

June 27, 2003

Mr. C. Lance Terry  
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, UNIT 2 - RE: RELIEF FROM  
THE REQUIREMENTS OF THE AMERICAN SOCIETY OF MECHANICAL  
ENGINEERS BOILER AND PRESSURE VESSEL CODE, SECTION XI,  
CONCERNING RELIEF REQUESTS B-7, REVISION 1, B-8, REVISION 1, B-9,  
REVISION 1 AND C-6, REVISION 1 (TAC NO. MB5576)

Dear Mr. Terry:

By letter dated July 11, 2002, as supplemented by letter dated April 9, 2003, TXU Generation Company, LP (the licensee) requested relief from the requirements of the 1986 Edition of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code, with no Addenda, Section XI. The purpose of the relief requests was to address surface and volumetric examination of specific welds as described in detail in Relief Requests B-7, Revision 1; B-8, Revision 1; B-9, Revision 1; and C-6, Revision 1 for the Comanche Peak Steam Electric Station (CPSES), Unit 2.

Based on its evaluation, the Nuclear Regulatory Commission (NRC) staff concludes that it is impractical for the licensee to comply with the requirement. Further, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR), Section 50.55a(g)(6)(i), the licensee's Relief Requests B-7, Revision 1; B-8, Revision 1; B-9, Revision 1; and C-6, Revision 1; for CPSES Unit 2, provide reasonable assurance of structural integrity, are authorized by law and will not endanger life or property or the common defense and security and are otherwise in the public interest giving due consideration to the burden upon the licensee that could result if the requirements were imposed on the facility. The subject relief requests are granted for the inservice examination in the third period of the first 10-year interval.

C. Lance Terry

-2-

The NRC staff's evaluation and conclusions are contained in the enclosed safety evaluation. Should you have any questions regarding this safety evaluation, please contact Mr. David H. Jaffe, at (301) 415-1439.

Sincerely,

*/RA/*

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

Docket No. 50-446

Enclosure: Safety Evaluation

cc w/encl: See next page

C. Lance Terry

-2-

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\*SE input my memo dated 06/16/03 with no significant changes

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Comanche Peak Steam Electric Station

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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SECOND 10-YEAR INSERVICE INSPECTION INTERVAL

REQUEST FOR RELIEF

TXU GENERATION COMPANY, LP

COMANCHE PEAK STEAM ELECTRIC STATION, UNIT 2

DOCKET NO. 50-446

1.0 INTRODUCTION

By letter dated July 11, 2002, as supplemented by letter dated April 9, 2003, TXU Generation Company, LP (the licensee, TXU Energy) submitted relief requests B-7, Revision 1; B-8, Revision 1; B-9, Revision 1; and C-6, Revision 1; seeking relief from certain inservice inspection (ISI) requirements of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (Code), Section XI for Comanche Peak Steam Electric Station (CPSES), Unit 2. To support its relief requests, the licensee provided its response to the staff's request for additional information in the supplemental letter dated April 9, 2003, which superseded the July 11, 2002, requests for relief.

2.0 REGULATORY REQUIREMENTS

ISI of the ASME Code Class 1, 2, and 3 components is to be performed in accordance with Section XI of the ASME Code Addenda as required by Title 10 of the *Code of Federal Regulations* (10 CFR), Section 50.55a(g), except where specific relief has been granted by the U. S. Nuclear Regulatory Commission (NRC, Commission) pursuant to 10 CFR 50.55a(g)(6)(i). Pursuant to 10 CFR 50.55a(g)(5)(iii), if a licensee determines that conformance to a certain code requirement is impractical the licensee shall submit information supporting that determination to the Commission. Pursuant to 10 CFR 50.55a(g)(6)(i) the Commission will evaluate such determinations of impracticality and may grant such relief and may impose such alternative requirements as it determines is authorized by law and will not endanger life or property or the common defense and security and is otherwise in the public interest giving due consideration to the burden upon the licensee that could result if the requirements were imposed on the facility.

Pursuant to 10 CFR 50.55a(g)(4), ASME Code Class 1, 2, and 3 components (including supports) shall meet the requirements, except the design and access provisions and the preservice examination requirements, set forth in the ASME Code, Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components," 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 ten-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 Code of record for the CPSES first 10-year ISI interval is the 1986 Edition of the ASME Code.

