification requirements for each position were not clearly specified and practical training was not required. A large portion of the training for the emergency responders had been provided, but the changes to the emergency organizational structure and the ongoing work on some plant systems will require further training. In addition, a small number of emergency responders has not received training consistent with their duties at the time of the appraisal. Those portions of the emergency response facilities that had been completed were satisfactory; however, some emergency facilities (e.g., technical support center) were still in various stages of completion, and some equipment and supplies were not in place.

Demonstration of personnel accountability and evacuation of the protected area and evacuation of the owner-controlled area were not accomplished during the emergency preparedness exercise. The applicant has a unique situation in this regard due to a large number of workers in the protected and owner-controlled areas. Specific deficiencies were found in some procedures, mainly in the procedure used for making protective action recommendations. These deficiencies included the absence of operational assessment of plant conditions, and the inclusion of extraneous considerations which may impact on the timely release of protective action recommendations.

The relatively small number of findings that resulted from the appraisal indicate that the applicant has made a strong commitment to the emergency preparedness program. The significant findings identified in the appraisal need to be corrected in order for the applicant to implement an adequate emergency preparedness program.

An emergency exercise inspection was also conducted during this assessment period. Although seven open items were identified during the exercise, the inspection team concluded that the applicant had demonstrated the ability to implement the emergency

plan in order to protect the health and safety of the public. In addition, the inspection team concluded that the applicant's internal assessment program was able to identify and properly characterize its own deficiencies.

The applicant has demonstrated a strong commitment to provide management support to the development of a quality emergency preparedness program. This commitment involves training program improvements, installation of state-of-the-art facilities and equipment, and moving the operational support center to a better location.

In addition, the applicant has implemented an aggressive and comprehensive audit program to identify potential problem areas. Applicant audits conducted since August 1988 have resulted in a relatively small number of significant findings.

The applicant's ongoing interaction with offsite agencies appears to be adequate. The applicant has developed the necessary emergency implementing procedures to ensure that emergency activities are properly addressed.

2. Performance Rating

The applicant's rating is Performance Category 2 in this area.

3. Board Recommendations

a. Recommended NRC Action

None.

b. Recommended Applicant Action

Correct the "significant" findings identified in the appraisal.

V. Supporting Data and Summaries

A. Applicant/NRC Activities

During this assessment period, September 1, 1988, through August 31, 1989, the applicant has been engaged in those activities necessary to complete the Corrective Action Program (CAP) and those activities necessary to demonstrate the operational readiness of Unit 1. The activities required to complete the CAP are described in TU Electric Project Status Reports (PSRs) which address 11 specific areas of design and construction. The PSRs present the results of the Design Validation Program and describe the actions of the Post-Construction Hardware Validation Program (PCHVP). The PSRs also provide for a final reconciliation of the validated design and the validated

hardware to assure that the as-built plant is consistent with the validated design.

The activities performed to demonstrate the operational readiness of Unit 1 consisted primarily of (1) the completion of prerequisite and preoperational testing, (2) the performance of NRC required exercises such as the graded Emergency Preparedness Exercise, and (3) the preparation of Site Radiation Protection and Site Security programs. Major tests performed during the SALP period included performance of the Hot Functional Test (HFT), the ASME VT-2 Pressure Test of the Reactor Coolant System (RCS) which was conducted as a supplement to the previous Cold Hydrostatic test of the RCS, the Containment Integrated Leak Rate Test (CILRT), and the Integrated Test Sequence (ITS).

At the end of the assessment period, Unit 1 construction was essentially complete. Construction activities on Unit 2 have been limited by the applicant to those activities required to support Unit 1 operation and to minimize Unit 2 construction personnel in Unit 1 areas after Unit 1 goes into operation. Construction of Unit 2 is approximately 85% complete. This assessment is applicable to applicant's activities on both Unit 1 and Unit 2.

B. NRC Direct Inspection and Review Activities

NRC inspection activities during this SALP evaluation period are documented in 91 inspection reports with over 21,000 direct inspection hours expended. The majority of the NRC inspections covered the applicant's activities for the construction program, the CAP, and the preoperational test program. The NRC inspections included specific activities of the applicant to demonstrate operational readiness.

NRC inspections performed included three team inspections of the CAP, and team inspections of equipment qualification, pump and valve operability, seismic qualification, graded emergency exercise, emergency preparedness, emergency operating procedures, operations and maintenance procedures, and licensed operator requalification examinations. The NRC also conducted specific inspections of the Radiological Controls Program, the Security Program, chemistry and radiochemistry, and the Preservice Inspections (PSI) program.

