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July 21, 2003

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

SUBJECT: COMANCHE PEAK STEAM ELECTRIC STATION (CPSES)
DOCKET NO. 50-445
LICENSE AMENDMENT REQUEST (LAR) 03-03
REVISION TO TECHNICAL SPECIFICATION (TS) 5.5.9
STEAM GENERATOR TUBE REPAIR USING LEAK LIMITING ALLOY 800 SLEEVES

Pursuant to 10CFR50.90, TXU Generation Company LP (TXU Energy) hereby requests an amendment to the CPSES Unit 1 Operating License (NPF-87) by incorporating the attached change into the CPSES Unit 1 and 2 Technical Specifications. This change request applies to CPSES Unit 1.

The proposed change will revise TS 5.5.9 entitled, "Steam Generator (SG) Tube Surveillance Program." The proposed Technical Specification will allow CPSES the use of Westinghouse leak limiting Alloy 800 sleeves to repair defective steam generator tubes as an alternative to plugging the tube. The technique for repairing the degraded tubes is described in the Westinghouse Electric LLC. Proprietary Class 2 report WCAP-15918-P, Revision 0, (CEN-633-P, Revision 05-P), "*Steam Generator Tube Repair for Combustion Engineering and Westinghouse Designed Plant with ¾ Inch Inconel 600 Tubes Using Leak Limiting Alloy 800 Sleeves,*" dated November 2002. This report details the analyses and testing performed to verify the adequacy of Alloy 800 sleeves for installation in a steam generator tube and demonstrates sleeving to be an acceptable repair technique.

Attachment 1 provides a detailed description of the proposed changes, a safety analysis of the proposed changes, TXU Energy's determination that the proposed changes do not involve a significant hazard consideration, a regulatory analysis of the proposed changes and an environmental evaluation. Attachment 2 provides 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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TXU Energy requests approval of the proposed License Amendment by December 31, 2003 to be implemented within 60 days of the issuance of the license amendment. The approval date was administratively selected to allow for NRC review since the plant does not presently require this amendment to allow continued safe full power operations. This amendment will be required to enter MODE 4 following the 2004 spring refueling outage.

In accordance with 10CFR50.91(b), TXU Energy is providing the State of Texas with a copy of this proposed amendment.

This communication contains no new or revised licensing basis commitments.

Should you have any questions, please contact Mr. Bob Kidwell at (254) 897-5310.

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

Executed on July 21, 2003.

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 B. Walker
Roger B. Walker
Regulatory Affairs Manager

RJK/rk

Attachments
1. Description and Assessment
2. Markup of Technical Specifications pages
3. Retyped Technical Specification Pages

cc: T. P. Gwynn, Region IV
W. D. Johnson, Region IV
D. H. Jaffe, NRR
Resident Inspectors, CPSES

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ATTACHMENT 1 to TXX-03102

DESCRIPTION AND ASSESSMENT
LICENSEE'S EVALUATION

1.0 DESCRIPTION

By this letter, TXU Generation Company LP (TXU Energy) requests an amendment to the CPSES Unit 1 Operating License (NPF-87) by incorporating the attached change into the CPSES Unit 1 and 2 Technical Specifications. Proposed change LAR-03-03 is a request to revise Technical Specification (TS) 5.5.9 entitled Steam Generator (SG) Tube Surveillance Program. The proposed Technical Specification will allow CPSES the use of Westinghouse leak limiting Alloy 800 sleeves to repair defective steam generator tubes as an alternative to plugging the tube. The technique for repairing the degraded tubes is described in the Westinghouse Electric LLC Proprietary Class 2 report WCAP-15918-P Revision 0, (CEN-633-P, Revision 05-P), "Steam Generator Tube Repair for Combustion Engineering and Westinghouse Designed Plant with ¾ Inch Inconel 600 Tubes Using Leak Limiting Alloy 800 Sleeves," dated November 2002. This report details the analyses and testing performed to verify the adequacy of Alloy 800 sleeves for installation in a steam generator tube and demonstrates sleeving to be an acceptable repair technique.

TXU Energy is requesting approval of this amendment by December 31, 2003 to support the Spring 2004 Cycle 10 Refueling Outage.

2.0 PROPOSED CHANGE

The proposed change, which allows steam generator tube sleeves as a repair option, affects the following sections of Technical Specification 5.5.9, "Steam Generator (SG) Tube Surveillance Program."

Section 5.5.9.f – adds to the definition of Plugging Limit to include leak limiting sleeves.

