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June 13, 2017

L-MT-17-044
10 CFR 50.90

ATTN: Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Monticello Nuclear Generating Plant
Docket No. 50-263
Renewed Facility Operating License No. DPR-22

LER 2017-002-00 "Main Steam Isolation Valve Closure Time Outside of Technical Specification Requirements"

Enclosed is the Monticello Nuclear Generating Plant (MNGP) Licensee Event Report (LER) 2017-002-00, "Main Steam Isolation Valve Closure Time Outside of Technical Specification Requirements." This condition is reportable to the NRC in accordance with 10 CFR 50.73(a)(2)(i)(B), as an operation or condition which was prohibited by the plant's Technical Specifications.

Summary of Commitments

This letter makes no new commitments and no revisions to existing commitments.

Kent Scott for P. Gardner

Peter A. Gardner
Site Vice President, Monticello Nuclear Generating Plant
Northern States Power Company – Minnesota

Enclosure

cc: Administrator, Region III, USNRC
Project Manager, Monticello Nuclear Generating Plant, USNRC
Resident Inspector, Monticello Nuclear Generating Plant, USNRC

NRC FORM 366 (06-2016) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB: NO. 3150-0104 EXPIRES: 10/31/2018

Estimated burden per response to comply with this mandatory collection request: 80 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the FOIA, Privacy and Information Collections Branch (T-5 F53), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to Infocollects.Resource@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

LICENSEE EVENT REPORT (LER)

(See Page 2 for required number of digits/characters for each block)

1. FACILITY NAME	2. DOCKET NUMBER	3. PAGE
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4. TITLE

Main Steam Isolation Valve Closure Time Outside of Technical Specification Requirements

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO.	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
										05000
04	15	2017	2017	- 002	- 00	06	13	2017	FACILITY NAME	DOCKET NUMBER
										05000

9. OPERATING MODE	11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: *(Check all that apply)*			
4	☐ 20.2201(b)	☐ 20.2203(a)(3)(i)	☐ 50.73(a)(2)(ii)(A)	☐ 50.73(a)(2)(viii)(A)
	☐ 20.2201(d)	☐ 20.2203(a)(3)(ii)	☐ 50.73(a)(2)(ii)(B)	☐ 50.73(a)(2)(viii)(B)
	☐ 20.2203(a)(1)	☐ 20.2203(a)(4)	☐ 50.73(a)(2)(iii)	☐ 50.73(a)(2)(ix)(A)
10. POWER LEVEL	☐ 20.2203(a)(2)(i)	☐ 50.36(c)(1)(i)(A)	☐ 50.73(a)(2)(iv)(A)	☐ 50.73(a)(2)(x)
	☐ 20.2203(a)(2)(ii)	☐ 50.36(c)(1)(ii)(A)	☐ 50.73(a)(2)(v)(A)	☐ 73.71(a)(4)
000	☐ 20.2203(a)(2)(iii)	☐ 50.36(c)(2)	☐ 50.73(a)(2)(v)(B)	☐ 73.71(a)(5)
	☐ 20.2203(a)(2)(iv)	☐ 50.46(a)(3)(ii)	☐ 50.73(a)(2)(v)(C)	☐ 73.77(a)(1)
	☐ 20.2203(a)(2)(v)	☐ 50.73(a)(2)(i)(A)	☐ 50.73(a)(2)(v)(D)	☐ 73.77(a)(2)(i)
	☐ 20.2203(a)(2)(vi)	☒ 50.73(a)(2)(i)(B)	☐ 50.73(a)(2)(vii)	☐ 73.77(a)(2)(ii)
		☐ 50.73(a)(2)(i)(C)	☐ OTHER Specify in Abstract below or in NRC Form 366A	

12. LICENSEE CONTACT FOR THIS LER

LICENSEE CONTACT	TELEPHONE NUMER *(Include Area Code)*
Steve Sollom, Licensing Engineer	763-295-1611

