APPENDIX

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Inspection Report: 50-445/93-46
50-446/93-46

Licenses: NPF-87
NPF-89

Licensee: TU Electric
Skyway Tower
400 North Olive Street, L.B. 81
Dallas, Texas

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

Inspection At: Glen Rose, Texas

Inspection Conducted: December 26, 1993, through February 5, 1994

Inspectors: D. N. Graves, Senior Resident Inspector
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Division of Reactor Projects

March 2, 1994
Date

Inspection Summary

Areas Inspected (Units 1 and 2): Routine, unannounced inspection of onsite followup of events, operational safety verification, maintenance and surveillance observations, startup test results evaluation, followup on corrective actions for violations, other followup, and followup of licensee event reports (LERs).

Results (Units 1 and 2):

- Observed operator performance during a post-trip evaluation, routine operations, and a high risk activity was considered to be good (Sections 2, 3.1, and 3.5).
- Safety-related systems were found to be properly aligned (Section 3.4).
- Radiation Protection and Security personnel performance was determined to be excellent, although one minor incident was noted regarding an

improperly established radiation barrier (Sections 3.1, 3.2, 3.3, 4.3, and 5.2).

- Conduct of maintenance activities in the field was very good, although several weaknesses were noted regarding the operations impact review, compensatory measures planned, and coordination/communication between departments regarding an annunciator power supply repair. Several other maintenance activities were conducted with excellent planning and prejob activities (Section 4).

- Surveillance testing was well coordinated and conducted (Section 5).

- Startup test results evaluation concluded that the tests were appropriately conducted, documented, and that identified deficiencies were appropriately resolved (Section 6).

Summary of Inspection Findings:

- Violation 445;446/92201-01 was closed (Section 7.1).
- Violations 445;446/92201-02 and 446/9260-03 were closed (Section 7.2).
- Violation 446/9260-01 was closed (Section 7.3).
- Violation 445;446/9262-01 was closed (Section 7.4).
- Violation 445;446/9262-02 was closed (Section 7.5).
- Inspection Followup Item (IFI) 445/9162-04 was closed (Section 8.1).
- IFI 445/9222-01 was closed (Section 8.2).
- IFI 445/9229-06 was closed (Section 8.3).
- IFI 445/9259-01 was closed (Section 8.4).
- Safeguards Event Report 445/90-S01 was closed (Section 9.1).
- LER 445/93-001 was closed (Section 9.2).
- Violation 445;446/92201-03 was closed (Section 9.2).

Attachment:

- Attachment - Persons Contacted and Exit Meeting

DETAILS

1 PLANT STATUS (71707)

At the beginning of this inspection period, Unit 1 was critical in Mode 2 recovering from a reactor trip that occurred on December 24, 1993. The unit was raised to 100 percent power and operated at that power level until a turbine generator and reactor trip occurred on February 1, 1994, as a result of a spurious main generator primary water low flow signal. The unit was made critical on February 3 and power was subsequently increased to 100 percent where it remained until the end of the inspection period.

Unit 2 operated at power during the entire inspection period. Power was decreased to as low as 55 percent for fuel conservation purposes. The licensee was managing their fuel inventory such that the unit would be available for full-power operation during the anticipated summer peak load period.

2 ONSITE FOLLOWUP TO EVENTS (93702)

On February 1, 1994, at approximately 9:38 p.m. (CST), Unit 1 experienced a turbine generator/reactor trip following receipt of an indication that main generator primary water stator flow was low. All safety systems responded as required and the plant was stabilized in Mode 3.

Troubleshooting by the licensee determined that no cause for an actual low flow condition could be found. The system was still intact and proper flow was indicated. Ultrasonic flow measurements determined that the flow instruments were indicating properly. The flow transmitters were verified to be properly calibrated and that the sensing lines were free of obstructions. The isolation valve for stator water flow, a manual valve, was manually stroked and verified to be operating properly. The valve was also radiographed to ensure that the internals were still intact.

Troubleshooting of the electronic circuits associated with the turbine generator determined that a ground existed on the Main Turbine No. 1 control valve automatic turbine tester motor limit switch and was subsequently repaired. However, no definite link could be established between the ground on the valve limit switch and the indicated generator primary water low flow condition. The power supplies to and from the flow transmitters were monitored for performance. Although some noise and electrical spikes were detected on the power supplies, there was no correlation between the occurrence of the noise spikes and any indicated flow anomalies. Also, the power supplies and transmitter output signals were monitored for abnormalities while keying security and operations hand-held radios. Again, no variations in indicated flow could be induced by keying of the hand-held radios.

While a precise cause for the indicated low generator primary water stator flow could not be determined, the troubleshooting actions led the licensee to conclude that the cause was a spurious electronic signal. This conclusion was

documented by the licensee as part of an engineering evaluation of the event and was attached to the post-trip review package.

The inspector reviewed the post-trip evaluation, including the engineering evaluation, and determined that the licensee had taken reasonable measures to attempt to identify and correct the cause of the trip, and that the decision to restart the unit was appropriate.

The reactor was made critical on February 3, 1994, at approximately 8:31 p.m. During the turbine startup, additional monitoring was provided for primary water flow to the stator utilizing the Data Acquisition System, Stator Bar Monitor, and ultrasonic flow measurement equipment. No abnormalities in flow were detected, and the additional monitoring continued throughout the remainder of the inspection period.

