



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

November 10, 2011

Mr. Rafael Flores
Senior Vice President and
Chief Nuclear Officer
Attention: Regulatory Affairs
Luminant Generation Company LLC
P.O. Box 1002
Glen Rose, TX 76043

SUBJECT: COMANCHE PEAK NUCLEAR POWER PLANT, UNIT 1 – APPROVAL OF
RELIEF REQUEST NOS. B-10 AND B-11 FOR THE SECOND 10-YEAR
INSERVICE INSPECTION INTERVAL (TAC NOS. ME5217 AND ME5218)

Dear Mr. Flores:

By two letters dated December 15, 2010 (Agencywide Documents Access and Management System (ADAMS) Accession Nos. ML103560597 and ML103560596), as supplemented by letter dated June 15, 2011 (ADAMS Accession No. ML11173A064), Luminant Generation Company LLC (the licensee) submitted requests for relief (B-10 and B-11) from the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code), Section XI, inspection requirements pursuant to paragraph 50.55a(g)(5)(iii) of Title 10 of the *Code of Federal Regulations* (10 CFR) for Comanche Peak Nuclear Power Plant (CPNPP), Unit 1.

The geometry of the safety injection (SI) piping welds makes the ASME Code-required volumetric examination coverage requirements impractical. In relief request (RR) B-10, the licensee proposed ultrasonic testing (UT) of the subject weld to the maximum extent practical based on design configuration restrictions. The licensee further proposed supplemental examination pressure test VT-2 visual examinations pursuant to 10 CFR 50.55a(g)(5)(iii).

The geometry of the inlet reactor pressure vessel (RPV) nozzle safe-end to stainless steel piping weld makes the ASME Code-required volumetric examination coverage requirements impractical. In RR B-11, the licensee proposed UT of the subject weld to the maximum extent practical based on design configuration restrictions. The licensee further proposed supplemental examination by eddy current technique and pressure test VT-2 visual examinations pursuant to 10 CFR 50.55a(g)(5)(iii).

The U.S. Nuclear Regulatory Commission (NRC) staff has reviewed the subject requests and concludes, as set forth in the enclosed safety evaluation, that the licensee provided sufficient technical basis to find that compliance with the ASME Code requirements with respect to the SI piping welds and RPV nozzle safe-end to stainless steel piping weld is impractical. An imposition of the ASME Code requirements would be a burden on the licensee. The alternative weld examination methods proposed by the licensee by RRs B-10 and B-11, provides reasonable assurance of the structural integrity of the subject welds, is authorized by law and will not endanger life or property, or the common defense and security, and is otherwise in the public interest given due consideration to the burden upon the licensee that could result if the requirements were imposed on the facility. Therefore, the licensee's requests for relief are

R. Flores

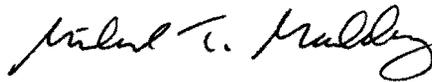
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granted pursuant to 10 CFR 50.55a(g)(6)(i) for the CPNPP, Unit 1, second 10-year inservice inspection interval, which began on August 13, 2000, and ended on August 12, 2010.

All other ASME Code, Section XI, requirements for which relief has not been specifically requested remain applicable, including a third-party review by the Authorized Nuclear Inservice Inspector.

If you have any questions, please contact Balwant K. Singal at 301-415-3016 or by e-mail at Balwant.Singal@nrc.gov.

Sincerely,

A handwritten signature in black ink, appearing to read "Michael T. Markley". The signature is written in a cursive style with a large, stylized initial "M".

Michael T. Markley, Chief
Plant Licensing Branch IV
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-445

Enclosure:
As stated

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

REQUEST FOR RELIEF NOS. B-10 AND B-11

SECOND 10-YEAR INSERVICE INSPECTION INTERVAL PROGRAM

LUMINANT GENERATION COMPANY LLC

COMANCHE PEAK NUCLEAR POWER PLANT, UNIT 1

DOCKET NO. 50-445

1.0 INTRODUCTION

By two letters dated December 15, 2010 (Agencywide Documents Access and Management System (ADAMS) Accession Nos. ML103560597 and ML103560596), as supplemented by letter dated June 15, 2011 (ADAMS Accession No. ML11173A064), Luminant Generation Company LLC (the licensee) submitted requests for relief (B-10 and B-11) from the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code), Section XI, inspection requirements pursuant to paragraph 50.55a(g)(5)(iii) of Title 10 of the *Code of Federal Regulations* (10 CFR) for Comanche Peak Nuclear Power Plant (CPNPP), Unit 1.

