

APPENDIX A

U.S. NUCLEAR REGULATORY COMMISSION  
REGION IV

NRC Inspection Report Nos. 50-445/92-21  
50-446/92-21

Operating License No. NPF-87

Construction Permit No. CPPR-127

Licensee: TU Electric  
Skyway Tower  
400 North Olive Street  
Lock Box 81  
Dallas, Texas 75201

Facility Name: Comanche Peak Steam Electric Station (CPSES)

Inspection At: CPSES, Glen Rose, Texas

Inspection Conducted: May 20 through July 8, 1992

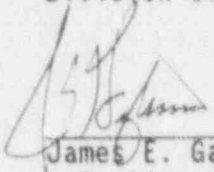
Inspectors: Dennis L. Kelley, Reactor Inspector, Test Programs Section  
Division of Reactor Safety

Michael E. Murphy, Reactor Inspector, Test Programs Section  
Division of Reactor Safety

Dr. Dale A. Powers, Senior Reactor Inspector, Test Programs  
Section, Division of Reactor Safety

Robert B. Vickrey, Reactor Inspector, Plant Systems Section  
Division of Reactor Safety

Approved:

  
James E. Gagliardo, Chief, Test Programs  
Section, Division of Reactor Safety

7/17/92  
Date

Inspection Summary

Inspection Conducted May 20 through July 8, 1992 (Report 50-445/92-21)

Areas Inspected: No inspection of Unit 1 was performed.

Results: Not applicable.

Inspection Conducted May 20 through July 8, 1992 (Report 50-446/92-21)

Areas Inspected: Routine, announced inspection of Unit 2 activities including followup on corrective actions, preoperational test program requirements, and preoperational test program procedures.

Results: The licensee's corrective actions taken to improve preoperational test procedures was successful. The inspectors noted a marked improvement in the quality of procedures and found none of the previously identified problems in the recently generated procedures. The inspectors reviewed eight preoperational procedures in reaching this observation. Consequently, the NRC followup review on a previously identified violation (446/9157-01) was closed. The inspectors noted that the licensee needed to continue to improve on the timeliness of preoperational test procedure issuances so that test personnel would have adequate time to become familiar with and to be trained on procedures prior to testing.

The licensee had not yet decided what types of communications to install in the area of the Unit 2 remote shutdown panel.

No violations or deviations were identified in the review of these program areas.

DETAILS

1. PERSONS CONTACTED

TU ELECTRIC

- + J. Ayres, Operations Quality Assurance Manager, Quality Assurance
- # H. Bruner, Senior Vice President
- # W. Cahill, Jr., Group Vice President
- # R. Daly, Manager, Startup
  - D. Fonner, Special Programs
- # J. Greene, Licensing Engineer, Unit 2 Licensing
- # E. Gully, Unit 2 Engineering Licensing Manager, Engineering
- \* T. Hope, Licensing Manager, Unit 2
  - G. Hughs, Startup
- # R. Martell, Texas Utilities Overview, Unit 2 Project Management
  - P. Olson, Hot Functional Test Milestone Manager, Startup
  - G. Ondriska, Supervisor, Programs Test Group, Startup
- + S. Palmer, Stipulation Manager
- # D. Pendleton, Manager, Unit 2 Regulatory Services
- # C. Rau, Project Manager, Unit 2 Project Management
  - S. Trickovic, Test Engineer, Startup
- + C. Wells, Unit 2 Operations
- + J. Wren, Construction Quality Assurance Manager, Quality Assurance

BECHTEL

- + D. Zolfo, Project Manager

CASE

- + O. Thero, Consultant

NRC

- D. Graves, Senior Resident Inspector, Unit 2
- # R. Latta, Resident Inspector, Unit 2

During the inspection, the inspectors also contacted other licensee personnel.

- \* Denotes those in attendance at the exit meeting on July 8, 1992.
- + Denotes those in attendance at the interim exit meeting on June 18, 1992
- # Denotes those in attendance at both exit meetings.

