



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

January 23, 2025

Thomas Conboy  
Site Vice President  
Northern States Power Company – Minnesota  
Prairie Island Nuclear Generating Plant  
1717 Wakonade Drive East  
Welch, MN 55089

SUBJECT: PRAIRIE ISLAND NUCLEAR GENERATING PLANT, UNIT 2 – PROPOSED  
ALTERNATIVE RR-10 REGARDING LETDOWN LINE ISOLATION TRAIN B  
CONTROL VALVE CV-31279 (EPID L-2025-LLR-0003)

Dear Thomas Conboy:

By electronic submission dated January 7, 2025, Northern States Power Company, a Minnesota corporation (NSPM, the licensee), doing business as Xcel Energy, submitted a request to the U.S. Nuclear Regulatory Commission (NRC) for the use of an alternative to certain American Society of Mechanical Engineers (ASME) Code for Operation and Maintenance of Nuclear Power Plants (OM Code) requirements at the Prairie Island Nuclear Generating Plant (Prairie Island), Unit 2.

Specifically, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) 50.55a(z)(2), NSPM requested to use an alternative to the requirements of ASME OM Code, subsection ISTC, "Inservice Testing of Valves in Light-Water Reactor Nuclear Power Powers," paragraph ISTC-3310, "Effects of Valve Repair, Replacement, or Maintenance on Reference Values," for inservice testing of the Letdown Line Isolation Train B Control Valve CV-31279 (CV-31279) on the basis that complying with the specified requirement at this time would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

The NRC staff has reviewed the subject request and concludes, as set forth in the enclosed safety evaluation, that NSPM has adequately addressed all of the regulatory requirements set forth in 10 CFR 50.55a(z)(2) to demonstrate that performance of the ISTC-3310 testing for the Prairie Island, Unit 2, Letdown Line Isolation Train B Control Valve CV-31279 at this time would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety. For the duration of the alternative request, the licensee has provided reasonable assurance that CV-31279 is capable of performing its safety function to close. Therefore, the NRC staff authorizes the use of Alternative Request RR-10 for CV-31279 until startup from the next Prairie Island, Unit 2, refueling outage, currently scheduled for October 31, 2025, or the end of the Fifth IST Program, whichever occurs first.

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

T. Conboy

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If you have any questions, please contact the Project Manager, Brent Ballard, at 301-415-0680 or by e-mail to [Brent.Ballard@nrc.gov](mailto:Brent.Ballard@nrc.gov).

Sincerely,

Ilka Berrios, Chief  
Plant Licensing Branch III  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket No. 50-306

Enclosure:  
Safety Evaluation

cc: ListServ



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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

PROPOSED ALTERNATIVE RR-10 REGARDING

LETDOWN LINE ISOLATION TRAIN B CONTROL VALVE CV-31279

NORTHERN STATES POWER COMPANY

PRAIRIE ISLAND NUCLEAR GENERATING PLANT, UNIT 2

DOCKET NO. 50-306

1.0 INTRODUCTION

By electronic submission dated January 7, 2025 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML25007A235), Northern States Power Company, a Minnesota corporation (NSPM, the licensee), doing business as Xcel Energy, submitted Alternative Request RR-10 to the U.S. Nuclear Regulatory Commission (NRC) in lieu of specific inservice testing (IST) requirements in the 2004 Edition through the 2006 Addenda of the American Society of Mechanical Engineers (ASME) Code for Operation and Maintenance of Nuclear Power Plants (OM Code) during the fifth Interval IST program at the Prairie Island Nuclear Generating Plant (Prairie Island), Unit 2.

Specifically, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) 50.55a(z)(2), the licensee requested to use an alternative to the requirements of ASME OM Code, subsection ISTC, "Inservice Testing of Valves in Light-Water Reactor Nuclear Power Powers," paragraph ISTC-3310, "Effects of Valve Repair, Replacement, or Maintenance on Reference Values," for IST of the Letdown Line Isolation Train B Control Valve CV-31279 (CV-31279) on the basis that complying with the specified requirement at this time would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

The fifth interval IST program at Prairie Island, Unit 2, began on December 21, 2014, and is scheduled to end on December 20, 2025, using the 1-year extension allowed by the ASME OM Code with conditions.

2.0 REGULATORY EVALUATION

The NRC regulations in 10 CFR 50.55a(f)(4), "Inservice testing standards requirement for operating units," 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), "Alternatives to codes and standards requirements," state that alternatives to the requirements of 10 CFR 50.55a(b) through (h) or portions thereof may be used when authorized by the Director, Office of Nuclear Reactor Regulation. A proposed alternative must be submitted and authorized prior to implementation. The applicant or licensee must demonstrate that:

(1) Acceptable level of quality and safety. The proposed alternative would provide an acceptable level of quality and safety; or

(2) Hardship without a compensating increase in quality and safety. Compliance with the specified requirements of this section would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

### 3.0 TECHNICAL EVALUATION

The information provided by the licensee in support of the request for the alternative to IST requirements in the ASME OM Code, as incorporated by reference in 10 CFR 50.55a, has been evaluated and the bases for disposition are documented in this safety evaluation.

