UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
611 RYAN PLAZA DRIVE, SUITE 400
ARLINGTON, TEXAS 76011-4005

January 20, 2004

Mr. M. R. Blevins, Senior Vice President
and Principal Nuclear Officer
TXU Energy
ATTN: Regulatory Affairs
Comanche Peak Steam Electric Station
P.O. Box 1002
Glen Rose, Texas 76043

SUBJECT: COMANCHE PEAK STEAM ELECTRIC STATION - NRC INTEGRATED INSPECTION REPORT 05000445/2003004 AND 05000446/2003004

Dear Mr. Blevins:

On December 31, 2003, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Comanche Peak Steam Electric Station, Units 1 and 2, facility. The enclosed integrated inspection report documents the inspection findings which were discussed on January 8, 2004, with you and other members of your staff.

This inspection examined activities conducted under your licenses as they related to safety and compliance with the Commission's rules and regulations and with the conditions of your licenses. Within these areas, the inspection consisted of selected examination of procedures and representative records, observations of activities, and interviews with personnel.

The enclosed report documents two self-revealing findings and a licensee-identified finding, each of very low safety significance (Green). All of these findings were determined to involve violations of NRC requirements. However, because of the very low safety significance and because they were entered into your corrective action program, the NRC is treating these three findings as noncited violations (NCVs) consistent with Section VI.A of the NRC Enforcement Policy. If you contest any NCV in this report, you should provide a response within 30 days of the date of this inspection report, with the basis of your denial, to the U.S. Nuclear Regulatory Commission, ATTN.: Document Control Desk, Washington DC 20555-0001; with copies to the Regional Administrator Region IV; the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at the Comanche Peak Steam Electric Station.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response will be made available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Should you have any questions concerning this inspection, we will be pleased to discuss them with you.

Sincerely,

/RA/

William D. Johnson, Chief
Project Branch A
Division of Reactor Projects

Dockets: 50-445
50-446
Licenses: NPF-87
NPF-89

Enclosure:
NRC Inspection Report 05000445/2003004 and 05000446/2003004
w/attachment: Supplemental Information

cc w/enclosure:
Roger D. Walker
Regulatory Affairs Manager
TXU Generation Company LP
P.O. Box 1002
Glen Rose, TX 76043

George L. Edgar, Esq.
Morgan Lewis
1111 Pennsylvania Avenue, NW
Washington, DC 20004

Terry Parks, Chief Inspector
Texas Department of Licensing
and Regulation
Boiler Program
P.O. Box 12157
Austin, TX 78711

The Honorable Walter Maynard
Somervell County Judge
P.O. Box 851
Glen Rose, TX 76043

Chief, Bureau of Radiation Control
Texas Department of Health
1100 West 49th Street
Austin, TX 78756-3189

Environmental and Natural
Resources Policy Director
Office of the Governor
P.O. Box 12428
Austin, TX 78711-3189

Brian Almon
Public Utility Commission
William B. Travis Building
P.O. Box 13326
1701 North Congress Avenue
Austin, TX 78711-3326

Susan M. Jablonski
Office of Permitting, Remediation and Registration
Texas Commission on Environmental Quality
MC-122
P.O. Box 13087
Austin, TX 78711-3087

Technological Services Branch
Chief
FEMA Region VI
800 North Loop 288
Federal Regional Center
Denton, Texas 76201-3698

Electronic distribution by RIV:
Regional Administrator **(BSM1)**
DRP Director **(ATH)**
DRS Director **(DDC)**
Senior Resident Inspector **(DBA)**
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Staff Chief, DRP/TSS **(PHH)**
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CP Site Secretary **(vacant)**
W. A. Maier, RSLO **(WAM)**
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ENCLOSURE

U.S. NUCLEAR REGULATORY COMMISSION

REGION IV

Dockets:	50-445, 50-446
Licenses:	NPF-87, NPF-89
Report:	05000445/2003004 and 05000446/2003004
Licensee:	TXU Generation Company LP
Facility:	Comanche Peak Steam Electric Station, Units 1 and 2
Location:	FM-56, Glen Rose, Texas
Dates:	October 5 through December 31, 2003
Inspectors:	D. B. Allen, Senior Resident Inspector A. A. Sanchez, Resident Inspector J. M. Keeton, Project Engineer W. M. McNeill, Reactor Inspector R. E. Lantz, Sr. Emergency Preparedness Inspector F. J. Laughlin, Emergency Preparedness Inspector, NRC Region I B. D. Baca, Health Physicist, Plant Support Branch
Approved by:	W. D. Johnson, Chief, Project Branch A Division of Reactor Projects
Attachment:	Supplemental Information

SUMMARY OF FINDINGS

Comanche Peak Steam Electric Station, Units 1 and 2
NRC Inspection Report 05000445/2003004, 05000446/2003004

IR 05000445/2003004, 05000446/2003004; 10/05/2003-12/31/2003; Comanche Peak Steam Electric Station, Units 1 & 2; Integrated Resident Report; Access Control to Radiologically Significant Areas, and Event Followup

This report covered a 3-month period of inspection by resident inspectors, regional inspectors and a project engineer. Three Green noncited violations were identified. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter 0609, "Significance Determination Process". Findings for which the Significance Determination Process does not apply may be Green or may be assigned a severity level after NRC management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 3, dated July 2000.

A. NRC-Identified and Self-Revealing Findings

Cornerstone: Mitigating System

- Green. A self-revealing noncited violation of Technical Specification 3.0.3 was identified when both trains of the Units 1 and 2 control room air conditioning system were inoperable for longer than the 7 hours specified without placing both units in Mode 3. Specifically, on August 20, 2003, the licensee discovered that Unit 1 and 2 control room air conditioning system units had been inoperable according to Technical Specification 3.7.11 for several hours prior to discovery, because support systems required for operability had been removed from service for routine maintenance and surveillance. The appropriate systems were restored to make one train of CRACS operable prior to an actual power reduction, but the total duration with less than one operable train exceeded the time to enter Mode 3, as required by Technical Specification 3.0.3. Corrective actions included issuing a Shift Order; issuing lessons learned to operators and schedulers; and reviewing operations and work control procedures for improvement. This event was reported in Licensee Event Report 50-445,446/03-004-00 and was entered into the licensee's corrective action program as SMF-2003-2463.

  This violation is greater than minor because it involves a failure to perform required actions of a Technical Specification and affects an attribute and objective of the mitigating systems cornerstone in that the lack of proper configuration control affected the capability of the control room air conditioning system to respond to initiating events. The violation is considered to have a very low safety significance (Green) because it affected only the mitigating system cornerstone and did not represent an actual loss of safety function (Section 4OA3).

Cornerstone: Occupational Radiation Safety

- Green. A self-revealing noncited violation of Technical Specification 5.4.1.a was identified because two operators failed to follow radiological postings as required by procedure. Specifically, on May 11, 2003, two operators entered Unit 1 Room 1-092 which was posted “Not Routinely Surveyed, Contact RP Prior To Entry,” to hang clearance tags for valve work. However, the two operators entered to complete their task and received electronic dosimeter accumulated dose alarms. During an investigation of the dosimeter alarms, it was identified that the operators entered the room without contacting radiation protection for current radiological conditions. This event was entered into the licensee’s corrective action program as SMF 2003-1313.

  The finding is greater than minor because it affected the Occupational Radiation Safety cornerstone objective to ensure adequate protection of worker health and safety from exposure to radiation and is associated with a cornerstone attribute (Program & Process). The finding involved individuals’ potential for unplanned or unintended dose. When processed through the Occupational Radiation Safety Significance Determination Process the finding was determined to be of very low safety significance because the finding was not associated with ALARA planning or work controls, there was no overexposure or a substantial potential for an overexposure, and the ability to assess dose was not compromised (Section 2SO1).

B. Licensee Identified Violations

A violation of very low safety significance, which was identified by the licensee, has been reviewed by the inspectors. Corrective actions taken or planned by the licensee have been entered into the licensee’s corrective action program. This violation and the corrective actions are listed in Section 4OA7 of this report.

CONTENTS

REPORT DETAILS

Summary of Plant Status

Comanche Peak Steam Electric Station (CPSES) Unit 1 operated at essentially 100 percent power for the entire report period.

