



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**

REGION III
2443 WARRENVILLE ROAD, SUITE 210
LISLE, ILLINOIS 60532-4352

May 4, 2023

Christopher Domingos
Site Vice President
Monticello Nuclear Generating Plant
Northern States Power Company, Minnesota
2807 West County Road 75
Monticello, MN 55362-9637

SUBJECT: MONTICELLO NUCLEAR GENERATING PLANT-INTEGRATED INSPECTION
REPORT 05000263/2023001

Dear Christopher Domingos:

On March 31, 2023, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at Monticello Nuclear Generating Plant. On April 13, 2023, the NRC inspectors discussed the results of this inspection with Shawn Hafen, Plant Manager, and other members of your staff. The results of this inspection are documented in the enclosed report.

No findings or violations of more than minor significance were identified during this inspection.

This letter, its enclosure, and your response (if any) will be made available for public inspection and copying at <http://www.nrc.gov/reading-rm/adams.html> and at the NRC Public Document Room in accordance with Title 10 of the *Code of Federal Regulations* 2.390, "Public Inspections, Exemptions, Requests for Withholding."

Sincerely,

A handwritten signature in cursive script that reads "April M. Nguyen".

Nguyen, April signing on behalf
of Peterson, Hironori
on 05/04/23

Hironori Peterson, Chief
Reactor Projects Branch 3
Division of Operating Reactor Safety

Docket No. 05000263
License No. DPR-22

Enclosure:
As stated

cc w/ encl: Distribution via LISTSERV

Letter to Christopher Domingos from Hironori Peterson dated May 4, 2023.

SUBJECT: MONTICELLO NUCLEAR GENERATING PLANT-INTEGRATED INSPECTION REPORT 05000263/2023001

DISTRIBUTION:

Jessie Quichocho
Paul Zurawski
RidsNrrDorlLpl3
RidsNrrPMMonticello
RidsNrrDrolrib Resource
John Giessner
Mohammed Shuaibi
Diana Betancourt-Roldan
Allan Barker
R3-DORS

ADAMS ACCESSION NUMBER: ML23124A108

<input checked="" type="checkbox"/> SUNSI Review		<input checked="" type="checkbox"/> Non-Sensitive <input type="checkbox"/> Sensitive		<input checked="" type="checkbox"/> Publicly Available <input type="checkbox"/> Non-Publicly Available	
OFFICE	RIII	RIII			
NAME	NShah:gmp	ANguyen for HPeterson			
DATE	05/04/2023	05/04/2023			

OFFICIAL RECORD COPY

**U.S. NUCLEAR REGULATORY COMMISSION
Inspection Report**

Docket Number: 05000263

License Number: DPR-22

Report Number: 05000263/2023001

Enterprise Identifier: I-2023-001-0061

Licensee: Northern States Power Company, Minnesota

Facility: Monticello Nuclear Generating Plant

Location: Monticello, MN

Inspection Dates: January 01, 2023 to March 31, 2023

Inspectors: N. Bolling, Project Engineer
T. McGowan, Resident Inspector
C. Norton, Senior Resident Inspector
K. Pusateri, Resident Inspector
D. Tesar, Senior Resident Inspector

Approved By: Hironori Peterson, Chief
Reactor Projects Branch 3
Division of Operating Reactor Safety

Enclosure

SUMMARY

The U.S. Nuclear Regulatory Commission (NRC) continued monitoring the licensee's performance by conducting an integrated inspection at Monticello Nuclear Generating Plant, in accordance with the Reactor Oversight Process. The Reactor Oversight Process is the NRC's program for overseeing the safe operation of commercial nuclear power reactors. Refer to <https://www.nrc.gov/reactors/operating/oversight.html> for more information.

List of Findings and Violations

No findings or violations of more than minor significance were identified.

Additional Tracking Items

None.

