



Prairie Island Nuclear Generating Plant  
1717 Wakonade Drive East  
Welch, MN 55089

JUN 22 2016

L-PI-16-053  
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 No. 50-306  
Renewed Facility Operating License No. DPR-60

Revised Licensee Event Report 50-306/2015-002-01, 21 Feedwater Pump Lockout,  
Unit 2 Reactor Trip Due to Pressure Switch Failure

Reference: 1. K. Davison, NSPM, letter to USNRC Document Control, Licensee Event Report (LER) 50-306/2015-002-00, 21 Feedwater Pump Lockout, Unit 2 Reactor Trip Due to Pressure Switch Failure, dated 6/1/2015 (ADAMS Access Number ML15152A400).

Northern States Power Company, a Minnesota corporation, doing business as Xcel Energy (hereafter "NSPM"), encloses revised LER 50-306/2015-002-01, 21 Feedwater Pump Lockout, Unit 2 Reactor Trip Due to Pressure Switch Failure. NSPM has determined that the failure of the pressure switch was due to suction flow pressure oscillations and not due to age-related degradation. Therefore, NSPM deletes the corrective action in the original LER (Reference 1) to revise the replacement frequency of the pressure switch to address age-related degradation. The corrective action cited in Reference 1 to install snubbers on the feedwater pump pressure switches to reduce the likelihood of failure due to suction flow pressure oscillations is complete.

If there is any question or if additional information is needed, please contact Dr. Glenn A. Carlson, P.E., at 651-267-1755.

Summary of Commitments

This letter contains no new commitment and no revision to an existing commitment.

Scott Northard  
Acting Site Vice President, Prairie Island Nuclear Generating Plant  
Northern States Power Company - Minnesota

Enclosure (1)

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

**ENCLOSURE 1**

**LICENSEE EVENT REPORT 50-306/2015-002-01**

3 pages follow



## LICENSEE EVENT REPORT (LER)

(See Page 2 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 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.

<b>1. FACILITY NAME</b> Prairie Island Nuclear Generating Plant Unit 2	<b>2. DOCKET NUMBER</b> 05000 306	<b>3. PAGE</b> 1 OF 3
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**4. TITLE**

21 Feedwater Pump Lockout, Unit 2 Reactor Trip Due to Pressure Switch Failure

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
4	3	2015	2015	002	01	6	22	2016		05000
									FACILITY NAME	DOCKET NUMBER
										05000

<b>9. OPERATING MODE</b>	<b>11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply)</b>			
MODE 1	<input type="checkbox"/> 20.2201(b)	<input type="checkbox"/> 20.2203(a)(3)(i)	<input type="checkbox"/> 50.73(a)(2)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)
	<input type="checkbox"/> 20.2201(d)	<input type="checkbox"/> 20.2203(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(ii)(B)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)
	<input type="checkbox"/> 20.2203(a)(1)	<input type="checkbox"/> 20.2203(a)(4)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(ix)(A)
	<input type="checkbox"/> 20.2203(a)(2)(i)	<input type="checkbox"/> 50.36(c)(1)(i)(A)	<input checked="" type="checkbox"/> 50.73(a)(2)(iv)(A)	<input type="checkbox"/> 50.73(a)(2)(x)
10. POWER LEVEL  100%	<input type="checkbox"/> 20.2203(a)(2)(ii)	<input type="checkbox"/> 50.36(c)(1)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(v)(A)	<input type="checkbox"/> 73.71(a)(4)
	<input type="checkbox"/> 20.2203(a)(2)(iii)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(v)(B)	<input type="checkbox"/> 73.71(a)(5)
	<input type="checkbox"/> 20.2203(a)(2)(iv)	<input type="checkbox"/> 50.46(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(v)(C)	<input type="checkbox"/> 73.77(a)(1)
	<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)(D)	<input type="checkbox"/> 73.77(a)(2)(i)
	<input type="checkbox"/> 20.2203(a)(2)(vi)	<input type="checkbox"/> 50.73(a)(2)(i)(B)	<input type="checkbox"/> 50.73(a)(2)(vii)	<input type="checkbox"/> 73.77(a)(2)(ii)
		<input type="checkbox"/> 50.73(a)(2)(i)(C)	<input type="checkbox"/> OTHER	Specify in Abstract below or in NRC Form 366A

**12. LICENSEE CONTACT FOR THIS LER**

LICENSEE CONTACT

Glenn A. Carlson

TELEPHONE NUMBER (Include Area Code)

651-267-1755

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

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX

**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 April 3, 2015, Prairie Island Nuclear Generating Plant (PINGP) Unit 2 was operating at 100 percent power, when at 0652 CDT, an unexpected annunciator, 47510-0104 21 FEEDWATER PUMP LOCKED OUT was received. The reactor was manually tripped as required by the annunciator response procedure. This also resulted in a turbine trip as designed. The Operations crew entered the reactor trip emergency operating procedures and stabilized the unit in Mode 3, at normal operating pressure and temperature. All control rods fully inserted into the core following the trip. The Auxiliary Feedwater Pumps actuated as designed on low narrow range steam generator level. Steam Generator levels were returned to normal.

