



1717 Wakonah Drive
Weich, MN 55089

March 21, 2024

L-PI-24-001
10 CFR 50.73

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

Prairie Island Nuclear Generating Plant, Units 1 and 2
Docket Nos. 50-282 and 50-306
Renewed Facility Operating License Nos. DPR-42 and DPR-60

Prairie Island Nuclear Generating Plant Unit 1 Licensee Event Report 2023-001-01

Northern States Power Company, a Minnesota corporation, doing business as Xcel Energy (hereafter "NSPM"), hereby submits Licensee Event Report (LER) 50-282/2023-001-01 per 10 CFR 50.73(a)(2)(iv)(A). This report is a planned supplement to LER 2023-001-00 submitted on December 04, 2023 (ADAMS Accession number ML23338A277).

Summary of Commitments

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

A handwritten signature in black ink, appearing to read 'Timothy P. Borgen', written over a horizontal line.

Timothy P. Borgen
Plant Manager, Prairie Island Nuclear Generating Plant
Northern States Power Company – Minnesota

Enclosure

cc: Administrator, Region III, USNRC
Project Manager, Prairie Island, USNRC
Resident Inspector, Prairie Island, USNRC
State of Minnesota

ENCLOSURE

**PRAIRIE ISLAND NUCLEAR GENERATING PLANT
LICENSEE EVENT REPORT 50-282/2023-001-01**

4 pages follow



LICENSEE EVENT REPORT (LER)

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

(See NUREG-1022, R.3 for instruction and guidance for completing this form
<http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1022/r3/>)

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, Library, and Information Collections Branch (T-6 A10M), U. S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by email to Infocollections.Resource@nrc.gov, and the OMB reviewer at: OMB Office of Information and Regulatory Affairs, (3150-0104), Attn: Desk Officer for the Nuclear Regulatory Commission, 725 17th Street NW, Washington, DC 20503; email: omb_submission@omb.eop.gov. The NRC may not conduct or sponsor, and a person is not required to respond to, a collection of information unless the document requesting or requiring the collection displays a currently valid OMB control number.

1. Facility Name Prairie Island Nuclear Generating Plant, Unit 1	<input checked="" type="checkbox"/> 050	2. Docket Number -282	3. Page 1 OF 4
	<input type="checkbox"/> 052		

4. Title
Reactor trip, Auxiliary Feedwater and Emergency Service Water system actuation due to electrical transient in DC control power cables

5. Event Date			6. LER Number			7. Report Date			8. Other Facilities Involved		
Month	Day	Year	Year	Sequential Number	Revision No.	Month	Day	Year	Facility Name	<input type="checkbox"/> 050	Docket Number
10	19	2023	2023	001	01	03	21	2024	Prairie Island, Unit 2	<input checked="" type="checkbox"/>	-306
									Facility Name	<input type="checkbox"/> 052	Docket Number

9. Operating Mode 1	10. Power Level 100
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11. This Report is Submitted Pursuant to the Requirements of 10 CFR §: (Check all that apply)

<input checked="" type="checkbox"/> 10 CFR Part 20	<input type="checkbox"/> 20.2203(a)(2)(vi)	<input checked="" type="checkbox"/> 10 CFR Part 50	<input type="checkbox"/> 50.73(a)(2)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)	<input type="checkbox"/> 73.1200(a)
<input type="checkbox"/> 20.2201(b)	<input type="checkbox"/> 20.2203(a)(3)(i)	<input type="checkbox"/> 50.36(c)(1)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(ii)(B)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)	<input type="checkbox"/> 73.1200(b)
<input type="checkbox"/> 20.2201(d)	<input type="checkbox"/> 20.2203(a)(3)(ii)	<input type="checkbox"/> 50.36(c)(1)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(ix)(A)	<input type="checkbox"/> 73.1200(c)
<input type="checkbox"/> 20.2203(a)(1)	<input type="checkbox"/> 20.2203(a)(4)	<input type="checkbox"/> 50.36(c)(2)	<input checked="" type="checkbox"/> 50.73(a)(2)(iv)(A)	<input type="checkbox"/> 50.73(a)(2)(x)	<input type="checkbox"/> 73.1200(d)
<input type="checkbox"/> 20.2203(a)(2)(i)	<input checked="" type="checkbox"/> 10 CFR Part 21	<input type="checkbox"/> 50.46(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(v)(A)	<input checked="" type="checkbox"/> 10 CFR Part 73	<input type="checkbox"/> 73.1200(e)
<input type="checkbox"/> 20.2203(a)(2)(ii)	<input type="checkbox"/> 21.2(c)	<input type="checkbox"/> 50.69(g)	<input type="checkbox"/> 50.73(a)(2)(v)(B)	<input type="checkbox"/> 73.77(a)(1)	<input type="checkbox"/> 73.1200(f)
<input type="checkbox"/> 20.2203(a)(2)(iii)		<input type="checkbox"/> 50.73(a)(2)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(v)(C)	<input type="checkbox"/> 73.77(a)(2)(i)	<input type="checkbox"/> 73.1200(g)
<input type="checkbox"/> 20.2203(a)(2)(iv)		<input type="checkbox"/> 50.73(a)(2)(i)(B)	<input type="checkbox"/> 50.73(a)(2)(v)(D)	<input type="checkbox"/> 73.77(a)(2)(ii)	<input type="checkbox"/> 73.1200(h)
<input type="checkbox"/> 20.2203(a)(2)(v)		<input type="checkbox"/> 50.73(a)(2)(i)(C)	<input type="checkbox"/> 50.73(a)(2)(vii)		

