

Submission Date: August 25, 2021
Submitted By: Ronald Jacobson
Document Sensitivity: Non-Sensitive
Licensee: Xcel Energy
Plant Unit(s) and Docket No(s): Monticello (05000263)
Licensee Contact: Ron Jacobson
ronald.g.jacobson@xcelenergy.com
(612) 330-6542

Project Title:

10 CFR 50.55a Request Associated with the Monticello Sixth Inservice Testing Ten-Year Interval PR-04 (L-MT-21-013)

Proposed Alternative Number or Identifier:

PR-04

Request Type:

10 CFR 50.55a(z)(1)

Inservice Inspection (ISI) or Inservice Testing (IST)

Inservice Testing (IST)

Requested Completion Date:

September 23, 2022

Brief Description of Proposed Alternative

Northern States Power Company, a Minnesota corporation, doing business as Xcel Energy (hereafter "NSPM"), hereby requests NRC authorization of this 10 CFR 50.55a request to support the implementation of the sixth IST ten-year interval for Monticello Nuclear Generating Plant (MNGP). Proposed Alternative No. PR-04 requests authorization for an alternative means of determining the instrument range requirements for testing of the High-Pressure Coolant Injection (HPCI) and Reactor Core Isolation Cooling (RCIC) pumps. Summary of Commitments: This submittal makes no new commitments and no revisions to existing commitments.

Proposed Duration of Alternative (in terms of ISI/IST Program Interval with Start and End Dates):

This request, upon approval, will be applied to the MNGP sixth IST ten-year interval starting October 1, 2022 and is scheduled to end May 31, 2032.

Applicable ASME Code Requirements

ISTB-3510, General, paragraph (a), Accuracy, states, in part, 'Instrument accuracy shall be within the limits of Table ISTB-3510-1.' 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." Table ISTB-3510-1, Required Instrument Accuracy, contains the required accuracy for instruments measuring the various pump parameters, including pressure and differential pressure. It lists $\pm 2\%$ for pressure for a Group B test.

Applicable American Society of Mechanical Engineers (ASME) Boiler and Pressure

Vessel Code (BPV Code), or ASME Operation and Maintenance of Nuclear Power Plants (OM Code), Edition and Addenda

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

Current ISI or IST Program Interval Number and Start/End Dates

MNGP is currently on its fifth IST ten-year interval that is scheduled to end on September 30, 2022. The MNGP sixth IST ten-year interval begins on October 1, 2022.

Applicable ASME Code Components and/or System Description

P-209, High Pressure Coolant Injection (HPCI) Pump (Class 2) (Group B)

P-207, Reactor Core Isolation Cooling (RCIC) Pump (Class 2) (Group B)

Component/System Function

The HPCI System is designed to pump water into the reactor vessel under loss-of-coolant conditions which do not result in rapid depressurization of the pressure vessel. The loss-of-coolant might be due to loss of reactor feedwater or to small line breaks which do not cause depressurization of the reactor vessel.

The RCIC System consists of a turbine-driven pump unit capable of delivering makeup water to the reactor vessel during the unlikely event feedwater is isolated from the vessel.

Reason for Request

Pursuant to 10 CFR 50.55a, Codes and standards, paragraph (z)(1), an alternative to the requirement of ISTB-3510(b)(1) is proposed for pressure instruments PI-23-116, PI-13-66, and transmitter PT-23-100, which are used to determine differential pressure during Group B tests of pumps P-209 (HPCI) and P-207 (RCIC). The basis of this request is that the proposed alternative would provide an acceptable level of quality and safety.

The differential pressure for the HPCI and RCIC pumps is determined by subtracting the indicated suction pressure from the indicated discharge pressure. The HPCI pump suction pressure is read in the Control Room from instrument PI-23-116, which is sent a 10 to 50 mA signal from local transmitter PT-23-100. The RCIC pump suction pressure is read locally from instrument PI-13-66. The current instrument ranges exceed the ISTB-3510(b)(1) requirement of not greater than three times the current reference values. The relevant data for the instruments is included in Table PR 04-1 below:

