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Ref: 10CFR50.90

CPSES-200202369
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File # 00236

June 12, 2002

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 REQUEST FOR ADDITIONAL INFORMATION
REGARDING LICENSE AMENDMENT REQUEST (LAR) 01-14
REVISION TO TECHNICAL SPECIFICATION (TS) 5.5.16
CONTAINMENT LEAKAGE RATE TESTING PROGRAM
(TAC NOS. MB3685 and MB3685)

REF: 1) TXU Generation Company LP Letter logged TXX-01187, from C. L. Terry to the NRC dated December 26, 2001
2) TXU Generation Company LP Letter logged TXX-02023, from C. L. Terry to the NRC dated December 26, 2001

Gentlemen:

Pursuant to 10CFR50.90, TXU Generation Company LP requested, via Reference 1, an amendment to the CPSES Unit 1 Operating License (NPF-87) and CPSES Unit 2 Operating License (NPF-89) by incorporating a change into the CPSES Unit 1 and 2 Technical Specifications. The change request applies to both units.

The proposed change, as submitted by References 1 and 2, will revise TS 5.5.16 entitled Containment Leakage Rate Testing Program.

As a result of subsequent conversations with your NRC staff (D. H. Jaffe, et al.), it was agreed to respond to requests for additional information (See Attachment).

The information in this letter does not affect the proposed Technical Specification changes, the safety analysis of those changes, or the determination that the proposed

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changes do not involve a significant hazard consideration (provided by Attachments 1, 2 and 3 of Reference 1).

This communication contains no new or revised commitments.

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

Executed on June 12, 2002.

Should you have any questions, please contact Mr. Carl B. Corbin at (254) 897-0121.

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: MRBlevins
M. R. Blevins
VP & Deputy to Senior VP & Principal Nuclear Officer

CBC/cbc
Attachment

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

Mr. Authur C. Tate
Bureau of Radiation Control
Texas Department of Public Health
1100 West 49th Street
Austin, Texas 78704

NRC Requests for Additional Information and CPSES Responses

NRC Request for Additional Information # 1:

Since there is no description (or summarization) regarding the containment ISI program being implemented at the plant included in the submittal (reference), provide a description of the ISI methods that provide assurance that in the absence of a containment integrated leak rate testing (ILRT) for 15 to 20 years, the containment structural and leak-tight integrity will be maintained.

CPSES Response:

See Section 4.1.1.1 on Page 6 of Attachment 1 to Reference 1.a.

NRC Request for Additional Information # 2:

IWE-1240 requires licensees to identify the containment surface areas requiring augmented examinations. Provide the locations of the steel containment (or concrete containment liner) surfaces that have been identified as requiring augmented examination and a summary of the findings of the examinations performed.

CPSES Response:

Based on the completed results of the containment ISI examinations of 2001, there are no areas of the containment liner that require augmented examinations per Subarticle IWE-1240 of Subsection IWE of 1998 ASME Section XI.

References 2 and 3 discuss a Unit 1construction deficiency regarding certain containment liner insert plates which contain full penetration attachment welds. As part of the resolution of that issue, a portion of the subject welds were examined by magnetic particle. The examinations found three relevant indications (1/8", 1/4", and 1/2" in length). An evaluation determined that insert plate welds were of an acceptable quality to adequately assure performance of the safety function of the containment liner. FSAR Section 3.8.1.2.5 was revised to reflect this code exception and TXU Energy committed to monitor this issue (Commitment number 24794) by performing an examination of three indications discovered, after the first three ILRT Type A tests, and every second thereafter. The next examination of the three indications is scheduled to be completed by the end of the ninth refueling outage for Unit 1 in the fall of 2002.

The original inspections were performed by the magnetic particle examination process. FSAR Section 3.8.1.2.5 as updated by Reference 2 allowed examination of the welds using either the magnetic particle or liquid penetrant method. Commitment 24794 will be incorporated into the IWE program plan and continue to be performed after the first three ILRT Type A tests and then every second ILRT. Commitment number 24794 (originally identified in Reference 3) is updated as noted below to be consistent with FSAR Section 3.8.1.2.5.

Commitment Number	Updated Commitment Description
24794	TXU Energy will perform a magnetic particle or liquid penetrant examination of the three indications discovered by a partial examination of CB&I's liner attachment welds. The results of this examination will be used to verify that the liner's structural integrity and leak tight function have not been degraded. This commitment will be done after the first three ILRT tests and then every second ILRT.