13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT

CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX
B	SB	ISV	H198	Y					

14. SUPPLEMENTAL REPORT EXPECTED	15. EXPECTED SUBMISSION DATE	MONTH	DAY	YEAR
☐ YES *(If yes, complete 15. EXPECTED SUBMISSION DATE)* ☒ NO				

ABSTRACT *(Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)*

On April 15, 2017 at approximately 10:56 am, with the plant at 0% power in Mode 4 (Shutdown), while performing a plant shutdown procedure the "D" outboard Main Steam Isolation Valve (MSIV), AO-2-86D was functionally tested. The Monticello Nuclear Generating Plant (MNGP) Technical Specifications (TS) Surveillance Requirement (SR) 3.6.1.3.6 requires that the isolation time of each MSIV is $\geq$ 3 seconds and $\leq$ 9.9 seconds. During the functional test the "D" Outboard MSIV closing time was measured at approximately 40.7 seconds. The valve was declared inoperable and subsequently repaired. The failure was attributed to the air pack pilot valves.

This component failure is reportable in accordance with 10 CFR 50.73(a)(2)(i)(B) as a condition prohibited by TS 3.6.1.3 "Primary Containment Isolation Valves," since AO-2-86D may have been inoperable for greater than the TS 3.6.1.3, Required Action A.1, Completion Time of 8 hours to isolate a main steam line, and the Completion Time for TS 3.6.1.3, Required Action F, to be in Mode 3 in 12 hours and Mode 4 in 36 hours when the completion time of A.1 is not met. There were minimal safety consequences associated with the condition since the primary containment isolation function was maintained.

1. FACILITY NAME	2. DOCKET NUMBER	3. LER NUMBER		
		YEAR	SEQUENTIAL NUMBER	REV NO.
Monticello Nuclear Generating Plant	05000-263	2017	002	- 00

NARRATIVE

EVENT DESCRIPTION

On April 15, 2017 at approximately 10:56 AM, with the plant at 0% power in Mode 4 (Shutdown), while performing a plant shutdown procedure the "D" outboard Main Steam [SB] Isolation Valve (MSIV) [ISV] AO-2-86D was functionally tested. The Monticello Nuclear Generating Plant (MNGP) Technical Specifications (TS) Surveillance Requirement (SR) 3.6.1.3.6 requires that the isolation time of each MSIV is $\geq$ 3 seconds and $\leq$ 9.9 seconds. During the functional test the "D" Outboard MSIV closing time was measured at approximately 40.7 seconds. The valve was declared inoperable and repaired during the refueling outage.

During the test AO-2-86D was given a close signal via the control room hand switch [HS]. The valve delayed to start of closing by approximately 35 seconds and then proceeded to close normally in about 5 seconds.

On site troubleshooting activities commenced and determined that the Hiller Co. air pack pilot valves (Model No. C10010A – called V1 and V3) were the cause of the closure delay. The V1 pilot valve was found to be stuck in a closed position. The air pack was sent to the vendor to perform more inspection, testing and repair. The vendor discovered scoring on the piston rod and mounting plate of the booster assembly on the V1 pilot valve. This is evidence of binding and misalignment that caused the valve to not shuttle when called upon. The V3 pilot valve was shown through data analysis to have delayed movement during the event. The air pack was repaired by the vendor replacing the solenoid cluster and the pilot valves, and the boosters were rebuilt.

The air pack was returned to MNGP, reinstalled and AO-2-86D completed satisfactory testing on 5/5/2017.

A previous similar failure occurred on November 23, 2015 when AO-2-86D closed in 130 seconds after delaying start of closure. The troubleshooting of that failure indicated the plunger sticking or binding of an in-series solenoid valve was the cause of the failure to close in the required TS limits. Upon further review, this MSIV closure time failure is now attributed to the AO-2-86D air pack pilot valves failing to function as designed.