Instrument	Pump	Instrument Range	Adjusted Reference Value	Range to Reference Value Ratio
PI-23-116 (Note 1)	P-209	30” Hg – 100 psi	33.7 psi	114.7/33.7=3.4
PT-23-100 (Note 2)	P-209	10 – 50 mA	11.8 mA*	40/11.8=3.4
PI-13-66 (Note 1)	P-207	30” Hg – 100 psi	33.7 psi	114.7/33.7=3.4

* 21.8 mA equates to 11.8 mA on the 40 mA span

NOTE 1: The vacuum range for the pressure indicators was converted to pounds per square inch (psi) for determining the ratio. 30" HG Vacuum = 14.7 psi; thus the range = 100 + 14.7 psi. The same principle was applied to the reference value. With a reference value of 19 psi indicated on the instrument, the reference value used for the ratio determination is 19 + 14.7 = 33.7 psi.

NOTE 2: The pressure transmitter has a 10 to 50 mA range, or a span of 40 mA. The ratio for this instrument must be determined by reducing the reference value to its value on the 40 mA span.

Subparagraph ISTB-3510(a) requires that instrument accuracy be within the limits of Table ISTB-3510-1, which specifies an accuracy requirement of $\pm 2\%$ of full-scale for analog flow instruments for Group B tests. Subparagraph ISTB- 3510(b)(1) requires that the full-scale range of each analog instrument be not greater than three times the reference value. The combination of the two requirements (i.e., accuracy equal to $\pm 2\%$ of full-scale and full scale being up to 3 times the reference value) yields a permissible inaccuracy of $\pm 6\%$ of the reference value.

Full Description of Proposed Alternative

In accordance with ISTB-3510(b)(1), three times the reference value will be used for determination of the OM Code maximum allowed range for the instruments. Monticello Nuclear Generating Plant (MNGP) proposes to apply the $\pm 2\%$ Code required instrument accuracy for determining pressure for a Group B test using this Code maximum allowed range as described in Table PR 04-2 below:

Table PR 04-2			
Instrument	Reference Value	Code Maximum Range	2% of Code Maximum Range
PI-23-116	33.7 psi	3 x 33.7 = 101 psi	± 2 psi
PT-23-100*	21.8 mA	3 x 11.8 = 35.4 mA	± 0.7 mA
PI-13-66	33.7 psi	3 x 33.7 = 101 psi	± 2 psi
* 21.8 mA equates to 11.8 mA on the 40 mA span			

The instrument calibration tolerances will be ± 2 psi for the pressure indicators and ± 0.7 mA for the pressure transmitter. The as-found data in the calibration history for these instruments shows that they have been consistently well within these Code alternate tolerances.

NSPM's proposed alternative to the OM Code requirements of paragraph ISTB-3510(b)(1) for Group B tests are summarized as follows:

Pressure transmitter PT-23-100 and pressure indicators PI-23-116 and PI-13-66 will be calibrated to ± 2 percent of the OM Code maximum allowed range for Group B tests. The OM Code maximum allowed range will be calculated by multiplying the current test parameter reference value by three.

Description of Basis for Use

Using the provisions of this request as an alternative to the requirements of ISTB-3510(b)(1)

provides an acceptable level of quality and safety pursuant to 10 CFR 50.55a(z)(1), as the proposed instrument calibrations and establishment of a calculated ASME OM Code equivalent range for the Group B testing are consistent with the recommendations described in NUREG-1482, Revision.3, Section 5.5.1, “Range and Accuracy of Analog Instruments.”

Describe Hardship or Unusual Difficulty

Not Used.

Any Additional Information (submission attachments listed here)

None.

Precedents

This request (No. PR-04) was previously approved for the fifth 10-year interval at MNGP, as documented in the NRC safety evaluation dated September 26, 2012 (Reference 2).

References

1. NUREG-1482, Guidelines for Inservice Testing at Nuclear Power Plants, Revision 3, dated July 2020.
2. NRC safety evaluation “Monticello Nuclear Generating Plant – Relief from the Requirements of the American Society of Mechanical Engineers Code for Operation and Maintenance of Nuclear Power Plants for the Fifth 10-Year Inservice Testing Program interval (TAC Nos. ME8067, ME8088, ME8089, ME8090, ME8091, ME8092, ME8093, ME8094, ME8095, and ME8096),” dated September 26, 2012 (ADAMS Accession Number ML12244A272).