

**ENCLOSURE**

U.S. NUCLEAR REGULATORY COMMISSION  
REGION IV

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50-446

License Nos.: NPF-87  
NPF-89

Report No.: 50-445/99-12  
50-446/99-12

Licensee: TU Electric

Facility: Comanche Peak Steam Electric Station, Units 1 and 2

Location: FM-56  
Glen Rose, Texas

Dates: May 30 through July 10, 1999

Inspectors: Anthony T. Gody, Senior Resident Inspector  
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Division of Reactor Projects

ATTACHMENT: Supplemental Information

## EXECUTIVE SUMMARY

Comanche Peak Steam Electric Station, Units 1 and 2  
NRC Inspection Report No. 50-445/99-12; 50-446/99-12

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

### Operations

- Overall, plant cleanliness and material condition continue to be good. The licensee took prompt and effective steps to correct minor housekeeping issues as they arose (Section 02.1).
- Operators were generally attentive to the control boards and demonstrated a questioning approach towards routine plant operations. Control room operators did not enter a 4-hour shutdown action statement for a feedwater isolation valve which operated abnormally during a surveillance test. Although the licensee was able to demonstrate operability before the 4-hour allowed outage time would have expired, this demonstrated a departure from the licensee's typically conservative decision making (Section 04.1).

### Maintenance

- The conduct of maintenance and surveillance activities was good. Maintenance and surveillance activities conducted were well planned and safely coordinated. Personnel directing surveillance tests were knowledgeable, followed the procedures, and maintained good command and control of the activities. The licensee correctly identified and classified the failure of the Unit 2 charging flow control valve as a maintenance preventable functional failure (Section M1.1).

### Engineering

- The licensee was thorough in the evaluation of 6.9 kV and 480 volt relay setpoints as these setpoints were transferred from existing Technical Specifications to the Technical Requirements Manual during transition to Improved Technical Specifications. The licensee reviewed the basis for the setpoint data, which revealed several nonconservative values, rather than transferring it directly to the Technical Requirements Manual. Immediate corrective actions taken were appropriate, and the remaining corrective actions will be tracked in the licensee's corrective action program (Section E2.1).

### Plant Support

- In general, the inspectors observed good radiological practices being implemented by all plant personnel. Workers were familiar with radiological work permit requirements. Locked high radiation area doors and room postings were found as required. (Section R1).

- Personnel involved in the transfer of spent resin to a high-integrity container for shipment offsite were knowledgeable of the procedure and the expected dose rates during the process. Radiation protection technicians were effective in maintaining the dose ALARA during the evolution (Section R1.2).
- Radiation workers demonstrated a lack of knowledge on the operation of the PM-7 portal monitor. As a direct result, approximately 20 radiation workers did not recognize an actual alarming condition when an individual who recently had a radio-chemical treatment for medical reasons caused all the PM-7 portal monitors to alarm as out of service, an expected alarm condition for high radiation background (Section R4.1).

## Report Details

### Summary of Plant Status

Both units operated at approximately 100 percent power for the entire 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 operations. In general, the conduct of operations was professional and safety-conscious; specific events and noteworthy observations are detailed in the sections below. Through daily observations of control room activities, the inspectors concluded that both units were operated by knowledgeable operators using good self-verification techniques and communications.

#### **O2 Operational Status of Facilities and Equipment**

##### **O2.1 Plant Tours and Engineered Safety Features Walkdowns**

###### **a. Inspection Scope (71707)**

The inspectors used Inspection Procedure 71707 to walk down accessible portions of the following engineered safety features systems:

- Station service water intake structure
- Units 1 and 2 safeguards buildings
- Units 1 and 2 control room
- Units 1 and 2 auxiliary building
- Units 1 and 2 fuel handling buildings
- Units 1 and 2 electrical control building
- Units 1 and 2 turbine buildings

###### **b. Observations and Findings**

Overall, plant cleanliness and material condition continued to be good. However, during tours of the Units 1 and 2 safeguards building and the auxiliary building, the inspector noted boron crystals around compression fittings on the Containment Spray Pump 1-02 vent header piping. The inspector verified that this condition had been properly evaluated under the guidelines of the Radioactive System Leakage Inspection Program. The inspectors also found a rubber hose was fouling the door to the Component Cooling Water Pump 2-02 pump room with no work-in-progress tag on it. This was brought to the attention of the licensee and corrected.

During this inspection period, the licensee experienced high ambient temperatures in the Unit 2 Safeguards Building, Room 832. This room is a nonradioactive piping penetration room which historically develops high temperatures during the summer.