3 OPERATIONAL SAFETY VERIFICATION (71707)

3.1 General Plant Tours

Reviews of operating logs for both units and the station log concluded that entries were generally good. Active limiting conditions for operation were selected at random and verified to be accurately logged and the action requirements were verified to be properly implemented. Control room operators were found to be attentive to their panels and knowledgeable of plant and equipment status.

Plant tours conducted by the inspectors determined that the general plant housekeeping was good. The Thermo-Lag upgrades in progress in Unit 1 and common areas created a construction-like atmosphere with the amount of scaffolding and plastic sheeting utilized. The areas where the Thermo-Lag was being installed were well contained, and no personnel safety or operational concerns were identified.

Tours of the Central Alarm Station found the security staff attentive to plant security equipment and testing activities.

3.2 Unit 2 Turbine Building Walkdown

On December 28, 1993, while conducting a tour of the Unit 2 turbine building, the inspector observed a radiation protection (RP) technician performing radiation surveys on a posted radiation and radioactive materials storage area. This temporary radioactive materials storage area was established to accommodate radioactive demineralizers that were being used to assist in processing waste water from the Unit 1 outage. The technician and inspector identified that one area had not been properly posted and was missing the barrier rope. However, this access/egress route was not a normally traveled path. The highest general radiation level in the area was 0.2 mrem/hr which was below the maximum permissible level of radiation in an unrestricted area. No radiological safety hazard was present and the discovered discrepancy was

promptly corrected. Operation Notification and Evaluation (ONE) Form 93-2490 was written to document the discrepancy.

3.3 Unit 1 Containment Walkdown

The inspector accompanied operations personnel during a walkdown of Unit 1 containment on December 29, 1993. RP personnel conducted an excellent briefing concerning expected radiation levels, off-limit areas, and neutron dose areas. Most accessible areas of containment were visually inspected for primary and secondary leaks. The walkdown was adequate; however, some areas were bypassed and others only given a cursory inspection. Operations personnel did not conduct the containment walkdown per Standing Order No. 93-009 which discussed the need to examine previously identified leaks to ensure that the identified conditions had not changed. This observation was discussed with operations management.

At the time of the walkdown, Unit 1 containment was having approximately 600 gallons of water per day pumped out of the sumps. Numerous primary leaks consisting of extremely minimal leakage as evidenced by boron crystal buildup (pipe cap and fitting leaks) were identified as well as several secondary leaks from steam generator recirculation system relief valves. These identified secondary leaks were considered to be the majority of the water inventory being pumped from containment. During the inspection, the inspector completed a visual inspection of approximately 20 percent of the containment sump screens. All screens inspected displayed no physical damage and the sump enclosures provided no bypass openings.

3.4 Valve Position Verification

On January 6, 1994, the inspectors verified that selected Unit 2 station service water valves identified on Form OWI-103-2501, "Operations Department Unit 2 Station Service Water System Locked Component List," Revision 0, were in their correct position and properly locked. The inspectors identified three valves that were not in the position identified on Form OWI-103-2501. Two throttle valves, 2SW-0357 and 2SW-0369, appeared to be in the throttled position while Form OWI-103-2501 indicated that these valves should be in the open position. The licensee indicated that the position listed in the procedure was incorrect and the inspector later noted that the procedure had been revised to designate the throttled position as the correct position for these two valves. The third valve was found to be correctly entered in the Locked Component Deviation Log. The inspectors also identified a labelling error and a valve with a broken locking device. The licensee promptly corrected these discrepancies.

Inspectors verified the position of selected Unit 1 valves identified in Procedure OPT-218A-1, "Primary Containment Integrity Verification (ORC) Data Sheet," Revision 6. All valves were properly positioned, locking devices were properly attached, and caps on vent, drain, and test connection lines were installed where required.

3.5 Control Room Observations

On January 31, 1994, the inspector observed Unit 2 control room operators shift running turbine control hydraulic pumps by starting Pump B and securing Pump C. This was classified as a high risk activity due to plant transients which had been experienced during previous pump shifts. In a briefing conducted prior to the pump shift, operators discussed the evolution, expected plant response, and operator actions in the event that a turbine trip occurred. Special instrumentation was installed to monitor turbine control fluid parameters during the pump shift in an attempt to troubleshoot any abnormalities that may have been observed. The pump shift was completed with no adverse plant response.

3.6 Conclusions

The plant was found to be in generally good material condition based on observations during tours and system lineup verifications. Station activities were being safely performed in accordance with formal procedures, although licensee management's guidance regarding previously identified leakage followup inside containment was not followed and a radiation barrier was not properly installed. These items were considered minor and were appropriately addressed by the licensee.

4 MAINTENANCE OBSERVATIONS (62703)

4.1 Unit 1 Main Control Board Annunciator Repair

The inspector observed the activities of various groups during the repair of Annunciator Power Supply 19. The assessment consisted of attending numerous plan-of-the-day (POD) meetings, discussions with system engineers and their management, reviews of the work package, interviews with maintenance and operations personnel, and observation of the repair activity.

4.1.1 Background

The work was initially planned to repair Main Control Board Annunciator Alarm 1-ALB-10B, Window 1.17, "Annunciator System Trouble." The POD meeting packages identified this annunciator as being out-of-service since September 1992. Problems associated with the various components monitored by this alarm had been considered a concern by the licensee since August 1992.