Section 5.5.9.n – adds to the definition of Tube Repair to include Westinghouse WCAP-15918, Rev. 0.

In summary, the proposed change to Technical Specification Section 5.5.9 provides an alternative to plugging defective steam generator tubes. By repairing the defective tubes with the use of leak limiting sleeves, the tube is allowed to remain in service.

CPSES Technical Specification Administrative Section 5.0 does not have a supporting Bases section.

3.0 BACKGROUND

Pressurized water reactor steam generators have experienced tube degradation related to corrosion phenomena such as wastage, pitting, intergranular attack, stress corrosion cracking, and crevice corrosion, along with other phenomena such as denting and vibration wear. Tubes that experience excessive degradation reduce the integrity of the primary-to-secondary pressure boundary. Eddy current examination is used to measure the extent of tube degradation. When the reduction in tube wall thickness reaches a calculated value commonly known as the plugging criterion, when a crack is found, or when other alternate plugging criteria are exceeded, the tube is considered defective and corrective action is taken.

Currently, the CPSES Technical Specifications allow defective tubes to be repaired using either laser welded or Leak Tight sleeves. The proposed amendment revises the appropriate technical specification section to permit the use of leak limiting Alloy 800 repair sleeves developed by Westinghouse to be used at CPSES Unit 1. Westinghouse provides two types of leak limiting Alloy 800 repair sleeves. The first type of sleeve spans the hard rolled transition zone (TZ) of the steam generator tube at the top of the tubesheet. The TZ repair sleeve is hydraulically expanded into the tube at the upper end and is hard rolled into the tube within the steam generator tubesheet. The length of the TZ sleeves permits the sleeve to span the degraded tube section at the top of the tubesheet. The second type of repair sleeve spans degraded areas of the tube at a tube support (TS) plate elevation or in a free span section and is hydraulically expanded into the degraded tube near each end of the sleeve.

There are two distinct advantages associated with the leak limiting Alloy 800 repair sleeves. First, no welding, brazing, or heat treatment is required during sleeve installation. Secondly, the strain within the tube is low, thereby reducing the likelihood of future degradation due to stress-influenced mechanisms. Although the Alloy 800 repair sleeves may allow slight leakage past the sleeve (assuming the parent tube is leaking), the postulated leakage is expected to be well within the CPSES Technical Specification limits.

The Westinghouse analysis described in WCAP-15918-P, Revision 0 was performed for steam generator tube repair in Combustion Engineering and Westinghouse designed plants with ¾ inch outer diameter Inconel 600 tubes of varying wall thickness and addresses a combination of one TZ sleeve and/or up to two TS sleeves that could be installed in a single steam generator tube. Acceptable sleeve locations covered by the analysis are from the uppermost tube support plate elevation down to the top of the tubesheet. WCAP-15918-P, Revision 0 provides a detailed description of the design, installation, and testing associated with the Alloy 800 leak limiting repair sleeves.

NRC approved the use of the leak limiting Alloy 800 repair sleeves for Calvert Cliffs Nuclear Power Plant Units 1 and 2 on September 1, 1999 (ADAMS Accession Number ML010520103). Calvert Cliffs applied the technique described in Westinghouse Report CEN-633-P, Revision 3 as the basis for the Alloy 800 repair sleeve installation. Revision 3 of the report was for the specific tube size in the Calvert Cliffs steam generators. Since that time, the report has been revised to include additional testing and analysis and incorporate other industry comments. Revision 5 of the CEN-633-P report (issued as WCAP-15918-P, Revision 0) addresses the specific tube size of the CPSES steam generators.

4.0 TECHNICAL ANALYSIS

The principal accident associated with this proposed change is the steam generator tube rupture (SGTR) event. The consequences associated with a SGTR event are discussed in Comanche Peak Steam Electric Station (CPSES) Updated Final Safety Analysis Report Section 15.6.3, "Steam Generator Tube Failure." The SGTR event is a breach of the barrier between the reactor coolant system and the main steam system. The integrity of this barrier is significant from the standpoint of radiological safety in that a leaking steam generator tube allows the transfer of reactor coolant into the main steam system. In the event of a SGTR, radioactivity contained in the reactor coolant mixes with water in the shell side of the affected steam generator. This radioactivity is transported by steam to the turbine and then to the condenser, or directly to the condenser via the turbine bypass valves, or directly to the atmosphere via the atmospheric dump/relief valves, main steam safety valves, or the auxiliary feedwater pump turbine exhaust. Noncondensible radioactive gases in the condenser are removed by the condenser air removal system and discharged to the plant vent. The use of Westinghouse leak limiting Alloy 800 sleeves allows the repair of degraded steam generator tubes such that the function and integrity of the tube is maintained; therefore, the SGTR accident is not affected.