The geometry of the safety injection (SI) piping welds makes the ASME Code-required volumetric examination coverage requirements impractical. By relief request (RR) B-10, the licensee proposed ultrasonic testing (UT) of the subject weld to the maximum extent practical based on design configuration restrictions. The licensee further proposed supplemental examination pressure test VT-2 visual examinations pursuant to 10 CFR 50.55a(g)(5)(iii).

The geometry of the inlet reactor pressure vessel (RPV) nozzle safe-end to stainless steel piping weld makes the ASME Code-required volumetric examination coverage requirements impractical. By RR B-11, the licensee proposed UT of the subject weld to the maximum extent practical based on design configuration restrictions. The licensee further proposed supplemental examination by eddy current technique and pressure test VT-2 visual examinations pursuant to 10 CFR 50.55a(g)(5)(iii).

The second 10-year inservice inspection (ISI) interval at CPNPP, Unit 1, began on August 13, 2000, and ended on August 12, 2010.

2.0 REGULATORY EVALUATION

Inservice inspection of the ASME Code Class 1, 2, and 3 components is to be performed in accordance with Section XI of the ASME Code, and applicable addenda, as required by

Enclosure

10 CFR 50.55a(g), except where specific relief has been granted by the Commission pursuant to 10 CFR 50.55a(g)(6)(i). The regulations in 10 CFR 50.55a(a)(3) state that alternatives to the requirements of paragraph (g) may be used, when authorized by the U.S. Nuclear Regulatory Commission (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. The regulations in 10 CFR 50.55a(g)(5)(iii) state that if the licensee has determined that conformance with certain code requirements is impractical for its facility, the licensee shall notify the Commission and submit, as specified in 10 CFR 50.4, "Written communications," information to support the determinations.

Pursuant to 10 CFR 50.55a(g)(4), ASME Code Class 1, 2, and 3 components (including supports) must meet the requirements, except the design and access provisions and the preservice examination requirements, set forth in the 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 120-month inspection interval and subsequent intervals comply with the requirements in the latest edition and addenda of Section XI of the ASME Code, which was incorporated by reference in 10 CFR 50.55a(b), 12 months prior to the start of the 120-month interval, subject to the conditions listed therein. The ASME Code of record for CPNPP, Unit 1 is the 1998 Edition through the 2000 Addenda, of the ASME Code, Section XI. In addition, ASME Code, Section XI, 1995 Edition, 1996 Addenda is used for Appendix VIII, "Performance Demonstration for Ultrasonic Examination System."

3.0 TECHNICAL EVALUATION

The information provided by the licensee in support of the requests for relief from, or alternatives to, ASME Code requirements has been evaluated and the bases for disposition are documented below.

3.1 Request for Relief B-10, ASME Code, Section XI, Examination Category R-A, Item R1.16 Risk-Informed Piping Examinations

ASME Code Requirement

The examination requirements for the subject piping welds at CPNPP, Unit 1, are governed by a Risk-Informed Inservice Inspection (RI-ISI) program that was approved by the NRC in a safety evaluation (SE) dated September 28, 2001 (ADAMS Accession Number ML012710112). The RI-ISI program was developed in accordance with the Electric Power Research Institute (EPRI) Topical Report TR-112657, Revision B-A, Revised Risk-Informed Inservice Inspection Evaluation Procedure (PWRMRP-05)," December 1999 (ADAMS Accession No. ML013470102). The methodology in EPRI TR-112657, Revision B-A, is used as the examination method as well as for the selection of welds to be examined.

The RI-ISI program requires volumetric examination of the subject weld and extends the Code-required volume of the inner 1/3t (one-third of the pipe wall thickness) to 1/2-inch past the edge of the weld crown if no counterbore is present or a distance of 1/4-inch on either side of the weld counterbore, whichever is greater.

