



August 23, 2011

L-PI-11-066  
10 CFR 50.73

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

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

LER 50-306/2011-003-00, Unit 2 Offsite Power Sources Declared Inoperable As A  
Consequence of the Loss of the 2RY Transformer Bus Duct

Northern States Power Company, a Minnesota corporation (NSPM), doing business as Xcel Energy, herewith encloses Licensee Event Report (LER) 50-306/2011-003-00.

On June 27, 2011, the off-site AC power sources to Unit 2 Prairie Island Nuclear Generating Plant (PINGP) were declared inoperable as a result of Transformer 2RY lockout and less than the required minimum voltage on the transmission system. The paths to the transmission system was declared inoperable. Although inoperable, transmission system sources remained connected to Unit 2; emergency diesel generators were available but not required to run.

The overcurrent ground detection relay actuated due to a bus phase to ground fault resulting from failed gasket material resulting in the Transformer lockout. It was determined that a less than adequate review of the Preventive Maintenance (PM) Deferral Process delayed the bus duct inspections that would have likely identified and corrected the deficient gasket material.

Summary of Commitments

This letter contains no new commitments and no changes to existing commitments.

Mark A. Schimmel  
Site Vice President, Prairie Island Nuclear Generating Plant  
Northern States Power Company - Minnesota

Enclosure

cc: Administrator, Region III, USNRC  
Project Manager, Prairie Island Nuclear Generating Plant (PINGP), USNRC  
Resident Inspector, PINGP, USNRC  
Department of Commerce, State of Minnesota

**ENCLOSURE**

**LICENSEE EVENT REPORT 50-306/2011-003-00**

**4 Pages Follow**

**LICENSEE EVENT REPORT (LER)**(See reverse for required number of  
digits/characters for each block)

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 Records and FOIA/Privacy Service Branch (T-5 F53), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by Internet e-mail to [infocollects.resource@nrc.gov](mailto:infocollects.resource@nrc.gov), and to the Desk Officer, Office of Information and Regulatory Affairs, NEOF-10202, (3150-0066), 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.

**1. FACILITY NAME**

Prairie Island Nuclear Generating Plant Unit 2

**2. DOCKET NUMBER**

05000 306

**3. PAGE**

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**4. TITLE**

Unit 2 Offsite Power Sources Declared Inoperable As A Consequence of the Loss of the 2RY Transformer Bus Duct