2. FOLLOWUP ON CORRECTIVE ACTIONS FOR VIOLATIONS AND DEVIATIONS (92702)

2.1 (CLOSED) Violation (446/9167-01): Inadequate Preoperational Testing Procedures

During the preoperational test procedure review, the inspector concluded that the procedures were inadequate and not appropriate to the circumstance for which they were written. The licensee made several commitments for correcting the problem during the inspection. On March 9, 1992, the licensee submitted a written response to the violation documenting the commitments made during the inspection and delineated the specific actions taken to implement those commitments. The commitments made by the licensee were:

- \* To issue a preoperational test writers' and reviewers' guide;
- \* To review all preoperational test procedures for conformance with format requirements and the writers' guide;
- \* To perform a complete technical review of the preoperational test procedures;
- \* To form a group whose primary responsibility would be to review preoperational test procedures;
- \* To redefine the preoperational groups' tasks;
- \* To compare the Unit 2 preoperational test procedures to those used for Unit 1;
- \* To walkdown selected preoperational test procedures during the writing process; and
- \* To review and revise, as necessary, the startup administrative procedures.

During this inspection, the inspectors reviewed Procedure DTI-SU-008, "Preoperational Test Writers' and Reviewers' Guide"; Procedure SP-SAP-07B, "Preoperational Testing"; and records of system walkdowns. Also, since the December 1991 inspection, inspectors have reviewed eight preoperational test procedures. The preoperational test procedures showed a marked improvement, and the inspectors found none of the previous problems nor any new irregularities. Minutes of a joint test group (JTG) meeting documented a counseling session with members of the JTG regarding their scope of responsibility, particularly in the technical review of test procedures. The inspectors also confirmed the satisfactory functioning of the preoperational test review group.

The inspectors concluded (from the examination of the licensee's actions and interviews with licensee personnel) that the implemented corrective actions were appropriate in scope and detail. This item is closed.

### 3. OVERALL PREOPERATIONAL TEST PROGRAM REVIEW REQUIREMENTS (70301)

Throughout the inspection period, the inspectors routinely reviewed the implementation of the administrative controls exercised over the preoperational test program. In specific, inspectors attended various meetings, such as the plan-of-the-day or the Wednesday meetings, that the licensee held to discuss the status of the preoperational test program. The licensee had frequently changed the forecasted approval dates for preoperational test procedures, and to enable the inspectors to be aware of these changing schedules, the licensee faxed tracking log schedules to the Regional office each work day. A particular difficulty experienced by the inspectors was in the planning of inspector availability for witnessing tests. This difficulty arose as a result of the licensee's decision not to revise originally forecasted test performance dates associated with the hot-functional test (HFT).

The inspectors monitored the licensee's development and approval of preoperational test procedures and gave particular attention to whether the licensee's staff had adequate time to review the approved procedures and prepare for the conduct of the testing. As discussed above, the licensee had improved the quality of test procedures. This effort to improve test procedures did, however, result in less time for NRC review of those procedures prior to the applicable test dates. Consequently, inspectors occasionally provided advance comments by telephone and in informal meetings on the results of their procedure reviews. At the time of the exit meeting, the JTG had approved all preoperational test procedures required for the HFT. The inspectors encouraged the licensee to continue to improve on the timeliness of preoperational test procedure issuances so that test personnel would have adequate time to become familiar with and train on procedures prior to testing.

### 4. PREOPERATIONAL HOT FUNCTIONAL TESTING - PWR PROCEDURE REVIEW (70308)

The inspectors reviewed the licensee's Preoperational Test Procedure 2CP-PT-55-02, Revisions 0 and 1, "Hot Functional Test," for technical and administrative accuracy. The HFT procedure was a controlling procedure. An objective of the procedure was to provide directions for the plant heat up and to specify which ancillary procedures to conduct at various temperature plateaus. The procedure coordinated the performance of 24 preoperational tests and 6 acceptance tests. The prerequisite section (6.0) identified all the systems, which the licensee would test during HFT, and it also identified those systems needed to support the HFT.

Because the HFT procedure was a controlling procedure, the review concentrated on the adequacy of test performance at the various temperature plateaus. The inspectors concluded that the test contained precise instructions to heat up to the various temperature plateaus and the specific test or portions of tests that the licensee would conduct at these plateaus.

The licensee had not completed evaluating the results of the cold hydrostatic test, which was conducted in March 1992. The inspector questioned the licensee's representative as to whether the preliminary results from the cold hydrostatic test indicated any deficiency needing correction before the HFT. The licensee's representative stated that it had been monitoring the development of the results evaluation and that there had not been any potential deficiencies identified that would adversely impact on the HFT.

During the HFT, the licensee planned to monitor the reactor coolant system components and Class 1, 2, and 3 piping that would experience operating temperatures greater than 200°F. The test procedure for this monitoring effort was PT-90-03, Revision 0, "Hot Functional Piping Systems Thermal Expansion Test." The completion of the procedure's requirements was to demonstrate that swing clearances for piping systems would be free to expand and move during plant heat up and cool down and that hangers, snubbers, and struts would remain within specified design ranges.