EVENT ANALYSIS

The event was determined to be reportable in accordance with 10 CFR 50.73 (a)(2)(i)(B), "Any operation or condition which was prohibited by the plant's Technical Specifications." Specifically, this component failure is reportable in accordance with 10 CFR 50.73(a)(2)(i)(B) as a condition

prohibited by TS 3.6.1.3 "Primary Containment Isolation Valves," since AO-2-86D was inoperable for greater than the TS 3.6.1.3, Required Action A.1, Completion Time of 8 hours to isolate a main steam line, and the Completion Time for TS 3.6.1.3, Required Action F, to be in Mode 3 in 12 hours and Mode 4 in 36 hours when the completion time of A.1 is not met.

This event is not classified as a safety system functional failure as the inboard valve was fully operational.

SAFETY SIGNIFICANCE

There were minimal safety consequences associated with the condition. The inboard MSIV on Main Steam line "D" (AO-2-80D) was tested for both leak rate and closing time over the past cycle and each test was completed satisfactorily. Additionally, the inboard MSIVs are a different design and do not utilize Hiller Co. air pack pilot valves. Therefore, the primary containment isolation capability of the main steam lines remained operable which ensured the required isolation safety function was maintained.

CAUSE

The air pack assembly for AO-2-86D was sent to the vendor to perform an inspection, teardown and functional testing of the air pack. In addition to minor leaking at several fittings and around the solenoid valves and manifolds, the vendor discovered scoring on the V1 piston rod and mounting plate of the booster assembly, metallic pieces in the pilot valve body and fretting on the edges of the elastomeric valve seat. Some small black particles (foreign material) were also noted in the V3 pilot valve body and the solenoid manifold ports. Both the V1 and V3 valves must function correctly for the MSIV to close within the TS required time.

The cause of the event was attributed to a failure of both of the pilot valves. As described above the V1 pilot valve was found to be stuck in a closed position and score marks were found on the stem and bottom of the valve shaft. This is evidence of binding and misalignment that caused the valve to not shuttle when called upon.

Regarding pilot valve V3, NSPM performed a more detailed review of data from the April 15, 2017 event and previous operations of AO-2-86D. The review indicated that the MSIV Air supply pressure during the "D" MSIV delayed closure event on November 23, 2015 shows a pressure dip that corresponds to a partial opening of V3 prior to full close. The April 15, 2017 event does not show the same pressure dip, indicating that the V3 valve had delayed movement (sticking) prior to opening.

AO-2-86D was fully functional (closure time and leak rate) from April 14, 2014 to 1R27 as demonstrated by 1R26 As-left testing, cycle 27 On-line testing and 1R27 As-found testing. During 1R27, the AO-2-86D air pack for the AO-2-86D valve actuator was replaced thus introducing the failure mechanism (delay to close) observed twice, once on November 23, 2015 (two minute closure time) and again on April 15, 2017 (forty second closure time).

CORRECTIVE ACTION

The air pack assembly for AO-2-86D was sent to the vendor for repair. The vendor replaced the solenoid cluster, the pilot valves and the boosters were rebuilt. After the air pack was returned to MNGP, the air pack was bench tested to verify proper cycling of the assembly. The air pack was returned to MNGP, reinstalled and AO-2-86D completed satisfactory testing on May 5, 2017.

To reduce the risk of future failures NSPM is planning to develop a bench testing procedure for air pack assemblies prior to their installation in an MSIV.

PREVIOUS SIMILAR EVENTS

In LER 2015-006-00, NSPM reported that a previous similar failure occurred on November 23, 2015 when AO-2-86D closed after delaying by approximately 130 seconds. The troubleshooting from that event indicated that an in-series solenoid valve plunger sticking or binding was the cause of the failure to close within the required TS limits. Upon further review, as discussed above, this MSIV closure time failure is now attributed to the AO-2-86D air pack pilot valves failing to function as designed.

ADDITIONAL INFORMATION

The Institute of Electrical and Electronics Engineer codes for equipment are denoted by [XX].