



**TXU Energy**  
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**C. Lance Terry**  
Senior Vice President &  
Principal Nuclear Officer

Ref: 10 CFR 50.55a(a)(3)(ii)

CPSES-200300265  
Log # TXX-03025

February 11, 2003

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

**SUBJECT: COMANCHE PEAK STEAM ELECTRIC STATION (CPSES)  
DOCKET NOS. 50-446  
RELIEF REQUEST B-10 FOR THE SECOND 10 YEAR ISI  
INTERVAL FROM 10 CFR 50.55a REQUIREMENTS FOR CLASS 1  
REPAIR/REPLACEMENT OF CRDM CANOPY SEAL WELD  
(SECOND INTERVAL START DATE: AUGUST, 2003)**

Pursuant to 10 CFR 50.55a(a)(3)(ii), TXU Generation Company LP (TXU Energy) hereby requests NRC approval of the enclosed relief request (B-10) for second ten-year inservice inspection interval for Unit 2. Relief is requested from the requirements of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, 1986 Edition with no Addenda, IWA-4000, which would require liquid penetrant (PT) examination of a Control Rod Drive Mechanism (CRDM) intermediate canopy seal weld repair/replacement. As an alternative to the PT examination, this request will require an 8X visual examination of the repair. Additionally, this request includes use of ASME Code Case N-504-2 for guidance to establish the acceptability of a repair by increasing the weld thickness by weld overlay as an alternative to IWA-4300. Furthermore, TXU Energy is requesting the use of Alloy 52 nickel-based weld repair material rather than austenitic stainless steel as required by Code Case N-504-2.

A similar relief request (refer to NRC TAC No. MB6867) was granted for Unit 1. For the aforementioned relief request, the NRC staff concluded that the Code required repair or replacement and the surface examination of the canopy seal welds would result in a hardship or unusual difficulty, without a compensating increase in the level of quality or safety. This relief request is identical in nature and is generated to obtain approval for the same type of repair for Unit 2.

A member of the **STARS** (Strategic Teaming and Resource Sharing) Alliance

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The basis and justification for the relief request are attached. TXU Energy requests approval of this relief request for use during repair/replacement and examinations to be performed during the upcoming Unit 2 outage if required, and any future replacements or repairs to CRDM canopy seal welds should they become necessary during the second ten-year inservice inspection interval. Approval of this relief request is requested by October 1, 2003 for possible implementation during the seventh refueling outage (2RF07), currently scheduled for the fall of 2003.

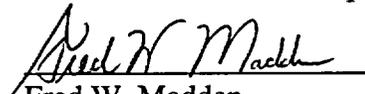
This communication contains no new licensing basis commitments regarding CPSES. If you have any questions regarding this request, please contact Obaid Bhatti at (254) 897-5839 or Douglas W. Snow at (254) 897-8448.

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:   
Fred W. Madden  
Nuclear Licensing Manager

DWS/dws  
Attachment

c - E. W. Merschoff, Region IV  
W. D. Johnson, Region IV  
D. H. Jaffe, NRR  
Resident Inspectors, CPSES  
G. Bynog, TDLR  
J.C. Hair ANII, CPSES

**TXU Energy  
Comanche Peak Steam Electric Station  
Request for Relief No. B-10 for Unit 2  
Proposed Alternative  
In Accordance With 10 CFR 50.55a(a)(3)(ii)**

**I. System/Component for Which Relief is Requested:**

Reactor control rod drive mechanism canopy seal welds - Class 1 Appurtenance to the Reactor vessel.

**II. Code Requirement from Which Relief is Requested:**

ASME Code, Section XI, 1986 Edition with no Addenda. Designed and fabricated to the ASME Code, Section III, 1974 Edition, Summer 1974 Addenda.

Article IWA-4120 of ASME Code, Section XI requires that repairs be performed in accordance with the Owner's original construction Code of the component or system, or later editions and addenda of the Code. The canopy seal weld is a Code seal weld as described in NB-3227 of Section III and requires a liquid PT examination of the final weld in accordance with NB-5271. IWB-4120 of Section XI requires that a defect be removed or reduced in size such that the resultant section thickness is equal to or greater than the minimum design thickness.

**III. Basis for Hardship or Unusual Difficulty without Compensating Increase in Level of Quality or Safety:**

During an inspection of a CRDM in Unit 1 in 2002, TXU Energy identified boric acid crystal buildup on the CRDM housing. Further investigation revealed evidence of minor leakage at the intermediate CRDM canopy seal weld. The CRDM canopy seal welds are located above the Reactor Vessel Closure Head, which is highly congested and subject to high radiation levels. It is unlikely that CPSES Unit 2 presently has a similar damaged mechanism. However, the Code-required repair method would involve excavation of the defects and restoration to the original configuration. The Code repair method requires manual excavation of the defects and manual repair welding, and has a higher risk of failure due to the difficulty of making a quality weld on the canopy seal accompanied by the required back-purging and cleaning. In addition to the difficulty and time required to remove the defect and re-weld the canopy, a similar level of difficulty and resultant time is required for a PT examination of the weld repair. The high radiological dose associated with strict compliance with these requirements would be contrary to the intent of the ALARA (as low as reasonably achievable) radiological controls program. The PT examination would result in an estimated total dose of approximately 0.6 person-Rem per CRDM canopy seal weld.

