ENCLOSURE

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Inspection Report: 50-445/95-27
50-446/95-27

Licenses: NPF-87
NPF-89

Licensee: TU Electric
Energy Plaza
1601 Bryan Street, 12th Floor
Dallas, Texas

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

Inspection At: Glen Rose, Texas

Inspection Conducted: October 30 through November 2, 1995

Inspectors: Thomas H. Andrews Jr, Radiation Specialist
Plant Support Branch, Division of Reactor Safety

Accompanying
Personnel: Michael Hay, Plant Support Branch
Division of Reactor Safety

Approved: Blaine Murray 11/29/95
Blaine Murray, Chief, Plant Support Branch Date
Division of Reactor Safety

Inspection Summary

Areas Inspected (Units 1 and 2): Routine, announced inspection of the radiation protection program. Specific areas inspected included planning and preparation of radiation work, training and qualification of personnel, external exposure control, and control of radioactive materials.

Results (Units 1 and 2):

Plant Support

- Planning and preparation for radiation work were coordinated with other work groups to help minimize radiation exposures (Section 2.1).

- The radiation worker training was adequate (Section 2.2).
- Management and administrative controls of external radiation exposure met requirements and were designed to maintain exposures as low as reasonably achievable (Section 2.3).
- The licensee identified a potential for improper release of contaminated materials from the radiological control area. An aggressive monitoring process for the use of drip catch/containment devices was established (Section 2.4).

Summary of Inspection Findings:

- Violation 445/9502-01; 446/9502-01 was closed (Section 3.1)
- Violation 445/9508-01; 446/9508-01 was closed (Section 3.2)
- Inspection Followup Item 445/9515-01; 446/9515-01 was closed (Section 3.3)
- Inspection Followup Item 445/9520-01; 446/9520-01 was closed (Section 3.4)
- Inspection Followup Item 445/9520-02; 446/9520-02 was closed (Section 3.5)

Attachment:

- Attachment - Persons Contacted and Exit Meeting

DETAILS

1 PLANT STATUS

Units 1 and 2 operated at full power during the inspection period. There were no operational occurrences that impacted the inspection. A practice emergency exercise was conducted on November 2 where the inspector observed ongoing emergency response activities during plant tours. Observations regarding the practice emergency response exercise were passed on to the licensee.

2 OCCUPATIONAL RADIATION EXPOSURE (83750)

2.1 Planning and Preparation

The inspector discussed the radiation work planning process with licensee personnel. The personnel were knowledgeable of procedures regarding issuance of radiation work permits and the content requirements. The as low as reasonably achievable (ALARA) reviewers were involved in plant planning meetings and used various means for maintaining awareness of ongoing activities. The licensee was able to present documentation to show where there had been negotiation of work practices and dose estimates for jobs; indicating a strong ALARA mindset.

The licensee stated that they were considering eliminating the current practice of generating radiation work permits in their present format. Instructions, area conditions, and requirements for the worker would be included as part of the work package. The licensee indicated that this would allow them to establish more direct control over individual jobs and would allow development of a component-based radiation exposure history.

Technical Specification 6.8.1 referenced Appendix A of Regulatory Guide 1.33, Revision 2, February 1978. Item 7.e.1 of Appendix A identified the need for procedures for "Access Control to Radiation Areas Including a Radiation Work Permit System." The licensee was reminded of this commitment. While the radiation work permit system may eventually be merged into the routine work package development process, the licensee recognized the need for access control to the radiological control area. The licensee indicated that the concept was still being evaluated and that there appeared to be some benefits to the change.

2.2 Training and Qualification of Personnel

The inspector met with representatives of the training department and discussed training for new personnel, refresher training for radiation workers, and the radiation protection technician qualification process. There were no significant changes to the process from that described in previous inspection reports.

As part of gaining access to the plant, an accompanying inspector participated in the complete general employee training process. This process covered site access and radiation worker/practical factors training. The site access and radiation worker training was performed using computer based training. During the practical factors portion of the process, the inspector toured the training area discussing observations with training personnel. There were no significant issues identified from the general employee training process.

The inspector reviewed training records and resumes for ALARA technicians to determine whether the individuals were appropriately qualified to carry out their assigned responsibilities. These individuals were selected for review because they were required to meet the requirements of a senior radiation protection technician. No discrepancies were noted regarding licensee's qualification of these individuals as senior radiation protection technicians.