ONE Form 92-839 documented five annunciator power supply failures during August 1992, failure mechanisms and histories, root causes, and proposed corrective actions. Additionally, the ONE form discussed the implications for the Unit 2 annunciator system.

ONE Form 92-839 short term corrective action recommended the replacement of components susceptible to repetitive, age related failures as the action to increase short term reliability of the annunciator system. Long term corrective actions were also discussed. System engineering personnel

recommended the replacement of existing inverter power supplies and the implementation of a preventative maintenance program to replace other subcomponents. Work orders were developed to refurbish the annunciator power supplies; however, no refurbishments or long term corrective actions had been completed by the end of this inspection period.

Refurbishment of the power supplies was planned to be accomplished during Unit 1 Refueling Outage 3 (1RF03); however, the work was removed from the outage since the work would have conflicted with the Unit 1 plant computer changeout and operations personnel did not want numerous annunciators disabled in addition to a loss of computer indications for various parameters.

As part of the licensee's effort to correct recurring problems associated with Alarm 1-ALB-10B, Window 1.17, Work Order 1-93-057031-00 was written to troubleshoot the annunciator. During 1RF03, initial troubleshooting on Annunciator Cabinet 1-CR-09, Bay 2, identified a failure of Power Supply 19 and two related relays with open coils. The technicians replaced the two relays and recommended the replacement of the power supply. The work package was revised. An outage scope change form (STA-627-2) incorrectly tied the power supply change out to ground detection equipment work that was subsequently determined to be not needed; consequently, the power supply replacement may have been inadvertently removed from the outage. Followup discussions with work control supervisors indicated that Work Order 1-93-057031-00 still would have been delayed until after the outage since the plant computer was being replaced.

4.1.2 Planning and Scheduling

While reviewing operations shift orders, the inspector observed that the replacement of Power Supply 19 was scheduled to be worked on January 4, 1994. The shift orders noted that approximately half of the main control board annunciators would be lost when the power supply was electrically isolated. The inspector reviewed Work Order 1-93-057031-00 in order to determine if appropriate actions were planned to compensate for the lost main control board annunciators.

During the review of the work package and electrical prints, the inspector determined that the work order impact sheet failed to identify the loss of Annunciator Power Supplies 28, 29, and 30. These power supplies supplied power to main control board annunciator panels (1-ALB-10A and 10B). However, no additional compensatory actions were required and no safety concerns were identified since power to the annunciator field contacts associated with Panels 1-ALB-10A and 10B were also deenergized as part of the clearance boundary. The loss of power (Power Supply 17) to the field contacts rendered the annunciators inoperable. The impact had previously identified the loss of Power Supply 17 and the affected alarm panels. Although no equipment or personnel were at risk, the failure of operations personnel to completely identify all affected equipment was considered a weakness.

The work order impact referenced Procedure ABN-740, "Control Room Annunciator System and Status Light Malfunction," Revision 2. Affected technical specification surveillances as well as annunciator power supplies, panels, and windows were appropriately annotated with the exceptions noted in the above paragraph. However, the impact failed to address all the operator actions required by Procedure ABN-740, Section 3.0, "Partial Loss of Control Room Annunciators," Step 3.3, "Operator Actions." The step required the inoperable annunciators to be evaluated per Procedure ODA-401, "Control of Annunciators, Instruments, and Protective Relays." Procedure ODA-401 required the evaluation of the problem/out-of-service annunciators for required compensatory monitoring actions. No compensatory actions for individual annunciators were included in the initial impact.

Discussions with operations management indicated that no reviews of individual annunciator windows had been accomplished. The annunciator work had been discussed in POD meetings 3-4 weeks prior to the annunciator repair work. After the inspector questioned the licensee concerning the compensatory action reviews, operations management completed a thorough review of all disabled annunciators. As part of the review, the licensee decided two additional reactor operators (ROs) were needed to observe main control board indications. The licensee had six ROs in the control room and two auxiliary operators in the field monitoring plant operation, in addition to the normal operations shift complement. The failure to thoroughly review annunciator compensatory actions, prior to being prompted by the inspector, as required by Procedure ABN-740 was considered a weakness.

4.1.3 System Engineering

The inspector had several discussions with the annunciator system engineer, his supervisor, and the system engineering manager. Initial discussions with the system engineer found that he was not aware of the planned work (Work Order 1-93-057031-00) on the annunciator system and was not involved with any of the troubleshooting. Further discussions with the system engineer centered on the corrective actions proposed by ONE Form 92-839 and the status concerning those corrective actions.

The system engineer stated that the utility was still planning on performing the annunciator power supply refurbishments, but none of the long term corrective actions associated with the current annunciator system (i.e., preventive maintenance) were going to be accomplished. All proposed long term corrective actions were cancelled by the system engineer with the exception of a requested design modification (RDM-92-026654) to replace the existing annunciator system. The engineer indicated that the power supply refurbishments were to be performed at power with an implementation plan that had been developed for the outage; however, the refurbishments were moved from 1RF03 to Unit 1 Refueling Outage 4.

The engineering supervisor responsible for the current annunciator reduction program gave conflicting information concerning the licensee's plans for annunciator power supply refurbishments and preventive maintenance. He

indicated that the utility had no plans to work the refurbishments at power, and that the proposed preventive maintenance was going to be done as specified in ONE Form 92-839. Additional conversations with the supervisor indicted that the annunciator refurbishments could not be worked at power with the outage implementation plan.

