

February 18, 2004

Mr. Michael R. Blevins
Senior Vice President &
Principal Nuclear Officer
TXU Energy
Attn: Regulatory Affairs Department
P. O. Box 1002
Glen Rose, TX 76043

SUBJECT: COMANCHE PEAK STEAM ELECTRIC STATION, UNITS 1 AND 2 -
RE: RELIEF FROM THE REQUIREMENTS OF THE AMERICAN SOCIETY OF
MECHANICAL ENGINEERS BOILER AND PRESSURE VESSEL CODE,
SECTION XI, CONCERNING RELIEF REQUESTS C-2 AND C-7
(TAC NOS. MB7947 AND MB7948)

Dear Mr. Blevins:

By letter dated March 5, 2003, as supplemented by letters dated September 11, 2003, and January 8, 2004, TXU Energy (TXU, the licensee) submitted Relief Requests C-2 and C-7 for Comanche Peak Steam Electric Station (CPSES), Units 1 and 2 respectively. The licensee requested the use of alternative repair techniques for specific degradation mechanisms. The use of the alternative repair techniques was proposed pursuant to the provisions of Section 50.55(a)(3)(i) of Title 10 of the *Code of Federal Regulations* (10 CFR), which states that alternatives to the requirements of Section XI of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (Code) may be used when authorized by the U.S. Nuclear Regulatory Commission (NRC), if the proposed alternatives would provide an acceptable level of quality and safety in lieu of actually complying with the corresponding requirements of the Code.

In the March 5, 2003, letter, the licensee proposed to use ASME Code Case N-562-1 (Code Case) to provide alternative requirements to those of IWA-4120(a) and IWA-4310 for the repair of internal defects or degradation in ASME Code Class 3 piping systems. The Code Case permits the use of the weld-overlay repair technique to repair flaws in ASME Code Class 3 piping. Code Case N-562-1 was subsequently determined by the NRC to be unacceptable for generic use. The reasons for not approving the use of the Code Case are documented in NRC Regulatory Guide 1.193, "ASME Code Cases Not Approved for Use," dated June 2003. The rationale for the rejection of the use of Code Case N-562-1 was discussed with the licensee during several telephone conversations.

As a result of those discussions, the licensee submitted a revised request dated January 8, 2004, in which TXU requested to invoke ASME Code Case N-661 instead of ASME Code Case N-562-1, and requested that the relief requests C-2 and C-7 be approved pursuant to ASME Code Case N-661 by March 5, 2004.

The NRC staff has reviewed the information provided by TXU. Based on its review, the NRC staff concludes that the licensee has provided acceptable alternatives to the requirements of IWA-4120(a) and IWA-4310, of Section XI of the ASME Code, subject to the following three

conditions which must be met when using Code Case N-661. Those conditions are: (a) if the root cause of the degradation has not been determined, the repair is only acceptable for one cycle, (b) weld overlay repair of an area can only be performed once in the same location, and (c) when through-wall repairs are made by welding on surfaces that are wet or exposed to water, the weld overlay repair is only acceptable until the next refueling outage.

The staff finds that the proposed alternatives, as supplemented by the three conditions listed above, provide reasonable assurance of structural integrity. Therefore, the staff concludes that the proposed alternatives provide an acceptable level of quality and safety and are authorized pursuant to 10 CFR 50.55a(a)(3)(i) for CPSES, Units 1 and 2, for each Unit's current 10-year inservice inspection interval, or until Code Case N-661 is approved for general use by reference in Regulatory Guide 1.147, "Inservice Inspection Code Case Acceptability -- ASME Section XI, Division 1." After that time, if the licensee wishes to continue to use Code Case N-661, the licensee may do so, subject to the conditions specified in the regulatory guide.

All other ASME Code, Section XI, requirements for which relief was not specifically requested and authorized herein by the NRC staff remain applicable, including third party review by the Authorized Nuclear Inservice Inspector.

The NRC staff's evaluation and conclusions are contained in the enclosed safety evaluation. If there are any questions regarding this evaluation, please contact Mr. Mohan C. Thadani, at (301) 415-1476.

