ENCLOSURE 2

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

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Report No.:	50-445/96-12 50-446/96-12
Licensee:	TU Electric
Facility:	Comanche Peak Steam Electric Station, Units 1 and 2
Location:	FM-56 Glen Rose, Texas
Dates:	September 29 through November 9, 1996
Inspectors:	A. T. Gody, Senior Resident Inspector H. A. Freeman, Resident Inspector V. L. Ordaz, Resident Inspector W. J. Wagner, Reactor Inspector
Approved By:	J. I. Tapia, Chief, Project Branch A Division of Reactor Projects
Attachment:	Supplemental Information

EXECUTIVE SUMMARY

Comanche Peak Steam Electric Station, Units 1 and 2
NRC Inspection Report 50-445/96-12;50-446/96-12

This resident inspection included aspects of licensee operations, engineering, maintenance, and plant support. The report covers a 6-week period of resident inspection.

Operations

- Operations response to transients continued to be characterized by strong command and control and effective three-way communications (Section O1.3).

- An inadequate system operating procedure resulted in a reactor vessel level fluctuation during draindown. The licensee took immediate and appropriate corrective actions (Section O3.1).

- Operations surveillances were conducted well with thorough pre-evolution briefs focused on safety. Operators demonstrated questioning attitudes and good command and control and consistently used three-way communications. Shift management used good self- assessment techniques in their critiques of the surveillance activities (Section O4.1).

Maintenance

- Maintenance and maintenance surveillance activities were conducted well and indicated an overall improvement from previous outages (Section M1.1).

- A work package for safety chiller maintenance was poorly written in that work steps could not be followed as written (Section M2.2).

- Work planners expressed a lack of confidence in the master equipment list and noted that an incorrect relief valve setpoint was entered in a work package because it had inaccuracies (Section E2.2).

Engineering

- The control room air conditioning system engineer was not aware of the location of all his assigned equipment and did not understand the purpose of an emergency response guideline tag (Section O2.1).

- In general, the inspectors observed good engineering support for the Unit 1 refueling outage and Unit 2 operation (Section E1.1).

- The inspectors found that the licensee's procedure for testing relief valves did not meet ASME/ANSI Code requirements (Section E2.2).

Plant Support

- The licensee's ALARA planning for the Unit 1 pressurizer inservice inspection was very good. Radiation protection technicians provided excellent support to minimize the dose to workers. The use of a mock-up for electrical maintenance and the modification to the pressurizer insulation were found to be program strengths (Section R1.2).

- The licensee identified and immediately corrected a failure to properly post a locked high radiation area as required by Technical Specifications (Section R4.1).

- Site access control was implemented in accordance with station procedures and security personnel were attentive and knowledgeable of their positions (Section S2.1).

Report Details

Summary of Plant Status

Unit 1 began the inspection period at 100 percent power. On September 30, Unit 1 began coasting down prior to entry into the fifth refueling outage which was entered on October 4. At the end of the report period, Unit 1 was in Mode 5, making preparations for entering Mode 4.

Unit 2 began the inspection period at 100 percent power. On October 18, a loss of power to Reactor Coolant Pump 2-03 caused a reactor trip (Section O1.3). Unit 2 was restarted on October 19 and remained at approximately 100 percent power for the remainder of the report period.

I. Operations

O1 Conduct of Operations

O1.1 General Comments (71707)

Using Inspection Procedure 71707, the inspectors conducted frequent reviews of ongoing plant operation by touring the plant, walking down control boards and safety systems, and performing periodic reviews of logs. In general, the conduct of operation was professional. Operations personnel demonstrated a safety-conscious approach towards plant operations; specific events and noteworthy observations are detailed in the sections below.

O1.2 End of Cycle Shutdown (Unit 1)

a. Scope (71707)

The inspector reviewed portions of the procedure, attended the pre-evolution briefing, and observed the unit shutdown from 100 percent to approximately 60 percent power prior to entry into a refueling outage.

b. Observations and Findings

The inspector found that the licensee controlled the shutdown well and in accordance with the procedure. The pre-evolution brief was thorough and focused on safety.