Unit 2 began the report period in Mode 4 at the start of refueling outage 2RF07. At 5:24 p.m. on October 29, 2003, the Main Generator Output Breaker 8020 was closed, ending the outage after 25 days and 7 hours. On November 5, 2003, Unit 2 achieved full power at 9:12 a.m. On December 22, 2003, at 8:27 a.m., Unit 2 experienced a reactor trip due to a main turbine generator trip. The cause of the turbine generator trip was metallic debris falling into the exciter rectifier wheels. After repair of the exciter rectifier wheels, Unit 2 commenced reactor startup on December 25, 2003. The Main Generator Output Breaker 8020 was closed on December 26, 2003 at 6:14 a.m. Unit 2 achieved full rated power on December 27, 2003, at 4:10 p.m. and remained at that power level for the duration of the report period.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R04 Equipment Alignment (71111.04)

a. Inspection Scope

The inspectors conducted partial walkdowns of the following two risk-significant systems to verify that they were in their proper standby alignment as defined by system operating procedures and system drawings. During the walkdowns, inspectors examined system components for materiel conditions that could degrade system performance. In addition, the inspectors evaluated the effectiveness of the licensee's problem identification and resolution program in resolving issues which could increase event initiation frequency or impact mitigating system availability.

- Unit 1 Train A motor driven auxiliary feedwater system in accordance with System Operating Procedure (SOP) SOP-304A, "Auxiliary Feedwater System," Revision 15, while the Train B motor driven auxiliary feedwater pump was inoperable due to scheduled surveillance testing on November 6, 2003

- Unit 2 Train A safety injection system in accordance with SOP-201B, "Safety Injection System," Revision 5, while the Train B safety injection was inoperable due to scheduled maintenance on November 24, 2003

b. Findings

No findings of significance were identified.

1R05 Fire Protection (71111.05)

a. Inspection Scope

The inspectors assessed the licensee's control of transient combustible materials, the materiel condition and lineup of fire detection and suppression systems, and the materiel condition of manual fire equipment and passive fire barriers during tours of the following six risk-significant areas. The licensee's fire preplans and Fire Hazards Analysis Report were used to identify important plant equipment, fire loading, detection and suppression equipment locations, and planned actions to respond to a fire in each of the plant areas selected. Compensatory measures for degraded equipment were evaluated for effectiveness.

- Fire Area 2CA - Unit 2 containment building on October 23, 2003
- The 345 kV Startup Transformer XST-2 on November 5, 2003
- Fire Zone EA043 - Units 1 and 2 steam generator blowdown room on November 5, 2003
- Fire Zone 1 SE018 - Unit 1 Train B switchgear room on November 6, 2003
- Fire Zone 2 SE018 - Unit 2 Train B switchgear room on November 6, 2003
- Unit 1 and 2 service water intake structure building on November 7, 2003

b. Findings

No findings of significance were identified.

1R06 Flood Protection Measures (71111.06)

a. Inspection Scope

The inspectors reviewed the Final Safety Analysis Report regarding flooding from external sources and Design Basis Document DBD-CS-071, "Probable Maximum Flood (PMF)," Revision 7, to verify that the assumptions made in the external flooding analysis remained valid.

b. Findings

No findings of significance were identified.

1R08 Inservice Inspection Activities (71111.08)

The NRC inspection procedure (71111.08P) requires a minimum sample of six activities and also requires the following distribution of activities: two to three nondestructive examination activities, one to three welds since the previous outage, one to two repair/replacement activities and steam generator tube inspection activities. During this inspection the inspectors sampled six activities:

- Two nondestructive examination activities (ultrasonic and visual)
- Two welding activities since the previous outage (weld buildup on main steam piping and welding of valves in the residual heat removal system)
- One replacement activity (service water piping)
- Steam generator (eddy current) inspection activities

a. Inspection Scope

.1 Performance of Nondestructive Examination (NDE) Activities Other than Steam Generator Tube Inspections

The inspectors observed licensee and its contractor NDE personnel perform the ASME Code Section XI examinations listed below:

System	Component/Weld Identification	Examination Method
Main Steam	Transition Cone to Upper Shell Weld Summary Number 094600	Ultrasonic Examination
Main Steam	Auxiliary Feedwater Nozzle to Vessel Summary Number 095000	Ultrasonic Examination
Feedwater	Spring Can FW-2-017-433-C42S	Visual Examination
Feedwater	Snubber FW-2-017-700-C42K	Visual Examination
Safety Injection	Snubber H-SI-2-RB-00-9-7007-1	Visual Examination
Safety Injection	Snubber H-SI-2-RB-00-9-7009-1	Visual Examination

During the performance of each examination, the inspectors verified that the licensee used the correct NDE procedure, the licensee met the procedural requirements specified in the procedure, and the licensee used properly calibrated test instrumentation or equipment. The inspectors verified that the licensee compared the indications revealed by the examinations against the previous outage examination reports.

The inspectors found the licensee performed 11 welding repairs under Section III of the ASME Code for Class 1 and 2 components since the last outage. The inspectors reviewed a sample of two work orders on the weld buildup of pipe wall on the main steam system and weld of a pressure relief piping for two residual heat removal valves. The inspectors reviewed the radiographic film of the repair welding. The inspectors verified that the repair activities met ASME Code requirements.

The inspectors found the licensee planned one repair/replacement activity during the current outage. The inspectors observed the welding activities of the service water pipe replacement that took place during the inspection.

.2 Steam Generator (SG) Tube Inspection Activities

The inspectors reviewed the leakage history for the steam generators to verify that the leakage was less than 0.15 gallons per day during late operations. The licensee and its contractors used properly qualified eddy current probes and equipment for the expected types of tube degradation. The inspectors observed the collection and analysis of eddy current data by contractor personnel performed to evaluate tubes and a possible loose part in a steam generator. The inspectors found the licensee reviewed the areas of potential degradation based on site-specific and industry experience. The inspectors verified that the licensee compared flaws detected during the current outage against the previous outage data. The inspectors reviewed the repair criteria used. The inspectors also verified the licensee’s eddy current examination scope and expansion criteria met the Technical Specifications, industry guidelines, and commitments to the NRC.

At the time of this inspection the inspectors found the licensee had not established the scope of plugging and in-situ pressure testing. The inspectors verified that the predictions of tube plugging appeared to be the same as experienced in the past. Plugging had not begun at the time of this inspection.

.3 Identification and Resolution of Problems

The inspectors reviewed 17 Smart Forms (SMF) (corrective action documents) issued during the past 18 months and reviewed in detail six SMF on inservice inspections and steam generator eddy current inspection activities. The inspectors verified that the licensee identified, evaluated, corrected, and trended problems.

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification (71111.11)

No licensed operator requalification testing or training activities in the control room simulator were scheduled for this quarter. The inspectors did complete the baseline inspection in this area for the year, but did not inspect in this area this quarter due to a lack of opportunity.

1R12 Maintenance Rule Implementation (71111.12)

a. Inspection Scope

During the week of December 8, 2003, the inspectors independently verified that CPSES personnel properly implemented 10 CFR 50.65, "Requirements for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," for two equipment performance problems identified in the following SMF:

- SMF-2003-003866-00
- SMF-2002-003869-00

The inspectors also independently verified that the corrective actions and responses were appropriate and adequate.

The inspectors reviewed whether the structures, systems, or components (SSCs) were properly characterized in the scope of the Maintenance Rule Program and whether the SSCs failure or performance problem was properly characterized. The inspectors assessed the appropriateness of the performance criteria established for the SSCs where applicable.

b. Findings

No findings of significance were identified.

1R13 Maintenance Risk Assessments and Emergent Work Evaluation (71111.13)

a. Inspection Scope

The inspectors reviewed five selected activities regarding risk evaluations and overall plant configuration control. The inspectors discussed emergent work issues with work control personnel and reviewed the potential risk impact of these activities to verify that the work was adequately planned, controlled, and executed. The activities reviewed were associated with:

- Rescheduled surveillance testing of Emergence Diesel Generator 1-02 due to solar flare activities the week of October 26, 2003

- Repair of leaking valve shaft lower gasket container plate on Valve 1-CC-0049, Component Cooling Water Heat Exchanger 1-02 outlet to crosstie valve, during scheduled Train A work week of November 10, 2003

- Emergent troubleshooting and repair of Unit 2 main transformer fan bank on December 1, 2003

- Planned clearance and inspection of Train B Ventilation Chiller X-02 during a Train A work week the week of December 8, 2003

- Planned modification to Unit 2 Train A containment spray chemical addition tubing configuration in accordance with Work Order 2-03-148097 during the week of December 8, 2003

b. Findings

No findings of significance were identified.

1R14 Personnel Performance During Nonroutine Evolutions and Events (71111.14)

a. Inspection Scope

For the nonroutine event described below, the inspectors reviewed operator logs, procedure use, plant computer data, and applicable SMFs and interviewed operators to determine what occurred and to determine if the operator response was in accordance with plant procedures. When applicable the inspectors also attended Plant Event Review Committee meetings.