Sincerely,

/RA/

Robert A. Gramm, Chief, Section 1
Project Directorate IV
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket Nos. 50-445 and 50-446

Enclosure: Safety Evaluation

cc w/encl: See next page

conditions which must be met when using Code Case N-661. Those conditions are: (a) if the root cause of the degradation has not been determined, the repair is only acceptable for one cycle, (b) weld overlay repair of an area can only be performed once in the same location, and (c) when through-wall repairs are made by welding on surfaces that are wet or exposed to water, the weld overlay repair is only acceptable until the next refueling outage.

The staff finds that the proposed alternatives, as supplemented by the three conditions listed above, provide reasonable assurance of structural integrity. Therefore, the staff concludes that the proposed alternatives provide an acceptable level of quality and safety and are authorized pursuant to 10 CFR 50.55a(a)(3)(i) for CPSES, Units 1 and 2, for each Unit's current 10-year inservice inspection interval, or until Code Case N-661 is approved for general use by reference in Regulatory Guide 1.147, "Inservice Inspection Code Case Acceptability -- ASME Section XI, Division 1." After that time, if the licensee wishes to continue to use Code Case N-661, the licensee may do so, subject to the conditions specified in the regulatory guide.

All other ASME Code, Section XI, requirements for which relief was not specifically requested and authorized herein by the NRC staff remain applicable, including third party review by the Authorized Nuclear Inservice Inspector.

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*No significant change from input

NRR-028

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DATE	2/5/04	2/5/04	01/20/04	2/12/04	2/17/04

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
SECOND 10-YEAR INSERVICE INSPECTION INTERVAL
RELIEF REQUESTS C-2 AND C-7
TXU GENERATION COMPANY, LP
COMANCHE PEAK STEAM ELECTRIC STATION, UNITS 1 AND 2
DOCKET NOS. 50-445 AND 50-446

1.0 INTRODUCTION

The inservice inspection (ISI) of American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (Code) Class 1, Class 2, and Class 3 components is performed in accordance with Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components," of the ASME Code and applicable editions and addenda, as required by 10 CFR 50.55a(g), except where specific relief has been granted by the Commission pursuant to 10 CFR 50.55a(g)(6)(i). Pursuant to 10 CFR 50.55a(a)(3), alternatives to the requirements of paragraph (g) may be used, when authorized by the NRC, if the licensee demonstrates that: (i) the proposed alternatives would provide an acceptable level of quality and safety, or (ii) compliance with the specified requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

Pursuant to 10 CFR 50.55a(g)(4), ASME Code Class 1, 2, and 3 components (including supports) will meet the requirements, except the design and access provisions and the preservice examination requirements, set forth in ASME Code, Section XI, to the extent practical within the limitations of design, geometry, and materials of construction of the components. The regulations require that inservice examination of components and system pressure tests conducted during the first 10-year interval and subsequent intervals comply with the requirements in the latest edition and addenda of Section XI of the ASME Code, incorporated by reference in 10 CFR 50.55a(b), twelve months prior to the start of the 120-month interval, subject to the limitations and modifications listed therein. The components (including supports) may meet the requirements set forth in subsequent editions and addenda of the ASME Code incorporated by reference in 10 CFR 50.55a(b), subject to the limitations and modifications listed therein and subject to Commission approval. The ISI Code of record for Comanche Peak Steam Electric Station (CPSES), Unit 1, second 10-year ISI interval, which began August 14, 2000, is the 1986 Edition of the ASME Code. The ISI Code of record for the Unit 2 current 10-year ISI interval is the 1986 Edition of the ASME Code. By letter dated February 24, 2000, TXU Energy (the licensee), requested approval to delay updating the ISI program to the applicable code edition for CPSES, Unit 1, until the time of the required update of the ISI program for CPSES, Unit 2, for the second 10-year ISI interval. The NRC staff approved the licensee's request to continue to use the 1986 Edition of the ASME Code, Section XI, pursuant to 10 CFR 50.55a(a)(3)(i) in NRC's letter dated June 29, 2000. After the start of the second 10-year interval for CPSES, Unit 2, on August 3, 2003, both CPSES units would utilize the 1998 Edition through the 2000 Addenda of the Code.

By letter dated March 5, 2003, as supplemented by letters dated September 11, 2003, and January 8, 2004, the licensee submitted Relief Requests C-2 and C-7 for CPSES, Units 1 and 2, respectively. The licensee requested the use of alternative repair techniques for specific degradation mechanisms. The use of the alternative repair techniques was proposed pursuant to the provisions of 10 CFR 50.55(a)(3)(i), which states that alternatives to the requirements of Section XI of the ASME Code may be used when authorized by the U.S. Nuclear Regulatory Commission (NRC) if the proposed alternatives would provide an acceptable level of quality and safety in lieu of actually complying with the corresponding requirements of the Code.