The CPNPP, Unit 1, second 10-year ISI plan also implements ASME Code Case N-460, "Alternative Examination Coverage for Class 1 and 2 Welds, Section XI, Division 1," which is endorsed by the NRC in Revision 16 of Regulatory Guide 1.147, "Inservice Inspection Code Case Acceptability ASME Section XI, Division 1"; ADAMS Accession No. ML101800536). Code Case N-460 states when the entire examination volume or area cannot be examined due to interference by another component or part geometry, a reduction in examination coverage on any Class 1 or Class 2 weld may be accepted, provided the reduction coverage for that weld is less than 10 percent of the required examination volume (i.e., "essentially 100 percent").

Licensee's ASME Code Relief Request

In accordance with 10 CFR 50.55a(g)(5)(iii), the licensee requested relief from the 100 percent volumetric examination of the Class 1 piping welds shown in Table 1, below.

Table 1 – ASME Code, Section XI, Examination Category R-A				
ASME Code Item	Weld ID	Weld Type	Material	Coverage Obtained Percent
R1.16	TBX-1-4201-9	10" elbow to pipe weld	SA376, type 304 SS	82.0
R1.16	TBX-1-4201-10	10" elbow to pipe weld	SA376, type 304 SS	79.0

Licensee's Basis for Relief Request (as stated by the licensee)

The examinations of the subject piping welds were limited by the closeness of the piping welds to safety injection piping structural restraints, attached to the steam generator [support] lower beam. This configuration limited portions of the weld volume from being examined. Volumetric examinations were performed with shear search units having a nominal angle of 45° in the two axial and circumferential directions. Minimum coverage obtained was 82% for TBX-1-4201-9 and 79% for TBX-1-4201-10 (Refer to Attachment 2 [of the licensee's letter dated December 15, 2010]). The examinations were conducted in accordance with procedure TX-ISI-302, "Ultrasonic Examination of Austenitic Piping Welds.

Consideration was given to selecting other welds that possibly could have provided full coverage, but it was not feasible. There are only twelve welds in four SI segments, classified as risk category 5a, with a medium consequence and a degradation mechanism of IGSCC [intergranular stress-corrosion cracking]. The SI piping, subject piping welds, and support configurations are identical in each of the Loop Rooms. Four of the [twelve] welds, one per Loop, are at valves, with the examination single sided. The other eight welds, two per Loop, are identical to the ones selected, with structural steel supports limiting the examinations. After looking at all of the associated piping in the four Loop Rooms, it was determined that the welds in Loop 2, TBX-1-4201-9 and TBX-1-4201-10, would provide the most coverage.

The design configuration restrictions of the subject components make the [ASME] Code required examination coverage requirements for the weld volume impractical. Plant modifications or replacements of components designed to allow for complete coverage would be needed to meet the [ASME] Code requirements. This would cause considerable burden to CPNPP.

Licensee's Proposed Alternative Examination (as stated by the licensee)

The following alternatives are proposed in lieu of the required examination coverage of essentially 100 percent:

1. Ultrasonic testing (UT) of the subject component weld was performed to the maximum extent practical during the second ten-year interval.
2. Pressure test VT-2 visual examinations were performed, as required by Code Category B-P, during the second ten-year interval. No evidence of leakage was identified for this component.

NRC Staff Evaluation

The examination requirements for the subject piping welds at CPNPP, Unit 1 are governed by a RI-ISI program that was approved by the NRC in an SE dated September 28, 2001. This program assigns ASME Code, Examination Category R-A, Items R1.16 piping inspection elements subject to IGSCC. The program requires inspection of 100 percent of the examination location volume for ASME Code, Class 1 circumferential piping welds. However, the design configurations of these welds limit volumetric examinations. In order to increase coverage, the welds would have to be re-designed and modified. This would place a burden on the licensee; therefore, the ASME Code-required volumetric examinations are considered impractical.

