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Ref: 10CFR50.90

CPSES-200400541
Log # TXX-04045
File # 00236

March 8, 2004

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

SUBJECT: COMANCHE PEAK STEAM ELECTRIC STATION (CPSES)
DOCKET NO. 50-445
RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION RELATED TO LICENSE AMENDMENT REQUEST 03-03, REVISION TO TECHNICAL SPECIFICATION (TS) 5.5.9 STEAM GENERATOR TUBE REPAIR USING LEAK LIMITING ALLOY 800 SLEEVES (TAC NO. MC0197)

REF: 1) TXU Energy Letter, logged TXX-03102, from C. L. Terry to the U. S. Nuclear Regulatory Commission, dated July 21, 2003.

2) TXU Energy Letter, logged TXX-03198, from Mike Blevins to the U. S. Nuclear Regulatory Commission, dated January 8, 2004.

Gentlemen:

The purpose of this letter is to reply to your Request for Additional Information concerning our submittal of License Amendment Request 03-03 originally transmitted by Reference 1 and supplemented by TXU Energy's response to the NRC's initial request for additional information provided by Reference 2. The current NRC questions are restated in Attachment 1 with TXU Energy's response immediately following each question.

Attachment 2 provides a revised copy of the affected Technical Specification pages, marked-up to reflect the proposed changes.

Attachment 3 provides retyped Technical Specification pages which incorporate the requested changes.

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This communication contains the following commitment regarding CPSES Unit 1:

Commitment Number	Commitment
27311	During the next operating cycle, TXU Energy will develop and provide a technical basis for the effectiveness of this inspection method in detecting parent tube flaws located behind the nickel band.

Should you require any other additional information please contact Mr. Bob Kidwell at (254) 897-5310.

I state under penalty of perjury that the foregoing is true and correct.

Executed on March 8, 2004.

Sincerely,

TXU Generation Company LP
By: TXU Generation Management Company LLC,
Its General Partner

Mike Blevins

RJK/rk

Attachments
1. TXU Energy Response to RAI
2. Markup of revised Technical Specifications Pages
3. Retyped revised Technical Specification Pages

c - B. Mallett, Region IV
W. D. Johnson, Region IV
M. C. Thadani, NRR
Resident Inspectors, CPSES

Ms. Alice Rogers
Bureau of Radiation Control
Texas Department of Public Health
1100 West 49th Street
Austin, Texas 78756-3189

Attachment 1 to TXX-04045

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION
COMANCHE PEAK STEAM ELECTRIC STATION (CPSES) UNIT 1
LICENSE AMENDMENT REQUEST 03-03
TAC No. MC0197

1. In your response to NRC staff Question 9 in your letter dated January 8, 2004, it was stated that the qualification program included sixteen sleeve/tube assemblies with laboratory-grown stress corrosion cracks.

   A. Discuss whether any of these laboratory-grown stress corrosion cracks were situated in the portion of the tube that is adjacent to (i.e., behind) the sleeve's nickel band.

   B. If some of the cracks were situated behind the nickel band, (1) discuss the size and location of these cracks (i.e., were some of the cracks situated in a manner that would require the eddy current signal to pass through the nickel band in order for the cracks to be detected); (2) discuss the orientation of the cracks (e.g., axial, circumferential, etc.); (3) discuss the effectiveness of the eddy current inspection method in detecting these cracks, and (4) if the eddy current technique is not effective at detecting these cracks, discuss which method will be used for this inspection and the technical basis for this method.

   C. If some of the cracks were not situated behind the nickel band, provide a methodology (and technical basis) for addressing the structural and leakage integrity for the sleeve/tube assembly, assuming that degradation (e.g., a 360°, 100% through-wall circumferential flaw) could be occurring in the portion of the tube that is adjacent to (i.e., behind) the sleeve's nickel band.