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**IV. Basis for Relief:**

TXU Energy requests relief from the requirements of IWA-4000 in accordance with 10 CFR 50.55a (a)(3)(ii) by proposing an alternative method of repair and nondestructive examination due to hardship and unusual difficulty without a compensating increase in quality or safety.

ASME Code Case N-504-2, "Alternative Rules for Repair of Class 1, 2, and 3 Austenitic Stainless Steel Piping, Section XI, Division 1," (approved in DG-1091 Table 1, page 5) will be used as guidance for repair by weld overlay which increases the weld thickness to establish the acceptability of the defect in accordance with IWB-3640. In addition, alloy 52 nickel-based weld repair material will be used rather than austenitic stainless steel as required by Code Case N-504-2. In lieu of performance of PT examinations of CRDM seal weld repairs or replacement, an enhanced 8X visual (VT-1) examination will be performed after welding is completed.

The alternative method of repair and nondestructive examination is being requested to facilitate such a repair in Unit 2 should the need arise for the second interval of Unit 2 operation.

Industry experience with failure analyses performed on leaking canopy seal welds removed from service at other plants has attributed the majority of the cases to transgranular stress corrosion cracking (SCC). The size of the opening where leakage occurs has been extremely small, normally a few thousandths of an inch. The crack orientations vary, but often radiate outward such that a pinhole appears on the surface, as opposed to a long crack. The SCC results from exposure of a susceptible material to residual stress, which is often concentrated by weld discontinuities, and to a corrosive environment, such as water trapped in the cavity behind the seal weld that is mixed with the air initially in the cavity, resulting in higher oxygen content than is in the bulk primary coolant.

As allowed by the guidance of Code Case N-504-2, the CRDM canopy seal weld flaws will not be removed, but an analysis of the repaired weldment will be performed using Paragraph (g) of the Code case as guidance to assure that the remaining flaw will not propagate unacceptably. This analysis establishes the critical flaw size used to qualify the VT-1 examination method to ensure capability of detecting a flaw sufficiently small to assure an adequate margin of safety is maintained. The canopy seal weld is not a structural weld, nor a pressure-retaining weld, but provides a seal to prevent reactor coolant leakage if the mechanical joint leaks.

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The alternative CRDM canopy seal weld repair uses a Gas Tungsten Arc Welding (GTAW) process and VT-1 examination controlled remotely. The VT-1 examination will use a video camera with approximately 8X magnification within several inches of the weld, qualified to ensure identification of a flaw significantly smaller than the analyzed critical flaw size. The examination technique will be demonstrated to resolve a 0.001 inch thick wire against the surface of the weld. The proposed alternative is an enhanced visual examination technique with resolution and consistency much greater than that provided by the requirements of a Code (visually unaided) VT-1 and comparable to flaw sizes detectable using PT. Based on the capability of the remote visual examination system to resolve flaws of a size 0.001 inch in width, reasonable assurance of the weld integrity is provided.

Additionally, alloy 52 nickel-based weld repair material will be used rather than austenitic stainless steel as required by Code Case N-504-2. Alloy 52 nickel-base weld repair material was selected rather than austenitic stainless steel as required by Code Case N-504-2, Paragraph (b), for the repair because of its resistance to stress corrosion cracking. Consequently, the ferrite requirements of Code Case N-504-2, Paragraph (e) do not apply. The repair will be documented on Form NIS-2, reviewed by the Authorized Nuclear Inspector, and maintained in accordance with the requirements for archiving permanent plant records.

The GTAW weld repair and VT-1 examination methods result in significantly lower radiation exposure because the equipment is remotely operated after setup.

The use of remote visual examination and pressure test provide weld integrity for the multiple layer seal weld repair or the seal weld replacement. The radiation exposure associated with performance of a Code-required repair or surface examination would not result in a compensating increase in the level of quality and safety.

**V. Duration of Proposed Relief Request:**

TXU Energy requests this relief for the second 10 year interval of the plant. No undue risk to the public health and safety is presented by this request.

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**VI. Similar Precedents:**

1. Letter from Robert A. Gramm (NRC) to William T. Cottle (STP NOC) dated November 5, 2002; Subject: Request For Relief (TAC No. MB6576 and MB6577)
2. Letter from Robert A. Gramm (NRC) to C. Lance Terry (TXU Energy) dated January 3, 2003; Subject Request For Relief (TAC No. MB6867)