Overall, the inspector concluded that the engineering department did not have an individual knowledgeable of an overall corrective action plan for the current annunciator system. This observation was discussed with the system engineering manager. Also, the licensee did not appear to have anyone responsible for coordinating the corrective actions associated with ONE Form 92-839.

4.1.4 Work Order 1-93-057031-00 Implementation

During the POD meetings, management and operations personnel had been informed that the work on Power Supply 19 was being accomplished in order to clear problem Annunciator 1-ALB-10B, Window 1.17; however, the work only cleared one input to the alarm. Management personnel were aware that approximately half of the control room annunciators would be lost, and gave their approval for the work based on their understanding of the work activity.

The work was completed on January 13, 1994. Operations held an excellent prejob brief. The unit supervisor ensured that all personnel were aware of the indications that needed to be monitored and that the technicians were cognizant of the job scope. Six ROs supplemented the 2 on-shift ROs and were instructed to monitor parameters only (no control board manipulations were authorized).

Prior to the start of the work, the inspector discussed the work with the electricians and the system engineer. They stated that the planned scope of repair activities would not result in clearing the annunciator window. The power supply was determined to be operating properly, but a relay on the voltage supply was not responding as expected. The electricians decided to change out a voltage sensing card as part of the troubleshooting/repair activity prior to replacing the power supply. The inspector verified that this was within the scope of the troubleshooting work package and was allowed by procedure. The card was changed and the power supply relay functions returned to normal. The technicians used good work practices and properly documented the work performed.

4.1.5 Licensee Review

The inspector questioned the integrated planning and scheduling manager concerning the presentation to licensee operations and senior management from the maintenance department that the annunciator power supply change out would clear the alarm window. The inspector was concerned that information was being improperly or incorrectly portrayed to licensee management. In addition, the inspector discussed the above identified weaknesses.

The licensee established a team to review the concerns identified by the inspector. The team's findings included the following recommended corrective actions:

- Electrical maintenance and system engineering personnel were to develop annunciator troubleshooting guidelines.

- Electrical maintenance personnel were to develop a coordinated troubleshooting plan for specific problems associated with the alarm window in order to provide an integrated plan to correct the failed inputs to Alarm 1-ALB-10B, Window 1.17.

- Work control personnel were to generate a plan on refurbishing annunciator power supplies at power, including parts availability.

- Operations personnel were to evaluate the feasibility of the refurbishment plan.

The inspector found that the team's findings were comprehensive and addressed the areas of concern.

4.2 Unit 2 Diesel Generator (DG) 2-01 Governor Replacement

The inspectors observed meter and relay technicians replacing the electronic governor assembly and motor operated potentiometer on Unit 2 DG 2-01 in accordance with Work Order 1-93-061691-00. Additionally, the technicians were observed installing temporary monitoring equipment for the monitoring of generator voltage and frequency during the adjustment and testing phase of the electronic governor assembly (1-93-053213-00). All test equipment calibration dates were current. The technicians were observed using excellent self-verification techniques.

The maintenance activity was being performed to correct previously identified DG surging and slow full speed response. The licensee stated that reviews of instrumentation and discussion with vendor representatives indicated that the DG problems were being initiated by the electronic governor assembly and possibly other components located within the control circuitry. No absolute failure of any component was identified; however, engineering personnel concerns about future component degradation and reliability prompted the licensee to replace the electronic components which represented the most probable failing components.

The work activity was well coordinated with good support provided by system engineering supplemented by technical support provided by a vendor representative. The specified post work testing activities were comprehensive and adequately demonstrated the operability of the diesel following the corrective maintenance activity.

4.3 Unit 2 Incore Detector Replacement

The inspector observed various aspects of the licensee's activities associated with the replacement of a malfunctioning detector in the movable incore detector system.

Work Order 1-94-062369-00 was reviewed by the inspector prior to authorization for clarity and thoroughness of instructions. The work order specified the requirements for deenergizing the D drive, which was to have its detector replaced, as well as all other drives to prevent inadvertent removal of any detector from its storage position. Procedure INC-3011, "Incore Flux Mapping Detector Replacement," Revision 0, was referenced, included in the work order, and provided detailed instructions for the actual detector replacement. The work order, including Procedure INC-3011 was found to be well written and sufficiently detailed to provide adequate instructions for detector replacement and personnel safety.

The Radiation Work Permit 94-209 was reviewed and found to provide sufficient measures to ensure any contamination was identified and controlled and that personnel were adequately protected, monitored, and radiation exposures were as low as reasonable achievable.

The prejob planning briefing was observed by the inspector. A very detailed and thorough prejob briefing was conducted prior to performance of the task. The briefing was attended by the instrumentation and control (I&C) maintenance manager, the I&C planner, the station nuclear engineer accompanying the work group, the I&C technicians who were to perform the task, and the RP technician who wrote the radiation work permit. The meeting was constructive in that the expectations of each work group were voiced and clarified prior to actual job task performance.

Immediately prior to the containment entry for the detector replacement, another briefing was held with the individuals making the containment entry at the radiological control area access point to issue neutron dosimetry and to conduct a final discussion of expectations and requirements.