#### 3.1 The Licensee's Alternative Request RR-10

##### Applicable ASME OM Code Edition

The applicable Code of Record for the fifth interval IST program at Prairie Island, Unit 2, is the 2004 Edition through the 2006 Addenda of the ASME OM Code, as incorporated by reference in 10 CFR 50.55a.

##### Applicable ASME OM Code Component

In its submittal, the licensee proposed alternative testing for the 2-inch air-operated globe valve CV-31279, at Prairie Island, Unit 2. The licensee has categorized this normally open/failed close air-operated valve (AOV) as ASME OM Code Category B, which is defined by ASME as a valve for which seat leakage in the closed position is inconsequential for fulfillment of its required functions. Valve CV-31279 is the second series valve from the reactor coolant system (RCS) Loop B cold leg and is open during normal operations to place the normal letdown path in service. Letdown is not required for safe shutdown or accident mitigation. Valve CV-31279 closes automatically on low pressurizer level, loss of power, or loss of air. The letdown line is provided with two fail-closed AOVs near the reactor coolant loop. The RCS to the chemical and volume control system boundary occurs at the second isolation valve. In the event of low pressurizer level, these AOVs are automatically closed.

##### Applicable ASME OM Code Requirements

The IST requirements in the ASME OM Code, 2004 Edition through the 2006 Addenda, as incorporated by reference in 10 CFR 50.55a, related to this alternative request are as follows:

ASME OM Code, subsection ISTC, "Inservice Testing of Valves in Light-Water Reactor Nuclear Power Powers," paragraph ISTC-3310, "Effects of Valve Repair, Replacement, or Maintenance on Reference Values," states:

When a valve or its control system has been replaced, repaired, or has undergone maintenance [Footnote 1] that could affect the valve's performance, a new reference value shall be determined or the previous value reconfirmed by an inservice test run before the time it is returned to service or immediately if not removed from service. This test is to demonstrate that performance parameters that could be affected by the replacement, repair, or maintenance are within acceptable limits. Deviations between the previous and new reference values shall be identified and analyzed. Verification that the new values represent acceptable operation shall be documented in the record of tests (see ISTC-9120). Safety and relief valves and nonreclosing pressure relief devices shall be tested as required by the replacement, repair, and maintenance requirements of Mandatory Appendix I.

Footnote 1 states:

Adjustment of stem packing, limit switches, or control system valves, and removal of the bonnet, stem assembly, actuator, obturator, or control system components are examples of maintenance that could affect valve performance parameters.

#### Proposed Alternative and Basis for Use

In Alternative Request RR-10, the licensee describes its proposal as follows:

Rather than perform immediate testing, NSPM proposes to correct the valve position indication issue and perform the required testing during the next scheduled Unit 2 refueling outage because performing the inservice test run on CV-31279 immediately would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

The licensee specifies the proposed duration of Alternative Request RR-10 as follows:

This alternative will continue from approval until startup from the next Unit 2 refueling outage, currently scheduled for 10/31/2025 or the end of the 5th interval, whichever comes first.

As the basis for this request, the licensee states the following:

Compliance with the specified requirements of this section for the affected component would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

In order to perform the inservice test of CV-31279 during plant operation, letdown would need to be isolated which would cause flow perturbations, pressurizer level swings, and thermal cycles on the primary piping nozzles. Additionally, to correct the issue with the valve stem rod requires disassembly of the actuator which would be a hardship at power due to radiological conditions. The proposed alternative to delay testing will not reduce safety as the condition is known to be related to the remote position indication, and CV-31279 has been verified to operate properly to its closed position. The remote position indication for CV-31279 does not affect the valve's ability to perform its function.

### Reason for Request

In its submittal, the licensee states the following as the reason for the request:

On 08/06/2024 CV-31279, which is normally open during operation at power and typically is not operated for routine plant operation, was closed in support of maintenance on an unrelated system. At that time, dual light indication was observed when the valve was expected to indicate closed. After evaluating the effect of having a degraded, potentially non-functional component and based on a desire to restore letdown to normal operation, the valve was returned to its normal open/auto-close condition prior to determining the cause of the dual light indication. On 09/11/2024, during investigation of the issue, plant personnel identified that the valve stem rod that functions to actuate the limit switch was misaligned. The valve was observed to travel to the full open and full closed positions in approximately the normal amount of stroke time. The valve stem rod was manually adjusted at that time to improve the remote indication, but not corrected in a manner that ensured it would remain in place.

On 10/11/2024, NRC staff informed plant personnel that the adjustment of the valve stem rod should have been classified as "maintenance that could have affected valve performance parameters" per ISTC-3310; therefore, testing CV-31279 was required. Because PINGP [Prairie Island Nuclear Generating Plant] became aware of the need for testing while CV-31279 was in service, per ISTC-3310 testing is required immediately.

