



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

September 28, 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: QUAD CITIES NUCLEAR POWER STATION, UNITS 1 AND 2 – PROPOSED
ALTERNATIVE TO THE REQUIREMENTS OF THE ASME OM CODE
(EPID L-2022-LLR-0016)

Dear Mr. Rhoades:

By letter dated February 17, 2022 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML22048B569), Constellation Energy Generation, LLC (the licensee), submitted an alternative request to the U.S. Nuclear Regulatory Commission (NRC) to the requirements of the American Society of Mechanical Engineers (ASME) Code for Operation and Maintenance of Nuclear Power Plants (OM Code), associated with valve inservice testing (IST) at Quad Cities Nuclear Power Station, Units 1 and 2 (QCNPS).

Specifically, pursuant to subparagraph (1) in paragraph (z) in Part 50 to Title 10 of the *Code of Federal Regulations* (10 CFR 50.55a(z)(1)), the licensee requested that the NRC authorize alternative request RV-07 on the basis that the proposed alternative for use of the QCNPS technical specification (TS) stroke-time limits for the main steam isolation valves (MSIVs) in lieu of the requirements in the ASME OM Code for stroke-time limits based on test reference values would provide an acceptable level of quality and safety. This safety evaluation (SE) describes the NRC staff review of proposed alternative request RV-07 for the sixth 10-year IST interval at QCNPS

The NRC staff has reviewed the subject request and concludes as set forth in the enclosed SE that the proposal in alternative request RV-07 to apply an acceptable stroke-time range of ≥ 3 seconds and ≤ 5 seconds for the applicable MSIVs at QCNPS will provide reasonable assurance of their operational readiness in lieu of the reference value stroke-time acceptance criteria required by ASME OM Code, Appendix IV, paragraph IV-7100(b). Accordingly, the licensee has adequately addressed the regulatory requirements set forth in 10 CFR 50.55a(z)(1) for an acceptable level of quality and safety with respect to alternative request RV-07 at QCNPS, Units 1 and 2. Therefore, the NRC staff authorizes alternative request RV-07 for the sixth 10-year IST interval at QCNPS, which is scheduled to begin on February 18, 2023, and end on February 17, 2033.

All other ASME OM Code requirements as incorporated by reference in 10 CFR 50.55a for which a relief or an alternative was not specifically requested, and granted or authorized (as appropriate), in the subject request remain applicable.

If you have any questions, please contact the Project Manager, Robert Kuntz at 301-415-3733 or via e-mail at Robert.Kuntz@nrc.gov.

Sincerely,

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

Docket Nos. 50-254 and 50-265

Enclosure: Safety Evaluation

cc: Listserv



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

RELATED TO

ALTERNATIVE REQUEST RV-07

CONSTELLATION ENERGY GENERATION, LLC

QUAD CITIES NUCLEAR POWER STATION, UNITS 1 AND 2

DOCKET NOS. 50-254 AND 50-265

1.0 INTRODUCTION

By letter dated February 17, 2022 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML22048B569), Constellation Energy Generation, LLC (the licensee) submitted alternative request RV-07 to the U.S. Nuclear Regulatory Commission (NRC) for use of an alternative to specific inservice testing (IST) requirements in the 2017 Edition of the American Society of Mechanical Engineers (ASME) Operation and Maintenance of Nuclear Power Plants, Division 1, OM Code: Section IST (OM Code) at the Quad Cities Nuclear Power Station, Units 1 and 2 (QCNPS) for the sixth 10-year IST interval.

Specifically, pursuant to subparagraph (1) in paragraph (z) in Part 50 to Title 10 of the *Code of Federal Regulations* (10 CFR 50.55a(z)(1)), the licensee requested that the NRC authorize alternative request RV-07 on the basis that the proposed alternative for use of the QCNPS technical specification (TS) stroke-time limits for the main steam isolation valves (MSIVs) in lieu of the requirements in the ASME OM Code for stroke-time limits based on test reference values would provide an acceptable level of quality and safety. This safety evaluation (SE) describes the NRC staff review of proposed alternative request RV-07 for the sixth 10-year IST interval at QCNPS.

