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Ref. # 10CFR50.73(a)(2)(ii)(A)

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April 25, 2003

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

SUBJECT: COMANCHE PEAK STEAM ELECTRIC STATION (CPSES)
DOCKET NO. 50-445
SUPPLEMENTAL LICENSEE EVENT REPORT 445/02-002-01
STEAM GENERATORS MEETING C-3 CATEGORY

Gentlemen:

Enclosed is the supplemental Licensee Event Report (LER) 02-002-01 for Comanche Peak Steam Electric Station Unit 1, "Steam Generator Tube Plugging".

This LER is submitted pursuant to CPSES Technical Specification 5.6.10.c.

This LER has been revised to reflect information made available after vendor evaluation of tubes subsequent to the Unit 1 ninth refueling outage (1RF09).

This communication contains no new licensing basis commitments regarding CPSES Unit 1.

IE22

TXU

Sincerely,

TXU Generation Company LP

By: TXU Generation Management Company LLC,
Its General Partner

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

By: Roger D. Walker
Roger D. Walker
Regulatory Affairs Manager

RJK/rk
Enclosure

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

NRC FORM 366 (7-2001)

U.S. NUCLEAR REGULATORY COMMISSION

LICENSEE EVENT REPORT (LER)

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Title (4)
TECHNICAL SPECIFICATION REPORT FOR STEAM GENERATORS MEETING C-3 CATEGORY

Event Date (5)			LER Number (6)			Report Date (7)			Other Facilities Involved (8)	
Month	Day	Year	Year	Sequential Number	Revision Number	Month	Day	Year	Facility Name	Docket Numbers
									N/A	05000
10	06	02	02	002	01	04	25	2003		05000

Operating Mode (9): 6

Power Level (10): 0

This report is submitted pursuant to the requirements of 10 CFR (Check all that apply) (11)

	20 2201(b)		20.2203(a)(3)(i)		50 73(a)(2)(i)(C)		50 73(a)(2)(vii)
	20 2201(d)		20.2203(a)(3)(ii)	X	50 73(a)(2)(ii)(A)		50 73(a)(2)(viii)(A)
	20 2203(a)(1)		20.2203(a)(4)		50 73(a)(2)(ii)(B)		50 73(a)(2)(viii)(B)
	20 2203(a)(2)(i)		50.36(c)(2)(i)(A)		50.73(a)(2)(iii)		50 73(a)(2)(ix)(A)
	20 2203(a)(2)(ii)		50.36(c)(1)(ii)(A)		50 73(a)(2)(iv)(A)		50 72(a)(2)(x)
	20 2203(a)(2)(iii)		50.36(c)(2)		50 73(a)(2)(v)(A)		73 71(a)(4)
	20 2203(a)(2)(iv)		50 46(a)(3)(ii)		50 73(a)(2)(v)(B)		73.71(a)(5)
	20.2203(a)(2)(v)		50 73(a)(2)(i)(A)		50 73(a)(2)(v)(C)		OTHER
	20.2203(a)(2)(vi)		50 73(a)(2)(i)(B)		50.73(a)(2)(v)(D)		Specify in Abstract below or in NRC Form 366A

Licensee Contact For This LER (12)

Name	Telephone Number (Include Area Code)
Ben Mays - Manager, System Engineering	254-897-6816

Complete One Line For Each Component Failure Described in This Report (13)

Cause	System	Component	Manufacturer	Reportable To EPIX	Cause	System	Component	Manufacturer	Reportable To EPIX
				N					

Supplemental Report Expected (14)				Expected Submission Date (15)	Month	Day	Year
	YES (If YES, complete EXPECTED SUBMISSION DATE)	X	NO				

ABSTRACT (Limit to 1400 spaces, i e., approximately 15 single-spaced typewritten lines) (16)

Comanche Peak Steam Electric Station (CPSES) Unit 1 was taken off line on September 28, 2002 for the ninth refueling outage (1RF09). As part of the scheduled surveillance requirements of CPSES Technical Specification (TS) 5.5.9, analysis of eddy current plus point testing data on the Steam Generators (SGs) indicated that greater than 1 percent of the total tubes inspected in 3 of 4 SGs were defective. The majority of the tube defects are attributed to circumferential outside diameter stress corrosion cracking (ODSCC) at the hot leg top of tubesheet (TTS) transition.

TXU Generation Company LP (TXU Energy) has plugged and/or sleeved the defective tubes identified during the current refueling outage. With the exception of one tube (which is discussed in the Safety Consequences and Implications below), all defective tubes met the criteria of NUREG 1022, Revision 2, for structural integrity. TXU Energy maintains a comprehensive program to identify SG tube degradation.

