



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

June 21, 2022

**MONTICELLO NUCLEAR GENERATING PLANT – AUTHORIZATION AND SAFETY  
EVALUATION FOR ALTERNATIVE REQUEST NO. VR-01 (EPID L-2021-LLR-0062)**

**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(s):** 50-263

**APPLICATION INFORMATION**

**Submittal Date:** August 25, 2021

**Submittal Agencywide Documents Access and Management System (ADAMS) Accession No.:** ML21237A371

**Alternative Provision:** The applicant requested an alternative under Title 10 of the *Code of Federal Regulations* (10 CFR), paragraph 50.55a(z)(2).

**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 ISTC-3510, "Exercising Test Frequency," states, in part, "Active Category A, Category B, and Category C check valves shall be exercised nominally every 3 months, except as provided by paragraphs ISTC-3520, ISTC-3540, ISTC-3550, ISTC-3570, ISTC-5221, and ISTC-5222." ISTC-3522, "Category C Check Valves," subparagraph (a) states, in part, "Each check valve exercise test shall include open and close tests." ISTC-5221, "Valve Obturator Movement," subparagraph (a)(2) states, "Check valves that have a safety function in only the open direction shall be exercised by initiating flow and observing that the obturator has traveled either the full open position or to the

position required to perform its intended function(s) (see paragraph ISTA-1100), and verify closure.”

**Brief Description of the Proposed Alternative:** Northern States Power Company, a Minnesota corporation, doing business as Xcel Energy (hereafter the licensee), requested the U.S. Nuclear Regulatory Commission (NRC) authorization of this 10 CFR 50.55a request to support the implementation of the sixth IST 10-year program interval for Monticello Nuclear Generating Plant (Monticello). Proposed Alternative No. VR-01 requests authorization for an alternative means of close testing the control rod drive (CRD) scram discharge header check valves (CRD-114, typical 121 valves, one per hydraulic control unit (HCU)).

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**

There is one CRD-114 scram discharge header check valve on each of the 121 HCUs. For all control rods to scram, all of the CRD-114 check valves must open along with other CRD system valves. Paragraph ISTC-3510 of the ASME OM Code requires that check valves be exercised every 3 months to verify that they can fulfill their safety function. Paragraph ISTC-3221 allows that if exercising is not practicable during plant operation and cold shutdown, it shall be performed during the refueling outage. The subject check valves, CRD-114, are a simple ball-check design. There are no internal parts in the check valves that are susceptible to rapid degradation and sudden failure. In addition, the control rods are infrequently scrammed and these valves are thus subjected to few stress/wear cycles. Furthermore, the valves are welded into the line and it is not practicable to perform a disassembly and inspection of each valve in accordance with paragraph ISTC-5221(c). The licensee proposed to demonstrate the proper functioning of each CRD-114 check valve in conjunction with the scram time testing as required by Technical Specifications (TS) Surveillance Requirement (SR) 3.1.4.1 and TS SR 3.1.4.2, which are performed at least once during each operating cycle.

The CRD scram discharge header check valves do not have a safety-related function in the closed direction. These check valves must open throughout the entire scram stroke of the control rod and until volume pressure equals reactor vessel pressure. This check valve's closed function is to prevent backflow from the scram discharge volume (SDV) to the over piston area of the drive when a scram is reset. Exercising these CRD check valves quarterly during power operations is not practicable because it could result in the rapid insertion of one or more control rods. The scram time test frequency of at least once during each operating cycle identified in the TSs for use as the valve testing frequency is equivalent to that required by the ASME OM Code when testing is not practical during normal plant operation and cold shutdown. This frequency also minimizes rapid reactivity transients and wear of the CRD mechanisms.

If a particular scram insertion time is less than the specified scram time, then the related valves are shown functioning properly. The successful scram time of a CRD also represents the successful full stroke exercising of these check valves. Therefore, verifying that the associated control rod meets the scram insertion time limits defined in the TSs is a viable alternative method of detecting degradation of the check valves. Trending the scram stroke times is

unnecessary because they are indirectly stroke timed and no meaningful correlation between scram time and valve degradation can be obtained.

Testing of the scram discharge header check valves per the requirements of paragraphs ISTB-3510, ISTC-3522, and ISTC-5221(a)(2) represents a hardship without a compensating increase in the level of quality or safety. The NRC staff finds that the proposed alternative from the exercise and frequency requirements of paragraphs ISTC-3510, ISTC-3522, and ISTC-5221(a)(2) for the CRD scram discharge header check valves, located on each CRD HCU, provides reasonable assurance of the operational readiness of these valves.

### **CONCLUSION**

The NRC staff has determined that complying with the specified requirements described in the request referenced above would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

The proposed alternative provides reasonable assurance that the 121 scram discharge header check valves CRD-114 are operationally ready.

The NRC staff concludes that the licensee has adequately addressed the regulatory requirements set forth in 10 CFR 50.55a(z)(2).

The NRC staff authorizes the use of proposed alternative VR-01 at Monticello, for the sixth 10-year IST program interval, starting October 1, 2022, and scheduled to end May 31, 2032.

All other ASME OM Code requirements for which an alternative was not specifically requested and approved remain applicable.

**Principal Contributor:** Ian Tseng

**Date:** June 21, 2022

Nancy L. Salgado Chief  
Plant Licensing Branch IIII  
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 21, 2022**

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