The consequences of a hypothetical failure of a leak limiting Alloy 800 repair sleeve and/or associated steam generator tube would be bounded by the current SGTR analysis described above. Due to the slight reduction in the inside diameter of the steam generator tube caused by the sleeve wall thickness, primary coolant release rates would be slightly less than assumed for the SGTR analysis and, therefore, would result in lower total primary fluid mass release to the secondary system. A main steam line break (MSLB) or feedwater line break (FLB) will not cause a SGTR since the sleeves are analyzed for a design accident differential pressure greater than that predicted in the CPSES safety analysis. The impact of repair sleeving on steam generator performance, heat transfer, and flow restriction is minimal and/or insignificant compared to plugging. The proposed CPSES Technical Specification change to allow the use of leak limiting Alloy 800 repair sleeves does not adversely impact any other previously evaluated design basis accident.

Evaluation of the proposed leak limiting Alloy 800 repair sleeves indicates no detrimental effects on the sleeve or sleeved tube assembly from reactor system flow, primary or secondary coolant chemistries, thermal conditions or transients, or other pressure conditions that may be experienced at CPSES Unit 1. The minimal leakage, which is assumed but not expected, experienced during normal operation is well within the established leakage limits when combined with calculated leakage for other alternate plugging criteria. Data and calculation methodology concerning the reduction in primary coolant flow rate and sleeve-to-plug equivalency ratios is contained in Section 10 of WCAP-15918-P, Rev. 0. Table 1 of this Attachment provides a comparison of loading conditions assumed in WCAP-15918-P, Rev. 0, with respect to CPSES Unit 1 corresponding operating and accident values. The values assumed in WCAP-15918-P, Rev. 0 are either equivalent or more conservative than CPSES Unit 1 plant specific values.

TABLE 1

LOADING CONDITION COMPARISON

		CPSES Unit 1	WCAP-15918-P
T-Hot (Primary) Inlet	Actual Design	~619°F 650°F	620°F 650°F
T-Steam (Secondary)	Actual Design	~540°F 570°F	526.5°F 570°F
Prim-to-Sec ΔT	Actual	~79°F	93.5°F
Pressure Primary	Actual Design	2250 psia 2500 psia	2250 psia 2500 psia
Pressure Secondary	Actual Design	~959 psia 1200 psia	877 psia 1200 psia
Prim-to-Sec	Actual	~1291 psid	1373 psid
MSLB/FLB		<2750 psi	2850 psi
LOCA		<1198 psi	1198 psi

The detailed report describing the specific qualifications of Alloy 800 leak limiting repair sleeves is contained in the proprietary Westinghouse WCAP-15918-P report (CEN-633-P Revision 05-P). The summary of the results from the report are discussed below.

General Structural Assessment

The Alloy 800 tubing, from which the repair sleeves are fabricated, is procured to the requirements of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section II, Part B, SB-163, NiFeCr Alloy UNS N08800, and Section III, Subsection NB-2000. Additionally, supplemental requirements more tightly controlling parameters within the limits allowed by the ASME specification are imposed. Fatigue and stress analysis of the sleeved tube assemblies have been completed in accordance with the requirements of Section III ASME Boiler and Pressure Vessel Code and NRC Regulatory Guide 1.121, "Bases for Plugging Degraded PWR Steam Generator Tubes." Steam generator tubes with installed Alloy 800 repair sleeves meet the structural integrity requirements of tubes that are not degraded. Even in the event of the severance of the steam generator tube in the region behind the sleeve, the repaired sleeve will provide the required structural support and acceptable leakage between the primary and secondary systems for normal operating and accident conditions. The selected design criteria for the repaired sleeves ensure that all design and licensing requirements are considered. Extensive testing and analysis have been performed on the repair sleeve and sleeve-to-tube joints to demonstrate that these design criteria are met.