O1.3 Unit 2 Reactor Trip Caused by a Service Air Compressor Failure

a. Inspection Scope (93702, 62707, 37551)

On October 18, with Unit 2 operating at 100 percent of rated power, the Service Air Compressor 2-01 motor developed a phase-to-ground short which caused the Non-Class 1E Bus 2A3-1 supply breaker to trip. Because Bus 2A3 supplied power to Reactor Coolant Pump 2-03, the reactor tripped on low flow. The inspectors

responded to the control room and observed the operator response to the event. After the plant was stabilized, the inspectors observed electrical maintenance and reviewed the engineering support.

b. Observations and Findings

The inspectors verified that all safety equipment responded as expected. The inspectors noted that the control room crew responded well to the trip. Operators monitored annunciators and noted parameter trends. The inspectors verified that the crew used the appropriate emergency procedures. The inspectors found that the operator response was characterized by strong command and control and effective three-way communications.

During the trip, the control room received a report that sparks were coming from the Unit 2 auxiliary transformer. The licensee found that the shield wire from the neutral ground of one of the secondary windings had come loose. The end of the shield wire was burnt, most likely from excessive current flow. The licensee found that the ground wire shield from the other secondary winding on the Unit 2 auxiliary transformer was bolted to the transformer casing. Both ground wire shields were properly grounded at the other end near the ground resistor. The licensee repaired both Unit 2 auxiliary transformer secondary neutral ground shield wires.

The inspectors reviewed the engineering evaluation of the cause of the trip in the licensee's posttrip startup justification and found that the engineering documentation of the most-probable cause of the trip was adequate.

c. Conclusion

Operator performance during the reactor trip was good. The licensee adequately corrected the grounding problems prior to restart. The licensee's engineering evaluation of the potential cause of the trip documented in their restart justification was acceptable and verified that breaker coordination was proper.

O2 Operational Status of Facilities and Equipment

O2.1 Engineered Safety Feature System Walkdown

a. Inspection Scope (71707)

The inspector performed a walkdown of the accessible portions of the common control room air conditioning (CRAC) system and the emergency filtration and pressurization units. The inspector reviewed the Final Safety Analysis Report, Technical Specifications and their bases, design basis documents, plant drawings, and standard operating procedures for the system.

b. Observations and Findings

The inspector found that equipment operability, material condition, and housekeeping were acceptable. The CRAC system and the emergency filtration and pressurization units were maintained in a condition as described in the Final Safety Analysis Report and were tested in accordance with Technical Specification requirements. The inspector questioned the system engineer during a separate tour of the CRAC system about component tags, including an emergency response guideline tag, and on the location of the CRAC system on the control room panels. The inspector found that the system engineer was not familiar with the purpose of the emergency response guideline component tag nor with the location of the CRAC system components in the control room.

O3 Operations Procedures and Documentation

O3.1 Unit 1 Reactor Vessel Level Indication Fluctuation During Draindown

a. Inspection Scope (71707)

On October 9, after lowering the Unit 1 reactor coolant system level to 120 inches above the core plate, indicated level increased by 40 inches when the first thermocouple conoseal was loosened. The inspector reviewed the licensee's investigation into the cause of the reactor coolant system level fluctuation and the corrective actions taken.

b. Observations and Findings

The inspector found that the licensee appropriately documented the level fluctuation incident in Operations Notification and Evaluation (ONE) Form 96-1102. The licensee's investigation revealed that the level fluctuation occurred as a result of a vacuum being drawn in the reactor vessel head area during the draindown process because the temporary hose for the reactor vessel head vent had some water in it and created a loop seal. Once the conoseal was loosened, the vacuum in the reactor vessel head returned to atmospheric pressure and the indicated level fluctuation occurred. The inspector noted that actual reactor vessel level changed by less than 1 inch and that the indicated level during the draindown was less than actual level.

The loop seal in the vent line occurred because Step 5.3.17 of Procedure SOP-101B, "Reactor Coolant System," was not adequate in alerting operators to the importance of ensuring that all water was drained from the vent hose when placing the system into service. The licensee immediately removed the water from the vent line and restored the reactor vessel level indication system. The licensee revised Procedure SOP-101B by providing a caution statement that described the importance of removing water from the vent line. The inspector

noted that the licensee was considering a modification to the vent line to replace the hose with a permanent piping arrangement, which would prevent a loop seal from occurring.

This licensee-identified and corrected violation of Technical Specification 6.8.1 is being treated as a noncited violation, consistent with Section VII.B1 of the NRC Enforcement Policy (NCV 50 445/9612-01).