PLANT STATUS

The unit began the inspection period at rated thermal power. On February 6, 2023, the licensee reduced thermal power to 95 percent of rated to perform a control rod pattern adjustment and returned to rated thermal power the same day. On February 27, the licensee reduced thermal power to 95 percent of rated to perform a control rod pattern adjustment and returned to rated thermal power the same day. On March 3, the unit began coast down from rated thermal power with all control rods fully withdrawn and recirculation pumps at maximum speed. On March 18, the licensee reduced power from 95 percent of rated thermal power in coast down to 65 percent of rated thermal power, closed the inboard C main steam isolation valve, and returned to 75 percent of rated thermal power. On March 24, the licensee shutdown the reactor to repair a leak on the control rod drive suction header. On March 30, 2023, the licensee commenced a reactor startup. The unit ended the inspection period at 80 percent of rated thermal power in coast down.

INSPECTION SCOPES

Inspections were conducted using the appropriate portions of the inspection procedures (IPs) in effect at the beginning of the inspection unless otherwise noted. Currently approved IPs with their attached revision histories are located on the public website at <http://www.nrc.gov/reading-rm/doc-collections/insp-manual/inspection-procedure/index.html>. Samples were declared complete when the IP requirements most appropriate to the inspection activity were met consistent with Inspection Manual Chapter (IMC) 2515, "Light-Water Reactor Inspection Program - Operations Phase." The inspectors performed activities described in IMC 2515, Appendix D, "Plant Status," observed risk significant activities, and completed on-site portions of IPs. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel to assess licensee performance and compliance with Commission rules and regulations, license conditions, site procedures, and standards.

REACTOR SAFETY

71111.01 - Adverse Weather Protection

Impending Severe Weather Sample (IP Section 03.02) (1 Sample)

- (1) The inspectors evaluated the adequacy of the overall preparations to protect risk-significant systems from impending severe weather, winter storm advisory with high winds, icy conditions, and predicted 1-2 feet snow fall on February 21, 2023.

71111.04 - Equipment Alignment

Partial Walkdown Sample (IP Section 03.01) (5 Samples)

The inspectors evaluated system configurations during partial walkdowns of the following systems/trains:

- (1) Control rod drive (CRD) system suction piping on January 3, 2023
- (2) Emergency diesel generator (EDG) 12, protected train, essential service water subsystem on January 10, 2023
- (3) Division 2 filtration service water (FSW) following pipe replacement on January 19, 2023

- (4) Control rod drive system 12 protected train while CRD pump 11 was isolated and unavailable on January 25, 2023
- (5) Groundwater tritium mitigation system on January 27, 2023

Complete Walkdown Sample (IP Section 03.02) (1 Sample)

- (1) The inspectors evaluated system configurations during a complete walkdown of the control rod drive system on January 18, 2023

71111.05 - Fire Protection

Fire Area Walkdown and Inspection Sample (IP Section 03.01) (8 Samples)

The inspectors evaluated the implementation of the fire protection program by conducting a walkdown and performing a review to verify program compliance, equipment functionality, material condition, and operational readiness of the following fire areas:

- (1) Fire zone 1-G, CRD pump room on January 3, 2023
- (2) Fire zone 1-E, high pressure coolant injection (HPCI) room on January 3, 2023
- (3) Fire zone 12-A, lower 4 KV bus area 13 and 15 on January 5, 2023
- (4) Fire zone 14-A, upper 4 KV bus area 14 and 16 on January 5, 2023
- (5) Fire zone 1-C, reactor core isolation cooling (RCIC) room on January 5, 2023
- (6) Fire zone 2-H, west shutdown cooling area on February 6, 2023
- (7) Fire zone 33, emergency filtration train (EFT) building third floor on February 6, 2023
- (8) Fire zone 23-A, intake structure while hot work was in progress on March 22, 2023

71111.11Q - Licensed Operator Requalification Program and Licensed Operator Performance

Licensed Operator Performance in the Actual Plant/Main Control Room (IP Section 03.01) (1 Sample)

- (1) The inspectors observed and evaluated licensed operator performance in the control room during a loss of the plant heating boiler on January 10, 2023.

Licensed Operator Requalification Training/Examinations (IP Section 03.02) (1 Sample)

- (1) The inspectors observed and evaluated crew 4 operations training in preparation for the upcoming refueling outage on January 18, 2023.