OTHER (Specify here, in abstract, or NRC 366A).

12. Licensee Contact for this LER

Licensee Contact Nathan Fedora, Senior Nuclear Regulatory Engineer	Phone Number (Include area code) 612-342-8971
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13. Complete One Line for each Component Failure Described in this Report

Cause	System	Component	Manufacturer	Reportable to IRIS	Cause	System	Component	Manufacturer	Reportable to IRIS

14. Supplemental Report Expected

<input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes (If yes, complete 15. Expected Submission Date)	15. Expected Submission Date	Month	Day	Year
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16. Abstract (Limit to 1326 spaces, i.e., approximately 13 single-spaced typewritten lines)

At 11:10 on October 19, 2023, with Prairie Island Nuclear Generating Plant Unit 1 operating at 100 percent power in Mode 1, power operations, multiple substation breakers unexpectedly opened and multiple grounds were detected on DC control power cabling from the plant to the substation control house. This resulted in a Unit 1 Turbine Trip and subsequent Reactor Trip with a loss of all non-safety related busses and the actuation of Auxiliary Feedwater and Emergency Service Water. Operators responded to the event in accordance with approved procedures and safely placed the plant in Mode 3.

Horizontal directional drilling in progress at the site damaged DC control cables resulting in the identified plant response. This was caused by weakness in the Excavation Permit approval process as well as inadequate oversight of the personnel performing the work. DC cable replacement has been completed and multiple procedure changes have been initiated to address the identified gaps and prevent recurrence of this event.

There were no radiological impacts from the event. The health and safety of the public and site personnel were not impacted during this event. This event is reportable under 10 CFR 50.73(a)(2)(iv)(A) due to a Reactor Trip, a valid Auxiliary Feedwater actuation of Emergency Service Water system.



**LICENSEE EVENT REPORT (LER)
CONTINUATION SHEET**

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1. FACILITY NAME Prairie Island Nuclear Generating Plant, Unit 1	<input checked="" type="checkbox"/> 050	2. DOCKET NUMBER -282	3. LER NUMBER		
	<input type="checkbox"/> 052		YEAR 2023	SEQUENTIAL NUMBER 001	REV NO. 01

NARRATIVE

Plant Operating Conditions Prior to the Event:
Unit 1 - Mode 1, 100 percent Power
Unit 2 - Defueled

EVENT DESCRIPTION

At 11:10 on October 19, 2023, with Prairie Island Nuclear Generating Plant (PINGP) Unit 1 operating at 100 percent power and Unit 2 defueled in a scheduled refueling outage, multiple substation breakers, including the Unit 1 generator output breaker, unexpectedly opened causing a Unit 1 Turbine [TA] Trip and subsequent Reactor Trip. In addition, multiple grounds were detected on DC control cabling for both Units from the plant to the substation control house. The Turbine Trip caused 1M Main Transformer to become deenergized, which is the normal power supply to non-safety related (NSR) busses on Unit 1. 1R Auxiliary Transformer was also deenergized as a result of the event and therefore was not available for a Fast Bus Transfer, which resulted in a loss of all NSR busses on both Units.

The reactor trip resulted in Steam Generator Water Level (SGWL) in both Steam Generators rapidly shrinking to below the setpoint for an automatic start of both Auxiliary Feedwater (AFW)[BA] pumps. These pumps ensure that at least one Steam Generator contains enough water to serve as the heat sink for reactor decay heat and sensible heat removal following a reactor trip. Both the 11 Turbine Driven AFW Pump and 12 Motor Driven AFW Pump actuated upon reaching the automatic start setpoint for low SGWL.

The 121 Motor Driven Cooling Water Pump (MDCLP) auto started on low header pressure due to the loss of the NSR 11 Cooling Water (CL) Pump. The 121 MDCLP is designed to start automatically if CL header pressure drops to 80 pounds per square inch gauge (psig). The 121 MDCLP is a part of the PINGP Cooling Water (CL) System [BI]. The CL system is a ring header which is shared by Units 1 and 2 that provides a heat sink for the removal of process and operational heat from safety-related components during a design basis accident or transient.