The containment entry was well coordinated and conducted, with the RP technician assigned to the team performing an excellent radiation survey of the general area as well as performing a comprehensive smear survey of the detector drive cabinet during disassembly. The results of the smear survey were subsequently reviewed by the inspector and determined to accurately reflect the observed actions.

The I&C technicians were familiar with the procedure and were well prepared to perform the task which was accomplished without incident. The inspector confirmed that the part number on the replacement detector matched the part number identified in the work order.

Licensee personnel were informed of two observations made by the inspector during the task. The detector drive units in Unit 2 were not identified with

the enhanced labels utilized for most plant equipment. The units were clearly identified with permanent marker visible from all sides, and the technicians were cautious and thorough in assuring themselves that they were on the correct detector drive units. The licensee began processing a request for enhanced labeling of the detector drive units. Also, following the cutting of the faulty detector loose from its cable, the name tag identifying the faulty detector was incorrectly attached to the formerly spare tube which now contained the new detector. This was brought to the technicians attention and the tag was placed on the faulty detector's tube and a tag identifying the new detector was attached to the formerly spare tube.

In conclusion, the inspector determined that the overall planning and conduct of the task, including operations, I&C, RP and station nuclear engineering was excellent.

4.4 Valve X-RV-5253 Maintenance

On January 7, 1994, the inspector observed a portion of maintenance activities on Valve X-RV-5253, "LWPS LHMT X-01/X-02 Disch Hdr Rad Isol Vlv." The purpose of the maintenance, conducted in accordance with Work Order 3-92-308162-01 and Procedure MSM-CO-8861, "ITT Grinnell Diaphragm Valve Maintenance (With Air Motor Model 3225)," Revision 1, was to replace the valve elastomers. The inspector observed good procedural adherence and good maintenance work practices. The inspector verified that these components were being replaced within the required 5-year interval.

4.5 Balance-of-Plant Inverter 1V1EC1

On February 2, 1994, the inspector observed technicians troubleshoot and repair 118 VAC Balance-of-Plant Inverter 1V1EC1 in accordance with Work Order 1-93-060584.

A prejob brief was conducted on February 1. The purpose of the brief was to ensure all personnel involved in the activity were aware of their duties, conduct a walkthrough of the activity, discuss expected results, and discuss contingency actions in the event that problems were encountered. The briefing was comprehensive with several enhancements recommended and subsequently incorporated into the work order.

The observed maintenance activities were performed well. The inspector observed good coordination between operations, maintenance, and engineering personnel. Technicians took proper electrical safety precautions while working in the partially energized inverter and performed proper independent verification when detaching and relanding electrical leads. The field support supervisor provided appropriate supervision to the auxiliary operator during the removal of the inverter from service and its subsequent restoration.

4.6 Conclusions

The inspectors concluded that the general performance of maintenance activities in the field was very good. The observations relating to planning and prejob activities concluded that, in general, maintenance planning and prejob activities were good, although several weaknesses were identified during the annunciator power supply repair regarding the loss of equipment identified during the impact review, the review of compensatory actions required by the anticipated loss of annunciators, and the lack of coordination/communication between the various organizations regarding the expected result of the maintenance activity.

5 SURVEILLANCE OBSERVATIONS (61726)

5.1 Slave Relay and Motor-Driven Auxiliary Feedwater (MDAFW) Pump System Test

On January 19, 1994, the inspectors observed surveillance testing on Train A Slave Relay K640 and MDAFW Pump 1-01. The surveillance testing was performed in accordance with Procedures OPT-206A, "Auxiliary Feedwater System," Revision 8; and OPT-450A, "Train A Safeguards Slave Relay K640 Actuation Test," Revision 3. The procedures were reviewed and found to be in conformance with Technical Specifications requirements. The inspectors observed the performance of licensed operators during the slave relay test and subsequent start of MDAFW Pump 1-01 from the control room, as well as the performance of the auxiliary operators and test personnel in the field.

The prejob briefing was conducted with all personnel involved in the test. The inspectors verified that the appropriate limiting conditions for operations were met. The tests were performed in accordance with the approved test procedures and were satisfactory. The MDAFW pump test data was verified and met the acceptance criteria. The operators demonstrated good communications techniques and appropriately used the self-verification techniques when manipulating main control board equipment and valves in the field.

The inspectors verified that the appropriate ASME Section XI vibrational data was collected, was within acceptable limits, and was comparable to the previous test. All test equipment was verified to be within calibration date.

5.2 Airlock Test

On January 20, 1994, the inspector observed licensee personnel performing portions of Surveillance Procedure PPT-SI-8057, "Appendix J Leak Rate Test of Emergency Airlock and Interlock Test," Revision 1, for Unit 1. Operations, maintenance, and engineering personnel were involved in the performance of the test.

The prejob briefing was conducted by the test engineers with all personnel involved. The procedure was reviewed and evolutions from installing test equipment to equipment restoration were discussed.

The unit supervisor questioned the test engineer about the door in the safeguards building to the roof affecting Technical Specification 3.6.8, "Primary Plant Ventilation System." This door was a negative pressure control boundary and would be breached for approximately 5 hours with an air hose running through it. The test engineer was not aware of this door affecting the primary plant ventilation system, but stated that he would ensure that it would be addressed in the procedure for future tests. Both the security and fire door breaches were addressed and impairment forms were obtained. The inspector noted that this was an example of a good questioning attitude by the unit supervisor ensuring that limiting conditions for operations are met.