- On December 22, 2003, Unit 2 experienced a reactor trip due to a turbine-generator trip caused by metal debris getting into the exciter rectifier wheel, which caused significant current and voltage fluctuations. Inspectors responded to the control room and observed control room activities to establish stable plant conditions and to assess the cause of the turbine generator trip. SMF-2003-4018-00 was initiated to enter the event into the corrective action program.

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations (71111.15)

a. Inspection Scope

The inspectors selected two operability evaluations conducted by CPSES personnel during the report period involving risk-significant systems or components. The inspectors evaluated the technical adequacy of the licensee's operability determination, determined whether appropriate compensatory measures were implemented, and determined whether or not other pre-existing conditions were considered, as applicable. Additionally, the inspectors evaluated the adequacy of the CPSES problem identification and resolution program as it applied to operability evaluations. Specific operability evaluations reviewed are listed below:

- Evaluation EVAL-2003-003034-01-01, operability evaluation of safety ventilation duct work following removal of loose debris in Units 1 and 2 containment air conditioning refrigeration ducts, dated October 23, 2003

- Quick Turnaround Evaluation QTE-2003-003621-01-02, operability evaluation of Unit 1 Train B component cooling water system with a jack supporting the lower gasket container plate on Valve 1CC-0049 which is required to arrest a 0.3 gpm leak out of the component cooling water system on November 14, 2003

b. Findings

No findings of significance were identified.

1R16 Operator Workarounds (71111.16)

a. Inspection Scope

The inspectors reviewed the following two operator workarounds to determine if the functional capability of the system or human reliability in responding to an initiating event was affected. The workarounds' effect on the operator's ability to implement abnormal or emergency procedures was also evaluated.

- Station Service Water (SSW) screen wash cross-tie between Unit 1 and Unit 2 during a tear down inspection of the Screen Wash Pump X-02, the week of September 26 through October 3, 2003

- Unit 2 Containment Spray Chemical Addition Tank Isolation Valves 2-LV-4752 and 2-LV-4754 during implementation of the Final Design Authorization FDA-2002-1866, on December 10, 2003

b. Findings

No findings of significance were identified.

1R19 Postmaintenance Testing (71111.19)

a. Inspection Scope

The inspectors witnessed or reviewed the results of the postmaintenance tests for the following five maintenance activities:

- Preventative maintenance test packages for Unit 2 Train A diesel generator following 10-year maintenance and Integrated Surveillance OPT - 430B, "Train A Diesel Generator Integrated Test Sequence," performed on October 16, 2003

- Unit 2 Station Service Water Pump Motor 2-02 replacement during 2RFO7 in accordance with OPT-207B, “Service Water System’” Revision 11, on October 19, 2003

- Completion of a complete tear down maintenance of the Unit 2 turbine driven auxiliary feedwater pump turbine and subsequent adjustment of the governor valve stroke linkage during Mode 3 testing on October 28, 2003

- Installation of a control power hand switch on Control Room Air Conditioning System (CRACS) Unit X-01 and testing in accordance with PPT-TP-03C-005, “Control Room Functional Test,” Revision 0, on December 17, 2003

- Unit 2 Control Rod Drive Mechanism troubleshooting, part replacement, and reconnection in accordance with OPT-106B, “Control Rods Exercise,” Revision 8, on December 25, 2003

In each case, the associated work orders and test procedures were reviewed in accordance with the inspection procedure to determine the scope of the maintenance activity and determine if the testing was adequate to verify equipment operability.

b. Findings

No findings of significance were identified.

1R20 Refueling and Outage Activities (71111.20)

a. Inspection Scope

The inspectors evaluated licensee Unit 2 Refueling Outage 2RF07 activities to ensure that risk was considered when deviating from the outage schedule, the plant configuration was controlled in consideration of facility risk, mitigation strategies were properly implemented, and Technical Specification requirements were implemented to maintain the appropriate defense-in-depth. Specific outage activities reviewed and/or observed by the inspectors include:

- Discussions and review of the outage schedule concerning risk with the Outage Manager

- Reduced inventory and midloop activities to perform steam generator nozzle dam removals and manway installation

- Verified reactor coolant system instrumentation including Mansell level instrumentation

- Defense in depth and mitigation strategy implementation

- Containment closure capability

- Verification of decay heat removal system capability
- Spent fuel pool cooling capability
- Reactor water inventory control including flow paths, configurations, alternate means for inventory addition, and controls to prevent inventory loss
- Controls over activities that could affect reactivity
- Refueling activities that include fuel offloading, fuel transfer, and core reloading
- Electrical power source arrangement
- Containment cleanup and inspection
- Containment recirculation sump inspection
- Unit heatup and startup
- Licensee identification and resolution of problems related to refueling activities

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing (71111.22)

a. Inspection Scope

The inspectors evaluated the adequacy of periodic testing of important nuclear plant equipment, including aspects such as preconditioning, the impact of testing during plant operations, and the adequacy of acceptance criteria. Other aspects evaluated included test frequency and test equipment accuracy, range, and calibration; procedure adherence; record keeping; the restoration of standby equipment; test failure evaluations; and the effectiveness of the licensee's problem identification and correction program. The following two surveillance test activities were observed and reviewed by the inspectors:

- Unit 2 containment sump inspection in accordance with OPT-306, "Containment Sump Inspection" Revision 6, on October 8, 2003
- Unit 2 containment close out inspection in accordance with OPT305, "Containment Close Out Inspection," Revision 11, on October 25, 2003

b. Findings

No findings of significance were identified.

1R23 Temporary Plant Modifications (71111.23)

a. Inspection Scope

The inspectors reviewed the following three temporary modifications and associated 10 CFR 50.59 reviews, as applicable. The temporary modifications were verified to be installed in accordance with plant documentation and procedures. The postinstallation tests were reviewed to confirm the tests were adequate and that the test results were satisfactory.

- Installation of a mechanical gag that closed Screen Wash Pump X-02 Discharge Valve X-LV-4289 and modified SSW screen wash operation, during the week of September 26 through October 3, 2003

- Installation of an austenitic stainless steel catch basin between the lower and upper conoseals for Instrument Tube-75 on Unit 2 reactor vessel head as described in EVAL-2003-003485-01-01, on October 28, 2003

- Installation of a manual hydraulic jack against the shaft lower gasket container plate on Valve 1CC-0049, as a compensatory measure to arrest a leak from the gasket area as described in Quick Technical Evaluation QTE-2003-003621-01-02 on November 12, 2003

b. Findings

No findings of significance were identified.

Cornerstone: Emergency Preparedness

1EP1 Exercise Evaluation (71114.01)

a. Inspection Scope

The inspectors reviewed the objectives and scenario for the 2003 biennial emergency plan exercise to determine if the exercise would acceptably test major elements of the emergency plan. The scenario simulated a fire in the protected area, a large loss of reactor coolant to the containment, fuel cladding failures, and a breach in the containment equipment hatch, resulting in a large release of radioactive material to the environment.

The inspectors evaluated exercise performance by focusing on the risk-significant activities of classification, notification, protective action recommendations, and offsite dose consequences in the following emergency response facilities:

- Simulator Control Room
- Technical Support Center
- Operations Support Center
- Emergency Operations Facility

The inspectors also assessed personnel recognition of abnormal plant conditions, the transfer of emergency responsibilities between facilities, communications, protection of emergency workers, emergency repair capabilities, and the overall implementation of the emergency plan.

The inspectors attended the post-exercise critiques in each of the above facilities to evaluate the initial licensee self-assessment of exercise performance. The inspectors also attended a subsequent formal presentation of critique items to plant management.

The licensee's exercise performance was evaluated against licensee procedures for classification, notification, protective action recommendations, and worker protection, against the requirements of 10 CFR 50.47(b) and Appendix E, and against the guidance of NEI 99-02, "Regulatory Assessment Performance Indicator Guideline." The licensee's critique was evaluated against the requirements of the licensee's corrective action procedures, and the requirements of 10 CFR 50.47(b)(14) and 10 CFR Part 50, Appendix E IV.F.2(g). The inspectors completed the one required sample.

b. Findings

No findings of significance were identified.

1EP4 Emergency Action Level and Emergency Plan Changes (71114.04)

a. Inspection Scope

The inspectors performed an on-site review of Revision 31 to the Comanche Peak Steam Electric Station Emergency Plan, submitted July 2003. The revision to the Emergency Plan incorporated administrative changes and moved an emergency response function responsibility of rescue operations from the medical functional area to the fire brigade functional area. The revision was compared to the previous revision to the criteria of NUREG-0654, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants," and to the requirements of 10 CFR 50.47(b)(4) and 50.54(q) to determine if the revision decreased the effectiveness of the emergency plan. The inspectors completed the one required sample.

b. Findings

No findings of significance were identified.