In the March 5, 2003, letter, the licensee proposed to use ASME Code Case N-562-1 (Code Case) to meet the requirements of IWA-4120(a) and IWA-4310 for the repair of internal defects or degradation in ASME Code Class 3 piping systems by alternative repair techniques. The Code Case permits the use of the weld-overlay repair technique to repair flaws in ASME Code Class 3 piping. This Code Case was subsequently determined by the NRC to be unacceptable for generic use. The reasons for not approving the use of the Code Case are documented in the NRC Regulatory Guide (RG) 1.193, "ASME Code Cases Not Approved for Use," dated June 2003. The rationale for the rejection of the use of Code Case N-562-1 was discussed with the licensee during several telephone conversations.

As a result of those discussions, the licensee submitted a revised request dated January 8, 2004, in which the licensee requested to invoke ASME Code Case N-661 instead of ASME Code Case N-562-1, and requested that relief requests C-2 and C-7 be approved pursuant to ASME Code Case N-661 by March 5, 2004.

2.0 EVALUATION

2.1 Systems/Components for Which Relief is Requested

All ASME Class 2 and 3 carbon steel plant raw water piping systems.

2.2 Code Requirements from Which Relief Is Requested

- ASME Code 1986 Edition (No Addenda), Section XI, IWD-4120 requires that the defect be removed or reduced in size in accordance with Paragraph IWA-4310.
- ASME Code, Section XI, Paragraph IWA-4120(a) requires that repairs be performed in accordance with the Owner's Design Specification or the original Construction code of the component or system.
- ASME Code, Section XI, Paragraph IWA-4310 requires that defects be removed or reduced in size prior to implementing weld repair procedures.

2.3 Licensee's Proposed Alternative

CPSES proposes to implement the requirements of ASME Code Case N-661 for Class 2 and 3 plant raw water piping system repairs resulting from degradation mechanisms such as erosion, corrosion, cavitation, or pitting as an alternative to the requirements of IWA-4000. The alternative repair technique described in Code

Case N-661 involves the application of additional weld metal on the exterior of the piping system, which restores the wall thickness requirement. This repair technique will be utilized whenever engineering evaluation determines that such a repair is suitable for the particular defect or degradation being resolved. Provisions for use of this Code Case will be addressed in the Repair and Replacement Program.

Those provisions will require that adjacent areas be examined to verify that the entire flawed area will be encompassed by the repair and that there are no other unacceptable degraded locations within a representative area dependent on the degradation mechanism present. An evaluation of the degradation mechanism will be performed to determine the re-examination schedule to be performed over the life of the repair. The repair will be considered to have a maximum service life of two fuel cycles unless examinations during each of the two fuel cycles are performed to establish a different life expectancy.

Additionally, the licensee is proposing the following restrictions on the use of Code Case N-661 to assure that use of the Code Case will provide an acceptable alternative pursuant to 10 CFR 50.55a(a)(3)(i):

- (a) If the root cause of the degradation has not been determined, the repair is only acceptable for one cycle.
- (b) Weld overlay repair of an area can only be performed once in the same location.
- (c) When through-wall repairs are made by welding on surfaces that are wet or exposed to water, the weld overlay repair is only acceptable until the next refueling outage.

Code Case N-661 was approved by the ASME Code Committee on July 23, 2002; however, it has not been incorporated into NRC RG 1.147, "Inservice Inspection Code Case Acceptability -- ASME Section XI, Division 1," dated May 1999, and thus is not available for application at nuclear power plants without specific NRC approval. Therefore, the licensee is documenting the request to apply the alternative repair technique described in the Code Case via this relief request.

This alternative will be used at CPSES, Units 1 and 2, during each Unit's current 10-year ISI interval. The use of this alternative is requested until the NRC publishes Code Case N-661 in a future revision of RG 1.147.

2.4 Licensee's Basis for Relief

The basis for use of the repair technique described in Code Case N-661 is set forth in Section XI of the ASME Code, and requires determination that this repair technique provides an acceptable alternative to the requirements of IWA-4000 and provides an acceptable level of quality and safety. Therefore, the proposed alternative is justified per 10 CFR 50.55a(a)(3)(i).