This event is reportable under 10 CFR 50.72(b)(2)(iv)(B), any event or condition that results in actuation of the reactor protection system (RPS) when the reactor is critical except when the actuation results from and is part of a pre-planned sequence during testing or reactor operation, and 10 CFR 50.72(b)(3)(iv)(A), any event or condition that results in valid actuation of any of the systems listed in paragraph 10 CFR 50.72(b)(3)(iv)(B)(6), PWR auxiliary or emergency Feedwater system.

The cause evaluation determined that the event was caused by pressure fluctuation within the system which resulted in the bourdon tube movement at a high frequency causing wear of the internal components of the pressure switch. Corrective actions: Pressure Switch (PS-16012) was replaced immediately on April 3, 2015, and to install snubbers to reduce process flow fluctuations experienced by Feedwater Pump pressure switches.

NRC FORM 366A  
(11-2015)

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB: NO. 3150-0104

EXPIRES: 10/31/2018



## LICENSEE EVENT REPORT (LER) CONTINUATION SHEET

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 [Infocollect.Resource@nrc.gov](mailto:Infocollect.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.

1. FACILITY NAME	2. DOCKET NUMBER	3. LER NUMBER		
Prairie Island Nuclear Generating Plant Unit 2	05000- <div style="border: 1px solid black; width: 100px; height: 30px; margin: 5px auto; text-align: center;">306</div>	YEAR <div style="border: 1px solid black; width: 40px; height: 30px; margin: 5px auto; text-align: center;">2015</div>	SEQUENTIAL NUMBER <div style="border: 1px solid black; width: 60px; height: 30px; margin: 5px auto; text-align: center;">002</div>	REV NO. <div style="border: 1px solid black; width: 40px; height: 30px; margin: 5px auto; text-align: center;">01</div>

### NARRATIVE

On April 3, 2015, at 0652 CDT, the Unit 2 reactor was manually tripped while operating at 100 percent power, due to a lockout trip of 21 Main Feedwater Pump (245-261) as required by the Annunciator Response Procedure (ARP 47510-01 04) for the lockout alarm. This also resulted in a turbine trip as designed. The Operations crew entered the reactor trip emergency operating procedures and stabilized the unit in Mode 3 at normal operating pressure and temperature. All control rods fully inserted into the core following the trip. The Auxiliary Feedwater System (EIS System Code - BA) actuated to start the Auxiliary Feedwater Pumps as designed on low narrow range Steam Generator level and provided makeup flow to the Steam Generator. Steam Generator levels were returned to normal. The Auxiliary Feedwater Pumps were subsequently secured and returned to automatic. Steam Generators were being supplied by 22 Main Feedwater Pump and decay heat was removed by the condenser steam dump system. This event was entered into the Corrective Action Program (AR 01472846).

This event is reportable under 10 CFR 50.72(b)(2)(iv)(B), any event or condition that results in actuation of the reactor protection system (RPS) when the reactor is critical except when the actuation results from and is part of a pre-planned sequence during testing or reactor operation, and 10 CFR 50.72(b)(3)(iv)(A), any event or condition that results in valid actuation of any of the systems listed in paragraph 10 CFR 50.72(b)(3)(iv)(B)(6), PWR auxiliary or emergency Feedwater system.

### EVENT ANALYSIS

The PS-16012 was identified as a Mercoid, Model DSW-7223-153S1-10S pressure switch. A failure analysis was performed of the failed switch. The switch was disassembled and observations were made of the internal components. The results of this evaluation concluded that a C-clip that secures the linkage connecting the bourdon tube to the switch mechanism had fallen off the pin allowing the linkage to become disconnected from the switch mechanism. Wear was observed on the pin at the interface of the C-clip to the pin. The wear on the pin connected to the intermediate linkage was the cause for the switch failure.

There were no complications during the shutdown as all control rods fully inserted and Reactor Pressure Vessel pressure was maintained by normal means. All systems actuated as required. The Auxiliary Feedwater Pumps actuated as designed on low Steam Generator level. This is reportable under 10 CFR 50.73(a)(2)(iv)(A), any event or condition that results in manual or automatic actuation of any of the systems listed in paragraph 10 CFR 50.73(a)(2)(iv)(B)(1), RPS including: reactor scram or reactor trip, and in paragraph 10 CFR 50.73(a)(2)(iv)(B)(6), PWR auxiliary or emergency Feedwater system.

### SAFETY SIGNIFICANCE

This event did not challenge nuclear safety as all plant systems responded as designed. The reactor was manually tripped in accordance with the annunciator response procedure. There were no radiological, environmental, or industrial impacts associated with this event and PINGP did not affect the health and safety of the public.

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Prairie Island Nuclear Generating Plant Unit 2	05000- 306	YEAR 2015	SEQUENTIAL NUMBER 002	REV NO. 01

### NARRATIVE

#### CAUSE

The causal evaluation determined that pressure fluctuation within the system is resulting in the bourdon tube movement at a high frequency causing wear of the internal components of the pressure switch.

#### CORRECTIVE ACTION

- Immediate action to replace Pressure Switch PS-16012 per Work Order (WO) 00519920-01. Complete.
- Implement interim action monitoring plan for all Feedwater Pump suction pressure switches. Complete.
- Install pressure snubbers on the four Feedwater Pump suction pressure switches. Complete.
- [deleted]

#### PREVIOUS SIMILAR EVENTS

A LER historical search was conducted and no similar LER events at PINGP with the same apparent cause were identified in the last three years.