### 3.0 TECHNICAL EVALUATION

#### 3.1 LICENSEE'S RELIEF REQUEST B-7, REV. 1

##### 3.1.1 Components for Which Relief is Requested

###### ASME Class 1

Reactor Pressure Vessel (RPV) closure head to flange weld (Weld No. TCX-1-1300-1) and RPV closure head to disc weld (Weld No. TCX-1-1300-2)

###### Code Requirement:

TXU Energy requests relief from the 1986 Edition of the ASME Code, Section XI, with no Addenda, for the following:

Weld No. TCX-1-1300-1:

Table IWB-2500-1. Examination Category B-A, Code Item B1.40, Figure IWB-2500-5. The subject weld is a full penetration weld, and requires 100 percent volumetric and surface examination of the RPV head to flange welds as defined by Figure IWB-2500-5.

Weld No. TCX-1-1300-2:

Table IWB-2500-1. Examination Category B-A, Code Item B1.21, Figure IWB-2500-3. The subject weld is a full penetration weld, and requires 100 percent volumetric examination of the accessible portion of all circumferential welds, as defined by Figure IWB-2500-3.

###### Licensee's Proposed Alternative Examination:

There are no proposed alternatives.

###### Licensee's Basis for Requesting Relief:

The examination coverage is limited by physical interferences from the reactor head flange, shroud, and lifting lugs. To gain access for examination, the RPV head would require design modification which would represent a significant burden on the licensee. The licensee has examined a significant portion of these welds, obtaining approximately 84 percent of weld TCX-1-1300-2, and 85 percent of weld TCX-1-1300-1 of the required volumetric examination coverage. Additionally, 100 percent of the required surface examination of weld TCX-1-1300-1 was performed. There were no recordable indications identified by the volumetric examinations or surface examination. The subject welds were examined to the maximum extent possible (approximately 84 percent and 85 percent of examination completed in all cases) and yielded

no indications. Based on the high percentage of the examination volume completed, and the lack of any reportable indications, the licensee concludes that there is a high level of confidence in the continued structural integrity of the welds. The CPSES ISI plan requires one-third of each weld be examined each inspection period. The limitations of the first two inspection periods have been reviewed and approved under previous relief requests. Therefore, pursuant to the requirements of 10 CFR 50.55a(g)(5)(iii), relief is requested from performing 100 percent volumetric examination requirements, Figures IWB-2500-3 and IWB-2500-5.

#### Staff Evaluation:

The Code requires 100 percent volumetric examination of the weld length of the Reactor Vessel Closure Head to Flange and Reactor Vessel Closure Head to Disc Welds. The licensee noted that interferences from the reactor head flange, shroud, and lifting lugs preclude the complete ultrasonic examination of the subject welds. The licensee has examined a significant portion of the subject welds, obtaining approximately 84 percent of weld TCX-1-1300-2 and 85 percent of weld TCX-1-1300-1 of the required volumetric examination coverage of the subject welds. Also, the licensee found no recordable indications by its best effort volumetric examination or by the required surface examination performed on TCX-1-1300-1. The staff determined, through the review of sketches and non-destructive examination (NDE) reports provided by CPSES, that Code requirements are impractical and to meet the Code requirements, design modifications would be necessary to provide access for examination. Imposition of the Code requirements would result in an undue burden on the licensee. Based on the licensee's examinations, reasonable assurance of structural integrity of the subject components has been provided; therefore, relief is granted pursuant to 10 CFR 50.55a(g)(6)(i).

### 3.2 LICENSEE'S RELIEF REQUEST B-8, REVISION 1

#### 3.2.1 Components for Which Relief is Requested

ASME Class 1

RPV Lower Vessel Head Circumferential Weld (Weld No. TCX-1-1100-5).

#### Code Requirement:

TXU Energy requests relief from the 1986 Edition of the ASME Code, Section XI, with no Addenda, for the following:

Weld No. TCX-1-1100-5:

Table IWB-2500-1. Examination Category B-A, Code Item B1.21, Figure IWB-2500-3. The subject weld is a full penetration weld, and requires 100 percent volumetric examination of the accessible portion of all circumferential welds, as defined by Figure IWB-2500-3.

#### Licensee's Proposed Alternative Examination:

There are no proposed alternatives.

#### Licensee's Basis for Requesting Relief:

The examination coverage is limited by physical interferences from the reactor vessel bottom mounted instrument tubes. The areas behind the penetrations were not accessible to the ultrasonic scanning sled. These conditions make 100 percent examination impractical for these welds. To gain access for examination, the RPV head would require design modification which would represent a significant burden on the licensee. However, cameras on the examination tools were used to visually access the areas that were not accessible to the ultrasonic transducer scanning sled. The subject welds were examined to the maximum extent possible (approximately 75 percent) and yielded no indications. Based on the high percentage of the examination volume completed, and the lack of any reportable indications, the licensee concludes that there is a high level of confidence in the continued structural integrity of the welds. Therefore, pursuant to the requirements of 10 CFR 50.55a(g)(5)(iii), relief is requested from performing 100 percent volumetric examination requirements, Figure IWB-2500-3.

