TXU Electric
Comanche Peak
Steam Electric Station
P.O. Box 1002
Glen Rose, TX 76043
Tel: 254 897 8920
Fax: 254 897 6652
lterry1@txu.com

C. Lance Terry
Senior Vice President & Principal Nuclear Officer

Ref: 10CFR50.54(f)

CPSES-200101966
Log # TXX-01145
File # 10010, 10115

August 31, 2001

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555

SUBJECT: COMANCHE PEAK STEAM ELECTRIC STATION (CPSES)
DOCKET NOS. 50-445 AND 50-446
RESPONSE TO NRC BULLETIN 2001-01, "CIRCUMFERENTIAL CRACKING OF REACTOR PRESSURE VESSEL HEAD PENETRATION NOZZLES"

Gentlemen:

Attached is the TXU Electric response to U.S. Nuclear Regulatory Commission (NRC) Bulletin 2001-01, "Circumferential Cracking of Reactor Pressure Vessel Head Penetration Nozzles," dated August 3, 2001. NRC Bulletin 2001-01 requested information relative to the Reactor Pressure Vessel (RPV) head penetration nozzle configuration, previous RPV head inspections, and plans for future RPV head inspections. TXU Electric is participating in the Electric Power Research Institute, Inc., Materials Reliability Program associated with the issue. Comanche Peak Steam Electric Station is in the category of plants with low susceptibility to circumferential cracking of the reactor pressure vessel head penetration nozzles. TXU Electric has prepared this response in coordination with the other participants in the Strategic Teaming and Resource Sharing (STARS) group.

A088

This communication contains the following new commitments which will be completed as noted:

Commitment Number	Commitment
27244	TXU Electric will provide the requested information within 30 days after plant restart following the next refueling outage for each unit (NRC Bulletin 2001-01, Request 5).

If you should have any questions regarding this submittal, please contact Mr. J. D. Seawright at (254) 897-0140.

Sincerely,

C. L. Terry

JDS/js
Attachments

c - E. W. Merschoff, Region IV
J. A. Clark, Region IV
D. H. Jaffe, NRR
Resident Inspectors, CPSES

UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

In the Matter of	)		
	)		
TXU Electric Company	)	Docket Nos.	50-445
	)		50-446
(Comanche Peak Steam Electric	)	License Nos.	NPF-87
Station, Units 1 & 2)	)		NPF-89

AFFIDAVIT

C. L. Terry being duly sworn, hereby deposes and says that he is Senior Vice President and Principal Nuclear Officer of TXU Electric, the licensee herein; that he is duly authorized to sign and file with the Nuclear Regulatory Commission this response to NRC Bulletin 2001-01; that he is familiar with the content thereof; and that the matters set forth therein are true and correct to the best of his knowledge, information and belief.

C. L. Terry
Senior Vice President and
Principal Nuclear Officer

STATE OF TEXAS)
)
COUNTY OF Somervell)

Subscribed and sworn to before me, on this 31 day of August, 2001.

Notary Public

JEAN AMUNDSON
NOTARY PUBLIC
STATE OF TEXAS
My Commission Expires 08-31-2002

Response to NRC Bulletin 2001-01
Circumferential Cracking of Reactor Pressure Vessel Head Penetration Nozzles

Below is the TXU Electric response to Nuclear Regulatory Commission (NRC) Bulletin 2001-01, Circumferential Cracking of Reactor Pressure Vessel Head Penetration Nozzles, dated August 3, 2001 (Reference 1). The Bulletin's "Requested Information" is shown in bold.

TXU Electric is participating in the Electric Power Research Institute, Inc. (EPRI) Materials Reliability Program (MRP) associated with this issue. Information associated with the MRP efforts are compiled in "PWR Materials Reliability Program Response to NRC Bulletin 2001-01 (MRP-48), EPRI, Palo Alto, CA: 2001: TP-1006284," (Reference 2). This report was transmitted to the NRC by Nuclear Energy Institute (NEI) letter, "Generic Information for Use by Licensees in Response to NRC Bulletin 2001-01," dated August 21, 2001 (Reference 3). Reference to the MRP report is made, where appropriate.

Requested Information

1. **All addressees are requested to provide the following information:**

   a. **the plant-specific susceptibility ranking for your plant(s) (including all data used to determine each ranking) using the PWSCC [Primary Water Stress Corrosion Cracking] susceptibility model described in Appendix B to the MRP-44, Part 2, report;**

Response

As shown in Table 2-1 of Reference 2, Comanche Peak Steam Electric Station (CPSES) has been evaluated for relative susceptibility to PWSCC of the Reactor Pressure Vessel (RPV) head penetration nozzles. The evaluation indicates it would take approximately 102.5 and 105 Effective Full Power Years (EFPYs) of additional operation by CPSES Units 1 and 2, respectively, to reach the same time-at-temperature as Oconee Nuclear Station Unit 3 (ONS3). These ranking values are referenced to March 1, 2001. March 2001 is when leaking nozzles were discovered at ONS3. As described in Reference 2, the evaluation used the same time-at-temperature model as described in Appendix B to MRP-44, Part 2 (Reference 4).

