



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

February 22, 2022

Mr. David P. Rhoades  
Senior Vice President  
Constellation Energy Generation, LLC  
President and Chief Nuclear Officer  
Constellation Nuclear  
4300 Winfield Road  
Warrenville, IL 60555

SUBJECT: CLINTON POWER STATION, UNIT 1 – RELIEF FROM THE REQUIREMENTS  
OF THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS CODE  
(EPID L-2021-LLR-0047)

Dear Mr. Rhoades:

By letter dated June 28, 2021 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML21179B389), Exelon Generation Company, LLC (the licensee) submitted a request to the U.S. Nuclear Regulatory Commission (NRC) for relief from certain American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code), Section XI, requirements at Clinton Power Station, Unit 1 (CPS). On February 1, 2022 (ADAMS Accession No. ML22032A333), Exelon Generation Company, LLC was renamed Constellation Energy Generation, LLC.

Specifically, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) 50.55a(g)(5)(iv), the licensee requested relief on the basis that achieving the ASME Code required examination coverage for the components and welds identified in relief request (RR) I3R-18 is impractical.

The NRC staff has reviewed the subject request and concludes, as set forth in the enclosed safety evaluation, that granting relief in accordance with 10 CFR 50.55a(g)(5)(iv) is authorized by law, 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 that the licensee has adequately addressed all the regulatory requirements set forth in the regulations at 10 CFR 50.55a(g)(5)(iv). Therefore, the NRC staff grants the licensee's RR I3R-18 at CPS for the third 10-year inservice inspection interval.

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

If you have any questions, please contact the Senior Project Manager, Joel S. Wiebe, at (301) 415-6606 or [Joel.Wiebe@nrc.gov](mailto:Joel.Wiebe@nrc.gov).

Sincerely,

Nancy L. Salgado, Chief  
Plant Licensing Branch III  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket No. 50-461

Enclosure:  
Safety Evaluation

cc: Listserv



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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELIEF REQUEST I3R-18 REGARDING INSERVICE INSPECTION

IMPRACTICALITY OF RPV FLANGE WELD EXAMINATION

CONSTELLATION ENERGY GENERATION, LLC

CLINTON POWER STATION, UNIT 1

DOCKET NO. 50-461

1.0 INTRODUCTION

By letter dated June 28, 2021 (Agencywide Documents and Access Management System (ADAMS) Accession No. ML21179B389), Exelon Generation Company, LLC (the licensee) submitted relief request (RR) I3R-18 for U.S. Nuclear Regulatory Commission (NRC or Commission) review and approval for the third 10-year inservice inspection (ISI) interval for Clinton Power Station, Unit 1 (CPS). Relief is requested due to the impracticality of satisfying a specific requirement 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." On February 1, 2022 (ADAMS Accession No. ML22032A333), Exelon Generation Company, LLC was renamed Constellation Energy Generation, LLC.

Specifically, pursuant to paragraph 50.55a(g)(5)(iv) of Title 10 of the *Code of Federal Regulations* (10 CFR), the licensee requested relief on the basis that achieving the ASME Code required examination coverage for the components and welds identified in RR I3R-18 is impractical.

2.0 REGULATORY EVALUATION

The NRC staff considered the following regulatory requirements and guidance in its evaluation.

Pursuant to 10 CFR 50.55a(g)(4), "Inservice inspection standards requirement for operating plants," components that are classified as ASME Code Class 1, 2, and 3 must meet the requirements, except the design and access provisions and preservice examination requirements, as set forth in Section XI of the ASME Code incorporated by reference in 10 CFR 50.55a(a) 12 months prior to the start of the 120-month interval, subject to the conditions listed in 10 CFR 50.55a(b) throughout the service life of a boiling or pressurized-water-cooled nuclear power facility.

Enclosure

Pursuant to 10 CFR 50.55a(g)(5)(iv), "ISI program update: Schedule for completing impracticality determinations," if the licensee determines that an examination required by Code edition or addenda is impractical, the basis for this determination must be submitted for NRC review and approval not later than 12 months after the expiration of the initial or subsequent 120-month inspection interval for which relief is sought.

Pursuant to 50.55a(g)(6)(i), "Impractical ISI requirements: Granting of relief," the Commission will evaluate determinations under paragraph (g)(5) of 10 CFR 50.55a, that ASME 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.

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

## 2.0 TECHNICAL EVALUATION

### 2.1 Licensee's Relief Request

#### 2.1.1 ASME Code Components Affected

The components affected are ASME Code Class 1, Category B-A, Item No. B1.30, Reactor Pressure Vessel (RPV) RPV-C5 Shell to Flange Welds.