2. RADIATION SAFETY

Cornerstone: Occupational Radiation Safety

2OS1 Access Control to Radiologically Significant Areas (71121.01)

a. Inspection Scope

In order to review and assess the licensee's performance in implementing physical and administrative controls for airborne radioactivity areas, radiation areas, and high radiation areas, the inspector interviewed supervisors, radiation workers, and radiation protection personnel involved in high dose rate and high exposure jobs during refueling activities. The inspector discussed changes and trends of the access control program with the Radiation Protection Manager and other members of the radiation protection staff. The inspector also walked down various parts of the radiological controlled area and conducted independent radiation surveys of selected work areas (auxiliary, reactor, containment, and spent fuel buildings).

The following items were reviewed and compared with regulatory and procedural requirements:

- Area postings, radiation work permits, radiological surveys, and other controls for airborne radioactivity areas, radiation areas, and high radiation areas

- Technical specification high radiation and very high radiation area key control program

- Internal dose assessment for exposures exceeding 50 mrem Committed Effective Dose Equivalent (none observed during the inspection period)

- Setting, use, and response of electronic personal dosimeter alarms for work in the Radiological Controlled Area (RCA)

- Associated radiation work permits (RWP), radiological surveys, and controls as well as the conduct of work by radiation protection technicians and radiation workers during conoseal removal and reactor head lift activities (RWP 2003-2600, Task 3)

- ALARA pre-job briefings for conoseal removal and reactor head lift activities (RWP 2003-2600, Task 3, "Conoseal/Graylock Work/Reactor Head Lift/Sets O-ring Replacement, and Upper Internals Moves")

- Dosimetry placement when work involved a significant dose gradient (RWP 2003-2600, Task 3)

- Controls involved with the storage of highly radioactive items in the spent fuel pool

- Audits and self-assessments involving high radiation area controls and worker performance

- Summary of corrective action documents written since the last inspection and selected documents relating to high radiation area incidents, radiation protection technician and radiation worker errors, repetitive, and significant individual deficiencies

Performance indicator reviews are documented in Section 4OA1 of this report.

In addition, the inspectors reviewed the licensee's respiratory protection program for compliance to 10 CFR 20.1703(f).

This inspection completed all 21 required samples.

b. Findings

Introduction. A Green, self-revealing noncited violation (NCV) was identified for failure to follow radiological postings as required by a Technical Specification 5.4.1.a procedure.

Description. On May 11, 2003, two operators entered Unit 1 Room 1-092 to hang clearance tags for valve work. Room 1-092 was posted "Not Routinely Surveyed. Contact RP Prior To Entry" due to infrequent access. However, the two operators entered to complete their task. During their activity, the operators' electronic dosimeters alarmed and they left the area. During an investigation of the dosimeter alarms, it was identified that the operators entered the room without contacting radiation protection for current radiological conditions.

Procedure STA-650, Revision 5, Section 6.4.4, stated radiological boundaries are established to alert personnel to the presence and magnitude of radiological hazards associated with a particular area. The posting for Room 1-092 indicated a possible change in radiological conditions since the last survey and to contact radiation protection prior to entry. Section 5.3 of the same procedure stated, in part, that radiation workers are responsible for complying with radiological work practices and procedures.

Analysis. The failure to follow radiological postings is a performance deficiency. This finding was greater than minor because it affected the Occupational Radiation Safety cornerstone to ensure adequate protection of worker health and safety from exposure to radiation and is associated with a cornerstone attribute (Program and Process).

This occurrence involved individuals' unplanned, unintended dose, or a potential of such a dose resulting from actions contrary to licensee procedures which could have been greater with a single minor alteration of circumstances (i.e. higher dose rates). The inspector used the Occupational Radiation Safety Significance Determination Process as described in Manual Chapter 0609, Appendix C, to analyze the significance of the finding. Since this finding was not an ALARA issue, there was not overexposure or substantial potential for an overexposure, and it did not compromise the ability to assess dose, this finding is of very low safety significance.

Enforcement. Technical Specification 5.4.1.a requires procedures applicable to Regulatory Guide 1.33, Revision 2, Appendix A, Section 7 for Access Control to Radiation Areas. Procedure STA-650 Section 5.3 stated, in part, that radiation workers are responsible for complying with radiological work practices and procedures.

Contrary to STA-650 procedure requirements, two operators did not comply with radiological work practices and procedures (i.e. complying with radiological postings) and that a single minor alteration of circumstances could have resulted in increased workers' unplanned, unintended dose, or a potential of such a dose. Because the failure to follow radiological postings is of very low safety significance and has been entered into the licensee's corrective action program (SMF 2003-1313), this violation is being treated as an NCV, consistent with Section IV.A of the NRC Enforcement Policy: NCV 05000445, 446/2003-04-01, Failure to Follow Radiological Postings.

4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification (71151)

1. Mitigating Systems Cornerstone

a. Inspection Scope

The inspector reviewed a sample of performance indicator (PI) data submitted by the licensee regarding the mitigating system cornerstone to verify that the licensee's data was reported in accordance with the requirements of NEI 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 2. Reactor operator logs, limiting condition for operation action requirement logs, Smartforms SMF-2002-3927, SMF-2003-756, SMF-2003-1346, SMF-2003-2211 and licensee event reports for November 2002 to September 2003, were reviewed for both units to identify safety system functional failures.

b. Findings

No findings of significance were identified.

2. Emergency Preparedness Cornerstone

a. Inspection Scope

The inspectors sampled licensee submittals for the PIs listed below for the period January 1, 2002, through September 30, 2003. The definitions and guidance of NEI 99-02, "Regulatory Assessment Indicator Guideline," were used to verify the licensee's basis for reporting each data element in order to verify the accuracy of PI data reported during the assessment period. The licensee's PI data were also reviewed against the guidance of Emergency Preparedness Staff Guideline 020, "NRC Performance Indicators."

Emergency Preparedness Cornerstone:

- Drill and Exercise Performance (DEP)
- Emergency Response Organization Participation (ERO)
- Alert and Notification System Reliability (ANS)

The inspectors reviewed a sampling of drill and exercise scenarios, licensed operator simulator training sessions, notification forms, and attendance and critique records associated with training sessions, drills, and exercises conducted during the verification period. The inspectors reviewed emergency responder qualification, training, and drill participation records for ten key emergency responders. The inspectors reviewed siren test results, maintenance records, and procedures. The inspectors also interviewed licensee personnel that were accountable for collecting and evaluating the PI data. The inspectors completed three samples.

b. Findings

No findings of significance were identified.

3. Occupational Radiation Safety Cornerstone

a. Inspection Scope

The inspector sampled licensee submittals for the PI listed below for the period from April 2002 through October 2003. To verify the accuracy of the PI data reported during that period, PI definitions and guidance contained in NEI 99-02, "Regulatory Assessment Indicator Guideline," Revision 2, were used to verify the basis in reporting for each data element.

Occupational Radiation Safety Cornerstone

- Occupational Exposure Control Effectiveness

Licensee records were reviewed from April 2002 through October 2003 which included corrective action documentation (SMF 2002-2958, 2002-2977, and 2002-3785) that identified occurrences or potential occurrences of locked high radiation areas (as defined in Technical Specification 5.7), very high radiation areas (as defined in 10 CFR 20.1003), and unplanned personnel exposures (as defined in NEI 99-02). Additional records reviewed included ALARA records. There were no internal dose assessments exceeding 50 mrem Committed Effective Dose Equivalent for this inspection period. The inspector interviewed licensee personnel that were accountable for collecting and evaluating the PI data. In addition, the inspector toured plant areas to verify that high radiation, locked high radiation, and very high radiation areas were properly controlled.

b. Findings

No findings of significance were identified.

4. Public Radiation Safety Cornerstone

a. Inspection Scope

The inspector sampled licensee submittals for the PI listed below for the period from April 2002 through October 2003. To verify the accuracy of the PI data reported during that period, PI definitions and guidance contained in NEI 99-02, "Regulatory Assessment Indicator Guideline," Revision 2, were used to verify the basis in reporting for each data element.

Public Radiation Safety Cornerstone

- Radiological Effluent Technical Specification/Offsite Dose Calculation Manual Radiological Effluent Occurrences

Licensee records were reviewed from April 2002 through October 2003 which included corrective action documentation that identified occurrences or potential occurrences for liquid or gaseous effluent releases that were reported to the NRC or exceeded PI thresholds. The inspector interviewed licensee personnel that were accountable for collecting and evaluating the PI data.

b. Findings

No findings of significance were identified.