The QCNPS sixth 10-year IST interval is scheduled to begin on February 18, 2023, and is scheduled to end on February 17, 2033.

2.0 REGULATORY EVALUATION

The NRC regulations in 10 CFR 50.55a(f)(4), "Inservice testing standards requirement for operating plants," state, in part, that throughout the service life of a boiling or pressurized-water-cooled nuclear power facility, pumps and valves that are within the scope of the ASME OM Code must meet the IST requirements (except design and access provisions) set forth in the ASME OM Code and addenda that become effective subsequent to editions and addenda specified in 10 CFR 50.55a(f)(2) and (3) and that are incorporated by reference in

10 CFR 50.55a(a)(1)(iv), to the extent practical within the limitations of design, geometry, and materials of construction of the components.

The NRC regulations in 10 CFR 50.55a(z) state, in part, that alternatives to the requirements of 10 CFR 50.55a(b) through (h) may be used, when authorized by the NRC, if the licensee demonstrates (1) the proposed alternatives would provide an acceptable level of quality and safety or (2) compliance with the specified requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

The sixth 10-year IST interval at QCNPS is scheduled to commence on February 18, 2023, and end on February 17, 2033.

The ASME OM Code of record for the sixth 10-year IST interval at QCNPS is the 2017 Edition of the ASME OM Code as incorporated by reference in 10 CFR 50.55a.

The IST requirements in the ASME OM Code, as incorporated by reference in 10 CFR 50.55a, related to alternative request RV-07 are in ASME OM Code, Division 1, Mandatory Appendix IV, "Preservice and Inservice Testing of Active Pneumatically Operated Valve Assemblies in Nuclear Reactor Power Plants" and include:

Paragraph IV-7100, "Stroke Test Acceptance Criteria," which states in the introduction that "Test results shall be compared to the reference values established in accordance with paras. IV-3510, IV-3520, and IV-3530."

Paragraph IV-7100, subparagraph (b), states that "Valves with reference stroke times of less than or equal to 10 sec [seconds] shall exhibit no more than $\pm 50\%$ change in stroke time when compared to the reference value."

3.0 TECHNICAL EVALUATION

3.1 Alternative Request RV-07

3.1.1 ASME Code Components Affected

The components affected by the alternative request are provided on page 1 of 2 of "10 CFR 50.55a Request Number RV-07" included in the Attachment to the February 17, 2022, letter under item 1, "ASME Code Components Affected."

3.1.2 Reason for Request

Pursuant to 10 CFR 50.55a(z)(1), the licensee proposes an alternative to the requirement of ASME OM Code, Mandatory Appendix IV, subparagraph IV-7100(b). The basis of this request is that the proposed alternative would provide an acceptable level of quality and safety.

ASME OM Code, Appendix IV, bases the stroke time acceptance criteria on a fixed reference value taken from a baseline test. However, TS 3.6.1.3, "Primary Containment Isolation Valves (PCIVs)," Surveillance Requirement (SR) 3.6.1.3.6, PCIVs, establishes an invariable acceptable stroke time range for the MSIVs of ≥ 3 seconds to ≤ 5 seconds. This fixed range is more conservative and consistent than that required by Appendix IV, paragraph I-7100, because the range is not dependent on a baseline value that may vary by as much as ± 1 second.

3.1.3 Licensee's Proposed Alternative and Basis for Use

TS SR 3.6.1.3.6 establishes an acceptable stroke time range for the MSIVs of 3.0 seconds $\leq T_{\text{MSIV}} \leq 5.0$ seconds. The licensee will use this range for evaluating an acceptable MSIV stroke time in lieu of establishing an acceptance band based on MSIV stroke time reference values. The licensee has also established additional limitations on stroke time based on reactor power levels to ensure that the TS SR limits are met. Any MSIV that fails to meet the TS SR limits will be considered inoperable and any required actions would continue to be taken in accordance with the QCNPS TS and ASME OM Code, Appendix IV, paragraph IV-7200, Stroke Test and Fail Safe Corrective Actions. Therefore, the licensee asserts that this proposed testing methodology for the affected MSIVs provides an acceptable level of quality and safety pursuant to 10 CFR 50.55a(z)(1).

