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July 2, 2010

L-PI-10-066
10 CFR 50.73

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

Prairie Island Nuclear Generating Plant Units 1 and 2
Dockets 50-282 and 50-306
License Nos. DPR-42 and DPR-60

LER 50-282/2010-001-01, Unanalyzed Condition Due to Postulated High Energy Line Break On Cooling Water System, Supplement 1

Northern States Power Company, a Minnesota corporation (NSPM), doing business as Xcel Energy, herewith encloses Licensee Event Report (LER) 50-282/2010-001-01. The results of the causal evaluation for the reported condition are included.

Summary of Commitments

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

for M. Schimmel

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, USNRC
Resident Inspector, Prairie Island, USNRC
Department of Commerce, State of Minnesota

ENCLOSURE

LICENSEE EVENT REPORT 50-282/2010-001-01

4 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 1	05000282	1 of 4

4. TITLE

Unanalyzed Condition Due to Postulated High Energy Line Break On Cooling Water System

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
03	05	2010	2010	– 001 –	01	07	02	2010	Prairie Island Unit 2	05000306
									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)*

☐ 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)
Kathryn Mews	651.388.1121 x7384

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

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 March 5, 2010, Prairie Island Nuclear Generating Plant (PINGP) Unit 1 and Unit 2 were at 100% power. PINGP staff determined that in the event of a postulated high energy line break (HELB) event with a concurrent loss of offsite power (LOOP) and a single active failure of a cooling water (CL) pump without a corresponding safety injection (SI) signal, the CL system might not provide sufficient water to required cooling loads until after the turbine building cooling loads were isolated.

The condition was determined to be reportable while investigating licensing conditions associated with a HELB. Inadequate management of HELB analyses impaired the station's ability to discover additional potential legacy vulnerabilities in a timely manner. Procedural changes have been made to ensure that the current configuration of two OPERABLE and one additional FUNCTIONAL safeguards cooling water pumps is maintained. In addition, a design basis document will be developed for the HELB program.

EVENT DESCRIPTION

The Prairie Island Nuclear Generating Plant's (PINGP) Cooling Water (CL) System[1] consists of a shared system common to both units. The CL system provides a heat sink for the removal of process and operating heat from safety related components during a Design Basis Accident (DBA) or transient. The CL system consists of a common CL pump discharge header for the five CL (2 nonsafeguards, 2 safeguards, and 1 that can be designated as safeguards or nonsafeguards) pumps that direct flow into two separate, 100% capacity, CL headers. Each header then supplies loops in the Turbine Building (TB), Auxiliary Building (AB) and Containments for the two units. Normally, three safeguards pumps were maintained available.

A high energy line break (HELB) can cause consequential failure of adjacent piping such as cooling water lines. For a postulated HELB event, any consequential failures due to the HELB must be assumed along with a loss of offsite power (LOOP) and the most-limiting single failure. The most-limiting single failure for a HELB event is dependent on the system or component being evaluated.

For evaluations of the CL system, the most-limiting single failure would be the failure that most challenges the ability of the system to perform its mitigating functions. Given that the CL system is typically not required to change state (i.e., split headers, isolate loads, etc.) in a HELB event due to the lack of a safety injection[2] (SI) signal, the most limiting single-failure for the system would be the failure that results in the least flow to the required mitigating equipment.

Most required components in the CL system are arranged in parallel such that a failure of one component will not adversely affect the flow in the system. The remaining active components required to operate in a HELB event are the safeguards CL pumps. If only two safeguards CL pumps were available and the single failure assumed is the failure of one of the pumps to start, both supply headers would be supplied by a single safeguards CL pump. This condition has been previously evaluated to be acceptable with no break in the supply header; however, there is not expected to be sufficient margin available to show that a single CL pump can supply both headers and the flow through the broken pipe due to the HELB event. Therefore, the failure of one safeguards CL pump to start is expected to be the most-limiting single failure.

PINGP staff has been in the process of evaluating the potential effects of a postulated HELB event. On March 5, 2010, Unit 1 and Unit 2 were at 100% power. It was determined that there was a previous period in the last three years during which only two safeguards CL pumps were OPERABLE for a period greater than seven days. During this timeframe, the postulated HELB licensing basis scenario would have resulted in the potential for a single CL pump to attempt supplying all normal loads on both trains of the CL system plus the flow through the break location. This was beyond the analyzed conditions for the CL system and determined to be reportable.

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[1] EIIS System Code: BI
[2] EIIS System Code: BP

EVENT ANALYSIS

For the postulated HELB event (which includes a LOOP, with two safeguards CL pumps available, no SI signal and the most-limiting single failure), the most limiting single-failure for the system would be the failure of one of the safeguards CL pumps to start or operate. During this condition, the CL system might not provide sufficient water to required safety-related cooling loads until after the turbine building cooling loads were isolated. This event is being reported under 10 CFR 50.73(a)(2)(ii)(B) as an unanalyzed condition.

NUREG-1022, "Event Reporting Guidelines 10 CFR 50.72 and 50.73", Revision 2, page 54, regarding the reporting of safety system functional failures states, "In determining the reportability of an event or condition that affects a system, it is not necessary to assume an additional random single failure in that system." Considering that an additional single failure does not need to be assumed for the reporting of a safety system functional failure, the additional failure of one safeguards CL pump does not need to be assumed. The two safeguards CL pump capacity would have been available and adequate to supply system loads during a HELB event. Therefore, this event does not represent a safety system functional failure for Unit 1 or Unit 2.

SAFETY SIGNIFICANCE

This condition resulted in a potential for a postulated HELB to cause a break in a CL line. This LER is not associated with an event resulting in an actual HELB in any portion of the plant. There were no actual consequences to the health and safety of the public as a result of this condition.

CAUSE

Inadequate management of HELB analyses impaired the station's ability to discover additional potential legacy vulnerabilities in a timely manner.

CORRECTIVE ACTION

Corrective actions have been implemented that revised procedures to ensure that the current configuration of two OPERABLE and one additional FUNCTIONAL safeguards cooling water pumps is maintained.

An additional long term corrective action is the development of a design basis document for the HELB program. Also, procedures are being revised to ensure that projects funded by department line budgets are subjected to the site review process. Delays and scope changes for risk-significant approved projects will have additional tracking measures.

PREVIOUS SIMILAR EVENTS

LER 2-08-01 for PINGP, Unit 2 regarding an "Unanalyzed Condition Due to Both Trains of Component Cooling Susceptible to a Postulated High Energy Line Break" was submitted on January 19, 2009. This LER described a condition where both trains of the component cooling[3] water system were susceptible to a single failure caused by a postulated HELB in the turbine building.

LER 1-09-06 for PINGP, Units 1 and 2, regarding an "Unanalyzed Condition Due to Potential Safety System Susceptibility to Turbine Building Flooding Due to a Postulated High Energy Line Break, Supplement 1" was submitted April 8, 2010. This LER described a condition where the operability of the Unit 1 Emergency Diesel Generators[4] may not be assured during a HELB event.

[3] EIIS System Code CC
[4] EIIS System Code: EK