4OA2 Problem Identification and Resolution (71152)

resolution processes relating to high radiation area incidents and radiation protection technician and radiation worker errors. No findings of significance were identified.

2. Emergency Preparedness Annual Sample Review

a. Inspection Scope

The inspectors reviewed performance and facility problems documented in calendar years 2002 and 2003 in the licensee’s corrective action program, emergency preparedness action tracking system, and drill reports. The inspectors selected 15 items to verify effective corrective action through observation during the evaluated exercise.

b. Findings and Observations

No findings of significance were identified.

3. Cross-References to PI&R Findings Documented Elsewhere

None.

4OA3 Event Followup (71153)

(Closed) LER 50-445, 446/03-004-00 Inadvertent TS 3.0.3 Entry Due to Inoperable Control Room Air Conditioning System Trains

a. Inspection Scope

The inspector reviewed the LER and SMF-2003-002463-00, which documents this event in the CPSES corrective action program, to verify the causes of the event were identified and the corrective actions were reasonable.

b. Findings

Introduction. A Green self-revealing noncited violation of Technical Specification 3.0.3 was identified when both trains of the Units 1 and 2 CRACS were inoperable for longer than the 7 hours specified without placing both units in Mode 3.

Description. On August 20, 2003, the licensee discovered that Unit 1 and 2 CRACS units had been inoperable according to TS 3.7.11 for several hours prior to discovery, because support systems required for operability had been removed from service for routine maintenance and surveillance. The licensee entered TS 3.0.3 and determined which support systems required restoration to return CRACS operability prior to actually starting to reduce power to comply with the TS 3.0.3 action statement that allows one hour to analyze the situation and six hours to be in Mode 3 in both units. TXU attributed the causes of the event to operators' failure to directly reference the Safety Function Determination Program (SFDP) Support System Reference Guide when completing the operability review for clearances, overreliance by the operators on the probabilistic risk assessment reviews to detect TS 3.0.3 conditions, and overreliance by the operators on the operations work control group to detect TS 3.0.3 conditions during work planning. The appropriate systems were restored to make the CRACS operable prior to an actual power reduction. Additional corrective actions, completed or planned, included reviewing operations and work control procedures for improvement; issuing a Shift Order; issuing a lessons-learned to operators and schedulers. No new findings were identified in the inspector's review.

Analysis. The inspector determined that the violation is a performance deficiency because operators failed to perform actions required by Technical Specifications, including placing both units in Mode 3 within 7 hours, per limiting condition for operations (LCO) 3.0.3. This self-revealing violation is more than minor because it represents a failure to perform required actions of a TS and affects an attribute and objective of the mitigating systems cornerstone in that the lack of proper configuration control affected the capability of the CRACS to respond to initiating events. The violation is considered to have a very low safety significance (Green) using Appendix A, SDP Phase 1 of Manual Chapter 0609 because it affected only the mitigating system cornerstone and did not represent an actual loss of safety function. This event has been entered into the corrective action program as SMF-2003-2463.

Enforcement. Technical Specification 3.7.11, Action E for two CRACS trains inoperable in Mode 1, 2,3, or 4 requires to either verify at least 100 percent of the required heat removal capability equivalent to a single operable train available or immediately enter LCO 3.0.3. LCO 3.0.3 requires action to be initiated within 1 hour to place the applicable unit in Mode 3 within 7 hours. On August 20, 2003, both trains of CRACS were inoperable for greater than 7 hours and Units 1 and 2 were not placed in Mode 3. Because this failure to maintain at least one train of CRACS operable is of very low safety significance and has been entered into the corrective action program (SMF-2003-002463), this violation is being treated as an NCV, consistent with Section VI.A of the NRC Enforcement Policy. NCV 05000445, 446/2003-004-02, Inadvertent TS 3.0.3 Entry Due to Inoperable CRACS Trains. This licensee event report is closed.

4OA5 Other Activities

1. Reactor Containment Sump Blockage (NRC Bulletin 2003-01) (Temporary Instruction 2515/153)

This Temporary Instruction provided guidelines to assess adequacy and completion of licensee commitments to NRC Bulletin 2003-01, “Potential Impact of Debris Blockage on Emergency Sump Recirculation at Pressurized-Water Reactors.” The bulletin requests information from addressees via two options. For CPSES, TXU chose Option 2 which requested they describe any interim compensatory measures that have been implemented or that will be implemented to reduce the potential risk associated with potentially degraded or nonconforming emergency core cooling system and containment spray system recirculation functions while evaluations to determine compliance with all existing applicable regulatory requirements proceed. Accordingly, the inspectors used the criteria for evaluating responses describing interim compensatory measures.

a. Inspection Scope

The inspectors verified that the licensee’s response established interim compensatory measures to reduce the risk associated with degraded recirculation performance. The inspectors also verified that the implementation or the schedule for planned implementation for the licensee’s commitments was consistent with the licensee’s response. The inspectors also viewed the condition of the Unit 2 containment sump.

Specifically the inspectors (1) accompanied the licensee on a containment sump inspection, (2) accompanied the licensee on a containment closeout inspection,

(3) reviewed training records, (4) reviewed training material, (5) interviewed licensee staff, (6) reviewed applicable licensee procedures and (7) reviewed licensee event reports.

The inspectors reviewed the following documents during this inspection:

- NRC Bulletin 2003-01, “Potential Impact of Debris Blockage on Emergency Sump Recirculation at Pressurized-Water Reactors,” dated June 9, 2003
- CPSES Response to NRC Bulletin 2003-01, “Response to NRC Bulletin 2003-01, ‘Potential Impact of Debris Blockage on Emergency Sump Recirculation at Pressurized-Water Reactors,’” TXX-03130, dated August 8, 2003
- CPSES Operations Testing Manual Procedure No. OPT-305 “Containment Close Out Inspection,” Revision 9, Effective October 22, 2003
- CPSES Operations Testing Manual Procedure No. OPT-306 “Containment Sump Inspection,” Revision 6, Effective July 27, 1999
- Licensee Event Reports 446/97-004-001 dated June 8, 1998 and 445/97-008-01 dated December 10, 1997

b. Findings

No findings of significance were identified. The inspectors concluded that TXU has performed those commitments which were to be accomplished prior to 2RFO7, as described below, and that the pending commitments are appropriately scheduled. The following details are provided as required by Temporary Instruction 2515/153, “Reactor Containment Sump Blockage (NRC Bulletin 2003-01).”

.1 Commitments completed

Commitments 27289, 27291 and 27292 address training. Specifically, in Commitment 27289 the licensee committed to training shift operations and emergency response organization personnel on the technical nature of the bulletin and a discussion of the potential Emergency Response Guideline (ERG) procedure changes. The inspectors reviewed the self-study training material and training records and have determined that this commitment has been completed on schedule prior to the Unit 2 refueling outage in October of 2003.

In Commitment 27291, the licensee committed to training appropriate station personnel to emphasize Foreign Material Exclusion (FME) and good housekeeping practices and adding this training to the CPSES Contractor Administrative Training program. The inspectors reviewed the lesson plans and self-study training material and training records and have determined that this commitment has been completed on schedule prior to 2RFO7.

In Commitment 27292, the licensee committed to training permanent plant personnel to emphasize FME and good housekeeping practices. The inspectors reviewed the self-study training material and training records and have determined that this commitment has been completed on schedule prior to 2RFO7.

In Commitment 27293, the licensee committed to reviewing site containment housekeeping expectations for possible enhancement. Through a review of the licensee documentation (EVAL-2003-002008-02-00) and interviews with licensee personnel, the inspectors have determined that the licensee has evaluated these procedures adequately. As a result of the review of these procedures, the licensee determined that the wording in the procedures allow for discretionary application of the procedure in that a reader could assume that minor amounts of dust, dirt and particles smaller than the fine screen mesh on the sumps are not a significant concern. The licensee decided to not revise the procedures at this time but has sampled latent debris from less accessible areas from 2RFO7 to determine if the debris could be a threat to sump integrity. The licensee will evaluate actions to be taken for the Unit 1 outage scheduled for the spring of 2004. The inspectors verified that the licensee has included this in their corrective action program (ACTN-MAN-2003-002008-06-00).

.2 Commitments pending

In Commitment 27290, the licensee committed to revising operations training and ERG procedure changes. The licensee targeted the end of the second quarter of 2004 as a completion date for this Commitment to allow time for developing the necessary training material and simulator exercises. The inspectors have confirmed that the licensee has added these tasks to their corrective action program (ATTN-MAN-2003-002008).