O4 Operator Knowledge and Performance

O4.1 Operations Surveillance Tests

a. Inspection Scope (61726)

The inspectors observed all or portions of the following Unit 2 operations surveillance tests:

- Safeguards Slave Relay K641 actuation test
- Safety injection blackout sequencer test
- Emergency Diesel Generator 2-02 operability test
- Safeguards Slave Relay K634 actuation test
- Safeguards Slave Relay K644 actuation test
- Safeguards Slave Relay K645 actuation test
- Containment spray pump and valve operability test

b. Observations and Findings

The inspectors found that the surveillance tests performed by the operators were conducted well and in accordance with plant procedures. Communications between the operators at the controls and the unit supervisors was consistently good. Operators demonstrated a thorough knowledge of the procedural requirements and demonstrated a questioning attitude. Unit supervisors demonstrated good command and control of the surveillance activities observed. The inspectors reviewed selected procedures and verified that the surveillance test satisfied Technical Specification requirements and that the components were restored to their proper positions at the completion of the tests.

The inspectors found that the operators thoroughly reviewed the procedure during the pre-evolution briefing. The inspectors observed the shift manager use a briefing critique form to provide feedback to the unit supervisor concerning areas for improvement.

Prior to the emergency diesel generator operability test on October 10, the inspector discussed the effect that an offsite breaker problem had on the test and found that

the licensee had appropriately considered risk before proceeding with the test. The inspector found that the surveillance was well controlled and that the licensee's self-assessment efforts were good.

II. Maintenance

M1 Conduct of Maintenance

M1.1 Maintenance Observations

a. Inspection Scope (62707, 61726)

The inspectors observed all or portions of the following maintenance and maintenance surveillance tests, reviewed the Technical Specification requirements, and verified compliance with station procedures:

- Unit 1, safety chiller maintenance
- Unit 1, source range detector troubleshooting
- Unit 2, main feedwater pump maintenance
- Common Control Room Air Conditioner X-03 maintenance
- Unit 2, Service Air Compressor Breaker 2-01 maintenance
- Unit 2, channel calibration for reactor coolant flow, Loop 2
- Unit 2, channel calibration for reactor coolant flow, Loop 4
- Unit 1, Residual Heat Removal System Heat Exchanger 1-01 component cooling water return valve maintenance

b. Observations and Findings

The inspectors found that maintenance and maintenance surveillances were performed in accordance with station procedures. Work packages were properly maintained and the appropriate approvals were obtained prior to the initiation of work. The inspectors observed maintenance personnel follow appropriate personnel safety practices. Foreign material exclusion procedure improvements were evident. Foreign material exclusion boundaries were properly established and materials entering the areas were properly controlled. The inspectors also observed maintenance personnel use appropriate radiological work practices. In general, the inspectors concluded that maintenance was performed in a safe manner and the amount of required rework was less than in previous outages, indicating an improvement in quality.

M2 Maintenance and Material Condition of Facilities and Equipment

M2.1 Unit 1 Source Range Detector Degradation

a. Inspection Scope (62707, 92902)

The inspector observed portions of the licensee's troubleshooting efforts, reviewed engineering calculations for acceptance criteria, and discussed replacement and repair plans with licensee management. The inspector compared Technical Specification operability requirements with the licensee's outage schedule.

b. Observations and Findings

Following shutdown of Unit 1 for a refueling outage, the licensee identified that one of the source range detectors indicated approximately one-half of what the other detector indicated. Because the licensee's procedure required that both detectors indicate the same value within a factor of two, the licensee investigated the problem and later declared the channel inoperable. The licensee adjusted the detector high voltage and verified the proper operation of the detector. The inspector found that the licensee's evaluation and resolution of the problem was good.

The inspector reviewed the licensee's outage schedule and found that the licensee had correctly considered the effects of an inoperable detector into the schedule. The inspector found that the licensee was in compliance with Technical Specification prohibitions on adding positive reactivity without two operable detectors.

M2.2 Electrical Breaker Troubleshooting

a. Inspection Scope (62707)

On October 18, 1996, when Unit 2 was stable in Mode 3 after the reactor trip, the inspectors observed maintenance troubleshooting activities.

b. Observations and Findings

Electricians removed the Service Air Compressor 2-01 breaker and performed as-found testing. The inspectors noted that the breaker passed all the tests performed. The electricians were thorough in their visual inspection and measurements. The maintenance activity was characterized by good independent verification and sound personal safety practices. The inspectors noted that the system engineer was actively involved in the work package preparation and troubleshooting.

