



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

August 2, 2021

Mr. Ernest J. Kapopoulos, Jr.
Site Vice President
H. B. Robinson Steam Electric Plant
Duke Energy Progress, LLC
3581 West Entrance Road, RNPA01
Hartsville, SC 29550

SUBJECT: H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2 – PROPOSED
ALTERNATIVE REQUEST IST-RR-8 RELATED TO THE INSERVICE TESTING
PROGRAM (EPID L-2021-LLR-0023)

Dear Mr. Kapopoulos:

By letter dated March 29, 2021 (Agencywide Documents Access and Management System Accession No. ML21088A139), Duke Energy Progress, LLC (Duke Energy, the licensee) submitted a request to the U.S. Nuclear Regulatory Commission (NRC) for the use of an alternative to certain requirements of American Society of Mechanical Engineers (ASME) Code for "Operation and Maintenance of Nuclear Power Plants," (OM Code) related to the Inservice Testing (IST) program at H. B. Robinson Steam Electric Plant, Unit 2 (RNP).

Specifically, in alternative request IST-RR-8, the licensee requested to use the provisions of ASME Code Case OMN-25 for testing pressure relief valves at RNP as the proposed alternative to the requirements in ASME OM Code, Appendix I, part I-1320(a), I-1320(c), I-1350(a), and I-1350(c). The licensee requested approval of IST-RR-8 for use during the sixth 10-year IST program interval, beginning on February 19, 2022. Pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) 50.55a(z)(1), the licensee requested to use the proposed alternative on the basis that the alternative provides an acceptable level of quality and safety.

The NRC staff has reviewed the subject request and concludes, as set forth in the enclosed safety evaluation, that Duke Energy has adequately addressed all of the regulatory requirements set forth in 10 CFR 50.55a(z)(1). The NRC staff finds that the proposed alternative IST-RR-8 described in the licensee's request provides an acceptable level of quality and safety. Therefore, the NRC staff authorizes the proposed alternative IST-RR-8 for the sixth 10-Year IST Program interval at RNP, which is scheduled to begin on February 19, 2022.

All other ASME Boiler and Pressure Vessel Code or ASME OM Code requirements for which relief was not specifically requested and approved remain applicable.

E. Kapopoulos

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If you have any questions, please contact the Project Manager, John Klos at 301-415-5136 or John.Klos@nrc.gov.

Sincerely,

/RA/

David J. Wrona, Chief
Plant Licensing Branch II-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-261

Enclosure:
Safety Evaluation

cc: Listserv



UNITED STATES
NUCLEAR REGULATORY COMMISSION
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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
PROPOSED ALTERNATIVE REQUEST IST-RR-8
RELATED TO THE INSERVICE TESTING PROGRAM
DUKE ENERGY PROGRESS, LLC
H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2
DOCKET NUMBER 50-261

1.0 INTRODUCTION

By letter dated March 29, 2021 (Agencywide Documents Access and Management System Accession No. ML21088A139), Duke Energy Progress, LLC (Duke Energy, the licensee) submitted a request to the U.S. Nuclear Regulatory Commission (NRC) for the use of an alternative to certain requirements of American Society of Mechanical Engineers (ASME) Code for "Operation and Maintenance of Nuclear Power Plants," (OM Code) related to the Inservice Testing (IST) program at H. B. Robinson Steam Electric Plant, Unit 2 (RNP).

Specifically, in alternative request IST-RR-8, the licensee requested to use the provisions of ASME Code Case OMN-25 for testing pressure relief valves at RNP as the proposed alternative to the requirements in ASME OM Code, Appendix I, part I-1320(a), I-1320(c), I-1350(a), and I-1350(c). The licensee requested approval of IST-RR-8 for use during the sixth 10-year IST program interval, beginning on February 19, 2022. Pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) 50.55a(z)(1), the licensee requested to use the proposed alternative on the basis that the alternative provides an acceptable level of quality and safety.

The NRC staff describes its review of the proposed alternative IST-RR-8 for specific relief valves at RNP in this safety evaluation (SE).

2.0 REGULATORY EVALUATION

The NRC regulations in 10 CFR 50.55a(f)(4), "Inservice testing standards requirement for operating plants," states, 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) states, in part, that alternatives to the requirements of 10 CFR 50.55a(f) 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.

3.0 TECHNICAL EVALUATION

3.1 The Licensee's Proposed Alternative IST-RR-8

The licensee's request is an alternative test plan in lieu of certain IST requirements of the 2017 edition of the ASME OM Code for the IST Program at RNP for the sixth 10-year IST Program interval, which the licensee stated is scheduled to begin on February 19, 2022.