Mechanical testing has been performed to support the analyses prepared using ASME Code stress allowables. Corrosion testing of sleeve/tube assemblies has been performed in Belgium (Laborelec) and the U.S. (Westinghouse) with satisfactory results. These results, when analyzed in conjunction with corrosion test results from the tungsten inert

gas-welded sleeve program, confirm the adequacy of the sleeve joint design. The Alloy 800 sleeve material showed no signs of degradation under high temperature and pressure conditions in a caustic environment, while the sleeve/tube specimens maintained primary side pressure and exhibited no leakage throughout the duration of the test program. Earlier design variations of this sleeve/tube assembly (larger diametrical hydraulic expansion or varying number of expansions/configurations) were used at KORI 1 (South Korea) and Tihange 3 (Belgium) steam generators. The current design configuration is in service at Angra 1 (Brazil), KRSKO (Slovenia), Ringhals 4 (Sweden), Tihange 2 (Belgium), Ulchin 1 & 2 (South Korea), and Calvert Cliffs 1 and 2 (U.S.) steam generators.

Regulatory Guide 1.121, along with the Electrical Power Research Institute (EPRI) Steam Generator Degradation Specific Management Flaw Handbook, which adds margin to account for configuration of a long axial crack, are used to develop the structural limit of the repair sleeve should sleeve wall degradation occur as described in Section 8.2 of WCAP-15918. Alloy 800 leak limiting repair sleeves are shown (by test and analysis) to retain burst strength in excess of three times the normal operating pressure differential at end of cycle conditions. No credit for the presence of the parent tube behind the sleeve is assumed when performing the minimum wall burst evaluation for the Alloy 800 repair sleeve. For sleeves with minimum wall thickness, the structural limit imperfection depth is determined conservatively to be 48 percent (%) and bounds both normal and accident conditions. Appendix H of the EPRI Pressurized Water Reactor (PWR) Steam Generator Examination Guideline specifies that adequate flaw detection capability in the parent tube be demonstrated for flaws greater than or equal to 60% throughwall. For the purpose of this sleeve inspection qualification, these values were conservatively reduced to greater than or equal to 50% throughwall for the parent tube and greater than or equal to 45% for the sleeve in order to provide an operational margin between the detection limit and the structural limit for defect growth. A sufficient number of flaw samples has been used to demonstrate that the statistical requirements for probability of detection are met. The proposed Technical Specification changes require that a sleeved tube be plugged upon the detection of degradation in the sleeve/tube assembly.

Corrosion Assessment

Historically, Alloy 800 has been used successfully for steam generator tubes, tube plugs, and sleeves primarily in Western Europe. Over 200,000 Alloy 800 tubes have been used for up to 23 years with only minimal tube failures (thinning/wastage, wear). No evidence of primary or secondary side stress corrosion cracking has been identified in any Alloy 800 tube. Over 5,300 Alloy 800 repair sleeves of the leak limiting type design have been used in 10 units worldwide of which none have identified any service induced stress corrosion cracking in the sleeved tube assembly to-date. Accelerated corrosion testing of Alloy 800 repair sleeve/tube assemblies has been performed in simulated primary and secondary side steam generator environments resulted in no matters of concern. The specific details of Alloy 800 repair sleeve corrosion performance are contained in Section 6 of WCAP-15918.

Mechanical Integrity Assessment

Mechanical testing of Alloy 800 repair sleeve/tube assemblies was performed using mock-up steam generator tubes. The tests determined axial load, pressure load, collapse, burst, leak rates, wear, load cycling, and thermal cycling capability. The test results correlated well with applicable structural analysis results (analyses always conservative). The loading conditions developed in Section 8 of WCAP-15918 were used to develop the conditions that were tested in Section 7 of WCAP-15918. The temperature and pressure differentials described in Section 8 of WCAP-15918 are conservative with respect to CPSES operating and accident conditions.

Leakage Rate Assessment

The Alloy 800 TZ and TS repair sleeve leakage characteristics were evaluated at room and operating temperatures so that all possible plant conditions would be enveloped by the test results. Based on the worst-case leakage and excluding calculated leakage from alternate plugging criteria in effect, over 11,000 TZ sleeves could be installed and still meet the Technical Specification leakage limit of 150 gallons per day primary to secondary leakage for a single steam generator during normal operation and 1 gallon per minute for all steam generators during MSLB accident conditions. Details of the leakage assessment are contained in Section 7 of WCAP-15918.

Sleeve Examination

A post-installation sleeve/tube assembly examination will be performed using eddy current testing techniques qualified per EPRI Appendix H criteria. This examination will establish inservice inspection baseline data and initial installation acceptance data on the primary pressure boundary of the sleeve/tube assembly repair. Subsequent examinations will be consistent with plant Technical Specifications and EPRI Steam Generator Examination Guideline Revision 6 inspection requirements. Section 5 of WCAP-15918 describes repair sleeve/tube assembly examination methodology.