71111.12 - Maintenance Effectiveness

Maintenance Effectiveness (IP Section 03.01) (3 Samples)

The inspectors evaluated the effectiveness of maintenance to ensure the following structures, systems, and components (SSCs) remain capable of performing their intended function:

- (1) 11 EDG immersion heater temperature sensor, TS-7194 replaced due to unexpected rise in lube oil cooler outlet temperature
- (2) Division 2 125-Vdc battery charger, D-20

- (3) Division 1 residual heat removal (RHR) 11 pump motor replaced due to historical vibrations in the alert range (decreased reliability)

71111.13 - Maintenance Risk Assessments and Emergent Work Control

Risk Assessment and Management Sample (IP Section 03.01) (3 Samples)

The inspectors evaluated the accuracy and completeness of risk assessments for the following planned and emergent work activities to ensure configuration changes and appropriate work controls were addressed:

- (1) CRD pump 11 with elevated vibrations on January 25, 2023
- (2) Elevated temperatures in steam chase on March 10, 2023
- (3) Aggregate risk associated with multiple residual heat removal service water (RHRSW) deficiencies which potentially impacted system operability on March 26, 2023

71111.15 - Operability Determinations and Functionality Assessments

Operability Determination or Functionality Assessment (IP Section 03.01) (6 Samples)

The inspectors evaluated the licensee's justifications and actions associated with the following operability determinations and functionality assessments:

- (1) 501000070625, safety relief valve 'G' reached 165 degrees Fahrenheit
- (2) 501000070299, unexpected configuration of 10A-K48B 2/3 core height interlock
- (3) 501000070173, evidence of battery cell 29 positive post-seal leakage on battery string 16
- (4) 501000070634, unexpected annunciator 5-A-43, rod block monitor downscale/trouble
- (5) 501000070666, degraded fire barrier
- (6) 501000072235, 11 RHR pump failed to start manually; 501000072261, Fuse 10A-F19A (panel C-32) found open

71111.18 - Plant Modifications

Temporary Modifications and/or Permanent Modifications (IP Section 03.01 and/or 03.02) (2 Samples)

The inspectors evaluated the following temporary or permanent modifications:

- (1) Tritium mitigation tank siting for interference with FLEX strategies
- (2) Replacement and modification of the control rod drive pumps' suction line from the condensate system

71111.20 - Refueling and Other Outage Activities

Refueling/Other Outage Sample (IP Section 03.01) (1 Sample)

- (1) The inspectors evaluated forced outage 23-01 activities from March 25–30, 2025

71111.24 - Testing and Maintenance of Equipment Important to Risk

The inspectors evaluated the following testing and maintenance activities to verify system operability and/or functionality:

Post-Maintenance Testing (PMT) (IP Section 03.01) (4 Samples)

- (1) 0255-11-IIC-2, Emergency Service Water System Leakage Test-Loop 'B,' after FSW pipe replacement, on January 19, 2023
- (2) B.09.12-05 G4, Transfer of Reactor Protection System (RPS) Bus Back to Motor Generator (MG) Set 'B', following 'B' RPS motor generator replacement on January 31, 2023
- (3) Cycling MO-2012, RHR division 1 low pressure coolant injection outboard valve, after swapping motor operated valve (MOV) breaker fuses, on March 7, 2023
- (4) 0255-05-IA-1-1, 'A' RHRSW Pump and Valve Quarterly Test, for CV-1728, RHR 11 heat exchanger RHRSW outlet valve, after maintenance, on March 9, 2023

Surveillance Testing (IP Section 03.01) (5 Samples)

- (1) EDG 11 comprehensive load test on January 9, 2023
- (2) Emergency service water 14 quarterly pump and valve tests on February 3, 2023
- (3) Standby liquid control quarterly pump and valve tests on February 9, 2023
- (4) RHRSW train 'A' quarterly pump and valve tests on March 9, 2023
- (5) RHRSW train 'B' quarterly pump and valve tests on March 24, 2023

Inservice Testing (IST) (IP Section 03.01) (1 Sample)

- (1) IST, Division 2 Filtration Service Water System Test, following pipe replacement, per work order 7001036969-0070

Containment Isolation Valve (CIV) Testing (IP Section 03.01) (1 Sample)

