UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

OF REQUESTS FOR RELIEF NOS. B-9, B-10, AND B-11 FOR

COMANCHE PEAK STEAM ELECTRIC STATION, UNIT 1

TEXAS UTILITIES ELECTRIC STATION

DOCKET NO. 50-445

1.0 INTRODUCTION

Inservice inspection of the American Society of Mechanical Engineers (ASME) Code Class 1, 2, and 3 components shall be performed in accordance with Section XI of the ASME Boiler and Pressure Vessel (B&PV) Code and applicable 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(6)(g)(i). 10 CFR 50.55a(a)(3) states that alternatives to the requirements of paragraph (g) may be used, when authorized by the Nuclear Regulatory Commission, if (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) shall meet the requirements, except the design and access provisions and the pre-service 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 Comanche Peak Steam Electric Station, Unit 1 is the 1986 Edition.

2.0 EVALUATION

By letter dated February 7, 1997 (TXX-97014), Texas Utilities Electric Company (licensee) submitted its First Ten-Year Interval Inservice Inspection Program Plan Requests for Relief Nos. B-9, B-10, and B-11 for Comanche Peak Steam Electric Station, Unit 1. The Idaho

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National Engineering and Environmental Laboratory (INEEL), has evaluated the information provided by the licensee in support of its First Ten-Year Interval Inservice Inspection Program Requests for Relief Nos. B-9, B-10, and B-11 for Comanche Peak Steam Electric Station, Unit 1. Based on the results of the review, the staff adopts the contractor's conclusions and recommendations presented in the Technical Letter Report (TLR) attached.

The information provided by the licensee in support of the requests for relief from Code requirements has been evaluated and the basis for disposition is documented below.

Request for Relief No. B-9: ASME Code, Section XI, Examination Category B-D, Item B3.110 requires 100 percent volumetric examination during each inspection interval of the pressurizer nozzle-to-vessel welds as defined by Figure IWB-2500-7.

Pursuant to 10 CFR 50.55a(g)(5)(iii), the licensee requested relief from the Code-required 100 percent volumetric examination of pressurizer nozzle-to-vessel Welds TBX-1-2100-11, -12, -13, -14, -15, and -16.

The Code requires 100 percent volumetric examination of the pressurizer nozzle-to-vessel welds each inspection interval. The staff reviewed the information and figures provided by the licensee that describe the limitations associated with examination of the subject welds. The staff determined that because of the surface geometry and, for the pressurizer surge nozzle, the heater penetrations, the Code-required coverage requirements are impractical for the subject welds. To obtain complete volumetric coverage, design modifications would be required causing a significant burden on the licensee.

The licensee proposed to perform the volumetric examinations to the extent practical. For the spray, safety, and relief nozzle welds, approximately 26 percent of the required examination volume could not be scanned in two beam path directions with two different beam angles, as required by the Code; 96 percent of the required volume was examined in at least one beam path direction with one beam angle, and 93 percent of the required volume was examined in one beam path direction with two beam angles. For the surge nozzle weld, approximately 48 percent of the examination volume did not receive the full Code-required coverage; 65 percent of the required volume was examined in at least one beam path direction with two different beam angles, and approximately 80 percent of the required volume was examined in at least one beam path direction with one beam angle. All of the subject nozzle-to-vessel welds received full circumferential and 0 degree straight beam coverage. No indications were observed as a result of the limited examinations performed.

The staff concluded that based on the examination coverage of the subject welds that a pattern of degradation, if present, would be detected and the licensee's proposed alternative provides reasonable assurance of structural integrity of the subject welds. Therefore, the licensee request for relief is granted, pursuant to 10 CFR 50.55a(g)(6)(i) for the current interval.

Request for Relief No. B-10: ASME Code, Section XI, Examination Category B-J, Item B9.31 requires 100 percent surface and volumetric examination of branch connection welds NPS 4 and larger each inspection interval as defined by Figures IWB-2500-9, -10, and -11.

Pursuant to10 CFR 50.55a(g)(5)(iii), the licensee requested relief from the Code-required 100 percent volumetric examination for branch connection-to-pipe Weld TBX-1-4104-1.

