



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

August 7, 2018

Mr. Bryan C. Hanson
President and Chief Nuclear Officer
Exelon Nuclear
4300 Winfield Road
Warrenville, IL 60555

SUBJECT: LIMERICK GENERATING STATION, UNITS 1 AND 2 – RELIEF FOR I3R-23
THIRD 10-YEAR INSERVICE INSPECTION INTERVAL
(EPID L-2017-LLR-0098)

Dear Mr. Hanson:

By letter dated September 29, 2017, as supplemented by letters dated January 17, 2018, and May 24, 2018, Exelon Generation Company, LLC (the licensee), submitted Relief Request I3R-23 to request relief from the requirements of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code), Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components," 2001 Edition through 2003 Addenda, regarding the examination of welds, nozzle inside radius sections, and supports at Limerick Generating Station, Units 1 and 2 (LGS).

Specifically, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, Section 55a(g)(5)(iii), the licensee requested relief for the Third 10-year In-service Inspection (ISI) Interval items on the basis that the ASME Code requirement is impractical.

The U.S. Nuclear Regulatory Commission (NRC) staff determines that it is impractical for the licensee to comply with the requirements of the ASME Code, Section XI. Accordingly, 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). The NRC staff determines that granting relief 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 giving due consideration to the burden upon the licensee that could result if the requirements were imposed on the facility. Therefore, the NRC grants Relief Request I3R-23 at LGS for their third 10-year ISI interval ended on January 31, 2018.

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.

B. Hanson

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If you have any questions, please contact the LGS Project Manager, Dr. V. Sreenivas, at 301-415-2597.

Sincerely,

A handwritten signature in black ink, appearing to read "James G. Danna". The signature is fluid and cursive, with a long horizontal stroke at the end.

James G. Danna, Chief
Plant Licensing Branch I
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-352
50-353

Enclosure: As stated

cc: ListServ



UNITED STATES
NUCLEAR REGULATORY COMMISSION
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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELIEF REQUEST I3R-23

THIRD 10-YEAR INSERVICE INSPECTION INTERVAL

EXELON GENERATION COMPANY, LLC

LIMERICK GENERATING STATION, UNITS 1 AND 2

DOCKET NOS. 50-352 AND 50-353 (EPID: L-2017-LLR-0098)

1.0 INTRODUCTION

By letter dated September 29, 2017 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML17275A202), and supplemented by letters dated January 17, 2018, and May 24, 2018 (ADAMS Accession Nos. ML18017A376 and ML18144A251, respectively), Exelon Generation Company, LLC (Exelon, the licensee), submitted Relief Request (RR) I3R-23 to request relief from the requirements of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code), Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components," 2001 Edition through 2003 Addenda, regarding the examination of welds, nozzle inside radius sections, and supports at Limerick Generating Station, Units 1 and 2 (LGS).

Specifically, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, paragraph 55a(g)(5)(iii), the licensee requested relief for the Third 10-year In-service Inspection (ISI) Interval items on the basis that the ASME Code requirement is impractical.

2.0 REGULATORY EVALUATION

Paragraph 50.55a(g)(1) of 10 CFR states that a boiling or pressurized water-cooled nuclear power facility whose construction permit was issued before January 1, 1971, components (including supports) must meet the requirements of paragraphs (g)(4) and (g)(5) of this section to the extent practical.

Adherence to Section XI of the ASME Code is mandated by 10 CFR 50.55a(g)(4), which states, in part, that ASME Code Class 1, 2, and 3 components will meet the requirements, except the design and access provisions and the pre-service examination requirements, set forth in ASME Code, Section XI.

Enclosure

Paragraph 50.55a(g)(5)(iii) of 10 CFR states that if the licensee has determined that conformance with an ASME Code requirement is impractical for its facility, the licensee must notify the U.S. Nuclear Regulatory Commission (NRC) and submit, as specified in 10 CFR 50.4, information to support the determinations. Determinations of impracticality in accordance with this section must be based on the demonstrated limitations experienced when attempting to comply with the ASME Code requirements during the ISI 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)(5)(iv) of 10 CFR requires that where an examination requirement by the ASME Code or Addenda is determined to be impractical by a licensee, the basis for this determination must be demonstrated to the satisfaction of the Commission not later than 12 months after the expiration of the initial 120-month period of operation from the start of facility commercial operation and each subsequent 120-month period of operation during which the examination is determined to be impractical.