TXU Energy Response:

1.A None of the laboratory-grown stress corrosion cracks were situated in the portion of the tube that is adjacent to (i.e., behind) the sleeve's nickel band. Based on review of the WCAP-15918, industry events, and associated laboratory testing it was concluded that there is no documented report which depict that corrosion cracks have been discovered behind an Alloy 800 sleeve's nickel band.

1.B None of the laboratory-grown stress corrosion cracks were situated in the portion of the tube that is adjacent to (i.e., behind) the sleeve's nickel band, therefore this question is not applicable.

1.C The nickel band improves sealing of the sleeve when it is rolled into the tube. The thermally-sprayed nickel alloy band (as described in the installation procedures) results in a rough surface and enhances the rolled mechanical joint. The rolled mechanical joint then becomes a pressure boundary area. Surface and subsurface indications in the sleeve and the parent tube within the defined pressure boundary (including the Nickel band) are detectable using an eddy current probe with a 75 kHz frequency. During the next operating cycle, TXU Energy will develop and provide a technical basis for the effectiveness of this inspection method in detecting parent tube flaws located behind the nickel band.

2. In your proposed technical specifications for the Plugging or Repair Limit, you indicate that the plugging limit for leak tight sleeve is equal to 20% of the nominal wall thickness (which is consistent with the definition of an imperfection) which indicates that indications below 20% of the nominal tube wall thickness may be considered as imperfections.

   If it is not your intent to plug all tubes with indications in the sleeves upon detection (regardless of the depth of degradation), please provide the technical basis for this plugging limit. In your response, please describes the testing programs used in determining the growth rate and non-destructive examination uncertainty used in the determination of this plugging limit. If you do intend to plug all tubes with indications in the sleeves upon detection (regardless of the depth of degradation), please modify your technical specifications appropriately.

TXU Energy Response:

2. The present statement in the Technical Specifications that "The plugging limit for Leak Tight Sleeves is equal to 20% of the nominal wall thickness" is only applicable to the leak tight (i.e., Alloy 690) sleeves previously approved by the NRC in License Amendment 101 on 25 September, 2002 (ADAMS Accession #ML022590423). This statement does not apply to the leak limiting (i.e., Alloy 800) sleeves.

   The leak limiting (Alloy 800) sleeves are addressed by the following statement added to Technical Specification 5.5.9.f; "All tubes repaired with Leak Limiting sleeves shall be plugged upon detection of degradation in the sleeve and/or pressure boundary portion of the original tube wall in the sleeve/tube assembly (i.e., the sleeve-to-tube joint) regardless of depth."

3. In your January 8, 2004 response to question 2, you indicate that if a tube flaw is below the sleeve, then it is allowed to stay in service due to the F* analysis. Please provide the technical basis for this proposal. Include in your response the test results showing that structural and leakage integrity will be maintained with just the sleeve/tube joint (i.e., ignoring the non-pressure boundary portion of the parent tube since its integrity will no longer be able to be relied upon). The staff notes that the basis for the F* criterion did not address whether the length of the parent tube at the rolled joint of a sleeve was adequate to ensure structural and leakage integrity given the assumed absence of the parent tube above this location (and spanned by the sleeve).

   Alternatively, modify your proposed technical specifications to indicate that the plugging or repair limit will apply to defects located below the sleeve.

   TXU Energy Response:

   F* criteria will not be applicable to tubes with leak limiting sleeves installed in the transition zone. See markup of Technical Specifications 5.5.9.f and 5.5.9.j in Attachment 2 to this letter.

4. In your January 8, 2004 response to question 4, you indicate that operational experience to date has confirmed these calculated values to be conservative. The intent of question 4 was to obtain any operating experience (under any condition including operating conditions) in which Alloy 800 sleeves has leaked. Please provide this information.

   TXU Energy Response:

   TXU Energy and Westinghouse are not aware of any reported or documented leakage of an operational steam generator tube in which an Alloy 800 sleeve has been installed. The lack of any conflicting operational data provides confirmation that the calculated maximum leakage values are conservative considering the operational experience to date.