NRC Request for Additional Information # 3:

NRC Request for Additional Information # 3:

For the examination of penetration seals and gaskets, and examination and testing of bolted connections associated with the primary containment pressure boundary (Examination Categories E-D and E-G), relief for the requirements of the Code had been requested. As an alternative, it was proposed to examine them during the leakrate testing of the primary containment. However, Option B of Appendix J for Type B and Type C testing (as per NEI 94-01 and RG 1.163), and the ILRT extension requested in this amendment for Type A testing provide flexibility in the scheduling of these inspections. Provide your schedule for examination and testing of seals, gaskets, and bolted connections that provide assurance regarding the integrity of the containment pressure boundary.

CPSES Response:

As stated in Reference 1.a, CPSES requested and received approval for Relief Requests E-1, "Metallic containment shell and penetration liners and their integral attachments" and L-1, "Concrete Containment Components" (Reference 4). The relief requests allow use of the 1998 Edition of the Subsections IWE and IWL of the ASME Code, supplemented by licensee commitments (Reference 4). CPSES completed the first interval inspections for Unit 1 and Unit 2 in September 2001, in accordance with Subsections IWE and IWL of ASME Code Section XI, with acceptable results.

Examination Category E-D, Seals, Gaskets, and Moisture Barriers, and Examination Category E-G, Pressure Retaining Bolting, have been eliminated from the 1998 Code.

Pressure-retaining bolting has been removed as a separate Examination Category in the 1998 Edition. A requirement for a general visual examination of pressure boundary bolting is still contained in the 1998 Edition of Table IWE 2500-1, footnote 1 for Item No. E1.10 Pressure Retaining Boundary. The Examination Category E-A requires a General Visual inspection to be performed once per 10 year interval and is not relaxed. The bolted connections are examined for any evidence of degradation that could affect the containment pressure retaining boundary.

There is no separately scheduled ISI on any seal, gasket, or bolting component that is Type B tested per Option B of Appendix J of 10CFR50. Type B testing is performed on O-rings, electrical and blind flange penetrations, and the airlocks. The CPSES testing strategy is adequate because the historical leakage rate for Type B penetrations (except the airlocks) is typically less than 1% of the total Type B and Type C allowable leakage limit (i.e., 0.6 L_a). Post maintenance testing is the Type B test. Though the frequency can be as long as 10 years, should the penetration be disturbed for any reason, the Type B test is required to assure proper operation. For example, the hatches used for access to primary containment are opened during outages. After the hatch is closed, the Type B test is conducted to assure that leakage is less than the administrative limit.

The general visual examinations for the Examination Category E-A and the Appendix J, Option B, Type B test provide reasonable assurance the integrity of the containment pressure boundary is maintained during the period of the extended Type A test frequency.

NRC Request for Additional Information # 4:

The stainless steel bellows have been found to be susceptible to trans-granular stress corrosion cracking, and the leakage through them are not readily detectable by Type B testing (see Information Notice 92-20). If applicable, provide information regarding inspection and testing of the bellows, and how such behavior has been factored into the risk assessment.

CPSES Response:

See Section 4.1.1.1 on Page 6 of Attachment 1 to Reference 1.a.

NRC Request for Additional Information # 5:

Inspections of some reinforced concrete and steel containment structures have found degradation on uninspectable (embedded) side of the drywell steel shell and steel liner of the primary containment. These degradations cannot be found by visual (i.e., VT-1 or VT-3) examinations unless they are through the thickness of the shell or liner, or 100 percent of the uninspectable surfaces are periodically examined by ultrasonic testing. Provide information addressing how potential leakage under high pressure during core damage accidents is factored into the risk assessment related to the extension of the ILRT.

CPSES Response:

CPSES has a large dry volume containment with the entire face of the containment being lined with a continuous welded steel liner plate anchored to the reinforced concrete. There is no air space between the liner and the concrete structure and no insulation material exists between the two surfaces to attract or retain liquids that could then promote corrosion. The interior liner surfaces are painted with a two coat inorganic zinc primer with epoxy finish coating which is visually inspected each refueling outage. As such, water can not leak between the liner and concrete surface and therefore the overall configuration is not conducive of water accumulation.