#### Staff Evaluation:

The Code requires 100 percent volumetric examination of the accessible portion of the RPV Lower Vessel Head Circumferential Weld. The licensee's best-effort examination resulted in volumetric coverage of approximately 75 percent, for the subject weld. The staff believes that the examination coverage expected to be obtained for the weld with the existing physical constraint should discover the existence of any service-related degradation with reasonable confidence. Also, cameras on the examination tools were used to visually access the areas that are not accessible to the ultrasonic transducer scanning sled to provide an additional level of confidence that any degradation should be discovered. This was a non-Code best effort visual examination. The staff has determined, through the review of sketches and NDE reports provided by CPSES, that the RPV Lower Vessel Head Circumferential Weld designated as TCX-1-1100-5, is inaccessible to ultrasonic scanning due to interference from the bottom mounted instrument tubes. Therefore, it is impractical to obtain the 100 percent volumetric coverage required by the Code for the subject welds unless the vessel is redesigned to improve access to the welds, which would impose a significant burden on the licensee. Based on the licensee's examinations, reasonable assurance of structural integrity of the subject component has been provided; therefore, relief is granted pursuant to 10 CFR 50.55a(g)(6)(i).

### 3.3 LICENSEE'S RELIEF REQUEST B-9, REVISION 1

#### 3.3.1 Components for Which Relief is Requested

ASME Class 1, RPV Outlet Nozzle to Shell Welds:

RPV Nozzle-to-Vessel Weld (Weld No. TCX-1-1100A-19)

RPV Nozzle-to-Vessel Weld (Weld No. TCX-1-1100A-22)

RPV Nozzle-to-Vessel Weld (Weld No. TCX-1-1100A-23)

RPV Nozzle-to-Vessel Weld (Weld No. TCX-1-1100A-26)

#### Code Requirement:

TXU Energy requests relief from the 1986 Edition of the ASME Code, Section XI, with no Addenda, for the following:

RPV Nozzle-to-Vessel Weld (Weld No. TCX-1-1100A-19)

RPV Nozzle-to-Vessel Weld (Weld No. TCX-1-1100A-22)

RPV Nozzle-to-Vessel Weld (Weld No. TCX-1-1100A-23)

RPV Nozzle-to-Vessel Weld (Weld No. TCX-1-1100A-26)

The subject welds are described in Table IWB-2500-1, Examination Category B-D, Code Item B3.90, Figure IWB-2500-7(b). The subject welds are full penetration welds of nozzles in the vessel, and require 100 percent volumetric examination of these welds.

Licensee's Proposed Alternative Examination:

There are no proposed alternatives.

Licensee's Basis for Requesting Relief:

The examination coverage is limited by area geometries of the reactor vessel outlet nozzles. Best effort examination by TXU Energy has resulted in volumetric coverage of approximately 84.4 percent of the required examination coverage due to weld and vessel shell configuration. The 84.4 percent of the required examination coverage is a combined percentage of various scan directions. Essentially 100 percent of the examination volume for each weld was examined in the axial scan direction from the nozzle inside bore by techniques designed for the detection and sizing of surface and subsurface flaws oriented in a plane normal to the vessel inside surface and parallel to the weld. The examination performed in this manner emphasizes the detection of the types of flaws that can result from welding processes or inservice conditions. There were no recordable indications identified by the volumetric examination. Additionally, cameras on the examination tool were used to visually access areas that were not accessible to the ultrasonic transducer scanning sled. The subject welds were examined to the maximum extent possible (approximately 84 percent of examination completed in all cases) and yielded no indications. It is impractical to obtain a volumetric coverage of 100 percent required by the Code for each of the subject welds unless the RPV is redesigned to improve access to the welds. Based on the high percentage of the examination volume completed, and the lack of any reportable indications, the licensee concludes that there is a high level of confidence in the continued structural integrity of the welds. Therefore, pursuant to the requirements of 10 CFR 50.55a(g)(5)(iii), relief is requested from performing 100 percent volumetric examination requirements Figure IWB-2500-7(b).