M3 Maintenance Procedures and Documentation

M3.1 Unit 2 Main Feedwater Pump Maintenance

a. Inspection Scope (62707, 37551)

The inspector reviewed the licensee's troubleshooting plans to repair Main Feedwater Pump 2-02 speed oscillations and observed portions of the repair.

b. Observations and Findings

The inspector found that the licensee's troubleshooting plans to repair the speed oscillations of Main Feedwater Pump 2-02 were thorough. The inspector noted that the licensee had determined potential causes for the oscillations prior to removing the pump from service. Appropriate vendor involvement was also assurred. The inspector concluded that the licensee's decision to downpower the unit to perform repairs to the feedwater pump was conservative.

The inspector also noted that the downpower and repairs were performed because an earlier work package, which was performed to rework the main feedwater pump hydraulic operating cylinder, did not specify the proper postmaintenance testing. The inspector discussed this with licensee management who indicated that this was a good lesson learned since the digital feedwater control system was more sensitive to small alignment changes than had been originally thought.

M4 Maintenance Staff Knowledge and Performance

M4.1 Common Control Room Air Conditioning Unit X-03 Corrective Maintenance

a. Inspection Scope (62707)

On October 23, the inspector observed prompt team electricians perform emergent maintenance on CRAC Unit X-03 in accordance with work order instructions and the applicable procedure. The purpose of the maintenance activity was to replace a failed heater element in the compressor crankcase for CRAC X-03.

b. Observations and Findings

The inspector found that the activity was performed in accordance with the work order instructions and procedural requirements. The inspector verified that CRAC Unit X-03 was appropriately tagged out of service, and the redundant train was operating in accordance with Technical Specification requirements. A quality control individual verified portions of the activity and signed the work package, when required. The Prompt Team supervisor was present near the end of the activity and monitored the job for conformance with management expectations.

The inspector verified that Technical Specification 3.7.7.2 was properly entered when the activity commenced and exited when the oil temperature for the compressor reached its operational limit.

M4.2 Unit 1 Safety Chiller Maintenance

a. Inspection Scope (62707)

The inspector reviewed Work Order 3-96-309131 and Maintenance Procedure MSE-P0-7333 which were being used to perform preventive maintenance on Safety Chiller 1-05. The inspector also discussed the ongoing activity with an electrician performing the maintenance.

b. Observations and Findings

The inspector found that the electrician was knowledgeable and that the work was being conducted under the supervision of a vendor representative.

The inspector also found that the work order being used to perform the work was not written clearly nor ordered sequentially. For example, Step 2A of the work order removed the refrigerant from the chiller while Step 2C stated, "record amount of refrigerant added or removed." The inspector noted that refrigerant was not added to the chiller until Step 11. Step 4 required that, "applicable sections of MSE-P0-7333, that can be accomplished while power is off," be performed. Procedure MSE-P0-7333 included a variety of instructions which included: oil filter replacement, compressor motor filter change, megger testing, and overload relay testing. Procedure MSE-P0-7333 was not written in sequential order and, consequently, different sections were in various stages of completion. The inspector concluded that the work order was poorly written in that work steps could not be followed as written and that successful completion of the work relied heavily on the skill and knowledge of the craft performing the maintenance.

III. Engineering

E1 Conduct of Engineering

E1.1 General Observations

In general, the inspectors observed good engineering support to the Unit 1 refueling outage and Unit 2 operation. System engineers were involved in emergent troubleshooting activities and typically provided timely and correct engineering support of operations and maintenance issues. The inspectors noted that the

licensee established a 24-hour engineering support team for the Unit 1 refueling outage and observed that the new team was an improvement in engineering support.

E2 Engineering Support of Facilities and Equipment

E2.1 Unit 1 Steam Generator Chemical Cleaning Impact

a. Inspection Scope (37551)

The inspector reviewed the engineering evaluation for the steam generator chemical cleaning process to determine whether control room habitability would be impacted.

b. Observations and Findings

The steam generator cleaning process involved the storage of several volatile chemicals. The inspector discussed the analysis of chemical concentrations that would be released to the atmosphere following a postulated rupture of the storage tanks with the lead engineer. The inspector independently verified the licensee's conclusion that there would be no impact on control room habitability.