To assess potential steel liner degradation by an unidentified mechanism, the probability and consequence for leakage is explicitly included in the ILRT risk assessment (RI-ILRT) [Enclosure 1 to Reference 1.a]. The intact containment case (EPRI Containment Failure Class 1) includes a leakage term, which is independent of the source of leakage. The CPSES RI-ILRT assessment of the intact containment case is assumed to leak at the design leak rate.

The RI-ILRT assessment also includes specific containment failure classes due to extending the ILRT interval. The EPRI Containment Failure Class 3 leakage path is through the part of containment that is not Type B or Type C tested. That is, these classes (Class 3a and 3b) include the potential that the leakage is due to liner failure. The risk evaluation of extending the ILRT testing interval evaluated the probability of a liner breach based on historical data. This data accounts for the identified means by which a leakage could occur that could only be identified by Type A testing. Given that the database is inclusive of all known events; the calculated probability inherently includes the probability that a liner failure would occur due to corrosion degradation. Therefore, the probability of a degradation liner failure is less than that experienced for other failures. Since the estimate utilizes an upper bound approach for the probability of failure, it can be concluded that this failure mode is already included in the existing ILRT evaluation.

In addition, CPSES has performed several other sensitivity studies in support of this submittal. The first doubled the assumed Class 3a and 3b multipliers, 10 and 35 respectively. The results indicate that the change had no distinguishable impact on LERF. As expected, the person-rem dose increases slightly in this case as a direct result of the change in the assumed factor. However, given the small increase calculated for this case, the overall conclusions are not altered. The second case study, increased the intact containment leakage (Class 1) to twice the limit (La). The results indicate that the increase due to the extension is actually reduced. This is reasonable since the intact containment cases are assumed to have an increased release and contribute more to the plant risk. Therefore, transferring frequency contribution from intact containment class (Class 1) to the Type A failure classes (3a and 3b) result in a smaller net increase. The change only impacts dose and not LERF. The third sensitivity case examined the impact of extending the test period to 20 years. The increase in exposure time leads to a direct increase in LERF. The increases, however, do not result in a sufficiently significant increase to change the overall conclusions. Specifically, the LERF increase is still below the guidance provided in Regulatory Guide 1.174. These sensitivity studies were performed to determine if reasonable changes in key parameters would alter the overall results or conclusions of the baseline analysis. On the basis of these studies the overall conclusions and results are essentially unaffected by reasonable changes in the parameters.

The Calvert Cliffs Nuclear Plant (CCNP) methodology (Reference 5) was used to ensure CPSES adequately analyzed the risk associated with containment liner corrosion. This methodology is an acceptable approach to address the liner corrosion issue. The results of the analysis, using CCNP methodology, were that increasing the ILRT frequency from three to fifteen years did not significantly increase plant risk of a large early release.

The following tables summarize the results obtained from the CCNP methodology (Reference 5) based on using plant specific data for CPSES:

Table 1
Liner Corrosion Table

Step	Description	Containment Cylinder and Dome 85%		Containment Basemat 15%	
1	**Historical Liner Flaw Likelihood** Failure Data: Containment location specific Success Data: Based on 70 steel-lined Containments and 5.5 years since the 10CFR 50.55a requirements of periodic visual inspections of containment surfaces.	Events: 2 (Brunswick 2 and North Anna 2) 2 / (70*5.5) = **5.19E-03**		Events: 0 Assume half a failure 0.5 / (70 *5.5) = **1.30E-03**	
2	**Aged Adjusted Liner Flaw Likelihood** During 15-year interval, assume failure rate doubles every five years (14.9% increase per year). The average for the 5th to 10th year set to the historical failure rate	<u>Year</u> 1 avg. 5-10 15	***Failure Rate*** 2.05E-03 5.19E-03 1.43E-02	***Year*** 1 avg. 5-10 15	<u>Failure Rate</u> 5.13E-04 1.30E-03 3.57E-03
		<u>**15 year avg. = 6.44E-03**</u>		**15 year avg. = 1.61E-03**	
3	**Increase in Flaw Likelihood Between 3 and 15 years** Uses aged adjusted liner flaw likelihood (Step 2), assuming failure rate doubles every five years.	**8.7%**		**2.2%**	