The applicable code requirements associated with this requested alternative are:

The ASME OM Code (2017 Edition), Appendix I, "Inservice Testing of Pressure Relief Devices in Water-Cooled Reactor Nuclear Power Plants," paragraph I-1320, "Test Frequencies, Class 1 Pressure Relief Valves," subparagraph (a), "5-[Year] Test Interval," which states:

Class 1 pressure relief valves shall be tested at least once every 5 [years], starting with initial electric power generation. No maximum limit is specified for the number of valves to be tested within each interval; however, a minimum of 20% of the valves from each valve group shall be tested within any 24-month interval. This 20% shall consist of valves that have not been tested during the current 5-[year] interval, if they exist. The test interval for any installed valve shall not exceed 5 [years]. The 5-[year] test interval shall begin from the date of the as-left set-pressure test for each valve.

Appendix I, paragraph I-1320, paragraph (c), "Requirements for Testing Additional Valves," which 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 [subparagraph (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.

Appendix I, paragraph I-1350, "Test Frequency, Classes 2 and 3 Pressure Relief Valves Except PWR Main Steam Safety Valves," subparagraph (a), "Test Interval," which states:

(1) The maximum allowable time between tests for any valve, with the exception of [Pressurized Water Reactor (PWR)] main steam safety valves, shall not exceed 10 [years], starting with initial electric power generation.

(2) For valve groups containing only one valve, the valve shall be tested at least every 48 months.

(3) For valve groups containing more than one valve, a minimum of 20% of the valves from each valve group shall be tested within any 48-month interval. This 20% shall consist of valves that have not been tested during the current 10-[year] test interval, if they exist.

The test interval shall begin from the date of the as left set-pressure test for each valve. PWR main steam safety valves shall be tested in accordance with [paragraph] I-1320.

Appendix I, paragraph I-1350, subparagraph (c), "Requirements for Testing Additional Valves," which 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 \pm 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, such as the acceptance of auxiliary actuating devices, compliance with the 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.

Additionally, the licensee stated that the relief request alternative testing applies to the following relief valves:

Table 1			
Valve ID	Function	Category	Class
RC-551A	Pressurizer Relief	C	1
RC-551B	Pressurizer Relief	C	1
RC-551C	Pressurizer Relief	C	1
CC-715	Excess Letdown Heat Exchanger Relief	C	2
CVC-203A	Letdown Orifices Outlet Relief	C	2
CVC-203B	Letdown Orifices Outlet Relief	C	2
RHR-706	RHR System Relief	C	2
SI-857A	Boron Injection Tank to Safety Injection Test Line Relief	C	2
SI-857B	Loop "B" Cold Leg Injection Relief to Pressurizer Relief	C	2

	Tank Relief		
SI-858A	Safety Injection Accumulator "A" Relief	C	2
SI-858B	Safety Injection Accumulator "B" Relief	C	2
SI-858C	Safety Injection Accumulator "C" Relief	C	2
SI-859	Safety Injection Relief Valve to Pressurizer Relief Tank from the Safety Injection Test Line	C	2
SI-871	Containment Spray Pump Suction Relief	C	2
SV1-1A	Steam Generator "A" Safety Relief	C	2
SV1-1B	Steam Generator "B" Safety Relief	C	2
SV1-1C	Steam Generator "C" Safety Relief	C	2
SV1-2A	Steam Generator "A" Safety Relief	C	2
SV1-2B	Steam Generator "B" Safety Relief	C	2
SV1-2C	Steam Generator "C" Safety Relief	C	2
SV1-3A	Steam Generator "A" Safety Relief	C	2
SV1-3B	Steam Generator "B" Safety Relief	C	2
SV1-3C	Steam Generator "C" Safety Relief	C	2
SV1-4A	Steam Generator "A" Safety Relief	C	2
SV1-4B	Steam Generator "B" Safety Relief	C	2
SV1-4C	Steam Generator "C" Safety Relief	C	2
CC-707	Component Cooling Water Surge Tank Relief Valve	C	3
CC-722A	Reactor Coolant Pump "A" Thermal Barrier Outlet Relief	C	3
CC-722B	Reactor Coolant Pump "B" Thermal Barrier Outlet Relief	C	3
CC-722C	Reactor Coolant Pump "C" Thermal Barrier Outlet Relief	C	3
CC-729	Reactor Coolant Pumps Oil Cooler Outlet Relief	C	3
CVC-2080	Charging Pump "A" Suction Stabilizer Relief	C	3
CVC-2081	Charging Pump "B" Suction Stabilizer Relief	C	3
CVC-2082	Charging Pump "C" Suction Stabilizer Relief	C	3
CVC-1118A	Holdup Tank "A" Relief	C	3
CVC-1118B	Holdup Tank "B" Relief	C	3
CVC-1118C	Holdup Tank "C" Relief	C	3
CVC-209	CVC Low Pressure Letdown Relief	C	3
CVC-257	Volume Control Tank Relief	C	3
CVC-283A	Charging Pump "C" Discharge Relief	C	3
CVC-283B	Charging Pump "B" Discharge Relief	C	3
CVC-283C	Charging Pump "A" Discharge Relief	C	3
CVC-382	Reactor Coolant Pump Seal Return Line Relief	C	3
FO-32A	Emergency Diesel Generator "A" Engine Driven Pump Discharge Relief	C	3
FO-32B	Emergency Diesel Generator "B" Engine Driven Pump Discharge Relief	C	3
SI-872	Spray Additive Tank Relief	C	3
SW-546	HVH-4 Return Relief	C	3
SW-547	HVH-3 Return Relief	C	3
SW-548	HVH-2 Return Relief	C	3
SW-549	HVH-1 Return Relief	C	3
WD-1621	Waste Gas Decay Tank "A" Relief Valve	C	3
WD-1622	Waste Gas Decay Tank "B" Relief Valve	C	3
WD-1623	Waste Gas Decay Tank "C" Relief Valve	C	3
WD-1624	Waste Gas Decay Tank "D" Relief Valve	C	3

