

**Submission Date:** December 23, 2021

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**Licensee:** Xcel Energy

**Plant Unit(s) and Docket No(s):** Monticello (05000263)

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**Project Title:**

10 CFR 50.55a Request Associated with the Monticello Sixth Inservice Testing Ten-Year Interval OMN-22 (L-MT-21-051)

**Proposed Alternative Number or Identifier:**

PR-09

**Request Type:**

10 CFR 50.55a(z)(1)

**Inservice Inspection (ISI) or Inservice Testing (IST)**

Inservice Testing (IST)

**Requested Completion Date:**

February 28, 2023

**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). NSPM requests authorization to use the Proposed Relief Request PR-09 regarding an alternative for pump vibration testing on the basis that by applying ASME OM Code Case OMN-22, the proposed alternative would provide an acceptable level of quality and safety. 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-3300, 'Reference Values' paragraph (a) initial reference values shall be determined from the results of testing meeting the requirements of para. ISTB-3100, Preservice Testing, or from the results of the first inservice test. ISTB-3300, 'Reference Values' paragraph (d) reference values shall be established at a point(s) of operation (reference point) readily duplicated during subsequent tests. ISTB-3300, 'Reference Values' paragraph (f) requires that all subsequent test results shall be compared to these initial reference values or to new reference values established in accordance with para. ISTB-3310 or ISTB-3320, or subpara. ISTB-6200(c). Table ISTB-5121-1, 'Centrifugal Pump Test Acceptance Criteria' provides the values for the

Alert Range and Required Action Range for inservice testing. Table ISTB-5221-1, 'Vertical Line Shaft Centrifugal Pump Test Acceptance Criteria' provides the values for the Alert Range and Required Action Range for inservice testing. Table ISTB-5321-1, 'Positive Displacement Pump (Except Reciprocating) Test Acceptance Criteria' provides the values for the Alert Range and Required Action Range for inservice testing.

**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**

Table 1: Initial Scope of MNGP-GRP-OMN-22 (Note 1)

<b>Pump</b>	<b>Pump Description</b>	<b>ASME Group</b>
P-111A	11 Emergency Service Water Pump	B
P-111B	12 Emergency Service Water Pump	B
P-111C	13 Emergency Service Water Pump	B
P-111D	14 Emergency Service Water Pump	B
P-160A	11 EDG Diesel Oil Pump A	A
P-160B	12 EDG Diesel Oil Pump B	A
P-160C	11 EDG Diesel Oil Pump C	A
P-160D	12 EDG Diesel Oil Pump D	A
P-109A	11 Residual Heat Removal Service Water Pump	A
P-109B	12 Residual Heat Removal Service Water Pump	A
P-109C	13 Residual Heat Removal Service Water Pump	A
P-109D	14 Residual Heat Removal Service Water Pump	A
P-203A	11 Standby Liquid Control Pump	B
P-203B	12 Standby Liquid Control Pump	B

Note 1: OMN-22 may be applied to all pumps in the IST Program that meet OMN-22 requirements in the future.

**Component/System Function**

The Table 1 pumps are required to perform a specific function in shutting down the reactor to a safe shutdown condition, maintaining a safe shutdown condition, or in mitigating the consequences of an accident.

**Reason for Request**

Pursuant to 10 CFR 50.55a(z)(1), relief is requested from the requirements of the ASME OM Code, 2017 Edition, Subsection ISTB. The ASME Code committees have approved Code Case OMN-22, 'Smooth Running Pumps'. This Code Case has not been approved for use in

This Code Case allows for alternative requirements for use with smooth running pumps in lieu of use of vibration values obtained in the reference value tests. For very low reference values, hydraulic noise and instrument accuracy can represent a significant portion of the reading and affect the repeatability of subsequent measurements. A smooth running pump could be subject to unnecessary increased testing if the measured vibration parameter exceeds an acceptable range based on these very low reference values.