ATTACHMENT 2 to TXX-04045

PROPOSED TECHNICAL SPECIFICATION CHANGES (MARK-UP)

Pages 5.0-16 and 5.0-17

5.5.9 Steam Generator (SG) Tube Surveillance Program (continued)

f) Plugging or Repair Limit means the imperfection depth at or beyond which the tube shall be removed from service by plugging or (for Unit 1 only) repaired by sleeving and is equal to 40% of the wall thickness. The plugging limit for laser welded sleeves is equal to 43% of the nominal wall thickness. The plugging limit for Leak Tight sleeves is equal to 20% of the nominal wall thickness. This definition does not apply to that portion of the Unit 1 tubing that meets the definition of an F* tube. This definition does not apply to tube support plate intersections for which the voltage-based plugging criteria are being applied. Refer to 5.5.9e.1m) for the repair limit applicable to these intersections. All tubes repaired with Leak Limiting sleeves shall be plugged upon detection of degradation in the sleeve and/or pressure boundary portion of the original tube wall in the sleeve/tube assembly (i.e., the sleeve-to-tube joint) regardless of depth. The F* criteria is not applicable to the parent tube located behind the Leak Limiting sleeves installed in the tubesheet transition zone;

g) Unserviceable describes the condition of a tube if it leaks or contains a defect large enough to affect its structural integrity in the event of an Operating Basis Earthquake, a loss-of-coolant accident, or a steam line or feedwater line break as specified in Specification 5.5.9d.3, above;

h) Tube Inspection means an inspection of the steam generator tube from the tube end (hot leg side) completely around the U-bend to the top support of the cold leg. For a tube repaired by sleeving (for Unit 1 only) the tube inspection shall include the sleeved portion of the tube;

i) Preservice Inspection means an inspection of the full length of each tube in each steam generator performed by eddy current techniques prior to service to establish a baseline condition of the tubing. This inspection shall be performed prior to initial POWER OPERATION using the equipment and techniques expected to be used during subsequent inservice inspections;

j) F* Distance (Unit 1 only) is the distance of the hardroll expanded portion of a tube which provides a sufficient length of non-degraded tube expansion to resist pullout of the tube from the tubesheet. The F* distance is equal to 1.13 inches, plus an allowance for eddy current measurement uncertainty, and is measured down from the top of the tubesheet, or the bottom of the roll transition, whichever is lower in elevation. The F* criteria is not applicable to the parent tube located behind the Leak Limiting sleeves installed in the tubesheet transition zone;

k) F* Tube (Unit 1 only) is that portion of the tubing in the area of the tubesheet region below the F* distance with a) degradation below the F* distance equal to or greater than 40%, b) which has no indication of degradation within the F* distance, and c) that remains inservice;

(continued)

5.5.9 Steam Generator (SG) Tube Surveillance Program (continued)

4. Certain intersections as identified in WPT-15949 will be excluded from application of the voltage-based repair criteria as it is determined that these intersections may collapse or deform following a postulated LOCA + SSE event.

5. If an unscheduled mid-cycle inspection is performed, the following mid-cycle repair limits apply instead of the limits identified in 5.5.9e.1.m)1., 5.5.9e.1.m)2., and 5.5.9e.1.m)3. The midcycle repair limits are determined from the following equations:

$$V_{MURL} = \frac{V_{SL}}{1.0 + NDE + Gr\left(\frac{CL - \Delta t}{CL}\right)}$$

$$V_{MLRL} = V_{MURL} - (V_{URL} - V_{LRL})\left[\frac{CL - \Delta t}{CL}\right]$$

where:

V_{URL}	=	upper voltage repair limit
V_{LRL}	=	lower voltage repair limit
V_{MURL}	=	mid-cycle upper voltage limit based on time into cycle
V_{MLRL}	=	mid-cycle lower voltage repair limit based on V_{MLRL} and time into cycle
Δt	=	length of time since last scheduled inspection during which V_{URL} and V_{LRL} were implemented
CL	=	cycle length (the time between two scheduled steam generator inspections)
V_{SL}	=	structural limit voltage
Gr	=	average growth per cycle
NDE	=	95-percent cumulative probability allowance for nondestructive examination uncertainty (i.e., a value of 20-percent has been approved by the NRC)