As shown in the technical descriptions and sketches provided in the licensee's submittal dated December 15, 2010, the licensee has examined the subject welds to the extent practical, obtaining volumetric coverage ranging from 79 to 82 percent of the required volumes. In its letter dated June 15, 2011, the licensee indicated that the structural restraint is a pipe support for the SI line that is attached to the lower structural beam for steam generator #2 and cannot be easily removed. Removal would require a temporary support for the SI line and additional dose would be obtained during the removal/reinstallation of the restraint and temporary support. The licensee evaluated potential additional examinations of welds in similar risk-informed segments and concluded that no additional volumetric coverage or no increase in the level of quality and safety would be provided by choosing other welds for examination.

The licensee conducted all of the examinations with equipment, procedures, and personnel that were qualified by performance demonstration in accordance with ASME Code, Section XI, Appendix VIII. The licensee performed UT techniques using 45° shear waves from two sides in both the axial and circumferential directions on all accessible sides/directions. The UT examinations did not reveal any unacceptable flaws. Since the degradation mechanism IGSCC occurs from the inside diameter (ID), other examination techniques, such as eddy current on the

The NRC staff concludes that it is impractical to meet the ASME Code-required volumetric examination coverage for the subject welds due to the design geometry of the welds and materials of construction. Based on the licensee's UT results and coverage obtained and the pressure test results, the NRC staff concludes that if significant service-induced degradation had occurred in the subject piping segments, evidence of it would have been detected by the examinations performed.

3.2 Request for Relief B-11, ASME Code, Section XI, Examination Category R-A, Item R1.20 Risk-Informed Piping Examinations

ASME Code Requirement

The examination requirements for the subject piping welds at CPNPP, Unit 1, are governed by an RI-ISI program that was approved by the NRC in an SE dated September 28, 2001. The RI-ISI program was developed in accordance with the EPRI TR-112657, Revision B-A, "Revised Risk-Informed Inservice Inspection Evaluation Procedure (PWRMRP-05)," December 1999. The methodology in EPRI TR-112657, Revision B-A, is used as the examination method as well as for the selection of welds to be examined.

The RI-ISI program requires volumetric examination of the subject weld and extends the ASME Code-required volume of the inner 1/3t to 1/2-inch past the edge of the weld crown if no counterbore is present or a distance of 1/4-inch on either side of the weld counterbore, whichever is greater.

The CPNPP, Unit 1, second 10-year ISI plan also implements Code Case N-460, which is endorsed by the NRC in Revision 16 of Regulatory Guide 1.147. Code Case N-460 states when the entire examination volume or area cannot be examined due to interference by another component or part geometry, a reduction in examination coverage on any Class 1 or Class 2 weld may be accepted, provided the reduction coverage for that weld is less than 10 percent (i.e. "essentially 100 percent").

Licensee's ASME Code Relief Request

In accordance with 10 CFR 50.55a(g)(5)(iii), the licensee requested relief from the 100 percent volumetric examination of the Class 1 piping welds shown in Table 2, below.

ASME Code Item	Weld ID	Weld Type	Material	Coverage Obtained Percent
R1.20	TBX-1-4300-13	27.5" inlet RV nozzle safe-end to stainless steel piping weld	Pipe: SA351-F8A Safe-end: SA182 type F316 SS	88.99

Licensee's Basis for Relief Request (as stated by the licensee)

The automated examination of the subject piping weld was conducted from the inside diameter (ID) of the pipe. The ID configuration, i.e. counterbore and root configuration, limited the coverage to 88.99%. The examination was conducted by the contact technique using the WesDyne PARAGON multi-channel data acquisition system, interfaced to a SQUID nozzle scanner. The examination was conducted to the maximum extent practical with the access provided and within the limitation of the component's geometry.

Ultrasonic detection scan for the subject weld was performed from the ID surface using 70 degree L-wave transducers applied in all four scanning directions. This examination interrogated the [volume of the] inner 1/3 [pipe wall] thickness volume. An Eddy Current technique was also employed to examine the ID surfaces of this nozzle safe-end to piping weld, in accordance with procedure WDI-STD-146 revision 9. The examination of the volume was conducted with axial scans at a 0.25" increment and the circumferential scans at a 0.080" incremental distance.