Smooth running pumps have a much lower reference value for stable operation and the ranges for acceptable range and higher levels listed in the Alert Range do not allow for adequate vibration monitoring techniques to be applied. Guidelines set forth in OMN-22 allow for a very low baseline vibration value with a pump vibration velocity of  $\leq 0.050$  in/sec when establishing the vibration reference value, which allows for trending of the pump vibration on a much lower scale than what is currently allowed.

ASME OM Code Case OMN-22, has not been approved by the NRC and a relief request is required for use of this Code Case.

#### **Full Description of Proposed Alternative**

NSPM proposes to use the provisions of OMN-22. For those pumps with very low vibration values ( $\leq 0.050$  in/sec), the following vibration velocity criteria may be applied to any vibration test points qualifying for the use of the ‘minimum reference’ value:

Acceptable Range:  $\leq 0.125$  in/sec

Alert Range:  $> 0.125$  in/sec to  $0.300$  in/sec

Required Action Range:  $> 0.300$  in/sec

#### ***Supplemental Monitoring***

Pumps that will use the “minimum reference” value of OMN-22 for one or more vibration points shall be included in the MNGP Vibration Monitoring Program (VMP). The VMP shall apply predictive monitoring techniques and perform vibration analysis beyond the trending of vibration levels specified in the ASME OM Code to provide early identification of pump performance issues. NSPM will determine which VMP Supplemental Monitoring activities will be utilized on the pump.

At a minimum, NSPM shall perform spectral analysis of measured vibration of the applicable pumps. NSPM shall document the conclusion of the VMP performance analysis on the pump test record prior to the subsequent test with a conclusion of acceptable, degrading but acceptable, or unacceptable. Corrective action shall be initiated when an unacceptable trend in performance is identified.

#### ***Corrective Action***

If a measured pump vibration parameter falls within the alert range or the required action range specified above, then the ‘Corrective Action’ requirement of ISTB-6200 (2017 Edition) shall be followed. The alert and required action ranges are established in accordance with this Code Case rather than the referenced pump tables.

If a VMP Supplemental Monitoring activity identifies a parameter outside the normal operating range or identifies a trend toward an unacceptable degraded state, action shall be taken to (1) identify and document the condition in the corrective action program, (2) increase monitoring to establish the rate of change of the monitored parameter, (3) review component-specific information to identify the degradation cause, (4) develop a plan to remove the pump from service to perform maintenance prior to significant performance degradation, and (5) address potential common cause issues applicable to other pumps based on the results of the analysis of the specific pump performance.

In summary, NSPM proposes to test the pumps listed in this request and other pumps in the IST Program that meet the requirements through the use of ASME OM Code Case OMN-22.

#### **Description of Basis for Use**

Using the provisions of this request would provide adequate detection of component degradation and would continue to provide reasonable assurance of the operational readiness of affected MNGP components. Therefore, compliance with the requirements of OMN-22 would result in an acceptable level of quality and safety pursuant to 10 CFR 50.55a(z)(1).

#### **Describe Hardship or Unusual Difficulty**

NOT APPLICABLE

#### **Any Additional Information (submission attachments listed here)**

NOT USED (No Attachments)

#### **Precedents**

South Texas Project, Units 1 and 2 – Proposed Alternative PRR-01, PRR-02, PRR-03, and PRR-04 To the Requirements of the ASME OM Code (EPIDs L-2020-LLR-0007 to L-2020-LLR-0010), dated July 21, 2020 (ADAMS Accession Number ML20199M162). Millstone Power Station, Unit Nos. 2 and 3-Alternative Requests Related to the Fifth and Fourth 10-Year Interval Pump, Valve, and Snubber Inservice Testing Programs, Respectively (EPID L-2018-LLR-0012 - through EPID L-2018-LLR-0022), dated November 13, 2018 (ADAMS Accession Number ML18290A602).

#### **References**

1. ASME OM Code Case OMN-22, 'Smooth Running Pumps'.