The Code requires that the subject branch connection weld receive 100 percent volumetric and surface examinations. The staff has reviewed the information and figures provided by the licensee that describe the limitations and depict the pipe-to-branch connection joint configuration. The staff concluded that because of the surface geometry and the limited access to one side of the weld, the Code-required volumetric examination is impractical. To obtain complete volumetric coverage, design modifications would be required, causing a significant burden on the licensee.

The licensee proposed to perform the volumetric examination to the extent practical, resulting in 77 percent of the required examination volume being scanned in two axial beam path directions; 100 percent of the weld was covered in at least one beam path direction. Full circumferential scan coverage was obtained for this weld, along with 100 percent surface examination. The staff determined that based on the volumetric examination coverage obtained and the 100 percent surface examination performed, a pattern of degradation, if present, would be detected. As a result, the licensee's proposed alternative provides reasonable assurance of structural integrity of the subject components. Therefore, the licensee's request for relief is granted, pursuant to 10 CFR 50.55a(g)(6)(i) for the current interval.

Request for Relief No. B-11: ASME, Section XI, Examination Category B-J, Item B9.11 requires 100 percent surface and volumetric examination of selected circumferential pipe welds, NPS 4 and greater, as defined by Figure IWB-2500-8.

Pursuant to 10 CFR 50.55a(g)(5)(iii), the licensee requested relief from the Code-required 100 percent volumetric examination of pipe-to-valve Weld TBX-1-4201-7.

The Code requires 100 percent surface and volumetric examination of Class 1 circumferential pressure-retaining pipe welds greater than or equal to 4-inch NPS. However, as noted on the examination sketches provided in the licensee's submittal, component geometry and pipe hanger interferences restrict coverage and preclude 100 percent volumetric and surface examination of valve-to-pipe Weld TBX-1-4201-7. These examinations are, therefore, impractical to perform to the extent required by the Code. To meet the Code requirements, the weld joint or pipe hanger would have to be redesigned and modified. Imposition of this requirement would result in a burden on the licensee.

The licensee examined approximately 30 percent of the required weld volume and approximately 52 percent of the required weld surface area. The combination of the volumetric and surface examinations performed to the extent practical, VT-2 visual examination as required by the Code, and examination of other Examination Category B-J welds assures that existing patterns of degradation would be detected. Additionally, welds at the same locations in loops 1, 3, and 4 are also scheduled for examination during the first ISI interval. As a result the licensee's proposed alternative provides reasonable assurance of the structural integrity of the subject weld. Therefore, the licensee's request for relief is granted pursuant to 10 CFR 55.55a(g)(6)(i) for the current interval.

3.0 CONCLUSION

For Requests for Relief Nos. B-9, B-10, and B-11, the staff concluded that the examinations are impractical to perform to the extent required by the Code. Furthermore, the examinations performed provide reasonable assurance of the continued inservice structural integrity of the subject components. Therefore, Requests for Relief Nos. B-9, B-10, and B-11 are granted pursuant to 10 CFR 50.55a(g)(6)(i) for the current interval. The relief granted is authorized by law and will not endanger life or property, the common defense and security, and is otherwise in the public interest giving due consideration to the burden upon the licensee if the requirements were imposed on the facility.

Attachment: Technical Letter Report

Principal Contributor: T. McLellan

Date: January 27, 1999

TECHNICAL LETTER REPORT
ON FIRST 10-YEAR INTERVAL INSERVICE INSPECTION
REQUESTS FOR RELIEF NOS. B-9, B-10, AND B-11
FOR
TEXAS UTILITIES ELECTRIC CO.
COMANCHE PEAK STEAM ELECTRIC STATION, UNIT 1
DOCKET NUMBER 50-445

1. INTRODUCTION

By letter dated February 7, 1997, the licensee, Texas Utilities (TU) Electric Co., submitted Requests for Relief Nos. B-9, B-10, and B-11 seeking relief from the requirements of the ASME Code, Section XI, for the Comanche Peak Steam Electric Station (CPSES), Unit 1, first 10-year inservice inspection (ISI) interval. The Idaho National Engineering and Environmental Laboratory (INEEL) staff's evaluation of the subject requests for relief is in the following section.

2. EVALUATION

The information provided by TU Electric in support of the requests for relief from Code requirements has been evaluated and the bases for disposition are documented below. The Code of record for the CPSES, Unit 1, first 10-year ISI interval, which began August 13, 1990, is the 1986 Edition of Section XI of the ASME Boiler and Pressure Vessel Code.

