



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-0015)

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 Title 10 of the Code of Federal Regulations (10 CFR), Part 50 Section 55a, paragraph (z), subparagraph (2) (10 CFR 50.55a(z)(2)), to implement alternative request RV-06 for the frequency of the testing of certain pressure isolation valves at QCNPS on the basis that the proposed alternative provides an acceptable level of quality and safety. Although the licensee referred to this submittal as a “relief” request, this submittal represents an alternative request in accordance with 10 CFR 50.55a(z)(2).

The NRC staff has reviewed the subject request and concludes, as set forth in the enclosed safety evaluation, that that compliance with the sample expansion requirements in ASME OM Code, Mandatory Appendix I, and Code Case OMN-17 if a single main steam safety valve (MSSV) fails its set-pressure test, it would result in a hardship without a compensating increase in the level of quality and safety in light of the licensee’s proposal in alternative request RV-06 to conduct a set-pressure test of at least four of the eight MSSVs each refueling outage at QCNPS, and to expand the sample if at least two MSSVs failed their set-pressure tests. Accordingly, the NRC staff concludes that the licensee has adequately addressed the regulatory requirements set forth in 10 CFR 50.55a(z)(2). Therefore, the NRC staff authorizes the use of alternative request RV-06 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 a relief or an alternative was not specifically requested, and granted or authorized (as appropriate), in the subject request remain applicable.

D. Rhoades

- 2 -

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](mailto: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  
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO

ALTERNATIVE REQUEST RV-06

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-06 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, RV-06 proposed an alternative to modify the sample expansion requirements for set-pressure testing of the main steam safety valves (MSSVs) at QCNPS pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR), Part 50, section 55a, paragraph (z), subparagraph (2) (10 CFR 50.55a(z)(2)), on the basis that compliance with the applicable ASME OM Code requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety. Although the licensee referred to this submittal as a "relief" request, this submittal represents an alternative request in accordance with 10 CFR 50.55a(z)(2).

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

2.0 REGULATORY EVALUATION

The regulations in 10 CFR 50.55a(f)(4), "Inservice testing standards requirement for operating plants," state 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.

In proposing an alternative to IST requirements in the applicable edition or addenda of the ASME OM Code as incorporated by reference in 10 CFR 50.55a, a licensee must demonstrate that (1) the proposed alternative provides an acceptable level of quality and safety in accordance with 10 CFR 50.55a(z)(1), 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 in accordance with 10 CFR 50.55a(z)(2).

The applicable OM Code of Record for the sixth 10-year IST interval at QCNPS is the 2017 Edition of ASME OM Code as incorporated by reference in 10 CFR 50.55a. The IST requirements in the 2017 Edition of the ASME OM Code, subsection ISTC, "Inservice Testing of Valves in Water-Cooled Reactor Nuclear Power Plants," related to this alternative request are as follows:

Division 1, Mandatory Appendix I, "Inservice Testing of Pressure Relief Devices in Water-Cooled Reactor Nuclear Power Plants," paragraph I-1320, "Test Frequencies, Class 1 Pressure Relief Devices," paragraph (c), "Requirements for Testing Additional Valves," states:

Additional valves shall be tested in accordance with the following requirements:

- (1) For each valve tested for which the as-found set-pressure (first test actuation) exceeds the greater of either the plus/minus tolerance limit of the Owner established set-pressure acceptance criteria of subpara. I-1310(e) or  $\pm 3\%$  of valve nameplate set-pressure, two additional valves shall be tested from the same valve group.
- (2) If the as-found set-pressure of any of the additional valves tested in accordance with subpara. (c)(1) exceeds the criteria noted therein, then all remaining valves of that same valve group shall be tested.
- (3) The Owner shall evaluate the cause and effect of valves that fail to comply with the set-pressure acceptance criteria established in subpara. (c)(1) or the Owner established acceptance criteria for other required tests, e.g., the acceptance of auxiliary actuating devices, compliance with Owner's seat-tightness criteria, etc. Based upon this evaluation, the Owner shall determine the need for testing in addition to the minimum tests specified in subpara. (c) to address any generic concerns that could apply to valves in the same or other valve groups.