Using the criteria stated in NRC Bulletin 2001-01, CPSES can be considered as having a low susceptibility to circumferential cracking of the reactor pressure vessel head penetration nozzles.

Requested Information

1. All addressees are requested to provide the following information:

b. a description of the VHP [vessel head penetration] nozzles in your plant(s), including the number, type, inside and outside diameter, materials of construction, and the minimum distance between VHP nozzles;

Response

Reference 2, Table 2-3, provides the requested nozzle information.

Requested Information

1. All addressees are requested to provide the following information:

c. a description of the RPV head insulation type and configuration;

Response

The CPSES RPV head insulation type and configuration are briefly described in Reference 2, Table 2-1. The RPV head insulation is a reflective (mirror) insulation constructed to be permanent, yet removable and reusable. The main portion of the insulation is installed horizontally above the dome of the RPV with outer portions stepped down to accommodate the spherical vessel head configuration. The insulation is positioned between the top of the vessel and the head penetration flanges, which connect to the Control Rod Drive Mechanism (CRDM) housings. The insulation is provided in individual panels that fit together in a specific arrangement and are fastened by buckles.

Requested Information

1. All addressees are requested to provide the following information:

d. a description of the VHP nozzle and RPV head inspections (type, scope, qualification requirements, and acceptance criteria) that have been performed at your plant(s) in the past 4 years, and the findings. Include a description of any limitations (insulation or other impediments) to accessibility of the bare metal of the RPV head for visual examinations;

Response

TXU Electric has not performed RPV head and nozzle inspections within the past four years. However, no leakage has been identified during the performance of other unrelated RPV head inspection and maintenance activities. Accessibility limitations to the RPV head bare metal for visual examinations include the dose and time associated with removal of the insulation and CRDM cooling shroud.

Requested Information

1. **All addressees are requested to provide the following information:**

   e. **a description of the configuration of the missile shield, the CRDM housings and their support/restraint system, and all components, structures, and cabling from the top of the RPV head up to the missile shield. Include the elevations of these items relative to the bottom of the missile shield.**

Response

Table 1 provides the elevations for various significant components relative to the missile shield. CPSES Final Safety Analysis Report Figure 1.2-8 shows an elevation view general arrangement of equipment, including the RPV and the missile shield.

Reactor Missile Shield	The reactor missile shield is a steel plate attached to a roll away structure supported by the refueling pool walls and located above the RPV to provide protection against postulated CRDM missiles. The structure is moveable to allow access to the RPV during refueling. During normal plant operation, the missile shield is restrained for seismic loads.
Seismic Support Platform	The seismic support platform is located between the bottom of the missile shield and the top of the CRDMs and serves to provide support for the upper end of the CRDM rod travel housings. The platform is supported off the RPV head. Power, control, and instrumentation cables traverse upward from the components above the top of the RPV head, through the seismic support platform, and across to the cable trays. The seismic support platform also provides support for the reactor vessel head vents and associated piping.

CRDM Cooling Shroud	The CRDM cooling shroud is a generally cylindrical steel structure, which directs forced air cooling flow over the CRDM coils to maintain them in a suitable operating environment. The CRDM cooling shroud encircles the RPV head insulation and impedes access to the insulation panels.
RPV Head Penetrations	Of the seventy-eight, four-inch diameter RPV head penetrations, fifty-three are used for the CRDMs. Nineteen of the remaining penetrations are capped (including four capped latch housings), four are used for temperature monitoring instrumentation connections, and two contain the Reactor Vessel Level Instrumentation System (RVLIS) probes. There is an additional one-inch head penetration, which is used for venting the RPV head.
CRDMs	A CRDM consists of four separate subassemblies. They are (1) the pressure vessel (latch housing and rod travel housing), (2) coil stack assembly, (3) the latch assembly, and (4) the drive rod assembly. A rod position indicator (RPI) assembly surrounds the rod travel housing. The CRDM is connected by a seal-welded threaded connection to the CRDM RPV head penetration and restrained at the top by rod position indicator (RPI) top plates, which are an integral part of the seismic support platform. The CRDMs provide for withdrawal or insertion of the rod control cluster assemblies (RCCAs), and for RCCA position indication. The CRDM power cables are contained in conduit from the coil stack assemblies to the RPI top plates.
RPV Head Insulation	See response to 1.c.
CRDM RPV Head Penetrations	The CRDM RPV head penetrations provide a pressure boundary from the RPV to the seal-welded threaded connection for the CRDMs. The penetrations are designed to provide a uniform height transition from the round RPV dome to the CRDM housing.