Paragraph 50.55a(g)(6)(i) of 10 CFR states, in part, that the Commission will evaluate determinations, under 10 CFR 50.55a(g)(5), that ASME Code requirements are impractical. The Commission may grant such relief and may impose such alternative requirements as it determines is authorized by law.

Based on the above, and subject to the following technical evaluation, the NRC staff finds that regulatory authority exists for Exelon to request the NRC to grant relief.

3.0 TECHNICAL EVALUATION

3.1 The Licensee's Relief Request

Applicable Code Edition and Addenda

The Third 10-year ISI interval program at LGS was based on ASME Code, Section XI, 2001 Edition with the 2003 Addenda. The third 10-year ISI interval ended on January 31, 2017, for both Units 1 and 2.

Applicable Code Requirements

A volumetric examination of "essentially 100%" of the length of the risk informed in-service inspection (RI-ISI) welds is required in Examination Category R-A, Item Numbers R1.11 and R1.20, per Table 1 of ASME Code Case N-578-1. The RI-ISI program scope includes welds in the Break Exclusion Region piping, which includes several Class 3 and Non-Class welds that fall within the Break Exclusion Region Augmented Inspection Program.

The licensee has adopted ASME Code Case N-460 ("Alternative Examination Coverage for Class 1 and Class 2 Welds, Section XI, Division 1"), which defines "essentially 100%" as greater than 90% coverage of the examination volume or surface area, as applicable. ASME Code Case N-460 is an alternative approved for use by the NRC in Regulatory Guide 1.147, Revision 18, "Inservice Inspection Code Case Acceptability."

ASME Code Components Affected

Relief Request I3R-23 covers sixteen piping welds covered under the licensee's risk-informed inspection plan. The welds include ASME Code Class 1, 2, and 3 welds. The welds are described in Table 1.

Table 1: Piping Welds Covered by I3R-23

Unit	Component	Weld Description	Exam Category/ Item Number	Coverage Obtained
1	RW 138	6" Valve HV-44-1F040 to Pipe	Class 3 weld	50.0%
1	DCA-104-03 SWB01	12" HV-051-1F050B to Pup Piece	R-A/ R1.11	47.8%
1	DCA-104-01 SW1402	12" Pup Piece to HV- 051-1F050B	R-A/ R1.11	50.0%
1	DCA-318-1 FW1	12" Pipe to Safe End	R-A/ R1.11	77.4%
1	RHB 003	12" Valve 51-1F065B to Pipe	R-A/ R1.11	50.0%
1	RRB 028	22" Pipe to 22"x12" Sweep-o-let	R-A/ R1.20	50.0%
1	RW 118	2" Pipe to Elbow	R-A/ R1.20	50.0%
1	RRB 004	28" x28" x20" Tee to 28" Pipe	R-A/ R1.20	50.0%
2	DCA-420-1 FW1	10" Pipe to Safe End	R-A/ R1.11	72.0%
2	DCA-204-1 SW1502	12" Pipe to Check Valve HV-51- 2F050B Pup Piece	R-A/ R1.11	50.0%
2	DCA-204-3 SW1101	12" Valve HV-51- 2F050B to Pup Piece	R-A/ R1.11	50.0%
2	DCA-418-4 FW1	12" Pipe to Safe End	R-A/ R1.11	78.0%
2	DCA-419-1 FW7	12" Elbow to Pipe (CS)	R-A/ R1.20	70.0%
2	EBB-201-1 FW33	26" Valve HV-41- 2F028C to 26" Pipe ID.	R-A/ R1.20	75.0%
2	GBB-205-2 FW8	16" Elbow to Valve HV-51- 2F021B	R-A/ R1.20	87.5%
2	DCA-201-1 FW13	6"x 6" x 6" Tee to 6" Pipe	R-A/ R1.20	76.9%

Relief Request I3R-23 initially included examinations of the D Emergency Service Water Pump Upper and Lower Seismic Restraints and the A Residual heat Removal Service Water Pump Upper and Lower Seismic Restraints. The licensee withdrew these components from RR I3R-23 in the letter dated May 24, 2018 (ADAMS Accession No. ML18144A251).