4	**Likelihood of Breach in Containment Given Liner Flaw** The upper end pressure is consistent with the current CPSES Probabilistic Risk Assessment (PRA) Level 2 analysis. 0.1% is assumed for the lower end. Intermediate failure likelihood's are determined through logarithmically interpolation. The basemat is assumed to be 1/10 of the cylinder/dome analysis	Pressure (psia) 20 63 100 120 128.7	Likelihood of Breach 0.1% 1.54% 16.14% 57.54% 100%	Pressure (psia) 20 63 100 120 128.7	Likelihood of Breach 0.01% 0.154% 1.614% 5.754% 10.0%
5	**Visual Inspection Detection Failure Likelihood**	10% 5% failure to identify visual flaws plus 5% likelihood that the flaw is not visible (not through-cylinder but could be detected by ILRT) All events have been detected through visual inspection. 5% visible failure detection is a conservative assumption.		100% Cannot be visually inspected	
6	**Likelihood of Non-Detected Containment Leakage** (Steps 3*4*5)	**0.0133%** 8.7% * 1.54% * 10%		**0.00339%** 2.2% * 0.154% * 100%	

The total likelihood of the corrosion-induced, non-detected containment leakage is the sum of step 6 for containment cylinder and dome and the containment basemat.

Total likelihood of non-detected containment leakage = 0.0133% + 0.00339% = 0.01678%

The non-large early release frequency (LERF) containment over-pressurization failures for CPSES are estimated at 1.56E-05 per year. This value does not include those CPSES Level II category VII and VIII sequences where containment sprays are available. If all non-detectable containment leakage events, where containment sprays are not available, are considered to be LERF, then the increase in LERF associated with the liner corrosion issue is:

Increase in LERF (ILRT 3 to 15 years) = 0.01678% * 1.56E-05 = 2.62E-09 per year

Table 2
Person-REM/YR

Changes due to extension from 10 years (current) to 15

Method	LERF Increase	Person-REM/YR Increase	Percentage – Increase in Person-REM/YR
NRC Approved Method (CPSES Submittal basis)	1.85E-08 [1]	3.09E-03 [1,2]	3.09E-03/89.258[1] = .00346%
NRC Approved Method with Liner Corrosion	2.11E-08 [1,3]	3.53E-03 [1,2]	3.53E-03/89.258 [1] = .0039%

1 – Person-Rem and LERF increase taken from Enclosure 1 of Reference 1.a
2 – Assumes all leaks associated with corrosion are large (conservative)
Person-Rem = LERF Increase x 1.67E+05 [1]
3 – LERF Increase = Submittal LERF + 2.62E-09 (calculated corrosion LERF Increase)

Changes due to extension from 3 years to 15

Method	LERF Increase	Person-REM/YR Increase	Percentage – Increase in Person-REM/YR
NRC Approved Method (CPSES Submittal basis)	5.56E-08 [1]	1.63E-02 [1]	1.63E-02/89.247 [1] = .018%
NRC Approved Method with Liner Corrosion	5.82E-08 [1,3]	9.72E-03 [1,2]	9.72E-03/89.247 [1] = .011%

1 – Person-Rem and LERF increase taken from Enclosure 1 of Reference 1.a
2 – Assumes all leaks associated with corrosion are large (conservative)
Person-Rem = LERF Increase x 1.67E+05 [1]
3 – LERF Increase = Submittal LERF + 2.62E-09 (calculated corrosion LERF Increase)

Table 3
Sensitivities

Age (Step 2)	**Containment Breach (Step 4)**	**Visual Inspection & Non-Visual Flaws (Step 5)**	**Likelihood Flaw is LERF**	**LERF Increase**
Base Case Doubles every 5 years	**Base Case** 1.54/0.154	**Base Case** 10%	**Base Case** 100%	**Base Case** 2.62E-09
Doubles every 2 years	Base	Base	Base	2.14E-08
Doubles every 10 years	Base	Base	Base	1.25E-09
Base	Base point 10 times lower (0.38/0.038)	Base	Base	6.50E-10
Base	Base point 10 times	Base	Base	1.05E-08

	higher (6.18/.618)			
Base	Base	5%	Base	1.57E-09
Base	Base	15%	Base	3.66E-09
Lower Bound				
Doubles every 10 years	Base point 10 times lower (0.38/0.038)	5%	10%	1.87E-11
Upper Bound				
Doubles every 2 years	Base point 10 times higher (26/0.26)	15%	100%	5.28E-07