**5. EVENT DATE**

MONTH	DAY	YEAR
06	27	2011

**6. LER NUMBER**

YEAR	SEQUENTIAL NUMBER	REV NO
2011	003	00

**7. REPORT DATE**

MONTH	DAY	YEAR
08	23	2011

**8. OTHER FACILITIES INVOLVED**

FACILITY NAME	DOCKET NUMBER
FACILITY NAME	DOCKET NUMBER

**9. OPERATING MODE**

Mode 1

**10. POWER LEVEL**

100%

**11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply)**

- |                                             |                                             |                                                       |                                               |
|---------------------------------------------|---------------------------------------------|-------------------------------------------------------|-----------------------------------------------|
| <input type="checkbox"/> 20.2201(b)         | <input type="checkbox"/> 20.2203(a)(3)(i)   | <input type="checkbox"/> 50.73(a)(2)(i)(C)            | <input type="checkbox"/> 50.73(a)(2)(vii)     |
| <input type="checkbox"/> 20.2201(d)         | <input type="checkbox"/> 20.2203(a)(3)(ii)  | <input type="checkbox"/> 50.73(a)(2)(ii)(A)           | <input type="checkbox"/> 50.73(a)(2)(viii)(A) |
| <input type="checkbox"/> 20.2203(a)(1)      | <input type="checkbox"/> 20.2203(a)(4)      | <input type="checkbox"/> 50.73(a)(2)(ii)(B)           | <input type="checkbox"/> 50.73(a)(2)(viii)(B) |
| <input type="checkbox"/> 20.2203(a)(2)(i)   | <input type="checkbox"/> 50.36(c)(1)(i)(A)  | <input type="checkbox"/> 50.73(a)(2)(iii)             | <input type="checkbox"/> 50.73(a)(2)(ix)(A)   |
| <input type="checkbox"/> 20.2203(a)(2)(ii)  | <input type="checkbox"/> 50.36(c)(1)(ii)(A) | <input type="checkbox"/> 50.73(a)(2)(iv)(A)           | <input type="checkbox"/> 50.73(a)(2)(x)       |
| <input type="checkbox"/> 20.2203(a)(2)(iii) | <input type="checkbox"/> 50.36(c)(2)        | <input type="checkbox"/> 50.73(a)(2)(v)(A)            | <input type="checkbox"/> 73.71(a)(4)          |
| <input type="checkbox"/> 20.2203(a)(2)(iv)  | <input type="checkbox"/> 50.46(a)(3)(ii)    | <input type="checkbox"/> 50.73(a)(2)(v)(B)            | <input type="checkbox"/> 73.71(a)(5)          |
| <input type="checkbox"/> 20.2203(a)(2)(v)   | <input type="checkbox"/> 50.73(a)(2)(i)(A)  | <input type="checkbox"/> 50.73(a)(2)(v)(C)            | <input type="checkbox"/> OTHER                |
| <input type="checkbox"/> 20.2203(a)(2)(vi)  | <input type="checkbox"/> 50.73(a)(2)(i)(B)  | <input checked="" type="checkbox"/> 50.73(a)(2)(v)(D) |                                               |
- Specify in Abstract below or in NRC Form 366A

**12. LICENSEE CONTACT FOR THIS LER**

NAME Sam J. DiPasquale, P.E.	TELEPHONE NUMBER (Include Area Code) 651.388.1121 x7350
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**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
A	FK	BU	0000	Y					

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

MONTH	DAY	YEAR

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

On June 27, 2011, the off-site AC power sources to Unit 2 Prairie Island Nuclear Generating Plant (PINGP) were declared inoperable as a result of Transformer 2RY lockout and less than the required minimum voltage on the transmission system. The paths to the transmission system was declared inoperable. Although inoperable, transmission system sources remained connected to Unit 2; emergency diesel generators were available but not required to run.

The overcurrent ground detection relay actuated due to a bus phase to ground fault resulting from failed gasket material resulting in the Transformer lockout. It was determined that a less than adequate review of the Preventive Maintenance (PM) Deferral Process delayed the bus duct inspections that would have likely identified and corrected the deficient gasket material.

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**EVENT DESCRIPTION**

For PINGP Unit 2, there are four possible paths between the offsite transmission system and the Safeguard 4160V buses<sup>1</sup>. Each path is capable of providing the required power to shutdown the reactor and maintain it in a shutdown condition.

At 13:10 CDT on June 27, 2011, Transformer 2RY was locked out. The lockout of the 2RY Transformer<sup>2</sup> occurred when the 51G/2RY Transformer ground detection relay<sup>3</sup> actuated. The actuation of the relay was caused by a 2RY bus phase to ground fault. PINGP Unit 2 entered Technical Specification (TS) 3.8.1, Condition A and a single path to the transmission system<sup>4</sup>.

At 13:44 CDT, the site was notified by transmission systems operator (TSO) that the 345 KV grid voltage could not be maintained at the minimum voltage required per the Electrical Power System Security Analysis procedure (C20.3). The path to the transmission system was declared inoperable and Unit 2 entered Technical Specification 3.8.1, Condition C. Although inoperable, transmission system sources remained connected to Unit 2; emergency diesel generators<sup>5</sup> were available but not required to run..

By securing a cooling tower pump and fans<sup>6</sup>, the required minimum transmission system voltage was met and determined to be sustainable. TS 3.8.1, Condition C, was exited on June 28, 2011 at 00:38 CDT.

On July 2, 2011 a visual inspection discovered that the lower exterior vertical section of the secondary 2RY bus duct<sup>7</sup> had a hole. The bus duct was repaired and returned to service on July 23, 2011.