At 14:15 on October 19, 2023, Event Notification (EN) # 56803 was reported to the NRC as a 4-hour Non-Emergency report under 10 CFR 50.72(b)(2)(iv)(B) actuation of the reactor protection system and 8-Hr Non-Emergency report under 10 CFR 50.72(b)(3)(iv)(A) for an Auxiliary Feedwater Actuation.

This event is reportable under 10 CFR 50.73(a)(2)(iv)(A) due to a trip of the Unit 1 reactor, a valid Pressurized Water Reactor (PWR) Auxiliary Feedwater actuation for Unit 1 and actuation of Emergency Service Water system (121 MDCLP for Unit 1 and Unit 2).

ASSESSMENT OF SAFETY CONSEQUENCES

All control rods were fully inserted into the core following the trip. All safety functions operated as designed. This event does not represent a safety system functional failure for Unit 1 or Unit 2.

AFW actuated as expected. The AFW System automatically supplied feedwater to the Steam Generators to remove decay heat from the Reactor Coolant System when SGWL shrunk after the reactor trip. Decay heat was removed by the Steam Generators through the Steam Generator Power Operated Relief Valves.

The auto start of 121 MDCLP did not challenge nuclear safety as the Cooling Water system responded as designed.



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Prior to the event, Spent Fuel Pool (SFP) cooling was being maintained with both trains operating. When Unit 1 tripped, the 121 SFP pump went offline, but cooling was still maintained with the 122 SFP pump. No impacts to the SFP temperature were observed.

There were no radiological impacts associated with this event. The health and safety of the public and site personnel were not impacted during this event.

CAUSE OF THE EVENT

As part of an ongoing project to replace one of the AC power cables between the substation and the plant, non-nuclear supplemental workers had been performing horizontal directional drilling (HDD) activities at PINGP for several days prior to this event. On the morning of October 19, 2023, the HDD crew began to bore a hole for the 5th conduit pull. At 11:10, the directional drilling equipment traveled through a DC cable bundle containing control cables, causing damage which resulted in the opening of multiple substation breakers in the switchyard [FK] leading to a Unit 1 Turbine Trip and subsequent Reactor Trip. This also resulted in a loss of all NSR busses on both Units and the actuation of Unit 1 AFW and 121 MDCLP.

The root cause of this human performance issue was weakness in the Excavation Permit approval process as well as the inadequate oversight of the non-nuclear supplemental workers performing HDD work.

Weaknesses were identified in the Excavation Permit approval process for the planned HDD work. Site personnel reviewing and approving the permit were not adequately intrusive to ensure that all interferences had been properly identified prior to approving the permit. Specifically, the use of Ground Penetrating Radar (GPR) had only been completed for some areas and had not been performed in the area that would have identified the interference with the DC cables.

Additionally, procedural weaknesses and poor communication between site departments allowed the HDD work to continue without a clear understanding of which site department was responsible for providing oversight to the HDD crew. This resulted in work progressing in the field without all controls in place that would be expected for work at a nuclear plant. Specifically, approved work plans were not always available at the work site and approved construction drawings for HDD work were not updated when changes were made in the field.

CORRECTIVE ACTIONS

The station has replaced the damaged DC control cables. The existing cables were abandoned in place. Equivalent conduits and cables were installed between the substation and plant.

To prevent similar events occurring in the future, multiple procedure changes have been initiated to address the gaps with the oversight of non-nuclear supplemental worker process and the Excavation Permit approval process.



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PREVIOUS SIMILAR EVENTS

On October 17, 2021, the PINGP 2RY Transformer was de-energized when operations personnel opened the 2RSY Reserve Auxiliary Transformer 34.5KV B Disconnect Switch instead of closing the 2RSX Reserve Auxiliary Transformer 34.5KV B Disconnect Switch during restoration of the 2RX Transformer in the substation. The de-energization of 2RY caused a loss of power to the Unit 2 4.16 KV Bus 23. This led to an auto-start of 121 Motor Driven Cooling Water Pump on a sensed low header pressure. The cause of the de-energization of 2RY was individual errors during hard match and concurrent verification. This was reported under LER 50-282/2021-002-00. Corrective actions for this event were revision to fleet standards to upgrade all substations switching activities to high risk to ensure supervisory oversight and appropriate barriers to reduce human error and preclude event. These corrective actions would not have prevented the incident that occurred in this LER.

On October 17, 2023, a substation breaker unexpectedly tripped open due to an incorrect trip switch being operated by non-nuclear supplemental workers. This caused a momentary loss of offsite power to safeguard Bus 16 until the safeguards load sequencer transferred the bus to the 1R transformer source. This incident occurred because the crew failed to verify the component being manipulated matched the component specified in the procedure. This event happened two days prior to event reported per this LER and not all corrective actions for this event had been implemented.

ADDITIONAL INFORMATION

All times are in Central Daylight Time.

Energy Industry Identification System (EIIS) codes are identified in the text as [XX].