2.3 External Exposure Control

The inspector toured the radiation control area on several occasions to observe plant conditions, activities within the plant, and to observe the use of dosimetry. The only "high radiation area" job that was observed was preparation for a resin transfer. During this process, the inspector observed that whole body dosimetry was being worn in the chest area and in the proximity of thermoluminecent dosimetry. For other, non-high radiation area work, some workers did not have thermoluminecent dosimeters assigned to them, but were wearing electronic dosimetry in the chest area. This was consistent with guidance provided in training and with information postings at the access point to the radiological control area.

While entering into the radiological control area, the inspector observed that electronic dosimeters had colored calibration stickers attached. The stickers were red or yellow, depending on the calibration date. The inspector observed that the information on many of the red stickers was worn off through use. Some of the sticker information was so diminished that it was not identifiable as a calibration sticker.

The inspector reviewed licensee procedures regarding calibration of radiation protection instrumentation. The procedure had two statements that could be applied to the calibration stickers. One statement was that calibration stickers shall be applied to all radiation protection instrumentation indicating the instrument's calibration due date. The other statement required workers to verify instruments were calibrated prior to use.

The inspector discussed this observation with the licensee. The licensee presented information indicating that electronic dosimeters with red calibration stickers had a calibration due date in January 1996. Yellow stickers on electronic dosimeters indicated a July 1996 calibration due date. As such, all of the dosimeters available for use were in calibration. The licensee stated that they implemented a color scheme to allow them to easily identify and collect dosimetry for calibration.

When questioned about the potential use of a dosimeter that was out of calibration since the worker could not read the calibration due date, the licensee stated that a feature of the access control computer prevented this. Each dosimeter had an assigned instrument number. Each instrument had its calibration due date stored in the computer.

When a worker used a dosimeter to sign into the radiological control area, the dosimeter's instrument number was electronically read into the computer and compared with information in the database. If a worker were to attempt to use a dosimeter that was out of calibration or not in the database, the computer would not allow the worker to log in to the area with that dosimeter. A message would appear on the screen indicating the problem as well as sending a message to the access control office to alert the access control supervisor. Using a dosimeter that was out of calibration from the calibration laboratory, the licensee demonstrated this feature to the inspector.

Because the licensee had affixed color coded calibration stickers to the dosimeters that were keyed to a calibration due date, and because the licensee had taken measures to ensure that a worker did not inadvertently use a dosimeter that was out of calibration, the inspector determined that this observation had minor safety significance. The inspector noted the placement of personnel monitoring devices and entering radiological controlled areas without proper personnel monitoring were issues identified in NRC Inspection Reports 50-45/95-08; 50-446/95-08 and 50-445/95-15; 50-446/95-15.

The inspector observed an entry into the volume control tank room that was posted and controlled as a high radiation area. The purpose of the entry was to look at the insulation around a line for a plant modification involving heat tracing of borated water lines. The licensee chose to use a robot with camera in lieu of sending workers into the radiation area.

The licensee demonstrated some of the features of the robot such as the ability to carry a survey meter, to retrieve materials, etc. As part of the demonstration of the use of robotics to reduce radiation exposures, the licensee had made a video tape of an entry of one of their robots into the biological shield area inside containment prior to an earlier outage. The purpose of the entry was to identify the source of a reactor coolant system leak. The video tape demonstrated the ability of the robot to access a hazardous environment and to view the area. The licensee said there were times they put dosimetry on the robot to monitor dose rates and to estimate dose savings.

2.4 Control of Radioactive Materials

During a review of radiological incident reports, the inspector noted there had been an incident involving the potential release of contaminated material from the radiological control area. In the particular incident, workers who had performed work in a beta contamination area used the small article

monitors to check for contamination on tools and other materials to be removed from the area. The small article monitors were not configured to detect beta contamination. Articles that were released using the small article monitors in this event were retrieved and monitored for contamination and dispositioned properly.

As a corrective action, the licensee initiated a process where individuals have to request permission to use the small article monitors from the health physics staff. The staff would question workers as to where the articles had been used to determine if there was a potential for beta contamination. If the potential was very low, the small article monitors could be used. Otherwise, the articles would be surveyed by a health physics technician.

The inspector toured the plant on several occasions to observe plant conditions and activities within the plant. The inspector observed postings and confirmed radiological survey results. Doors to locked high radiation areas were challenged and verified as being locked. There were no discrepancies noted related to postings or access control.

Areas throughout the radiological control area were clean, reflecting good housekeeping practices. The licensee had initiated a program to aggressively address the number of drip catches and containments used in the radiological control area. The status of work to reduce leakage and to remove drip catches and containments was presented to management weekly. The licensee stated that the program for control of these devices would be turned over to the radwaste department in December since use of these devices tended to affect radwaste volumes.