The procedure provided precautions, prerequisites, references, needed equipment, and instructions for system restoration following the HFT. The procedure provided for the accumulation of necessary data as a logical progression for each of the thermal plateaus specified by the HFT sequence (i.e., ambient, 180°F, 250°F, 350°F, 450°F, 557°F, and return to ambient). The procedure provided for the witnessing and sign off for each of the individual procedural steps, and for the disposition of components with measured parameters that fall outside of their given acceptance ranges. The procedure did not specify which licensee personnel were to initial and date the procedure's individual signoffs. The inspector discussed this matter with the appropriate licensee representative who indicated that the onshift startup engineer would sign off the procedural steps and that Brown & Root ASME quality assurance and quality control personnel would complete and sign off the appended data sheets.

Notwithstanding this exception, the procedure was a detailed document that reasonably addressed the necessary actions to gain assurance of the subject piping and associated equipment's freedom to expand and contract with the anticipated thermal transients arising from plant operation.

In addition, the inspector reviewed a Bechtel lessons-learned study of HFT on Unit 1. This Bechtel effort reviewed Unit 1 problem reports with piping expansion restrained by other commodities. The Bechtel review described programmatic actions (such as walkdowns to identify potential interferences) that should result in minimizing problems in Unit 2 that are similar to those experienced in Unit 1.

##### 5. MAIN STEAM ISOLATION VALVE TEST - PREOPERATIONAL TEST PROCEDURE REVIEW (70337)

The inspectors reviewed the licensee's Preoperational Test Procedure 2CP-PT-34-01, Revision 0, "Main Steam Isolation Valves." The inspectors gave particular attention to its technical and administrative

adequacy. The purpose of the procedure was to demonstrate the operability of the main steam isolation valves including their capability to close automatically, as required, and to demonstrate the control room position indication for the main steam isolation valve bypass valves.

The inspectors' review focused primarily on the administrative and human factor elements of the procedure. The procedure contained the necessary administrative and human factor elements of good practices. The inspectors found no technical errors in the procedure. The inspectors noted a few minor clerical errors and inconsistencies and brought these to the attention of the licensee representatives.

The inspectors concluded that the test procedure was well written and appropriately reviewed. The procedure contained a clear statement of purpose, clearly stated acceptance criteria, notes and cautions, specific actions for abnormal and unexpected equipment operation, independent verification of jumper removal and the relanding of lifted leads, coordination with other testing activities in progress, recording of data, and the performance of calculations. Other attributes of the procedure included consistency in the use of equipment identification nomenclature, level and clarity of instruction detail, logical sequence of instructional steps, and ease of performance.

The inspector concluded that this preoperational test procedure contained sufficient detail and control steps to permit the licensee to perform the test adequately.

6. EMERGENCY/STANDBY POWER SUPPLY SYSTEM TEST - PREOPERATIONAL TEST PROCEDURE REVIEW (70341)

The inspector reviewed Preoperational Test Procedure 2CP-PT-02-10, Revision 1, "480 Volt Class 1E Switchgear and Motor Control Centers," for technical adequacy and to determine that the described test was consistent with regulatory requirements, guidance, and the licensee commitments. The JTG had reviewed this procedure on April 22, 1992, in Meeting Number 92-25. It was, subsequently, approved by the startup manager on April 23, 1992.

During the review, the inspector noted that Objective 1.2 included the hot shutdown panel as a control point for Train B Class 1E 480 volt switchgear supply and bus tie breakers. Operation of Control Train B switchgear was not possible from the hot-shutdown panel. The inspector discussed this discrepancy with the licensee representatives, and they acknowledged the error. The licensee, consequently, issued Test Procedure Change Number 3 on May 21, 1992. This change corrected the error. The changed procedure meet the applicable regulatory requirements and was acceptable.

7. PRESSURIZER AND LEVEL CONTROL SYSTEM TEST - PREOPERATIONAL TEST PROCEDURE REVIEW (70347)

As part of the followup on the violation discussed in paragraph 2.0, the inspectors reviewed the licensee's Preoperational Test Procedure 2CP-PT-55-05,

Revision 0, "Pressurizer Level Control System." The JTG had approved the procedure on May 26, 1992. The purpose of the procedure was to enable the demonstration during HFT, that the pressurizer level control system would operate in conjunction with the chemical and volume control system to maintain proper reactor coolant system inventory. The test was divided into two performance sections. The first section was a pressurizer level control functional test to verify level indication, control functions, and interlocks over the full operating range of pressurizer level. The second section was a pressurizer level control dynamic response to verify the control system response to simulated level transients.