Impracticality of Compliance

The licensee is requesting relief on the basis that the ASME Code, Section XI "essentially 100%" volumetric examination coverage requirements for these components are impractical due to physical obstructions and/or component geometry. The licensee would incur significant engineering, material, and installation costs to perform such modifications without a compensating increase in the level of quality and safety.

For the RI-ISI weld population, Examination Category R-A welds submitted in this RR, the licensee completed a case-by-case review during outages to determine whether additional or alternative welds could have been examined to supplement the reduced volumetric coverage examination. The licensee determined that there were no other welds to select that would have resulted in better coverage. The licensee compared configurations, delta core damage frequency values, the systems involved, and inspection history to make this determination.

Burden Caused by Compliance

In order to maintain compliance with the applicable volumetric examination requirements in ASME Code, Section XI, the licensee would have to redesign and refabricate the subject and/or surrounding components. Based on this, ASME Code, Section XI, requirements are deemed impractical in accordance with 10 CFR 50.55a(g)(5)(iii).

Basis for Relief

The licensee has performed the ASME Code, Section XI required examinations to the maximum extent practical or best effort. Due to the physical interferences causing these limitations, there are no alternative examination techniques currently available to increase coverage.

Duration of Relief

The licensee stated that the relief is applicable to the third 10-year ISI interval, which concluded on January 31, 2017.

3.2 NRC STAFF EVALUATION

The information provided by the licensee in support of the RRs from ASME Code requirements has been evaluated and the bases for disposition are documented below.

Items R1.11 and R1.20 in Examination Category R-A of ASME Code Case N-578-1 requires a volumetric examination of "essentially 100%" of RI-ISI welds. Component RW 138 is in the Break Exclusion Region piping and currently managed by the licensee's Break Exclusion Region Augmented Inspection Program. This component would not normally be considered an ASME Code Section XI examination, but is included in their RI-ISI program and is, therefore, a Section XI examination.

Obtaining "essentially 100%" volumetric coverage for the welds in Table 1 is prevented by physical obstructions and/or component geometry. To achieve "essentially 100%" coverage, the weld and piping would require design modifications. This would place a burden on the licensee by causing significant engineering, material, and installation costs to perform such modifications without a compensating increase in the level of quality and safety. Therefore, obtaining 100 percent of ASME Code-required volumetric examinations for the subject welds is considered impractical.

The ultrasonic exams were conducted in accordance with ASME Code Section XI Appendix VIII. Enclosures 1 and 2 of the licensee's submittal provide coverage plots for each scan, tables listing the coverage obtained by each scan, and complete Ultrasonic Examination Data Reports for each weld. The total coverage was calculated by averaging the coverages obtained for each scan in each direction. The calculated coverage obtained for the welds ranged from 47.8 percent to 87.5 percent. NRC staff reviewed the licensee's coverage plots and calculations and determined that, due to the configuration of the nozzle, the licensee obtained the maximum practical volumetric coverage of the welds. Given the coverage obtained and the operational experience for these components, the NRC staff has determined that despite the limitations in coverage the ultrasonic examinations performed provide reasonable assurance of the leak tightness and structural integrity of the welds described in Table 1.

Based on the information above, the NRC staff determines that obtaining the required ASME Code volumetric coverage would impose an unnecessary burden on the licensee and is impractical in accordance with 10 CFR 50.55a(g)(5)(iii).

4.0 CONCLUSION

As set forth above, the NRC staff determines that it is impractical for the licensee to comply with the requirements of the ASME Code, Section XI. Accordingly, 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). The NRC staff determines that granting relief 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 giving due consideration to the burden upon the licensee that could result if the requirements were imposed on the facility. Therefore, the NRC grants RR I3R-23 at LGS for their third 10-year ISI intervals.

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Principal Contributors: D. Render
S. Cumblidge

Date: August 7, 2018

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