



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

November 17, 2017

Mr. Mark E. Reddemann
Chief Executive Officer
Energy Northwest
P.O. Box 968 (Mail Drop 1023)
Richland, WA 99352-0968

SUBJECT: COLUMBIA GENERATING STATION – RELIEF REQUEST NO. 3ISI-16 FROM
THE REQUIREMENTS OF THE ASME CODE, SECTION XI FOR THE THIRD
10-YEAR INSERVICE INSPECTION INTERVAL (CAC NO. MF8922;
EPID L-2016-LLR-0004)

Dear Mr. Reddemann:

By letter dated December 7, 2016, as supplemented by letter dated June 26, 2017, Energy Northwest (the licensee) submitted a relief request to the U.S. Nuclear Regulatory Commission (NRC) with regard to the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code), Section XI requirements for volumetric examination of reactor vessel bottom head meridional and circumferential welds at Columbia Generating Station (Columbia).

Specifically, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) 50.55a(g)(5)(iii), the license requested relief for the third inservice inspection (ISI) interval concerning this impracticality.

The NRC staff has reviewed the subject request and concludes, as set forth in the enclosed safety evaluation, that the licensee adequately addressed all of the regulatory requirements set forth in 10 CFR 50.55a(g)(5)(iii). Therefore, the NRC staff grants Relief Request 3ISI-16, pursuant to 10 CFR 50.55a(g)(6)(i), at Columbia for the third 10-year ISI interval, which began on December 13, 2005, and ended on December 12, 2015.

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

M. Reddemann

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If you have any questions regarding this matter, please contact the Project Manager, John Klos at (301) 415-5136 or via e-mail at John.Klos@nrc.gov.

Sincerely,



Robert J. Pascarelli, Chief
Plant Licensing Branch IV
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-397

Enclosure:
Safety Evaluation

cc: Distribution via Listserv



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELIEF REQUEST NO. 3ISI-16

FOR THE THIRD 10-YEAR INSERVICE INSPECTION INTERVAL

COLUMBIA GENERATING STATION

ENERGY NORTHWEST

DOCKET NO. 50-397

1.0 INTRODUCTION

By letter dated December 7, 2016 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML16343B035), as supplemented by letter dated June 26, 2017 (ADAMS Accession No. ML17178A204), Energy Northwest (the licensee), submitted Relief Request 3ISI-16 from the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code), Section XI, requirements for certain inservice inspections (ISI) of component welds. This relief was requested for Columbia Generating Station (Columbia) for the third 10-Year ISI Interval which began on December 13, 2005, and ended on December 12, 2015.

2.0 REGULATORY EVALUATION

Pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) 50.55a(g)(4), "Inservice inspection standards requirement for operating plants," 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 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(a) twelve months prior to the start of the 120-month interval, subject to the conditions listed in 10 CFR 50.55a(b). The ASME Code of Record for the Columbia third 10-year interval ISI program, which began on December 13, 2005, and ended on December 12, 2015, is the 2001 Edition through the 2003 Addenda of the ASME Code.

Paragraph 50.55a(g)(5)(iii), "ISI program update: Notification of impractical ISI Code requirements," of 10 CFR states that:

If the licensee has determined that conformance with [certain ASME Code requirements] is impractical for its facility the licensee must notify the NRC [U.S. Nuclear Regulatory Commission] and submit...information to support the determinations. Determination of impracticality in accordance with this section must be based on the demonstrated limitations experienced when attempting to comply with the Code requirements during the inservice inspection interval for which the request is being submitted. Requests for relief made in accordance with this section must be submitted to the NRC no later than 12 months after the expiration of the initial or subsequent 120-month inspection interval for which relief is sought.

Paragraph 50.55a(g)(6)(i), "Impractical ISI requirements: Granting of Relief," states that:

The Commission will evaluate determinations under paragraph (g)(5) of this section that code requirements are impractical. The Commission may grant such relief and may impose such alternative requirements as it determines are authorized by law, 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.

3.0 TECHNICAL EVALUATION

3.1 ASME Code Component Identification

The licensee's relief request involves the following identified components:

ASME Code Class: Code Class 1

Exam Category: B-A, Pressure Retaining Welds in Reactor Vessel

Item Numbers: B1.21, Circumferential Head Welds
B1.22, Meridional Head Welds

Weld Identification: DG, Bottom Head Circumferential Weld
DR, Bottom Head Circumferential Weld
DA, Bottom Head Meridional Weld
DB, Bottom Head Meridional Weld
DC, Bottom Head Meridional Weld
DD, Bottom Head Meridional Weld
DE, Bottom Head Meridional Weld
DF, Bottom Head Meridional Weld

3.2 ASME Code Requirement

ASME Code, Section XI, Examination Category B-A, Item No. B1.21 and B1.22 requires volumetric examination of the accessible length of the weld as defined in Table IWB-2500-1 and shown in Figure IWB-2500-3.