The airlock door interlock test and the overall airlock leak test were performed satisfactory. The inspector verified that all doors that were breached had the proper impairment tag and the testing equipment was within its current calibration cycle. The personnel performing the test had a good understanding of the test requirements and demonstrated excellent communications. Access to the emergency airlock door required exiting the radiological controlled area at a point other than the normal access point, and security was required to control access. The inspector verified that security requirements were met and good radiological controls were observed.

5.3 Conclusions

The observed surveillances were well conducted, with good communications and coordination between the involved departments.

6 STARTUP TEST RESULTS EVALUATION (72301)

The primary objective of this inspection was to determine if the licensee had met established technical and administrative requirements during the conduct of initial startup (ISU) testing. A second objective was to determine if the licensee's ISU testing review process had been conducted in accordance with the approved site procedures to verify that acceptable testing had been performed and documented.

6.1 Background

Of the startup test procedures reviewed, the inspector verified the acceptability of the licensee's evaluation of the test results. The inspector also verified that the licensee had complied with the following administrative procedures:

- Procedure STA-817, "Review, Approval, Revision of Changes to ISU Tests and Results," Revision 2

- Procedure STA-818, "Conduct of ISU Testing," Revision 2

The inspector noted that both these procedures were removed from service on October 7, 1993, after completion of all ISU testing.

The inspector reviewed the ISU test packages listed in Table 1. All the startup test results reviewed by the inspector were complete and were reviewed by the Test Review Group, Station Operating Review Committee, and the Plant Manager.

The inspector noted that of the tests reviewed, all acceptance criteria had been met. The inspector also noted that two tests, ISU-019B and ISU-020B, did not have acceptance criteria, but had review criteria. When questioned regarding why these tests had review criteria and not acceptance criteria, the licensee stated that the intent of the initial startup program was to measure the difference between predicted readings and actual values and calibrate instrumentation accordingly. If a measured value differed significantly from the expected value, then the issue was further evaluated for acceptance.

The inspector noted that the majority of the test results reviewed had anomalies that were identified during the licensee's evaluation of the test results. These anomalies were documented on problem reports and resolved by engineering evaluations.

The inspector found the results of all the startup tests reviewed to be acceptable. The following specific observations were noted during the inspector's evaluations.

6.2 Discussion

6.2.1 Loose Parts Monitoring

The purpose of this test was to obtain baseline data from the loose parts monitoring system at varying power plateaus. While reviewing a printout of test data at the 95 percent to 100 percent power plateau, the licensee noted that two sensor channels malfunctioned during the test. Once the channels were repaired, no additional baseline tests were performed. The licensee stated that no additional tests were required since sufficient data for both channels had already been obtained at other power plateaus to satisfy the recommendation of Regulatory Guide 1.68, Appendix A. The inspector agreed with this approach.

6.2.2 Containment & Penetration Rooms Temperature Survey

During data collection at the normal operating temperature and normal operating pressure plateau, the air temperature in two main steam penetration rooms exceeded the maximum allowable temperature of 104°F. The highest temperature recorded was in excess of 108°F.

The licensee investigated and found that during the time period in which the temperatures were recorded there were numerous steam leaks in the rooms. The licensee concluded that the steam leaks contributed to the escalated temperatures. The licensee also discovered that three large check valves were completely uninsulated. The check valves had surface temperatures of approximately 450°F.

The licensee repaired the steam leaks and insulated the check valves. The licensee also initiated shiftly surveillances to monitor the air temperature in the rooms. The inspector reviewed copies of the shiftly surveillance data and determined that the room temperatures had decreased and were now within their allowable range.

6.2.3 Startup Adjustment To Reactor Control Systems

During a post test data review at the 94 percent power plateau, the licensee noted that the turbine impulse pressure (P_{imp}) was excessive. Technical Evaluation 93-1536 was initiated and concluded that operation at the excessive pressure was acceptable and no adjustment in the P_{imp} program was made since there was no acceptance criteria. However, ONE Form 93-1478 recommended that the long term acceptability of operating with an increased P_{imp} be evaluated. The ONE form also stated that if it was decided to operate with the elevated pressure, then a decision must be made concerning whether to incorporate the revised T_{ref} program into the design basis or rescale the affected instrument loops to explicitly include the actual full power P_{imp}.

Westinghouse indicated in Letter WPT-15242 dated November 30, 1993, that the T_{ref} program should be rescaled based on the actual impulse pressure to correctly align the control system setpoints.

The licensee has since initiated a request for design modification (RDM) for both units. RDM 93-165 for Unit 2 and RDM-164 for Unit 1 have been initiated to rescale channels/components providing input and data for T_{ref} from turbine impulse pressure.

6.2.4 Main Feedwater System Test

During testing to verify feedwater isolation valve leakage, the licensee noted that when Handswitch 2-HS-2154, which controls Valves 2-HV-2154 and 2155 (Feedwater Line 2-01 and 2-02 secondary sample valves), was placed in the closed position a dual position indication would be obtained for both valves. The licensee locally verified that the valves were closed. The licensee identified that the limit switch mounting brackets were not level. A work request was initiated and the mounting brackets were repaired. Once repaired, the indicators indicated the correct valve positions.