Staff Evaluation:

The Code requires 100 percent volumetric examination of the accessible portion of the RPV outlet nozzle to shell welds. The licensee noted that examination coverage is limited by area geometries of the reactor vessel outlet nozzles and that best effort examination by TXU Energy has resulted in volumetric coverage of approximately 84.4 percent of the required examination coverage due to weld and vessel shell configuration. However, the staff believes that the examination coverage expected to be obtained for each weld with the existing physical constraint or geometric configuration should discover the existence of any service-related degradation with reasonable confidence. Also, cameras on the examination tools were used to visually access the areas that are not accessible to the ultrasonic transducer scanning sled to provide an additional level of confidence that any degradation should be discovered. This was a non-Code best effort visual examination. The staff has determined, through the review of sketches and NDE reports provided by CPSES, that the welds joining the four outlet nozzles to the vessel shell designated as TCX-1-1100-19, 22, 23, and 26, respectively, are inaccessible to

ultrasonic scanning due to weld and vessel shell configuration. It is impractical to obtain a volumetric coverage of 100 percent required by the Code for each of the subject welds unless the RPV is redesigned to improve access to the welds, representing a substantial burden to the licensee. Based on the licensee's examinations, reasonable assurance of structural integrity of the subject components has been provided; therefore, relief is granted pursuant to 10 CFR 50.55a(g)(6)(i).

### 3.4 LICENSEE'S RELIEF REQUEST C-6, REVISION 1

#### 3.4.1 Components for Which Relief is Requested

ASME Code Class 2 Integrally Welded Pump Attachments in Chemical and Volume Control (CVCS), Pump TCX-CSAPCH-01:

Weld No. TCX-2-3110-3WS

Weld No. TCX-2-3110-4WS

#### Code Requirement:

TXU Energy requests relief from the 1986 Edition of the ASME Code, Section XI, with no Addenda, for the following:

Weld No. TCX-2-3110-3WS

Weld No. TCX-2-3110-4WS

The subject welds are described in Table IWC-2500-1 for Examination Category C-C, Code Item, C3.30 (welded attachments for pumps). The Code requires that surface examination be performed on 100 percent of required areas (as shown in Figures IWC-2500-5) of each welded attachment.

#### Licensee's Proposed Alternative Examination:

There are no proposed alternatives.

#### Licensee's Basis for Requesting Relief:

The licensee stated that the Code required 100 percent surface examination of the required areas by liquid penetrant method could not be achieved for the subject welds. With best effort examination, the coverage was about 77 percent of the required area. This coverage limitation is due to interference from the housing seal and pump base plate. The licensee also stated that it is not practical to comply with the Code requirements, to obtain 100 percent coverage because it would require the CVCS pump to be redesigned or complete removal of the pedestal to improve access to the subject welds. Therefore, pursuant to the requirements of 10 CFR 50.55a(g)(5)(iii), relief is requested from performing 100 percent surface examination requirements, Figure IWC-2500-5.

#### Staff Evaluation:

Due to physical obstruction by the pump housing seal and pump base plate, the examination of subject attachment welds are limited. The best effort surface examination performed at the subject welds covered about 77 percent of the Code required surface area. The staff has reviewed the pictures and sketches provided by the licensee and confirmed that 100 percent surface examination by liquid penetrant of the Code required surface areas at the subject welds could not be achieved. The licensee also performed a best effort non-Code visual examination of the subject welds, including the use of an inspection mirror. The results of both the surface examinations and visual examinations did not reveal any reportable indications at the subject welds. The licensee also reviewed the industry service experience of such welds by polling a few utilities. No service failure of such welds was identified.

Based on its review of the licensee's submittal, the staff has determined that it is not practical for the licensee to comply with the Code requirements of performing surface examination on 100 percent of the required surface areas at each of the subject attachment welds. If the Code requirements were imposed, it would cause a significant burden on the licensee as it requires a redesign of the pump or disassembly of the pump to provide access to the subject welds. Furthermore, the results of the best effort surface and visual examinations provide a reasonable assurance that the structural integrity of the subject attachment welds will be maintained. Based on the licensee's examinations, reasonable assurance of structural integrity of the subject components has been provided; therefore, relief is granted pursuant to 10 CFR 50.55a(g)(6)(i).

#### 4.0 CONCLUSION

Pursuant to 10 CFR 50.55a(g)(6)(i), the staff has determined that conformance to the specified Code requirements is impractical. The licensee's relief requests B-7, Revision 1; B-8, Revision 1; B-9, Revision 1; and C-6, Revision 1; for CPSES Unit 2, provide reasonable assurance of structural integrity, are authorized by law, and will not endanger life or property or the common defense and security, and is otherwise in the public interest giving due consideration to the burden upon the licensee that could result if the requirements were imposed on the facility. The subject relief requests are granted for the inservice examination in the third period of the first 10-year interval. All other ASME Code, Section XI requirements for which relief was not specifically requested and approved in this safety evaluation, remain applicable including third-party review by the Authorized Nuclear Inservice Inspector.

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Date: June 27, 2003