



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

June 7, 2022

**MONTICELLO NUCLEAR GENERATING PLANT – AUTHORIZATION AND SAFETY  
EVALUATION FOR ALTERNATIVE REQUEST NO. PR-02 (EPID L-2021-LLR-0083)**

**LICENSEE INFORMATION**

**Recipient's Name and Address:** Mr. Christopher P. Domingos  
Site Vice President  
Northern States Power Company - Minnesota  
Monticello Nuclear Generating Plant  
2807 West County Road 75  
Monticello, MN 55362

**Licensee:** Northern States Power Company

**Plant Name(s) and Unit(s):** Monticello Nuclear Generating Plant

**Docket No.:** 50-263

**APPLICATION INFORMATION**

**Submittal Date:** November 1, 2021

**Submittal Agencywide Documents Access and Management System (ADAMS) Accession No.:** ML21305A067

**Alternative Provision:** The applicant requested an alternative under Title 10 of the *Code of Federal Regulations* (10 CFR), paragraph 50.55a(z)(1).

**Applicable Code Edition and Addenda:** American Society of Mechanical Engineers (ASME), Operation and Maintenance of Nuclear Power Plants (OM) Code, 2017 Edition with no Addenda.

**Applicable Inservice Inspection (ISI) or Inservice Testing (IST) Program Interval and Interval Start/End Dates:** Sixth 10-year IST interval currently scheduled to begin on October 1, 2022, and end on May 31, 2032.

**IST Requirement:** ASME OM Code, subsection ISTC, paragraph ISTB-3510, General, paragraph (b), Range, subparagraph (1) states, "The full-scale range of each analog instrument shall be not greater than three times the reference value."

**Brief Description of the Proposed Alternative:** Northern States Power Company, a Minnesota corporation, doing business as Xcel Energy (hereafter, the licensee), hereby requests NRC authorization of this 10 CFR 50.55a request to support the implementation of the sixth 10-year IST interval for Monticello Nuclear Generating Plant (Monticello). Proposed

Alternative No. PR-02 requests authorization for an alternative for determination of pump flow rate testing for Residual Heat Removal (RHR) and Residual Heat Removal Service Water (RHRSW) pumps.

Summary of Commitments: This submittal makes no new commitments and no revisions to existing commitments.

For additional details on the licensee's request, please refer to the documents located at the ADAMS Accession No(s) identified above.

## STAFF EVALUATION

The RHR and RHRSW pumps with their instrument loops at Monticello must be tested by meeting the instrument accuracy requirements in accordance with the ASME OM Code, subsection ISTB, "Inservice Testing of Pumps in Water-Cooled Reactor Nuclear Power Plants – Pre-2000 Plants," paragraph ISTB-3510(b), "Range," subparagraph (1), which requires that the full-scale range of each analog instrument be no greater than three times the reference value, and table ISTB-3500-1, "Required Instrument Accuracy," which requires the instrument accuracy for flow rate to be within  $\pm$  percent of full-scale. The combination of these two requirements results in an effective loop accuracy requirement of  $\pm 6$  percent of the reference value.

Alternative Request PR-02 proposed an alternative to the requirements in ASME OM Code, paragraph ISTB-3510(b)(1), for the Monticello existing flow transmitters FT-10-111A/B and FT-10-97A/B, flow isolators FY-4105 and FY-4106, and flow indicators FI-7188 and FI-7189, which are used for the loops of RHR pumps P-202A/B/C/D and RHRSW pumps P-109A/B/C/D. The RHR and RHRSW pumps at Monticello are ASME OM Code Group A pumps, which are pumps that are operated continuously or routinely during normal operation, cold shutdown, or refueling operations. The instrument loops are each designed to indicate flow while two parallel pumps (RHR or RHRSW) are operating. During inservice testing, only one pump operates at a time. The existing instruments do not meet the ASME OM Code requirement. The reference value of flow for one pump is less than one-third of each instrument's range.

The alternative proposes to use the existing station instruments to measure pump IST parameters. The licensee performed a loop check on each loop instrument as described in the submittal dated November 1, 2021, and determined that the installed RHR pumps in Divisions A and B, RHRSW pumps in Division A, and RHRSW pumps in Division B have as-found loop instrument accuracy of  $\pm 0.84$  percent,  $\pm 1.21$  percent, and  $\pm 1.25$  percent, respectively. The instrument accuracies are within the percent requirements for Group A and Group B tests in table ISTB-3510-1. Paragraph ISTB-3510(b)(1) requires that the full-scale range of each analog instrument be not greater than three times the reference value. Thus, when combining the required level of accuracy with the allowed range for the reference value, the effective instrument accuracy is  $\pm 6$  percent of the reference value.