Additional review was done to investigate the visual inspection of the containment liner at CPSES. The original submittal did not fully address the benefits of Subsection IWE visual inspections. The containment performance data is pre-1994; an amendment to 10 CFR 50.55a became effective September 9, 1996. This amendment, by endorsing the use of Subsections IWE and IWL of Section XI of the ASME B&PV Code, provides detailed requirements for ISI of containment structures. Inspection (which includes examination, evaluation, repair and replacement) of the concrete containment liner plate in accordance with the 10 CFR 50.55a requirements, involves consideration of potential corrosion areas. The improvement gained by this requirement makes the detection of flaws post- September 1996 much more likely than pre- September 1996 using visual inspections. CPSES has considered the guidance provided by EPRI TR-109937 section 8.3 (Coordination with Other Inspection) and has included interface criteria between the Protective Coatings Coordinator and the ISI program Coordinator. This interface is effective for evaluating and dispositioning coating deficiencies identified on the Liner Plate and associated attachments.

CPSES's Protective Coatings Program is implemented in accordance with engineering procedures. The procedure prescribes performing and documenting a complete visual inspection of coated surfaces (inclusive of the Liner Plate and Dome) within the Containment building. Recognition of degradation mechanisms as prescribed in EPRI TR-109907 are included in the Engineering Coatings Program. Frequency of inspection is conducted at a minimum once each fuel cycle. Items or areas, which cannot receive close visual examination, are examined from the best available vantage point using optical aids such as binoculars. Scaffolding and supplemental lighting are used, as required, in areas of particular interest. Items or areas, which are inaccessible to monitoring activities due to physical constraints or ALARA concerns, are documented.

The Inservice Inspection program (ISI) for Containment is implemented in accordance with the Containment ISI Plan. This Plan demonstrates compliance with the portion of 10CFR 50.55a, which endorses subsections IWE and IWL of ASME XI. This plan meets the alternative examination requirements detailed in CPSES approved relief request E-1 and L-1, which allows use of 1998 ASME Section XI.

The accessible surfaces of the Containment liner are examined and the examination documented once per interval by certified NDE examiners. The visual examinations are performed both directly and remotely depending upon the accessibility in the various areas. Examinations are scheduled in accordance with the scheduling requirement of ASME Section XI, Subsection IWE and 10CFR50.55a. The first interval exams for Units 1 and 2 were completed in September 2001, with no recordable indications identified for the liner plate.

References

1. License Amendment Request (LAR) 01-14 Revision to Technical Specification (TS) 5.5.16 Containment Leakage Rate Testing Program (TAC NOS. MB3685 and MB3686)

   a. TXU Generation Company LP letter logged TXX-01187, from C. L. Terry to the NRC dated December 26, 2001. (Original submittal)
   b. TXU Generation Company LP letter logged TXX-02023, from C. L. Terry to the NRC dated February 4, 2002. (Supplement One - No new information - increased level of information provided in the non-proprietary version of Appendix B of Enclosure 3 to Reference 1.a above.)

2. TXX-90011, dated January 15, 1990, from William J. Cahill, Jr., to the NRC, FSAR Amendment 78 Description, Description of change to FSAR Section 3.8.1.2.5, Pages 32 through 34 of Attachment

3. TXX-90032, dated January 26, 1990, from William J. Cahill, Jr., to the NRC, Request for Additional Information, FSAR Section 3.8.1.2.5

4. Relief Requests Relief Requests E-1, "Metallic containment shell and penetration liners and their integral attachments" and L-1, "Concrete Containment Components" ASME Boiler and Pressure Vessel Code Section XI, Subsections IWE and IWL.

   a. TXU Electric letter logged TXX-98041, from C. L. Terry to USNRC dated February 20, 1998.
   b. TXU Electric letter logged TXX-99082, from C. L. Terry to USNRC dated March 26, 1999.
   c. TXU Electric letter logged TXX-99130, from C. L. Terry to USNRC dated June 8, 1999.
   d. TXU Electric letter logged TXX-99152, from C. L. Terry to USNRC dated June 15, 1998.
   e. NRC Evaluation of Relief Requests: Use of 1998 Edition of Subsections IWE and IWL of the ASME Code for Containment Inspection (TAC NOS. MA2038 and MA2039), dated July 23, 1999.

5. Letter to NRC from Calvert Cliffs Nuclear Power Plant Unit No. 1: Docket No. 50-317, Response to Request for Additional Information Concerning the License Amendment Request for a One-Time Integrated Leakage Rate Test Extension, dated March 27, 2002.