Effects of Sleeving on Operation

The effects of sleeve installation on steam generator heat removal capability and reactor coolant system flow rate are discussed in Section 10 of WCAP-15918, which in summary states that the installation of the sleeves does not substantially affect the primary system flow rate or the heat transfer capability of the steam generators. This aforementioned information was used to provide hydraulic equivalency of plugs and installed sleeves, or the sleeve/plug ratio. Table 10-1 of WCAP-15918, provides the sleeve/plug ratio.

Alloy 800 was designed for SG tubing as an alternative to Alloy 600 and is comprised of the same three major metallurgical components (nickel, iron, chrome) as Alloys 600 and 690. It has been in use in steam generators for many years in European Nuclear Plants and has performed well in a primary chemistry environment similar to CPSES. Therefore Alloy 800 is compatible with the primary chemistry regime used at CPSES and no changes to this regime are necessary.

Conclusion

Based on past usage, extensive testing and analysis, the Westinghouse Alloy 800 leak limiting repair sleeves provide satisfactory repair of defective steam generator tubes. Design criteria were established based on the requirements of the ASME Code and Regulatory Guide 1.121. Qualified nondestructive examination techniques will be used to perform necessary repair sleeve and tube inspections for defect detection, and to verify proper installation of the repair sleeve.

In conclusion, based on the considerations discussed above, (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

5.0 REGULATORY SAFETY ANALYSIS

5.1 No Significant Hazards Consideration

TXU Energy has evaluated whether or not a significant hazards consideration is involved with the proposed amendment(s) by focusing on the three standards set forth in 10CFR50.92, "Issuance of amendment," as discussed below:

1. Do the proposed changes involve a significant increase in the probability or consequences of an accident previously evaluated?

   Response: No

   The Westinghouse Alloy 800 leak limiting repair sleeves are designed using the applicable American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code and, therefore, meet the design objectives of the original steam generator tubing. The applied stresses and fatigue usage for the repair sleeves are bounded by the limits established in the ASME Code. Mechanical testing has shown that the structural strength of repair sleeves under normal, upset, emergency, and faulted conditions provides margin to the acceptance limits. These acceptance limits bound the most limiting (three times normal operating pressure differential) burst margin recommended by NRC's Regulatory Guide 1.121, "Bases for Plugging Degraded PWR Steam Generator Tubes." Burst testing of sleeve/tube assemblies has confirmed the analytical results and demonstrated that no unacceptable levels of primary-to-secondary leakage are expected during any plant condition.

   The Alloy 800 repair sleeve depth-based structural limit is determined using NRC guidance and the pressure stress equation of ASME Code, Section III with additional margin added to account for configuration of long axial cracks. A bounding detection threshold value has been conservatively identified and statistically established to account for growth and determine the repair sleeve/tube assembly plugging limit. A sleeved tube is plugged on detection of degradation in the sleeve/tube assembly.

Evaluation of the repaired steam generator tube testing and analysis indicates no detrimental effects on the sleeve or sleeved tube assembly from reactor system flow, primary or secondary coolant chemistries, thermal conditions or transients, or pressure conditions as may be experienced at Comanche Peak Steam Electric Station (CPSES) Unit 1 and Unit 2. Corrosion testing and historical performance of sleeve/tube assemblies indicates no evidence of sleeve or tube corrosion considered detrimental under anticipated service conditions.

The implementation of the proposed amendment has no significant effect on either the configuration of the plant or the manner in which it is operated. The consequences of a hypothetical failure of the sleeve/tube assembly is bounded by the current steam generator tube rupture (SGTR) analysis described in CPSES Updated Final Safety Analysis Report. Due to the slight reduction in the inside diameter caused by the sleeve wall thickness, primary coolant release rates would be slightly less than assumed for the steam generator tube rupture analysis and therefore, would result in lower total primary fluid mass release to the secondary system. A main steam line break or feedwater line break will not cause a SGTR since the sleeves are analyzed for a maximum accident differential pressure greater than that predicted in the CPSES safety analysis. The minimal repair sleeve/tube assembly leakage that could occur during plant operation is well within the Technical Specification leakage limits when grouped with current alternate plugging criteria calculated leakage values.