- (1) 0255-18-IA, Traversing incore probe ball valve quarterly exercise, on February 15, 2023

71114.06 - Drill Evaluation

Drill/Training Evolution Observation (IP Section 03.02) (2 Samples)

The inspectors evaluated:

- (1) Tabletop drill, loss of alternating current (AC) and direct current (DC) power on January 10, 2023
- (2) Licensed operator, crew 3, performed an out-of-the-box scenario related to emergency action level classification on February 13, 2023

OTHER ACTIVITIES—BASELINE

71151 - Performance Indicator Verification

The inspectors verified licensee performance indicators submittals listed below:

IE01: Unplanned Scrams per 7000 Critical Hours Sample (IP Section 02.01) (1 Sample)

- (1) January 1, 2022 through December 31, 2022

IE03: Unplanned Power Changes per 7000 Critical Hours Sample (IP Section 02.02) (1 Sample)

- (1) January 1, 2022 through December 31, 2022

IE04: Unplanned Scrams with Complications (USwC) Sample (IP Section 02.03) (1 Sample)

- (1) January 1, 2022 through December 31, 2022

71153 - Follow Up of Events and Notices of Enforcement Discretion

Event Follow-up (IP Section 03.01) (1 Sample)

- (1) During the first quarter 2023, the inspectors evaluated the licensee response to the discovery of tritium in the groundwater between the turbine building and reactor building as described in Event Number: 56236.

INSPECTION RESULTS

Observation: Licensee Response to Event Number: 56236	71153
<p>On November 22, 2022, Monticello Nuclear Generating Plant initiated a voluntary communication to the State of Minnesota after receiving analysis results for an on-site monitoring well that indicated tritium activity above the offsite dose calculation manual for reporting as described in the Nuclear Energy Institute Groundwater Protection Initiative (ML101740201) reporting levels. Subsequently, the licensee notified the Nuclear Regulatory Commission (NRC) of the voluntary communication to the State of Minnesota in accordance with NRC reporting requirements contained in Title 10 of the <i>Code of Federal Regulations</i> (10 CFR) 50.72(b)(2)(xi). The NRC made the licensee's notice publicly available as event notification (EN) 56236 on November 23, 2022. The NRC inspectors independently determined there was no impact on the health and safety of the public, plant personnel, or the environment.</p> <p>As a follow up to this EN, the inspectors observed and evaluated the licensee's initial response to identify and quantify the source of the tritium leak and identified no performance deficiencies under the Public Radiation Safety Cornerstone. At that time, the inspectors verified the tritiated water was contained on-site, was identified through the groundwater monitoring program, and did not impact drinking water wells used by the community. The inspectors observed and evaluated the development and implementation of the licensee's actions to mitigate the leak by removing the tritiated water released to the ground and identified no performance deficiencies.</p>	

On December 29, 2022, the licensee determined that the leak to groundwater was in the gap between the turbine building and the reactor building in the below grade portion of the control rod drive (CRD) suction piping. NRC inspectors reviewed, evaluated, and observed licensee actions to contain the leak and identified no performance deficiencies.

On March 22, 2023, the catchment around the piping failed to contain the leak. Subsequently, on March 24, 2023, the licensee shut down the unit to replace the below grade portion of the carbon-steel CRD suction piping with stainless-steel piping. They also modified the design of the piping penetration to allow for periodic inspections to check for degradation. The inspectors reviewed, evaluated, and observed in-person critical aspects of the pipe replacement, and identified no performance deficiencies.

Unrelated to the licensee's actions in response to the aforementioned leak, while reviewing the design basis for the most recent license extension, the NRC inspectors identified a performance deficiency for the licensee's failure to include the below grade portion of the CRD suction piping in the Underground Piping and Tank Integrity (UPTI) Program. Had the below grade portion of the CRD piping been included in the UPTI program, the piping would have been coated or wrapped for protection and periodically inspected for degradation. The NRC inspectors determined this was a minor performance deficiency because it (1) could not be viewed as a precursor to a significant event, (2) if left uncorrected, did not have the potential to lead to a more significant safety concern, and (3) was not associated with any reactor oversight program cornerstone attributes.