In Commitment 27294, the licensee committed to evaluating enhanced instrumentation that may provide more definitive indication of sump performance. The inspectors have confirmed that the licensee has added these tasks to their corrective action program (EVAL-2003-002008-03-00).

.3 Units that entered refueling outages (RFO) and returned to power

Unit 2 entered the RFO on October 4, 2003, and returned to power on October 29, 2003. On October 25, 2003, prior to closing containment, the licensee performed procedure OPT-305 “Containment Close Out Inspection.” This procedure satisfies TRS 13.5.31.1 and is required to be performed once prior to entry into Mode 4. The licensee verified that there was no loose debris inside containment that could be transported to the containment sump and cause restriction of the pump suction during LOCA conditions. The resident inspector was present for the containment close out inspection.

During the RFO, on October 8, 2003, the licensee performed procedure OPT-306 “Containment Sump Inspection,” on Unit 2. This procedure satisfies Technical

Specification SR 3.5.2.8 and SR 3.5.3.1 (for SR 3.5.2.8) and is used when restoring the recirculation sumps to operation following a plant outage. The licensee verified that ECCS train containment sump and subsystem inlets (containment spray and RHR pump suction piping) were not restricted by debris, and the suction inlet trash racks and screens showed no evidence of structural distress or abnormal corrosion. The resident inspector accompanied the licensee during this inspection.

.4 Units currently in a RFO

There are no units currently in a RFO.

.5 Units that have not entered an RFO

Unit 1 has a planned refueling outage in the spring of 2004. The licensee will perform OPT-306 “Containment Sump Inspection” and OPT-305 “Containment Close Out Inspection” for Unit 1 as required by SR 3.5.2.8 and TRS 13.5.31.1, respectively. These requirements are applicable to both Units 1 and 2.

.6 Walkdowns Conducted

As part of procedure OPT-306 on Unit 2, the licensee verified that each ECCS train containment sump and subsystem inlets (containment spray and RHR pump suction piping) was not restricted by debris, and the suction inlet trash racks and screens showed no evidence of structural distress or abnormal corrosion. This inspection, along with repairs documented in Licensee Event Report 50-446/97-004-01, ensured that there were no openings through the sump enclosure boundaries. The containment close out inspection performed on Unit 2 in accordance with OPT-305 verified that there were no loose debris nor major obstructions that could restrict the flow to the containment sumps.

.7 Advance Preparations

The licensee is currently evaluating the need for enhanced instrumentation which could provide more definitive indication of sump performance. This is reflected in Commitment 27294. There are no other significant advance preparations at the present time to expedite the performance of potential sump-related modifications.

2. <u>Reactor Pressure Vessel Lower Head Penetration Nozzles (NRC Bulletin 2003-02) (Temporary Instruction 2515/152, Revision 1)</u>

This Temporary Instruction provided guidelines to verify compliance with licensee commitments to NRC Bulletin 2003-02, “Leakage From Reactor Pressure Vessel (RPV) Lower Head Penetrations and Reactor Coolant Pressure Boundary Integrity.” The inspectors used the criteria for bare metal visual examination to conduct this inspection on the CPSES Unit 2 RPV lower head during the 2RFO7 refueling outage, Fall 2003.

a. Inspection Scope

The inspectors performed this performance-based evaluation and assessment to ensure that the NRC had an independent review of the condition of the RPV lower head and the Bottom Mounted Instrumentation (BMI) tube penetrations. The inspectors assessed the effectiveness of the licensee examinations of the reactor vessel BMI penetrations. Specifically, the inspectors:

- Met with licensee representatives to review inspection plans
- Attended pre-job briefs
- Directly inspected and assessed the condition of the RPV lower head and the BMI tube penetrations
- Reviewed a large representative sample of the visual inspection from inside the reflective metal insulation via a video camera delivered by two remote controlled inspection robots
- Assessed the physical difficulties in performing the inspection, which included any debris, dirt, boron, and other viewing impediments
- Interviewed the examiner and the equipment operators and designer
- Assessed the licensee's ability to distinguish small boron deposits on the RPV lower head
- Evaluated the quality and resolution of the examination equipment
- Reviewed completed records, including the final engineering inspection report for CPSES Unit 2
- Verified that the licensee documented deficiencies in their corrective action program
- Assessed the overall effectiveness of the process used to perform the bare metal visual inspection

The inspectors also reviewed the following documents during this inspection:

- NRC Bulletin 2003-02, "Leakage From Reactor Pressure Vessel Lower Head Penetrations and Reactor Coolant Pressure Boundary Integrity," dated August 21, 2003

- Comanche Peak Steam Electric Station 30-Day Response to NRC Bulletin 2003-02, “Leakage From Reactor Pressure Vessel Lower Head Penetrations and Reactor Coolant Pressure Boundary Integrity,” TXX-03163, dated September 19, 2003

- Comanche Peak Steam Electric Station 60-Day Response to NRC Bulletin 2003-02, “Leakage From Reactor Pressure Vessel Lower Head Penetrations and Reactor Coolant Pressure Boundary Integrity,” and report on RCS Conoseal Leakage, TXX-03195, dated December 18, 2003

- Comanche Peak Steam Electric Station engineering report, “Unit 2 Baseline Reactor Vessel Lower Bare-Metal Visual Inspection,” dated December 15, 2003

- Comanche Peak Steam Electric Station Units 1 and 2 inspection plan, “Reactor Vessel Lower Head Visual Inspection Plan,” Revision 0, dated August 28, 2003

- NRC Information Notice 2003-01, “Leakage Found on Bottom-Mounted Instrumentation Nozzles,” dated August 13, 2003

b. Findings

No findings of significance were identified. The inspectors concluded that the licensee has met the applicable commitments in that they have performed an inspection of the RPV lower head and 100 percent of the circumference of all 58 BMI tube penetrations and the inspection was performed by a VT-2, Level III certified examiner. The clarity and resolution of the examination equipment, combined with the training, qualification, and procedures, ensured that the examiners could detect small boron deposits. The inspectors have provided the following details of the inspection as required by Temporary instruction 2515/152, “Reactor Pressure Vessel Lower Head Penetration Nozzles (NRC BULLETIN 2003-02),” Revision 1, dated November 5, 2003.

.1 Examination

The licensee’s examiner was certified in accordance with CPSES procedures to meet the ASME Section XI for VT-2 Level III. The licensee decided to use a tetherless robot to perform the major part of the reactor vessel lower head inspection along with a tethered magnetic crawler robot as a contingency and to supplement the tetherless robot. The equipment operators exercised these inspection robots on a full-scale mockup built at the South Texas Project for repair activities on their cracked BMI tubes.

The examination was conducted in accordance with the “Reactor Vessel Lower Head Visual Examination Plan,” Revision 0, approved on August 28, 2003. This plan was derived, in part, from the previously performed RPV vessel upper head inspection plan for Units 1 and 2.

The inspectors verified that the Reactor Vessel Lower Head Visual Examination Plan provided: (1) description of the bare metal visual inspection technique, the administration of this inspection, and the expectation of 100 percent inspection coverage; (2) explicit descriptions of the types of boric acid indications that might be identified; (3) types of indications that shall be investigated further, including boric acid buildup, wastage of carbon steel, and evidence of primary water leakage; (4) criteria for cleaning the lower head and general area; (5) acceptance criteria for the inspection; and (6) sufficient guidance to satisfy licensee commitments for the inspection of the RPV lower head penetrations and general surface of the RPV lower head. The inspectors concluded that the inspection plan, combined with the training, had provided adequate guidance for the licensee examiner to identify, disposition, and resolve deficiencies.

The inspectors determined that the robotic inspections coupled with the direct visual inspections of the VT-2 level III examiner enabled easy identification of boundary leakage as described in Bulletin 2003-02 and any RPV lower head corrosion, if present.

.2 Capability to identify and characterize small boric acid deposits

The inspectors determined that the visual inspection methods used by the licensee, as described in the following section, were capable of detecting, identifying, and characterizing small boric acid deposits, if present, as described in Bulletin 2003-02. This was determined via direct inspection during the licensee visual inspection of the RPV lower head, and by independent review of the video (DVD and VHS tapes) and photographic medium provided by the licensee.

.3 Visual inspection protocol

The bare metal visual inspection was conducted by a tetherless (wireless) robot, supplemented by a magnetic tethered crawler robot, and by direct visual inspection. All inspections were performed by a VT-2 Level III certified examiner.