A. Request for Relief No. B-9, Examination Category B-D, Item B3.110, Pressurizer Nozzle-to-Vessel Welds

Code Requirement: Examination Category B-D, Item B3.110 requires 100% volumetric examination during each inspection interval of the pressurizer nozzle-to-vessel welds as defined by Figure IWB-2500-7.

Licensee's Code Relief Request: In accordance with 10 CFR 50.55a(g)(5)(iii), the licensee requested relief from the Code-required 100% volumetric examination of

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pressurizer nozzle-to-vessel Welds TBX-1-21[illegible]0-11, -12, -13, -14, -15, and -16.

Licensee's Basis for Requesting Relief (as stated):

> "The specific examination area geometries of these nozzle to vessel welds preclude the complete ultrasonic examination of the volume required by Fig. IWB-2500-7. Approximately 26% of each of TBX-1-2100-12, 13, 14, 15, 16, the spray, safety and relief nozzle welds, did not receive the full code required coverage. Additional pressurizer heater interferences resulted in approximately 48% of TBX-1-2100-11, the surge nozzle weld, not receiving the full code required coverage. . .
>
> "Best effort examinations consisting of two separate angle beams were performed. Full circumferential scan and 0 degree straight beam coverage was obtained for all of the subject welds and required base metal areas. Axial scan coverage was achieved in at least one beam path direction with two different beam angles for 93% of each of the spray, safety and relief nozzle welds and for 65% of the surge nozzle weld. Axial scan coverage was achieved in at least one beam path direction with one beam angle for 96% of each of the spray, safety and relief nozzle welds and for 80% of the surge nozzle weld.
>
> "There were no recordable indications identified by the best effort examinations performed."

Licensee's Proposed Alternative Examination: None. The licensee is proposing to use the volumetric examinations performed as an acceptable alternative to the Code-required 100% volumetric examination for the subject pressurizer nozzle-to-vessel welds.

Evaluation: The Code requires 100% volumetric examination of the pressurizer nozzle-to-vessel welds each inspection interval. The INEEL staff reviewed the information and figures provided by the licensee that describe the limitations associated with examination of the subject welds. Because of the surface geometry and, for the pressurizer surge nozzle, the heater penetrations, the Code-required coverage requirements are impractical for the subject welds. To obtain complete volumetric coverage, design modifications would be required, causing a significant burden on the licensee.

The licensee proposed to perform the volumetric examinations to the extent practical. For the spray, safety, and relief nozzle welds, approximately 26% of the required examination volume could not be scanned in two beam path directions with two different beam angles, as required by the Code; 96% of the required volume was examined in at least one beam path direction with one beam angle, and 93% of the required volume was examined in

one beam path direction with two beam angles. For the surge nozzle weld, approximately 48% of the examination volume did not receive the full Code-required coverage; 65% of the required volume was examined in at least one beam path direction with two different beam angles, and approximately 80% of the required volume was examined in at least one beam path direction with one beam angle. All of the subject nozzle-to-vessel welds received full circumferential and 0 degree straight beam coverage. No indications were observed as a result of the limited examinations performed.

Based on the examination coverage of the subject welds, it can be concluded that a pattern of degradation, if present, would have been detected. As a result, reasonable assurance of structural integrity has been provided. Therefore, it is recommended that relief be granted, pursuant to 10 CFR 50.55a(g)(6)(i).

B. Request for Relief No. B-10, Examination Category B-J, Item B9.31, Branch Connection-to-Pipe Weld

Code Requirement: Examination Category B-J, Item B9.31 requires 100% surface and volumetric examination of branch connection welds NPS 4 and larger each inspection interval as defined by Figures IWB-2500-9, -10, and -11.

Licensee's Code Relief Request: In accordance with 10 CFR 50.55a(g)(5)(iii), the licensee requested relief from the Code-required 100% volumetric examination for branch connection-to-pipe Weld TBX-1-4104-1.

Licensee's Basis for Requesting Relief (as stated):

> "The specific examination area geometry of this pipe-to-branch connection weld precludes the complete ultrasonic examination of the volume required by Fig. IWB-2500-10. Approximately 23% of the examination volume did not receive the full code required coverage.
>
> "A best effort examination was performed. Full circumferential scan coverage was obtained. Axial scan coverage was achieved in one beam path direction with at least one beam angle for 100% of the examination volume.