EXIT MEETINGS AND DEBRIEFS

The inspectors verified no proprietary information was retained or documented in this report.

- On April 13, 2023, the inspectors presented the integrated inspection results to Shawn Hafen, Plant Manager, and other members of the licensee staff.

DOCUMENTS REVIEWED

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
71111.01	Procedures	1444	Pre and Post Severe Weather Inspection Checklist	21
71111.04	Drawings	NF 93493	Monticello Nuclear Generating Plant SW> Supply Line from Pump-111D To VEAV-14B (Turbine Building)	C
		NH-36036 (M-105)	P&ID Condensate & Feedwater	93
		NH-36039 (M-108)	P&ID Condensate & Demineralized Water Storage Systems	101
		NH-36244 (M-118)	Control Rod Hydraulic System P&ID	90
		NH-36245 (M-119)	P&ID Control Rod Hydraulic System	80
		NX-9525-21	Emergency Service Water Pumps P-111A and P-111B	77
	Procedures	B.08.01.02-05	EDG Emergency Service Water - System Operation	24
		CS-OP-PR-113	Energy Solutions, Monticello Well Water Demand Demin Skid	01/18/2023
		Ops Man B.01.03-01	CRD Hydraulic System	17
	Work Orders	700116710-0610	Ground Watering Monitoring Well 9	4
		700116710-0885	Groundwater Monitoring Well 12	4
		700117970	Groundwater Remediation	01/18/2023
	71111.05	Corrective Action Documents	501000071474	Fire Watch Secured Early
Corrective Action Documents Resulting from Inspection		501000070469	EFT/ASDS Phone Issues	02/07/2023
Fire Plans		Strategy A.3-01-C	RCIC Room and Appendix R Cable Enclosure	11
		Strategy A.3-01-E	HPCI Room - Reactor Building Elevation 896'	9
		Strategy A.3-01-G	Fire Zone 1-G, CRD Pump Room	5
		Strategy A.3-12-A	Lower 4KV Bus Area No. 13 & 15	19
		Strategy A.3-14-A	Upper 4KV Bus Area (14 & 16)	18

Inspection Procedure	Type	Designation	Description or Title	Revision or Date	
	Procedures	4 AWI-08.01	Combustible Source Use Permit	16	
		Strategy A.3-02-H	West Shutdown Cooling Area	10	
		Strategy A.3-23-A	Fire Zone 23-A, Intake Structure Pump Room	15	
		Strategy A.3-33	EFT Building Third Floor	12	
71111.11Q	Corrective Action Documents	501000069765	Heating Boiler Flame Fail	01/10/2023	
	Procedures	FP-OP-ROM-02	Shutdown Safety Management Program	18	
		OPs Man C.4-B.08.03A	Loss of Heating Boiler	22	
71111.12	Corrective Action Documents	501000044002	11 RHR, Possible Rotor Defects	09/09/2020	
		501000056563	11 RHR Pump Testing Frequency	09/30/2021	
		501000068846	TI-4766A Temperature Increasing (11 EDG Lube Oil Cooler Outlet Oil Temperature)	11/29/2022	
		501000071215	Motor Labeling Needs Updating	03/08/2023	
	Drawings	NE-36404-4	RHR Pump P-202A, ACB 152-504 Control	79	
		NH-36247 (M-121)	P&ID Residual Heat Removal System	96	
		NX-9216-8-5-4 (TS-7194)	Physical Schematic & Field Connections Model 999 - 11 EDG	82	
	Procedures	4075-PM	D20 Battery Charger Preventive Maintenance	8	
	Work Orders	700090492-0020	Alternate 125Vdc Supply from D40 to D21 (PMT/RTS)	01/18/2023	
		700094019-0010, 0020	D20 Battery Charger Preventive Maintenance	01/18/2023	
		700097218	11 RHR Motor Replacement	03/11/2023	
		700116900	Replace TS-7194 (11 EDG Immersion Heater Temperature Control)	01/10/2023	
	71111.13	Miscellaneous	Tagout: 1-CRD 11 CRD BEARING RPLC (2)	P-201A Rotate Pump Shaft by Hand	01/25/2023
		Procedures	B.02.04-05	Main Steam	41
C.5-1300			Secondary Containment Control (Mode 1, 2, 3)	19	
Work Orders		700118432-0050	P-201A, Manually Rotate	01/25/2023	
71111.15	Corrective Action	501000070173	16 Battery Positive Post Seal Leakage	01/26/2023	