The steam generator cleaning process described in the evaluation included a high temperature crevice cleaning step which required periodic opening of the atmospheric relief valves (ARVs) to depressurize the system and allow boiling in the steam generators. The gases vented through the ARVs were composed of water vapor and small amounts of ammonia, hydrazine, and methanol. The inspector verified that the calculations for hydrazine and methanol were acceptable. The amount of ammonia was evaluated using a Stone and Webster Engineering Corporation computer code. The evaluation stated that the amount of ammonia discharged from the ARVs was within the threshold limit of 25 parts-per-million (ppm). The inspector questioned what the actual value of the ammonia level was. The licensee indicated that the actual value was 0.02 ppm. After the inspector's questions, the licensee reanalyzed the ammonia value and found that the value was actually 7.0 ppm. Although the revised value was still below the 25 ppm threshold limit, the inspector was concerned about the error in the original calculation. The inspectors plan to evaluate the licensee's review process for approving calculations as an inspection followup item (IFI 50-445(446)/9612-02).

The inspector found that there would be no impact on control room habitability during the chemical cleaning process due to the stored chemical tanks or the venting process since the concentrations were within acceptable levels. In addition, other compensatory measures were planned to prevent gaseous vapors from entering the control room intake. These included: obtaining air samples during the venting process to monitor for ammonia, installing fans on top of the ARVs to

disperse the gases 100 feet in the air, and implementing a procedural requirement for operators to maintain control room intake through the damper farthest away from the ARVs.

E2.2 Relief Valve Testing Program

a. Inspection Scope (92903, 62707, 37551)

The inspector reviewed the licensee's corrective actions associated with past relief valve failures and evaluated changes to their relief valve testing program.

b. Observations and Findings

During a review of ONE forms, the inspector noted that a number of relief valve failures occurred during the Unit 2 Spring 1996 refueling outage. The licensee appropriately documented the failures on ONE forms and then wrote a single ONE form to combine the failures in one document (ONE Form 96-306). The inspector reviewed the engineering recommendations in the resolution of ONE Form 96-306 and found that the recommendations would generally improve relief valve test reliability, with one exception.

One recommendation resulted in a revision to Procedure MSM-G0-0204, "Safety Valve and Relief Valve Bench Testing." The revision, dated September 30, 1996, changed Step 8.3.1.22 to read, "if seat leakage was satisfactory, cycle valve as necessary to remove entrapped air, then reduce pressure to zero." The procedure then tests the "as found" pressure and records the value in Step 8.3.1.25. The inspector concluded that cycling the valve to vent the entrapped air in the relief valve inlet nozzle, as described in Step 8.3.1.22, had the potential to affect the "as found" setpoint test.

Technical Specification 4.0.5 requires that inservice testing of ASME Code Class 1, 2, and 3 valves be performed in accordance with Section XI of the ASME Boiler and Pressure Vessel Code. Section XI, Subsection IWV, 'Inservice Testing of Valves in Nuclear Power Plants," requires that valve testing be performed in accordance with the requirements stated in ASME/ANSI Operations and Maintenance, Part 10. Part 10, paragraph 4.3.1, requires that safety and relief valves meet the inservice test requirements of Part 1. Part 1, Paragraph 7.3, "Periodic Testing," requires that no maintenance, adjustment, disassembly, or other activity which could affect the "as found" set pressure or seat tightness data be conducted prior to valve testing.

The inspector noted that only one relief valve failed testing following the procedure change. One corrective action recommendation listed in the resolution of ONE Form 96-0306 required that a small group of mechanics should be trained on the use of the relief valve test apparatus because of the difficulty in getting consistent results. The inspector found that, during the Unit 1 refueling outage, relief valve testing was performed by the mechanical shop and not by a small group specially

contained an erroneous setpoint. Planners were reluctant to rely on the master equipment list because of past problems and planners did not always use the proper format for setpoint pressure tolerance in work packages which required mechanics to calculate the setpoints.

E8 Miscellaneous Engineering Issues (92700)

E8.1 (Closed) Licensee Event Report (LER) 50-446/94018: pressurizer safety valves found out of tolerance on October 25 and 26, 1994. The licensee performed maintenance on all three pressurizer safety valves and they were tested satisfactorily. The inspectors reviewed the results of pressurizer safety valve setpoint testing since the event report and concluded that no significant problem existed with the pressurizer safety valve test program or with pressurizer safety setpoint drifting.

E8.2 (Closed) LER 50-445/95002: dual unit automatic reactor trip caused by lightning strike. This event was discussed in NRC Inspection Report 50-445(446)/95-07. This LER was previously discussed in Safety Assessment and Quality Verification Inspection Report 50-445(446)/95-18. Following these trips, the licensee installed a new lightning deterrent system to help prevent lightning induced reactor trips; however, Unit 1 tripped on August 9, 1996, and Unit 2 tripped on September 18, 1996, both due to lightning strikes. These trips were reported in NRC Inspection Reports 50-445/96-10; 50-446/96-10 and 50-445/96-11; 50-446/96-11. Further corrective actions will be reviewed during the review of the corresponding LERs (50-445/96007 and 50-446/96006).