Therefore, TXU Energy has concluded that the proposed change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. Do the proposed changes create the possibility of a new or different kind of accident from any accident previously evaluated?

Response: No

The Alloy 800 leak limiting repair sleeves are designed using the applicable ASME Code as guidance; therefore, it meets the objectives of the original steam generator tubing. As a result, the functions of the steam generators will not be significantly affected by the installation of the proposed sleeve. The proposed repair sleeves do not interact with any other plant systems. Any accident as a result of potential tube or sleeve degradation in the repaired portion of the tube is bounded by the existing SGTR accident analysis. The continued integrity of the installed sleeve/tube assembly is periodically verified by the Technical Specification requirements and the sleeved tube will be plugged on detection of degradation.

The implementation of the proposed amendment has no significant effect on either the configuration of the plant, or the manner in which it is operated. Therefore, TXU Energy concludes that this proposed change does not create the possibility of a new or different kind of accident from any previously evaluated.

3. Do the proposed changes involve a significant reduction in a margin of safety?

Response: No

The repair of degraded steam generator tubes with Alloy 800 leak limiting repair sleeves restores the structural integrity of the degraded tube under normal operating and postulated accident conditions and thereby maintains current core cooling margin as opposed to plugging the tube and taking it out of service. The design safety factors utilized for the repair sleeves are consistent with the safety factors in the ASME Boiler and Pressure Vessel Code used in the original steam generator design. The portions of the installed sleeve/tube assembly that represent the reactor coolant pressure boundary can be monitored for the initiation of sleeve/tube wall degradation and the affected tube plugged on detection of degradation. Use of the previously identified design criteria and design verification testing assures that the margin to safety is not significantly different from the original steam generator tubes.

Therefore, TXU Energy concludes that the proposed change does not involve a significant reduction in a margin of safety.

Based on the above evaluations, TXU Generation Company LP concludes that the proposed amendment(s) present no significant hazards consideration under the standards set forth in 10CFR50.92(c) and, accordingly, a finding of "no significant hazards consideration" is justified.

5.2 Applicable Regulatory Requirements/Criteria

Based on past usage, extensive testing and analysis, the Westinghouse Alloy 800 leak limiting repair sleeves provide satisfactory repair of defective steam generator tubes. Design criteria were established based on the requirements of the ASME Code and Regulatory Guide 1.121. Qualified nondestructive examination techniques will be used to perform necessary repair sleeve and parent tube inspections for defect detection, and to verify proper installation of the repair sleeve.

In conclusion, based on the considerations discussed above, (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

6.0 ENVIRONMENTAL CONSIDERATION

TXU Generation Company LP has determined that the proposed amendment would change requirements with respect to the installation or use of a facility component located within the restricted area, as defined in 10CFR20, or would change an inspection or surveillance requirement. TXU Generation Company LP has evaluated the proposed changes and has determined that the changes do not involve (i) a significant hazards consideration, (ii) a significant change in the types or significant increase in the amount of effluent that may be released offsite, or (iii) a significant increase in the individual or cumulative occupational radiation exposure. Accordingly, the proposed change meets the eligibility criterion for categorical exclusion set forth in 10CFR51.22 (c)(9). Therefore, pursuant to 10CFR51.22 (b), an environmental assessment of the proposed change is not required.

7.0. REFERENCES

NRC approved the use of the leak limiting Alloy 800 repair sleeves for Calvert Cliffs Nuclear Power Plant Units 1 and 2 on September 1, 1999 (ADAMS Accession Number ML010520103). Calvert Cliffs applied the technique described in Westinghouse Report CEN-633-P, Revision 3 as the basis for the Alloy 800 repair sleeve. Revision 3 of the report was for the specific tube size in the Calvert Cliffs steam generators. Since that time, the report has been revised to include additional testing and analysis and incorporate other industry comments. Revision 5 of the aforementioned report addresses the specific tube size of the CPSES steam generators.

ATTACHMENT 2 to TXX-03102

PROPOSED TECHNICAL SPECIFICATION CHANGES (MARK-UP)

Pages 5.0-16 and 5.0-17

5.5 Programs and Manuals

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 and Leak Limiting 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;

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;

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)

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. 0 dated November 2002.

(continued)

ATTACHMENT 3 to TXX-03102

RETYPED TECHNICAL SPECIFICATION PAGES

Pages 5.0-16 and 5.0-17

5.5 Programs and Manuals

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 and Leak Limiting 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;

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;

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)

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. 0 dated November 2002.

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