The inspector observed the delivery of fuel storage racks to be installed in the spent fuel pool. The health physics technicians controlled the work process, performed area surveys, and controlled the vehicle access to ensure that there was not a spread of contamination from the radiological control area. The technician did a good job at controlling access through the gate to ensure that personnel that were not signed in on a radiation work permit did not enter the area.

3 FOLLOWUP ON VIOLATIONS AND INSPECTOR FOLLOWUP ITEMS (92702)

3.1 (Closed) Violation 50-445/9502-01; 50-446/9502-01: Failure to Implement Sampling and Monitoring Requirements

A violation was identified for numerous examples of missed liquid and gaseous sample collections required by the offsite dose calculation manual. Additionally, a missed sample from the low volume waste pond was identified as a repeat violation. These were all self-identified by the licensee and were considered as a problem in the control of radioactive effluent.

The licensee ascertained, as part of their followup to this violation, that although previous corrective actions appeared to be adequate, the assessment of generic considerations for controlling offsite dose calculation manual related activities was less than adequate. Previous corrective actions focused on one department rather than a generic perspective. Their review also revealed that the delineation of the overall responsibility for the monitoring and controlling the implementation of the offsite dose calculation manual program was unclear.

As part of the corrective actions, the licensee implemented an improved trending and analysis process to identify adverse trends and enhanced management awareness of offsite dose calculation manual concerns and problems by including this type of information in the "Monthly Management Report." The licensee also issued a memorandum to all personnel that clearly delineated responsibilities for monitoring and controlling the implementation of the offsite dose calculation manual program.

These activities were consistent with those in the licensee's response to the violation. Because the licensee has complied with the actions discussed in their response, this violation was closed.

3.2 (Closed) Violation 50-445/9508-01; 50-446/9508-01: Dosimetry Usage in Non-Uniform Dose Fields

During Refueling Outage 1RF04, extremity dosimetry was provided during steam generator diaphragm removal as previous experience had demonstrated the presence of activated corrosion products. Neither multiple dosimeters nor extremity dosimetry were provided during the remainder of steam generator work.

Whole-body dosimetry was left in the worker chest area throughout Refueling Outage 1RF04 steam generator work activities. The whole-body dosimetry had not been relocated to the upper arm for arm entries into the steam generators. Other means of dose assignment, such as timing the entries in conjunction with survey data, were not utilized. Information provided by the licensee indicated that a significant dose gradient did exist. However, an assessment of the gradient was not performed to justify not relocating the whole-body dosimeter to the arm for arm entries into the steam generators.

Because steam generator work involved entries into high radiation areas, personnel dosimetry was required. The failure to assess the deep-dose equivalent by monitoring whole-body dose at the highest whole-body receptor location (the upper arm) or by other means when making arm entries was identified as a violation of 10 CFR 20.1201(c).

As part of the corrective actions, the licensee analyzed and compared survey data to thermoluminecent dosimeter results for affected individuals. Based on their assessment, the maximum additional dose applied to an individual's dose

record was 69 millirem for a worker who received a measured dose of 931 millirem. The maximum percent deviation between measured dose and the calculated dose was 9.1 percent for a worker who received a measured dose of 342 millirem.

The inspector reviewed the corrective actions to prevent future violation. These actions were confirmed to be consistent with those in the licensee's response to the violation. Because the licensee has complied with the actions discussed in their response, this violation was closed.

3.3 (Closed) Inspection Followup Item 50-445/9515-01; 50-446/9515-01: Access to Radiological Control Area with Improper Dosimetry

The licensee began using electronic dosimetry in early 1995. As part of the process, they identified some instances where workers entered the radiological control area without dosimetry or with dosimetry that had not been switched on. Compared to the previous use of pocket ion chamber-type dosimetry, a new problem arose where the electronic dosimeters may not be activated if a person removed the dosimeter from the programming unit before the sign in process was completed. The inspector noted that between June and October 1995 that 25 incidents out of about 50,000 entries had been identified where workers had entered the radiological controlled area without electronic dosimeters being in a proper operating condition.

The inspector reviewed the licensee's actions to address problems with the electronic dosimeters. The inspector noted that the licensee had implemented several new software changes, which now verify that electronic dosimeters are in a proper operating condition before the worker enters a radiological controlled area. In addition, beginning January 1, 1996, thermoluminescence dosimeters will be provided to all workers.

The inspector concluded that the licensee's actions were appropriate to close this item.