"There were no recordable indications identified by the best effort volumetric examination or by the required surface examination performed."

Licensee's Proposed Alternative Examination: None. The licensee proposed to use the volumetric examination performed, along with the Code-required surface examination, as an alternative to the Code-required 100% volumetric examination of branch connection-to-pipe Weld TBX-1-4104-1.

Evaluation: The Code requires that the subject branch connection weld receive 100% volumetric and surface examinations. The INEEL staff has reviewed the information and figures provided by the licensee that describe the limitations and depict the pipe-to-branch connection joint configuration. Because of the surface geometry and the limited access to one side of the weld, the Code-required volumetric examination is impractical. To obtain complete volumetric coverage, design modifications would be required, causing a significant burden on the licensee.

The licensee proposed to perform the volumetric examination to the extent practical, resulting in 77% of the required examination volume being scanned in two axial beam path directions; 100% of the weld was covered in at least one beam path direction. Full circumferential scan coverage was obtained for this weld, along with 100% surface examination. Based on the volumetric examination coverage obtained and the 100% surface examination performed, it can be concluded that a pattern of degradation, if present, would have been detected. As a result, reasonable assurance of structural integrity has been provided. Therefore, it is recommended that relief be granted, pursuant to 10 CFR 50.55a(g)(6)(i).

C. Request for Relief No. B-11, Examination Category B-J, Item B9.11, Pressure- Retaining Circumferential Pipe Welds

Code Requirement: Examination Category B-J, Item B9.11 requires 100% surface and volumetric examination of selected circumferential pipe welds, NPS 4 and greater, as defined by Figure IWB-2500-8.

Licensee's Code Relief Request: In accordance with 10 CFR 50.55a(g)(5)(iii), the licensee requested relief from the Code-required 100% volumetric examination of pipe-to-valve Weld TBX-1-4201-7.

Licensee's Basis for Requesting Relief (as stated):

> "The specific pipe to valve examination geometry and interferences from reactor building structural steel members preclude the complete ultrasonic and liquid penetrant examinations of the volume and the surface area required by Fig. IWB-2500-8. Approximately 70% of the volume and 48% of the surface area did not receive the full code required coverage. . .
>
> "Best effort examinations were performed for the accessible areas of the weld. There were no recordable indications identified by the best effort volumetric or surface examinations performed."

Licensee's Proposed Alternative Examination: None. The licensee proposed to use the volumetric and surface examinations performed as an alternative to the Code-required 100% volumetric and surface examination of pipe-to-valve Weld TBX-1-4201-7. In addition, the licensee stated:

> ". . . welds at this same location in loops 1, 3 and 4 are included in the ISI Plan and are scheduled for examination during this interval."

Evaluation: The Code requires 100% surface and volumetric examination of Class 1 circumferential pressure-retaining pipe welds greater than or equal to 4-inch NPS. However, as noted on the examination sketches provided in the licensee's submittal, component geometry and pipe hanger interferences restrict coverage and preclude 100% volumetric and surface examination of valve-to-pipe Weld TBX-1-4201-7. These examinations are, therefore, impractical to perform to the extent required by the Code. To meet the Code requirements, the weld joint or pipe hanger would have to be redesigned and modified. Imposition of this requirement would result in a burden on the licensee.

The licensee examined approximately 30% of the required weld volume and approximately 52% of the required weld surface area. The combination of the volumetric and surface examinations performed to the extent practical, VT-2 visual examination as required by the Code, and examination of other Examination Category B-J welds assures that existing patterns of degradation would have been detected. Additionally, welds at the

same locations in loops 1, 3, and 4 are also scheduled for examination during the first ISI interval. As a result, reasonable assurance of the structural integrity of the subject weld has been provided. Therefore, it is recommended that relief be granted pursuant to 10 CFR 55.55a(g)(6)(i).

3. CONCLUSION

The INEEL staff evaluated the licensee's submittal and concluded that certain inservice examinations cannot be performed to the extent required by the Code at the CPSES, Unit 1. For Requests for Relief Nos. B-9, B-10, and B-11, the examinations are impractical to perform to the extent required by the Code. Furthermore, the examinations performed provide reasonable assurance of the continued inservice structural integrity of the subject components. Therefore, it is recommended that relief be granted, in each case, pursuant to 10 CFR 50.55a(g)(6)(i).