To correct the issue with the valve stem rod requires disassembly of the actuator which would be a hardship at power due to radiological conditions. In order to perform the inservice test of CV-31279 during plant operation, letdown would need to be isolated which would cause flow perturbations, pressurizer level swings, and thermal cycles on the primary piping nozzles. The proposed alternative to delay testing will not reduce safety as the condition is known to be related to the remote position indication, and CV-31279 has been verified to operate properly to its closed position. The remote position indication for CV-31279 does not affect the valve's ability to perform its function.

### 3.2 NRC Staff Evaluation

ASME OM Code, subsection ISTC, paragraph ISTC-3310, as incorporated by reference in 10 CFR 50.55a, requires that when a valve or its control system has been replaced, repaired, or has undergone maintenance that could affect the valve's performance, a new reference value shall be determined or the previous value reconfirmed by an inservice test run before the time it is returned to service or immediately if not removed from service. Paragraph ISTC-3310 also states that this test is to demonstrate that performance parameters that could be affected by the replacement, repair, or maintenance are within acceptable limits. Paragraph ISTC-3310 requires that deviations between the previous and new reference values shall be identified and analyzed. Paragraph ISTC-3310 also requires that verification that the new values represent acceptable operation shall be documented in the record of tests.

As described in Alternative Request RR-10, the licensee performed maintenance on the limit switch for Prairie Island, Unit 2, CV-31279, when dual light valve position indication occurred following closure of the valve for routine plant operations. The licensee did not take actions to satisfy the requirements in ASME OM Code, subsection ISTC, paragraph ISTC-3310, following the valve maintenance. The licensee stated in the submittal that it returned the valve to the normal open/auto-close condition prior to determining the cause of the dual light indication.

Based on many years of valve operational and regulatory experience, the NRC staff has determined that several types of maintenance can affect valve performance, including limit switch adjustments.

In Alternative Request RR-10, the licensee asserts that testing the CV-31279 at this time would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety. As a result, the licensee proposes in accordance with 10 CFR 50.55a(z)(2) to postpone the testing required by ASME OM Code, subsection ISTC, paragraph ISTC-3310, for CV-31279 following the completed limit switch maintenance that could have affected the valve's performance. The licensee proposes that this alternative continue from authorization until startup from the next Unit 2 refueling outage, currently scheduled for October 31, 2025, or the end of the Prairie Island fifth IST program interval, whichever occurs first.

In its alternative request, the licensee states that to perform the ISTC-3310 testing of CV-31279 during plant operation, the letdown line would need to be isolated, which would cause flow perturbations, pressurizer level swings, and thermal cycles on the primary piping nozzles. Further, the licensee states that repair of the limit switch indication requires disassembly of the actuator, which would result in radiological exposure to plant maintenance staff while operating the plant at power conditions. The NRC staff agrees with the licensee that performance of the ISTC-3310 testing of CV-31279 and the associate maintenance activities to support the testing at this time would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

In its submittal, the licensee described the activities to verify that CV-31279 can operate properly to the closed safety position. For example, those activities demonstrated that the valve disc travelled to the full open and full closed positions in approximately the normal amount of stroke time. Further, the degraded condition of CV-31279 was determined to relate to the remote position indication device. The NRC staff considers the licensee's activities to be adequate to support the assumption that CV-31279 is capable of performing its safety function for the duration of the alternative request pending any new or additional failure mechanisms.

In summary, the NRC staff finds that performance of the ISTC-3310 testing to verify the reference values for Prairie Island, Unit 2, Letdown Line Isolation Train B Control Valve CV-31279 at this time would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety. The staff also finds that the licensee has provided reasonable assurance that CV-31279 is capable of performing its close safety function for the duration of Alternative Request RR-10. As a result, the staff finds that Alternative Request RR-10 may be authorized.

#### 4.0 CONCLUSION

As set forth above, the NRC staff determines that NSPM has justified in Alternative Request RR-10 that performance of the testing required by ASME OM Code, subsection ISTC, paragraph ISTC-3310, to verify the reference values for the Prairie Island, Unit 2, CV-31279 at this time, would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety. For the duration of the alternative request, the licensee has provided reasonable assurance that CV-31279 is capable of performing its safety function to close. Accordingly, the NRC staff concludes that the licensee has adequately addressed all of the regulatory requirements set forth in 10 CFR 50.55a(z)(2). Therefore, the NRC staff authorizes Alternative Request RR-10 for CV-31279 at Prairie Island, Unit 2, until startup from the next Unit

2 refueling outage, currently scheduled for October 31, 2025, or the end of the fifth IST program interval at Prairie Island, whichever occurs first.

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

Principal Contributor: Thomas G. Scarbrough, NRR/DEX/EMIB

Date: January 23, 2025

SUBJECT: PRAIRIE ISLAND NUCLEAR GENERATING PLANT, UNIT 2 – PROPOSED  
ALTERNATIVE RR-10 REGARDING LETDOWN LINE ISOLATION  
TRAIN B CONTROL VALVE CV-31279 (EPID L-2025-LLR-0003) DATED  
JANUARY 23, 2025

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