3.4 (Closed) Inspection Followup Item 50-445/9520-01; 50-446/9520-01: Location of Control Air Sampler in Compliance with Offsite Dose Calculation Manual

According to Table 3.12-1 of the offsite dose calculation manual, the control air sampler is to be located 15 to 30 kilometers in the least prevalent wind direction from the plant. The control air sampler was located at the appropriate distance from the plant, however, the least prevalent wind direction from the plant was in the east sector rather than the southwest sector where the control air sampler was located during the implementation of the station's preoperational and operational radiological environmental monitoring programs. The southwest sector was the fifth least prevalent wind direction from the plant

Footnote 3 to Table 3.12-1 provides a definition for the purpose of the control air sampler and states, that, "The purpose of this sample is to obtain background information. If it is not practical to establish control locations in accordance with the distance and wind direction criteria, other sites that provide valid background data may be substituted." At the time of the inspection, the licensee could not provide documentation and rationale for locating the control air sampler in the southwest sector. Following the inspection, the licensee evaluated the control air sampler location and provided written documentation to support the choice of location.

The inspector reviewed this evaluation and determined that it satisfied the criteria listed in the offsite dose calculation manual. The historical data for wind data indicated that the wind blew towards the east 2.2 percent of the time. This was compared to the 2.9 percent time duration that the wind blew towards the southwest. Comparison of deposition in these directions showed that if the east sector would have a potential deposition 85 percent lower than the maximum wind direction versus 81 percent in the southwest sector. Given the small difference (4 percent), the licensee's justification for not relocating the control air sampler was valid.

Based on the documented evaluation results, this followup item was closed.

3.5 (Closed) Inspection Followup Item 50-445/9520-02; 50-446/9520-02: Dust Loading of Air Particulate Filters

According to Table 3.12-1 of the offsite dose calculation manual, a more frequent sampling of air particulate than weekly was required if dust loading of the air particulate filter was identified during the weekly sampling. Over the past 2 years, there were numerous occasions when the "as found" (off) sample flow rate recorded was less than the "start" (on) sample flow rate for that air sampler. This indicated that some physical reason caused the reduced air flow through the air particulate filter (possibly dust loading).

There was no criteria established for the evaluation of the cause of the reduced air sample flow when noted and recorded. There was also no criteria established to determine if the reduced air flow was caused by dust loading of the air particulate filter and whether an adequate sample was collected. If dust loading caused the reduced flow rate through the air particulate filter, a more frequent collection of the air particulate sample might be required for compliance the offsite dose calculation manual.

The licensee contacted the vendor for the air samplers and learned that a minimum flow rate of 20 liters per minute was considered to be a "minimum acceptable" flow rate for sampling purposes. The minimum ending flow rate observed over the two year period was 26 liters per minute. Therefore, the air sampling results for samples collected over the period were judged to be valid.

The licensee determined that there were two conditions that could result in lower than the desired flow rate of 30 liters per minute. One condition would be where there was a blockage of the filter media such as observed due to dust loading. The other could be the mis-adjustment of the air flow rate regulator. In the first case, air flow rate would return to the initial flow rate of 30 liters per minute when the sample head was removed. In the second case, the flow rate would read below the 30 liters per minute and would not change when the sample head was removed. The licensee has revised procedures for environmental air sample collection to reflect this information. Additionally, the procedure revision called for an evaluation to determine if increased sampling is warranted when filter loading or reduced flow rate is observed.

These actions adequately addressed the inspector's concerns. As such, this followup item is closed.

ATTACHMENT

1 PERSONS CONTACTED

1.1 Licensee Personnel

J. M. Blaikie, Health Physicist
*M. R. Blevins, Plant Manager
*R. S. Carr, Radiation Protection Supervisor (Dosimetry)
*J. R. Curtis, Radiation Protection Manager
*R. E. Fishencord, Radiation Protection Supervisor (ALARA Coordinator)
*N. S. Harris, Senior Regulatory Compliance Specialist
*T. A. Hope, Regulatory Compliance Manager
*D. C. Kay, Radiation Protection Supervisor (Technical Support)
A. H. Redlow, Health Physicist
*R. J. Sandford, Radiation Protection Training Specialist
*D. L. Stearns, Senior Nuclear Specialist

1.2 NRC Personnel

*T. Andrews, Radiation Specialist, Plant Support Branch, Division of Reactor Safety
H. Freeman, Resident Inspector, Comanche Peak
A. Gody, Senior Resident Inspector, Comanche Peak
*M. Shannon, Radiation Specialist, Plant Support Branch, Division of Reactor Safety

In addition to the personnel listed above, the inspector contacted other personnel during the inspection.

*Indicates those present at the exit meeting on November 3, 1995.

2 EXIT MEETING

An exit meeting was conducted on November 3, 1995, via telephone conference call. During this meeting, the inspector reviewed the scope and findings of the report. The licensee did not express a position on the inspection findings documented in this report. The licensee did not identify as proprietary any information provided to, or reviewed by, the inspectors.