The tetherless robot called “FlangeBot,” which was initially purchased to clean the reactor vessel flange, performed the majority of the bare metal visual inspection. The FlangeBot is a wheeled robot that operated on the inside of the lower head reflective metal insulation and gives a view from below the BMI tube penetrations. The video camera aboard the FlangeBot had tilt, zoom and lighting capabilities. The resolution of this camera was verified at six inches and at five feet (expected distances from the insulation to the BMI tube penetrations) with a neutral gray test card, a Jaeger Character Resolution Card, and a color chart. At a distance of six inches the J1 (character height 0.021") characters were readable, and at a distance of five feet, the J1 characters were discernable but the J2 (character height 0.042") characters were readable. The required resolution of a character height of 0.158 inches, per the inspection plan, was demonstrated. The FlangeBot inspection results were recorded on a DVD along with verbal annotation.

The tethered magnetic robot was called the Strategic Teaming and Resource Sharing (STARS) Alliance crawler. The STARS Alliance, which is comprised of six nuclear power plants, invested in purchasing this crawler for these types of inspections. The crawler will be shared among the STARS plants. The STARS crawler is a magnetic crawler, capable of operating on the reactor vessel lower head itself and can provide a very close-up view of the BMI tube penetrations. This crawler was used as a follow up inspection of three tube locations deemed necessary by the examiner. The resolution of the camera aboard the STARS crawler was tested using the same tests as the FlangeBot at a distance of three to five inches (expected distance from the crawler to the BMI tube penetrations) and the J1(character height 0.021") characters were readable. The required resolution of a character height of 0.158 inches, per the inspection plan, was demonstrated.

Direct visual inspection was performed by a VT-2 Level III examiner during equipment installation, during the robotic inspection, and during equipment removal. Direct visual inspection was also used as an initial evaluation of the RPV lower head, and during parts of the robotic evaluation.

.4 Inspection coverage

The inspectors determined that the licensee was able to fulfill its commitment to the NRC by completing a 100 percent, 360 degree bare metal visual inspection of the reactor vessel lower head and all 58 BMI tube penetrations.

.5 Condition of reactor pressure vessel lower head

In general, the examinations revealed that the RPV lower head was in good physical condition and was observed to be clean, but did exhibit limited evidence of water flow from sources above the BMI penetrations. Evidence of this consisted of relatively few, inactive flow trails that were grouped in two specific areas around the vessel circumference and were clearly traceable to leaks in the reactor refueling cavity manhole penetrations. More evidence of this leakage was apparent on the lower head reflective metal insulation. There were flow trails and small deposits in the seams of the insulation.

The reactor vessel lower head also seemed to have been painted with a grey coating. Historical photographic data shows that when the reactor vessel arrived at the site it was black in color. The current BMI inspection found that the RPV lower head had a grey coating and the black (brownish-black) coloration was observed to begin just outside the outer BMI tube penetrations and continuing up the reactor vessel. Evidence of the RPV lower head coating was also seen around the base of the BMI tube penetrations. Many of the BMI tube penetrations had an angular “hex-nut” ring around the penetrations that expose a brownish-black color, which closely resembles the color of the upper reactor vessel seen outside the outer BMI tubes. This suggests that the tubes were masked in preparation for coating application. A few horizontal grey streaks were discovered on several tubes that resembled a paintbrush stroke where masking was deficient.

Examinations using the FlangeBot identified three BMI tubes for further inspection with the STARS crawler. These BMI tubes (#8, #44, and #55) had small white marks located on the tube base and very near the annulus between the reactor vessel and the BMI tube. BMI Tubes #8 and #44 were examined first because of the white marks being similar in nature. The marks on these BMI tubes did not have a connection to the annulus region, were two-dimensional, and had a well defined shape with sharp, smooth edges, but within these edges the marks are neither continuous or solid. These features suggest a manual process and do not indicate a deposit emanating from the penetration annulus or from a tight crack through the base metal. Industry experience has demonstrated that these types of reactor coolant system leaks have definite three-dimensional characteristics, which would indicate an uncontrolled natural process.

BMI Tube #55 also had white marks, but were characterized as a small collection of scattered, two-dimensional, and generally randomly shaped marks in a band that extended half way around the tube. The most striking feature of this location are that the marks intersect at right angles. The licensee has determined these marks suggest tape adhesive left on the tube, possibly from previous masking activities. Again, these marks display geometric features that would indicate a manual process rather than an uncontrolled natural process.

.6 Identified material deficiencies that required repair

No material deficiencies that required repair were identified.

.7 Impediments to effective examinations

The inspectors concluded that, in general, the licensee encountered no impediments to performing a 100 percent bare metal examination of the RPV lower head and the BMI tube penetrations. The licensee’s preparation coupled with the excellent condition of insulation, the available lighting, the excellent quality of the robots, equipment, and camera resolution provided a thorough, complete, and well documented inspection.

.8 Follow on examinations above reactor pressure vessel lower head

The licensee did perform appropriate follow up Alloy 600 weld and pipe inspections in areas above the RPV lower head, which included vessel hot and cold leg nozzle penetration areas. These areas were systematically chosen with respect to the indications on the insulation and the flow trails on the lower head. Entrance to these reactor vessel hot and cold leg penetrations was through the manways in the reactor vessel refueling cavity. Removal of these manways revealed evidence of past leakage through these openings. Inspections and photographs of the hot and cold leg penetrations showed evidence of past leaks from the reactor cavity manways. The evidence included small accumulations of boric acid, residual water marks and staining. The hot and cold leg penetrations were intact and showed no sign of leakage. The inspectors concluded that leakage from the reactor cavity manways was the cause of the flow stains and small accumulations on the lower head and insulation.

.9 Samples of deposits and chemical analysis

As described in the previous section (5. and 8.) there were areas on the reactor vessel lower head that exhibited signs of a previous leak from above. There were no indications of deposits or evidence of primary coolant leaks on the reactor vessel lower head or in the annulus regions of the BMI tube penetrations. None of the stains on the reactor vessel lower head amounted to a collectable amount, they were two-dimensional in nature, and were indicative of previous leaks from above the RPV lower head. The material deposited in the seams of the reflective metal insulation was deemed insignificant and any analysis would not be of particular use. The licensee acted according to the licensee approved and NRC reviewed reactor vessel lower head inspection plan, and no samples were extracted and, therefore, no chemical analysis was performed.

.10 Plans for cleaning of the reactor pressure vessel lower head

The licensee currently has no plans to clean the reactor vessel lower head or the reflective metal insulation. The basis for not cleaning the reactor vessel lower head is that the amount of material on the RPV lower head is small, dry, and very thin (stained), does not impede current or future inspection of this area, and is not perceived as a threat to the carbon steel vessel material. The basis for not cleaning the reflective metal insulation is that the material residue poses no threat to the insulation itself or the reactor vessel, and does not impede inspection of the reactor vessel lower head area. In both cases, the benefit of cleaning the reactor vessel lower head area and the reflective metal insulation would not outweigh the expected dose received by cleaning personnel. The licensee demonstrated the application of good ALARA principles and practices.

.11 Licencee’s conclusions regarding deposit origins

The licensee has concluded that the origins of the minimal amount of deposit material in the seams of the reflective metal insulation and the flow trails on the lower head itself was attributed to previous leaks in the reactor cavity manway seals. The licensee determined this through a series of followup inspections of the hot and cold leg penetration areas that corresponded to the lower head deposit indications. The licensee determined that the deposits and flow trails were not indicative of RCS leakage or lower head degradation, and were not deemed to be an impediment to current or future inspection activities.

4OA6 Meetings, Including Exit

Exit Meeting Summary

On October 10, 2003, the inspector presented the Access Control to Radiologically Significant Areas inspection results to Mr. R. Flores, Vice-President of Nuclear Operations, and other members of his staff who acknowledged the findings. The inspector confirmed that proprietary information was not provided or examined during the inspection.

The inspectors presented the inspection results for the inservice inspection activities to Mr. M. Lucas, Director of Nuclear Engineering and other members of licensee management on October 17, 2003. The inspectors confirmed that proprietary information was not provided or examined during the inspection.

The inspectors presented the emergency preparedness inspection results to Mr. M. R. Blevins, Senior Vice President and Principal Nuclear Officer, and other members of his staff on November 20, 2003. The inspectors confirmed that proprietary information was not provided or examined during the inspection.

The inspectors presented the inspection results of the integrated resident Inspection Report 2003-004 to Mr. M. R. Blevins, Senior Vice President and Principal Nuclear Officer, and other members of licensee management on January 8, 2004. The inspectors confirmed that proprietary information was not provided or examined during the inspection.

4OA7 Licensee Identified Violations

The following violation of very low safety significance (Green) was identified by the licensee and is a violation of NRC requirements which meets the criteria of Section VI of the NRC Enforcement Policy, NUREG-1600, for being dispositioned as a noncited violation.