Also during portions of testing, the computer trend data was not usable due to the computer archive not updating as required. The licensee initiated Testing Problem Report B to document the problem, and the test was subsequently repeated. A review of the data indicated that feedwater temperatures were

lower than expected. The licensee's investigation determined that there were open work orders to adjust the feedwater computer constants. Once adjusted, this portion of testing was satisfactorily completed.

Also the licensee discovered that Computer Point T5272A was not in service during part of a required test data collection period. Procedure Change Notice No. 1 was written to allow utilization of alternate computer points and the required test data was gathered from the computer archives.

During 100 percent power plateau testing, the licensee noted that the temperature indicated by Computer Point T5270A was suspect in that it was approximately 8°F high. The licensee conducted calculations which showed that using the measured temperature only resulted in a 0.06 percent change in the maximum design steam generator preheated flow rate and was, therefore, acceptable. The inspector found this acceptable.

6.3 Conclusions

The inspector determined that the reviewed startup tests had met their acceptance criteria or the identified anomalies were evaluated and found acceptable by engineering. The administrative requirements of the governing documents were found to have been met.

TABLE 1

TEST RESULTS PACKAGES REVIEWED (72301)

ISU NO.	SEQ	TITLE	STATUS
ISU-006B	26	RCS and Secondary Chemistry	Complete
ISU-019B	28	Process Computer Software Validation	Complete
ISU-020B	28	Startup Adjustments of Reactor Control Systems	Complete
ISU-204B	18	Operational Alignment of Nuclear Instruments	Complete
ISU-208B	20	Radiation Survey Test	Complete
ISU-211B	33	Loose Parts Monitor Baseline Data	Complete
ISU-212B	34	Piping Vibration Monitoring	Complete
ISU-226B	21	Operational Alignment of Process Temperature & N16 Instruments	Complete
ISU-238B	37	Main Feedwater System Test	Complete
ISU-282B	23	Containment and Room Temperature Survey	Complete
ISU-308B	24	Thermal Expansion - Power Ascension	Complete

7 FOLLOWUP ON CORRECTIVE ACTIONS FOR VIOLATIONS (92702)

7.1 (Closed) Violation 445;446/92201-01: System Valve Misalignments

This violation involved a number of system misalignment and status control events that occurred during the completion of construction of Unit 2 and the transition to a two unit operating plant. The corrective actions associated with this violation included specific actions for each occurrence as well as general procedure reviews and changes, issuance of formal "lessons learned," and more specific guidance regarding the situations that allowed the status control problems to occur.

The inspectors reviewed the completed corrective actions and found them to be comprehensive in addressing the identified deficiencies and generic concerns as well as minimizing the chance of recurrence.

7.2 (Closed) Violations 445;446/92201-02 and 446/9260-03: Abnormal Operating Procedure Deficiencies

This violation involved deficiencies identified during field walkdowns of abnormal operating procedures. The licensee's actions were verified complete

and documented in NRC Inspection Reports 50-445/93-11; 50-446/93-11 and 50-445/93-15; 50-446/93-15.

7.3 (Closed) Violation 446/9260-01: Chemical and Volume Control System Valve Mispositionings

The issue identified in this violation was similar in nature to Violation 445/92201-01; 446/92201-01 discussed in Section 7.1 of this report. The corrective actions for this violation were within the scope and included in the corrective actions for Violation 445;446/92201-01.

7.4 (Closed) Violation 445;446/9262-01: Temporary Modification Drawing Control

This violation involved the failure to provide vital station drawings depicting the installation of temporary modifications. A review of the licensee's completed corrective actions concluded that interim measures implemented following the identification of the deficiency and their subsequent incorporation into plant procedures where necessary, provided reasonable assurance that vital station drawings depicting installed temporary modifications were available to personnel in the control room and work control center on a real time basis. The inspector compared the list of currently installed temporary modifications on both units to the stick file containing the updated drawings reflecting temporary modification installation in the main control room and in the work control center and found them to be accurate.

7.5 (Closed) Violation 445;446/9262-02: Failure to Promptly Identify and Correct Temporary Modification Program Deficiencies

This violation involved the failure of the licensee to take measures to disposition identified deficiencies in the temporary modification program. The inspector reviewed the licensee's corrective actions regarding this violation and concluded that adequate measures had been taken to ensure that identified deficiencies received appropriate management attention and review. The procedures regarding ONE form and Plant Incident Report review and dispositions were revised to provide more specific guidance regarding timeliness as well as ensuring that items not meeting the established goals be reviewed by the Station Operations Review Committee for review of prioritization and significance. The individual specifics of each identified deficiency were dispositioned appropriately, and the generic concern regarding timeliness of dispositions and management awareness of untimely dispositions was adequately addressed.

8 FOLLOWUP (92701)

8.1 (Closed) IFI 445/9162-04: Design Modification Process Weakness

NRC Inspection Report 50-445/91-62; 50-446/91-62, documented a potential weakness in the licensee's design modification process. The inspector identified that two annunciator windows had not been designated as spares as specified in a design modification which removed the main feedwater pump suction strainers and associated instrumentation. In response to this, the licensee issued a memorandum identifying the electrical maintenance organization as the group responsible for all annurciator work and more clearly defining how these activities were to be included in work orders. The inspector determined that the licensee's resolution of the issue was satisfactory.

