Xcel Energy®

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July 18, 2023

L-PI-23-020
10 CFR 50.73

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

Prairie Island Nuclear Generating Plant Unit 2
Docket No. 50-306
Renewed Facility Operating License No DPR-60

Prairie Island Nuclear Generating Plant Licensee Event Report 2023-001-00

Northern States Power Company, a Minnesota corporation, doing business as Xcel Energy (hereafter "NSPM"), hereby submits Prairie Island Nuclear Generating Plant Unit 2 Licensee Event Report (LER) 50-306/2023-001-00 per 10 CFR 50.73(a)(2)(iv)(A).

Summary of Commitments

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

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 1
PRAIRIE ISLAND NUCLEAR GENERATING PLANT
LICENSEE EVENT REPORT 50-306/2023-001-00

3 pages follow

NRC FORM 366 (03-14-2023) | U.S. NUCLEAR REGULATORY COMMISSION | APPROVED BY OMB: NO. 3150-0104 | EXPIRES: 08/31/2023

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/)

1. Facility Name		2. Docket Number	3. Page
Prairie Island Nuclear Generating Plant, Unit 2	■ 050 ☐ 052	-306	1 OF 3

4. Title

2GT/XFMR lockout due to failure of lightning arrester caused Unit 2 Reactor Trip

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	☐ 050	Docket Number
05	27	2023	2023	- 001 -	00	07	18	2023	Facility Name	☐ 052	Docket Number

9. Operating Mode	10. Power Level
1	100

11. This Report is Submitted Pursuant to the Requirements of 10 CFR §: *(Check all that apply)*

10 CFR Part 20	☐ 20.2203(a)(2)(vi)	**10 CFR Part 50**	☐ 50.73(a)(2)(ii)(A)	☐ 50.73(a)(2)(viii)(A)	☐ 73.1200(a)
☐ 20.2201(b)	☐ 20.2203(a)(3)(i)	☐ 50.36(c)(1)(i)(A)	☐ 50.73(a)(2)(ii)(B)	☐ 50.73(a)(2)(viii)(B)	☐ 73.1200(b)
☐ 20.2201(d)	☐ 20.2203(a)(3)(ii)	☐ 50.36(c)(1)(ii)(A)	☐ 50.73(a)(2)(iii)	☐ 50.73(a)(2)(ix)(A)	☐ 73.1200(c)
☐ 20.2203(a)(1)	☐ 20.2203(a)(4)	☐ 50.36(c)(2)	☑ 50.73(a)(2)(iv)(A)	☐ 50.73(a)(2)(x)	☐ 73.1200(d)
☐ 20.2203(a)(2)(i)	**10 CFR Part 21**	☐ 50.46(a)(3)(ii)	☐ 50.73(a)(2)(v)(A)	**10 CFR Part 73**	☐ 73.1200(e)
☐ 20.2203(a)(2)(ii)	☐ 21.2(c)	☐ 50.69(g)	☐ 50.73(a)(2)(v)(B)	☐ 73.77(a)(1)	☐ 73.1200(f)
☐ 20.2203(a)(2)(iii)		☐ 50.73(a)(2)(i)(A)	☐ 50.73(a)(2)(v)(C)	☐ 73.77(a)(2)(i)	☐ 73.1200(g)
☐ 20.2203(a)(2)(iv)		☐ 50.73(a)(2)(i)(B)	☐ 50.73(a)(2)(v)(D)	☐ 73.77(a)(2)(ii)	☐ 73.1200(h)
☐ 20.2203(a)(2)(v)		☐ 50.73(a)(2)(i)(C)	☐ 50.73(a)(2)(vii)		

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

12. Licensee Contact for this LER

Licensee Contact	Phone Number (Include area code)
Nathan Fedora, Senior Nuclear Regulatory Engineer	612-342-8971

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
X	FC	LAR	ABB	Y						

14. Supplemental Report Expected		15. Expected Submission Date	Month	Day	Year
☑ No	☐ Yes (If yes, complete 15. Expected Submission Date)				

16. Abstract (Limit to 1326 spaces, i.e., approximately 13 single-spaced typewritten lines)

At 18:19 on May 27, 2023, with Prairie Island Nuclear Generating Plant Unit 2 operating at approximately 100% power and steady-state operation, Unit 2 Generator Transformer (2GT/XFMR) lockout occurred causing the turbine and subsequently reactor to trip. Operators responded to the event in accordance with approved procedures and safely placed the plant in Mode 3.

The direct cause of this event was the failure of the A-phase lightning arrester on 2GT/XFMR. The failed arrester was sent out for a failure analysis to be performed by a third-party laboratory.