The inspectors' review focused primarily on the administrative and human factor elements of the procedure. The procedure contained the necessary administrative and human factor elements of good practices. The inspectors found no clerical or technical errors in the procedure.

The inspectors noted that the procedure was exceptionally good in regard to the use of notes and cautions, which provided the user with not only information on what to expect, but also what actions were necessary, if an unexpected or an alternative system and component response occurred. The procedure consistently provided accurate instructions for system restoration with appropriate independent verification. The procedure appropriately identified the acceptance criteria applicable to the data.

#### 8. REMOTE REACTOR SHUTDOWN TEST - PREOPERATIONAL TEST PROCEDURE REVIEW (70352)

The licensee issued the remote reactor shutdown test procedure as an initial startup test, ISU-223B, Revision 0, "Remote Shutdown Capability Tests." The effective date of the procedure was May 15, 1992. The inspector reviewed the procedure to determine if the technical adequacy of the test was consistent with regulatory requirements, guidance, and licensee commitments and if the licensee had incorporated the requirements of the Final Safety Analysis Report, Technical Specifications, and Regulatory Guides 1.68 and 1.68.2.

The procedure met the applicable regulatory requirements and was technically acceptable. The inspector questioned the licensee on the reliability and availability of communication equipment in the area of the remote shutdown panel. The Gaitronics system was the only procedure-referenced means of communicating during the use of the remote shutdown panel. Unless carefully controlled, the use of the Gaitronics system during the shutdown test or at a time of an actual emergency could result in communication problems due to fire damage or other ongoing communications. The licensee's representative responded that they had not decided on the types of communications to install for use by the operators at the remote shutdown panel, but that radio coverage and interference testing for Unit 2 was still under way. The inspector also questioned the licensee as to whether operators at the remote shutdown panel would have a means of communicating with the emergency operations facility (EOF) in the event of the need to abandon the technical support center due to fire, radiological hazard, or other adverse habitability



condition. The licensee's representative responded that it had not resolved this matter for Unit 2.

The demonstration of necessary and adequate communications in the Unit 2 remote shutdown panel area is an inspection followup item (446/9221-01) requiring further NRC review following the licensee's installation of communication equipment.

#### 9. EXIT MEETING

On June 18 and July 8, 1992, the inspectors met with members of the licensee's organization denoted in paragraph 1, and summarized the scope and findings of this inspection. The inspectors also met with the licensee's startup manager on May 20, 1992, and with other program managers on various dates to discuss the status and conduct of the preoperational test program.

The licensee did not identify, as proprietary, any information used in the performance of this inspection.

ATTACHMENT

Documents Reviewed

Procedure 2CP-PT-90-03, Revision 0, "Hot Functional Piping Systems Thermal Expansion Test," June 3, 1992

Office memorandum from R. Daly and R. Braddy to C. Rau, "Hot Functional Test Scope and Vibration Testing Outside of the HFT Boundaries," March 17, 1992

Office memorandum from C. Rau to W. Cahill, H. Bruner, and A. Scott, "Unit 2 Readiness for Hot Functional Testing (HFT)," June 9, 1992

Procedure DTI-SU-008, Revision 0, "Preoperational Test Writers and Reviewers Guide," January 3, 1992

Procedure ISU-223B, Revision 0, "Remote Shutdown Capability Tests," May 15, 1992

Handout at June 4, 1992, meeting, "HFT Lessons Learned Summary"

Procedure SP-SAP-07B, Revision 0, "Preoperational Testing," February 14, 1992

Procedure 2CP-PT-55-02, Revisions 0 and 1, "Hot Functional Test," June 6 and July 3, 1992

Procedure 2CP-PT-34-01, Revision 0, "Main Steam Isolation Valves," May 19, 1992

Procedure 2CP-PT-55-05, Revision 0, "Pressurizer Level Control System," May 26, 1992

Letter from G. Lushbaugh (Bechtel Energy Corporation) to R. Braddy (Texas Utilities Electric), "Lessons Learned from Unit 1 HFT," June 23, 1992

Procedure 2CP-PT-02-10, Revision 1, "480 Volt Class 1E Switchgear and Motor Control Centers," April 23, 1992