8.2 (Closed) IFI 445/9222-01: Molded Case Circuit Breaker Preventive Maintenance

NRC Inspection Report 50-445/92-22; 50-446/92-22, documented the inspector's review of TU Electric Quality Assurance Audit Report QAA-92-115 dated July 29, 1992. The audit identified that the licensee did not have a schedule for performing Technical Specification 4.8.4.b. which required that the containment penetration conductor overcurrent protective devices be demonstrated operable "At least once per 60 months by subjecting each circuit breaker to an inspection and preventive maintenance in accordance with procedures prepared in conjunction with its manufacturer's recommendations." The audit specifically identified the lack of a scheduled 60-month inspection and preventive maintenance of molded case circuit breakers and indicated that there were no manufacturer recommendations for inspection and preventive maintenance associated with these types of breakers. The audit report recommended that a formal evaluation be conducted to determine the need to perform these inspections.

The licensee determined that testing of these circuit breakers was required on a 60-month cycle and added these surveillances to their scheduling system.

8.3 (Closed) IFI 445/9229-06: Inconsistent Communications between Control Room Operators

The inspectors observed numerous routine and high risk activities performed in the control room over several inspection periods since this initial concern was identified. The results of those observations regarding control room communications have been documented in several NRC resident inspector inspection reports since May 1992. The inspectors concluded that communications between control room operators, auxiliary operators, and various other support groups had improved and were generally consistent with management's expectations regarding clarity, accuracy, formality, and repeat backs.

8.4 (Closed) IFI 445/9259-01: Manual Main Turbine Trip

The inspector performed a review of the licensee's evaluation regarding a Unit 1 manual turbine generator trip initiated at approximately 45 percent reactor power on December 30, 1992, when the high pressure turbine stop valves went closed during the installation of a modification to the turbine control circuitry cabinets. The modification installation had originally been scheduled to be performed during Refueling Outage 1RFO2 but was delayed due to miscommunication between the work control center and the system engineer. When subsequently reviewed by work control center personnel, the reviewers did not recognize that the reactor was then in Mode 1 when the original review had been performed assuming the reactor would be in Mode 3. Additional inadequacies were identified by the licensee in their review and evaluation of the event including poor clearance preparation and management oversight. The evaluation performed by the licensee was detailed and comprehensive, with root causes and corrective actions identified and verified complete by the inspector.

9 ONSITE REVIEW OF LER (92700)

9.1 (Closed) Safeguards Event Report 445/90-S01: Unintentional Disarming of Security Door

This event involved the disarming of a security door without having the appropriate compensatory measures in place. The door was inadvertently disarmed during the performance of a maintenance activity. The error was subsequently discovered by the licensee and appropriate compensatory measures were implemented until the door was armed.

The inspector reviewed the licensee's corrective actions specified in the submitted report which included identifying administrative doors in the computer data base, removing selected doors from the data base, adding a requirement to perform a perimeter test following the disarming of a device, and clarifying verbal communications requirements between the Central and Secondary Alarms Station officers prior to disarming a door. The actions were verified complete and sufficient to preclude recurrence.

9.2 (Closed) LER 445/93-001 and Violation 445;446/92201-03: "Reactor Trip Caused by Personnel Error During Solid State Protection System (SSPS) Testing"

This event and associated violation involved a reactor trip caused by not following the specified procedure steps during the performance of SSPS testing. The licensee's corrective actions were verified complete and included extensive changes to the SSPS surveillance test and system operating procedures for both units, additional supervision during the performance of testing activities, and the incorporation of more detailed training on the critical portions of protection system testing. The corrective actions were verified to be appropriate and complete. Several observations of SSPS testing

during the past year have indicated that the corrective actions were effective and no additional events have occurred during protection system testing.

ATTACHMENT

1 PERSONS CONTACTED

Licensee Personnel

J. L. Barker, Independent Safety Engineering Group Manager
O. Bhatty, Regulatory Affairs
R. D. Bird, Jr., Planning and Scheduling Manager
M. R. Blevins, Nuclear Overview Manager
D. M. Bozeman, Chemistry Manager
D. Buschbaum, Technical Compliance Manager
R. C. Byrd, Construction Operation Support Group Manager
D. L. Davis, Plant Analysis Manager
S. L. Ellis, Work Control Manager
W. G. Guldemond, System Engineering Manager
J. C. Hair, ANII
T. A. Hope, Regulatory Compliance Manager
D. C. Kross, Operations Support Manager
J. J. LaMarca, Engineering Outage Manager
W. Lawroski, Operation Review Committee
D. M. McAfee, Quality Assurance Manager
D. R. Moore, Maintenance Manager
J. W. Muffett, Station Engineering Manager
G. H. Ruszaln, Chemist
E. J. Schmitt, Operations Training Manager
D. M. Snow, Regulatory Affairs
G. J. Stein, Maintenance
J. Stevens, Chemist
M. W. Sunseri, Maintenance Engineering Manager
C. L. Terry, Vice President Nuclear Operations

NRC Personnel

I. Barnes, Technical Assistant
J. Whittemore, Reactor Inspector
W. Sifre, Reactor Engineer

The personnel listed above attended the exit meeting. In addition to the personnel listed above, the inspectors contacted other personnel during this inspection period.

2 EXIT MEETING

An exit meeting was conducted on February 11, 1994. During this meeting, the inspectors 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.