E8.3 (Closed) LER 50-446/96001: allowed outage time exceeded in conjunction with enforcement discretion for the reactor coolant system instrument channel. On December 31, 1995, the licensee discovered that the channel position indication for the wide range reactor coolant temperature was reading zero. The licensee found during troubleshooting that the red and black wires for the resistance temperature detector (RTD) were grounded. The licensee determined that the location of the ground was in an area inside containment that was normally only accessible during shutdown due to radiation levels and temperature. The Technical Specification action statement required that an inoperable instrument be restored to operable within 7 days. The licensee was granted a notice of enforcement discretion which allowed them to keep Unit 2 in Mode 1 with the wide range temperature remote shutdown until the February 1996 refueling outage.

The inspectors reviewed the licensee's One Form and Plant Incident Report and noted that the licensee found that the reflective insulation had crimped the RTD leads in two places, causing the failure. The licensee's corrective actions included trimming the insulation to avoid the possibility of crimping in the future. The licensee inspected the other loops and found one similar problem. The licensee adjusted the insulation to remove the potential of another failure. In addition, the

licensee initiated a work request to inspect the Unit 1 RTD leads. The inspector concluded that the licensee properly corrected the deficiency.

IV. Plant Support

R1 Radiological Protection and Chemistry Controls

R1.1 General (71707, 71750)

During periodic plant tours, the inspectors noted that radiation workers adhered to radiation work permits and followed appropriate radiation work practices. Radiation workers were observed utilizing radiation protection staff expertise to determine the specific hazards that they could encounter during their assigned activities. The inspectors observed that radiological hazards were properly posted and controlled in a manner that kept dose ALARA (as low as reasonably achievable).

R1.2 Unit 1 Pressurizer Surge Line Inservice Inspection and Heater Cable Maintenance

a. Inspection Scope (71707, 37551, 62707, 71750)

The inspector reviewed the licensee's ALARA, work order, and inservice inspection planning and observed the mock-up training facility, work order implementation, conduct of maintenance, inservice inspection, and radiological implementation for the Unit 1 pressurizer surge line weld inservice inspection activity.

b. Observations and Findings

The inspector reviewed the ALARA planning for the pressurizer surge line inservice inspection activity. The work plan involved erecting scaffolding, removing heat insulation, removing all the pressurizer heater cables, performing dye penetrant tests, ultrasonic tests of the Unit 1 pressurizer surge line welds, and restoring the pressurizer configuration.

The inspector noted that the licensee's ALARA plan estimate of the dose rates for the electrical work were very accurate and that the time estimates were slightly higher than actual. A review of the dose data following the completion of the activity showed that the dose rate estimate was very accurate. The inspector also noted that the ALARA planning for the insulation removal and installation was low (.560 person-rem planned versus .819 person-rem actual). The inspector was told that this was primarily due to difficulties encountered by the insulation workers. The inspector noted that the licensee designed new insulation for the pressurizer heaters which would allow easy access to the lower end of the pressurizer without removing all the pressurizer heater cables. The inspector concluded that the design change would reduce dose during future inservice inspection of the pressurizer.

The inspector performed a walkdown of the pressurizer heater mock-up training facility and found it to accurately represent the field conditions. The inspector's review of ALARA planning meeting minutes revealed that the mock-up training provided several insights on how to perform the heater cable removal and installation in a more efficient manner, which resulted in a dose savings of about 1.2 person-rem. The inspector concluded that the use of a mock-up facility in training electrical maintenance workers was a significant contribution towards maintaining dose ALARA.

The inspector observed licensee personnel perform the 10-year inservice inspection of the pressurizer surge nozzle safe-end welds as required by the inservice test program. The inspector concluded that the licensee followed inservice inspection procedures.

The inspector observed that the dose rate on one area of the pressurizer was about 1,200 millirem per hour on contact. Radiological support for the job was excellent; radiation protection technicians were very knowledgeable of the dose rates and maintained very good control of worker positioning to minimize accumulated dose.

c. Conclusions

The inspector concluded that ALARA planning was good (4.25 person-rem planned versus 3.15 person-rem actual). Radiation protection technicians provided excellent support to minimize the dose to workers. Inservice inspection was completed in accordance with station procedures. The use of a mock-up for the electrical work and the modification to the pressurizer insulation were found to be program strengths.