All times in this report are approximate and Central Daylight Savings Time unless noted otherwise.

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NARRATIVE (If more space is required, use additional copies of NRC Form 366A) (17)

I. DESCRIPTION OF REPORTABLE EVENT

A. REPORTABLE EVENT CLASSIFICATION

The subject event is reportable pursuant to the requirements of CPSES TS 5.6.10, specifically 10CFR50.73(a)(2)(ii)(A).

B. PLANT OPERATING CONDITIONS PRIOR TO THE EVENT

On October 6, 2002, CPSES Unit 1 was in Mode 6, Refueling, during its ninth refueling outage.

C. STATUS OF STRUCTURES, SYSTEMS, OR COMPONENTS THAT WERE INOPERABLE AT THE START OF THE EVENT AND THAT CONTRIBUTED TO THE EVENT

Not Applicable – There were no structures, systems, or components that were inoperable at the start of the event which contributed to this event.

D. NARRATIVE SUMMARY OF THE EVENT, INCLUDING DATES AND APPROXIMATE TIMES

On September 28, 2002, CPSES Unit 1 began its ninth refueling outage.
CPSES Technical Specification (TS) 5.5.9, "Steam Generator (SG) Tube Surveillance Program", requires that the results of each Steam Generator (EIIS: (AB)(SG)) tube inspection be classified as Category C-3 if more than 1 percent of the total tubes inspected are defective.

Additionally, if the results of the SG tube sample inspections are classified as Category C-3, then prompt NRC notification is required in accordance with TS 5.5.9 Table 5.5-2 and TS 5.6.10.c. During this ninth refueling outage, results of 3 SG inspections went into Category C-3 at separate times.

Two separate notifications were identified on the following dates and times:

1. On October 6, 2002, at 4:50 p.m., CPSES made notification of an event pursuant to the requirements of 10CFR50.72(b)(3)(ii)(A). The notification stated that analysis of eddy current testing data on SG 1-2 indicated that greater than 1 percent of the total tubes inspected in SG 1-2 were defective (Refer to NRC event number 39251).

2. On October 6, 2002, at 9:30 p.m., CPSES made notification of an event pursuant to the requirements of 10CFR50.72(b)(3)(ii)(A). The notification stated that analysis of eddy current testing data on SGs 1-3 and 1-4 indicated that greater than 1 percent of the total tubes inspected in SGs 1-3 and 1-4 were defective (Refer to NRC event number 39251).

E. THE METHOD OF DISCOVERY OF EACH COMPONENT OR SYSTEM FAILURE, OR PROCEDURAL OR PERSONNEL ERROR

The defective tubes were found during scheduled eddy current testing of the CPSES Unit 1 SG tubing.

II. <u>COMPONENT OR SYSTEM FAILURES</u>

A. FAILURE MODE, MECHANISM, AND EFFECTS OF EACH FAILED COMPONENT

TXU Energy believes that the predominant degradation mechanism was ODSCC. Additional degradation mechanisms identified, to a very limited extent, (<0.5 percent) included Primary Water Stress Corrosion Cracking (PWSCC) and wear.

B. DURATION OF SAFETY SYSTEM TRAIN INOPERABILITY

Not Applicable – No safety system train was rendered inoperable.

C. SAFETY CONSEQUENCES AND IMPLICATIONS

The ODSCC associated with the hot leg expansion transition was found to be the predominant degradation mechanism seen during the CPSES 1RF09 inspection. A total of 667 tubes were repaired (plugged or sleeved) for this mode of degradation. SG 1-1 had 31 tubes affected; SG 1-2 had 186 tubes affected, SG 1-3 had 216 tubes affected, and SG 1-4 had 234 tubes affected. The total plugs and sleeves installed to date remain well below the 10 percent tube plugging allowance provided by the accident analysis described in CPSES FSAR Chapters 4 and 15. Eight tubes with ODSCC associated with the hot leg expansion transition were in situ pressure tested with no leakage or achieving the burst point.

However, during the in situ pressure testing on SG 1-02, tube R41 C71, leakage exceeded the pump capacity at 2.6 gallons per minute (GPM) and 2070 psig. Limited pump capacity prevented reaching the Structural Integrity Performance Criterion of NEI 97-06, "Steam Generator Program Guidelines," therefore meeting this criterion is indeterminate. Due to the inaccessability of tube R41 C71 for removal, two tubes with similar indications to tube R41 C71 were removed

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and sent to the vendor (Westinghouse) for failure analysis after successful in situ pressure testing was completed. It should be noted that 10 additional tubes with defects similar in nature to tube R41 C71 were also in situ pressure tested with satisfactory results. Actual SG tube leakage prior to the ninth refueling outage was well within the allowed CPSES TS limit of 150 gpd and there were no measurable offsite radiological consequences.