#### 2.1.2 Applicable Code Edition and Addenda

The third 10-year ISI interval program of CPS ended on June 30, 2020, and complied with the 2004 Edition, with No Addenda, of ASME Code, Section XI.

#### 2.1.3 Applicable Code Requirement

The examination requirement for Examination Category B-A, Item No. B1.30, per ASME Code, Section XI, Table IWB-2500-1, requires a volumetric examination of essentially 100 percent of the weld length for shell-to-flange welds as shown in ASME Code, Section XI, Figure IWB-2500-4.

In addition, the licensee has adopted the NRC approved ASME Code Case N-460, "Alternative Examination Coverage for Class 1 and Class 2 Welds, Section XI, Division 1," which defines "essentially 100 percent" as greater than 90 percent coverage of the examination volume or surface area, as applicable.

#### 2.1.4 Licensee's Reason for Request

The licensee was unable to meet the Code exam requirements as the RPV shell flange configuration/geometry does not allow ultrasonic (UT) examination from the flange side. The RPV shell flange would have to be modified to perform a full Code required UT examination of this weld.

Licensee's Proposed Alternative: The licensee proposes to perform the UT from the RPV shell side only and perform UT examination on this weld to the maximum extent feasible.

The licensee evaluated the feasibility of using a remote auto UT system to potentially increase the examination volume. It was concluded that due to the size of the auto UT equipment the examination volume would have been less.

#### 2.1.5 Duration of the Request

The licensee submitted this request for the third 10-year ISI interval that ended on June 30, 2020.

### 2.2 NRC Staff Evaluation

The licensee has requested relief from the "essentially 100 percent" volumetric coverage requirements described in ASME Code, Section XI, and its ISI program because the design configuration of the subject weld limits access for volumetric inspection. In order to effectively increase the examination coverage to meet ASME Code requirements, the component would require significant modifications.

Performance of UT examination from the RPV shell side only provides reasonable assurance of the structural integrity of the entire weld. The licensee has performed UT examination on this weld to the maximum extent feasible. Due to the bend radius on the flange side and the thickness of the flange, the following examination volumes were scanned: from 0 degree to 180 degrees -- composite coverage of 62.8 percent; from 180 degrees to 360 degrees -- composite coverage of 72.9 percent. The licensee documented the impediment to examination in several diagrams that illustrate the problematic geometry surrounding the subject weld.

The coverage achieved represents a large sample such that if significant degradation were present in the weld it is likely that the degradation would have been detected. Evidence of significant service-induced degradation in the weld, if it were to occur, would likely be detected in the portions of the welds that were examined because the examined volume is the same material as the unexamined volume, is under the same loading conditions, and is exposed to the same reactor coolant environment. Based on operating experience at similar locations to date, the NRC staff believe that the likelihood that a degradation mechanism unique to CPS and located only in the unexamined portion of the weld is acceptably low.

The licensee stated that it would be a burden to meet the ASME Code-required 100 percent volumetric examination coverage for the subject weld due to its design. The NRC staff determined that relieving the nature of the impediment would require significant burden and would be impractical. Thus, RR I3R-18 meets the requirements for relief for impracticality described in the regulations at 10 CFR 50.55a(g)(6)(i).

Therefore, the NRC staff determined that modifying the RPV shell flange to increase coverage would be impractical. Based on the volumetric coverage obtained, the resistant material, and examination results, the staff concludes that there is reasonable assurance of structural integrity of the subject component. The staff notes that nearly identical RRs were approved for this weld during the first and second 10-year ISI interval. In light of the above, the staff concludes that relief should be granted from further action in examining this weld for the CPS third 10-year ISI interval because the coverage achieved was as high as practical, this coverage provides

reasonable assurance that no general degradation mechanism is active within the weld, and that to improve coverage would require undue burden.

### 3.0 CONCLUSION

The NRC staff determined that granting relief in accordance with 10 CFR 50.55a(g)(6)(i) is authorized by law, 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 that the licensee has adequately addressed all the regulatory requirements set forth in the regulations at 10 CFR 50.55a(g)(5)(iv). Therefore, the NRC staff grants the licensee's RR I3R-18 at CPS for the third 10-year ISI interval.

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

Principal Contributors: K. Sida  
D. Widrevitz

Date: February 22, 2022

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NAME	JWiebe	SRohrer	ABuford	NSalgado
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