Temperatures in this room approached the Technical Specification limit of 104°F. The licensee took appropriate corrective action by staging a blower in the room to reduce temperatures.

c. Conclusions

Overall, plant cleanliness and material condition continued to be good. The licensee took prompt and effective steps to correct minor housekeeping issues as they arose.

**O4 Operator Knowledge and Performance**

**O4.1 Control Room Operator Performance**

a. Inspection Scope (71707)

The inspectors conducted tours of the control room to observe routine operator performance and discussed operator performance with licensee management.

b. Observations and Findings

On June 7, control room operators noticed a decreasing level in the Unit 2 volume control tank without any corresponding change in charging flow or letdown flow. A plant equipment operator was dispatched to the auxiliary building to investigate and discovered that the Unit 2 charging flow control valve (2-FCV-121) had developed a 6-gallon-per minute packing leak. Operators shifted normal charging to the positive displacement charging pump and isolated the leak. The failure and subsequent repair of Control Valve 2-FCV-121 is discussed further in the maintenance section of this report.

The inspector observed control room operators performing the monthly control rod exercise and repositioning for Unit 1. Operators displayed good self-checking and peer-checking techniques while manipulating reactivity controls. Two reactor engineers were also present to verify proper control rod alignment during the evolution.

On Friday, June 4, while performing a partial stroke test on the Unit 1, Steam Generator 1, feedwater isolation valve (1-HV-2134), the valve failed to operate properly. The test required operators to place the valve test switch in test which should have caused the valve to travel 10 percent in the closed direction, then automatically reopen fully. When operators performed this step, the valve traveled past the 10 percent position and stopped in an unknown intermediate position. The valve did not reopen even when operators placed the valve control switch in open. This occurred at approximately 8 p.m., at which point engineering personnel were contacted by the control room to troubleshoot the valve. Although operators were unable to open the valve and plant conditions did not support closing the valve any further to verify that it was not stuck, the control room staff made the decision not to enter the 4-hour shutdown action statement, required by Technical Specifications at that time, for an inoperable feedwater isolation valve. Approximately 3 ½ hours later, the action

statement was entered during troubleshooting activities when nitrogen was vented from the top of the valve actuator cylinder in an attempt to open the valve. This action proved successful and the valve stroked fully open.

c. Conclusions

Operators were generally attentive to the control boards and demonstrated a questioning approach towards routine plant operations. Control room operators did not enter a 4-hour shutdown action statement for a feedwater isolation valve which operated abnormally during a surveillance test. Although the licensee was able to demonstrate operability before the 4-hour allowed outage time would have expired, this demonstrated a departure from the licensee's typically conservative decision making.

## II. Maintenance

### **M1 Conduct of Maintenance**

#### M1.1 Maintenance and Surveillance Observations

a. Inspection Scope (61726, 62707)

The inspectors reviewed and/or observed the conduct of both plant surveillance and maintenance during the report period. The inspectors observed all or portions of the following activities:

- Unit 1, turbine-driven auxiliary feedwater pump operability test
- Unit 1, Train B auxiliary feedwater flow control valve testing
- Unit 1, positive displacement pump repacking
- Unit 2, Train A residual heat removal pump operability test
- Unit 2, charging flow control valve (2-FCV-121) repacking
- Control room ventilation Test CPX-VAFUPK-24

The inspector observed good prejob briefings and work practices associated with the work activities listed above. Personnel used good three-part communications, good safety practices, and properly adhered to radiation work permits and procedures. Specific observations follow:

The inspector observed activities associated with the Unit 1 turbine-driven auxiliary feedwater pump test in the Unit 1 safeguards building. Personnel were knowledgeable of their duties and responsibilities, observed proper safety precautions while starting the pump, and demonstrated good communications with the control room.

The inspector attended the prejob briefing and observed the Unit 2 Train A residual heat removal pump operability test in the control room. The briefing was thorough and covered coordination of the test, communications, and lesson learned. The test was successfully completed without any complications.

As discussed in Section O4.1 of this report, the Unit 2 charging flow control valve (2-FCV-121) developed a 6-gallon-per-minute packing leak on June 7, 1999. The inspector observed maintenance personnel remove the valve packing in preparation for repacking. Personnel observed proper safety precautions by ensuring that the valve bonnet was fully depressurized prior to removing the packing gland. A radiation protection technician was present and personnel adhered to the requirements of the radiation work permit. After replacing the valve packing, normal charging was shifted back to the centrifugal charging pumps, however, 2-FCV-121 again developed a 6-gallon-per-minute packing leak 3 days later. When the valve packing was disassembled the second time, a packing bushing was found cracked which suggested that uneven or insufficient torque had been applied to the packing gland during the last repacking. The licensee appropriately classified this as a maintenance preventable functional failure and will be monitoring the performance of the Unit 2 chemical and volume control system in accordance with paragraph a(1) of the Maintenance Rule (10 CFR 50.65).

