Xcel Energy®

July 16, 2010

L-PI-10-071
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
License No. DPR-60

LER 50-306/2010-002-00, Unit 2 Turbine Shutdown Due To the Loss of a Main Feed Water Pump That Resulted in a Reactor Scram

Northern States Power Company, a Minnesota corporation (NSPM), doing business as Xcel Energy, herewith encloses Licensee Event Report (LER) 50-306/2010-002-00.

On May 25, 2010, Prairie Island Nuclear Generating Plant's (PINGP) Unit 2 Reactor was increasing power following the 2R26 Refueling Outage. At approximately 32% power the turbine automatically tripped due to a trip of the 21 Main Feed Water Pump (FWP). The turbine trip resulted in an automatic Unit 2 Reactor trip. The 21 FWP trip was due to the failure of the FWP suction pressure switch.

Summary of Commitments

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

Brad J. Sawatzke
Director Site Operations, 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
Department of Commerce, State of Minnesota

1717 Wakonade Drive East • Welch, Minnesota 55089-9642
Telephone: 651.388.1121

ENCLOSURE

LICENSEE EVENT REPORT 50-306/2010-002-00

3 Pages Follow

NRC FORM 366 (9-2007) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB NO. 3150-0104 EXPIRES: 08/31/2010

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 F52), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to infocollects@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-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.

LICENSEE EVENT REPORT (LER)

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

1. FACILITY NAME	2. DOCKET NUMBER	3. PAGE
Prairie Island Nuclear Generating Plant Unit 2	05000306	1 of 3

4. TITLE

Unit 2 Turbine Shutdown Due To the Loss of a Main Feed Water Pump That Resulted in a Reactor Scram

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
05	25	2010	2010	– 002 –	00	07	16	2010	FACILITY NAME	DOCKET NUMBER

9. OPERATING MODE

Mode 1

10. POWER LEVEL

32%

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

☐ 20.2201(b)	☐ 20.2203(a)(3)(i)	☐ 50.73(a)(2)(i)(C)	☐ 50.73(a)(2)(vii)
☐ 20.2201(d)	☐ 20.2203(a)(3)(ii)	☐ 50.73(a)(2)(ii)(A)	☐ 50.73(a)(2)(viii)(A)
☐ 20.2203(a)(1)	☐ 20.2203(a)(4)	☐ 50.73(a)(2)(ii)(B)	☐ 50.73(a)(2)(viii)(B)
☐ 20.2203(a)(2)(i)	☐ 50.36(c)(1)(i)(A)	☐ 50.73(a)(2)(iii)	☐ 50.73(a)(2)(ix)(A)
☐ 20.2203(a)(2)(ii)	☐ 50.36(c)(1)(ii)(A)	☑ 50.73(a)(2)(iv)(A)	☐ 50.73(a)(2)(x)
☐ 20.2203(a)(2)(iii)	☐ 50.36(c)(2)	☐ 50.73(a)(2)(v)(A)	☐ 73.71(a)(4)
☐ 20.2203(a)(2)(iv)	☐ 50.46(a)(3)(ii)	☐ 50.73(a)(2)(v)(B)	☐ 73.71(a)(5)
☐ 20.2203(a)(2)(v)	☐ 50.73(a)(2)(i)(A)	☐ 50.73(a)(2)(v)(C)	☐ OTHER
☐ 20.2203(a)(2)(vi)	☐ 50.73(a)(2)(i)(B)	☐ 50.73(a)(2)(v)(D)	Specify in Abstract below or in NRC Form 366A

12. LICENSEE CONTACT FOR THIS LER

NAME	TELEPHONE NUMBER (Include Area Code)
Sam J DiPasquale, P.E.	651.388.1121 x7350

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
X	SK	PS	M235	Y					

14. SUPPLEMENTAL REPORT EXPECTED	15. EXPECTED SUBMISSION DATE	MONTH	DAY	YEAR
○ YES (If yes, complete 15. EXPECTED SUBMISSION DATE). ⊙ NO				

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

On May 25, 2010, Prairie Island Nuclear Generating Plant's (PINGP) Unit 2 Reactor was increasing power following the 2R26 Refueling Outage. At approximately 32% power the turbine automatically tripped due to a trip of the 21 Main Feed Water Pump (FWP). The turbine trip resulted in an automatic Unit 2 Reactor trip. The 21 FWP trip was due to the failure of the FWP suction pressure switch.