ASME Code Case N-460, "Alternative Examination Coverage for Class 1 and Class 2 Welds, Section XI, Division 1," as approved for use by the NRC in Regulatory Guide (RG) 1.147, Revision 17, "Inservice Inspection Code Case Acceptability, ASME Section XI, Division 1," states that a reduction in examination coverage due to part geometry or interference for any ASME Class 1 or 2 weld is acceptable provided that the reduction is less than 10 percent (i.e., greater than 90 percent examination coverage is obtained).

ASME Code, Section XI, Mandatory Appendix I, Article I-2110, requires that ultrasonic examination of reactor vessels greater than 2 inches in thickness shall be qualified by performance demonstration in accordance with Appendix VIII for shell and head welds.

3.3 Licensee's Request for Relief

Pursuant to 10 CFR 50.55a(g)(5)(iii), the licensee requested relief on the basis that compliance with the ASME Code requirement is impractical. The licensee stated that the examination coverage limitations on the circumferential welds were due to interference from the bottom head penetrations. The licensee also stated that the examination coverage limitations on the meridional welds were due to interference by the vessel support skirt. The licensee stated that radiography is not a practical alternative because the configuration of the vessel welds prevents placement of the film and exposure source.

The licensee stated that the examinations were performed using a Performance Demonstration Initiative Appendix VIII qualified procedure specific to reactor pressure vessel assembly welds. The examination coverages are documented in the licensee documentation as follows, none of which had any unacceptable recordable indications:

	Total	Accessible	Examination
<u>Weld</u>	<u>Length</u>	<u>Length</u>	<u>Coverage</u>
DG	236 in.	46 in.	19%
DR	236 in.	46 in.	19%
DA	61 in.	44 in.	72%
DB	61 in.	44 in.	72%
DC	61 in.	44 in.	72%
DD	61 in.	44 in.	72%
DE	61 in.	44 in.	72%
DF	61 in.	44 in.	72%

3.4 NRC Staff Evaluation

As described in the licensee's submittal dated December 7, 2016, the examinations of the reactor vessel bottom head welds are limited by the geometric configuration of the components. For the circumferential welds DG and DR, examination coverage was limited by interference from the bottom head penetrations. For the meridional welds DA, DB, DC, DD, DE, and DF, examination coverage was limited by interference from the vessel support skirt.

The ASME Code requires volumetric examination of the accessible length of all welds for the Category B-A, Item B1.21 and B1.22 reactor vessel head welds. However, it was unclear in the licensee's submittal whether the examination coverage percentages stated in the relief request were based on the accessible weld length or the total weld length, and what the accessible weld

length was for each component in the relief request. In the licensee's supplemental letter dated June 26, 2017, the licensee stated that they examined 100 percent of the accessible length of the welds identified in this relief request. The licensee also clarified that they conservatively reported the coverage as a percentage of the total weld length, since Note 2 of Table IWB-2500-1 in the ASME Code states that the accessible length "[i]ncludes essentially 100% of the weld length," which the NRC staff finds acceptable. The NRC staff reviewed the examination coverages provided by the licensee. The staff also determined that the examination coverages achieved by the licensee for the third ISI interval were the same examination coverages achieved by the licensee for the second ISI interval. No unacceptable indications were found in the prior interval inspections.

The licensee's submittal stated that the ultrasonic examinations were performed using the 60-degree refracted longitudinal beam angle in the axial and circumferential directions. The licensee's submittal also stated that the ultrasonic examinations were performed using a Performance Demonstration Initiative Appendix VIII qualified procedure specific to reactor pressure vessel assembly welds. The NRC staff finds the licensee's request for relief acceptable, since the ultrasonic examination procedure is in accordance with the requirements of ASME Code, Section XI, Mandatory Appendix I, Article I-2110, for ultrasonic examination of reactor vessels, which are greater than 2 inches in thickness.

Based on the examination techniques used, the volumetric coverage obtained and the lack of unacceptable recordable indications, it is reasonable to conclude that, if significant service-induced degradation was present in these welds, evidence would have been detected by the examinations performed. Therefore, the NRC staff finds that the coverage achieved is acceptable.

4.0 CONCLUSION

The NRC staff has reviewed the subject request and concludes that the ASME Code examination coverage requirements are impractical for the subject welds listed in Relief Request 3ISI-16. Furthermore, based on the examination techniques used, the volumetric coverage obtained and the lack of unacceptable recordable indications, it is reasonable to conclude that if significant service-induced degradation was present, evidence of it would have been detected by the examinations that were performed. Granting relief pursuant to 10 CFR 50.55a(g)(6)(i) for Relief Request 3ISI-16, 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. Accordingly, the NRC staff concludes, as set forth in the above safety evaluation, that the licensee has adequately addressed all of the regulatory requirements set forth in 10 CFR 50.55a(g)(5)(iii). Therefore, the NRC staff grants Relief Request 3ISI-16, pursuant to 10 CFR 50.55a(g)(6)(i), at Columbia for the third 10-year ISI interval, which began on December 13, 2005, and ended on December 12, 2015.

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

Principal Contributor: J. Jenkins, NRR

Date: November 17, 2017

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