May 27, 2023 at 19:20 Event Notification (EN) # 56543 was reported to the NRC as a 4-hour notification under 10 CFR 50.72(b)(2)(iv)(B) actuation of the reactor protection system and a Notification of Unusual Event. On May 28, 2023 at 00:45, updated EN # 56543 reported to the NRC for 8-Hr Non-Emergency report IAW 10 CFR 50.72(b)(3)(iv)(A) for an AFW Actuation.

This event is reportable under 10 CFR 50.73(a)(2)(iv)(A) due to a Reactor Trip and a valid Pressurized Water Reactor Auxiliary Feedwater actuation signal.

LICENSEE EVENT REPORT (LER) CONTINUATION SHEET

(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/)

APPROVED BY OMB: NO. 3150-0104 EXPIRES: 08/31/2023

1. FACILITY NAME		2. DOCKET NUMBER	3. LER NUMBER		
			YEAR	SEQUENTIAL NUMBER	REV NO.
Prairie Island Nuclear Generating Plant, Unit 2	■ 050 ☐ 052	-306	2023	- 001	- 00

NARRATIVE

EVENT DESCRIPTION

At 18:19 on May 27, 2023, with Prairie Island Nuclear Generating Plant (PINGP) Unit 2 operating at approximately 100% power and steady-state operation, Unit 2 Main Transformer (2GT/XFMR) [XFMR] lockout occurred causing the main turbine [TA] and subsequently reactor to trip and the actuation of auxiliary feedwater (AFW) [BA]. A Notification of Unusual Event was declared based on multiple fire alarms in the containment building that were not verified within 15 minutes. At 18:45, there was verification of no fire in the containment building. Termination of the Notification of Unusual Event occurred at 23:04.

This event was reported to the NRC on May 27, 2023 at 19:20 in Event Notification (EN) number 56543, as a 4-hour notification under 10 CFR 50.72(b)(2)(iv)(B) actuation of the reactor protection system. On May 28, 2023 at 00:45, updated EN# 56543 reported to the NRC for 8 Hr Non-Emergency report IAW 10 CFR 50.72(b)(3)(iv)(A) for an AFW Actuation.

An outplant operator was in the vicinity of the 2GT/XFMR at the time of the trip and noted a loud noise and smoke from the transformer. Visual inspection of A-phase lightning arrester [LAR] showed evidence of arcing present between the top and bottom stack. This was corroborated by security camera footage revealing a bright flash and ensuing smoke emanating from a 2GT/XFMR lightning arrester.

Troubleshooting determined the most likely cause of the 2GT/XFMR lockout to be failure of the A-phase lightning arrester. The failed lightning arrester shorted to ground causing a correct actuation of protective relaying, specifically instantaneous overcurrent and short to ground that led to the lockout of the 2GT/XFMR transformer.

This event is reportable under 10 CFR 50.73(a)(2)(iv)(A) due to a reactor trip and an AFW actuation signal.

Unit 1 was not affected during this event and remained at 100% power.

ASSESSMENT OF SAFETY CONSEQUENCES

Nuclear: Operations actions were taken as a part of the event response procedures and successfully restored power to all non-safeguard buses at 19:25 on May 27, 2023. Steam generator level was maintained throughout the event using the AFW system.

Radiological: No additional Radiological Risk.

Industrial: No additional Industrial Risk.

Environmental: No additional Environmental Risk.

The health and safety of the public and site personnel were not impacted during this event.

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Prairie Island Nuclear Generating Plant, Unit 2	■ 050 ☐ 052	-306	2023	- 001	- 00

NARRATIVE

CAUSE OF THE EVENT

The direct cause of 2GT/XFMR lockout and Unit 2 Reactor Trip was the failure of A-Phase lightning arrester on the 2GT/XFMR.

The cause of the A-Phase lightning arrester failure on 2GT/XFMR was that transformer maintenance procedures did not effectively implement the maintenance strategy for the transformer lightning arresters.

It was determined that all of the probable failure modes would be in line with the degraded watts loss testing results obtained and therefore should have been identified as part of the program trending and inspections under the transformer maintenance procedure.

CORRECTIVE ACTIONS

On June 1, 2023, work was completed to replace all three lightning arresters on 2GT/XFMR.

Various inspections were performed to ensure no equipment proximal to the A-phase arrester was damaged when it failed. This includes thermographic inspections, doble testing of GT high and low bushings, transformer windings, and lightning arresters, Gas-in-oil sampling of the 2GT/XFMR and visual inspection of the transmission lines feeding the transformer.

On June 2, 2023 at 02:25, Unit 2 entered Mode 1 and was placed online.

On June 22, 2023, the failed arrester was sent out for failure analysis to be performed by a third-party laboratory.

Changes to transformer maintenance procedures are being implemented to clarify and enhance the testing and review requirements for the lightning arresters and are documented in the corrective action program.

PREVIOUS SIMILAR EVENTS

No previous similar events have occurred at PINGP in the prior 3 years.

ADDITIONAL INFORMATION

All times are in Central Daylight Time

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