2. If your plant has previously experienced either leakage from or cracking in VHP nozzles, addressees are requested to provide the following information:

a. a description of the extent of VHP nozzle leakage and cracking detected at your plant, including the number, location, size, and nature of each crack detected;

b. a description of the additional or supplemental inspections (type, scope, qualification requirements, and acceptance criteria), repairs, and other corrective actions you have taken in response to identified cracking to satisfy applicable regulatory requirements;

c. your plans for future inspections (type, scope, qualification requirements, and acceptance criteria) and the schedule;

d. your basis for concluding that the inspections identified in 2.c will assure that regulatory requirements are met (see Applicable Regulatory Requirements section). Include the following specific information in this discussion:

(1) If your future inspection plans do not include performing inspections before December 31, 2001, provide your basis for concluding that the regulatory requirements discussed in the Applicable Regulatory Requirements section will continue to be met until the inspections are performed.

(2) If your future inspection plans do not include volumetric examination of all VHP nozzles, provide your basis for concluding that the regulatory requirements discussed in the Applicable Regulatory Requirements section will be satisfied.

Response

CPSES has not previously experienced either leakage from or cracking in VHP nozzles. Therefore, this section is not applicable.

Requested Information

3. If the susceptibility ranking for your plant is within 5 EFPY of ONS3, addressees are requested to provide the following information:

a. your plans for future inspections (type, scope, qualification requirements, and acceptance criteria) and the schedule;

b. your basis for concluding that the inspections identified in 3.a. will assure that regulatory requirements are met (see Applicable Regulatory Requirements section). Include the following specific information in this discussion:

(1) If your future inspection plans do not include performing inspections before December 31, 2001, provide your basis for concluding that the regulatory requirements discussed in the Applicable Regulatory Requirements section will continue to be met until the inspections are performed.

(2) If your future inspection plans include only visual inspections, discuss the corrective actions that will be taken, including alternative inspection methods (for example, volumetric examination), if leakage is detected.

Response

CPSES's susceptibility ranking is not within 5 EFPY of ONS3. Therefore, this section is not applicable.

Requested Information

4. If the susceptibility ranking for your plant is greater than 5 EFPY and less than 30 EFPY of ONS3, addressees are requested to provide the following information:

a. your plans for future inspections (type, scope, qualification requirements, and acceptance criteria) and the schedule;

b. your basis for concluding that the inspections identified in 4.a will assure that regulatory requirements are met (see Applicable Regulatory Requirements section). Include the following specific information in this discussion:

(1) If your future inspection plans do not include a qualified visual examination at the next scheduled refueling outage, provide your basis for concluding that the regulatory requirements discussed in the Applicable Regulatory Requirements section will continue to be met until the inspections are performed.

(2) The corrective actions that will be taken, including alternative inspection methods (for example, volumetric examination), if leakage is detected.

Response

CPSES's susceptibility ranking is not within the band of greater than 5 EFPY and less than 30 EFPY of ONS3. Therefore, this section is not applicable.

Requested Information

5. **Addressees are requested to provide the following information within 30 days after plant restart following the next refueling outage:**

   a. **a description of the extent of VHP nozzle leakage and cracking detected at your plant, including the number, location, size, and nature of each crack detected;**

   b. **if cracking is identified, a description of the inspections (type, scope, qualification requirements, and acceptance criteria), repairs, and other corrective actions you have taken to satisfy applicable regulatory requirements. This information is requested only if there are any changes from prior information submitted in accordance with this bulletin.**

Response

TXU Electric will provide the requested information within 30 days after plant restart following the next refueling outage for each unit.

References

1. NRC Bulletin 2001-01, Circumferential Cracking of Reactor Pressure Vessel Head Penetration Nozzles, dated August 3, 2001.

2. PWR Materials Reliability Program Response to NRC Bulletin 2001-01 (MRP-48), EPRI, Palo Alto, CA: 2001. TP-1006284

3. NEI letter from Alexander Marion to Dr. Brian W. Sheron (NRC), Generic Information for Use by Licensees in Response to NRC Bulletin 2001-01, dated August 21, 2001.

4. PWR Materials Reliability Program, Interim Alloy 600 Safety Assessments for US PWR Plants (MRP-44): Part 2: Reactor Vessel Top Head Penetrations, EPRI, Palo Alto, CA: 2001.

Table 1

Comanche Peak Steam Electric Station

Relative Elevation of Significant Components

Elevation	Distance from Missile Shield	Component
864'	0'	Bottom of Missile Shield
860' 3"	3' 9"	Seismic Support Platform
860' 3"	3' 9"	Top of CRDMs
842' 11"	21' 1"	CRDM Penetration Flanges
841' 10"	22' 2"	Head Insulation (Upper Horizontal Step)
841' 5"	22' 7"	Top of RPV Head
841' 9"	22' 3"	Center of 32" Duct for CRDM Cooling Air
833' 11"	30' 1"	RPV Flange