- 10 CFR 20.1501(a) requires surveys to ensure compliance with other provisions of this part and to evaluate concentrations or quantities of radioactive materials. 10 CFR 20.1904(a) requires each container of radioactive material bear a label providing sufficient information to permit individuals handling or using the containers, or working in the vicinity of the containers to take precautions. On April 17, 2002, a label on a bag of radioactive material indicated it was 22 millirem per hour on contact; however, the bag was surveyed prior to release from the containment access point reading 350 millirem per hour on contact. This finding is of very low safety significance because it was not associated with ALARA planning or work controls, there was no overexposure or a substantial potential for an overexposure, and the ability to assess dose was not compromised. This event was captured in the corrective actions program as SMF 2002-1470.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee personnel

D. Barham, Emergency Preparedness Specialist
G. Bell, Security Specialist
M. Blevins, Senior Vice President & Principal Nuclear Officer
M. Bozeman, Manager, Emergency Preparedness
S. Bradley, Health Physics Supervisor, Radiation and Industrial Safety
J. Curtis, Radiation Protection Manager, Radiation and Industrial Safety
R. Flores, Vice President Operations
J. Kelley, Vice President, Nuclear Engineering and Support
S. Lakdawala, Engineering Programs Manager
M. Lucas, Director Nuclear Engineering
V. Polizzi, Steam Generator Programs Engineer
D. Reimer, Technical Support Manager
R. Sanford, Emergency Preparedness Specialist
M. Sunseri, System Engineering Manager
R. Walker, Manager, Regulatory Affairs
D. Wilder, Radiation and Industrial Safety Manager, Radiation and Industrial Safety

Hartford Steam Boiler

Joe Hair, ANII

NRC:

D. Allen, Senior Resident Inspector
A. Sanchez, Resident Inspector
J. Keeton, Project Engineer

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

NONE

Closed

50-445, 446/03-004-00	LER	Inadvertent Technical Specification 3.0.3 Entry Due to Inoperable Control Room Air Conditioning System Trains (Section 4OA3)

Opened and Closed During this Inspection

NCV	05000445, 446/2003-04-01	Failure to Follow Radiological Postings (Section 2OS1)
NCV	05000445, 446/2003-04-02	Inadvertent TS 3.0.3 Entry Due to Inoperable CRACS Trains (Section 4OA3)

Discussed

NONE

LIST OF DOCUMENTS REVIEWED

The following documents were selected and reviewed by the inspector to accomplish the objectives and scope of the inspection and to support any findings:

Section 1R08 Inservice Inspection Activities

Hanger Packages
Unit 2, Snubber FW-2-017-700-C42K
Unit 2, Spring Can FW-2-017-433-C42S
Unit 2, Snubber H-SI-2-RB-009-707-1
Unit 2, Snubber H-SI-2-RB-009-709-1

Procedures

Number	Title	Revision
MRS-GEN-1127	Guidelines for Steam Generator Eddy Current Data Quality Requirements	0
NDE 7.10	Steam Generator Tube Selection and Examination	5
STA-733	Steam Generator Reliability Program	7
TX-ISI-008	VT-1 and VT-3 Visual Examination	5
TX-ISI-210	Ultrasonic Examination Procedure for Welds in Ferritic Steel Vessels	4
TX-OPS-101	Preservice Inservice Examination Documentation for Comanche Peak Steam Electric Station	7

NDE ISI Reports

Ultrasonic, Unit 2, Steam Generator, Weld 3-6,   0 degrees, dated February 10, 1988
Ultrasonic, Unit 2, Steam Generator, Weld 3-6, 45 degrees, dated February 10, 1988
Ultrasonic, Unit 2, Steam Generator, Weld 3-6, 60 degrees, dated February 10, 1988
Ultrasonic, Unit 2, Steam Generator, Weld 3-6,   0 and 45degrees, dated October 8, 2003
Ultrasonic, Unit 2, Steam Generator, Weld 3-6, 60 degrees, dated October 8, 2003
Ultrasonic, Unit 2, Steam Generator, Weld 3-10,   0 degrees, dated February 13, 1988

Ultrasonic, Unit 2, Steam Generator, Weld 3-10, 45 degrees, dated February 13, 1988
Ultrasonic, Unit 2, Steam Generator, Weld 3-10, 60 degrees, dated February 13, 1988
Ultrasonic, Unit 2, Steam Generator, Weld 3-10, 0 and 45 degrees, dated October 8, 2003
Ultrasonic, Unit 2, Steam Generator, Weld 3-10, 60 degrees, dated October 8, 2003
Visual, Unit 2, Spring Can FW-2-017-433-C42S and Snubber FW-2-017-700-C42K, October 8, 2003
Visual, Unit 2, Snubbers H-SI-2-RB-009-707-1 and H-SI-2-RB-009-709-1, October 8, 2003

Smart Forms

SMF-2003-000311-00
SMF-2003-002375-00
SMF-2003-002437-00
SMF-2003-002573-00
SMF-2003-002770-00
SMF-2003-002949-00
SMF-2003-003172-00
SMF-2003-003214-00

Work Orders

2-01-138521-00
2-01-138523-00
2-02-142202-00
2-03-147427-00

Miscellaneous

Comanche Peak Steam Electric Station Unit No. 2 - First Interval ASME Section XI Inservice Inspection Program Plan, Revision 6

Technical Specifications Sections 5.5.9 and 5.6.10, Amendment 101

Unit 2 Steam Generator Eddy Current Analysis Guidelines 2ERF07, Revision 0

Welding Procedure Specification CP-201, Revision 10

Westinghouse Letter WPT-16477, Dated October 10, 2003, Use of Appendix H Qualified Techniques at Comanche Peak 2RF07 Rev. 1

Section 1EP1 Exercise Evaluation

EPP-100, Maintaining Emergency Preparedness, Revision 5
EPP-109, Duties and Responsibilities of the Emergency Coordinator/Recovery Manager, Revision 12
EPP-201, Assessment of Emergency Action Levels, Emergency Classification and Plan Activation, Revision 11
EPP-203, Notifications, Revision 13
EPP-204, Activation and Operation of the Technical Support Center, Revision 14
EPP-205, Activation and Operation of the Operations Support Center, Revision 11
EPP-206, Activation and Operation of the Emergency Operations Facility, Revision 14
EPP-303, Operation of Computer Based, Emergency Dose Assessment System, Revision 12

EPP-304, Protective Action Recommendations, Revision 16
EPP-314, Evacuation and Accountability, Revision 7

Section 4OA2

Drill and Exercise Reports since January 2003
List of Emergency Preparedness related Smart Forms dated from January 2002 to present
Smart Forms: SMF-2003-; 001414-00, 002688-00, 001364-00

Section 2OS1 Access Control to Radiologically Significant Areas

Condition Reports
SMF- 2002-1050, 2002-2009, 2002-2010, 2002-2273, 2002-2367, 2002-2897, 2002-3163, 2002-3468, 2002-3494, 2002-4253, 2002-4316, 2003-2969, 2003-3023, 2003-3051, and 2003-3055

Nuclear Overview Department Evaluation Reports
EVAL-2002-015, EVAL-2002-029, and EVAL-2003-022

Self-Assessments
SA-2002-032, SA-2002-042, SA-2003-001, SA-2003-026, SA-2003-029, and SA-2003-055

Procedures
RPI-110	Radiation Protection Shift Activities, Revision 8
RPI-528	Multiple Dosimetry Badging, Revision 8
RPI-602	Radiological Surveillance and Posting, Revision 22
RPI-606	Radiation Work and General Access Permits, Revision 11
RPI-922	Use and Maintenance of Portable HEPA Filter Ventilation Units, Revision 3
STA-650	General Health Physics Plan, Revision 5
STA-656	Radiation Work Control, Revision 11
STA-735	Nuclear Fuel Integrity Program, Revision 6
“Radiation Safety NRC Performance Indicators: Job Aide, Definitions, and Flow Chart”, November 15, 2002

LIST OF ACRONYMS

CFR	*Code of Federal Regulations*
CPSES	Comanche Peak Steam Electric Station
CRACS	control room air conditioning system
EDG	emergency diesel generator
ESF	engineered safety feature
EVAL	evaluation
FME	foreign material exclusion
FWIV	feedwater isolation valve
LCO	limiting conditions for operation
NDE	nondestructive examination
NEI	Nuclear Energy Institute
OPT	operability test
PI	performance indicator
QTE	quick turnaround evaluation
RCP	reactor coolant pump
RFO	refueling outage
RHR	residual heat removal
SDP	significance determination process
SMF	smart form
SOP	system operating procedure
SSC	structures, systems, or components
TDM	technical data manual