ASME OM Code Case OMN-17, "Alternative Rules for Testing ASME Class 1 Pressure Relief/Safety Valves," paragraph 1, "Test Frequencies, Class 1 Pressure Relief Valves," paragraph (c), "Requirements for Testing Additional Valves," states:

Additional valves shall be tested in accordance with the following requirements:

- (1) For each valve tested for which the as-found set-pressure (first test actuation) exceeds the greater of either the plus/minus tolerance limit of the Owner-established set-pressure acceptance criteria or  $\pm 3\%$  of valve

nameplate set-pressure, two additional valves shall be tested from the same valve group.

- (2) If the as-found set-pressure of any of the additional valves tested in accordance with subpara. (c)(1) exceeds the criteria noted therein, then all remaining valves of that same valve group shall be tested.
- (3) The Owner shall evaluate the cause and effect on system capability of valves that fail to comply with the set-pressure acceptance criteria established in subpara. (c)(1), or the acceptance criteria for other required tests (e.g., acceptance of auxiliary actuating devices, compliance with Owner's seat tightness criteria). Based upon this evaluation, to address any generic concerns, the Owner shall determine the need for testing in addition to the minimum tests specified.

### 3.0 TECHNICAL EVALUATION

#### 3.1 Alternative Request RV-06

##### 3.1.1 ASME Code Components Affected

The components affected by the alternative request are provided on page 1 of 3 of "10 CFR 50.55a Request Number RV-06" included in the Attachment to the February 17, 2022, letter under item 1, "ASME Code Components Affected."

##### 3.1.2 Reason for Request

Alternative request RV-06 describes the reason for the request pursuant to 10 CFR 50.55a(z)(2) to implement an alternative to the provisions of ASME OM Code, Mandatory Appendix I, paragraph I-1320(c), and ASME OM Code Case OMN-17, paragraph 1(c). QCNPS does not have the facilities necessary to perform setpoint tests on large relief and safety valves. In the event that expanded testing is required by a leakage test failure of one MSSV, the MSSVs in the expanded sample would need to be shipped to an off-site vendor facility for as-found testing. Because of the lengthy time period required for removal, transportation, testing and re-installation, the removal and testing of additional valves due to sample expansion might delay startup following a refueling outage by several days.

##### 3.1.3 Licensee's Proposed Alternative and Basis for Use

Alternative request RV-06 proposes to remove and test at least half of the eight MSSVs during each reactor refueling outage. If only one of the four MSSVs removed for testing fails its setpoint test, additional MSSVs will not be tested. However, if more than one MSSV fails its as-found initial setpoint test, then the sample expansion criteria of ASME OM Code, Appendix I, paragraph I-1320(c)(2), and ASME OM Code Case OMN-17, paragraph 1(c)(2), will be implemented. The request asserts that this proposed alternative testing of the MSSVs provides reasonable assurance of MSSV operational readiness. The licensee considers that complying with the sample expansion provisions in ASME OM Code, Appendix I, and Code Case OMN-17, would result in a hardship or unusual difficulty without a compensating increase in the level of quality and safety pursuant to 10 CFR 50.55a(z)(2).

### 3.2 NRC Staff Evaluation

ASME OM Code, Mandatory Appendix I, paragraph I-1320(a), "5-Yr Test Interval," requires, in part, that Class 1 pressure relief valves shall be tested at least once every 5 years, and that a minimum of 20 percent of the valves from each valve group shall be tested within a 24-month interval. NRC Regulatory Guide 1.192 (Revision 4), "Operation and Maintenance Code Case Acceptability, ASME OM Code," as incorporated by reference in 10 CFR 50.55a, accepts Revision 1 to ASME OM Code Case OMN-17 for use by nuclear power plant licensees without conditions. ASME OM Code Case OMN-17, Revision 1, in paragraph 1(a), specifies, in part, that Class 1 pressure relief valves shall be tested at least once every 6 years, and that a minimum of 20 percent of the valves from each valve group shall be tested within a 24-month interval. For each valve tested per ASME OM Code, Mandatory Appendix I, or ASME OM Code Case OMN-17 that fails its set-pressure test, an additional two valves must be tested as specified in ASME OM Code, Mandatory Appendix I, paragraph I-1320(c), or Code Case OMN-17, paragraph 1(c), as applicable.