All UT data was digitally recorded from baseline to 100% full screen height and evaluated off-line by PDI [performance demonstration initiative] qualified Level II or III examiners, having certification attachments issued by PDI, relative to procedure PDI-ISI-254-SE-NB revision 1.

The design configuration restrictions of the subject components make the Code required examination coverage requirements for the weld volume impractical. Plant modifications or replacements of components designed to allow for complete coverage would be needed to meet the Code requirements. This would cause considerable burden to CPNPP.

Licensee's Proposed Alternative Examination (as stated by the licensee)

The following alternatives are proposed in lieu of the required examination coverage of essentially 100 percent:

1. Ultrasonic testing (UT) of the subject component weld was performed to the maximum extent practical during the second ten-year interval.
2. Supplemental examination by Eddy Current techniques was performed. All areas of limitation were fully examined and no indications were detected.
3. Pressure test VT-2 visual examinations were performed, as required by Code Category B-P, during the second ten-year interval. No evidence of leakage was identified for this component.

NRC Staff Evaluation

The examination requirements for the subject piping welds at CPNPP, Unit 1, are governed by an RI-ISI program that was approved by the NRC in an SE dated September 28, 2001. This program assigns ASME Code, Examination Category R-A, Item R1.20 as a piping inspection element not subject to a known damage mechanism. The program requires inspection of 100 percent of the examination location volume for ASME Code, Class 1 circumferential piping welds. However, the design configurations of these welds limit volumetric examinations. In order to increase coverage, the welds would have to be re-designed and modified. This would place a burden on the licensee; therefore, the ASME Code-required 100 percent volumetric examination coverage is considered impractical.

Examination of the subject weld is limited by the ID configuration of the counterbore and root configuration. Where the sled with the transducers attached was not in the required contact surface with the weld and as such, 100 percent volumetric coverage was not possible. However, the licensee performed the volumetric examinations to the extent practical (88.99 percent coverage), and supplemented the examination with Eddy Current Testing.

The NRC staff concludes that it is impractical to meet the ASME Code-required volumetric examination coverage for the subject welds due to the design geometry of the welds and materials of construction. Based on the licensee's combined UT and Eddy Current results, the NRC staff concludes that, if significant service-induced degradation had occurred in the subject piping segments, evidence of it would have been detected by the examinations performed.

4.0 CONCLUSION

The NRC staff concludes that the proposed alternatives described in RRs B-10 and B-11 provide reasonable assurance that the structural integrity of the welds has been maintained satisfactorily in the second-10 year ISI interval.

The NRC staff concludes that the licensee has adequately addressed all of the regulatory requirements set forth in 10 CFR 50.55a(g)(5)(iii) for the subject examinations of the welds contained in RRs B-10 and B-11. Therefore, the NRC staff grants relief for the subject examinations of the components contained in RRs B-10 and B-11 for the second 10-year ISI interval at CPNPP, Unit 1. The NRC staff further concludes that granting these RRs pursuant to 10 CFR 50.55a(g)(6)(i) is authorized by law and will not endanger life or property, or the common defense and security, and is otherwise in the public interest given due consideration to the burden upon the licensee that could result if the requirements were imposed on the facility.

All other ASME Code, Section XI, requirements for which relief was not specifically requested and approved in the subject request for relief remain applicable, including third-party review by the Authorized Nuclear Inservice Inspector.

Principal Contributor: M. Audrain

Date: November 10, 2011

R. Flores

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granted pursuant to 10 CFR 50.55a(g)(6)(i) for the CPNPP, Unit 1, second 10-year inservice inspection interval, which began on August 13, 2000, and ended on August 12, 2010.

All other ASME Code, Section XI, requirements for which relief has not been specifically requested remain applicable, including a third-party review by the Authorized Nuclear Inservice Inspector.

If you have any questions, please contact Balwant K. Singal at 301-415-3016 or by e-mail at Balwant.Singal@nrc.gov.

Sincerely,

/RA/

Michael T. Markley, Chief
Plant Licensing Branch IV
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-445

Enclosure:
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*SE email dated 9/21/11

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