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

CPSES-200203940
Log # TXX-02206
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December 6, 2002

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

SUBJECT: COMANCHE PEAK STEAM ELECTRIC STATION (CPSES) UNIT 1
DOCKET NO. 50-445
RELIEF REQUEST B-3 FOR SECOND 10 YEAR ISI INTERVAL
FROM 10 CFR 50.55a REQUIREMENTS FOR CLASS 1
THE REPAIR/REPLACEMENT OF CRDM CANOPY SEAL WELD
(INTERVAL START DATE: AUGUST 13, 2000, SECOND
INTERVAL)

Gentlemen:

Pursuant to 10 CFR 50.55a(a)(3)(ii), TXU Generation Company LP (TXU Energy) hereby requests NRC approval of the enclosed relief request (Relief Request B-3) for the second ten-year inservice inspection interval for Unit 1. Relief is requested from the requirements of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel (B&PV) 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. 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.

During TXU Energy's current outage, an inspection on December 3, 2002, identified boric acid crystal buildup on a CRDM housing. Further investigation revealed evidence of minor leakage at the intermediate CRDM canopy seal weld. The repair/replacement of the leaking seal weld is required to be completed prior to Unit 1 startup.

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Relief is requested from the requirements of IWA-4000 by proposing an alternative method of repair and nondestructive examination due to hardship and unusual difficulty without a compensating increase in quality or safety. For clarification, the relief from the nondestructive examination requirements is being requested for either a repair or replacement of a CRDM canopy seal weld. In addition to the difficulty of removing the defect and conducting 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 an ALARA radiological controls program

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 Unit 1 outage currently in progress 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 December 13, 2002, to permit effective completion of repairs/replacements prior to restoration of the reactor coolant system and to assure that approval of the relief request for this emergent work would not delay startup of CPSES Unit 1.

This communication contains no new licensing basis commitments regarding CPSES. If you have any questions regarding this request, please contact Obaid Bhatty 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: Roger G. Walker
Roger D. Walker
Regulatory Affairs Manager

OB/dws

Attachment

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

TXU Energy
Comanche Peak Steam Electric Station
Request for Relief No. B-3 for Unit 1
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. 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.

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, 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. 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-l) examination will be performed after welding is completed.

The alternative method of repair is being requested to facilitate the repair during the current outage and to facilitate the use of this repair option for future repairs in the second 10-year ISI interval. The alternative nondestructive examination method is being requested to facilitate examination of either a repair or replacement of a CRDM canopy seal weld during the second 10-year ISI interval. The repair or replacement of the leaking canopy seal weld identified during the current outage is required to be completed prior to Unit 1 startup.

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-l 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.

VI. Similar Precedents:

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)