3.2 NRC Staff Evaluation

The alternative request RV-07 proposes to apply the TS stroke-time limits for the MSIVs at QCNPS in lieu of the requirements for establishing stroke-time limits based on test reference values in the ASME OM Code, Mandatory Appendix IV, as incorporated by reference in 10 CFR 50.55a, for the sixth 10-year IST interval.

The alternative request RV-07 provided justification that the proposed alternative to the requirements of ASME OM Code, Appendix IV, subparagraph IV-7100(b), would provide an acceptable level of quality and safety with respect to the MSIV stroke-time limits, pursuant to 10 CFR 50.55a(z)(1). Paragraph IV-7100 and its subparagraph (b) in ASME OM Code, Appendix IV, require that stroke-time test results be compared to reference values established by valve testing, and that valves with reference stroke times of less than or equal to 10 seconds exhibit no more than ± 50 percent change in stroke time when compared to the reference value. In lieu of these ASME OM Code requirements, the request proposes to apply an invariable acceptable stroke-time range for the MSIVs of ≥ 3 seconds to ≤ 5 seconds based on TS 3.6.1.3, SR 3.6.1.3.6. The request asserts that this fixed range is more conservative and consistent than that required by ASME OM Code, Appendix IV, paragraph I-7100, because this fixed range is not dependent on a baseline reference value that might vary by as much as ± 1 second.

Implementing alternative request RV-07 would use the fixed range of ≥ 3 seconds to ≤ 5 seconds in evaluating an acceptable MSIV stroke time in lieu of establishing an acceptance band based on MSIV stroke-time test reference values. The request notes that it has established additional limitations on stroke time based on reactor power levels to ensure that the TS SR limits are met. Alternative request RV-07 states that any MSIV that fails to meet the fixed stroke-time range of ≥ 3 seconds to ≤ 5 seconds will be considered inoperable and required actions will be taken in accordance with the QCNPS TS and Appendix IV, paragraph IV-7200, requirements.

Based on its review, the NRC staff finds that the licensee has justified that the provisions of alternative request RV-07 with the acceptable stroke-time range of ≥ 3 seconds and ≤ 5 seconds will provide reasonable assurance of the operational readiness of the MSIVs within the scope of the request in lieu of the reference value stroke-time acceptance criteria required by ASME OM Code, Appendix IV, paragraph IV-7100(b). Therefore, the NRC staff finds that alternative request RV-07 for the applicable MSIVs provides an acceptable level of quality and safety pursuant to 10 CFR 50.55a(z)(1) for implementation during the sixth 10-year IST interval at QCNPS.

4.0 CONCLUSION

As described in this safety evaluation, the NRC staff concludes that the licensee has justified that the proposal in alternative request RV-07 to apply an acceptable stroke-time range of ≥ 3 seconds and ≤ 5 seconds for the applicable MSIVs at QCNPS will provide reasonable assurance of their operational readiness in lieu of the reference value stroke-time acceptance criteria required by ASME OM Code, Appendix IV, paragraph IV-7100(b). Accordingly, the licensee has adequately addressed the regulatory requirements set forth in 10 CFR 50.55a(z)(1) for an acceptable level of quality and safety with respect to alternative request RV-07 at QCNPS. Therefore, the NRC staff authorizes alternative request RV-07 for the sixth 10-year IST interval at QCNPS, which will begin on February 18, 2023, and is scheduled to end on February 17, 2033.

All other ASME OM Code requirements as incorporated by reference in 10 CFR 50.55a for which relief or an alternative was not specifically requested, and granted or authorized (as appropriate), in the subject request remain applicable.

Principal Contributors: T. Villarreal, NRR
 T. Scarbrough, NRR

Date: September 28, 2022

SUBJECT: QUAD CITIES NUCLEAR POWER STATION, UNITS 1 AND 2 – PROPOSED ALTERNATIVE TO THE REQUIREMENTS OF THE ASME OM CODE (EPID L-2022-LLR-0016) DATED SEPTEMBER 28, 2022

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NAME	RKuntz	SRohrer	SBailey (KHsu for)	NSalgado
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