The licensee also stated that RNP is currently scheduled to begin its sixth 10-Year IST Program interval following the requirements of the 2017 Edition of the ASME OM Code as incorporated by reference in 10 CFR 50.55a. In lieu of performing the requirements of ASME OM Code (2017 Edition), Appendix I, paragraphs I-1320 and I-1350, for the relief valves listed in Table 1 of this SE, the licensee proposes to implement ASME OM Code Case OMN-25, "Alternative Requirements for Testing Appendix I Pressure Relief Valves," in its entirety.

3.2 NRC Staff Evaluation

The ASME OM Standards Committee approved ASME OM Code Case OMN-25 on August 14, 2019, with the NRC representative voting in the affirmative. ASME OM Code Case OMN-25 has also been approved by the ASME Board of Nuclear Codes and Standards. The licensee proposed to adopt the language of the ASME OM Code Case OMN-25 in its entirety. ASME OM Code Case OMN-25 is included in proposed Revision 4 to NRC Regulatory Guide (RG) 1.192, "Operation and Maintenance Code Case Acceptability, ASME OM Code," where it is listed in the table of Code Cases acceptable for use. There are no conditions in proposed Revision 4 to RG 1.192 on the use of ASME OM Code Case OMN-25. RG 1.192, Revision 4, is currently scheduled to be incorporated by reference in 10 CFR 50.55a in the spring of 2022.

ASME OM Code Case OMN-25 is a performance-based test plan where each valve is tested and tracked by its unique serial number as provided by its manufacturer or a unique identification as applied by the licensee. The initial test-to-test interval shall be at least 24 months up to a maximum 72 months for Class 1 valves, and at least 48 months up to a maximum of 120 months for Class 2 and 3 valves that have been in service at an operating nuclear power plant. For new valves added to the program scope, the initial test interval shall not exceed 24 months for Class 1 valves or 48 months for Class 2 and 3 valves.

For each valve tested for which the as-found set-pressure is within the tolerance limit of the established acceptance criteria or ± 3 percent of valve nameplate set-pressure, the test interval may be extended by up to 24 months. Each valve that fails the as-found set-pressure test shall have its test interval reduced by 24 months. The minimum required test interval is at least once every 24 months. The test interval for any Class 1 or Class 2 PWR main steam safety valve that is in service shall not exceed 72 months. The test interval for any Class 2 or 3 valve that is in service shall not exceed 120 months. Valves that fail the as-found set-pressure test shall enter the corrective action steps detailed in ASME OM Code Case OMN-25.

The NRC staff finds that testing Class 1, 2, and 3 relief valves on a performance-based test schedule that allows good performing valves to have their test interval extended in 2-year steps per interval with a maximum final interval of 6 years for Class 1 relief valves and 10 years for Class 2 and 3 relief valves, as described in ASME OM Code Case OMN-25, to be acceptable. Extending the test interval or reducing the test frequency in small increments is a reasonable approach in evaluating a component's performance over time. It will also help determine the most effective test interval in identifying performance degradation for that component. Therefore, the NRC staff finds that the licensee's proposed alternative IST-RR-8 to apply ASME OM Code Case OMN-25 for the relief valves in Table 1 of this SE provides an acceptable level of quality and safety in accordance with 10 CFR 50.55a(z)(1).

4.0 CONCLUSION

As set forth above, the NRC staff finds that the proposed alternative IST-RR-8 described in the licensee's request provides an acceptable level of quality and safety for components listed in Table 1 of this SE. Accordingly, the NRC staff concludes that the licensee has adequately addressed the regulatory requirements set forth in 10 CFR 50.55a(z)(1). Therefore, the NRC staff authorizes the proposed alternative IST-RR-8 for the sixth 10-Year IST Program interval at RNP, which is scheduled to begin on February 19, 2022.

All other ASME OM Code requirements for which relief or an alternative was not specifically requested and approved in the subject request remain applicable.

Principal Contributor: M. Farnan, NRR

Date: August 2, 2021

SUBJECT: H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2 – PROPOSED ALTERNATIVE REQUEST IST-RR-8 RELATED TO THE INSERVICE TESTING PROGRAM (EPID L-2021-LLR-0023) DATED AUGUST 2, 2021

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