The inspector observed the control room ventilation filter test on control room ventilation Filter X-24. A vendor was present to lend technical assistance to the test engineer and several other test engineers who were being trained to perform the test. The lead test engineer and vendor were both very knowledgeable in the operation of the test equipment, the test criteria, and the requirements of ANSI/ASME N510-1980, "Testing of Nuclear Power Plant Cleaning Systems." The test included a visual inspection of high efficiency particulate air (HEPA) filter housings and charcoal absorber trays, airflow measurements, and in-place leak testing of the charcoal absorber and HEPA filters. The inspection requirements and success criteria conformed to ANSI/ASME N510 1980. The inspector performed an independent visual inspection of portions of the system and found that the HEPA filter housings and charcoal absorber trays were in good condition. The inspector noted that the test procedure did not include correction factors for nonuniform distribution of trace gases through the filters. However, after observing the method used for injecting dioctyl pthalate and halide gas for the leak tests, the inspector concluded that this method was adequate to ensure uniform distribution of the trace gases over the entire surface area of the filter.

c. Conclusions

The conduct of maintenance and surveillance activities was good. Maintenance and surveillance activities conducted were well planned and safely coordinated. Personnel directing surveillance tests were knowledgeable, followed the procedures, and maintained good command and control of the activities. The licensee correctly identified and classified the failure of the Unit 2 charging flow control valve as a maintenance preventable functional failure.

**M8 Miscellaneous Maintenance Issues (92902)**

- M8.1 (Closed) Violation 50-445/9802-05: failure to follow new fuel receipt Procedure RFO-201, "Receipt, Inspection, and Storage of New Fuel and Insert Core Components."

The inspector reviewed the corrective actions completed by the licensee, which included changes to Procedure RFO-201, a reemphasis on procedure adherence, and a memo from the Vice President of Nuclear Operations to the Nuclear Generation Managers reinforcing their corrective action program responsibilities. The inspector concluded that the corrective actions were appropriate and, as such, this item is closed.

**III. Engineering**

**E2 Engineering Support of Facilities and Equipment**

- E2.1 480 Volt Degraded Voltage and Low Grid Undervoltage Relays

a. Inspection Scope (37750)

The inspector reviewed revisions to the 480 volt degraded voltage and low grid voltage relay setpoint calculations.

b. Observations and Findings

While validating setpoint data for conversion to Improved Technical Specifications, the licensee identified potentially nonconservative setpoints in Table 3.3-3 of Technical Specifications regarding the allowable value for the 6.9 kV and 480 volt bus undervoltage, degraded voltage, and low grid undervoltage relay settings. The allowable setpoints for these relays are established to protect electrical equipment from being exposed to sustained voltages less than 90 percent of their rated voltages. The existing allowable setpoints in the Technical Specifications are not high enough to ensure this protection in all cases. In addition, the calculation for the 480 volt relay setpoints did not take into consideration all channel tolerances as required by Regulatory Guide 1.105 (potential transformer accuracy, calibration equipment accuracy, and relay setpoint error). As a result, the setpoints for the 480 volt relays were subject to drifting below the allowable value prior to the next refueling outage when they are normally calibrated. The licensee reevaluated the error analysis included in the setpoint calculation and the sources of the error and determined that the relays would remain in tolerance until the end of the cycle. The inspector independently reviewed the calculations and agreed with these conclusions. The licensee has submitted a request to change the nonconservative values for the relay settings in Technical Specifications.

c. Conclusions

The licensee was thorough in the evaluation of 6.9 KV and 480 volt relay setpoints as these setpoints were transferred from existing Technical Specifications to the Technical Requirements Manual during transition to Improved Technical Specifications. The

licensee reviewed the basis for the setpoint data, which revealed several nonconservative values, rather than transferring it directly to the Technical Requirements Manual. Immediate corrective actions taken were appropriate and the remaining corrective actions will be tracked in the licensee's corrective action program.

#### IV. Plant Support

##### **R1 Radiological Protection and Chemistry Controls**

In general, the inspectors observed good radiological practices being implemented by all plant personnel, with some exceptions noted below. Workers were familiar with their radiological work permit requirements. The inspectors occasionally checked locked high radiation area doors and room postings; no discrepancies were found.