The steam plant and reactor protection system responded as expected to the initial event. After the reactor trip, operators responded utilizing emergency operating procedures for reactor trip and reactor trip recovery and transitioned into a normal shutdown procedure.

EVENT DESCRIPTION

On 5/25/2010, Prairie Island Nuclear Generating Plant's (PINGP) Unit 2 Reactor was increasing power following the 2R26 Refueling Outage. At approximately 32% power, the turbine[1] automatically tripped due to a trip of the 21 Main Feed Water Pump[2] (FWP). The turbine trip resulted in an automatic Unit 2 Reactor trip.

The steam plant and reactor protection system[3] responded as expected to the initial event. It was initially reported that the positive displacement charging pump[4] had a relief valve that lifted and failed to close. After investigation, Operations determined that the relief valve functioned as expected. The operating crew responded to the reactor trip utilizing emergency operation procedures for reactor trip and reactor trip recovery and transitioned into a normal shutdown procedure

The 21 FWP trip was due to the failure of the FWP suction pressure switch (PS-16012, 21 FW PMP SUCT PS). The subsequent investigation determined that on 5/25/2010 at approximately 03:14 the internal switch linkage pin for PS-16012 became disconnected from its bourdon tube. The pressure switch internal set point limit switch spring returned the limit switch contacts to their de-pressurized position closing contacts for a 21 FWP trip. The FWP trip, coincident with 22 FWP not running (due to the power level), initiated a turbine trip. Per plant design, a turbine trip that occured above 10% power automatically caused a reactor trip.

EVENT ANALYSIS

The PS-16012 switch had been installed since 12/3/1971. PS-16012 was identified as a Mercoid Model 7223-153S1 pressure switch. On 4/30/2010, the switch trip setpoint was found out of tolerance. The switch was recalibrated and verified to operate repeatedly. A detailed internal inspection of the pressure switch was not required as part of the calibration procedure. Action to replace the switch was initiated but not completed since a replacement switch was not in inventory. The switch replacement was deferred to the next refueling outage.

At the time of the turbine trip, condensate pressure was decreasing due to power escalation. This led to some relaxation of tension between the pin attached to the switch mechanism and the hole in the tab on the bourdon tube. This allowed the pin (no longer secured with the e-clip) to fall out of the tab on the bourdon tube. The pressure switch internal set point limit switch spring returned the limit switch contacts to their de-pressurized position that closed contacts for a 21 FWP trip.

An e-clip was found in the bottom of the PS-16012 switch enclosure during troubleshooting following the trip. Due to age of the switch this clip most likely fell off prior to the trip. The bourdon tube

---

[1] EIIS System Code: TA
[2] EIIS System Code: SK
[3] EIIS System Code: JC
[4] EIIS System Code: CB

linkage likely worked its way off of the mating linkage pin as the pressure switch was exercised for calibration and as condensate pressure varied as part of the start-up procedure.

This event is reportable in accordance with 10 CFR 50.73(a)(2)(iv)(A) because of the automatic reactor scram while critical. The FWPs have no active safety function. Therefore, this event does not represent a safety system functional failure for Unit 2.

SAFETY SIGNIFICANCE

The operating crew responded to the reactor trip utilizing emergency operating procedures for reactor trip and reactor trip recovery and transitioned into normal shutdown procedures. Therefore, this event did not affect the health and safety of the public.

CAUSE

The causal evaluation determined that the cause of the event was that PS-16012 experienced an age related failure since preventive maintenance does not periodically replace the pressure switch.

CORRECTIVE ACTION

- PS-16012 was replaced per Work Order (WO) 00404674.
- An extent of condition was performed and a Corrective Action to Prevent Recurrence (CAPR) to approve periodic Preventive Maintenance Changes to replace the 12 Mercoid Model 7223 pressure switches that provide safety related actuations, power generation related functions and have an impact on reactivity control systems was created.

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.