As shown below, table 1 summarizes submittal table PR-02-01, which specifies the ranges, equivalent references values, range to reference value ratio. Based on the information in submittal table PR-02-01 and the as-found loop instrument accuracy, calculated effective accuracies for the instruments in the RHR and RHRSW systems can be determined. The calculated effective instrument accuracies are less than the required effective accuracy of

±6 percent. Therefore, the NRC staff finds that these instruments yield readings at least equivalent to the reading achieved from instruments that meet ASME OM Code requirements.

<b>Table 1</b>					
<b>Instrument Loop</b>	<b>Pumps</b>	<b>Instrument Span (Range)</b>	<b>Equivalent Reference Value</b>	<b>Range to Reference Value Ratio</b>	<b>Effective Loop Accuracy with More Restrictive Instrument Accuracy</b>
<b>A RHR Pumps</b>					
FT-10-111A and FI-7189 loop	P-202A	4-20 mA (16 mA)	$(6.46-4) = 2.46$ mA	$(16/2.46) = 6.50$	$(6.50 \times 0.84\%) = \pm 5.46\%$
	P-202C	4-20 mA (16 mA)	$(6.59-4) = 2.59$ mA	$(16/2.59) = 6.18$	$(6.18 \times 0.84\%) = \pm 5.19\%$
<b>B RHR Pumps</b>					
FT-10-111B, FY-4106, and FI-7188 loop	P-202B	4-20 mA (16 mA)	$(6.43-4) = 2.43$ mA	$(16/2.43) = 6.58$	$(6.58 \times 0.84\%) = \pm 5.53\%$
	P-202D	4-20 mA (16 mA)	$(6.43-4) = 2.43$ mA	$(16/2.43) = 6.58$	$(6.58 \times 0.84\%) = \pm 5.53\%$
<b>A RHRSW Pumps</b>					
FT-10-97A and FI-7189	P-109A	10-50 mA (40 mA)	$(18.44-10) = 8.44$ mA	$(40/8.44) = 4.74$	$(4.74 \times 1.21\%) = \pm 5.73\%$
	P-109C	10-50 mA (40 mA)	$(18.40-10) = 8.4$ mA	$(40/8.40) = 4.76$	$(4.76 \times 1.21\%) = \pm 5.76\%$
<b>B RHRSW Pumps</b>					
FT-10-97B, FY-4105, and FI-7188	P-109B	4-20 mA (16 mA)	$(7.43-4) = 3.43$ mA	$(16/3.43) = 4.66$	$(4.66 \times 1.25\%) = \pm 5.83\%$
	P-109D	4-20 mA (16 mA)	$(7.42-4) = 3.42$ mA	$(16/3.42) = 4.68$	$(4.68 \times 1.25\%) = \pm 5.85\%$

Based on its review, the NRC staff finds that Alternative Request PR-02 will provide adequate accuracy of the instrumentation to be used for the flow testing of RHR pumps P-202A/B/C/D and RHRSW pumps P-109A/B/C/D at MNGP in demonstrating their operational readiness that will provide an acceptable level of quality and safety in accordance with 10 CFR 50.55a(z)(1).

### **CONCLUSION**

As discussed above, the NRC staff has determined that Alternative Request PR-02 will provide adequate accuracy of the instrumentation to be used for the flow testing of RHR pumps P-202A/B/C/D and RHRSW pumps P-109A/B/C/D at Monticello in demonstrating their operational readiness that will provide an acceptable level of quality and safety.

Therefore, the NRC staff concludes that the licensee has adequately addressed the regulatory requirements set forth in 10 CFR 50.55a(z)(1).

The NRC staff authorizes the use of Alternative PR-02 at Monticello for the sixth 10-year IST program interval currently scheduled to begin on October 1, 2022, and end on May 31, 2032.

All other ASME OM Code requirements for which relief or an alternative was not specifically requested, and granted or authorized (as applicable) remain applicable.

**Principal Contributor:** Y. Wong  
G. Bedi

**Date:** June 7, 2022

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

**cc: Listserv**

**MONTICELLO NUCLEAR GENERATING PLANT – AUTHORIZATION AND SAFETY  
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DATED JUNE 7, 2022**

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