##### **R1.2 Spent Resin Transfer Operations**

###### **a. Inspection Scope (71750)**

The inspector observed licensee personnel transfer spent resin from the spent resin storage tank to a high integrity container in preparation for shipment to a low-level waste disposal site.

###### **b. Observations and Findings**

The inspector observed personnel transferring resin from the spent resin storage tank to a high integrity container in preparation for shipment offsite. Personnel were knowledgeable of the procedure and of the expected dose rates in the vicinity of the container and resin transfer hose during the operation. Radiation protection technicians made good use of remote monitoring equipment and closed circuit television cameras in order to maintain dose ALARA to personnel. Dose rates at various points in the process line exceeded 1 rem per hour during transfer operations.

###### **c. Conclusions**

Personnel involved in the transfer of spent resin to a high-integrity container for shipment offsite were knowledgeable of the procedure and the expected dose rates during the process. Radiation protection technicians were effective in maintaining the dose ALARA during the evolution.

##### **R2 Staff Knowledge and Performance**

##### **R4.1 Radiation Worker Knowledge of PM-7 Portal Monitor Operation**

###### **a. Inspection Scope (71750)**

The inspector investigated why a number of radiation workers passed through three PM-7 portal monitors located at the alternate access point exit on June 21 even though

they were alarming as out of service. The PM-7 portal monitors located in the alternate access building are not required by any regulation, but are used as a stopgap measure to identify any radioactive material potentially leaving the site.

b. Observations and Findings

On June 21, while exiting the alternate access point, the inspector observed an individual standing in front of an alarming PM-7 portal monitor which subsequently went out of service. The individual then attempted to exit through another portal monitor and it also began alarming along with the third, and last, portal monitor that another radiation worker was exiting through at the same time. Both of these portal monitors subsequently went out of service. Several other radiation workers arrived at the scene on their way out of the alternate access building and were appropriately reluctant to leave since all the available portal monitors were now alarming as out of service. The inspector asked the personnel standing by the portal monitors if they knew why the portal monitors were all alarming as out of service. None knew why, including the individual who first caused the portal monitors to alarm. One individual speculated that a radioactive waste container had possibly been moved nearby, thus raising the background radiation levels above the minimum for the portal monitors. The inspector noted that, when radioactive waste containers were moved, the out-of-service alarms were typically transient in nature, and these alarms were continuously locked in. The individual agreed with the inspector's observation.

The inspector used a nearby phone to contact the radiation protection department. While the inspector was on the phone, personnel standing by (approximately 20, by this time) were instructed by a security officer to exit the alternate access point while the portal monitors were still alarming as out of service. The inspector asked the radiation protection technician on the phone if anyone in their office had just given security permission to let personnel through the alarming out-of-service portal monitors. The individual did not know. As soon as all the individuals left, the alarms cleared. The inspector informed the radiation protection technician that he would wait by the portal monitors until a radiation survey was conducted. The subsequent radiation survey revealed that no contamination had been transferred to the area.

Because regulations do not require radiation monitoring at protected area access points, no violation of requirements occurred when personnel were instructed to pass through the portal monitors while they were out of service. The inspector was concerned, however, that what he had observed was a significant lack of understanding of the operation of a PM-7 portal monitor by radiation workers. The inspector was concerned that one of the individuals, particularly the radiation worker first observed to cause the portal monitors to alarm, was contaminated or had radioactive material with him. None of the radiation workers knew that the PM-7 portal monitor could give an alarming out-of-service indication when a nearby individual is contaminated or carrying radioactive material raising the background radiation levels to unacceptable levels. None of the radiation workers present at the alternate access point questioned if one of them could have been contaminated.

The following day, the inspector attempted to identify the individual who had first caused the portal monitors to alarm by talking with approximately 20 engineers and the radiation protection department. Later that same day, the licensee identified the individual and determined that he had recently undergone a radio-chemical treatment for medical reasons.

c. Conclusions

Radiation workers demonstrated a lack of knowledge on the operation of the PM-7 portal monitor. As a direct result, approximately 20 radiation workers did not recognize an actual alarming condition when an individual who recently had a radio-chemical treatment for medical reasons caused all the PM-7 portal monitors to alarm as out of service, an expected alarm condition for high radiation background.

**V. Management Meetings**

**X1 Exit Meeting Summary**

The inspector presented the results of the inspection to members of licensee management on July 15, 1999. The licensee acknowledged the findings presented. No proprietary information was identified.