R4 Staff Knowledge and Performance

R4.1 Failure to Properly Post a Locked High Radiation Area

a. Inspection Scope (92904)

The inspector evaluated the effectiveness of licensee corrective actions following the identification of an improperly posted, locked high radiation area. The inspector also determined whether the cause was similar to a previously identified issue in NRC Inspection Report 50-445/96-08;50-446/96-08.

b. Observations and Findings

The radiation protection manager informed the inspector of a failure to properly post a locked high radiation area. After removing and bagging a spent seal injection filter from Unit 1 on October 28, a radiation protection technician placed the filter within a shielded booth located in the auxiliary building. The filter dose rate was

8,000 millirem per hour on contact and 1,500 millirem per hour at 1 foot. The highest dose rate outside the shielded booth was 450 millirem per hour on contact.

Technical Specification 6.12.2 requires that areas accessible to personnel with radiation levels such that a major portion of the body could receive a dose greater than 1000 millirem in 1 hour be provided with locked doors to prevent unauthorized entry. Licensee procedures provide alternate ways to satisfy the locking requirements when an area cannot be reasonably locked. In those cases, the licensee is required to barricade the area to the extent practical and post the area with a flashing light.

The licensee found that the off-going crew had replaced a Unit 1 seal injection filter late that night. Because the off-going lead radiation protection technician did not know the specific status of the filter, the on-coming lead technician had the area surveyed and found that the area within the shielded booth was required to be locked and posted as a locked high radiation area. The licensee immediately posted the booth and installed a flashing light as required by station procedures. The inspector concluded that the on-coming lead radiation protection technician demonstrated a questioning attitude and took the appropriate immediate corrective actions once the condition was identified.

The inspector noted that the area was not properly posted for a period of approximately 1.5 hours. The inspector also noted that the area surrounding the shielded booth was a high radiation area that required contacting radiation protection prior to entry. Therefore, little opportunity for excessive radiation exposure to personnel existed. However, the licensee's failure to properly post the area was a violation of Technical Specification 6.12.2.

The inspector questioned radiation protection department management about the effectiveness of corrective actions that were implemented for a previous violation cited in NRC Inspection Report 50-445/96-08; 50-446/96-08 where a locked high radiation area door was found by the inspectors to be unlocked. In addition, the inspector reviewed the licensee's changes to Station Administrative Procedure 660, "Control of High Radiation Areas," Revision 6, dated July 26, 1996, in response to the previous violation. The inspector concluded that the corrective actions from the previous violation would not have prevented the failure to properly post the area. This licensee-identified and corrected violation is being treated as a noncited violation, consistent with Section VII.B1 of the NRC Enforcement Policy (NCV 50-445(446)/9612-05).

c. Conclusion

The inspector concluded that the circumstances surrounding the failure to properly post an area were different from a previously identified violation and that the problem was identified by the licensee because of a questioning attitude demonstrated by radiation protection personnel. The licensee took immediate and

proper corrective actions which included properly posting the area and discussing lessons learned with the individuals involved.

S2 Status of Security Facilities and Equipment

S2.1 Protected and Vital Area Access Control

a. Inspection Scope (71750)

The inspectors evaluated protected and vital area access control throughout the report period by direct observations and discussions with security personnel.

b. Observations and Findings

The inspectors frequently toured the plant and discussed compensatory security measures with posted security personnel and concluded that compensatory measures were appropriate for the affected protected and vital area boundaries. Security personnel were knowledgeable of the purpose of their assignments and the potential threats caused by the degraded barriers. Overall, the inspectors concluded that access control was generally implemented in accordance with station procedures and security personnel were attentive and knowledgeable of their posted positions.

F1 Control of Fire Protection Activities

F1.1 Fire Impairments, Control of Fire Hazards, and Firefighting Equipment

a. Inspection Scope (71750)

The inspector observed the licensee implement their fire protection program during numerous outage-related maintenance activities.

b. Observations and Findings

The inspector observed the licensee use firewatches with the proper firefighting equipment available. Impaired fire doors had the proper fire impairment review and were tagged and tracked in accordance with licensee procedures. The inspector noted that the door to the fire hose station adjacent to the Unit 1 inverter installation activity was taped shut. Workers immediately untaped the hose station when the inspector identified the condition to them. The inspector concluded that this observation was isolated. Overall, the inspector concluded that the licensee properly implemented their fire protection program during outage activities.