2.5 Staff Evaluation

The licensee proposed to use ASME Code Case N-661 as an alternative to the requirements of IWA-4120(a) and IWA-4310 for the repair of internal defects or degradation in ASME Code Class 3 piping systems. The request was made pursuant to 10 CFR Part 50.55a(a)(3)(i). The relief is needed to address immediate replacement or weld repair of internal wall thinning conditions resulting from various wall thinning degradation mechanisms such as erosion, corrosion, cavitation, and pitting in Class 2 and 3 carbon steel raw water piping systems. The stated reason for the request was to provide adequate time for additional examination of adjacent piping so that pipe replacement can be planned to reduce impact on system availability and availability of replacement materials.

ASME Code, Section XI, IWA-4120(a) requires that repairs be performed in accordance with the Owner's Design Specification and the original Construction Code of the component or system. IWA-4310 requires that the defect be removed or reduced in size in accordance with Article IWA-4000. The licensee is proposing to use the provisions of Code Case N-661 to perform an alternative repair of degraded components which involves the application of weld metal overlay on the exterior of the piping system to restore the wall thickness of the component. This repair technique will be utilized by the licensee whenever engineering evaluation determines that such a repair is suitable for the particular defect/degradation being resolved. Provisions for use of this Code Case will be addressed in the licensee's Repair and Replacement Program. Those provisions will require that adjacent areas be examined to verify that the entire flawed area will be encompassed by the repair and that there are no other unacceptable degraded locations within a representative area dependent on the degradation mechanism present. An evaluation of the degradation mechanism will be performed to determine the re-examination schedule to be performed over the life of the repair. The repair will be considered to have a maximum service life of two fuel cycles unless examinations during each of the two fuel cycles are performed to establish a different life expectancy of the repair.

The staff finds the licensee's basis in support of its request for relief acceptable. This finding is based on the fact that the staff has reviewed Code Case N-661 for inclusion in its RG 1.147. In addition, the licensee has committed to follow three conditions established by the staff when using the provisions of Code Case N-661 to repair raw water system components. These conditions are: (a) if the root cause of the degradation has not been determined, the repair is only acceptable for one cycle, (b) weld overlay repair of an area can only be performed once in the same location, and (c) when through-wall repairs are made by welding on surfaces that are wet or exposed to water, the weld overlay repair is only acceptable until the next refueling outage.

The staff established these three conditions based on the following considerations: (a) if the root cause of the degradation has not been determined, a suitable reinspection frequency cannot be established, (b) weld overlay repair of an area can only be performed once to ensure that ineffective repairs are not being repeatedly implemented in the same location, and (c) performing through-wall weld repairs on surfaces that are wet or exposed to water would produce welds that include weld defects such as porosity, lack of fusion, and cracks. It is highly unlikely that a weld can be made on an

open root joint with water present on the backside of the weld without having several weld defects. These types of weld defects can, and many times do, lead to premature failure of a weld joint.

3.0 CONCLUSION

Based on the information provided in the licensee's submittal, the NRC staff concludes that the licensee has provided an acceptable alternative to the requirements of IWA-4120(a) and IWA-4310, of Section XI of the ASME Code, subject to the following three conditions which must be met when using Code Case N-661. These conditions are: (a) if the root cause of the degradation has not been determined, the repair is only acceptable for only one cycle, (b) weld overlay repair of an area can only be performed once in the same location, and (c) when through-wall repairs are made by welding on surfaces that are wet or exposed to water, the weld overlay repair is only acceptable until the next refueling outage. The staff concludes that the proposed alternative, as supplemented by the three conditions listed above, provides reasonable assurance of structural integrity and an acceptable level of quality and safety. Therefore, the proposed alternative is authorized pursuant to 10 CFR 50.55a(a)(3)(i) for CPSES, Units 1 and 2, for each Unit's current 10-year ISI interval, or until Code Case N-661 is approved for general use by reference in RG 1.147. After that time, if the licensee wishes to continue to use Code Case N-661, the licensee must follow the conditions, if any, specified in the RG. All other ASME Code, Section XI, requirements for which relief was not specifically requested and authorized herein by the NRC staff remain applicable, including third party review by the Authorized Nuclear Inservice Inspector.

Principal Contributor: Z. B. Fu

Date: February 18, 2004

Comanche Peak Steam Electric Station

cc:

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