In November 1988 the NRC staff issued evaluations of the applicant's CAP relative to the technical disciplines of mechanical; civil/structural; electrical; instrumentation and control (I&C); and HVAC. Additionally, Supplemental Safety Evaluation Report (SSER) 20 (to NUREG-0797), also issued in November, addressed the staff's evaluation of the implementation of the CPRT Program Plan and the Issue-Specific Action Plans, as well as CPRT assessments of certain CPSES programs and hardware.

In May of 1989, an NRC AIT reviewed the applicant's investigation and corrective actions related to AFW check valves which failed during the HFT.

In April 1989, the NRC staff issued SSER 21 which reports the status of certain licensing issues that had not been resolved when earlier supplements of the Safety Evaluation Report were published. This supplement also lists new issues identified since SSER 12 was issued and includes evaluations of licensing items resolved in the interim period.

C. Enforcement Activity

No civil penalties were proposed or issued during the assessment period. On November 9, 1988, an enforcement conference was held to discuss NRC findings regarding coating removal from the service water piping system and the applicant's performance for: (1) procuring contractor services for the removal, (2) controlling the special process used for the removal, (3) inspecting and monitoring the process, and (4) taking prompt and effective corrective actions for identified deficiencies. Although escalated enforcement action was considered, four Severity Level IV violations were issued. These issues are still open and the results of a follow-up inspection are under review in NRC Headquarters.

On February 28, 1989, a Severity Level III violation was issued for the failure in 1986, to submit a timely request for extension of the Unit 1 construction permit. No civil penalty was issued because of the corrective action that was taken, the age of the violation, and the lesser safety significance of the violation.

As a result of the Augmented Inspection Team (AIT) report issued July 10, 1989, (50-445/89-30; 50-446/89-30), the NRC identified three apparent violations of NRC regulatory requirements. The substance of the three apparent violations has been communicated to the applicant during an NRC monthly exit meeting held September 5, 1989, but no violations have yet been issued pending an enforcement conference. Although not formally issued during the assessment period, the three apparent violations occurred in this assessment period.

Table I provides a tabulation of NRC enforcement activity for each functional area during the assessment period.

D. Confirmation of Action Letters

On May 5, 1989, a confirmation of action letter was issued regarding backleakage through the failed check valves in the AFW system that had occurred during the Unit 1 HFT. The letter confirmed the actions that the NRC understood TU Electric to be taking in preparation for the NRC AIT. In brief, the letter required the following: the

gathering of all pertinent documents, performance of required testing and corrective actions, consideration of generic implications, and involvement of the NRC AIT in ongoing activities. Activities of the Augmented Inspection Team that evaluated the applicant's follow-up actions are documented in NRC Inspection Report 50-445/89-30; 50-446/89-30.

E. Allegations

The applicant has continued to demonstrate sensitivity towards allegers and employee concerns. As part of the Joint Stipulation to dismiss the ASLB proceedings Ms. Billie Garde, attorney for Citizens Association for Sound Energy, addressed all applicant and contractor supervisors and managers regarding employee concerns. Over a two-month period, Ms. Garde gave a two-hour presentation to 25 classroom-size groups of supervisors and managers to increase their understanding and awareness of the importance of the proper handling of employee concerns.

The applicant has methods in place by which employee concerns are received and resolved in a controlled manner. Employees are encouraged to take their concerns to supervision, to the management hot line, to SAFETEAM, or to the NRC.

At the beginning of the assessment period there were 29 open allegations. During the assessment period 26 allegations were received and 44 allegations were closed. At the conclusion of the assessment period, 11 allegations remained open. The low number of allegations received by the NRC indicates that the applicant's programs for addressing employee concerns are effective.

TABLE I*

ENFORCEMENT ACTIVITY

FUNCTIONAL AREA	NO. OF VIOLATIONS IN SEVERITY LEVEL					
	Dev.	V	IV	III	II	I
Construction & Corrective Action Programs	1	2	10	0	0	0
Engineering/Technical support	0	1	5	0	0	0
Safety Assessment/Quality	0	0	3	0	0	0
Plant Operation	0	1	2	0	0	0
Maintenance/Surveillance	0	0	2	0	0	0
Security	0	0	0	0	0	0
Radiological Controls	0	0	0	0	0	0
Emergency Preparedness	0	0	0	0	0	0
Other**	0	0	0	1	0	0
Totals	1	4	22	1	0	0

*This table of enforcement activity does not include three apparent violations resulting from the AIT findings and included in the exit meeting conducted on September 5, 1989. These apparent violations have not yet been issued.

**This violation occurred in 1986 and was due to the failure of TU Electric to submit a timely request to maintain the construction permit for Unit 1. Although the violation was issued in this SALP period, it does not reflect the performance of the applicant during this SALP period.