F8 Miscellaneous Fire Protection Issues

F8.1 Fire Barrier Penetration Seal Review

a. Inspection Scope (64704)

The inspector visually inspected 22 silicone foam fire barrier penetration seals installed in openings surrounding large pipe located in the auxiliary building, also known as the common area, between Units 1 and 2. The purpose of this inspection was to verify that the design of the installed silicone foam penetration seals were qualified by a fire test report and/or an engineering evaluation.

b. Observations and Findings

The inspector verified that the 22 silicone foam fire barrier penetration seals were installed in the proper configuration and in accordance with Brand Industrial Service Company (BISCO) report 748-49, "Fire Test Configuration for a Three Hour Rated Fire Seal Utilizing BISCO SF-20 Where: A Steel Sleeve Condition with Pipe Penetrant Exists," dated July 9, 1981.

The inspector also reviewed the licensee's engineering evaluation of BISCO Report 748-49, which was documented in Engineering Report ER-ME-038, "Evaluation of Fire-Rated Penetration Seal Details," Revision 1, dated October 2, 1989. The purpose of the engineering report was to define the method, design inputs, assumptions, acceptance criteria and results of reviews of fire test used to support the design of fire rated penetrations seals. The inspector found that the engineering report provided a proper evaluation of BISCO Report 748-49.

c. Conclusion

The silicone foam fire barrier penetrations located in the common area were of proper configuration for use as a 3-hour fire-rated barrier as defined in BISCO Report 748-49.

V. Management Meetings

X1 Exit Meeting Summary

The inspectors presented the inspection results to members of licensee management at a final exit meeting on November 7, 1996. The licensee acknowledged the findings presented. No proprietary information was identified during the exit meetings.

ATTACHMENT

SUPPLEMENTAL INFORMATION

PARTIAL LIST OF PERSONS CONTACTED

TU Electric

Blevins, M. R., Plant Manager
Byrd, R. C., Mechanical Maintenance Manager
Curtis, J. R., Radiation Protection Manager
Ellis, S. L, Instrument and Controls Maintenance Manager
Flores, R., System Engineering Manager
Hope, T. A., Regulatory Compliance Manager
Kelley, J. J., Vice President, Nuclear Engineering and Support
Kross, D. C., Operations Support Manager
Moore, D. R., Operations Manager
Muffett, J. W., Station Engineering Manager

INSPECTION PROCEDURES USED

37551	Onsite Engineering
61726	Surveillance Observations
62707	Maintenance Observations
64707	Fire Protection Program
71707	Plant Operations
71750	Plant Support Activities
92700	Onsite Followup of Written Reports of Nonroutine Events at Power Reactor Facilities
92902	Followup - Maintenance
92903	Followup - Engineering
92904	Followup - Plant Support
93702	Prompt Onsite Response To Events At Operating Power Reactors

ITEMS OPENED

50-445/9612-01	NCV	Inadequate Procedure Resulted in a Reactor Vessel Level Indication Fluctuation During Reactor Vessel Draindown
50-445(446)/9612-02	IFI	Engineering Calculation Review and Approval Process
50-445/9612-03	VIO	Failure to Meet ASME/ANSI Code Requirements For Relief Valve Testing
50-445(446)/9612-04	IFI	Master Equipment List
50-445(446)/9612-05	NCV	Failure to Properly Post a Locked High Radiation Area

ITEMS CLOSED

50-445/9612-01	NCV	Inadequate Procedure Resulted in a Reactor Vessel Level Indication Fluctuation During Reactor Vessel Draindown
50-445(446)/9612-05	NCV	Failure to Properly Post a Locked High Radiation Area
50-446/94018	LER	Pressurizer safety valves found out of tolerance on October 25 and 26, 1994
50-445/95002	LER	Dual unit automatic reactor trip caused by lightning strike
50-446/96001	LER	Allowed outage time exceeded in conjunction with enforcement discretion for the reactor coolant system instrument channel

LIST OF ACRONYMS USED

ALARA	as low as reasonably achievable
ANSI	American Nuclear Standards Institute
ASME	American Society of Mechanical Engineers
ARV	atmospheric relief valve
BISCO	Brand Industrial Service Company
CFR	Code of Federal Regulations
CRAC	control room air conditioning
ERG	emergency response guideline
IFI	inspection followup item
LER	licensee event report
NCV	noncited violation
ONE	Operations Notification and Evaluation
ppm	parts per million
RTD	resistance temperature detector
VIO	violation