Alternative request RV-06, asserts that complying with the sample expansion requirements in ASME OM Code, Mandatory Appendix I, and Code Case OMN-17 for the MSSVs at QCNPS would result in a hardship or unusual difficulty without a compensating increase in the level of quality and safety pursuant to 10 CFR 50.55a(z)(2). Therefore, alternative proposes to remove and test at least half of the eight MSSVs during each reactor refueling outage. If only one of the four MSSVs removed for testing fails its setpoint test, additional MSSVs will not be tested. However, if more than one MSSV fails its as-found setpoint test, then the sample expansion criteria of ASME OM Code, Mandatory Appendix I, paragraph I-1320(c)(2) and ASME OM Code Case OMN-17, paragraph (1)(c)(2), will be implemented. The licensee considers that this proposed alternative testing of the MSSVs provides reasonable assurance of adequate valve operational readiness.

The NRC staff has reviewed alternative request RV-06, to conduct a set-pressure test of at least four of the eight MSSVs each refueling outage at QCNPS, without testing additional MSSVs if only one of those four MSSVs fails its set-pressure test. The proposal provides for testing half of the MSSVs each outage compared to the ASME OM Code requirement and OMN-17 provision to test only 20 percent of the MSSVs within any 24-month interval. As indicated in the request, QCNPS does not have the facilities necessary to perform set-pressure tests on large relief and safety valves such that the sampled MSSVs must be removed, decontaminated, transported, tested, return transported, and reinstalled. Based on the proposal in alternative request RV-06 to test four of eight MSSVs each outage, the NRC staff considers the requirement in ASME OM Code, Mandatory Appendix I, paragraph I-1320(c), and Code Case OMN-17, paragraph 1(c), to expand the test sample if only one MSSV fails its set-pressure test to represent a hardship because of the extensive effort needed to set-pressure test each MSSV without a compensating increase in the level of quality and safety.

Based on its review, the NRC staff finds that compliance with the sample expansion requirements in ASME OM Code, Mandatory Appendix I, and Code Case OMN-17 if a single MSSV fails its set-pressure test would result in a hardship without a compensating increase in the level of quality and safety based on alternative request RV-06 to conduct a set-pressure test of at least four of the eight MSSVs each refueling outage at QCNPS, and to expand the sample if at least two MSSVs failed their set-pressure test.

#### 4.0 CONCLUSION

As indicated above, the NRC staff finds that compliance with the sample expansion requirements in ASME OM Code, Mandatory Appendix I, and Code Case OMN-17 if a single MSSV fails its set-pressure test would result in a hardship without a compensating increase in the level of quality and safety based on alternative request RV-06 to conduct a set-pressure test of at least four of the eight MSSVs each refueling outage at QCNPS, and to expand the sample if at least two MSSVs failed their set-pressure test. Accordingly, the NRC staff concludes that the licensee has adequately addressed the regulatory requirements set forth in 10 CFR 50.55a(z)(2). Therefore, the NRC staff authorizes the use of alternative request RV-06 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:           K. Hsu, 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-0015) DATED SEPTEMBER 28, 2022

DISTRIBUTION:

PUBLIC

PM File Copy

RidsACRS\_MailCTR Resource

RidsNrrDorlLpl3 Resource

RidsNrrDexEmib Resource

RidsNrrLASRohrer Resource

RidsNrrPMQuadCities Resource

RidsRgn3MailCenter Resource

**ADAMS Accession No. ML22264A175**

OFFICE	NRR/DORL/LPL3/PM	NRR/DORL/LPL3/LA	NRR/DEX/EMIB/BC	NRR/DORL/LPL3/BC
NAME	RKuntz	SRohrer	SBailey (RLi for)	NSalgado
DATE	9/20/2022	9/22/2022	9/6/2022	9/28/2022

**OFFICIAL RECORD COPY**