The condition of the tubes at the end of cycle (EOC) 9 for this damage mechanism meets the NRC accepted integrity levels. The number of indications for EOC 9 increased but the voltage amplitude distribution was equivalent to the results at the EOC 7 and EOC 8. Therefore, the structural and leakage integrity condition of the CPSES Unit 1 SGs is not significantly different from previous cycles and continues to meet the established regulations, codes, and standards, with the exception of tube R41 C71 as discussed above.

Based on the aforementioned, it was concluded that the event had no impact on the health and safety of the public

Supplemental Information:

Primary to secondary leakage was identified at the end of the cycle and the observation of dripping water from tube R41 C71 during shutdown indicated that a 100% through wall (TW) degradation was present. Subsequent visual examination of the inner diameter surface of R41 C71 clearly shows 2 collinear axial cracks at the elevation in question. The upper 100%TW tip of the lower crack is at the same elevation or slightly below the lower 100%TW tip of the upper crack. A non-degraded ligament is clearly visible between the 2 cracks. Based on burst testing results performed as part of the original F* alternate repair criterion development, it was concluded that collinear axial cracks act independently of each other with regard to burst capability.

Changes were made to the bobbin reporting criteria for the 1RF09 inspection designed to identify the early precursor signal for tube R41 C71. Therefore, if indications similar to R41 C71 were present in the CPSES SGs, they would have been reported in the bobbin reanalysis program. Also, all freespan differential signals (FSD) reported in the U-bend region of the CPSES SGs at 1RF09 were Plus Point™ (+Pt) inspected. Therefore, it is not reasonable to assume that an indication similar to R41 C71 in the prior refueling outage (1RF08) is currently present in the CPSES Unit 1 SGs.

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The maximum observed in situ test pressure for this tube was 2150 psi, with a measured leak rate of 2.6 GPM. The estimated 100%TW length to provide 2.6 GPM at a differential pressure of 2150 psi is 0.50 to 0.55". Based on the in situ testing results for R41 C71, the leak rate was projected for the CPSES Unit 1 Steam Line Break (SLB) differential pressure of 2350 psi with Power Operated Relief Valve (PORV) availability using the methodology applied to axial ODSCC indications at tube support plate (TSP) intersections that is part of the alternate repair criterion methodology. The projected leak rate is 5.1 GPM. This evaluation uses the elevated temperature tube material property values to estimate volumetric flow and then adjusts these values to room temperature conditions to provide an evaluation bases consistent with the offsite dose leakage limit. The offsite dose leakage limit for Comanche Peak Unit 1 is 27 GPM. Thus, while this indication would have provided leakage in excess of the NEI 97-06 performance criterion, doses at the site boundary would not have exceeded the licensing basis.

III. CAUSE OF THE EVENT

TXU Energy believes that the predominant damage mechanism (ODSCC) was caused by the temperature, chemistry, and residual stress effects on the tubing material (Inconel 600 MA).

IV. CORRECTIVE ACTIONS

TXU Energy believes that it has repaired the known defective tubes by plugging or sleeving as required by CPSES Technical Specifications.

V. PREVIOUS SIMILAR EVENTS

There have been three other previous events regarding SG inspections that went into Category C-3 at CPSES, which occurred during the SG tube inspections for the sixth, seventh, and eighth refueling outages. Corrective actions taken for the previous events would not have prevented this event.

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VI. ADDITIONAL INFORMATION

The following information meets the requirements of the Special Report as defined in CPSES Technical Specification 5.6.10.a. Total tubes plugged and/or sleeved during this outage (this includes some previously plugged tubes which were recovered by sleeving):

CPSES UNIT 1 STEAM GENERATOR 1

48 tubes were plugged in this steam generator
0 tubes were sleeved in this steam generator
0 tubes were designated as an F* (as defined in CPSES TS) tube.

CPSES UNIT 1 STEAM GENERATOR 2

18 tubes were plugged in this steam generator
213 tubes were sleeved in this steam generator
0 tubes were designated as an F* (as defined in CPSES TS) tube.

CPSES UNIT 1 STEAM GENERATOR 3

23 tubes were plugged in the steam generator
250 tubes were sleeved in this steam generator
0 tubes were designated as an F* (as defined in CPSES TS) tube.

CPSES UNIT 1 STEAM GENERATOR 4

12 tubes were plugged in this steam generator
273 tubes were sleeved in this steam generator
0 tubes were designated as an F* (as defined in CPSES TS) tube.