Implementation of these mid-cycle repair limits should follow the same approach as in TS 5.5.9e.1.m)1., 5.5.9e.1m)2., and 5.5.9e.1.m)3.

n. Tube Repair (for Unit 1 only) refers to the process that establishes tube serviceability. Acceptable tube repairs will be performed in accordance with the process described in Westinghouse WCAP-13698, Rev. 3 and Westinghouse Letter WPT-16094 dated March 20, 2000, WCAP-15090, Rev. 1, ~~and~~ CEN-630-P, Rev. 2 dated June 1997, and WCAP-15918, Rev. 1 dated January, 2004.

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ATTACHMENT 3 to TXX-04045

RETYPED TECHNICAL SPECIFICATION PAGES

Pages 5.0-16 and 5.0-17

5.5.9 Steam Generator (SG) Tube Surveillance Program (continued)

f) Plugging or Repair Limit means the imperfection depth at or beyond which the tube shall be removed from service by plugging or (for Unit 1 only) repaired by sleeving and is equal to 40% of the wall thickness. The plugging limit for laser welded sleeves is equal to 43% of the nominal wall thickness. The plugging limit for Leak Tight sleeves is equal to 20% of the nominal wall thickness. This definition does not apply to that portion of the Unit 1 tubing that meets the definition of an F* tube. This definition does not apply to tube support plate intersections for which the voltage-based plugging criteria are being applied. Refer to 5.5.9e.1m) for the repair limit applicable to these intersections. All tubes repaired with Leak Limiting sleeves shall be plugged upon detection of degradation in the sleeve and/or pressure boundary portion of the original tube wall in the sleeve/tube assembly (i.e., the sleeve-to-tube joint) regardless of depth. The F* criteria is not applicable to the parent tube located behind the Leak Limiting sleeves installed in the tubesheet transition zone;

g) Unserviceable describes the condition of a tube if it leaks or contains a defect large enough to affect its structural integrity in the event of an Operating Basis Earthquake, a loss-of-coolant accident, or a steam line or feedwater line break as specified in Specification 5.5.9d.3, above;

h) Tube Inspection means an inspection of the steam generator tube from the tube end (hot leg side) completely around the U-bend to the top support of the cold leg. For a tube repaired by sleeving (for Unit 1 only) the tube inspection shall include the sleeved portion of the tube;

i) Preservice Inspection means an inspection of the full length of each tube in each steam generator performed by eddy current techniques prior to service to establish a baseline condition of the tubing. This inspection shall be performed prior to initial POWER OPERATION using the equipment and techniques expected to be used during subsequent inservice inspections;

j) F* Distance (Unit 1 only) is the distance of the hardroll expanded portion of a tube which provides a sufficient length of non-degraded tube expansion to resist pullout of the tube from the tubesheet. The F* distance is equal to 1.13 inches, plus an allowance for eddy current measurement uncertainty, and is measured down from the top of the tubesheet, or the bottom of the roll transition, whichever is lower in elevation. The F* criteria is not applicable to the parent tube located behind the Leak Limiting sleeves installed in the tubesheet transition zone;

k) F* Tube (Unit 1 only) is that portion of the tubing in the area of the tubesheet region below the F* distance with a) degradation below the F* distance equal to or greater than 40%, b) which has no indication of degradation within the F* distance, and c) that remains inservice;

(continued)

5.5 Programs and Manuals

5.5.9 Steam Generator (SG) Tube Surveillance Program (continued)

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$$V_{MURL} = \frac{V_{SL}}{1.0 + NDE + Gr\left(\frac{CL - \Delta t}{CL}\right)}$$

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where:

V_{URL}	=	upper voltage repair limit
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