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
	Documents	501000070265	G SRV Reached 165 Degrees F	01/29/2023
		501000070299	Unexpected Configuration 10A-K48B	01/30/2023
		501000070634	Unexpected Annunciator 5-A-43	02/11/2023
		501000070666	Degraded Fire Barrier Found	02/14/2023
	Procedures	FP-OP-OL-01	Operability	22
		Ops Man B.05.01.02-01	Power Range Neutron Monitoring System	7
		Ops Man B.05.01.02-05	Power Range Neutron Monitoring System-System Operation	31
	Ops Manual C.5-3502	Containment Spray	21	
71111.18	Drawings	SK-ND-170051-3	CRD Pump Suction Modification	01
	Engineering Changes	601000004190	Modify Penetration for CRD Suction Line	0
		ECR 4190-01	CRD-3"-6B Penetration	1
	Procedures	3185	Anchor Control Record	12
		8053	Penetration Sealing and Visual Inspection	39
		8136-04	Secondary Containment Work Control Checklist	21
		QF1786	Temporary Facilities/Material Storage and Parking Authorization	1
Work Orders	700117891-0020	Replace Piping Segment Per ECR 601000004190	7	
71111.20	Drawings	P&ID M-115, NH36241	Nuclear Boiler Steam Supply System	91
	Procedures	0081	Control Rod Drive Scream Insertion Time Test	80
		0137-07A	Reactor Steam Supply Valves Leak Rate Testing	43
		0255-07-IA-2	Main Steam Isolation Valve Functional Checks Test	44
		Ops Man D.2-05	Underwater Vacuum Operation	36
		QF 1819	Foreign Material Recovery Plan	0
71111.24	Corrective Action Documents	501000070720	TIP 1-1 Stroke Time Out of Band	02/16/2023
		501000071206	SW-22-1 and SW-21-1 Failed Check Test	03/09/2023
	Procedures	0187-01A	Emergency Diesel Generator 11 / ESW 11 Comprehensive Pump and Valve Tests	56
		0255-02-III	SBLC Quarterly Pump and Valve Tests	69
		0255-05-IA-1-1	'A' RHRSW Quarterly Pump and Valve Tests	90

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
		0255-11-IIC-2	Emergency Service Water System Leakage Test-Loop B	9
		0255-11-III-4	14 ESW Quarterly Pump and Valve Tests	66, 67
		0255-18-IA	TIP Ball Valve Quarterly Exercise	22
		1399	ECCS Pump Motor Cooler Flush	12
		B.09.12-05 G4	Transfer of RPS Bus B Back to MG Set B	34
	Work Orders	700040571-0020	Replace Line Fuses (Breaker B3335)	0
		700072845-0040	CV-1728, PMT	4
		700099163-0020	P-202B/MTR, Swap Motor	5
		700099163-0050	12 RHR Pump Pre-Service Test	2
		700099163-0070	MT Replace Division 2 FSW Pipe	0
		700103969	Replace Division 2 FSW Pipe	1
		700114548-50	EFT Emergency Service Water Division 2 Parent	0
		700114960-0010	'A' RHRSW Quarterly Pump and Valve Tests	03/09/2023
71114.06	Miscellaneous	SEG# RQ-SS-191	RPV Flood	0
		Tabletop 22B	Loss of AC and DC Power	0
	Procedures	5790-102-02	Monticello Event Notification Form	47
		5790-102-02A	Monticello Event Notification Report Form Instructions	2
		A.2-807	Off-Site Dose Assessment Protective Action Recommendations	29
71151	Miscellaneous	QF0445	Unplanned Scrams per 7000 Critical Hours, Monthly Submission Forms (January - December 2022)	18
		QF0445	Unplanned Scrams/Complications, Monthly Submission Forms (January - December 2022)	18