**EVENT ANALYSIS**

Initial troubleshooting focused on the cause of the 51G/2RY relay actuation. The 2RY transformer and bus duct were separated and tested. On July 2, 2011 a visual inspection discovered that the lower exterior vertical section of the bus duct had a hole with evidence of an electrical fault around it. It was determined that the secondary bus ducts are susceptible to moisture intrusion due to their location outdoors and exposure to moisture and rain. The bus duct design includes removable panels and expansion joints that are sealed by gasketing material.

<sup>1</sup> EIIS System Code EB

<sup>2</sup> EIIS Component Identifier: XFMR

<sup>3</sup> EIIS Component Identifier: RLY

<sup>4</sup> EIIS System Code: FK

<sup>5</sup> EIIS Component Identifier: EK

<sup>6</sup> EIIS System Code: BS

<sup>7</sup> EIIS Component Identifier: BU

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The 2RY bus duct maintenance timeline was reviewed and the following was determined:

- 2/02 Bus duct 2R-YS/3000BD was inspected in February 2002 and no issues were found. The next performance of the bus duct inspection was due on 11/17/08 with a late date of 5/19/10.
- 3/16/10 Outage Scope change Request Scope Control (QF-1118) request # 181 filled out to add Preventive Maintenance (PM) task to 2R26 (Unit 2 refueling outage, Cycle 26).
- 3/29/10 QF-1118 form request # 181 was rejected due to the fact the work could be performed online.
- 3/31/10 A PM Change Request (PMCR) was generated to defer PM Task (PMRQ). Deferral requested until 12/31/10.
- 4/01/10 A General Note was added by the PM Coordinator to the PMCR stating verbal approval had been received from the engineering manager to defer maintenance until 12/31/10. A Corrective Action Request (CAP) was written to document the deferral of a PM without using the risk identification form (QF0922).
- 12/01/10 General Note added by system engineer to the PMCR stating "Deferral of this PMRQ can go to the end of 2011."
- 12/03/10 General Note added by PM Coordinator to the PMCR stating per the system engineer deferral had been extended to the end of 2011.
- 5/02/11 A PMCR was assigned to the system engineer requesting a PMRQ deferral.
- 5/19/11 PMCR deferral form (QF-0922) completed by system engineer.

It was determined that the 2RY secondary bus duct ground faulted due to a failed gasket on the expansion joint of the 2RY bus duct. The failed gasket allowed moisture intrusion into the bus duct which created a path for the electrical fault to occur. After additional analysis, it was determined that this condition was a safety system function failure for Unit 2 and reportable under 10 CFR 50.73(a)(2)(v)(D).

**SAFETY SIGNIFICANCE**

This event did reduce the nuclear safety margin, however, the transmission system sources remained connected to Unit 2 (even though they were declared inoperable). In addition, the emergency diesel generators were available but not required to run. By taking appropriate measures, PINGP was able to exit TS 3.8.1, Condition C (Two paths inoperable) in a timely manner. Therefore there were no

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radiological, environmental, or industrial impacts associated with this event and it did not affect the health and safety of the public.

CAUSE

The causal evaluation determined that a less than adequate review of the PM Deferral Process delayed the bus duct inspections that would have likely identified and corrected the deficient gasket material.

CORRECTIVE ACTION

Management will reinforce the Preventative Maintenance (PM) process of procedure adherence to the Preventative Maintenance Program procedure (FP-PE-PM-01). PM deferral decisions will be made with the proper risk information which is solicited by performing the risk assessment form QF-0922.

Bus duct inspections will be performed under currently planned work orders and scheduling future inspections per the maintenance frequency will alleviate maintenance issues.

The outdoor bus duct maintenance procedures will be modified to require the replacement of all inspection cover and expansion joint gasketing.

PREVIOUS SIMILAR EVENTS

A LER search was conducted and no similar events involving age-related failures of bus duct gaskets were identified in the last three years at PINGP. However, in November 2001, the 2RX transformer bus duct failed due to the presence of moisture inside the bus duct.