



Northern States Power  
Company

Prairie Island Nuclear Generating Plant  
1717 Wakonade Dr. East  
Welch, Minnesota 55089

March 11, 1996

10 CFR Part 50  
Section 50.73

U S Nuclear Regulatory Commission  
Attn: Document Control Desk  
Washington, DC 20555

PRAIRIE ISLAND NUCLEAR GENERATING PLANT  
Docket Nos. 50-282 License Nos. DPR-42  
50-306 DPR-60

High Head Safety Injection Water Flow Rates  
Outside the Technical Specification Limits

The Licensee Event Report for this occurrence is attached. In the report, we made one new NRC commitment:

*Requirements for the use of one minute time averaging, and for allowing system stabilization after valve manipulations, will be incorporated into surveillance procedure SP 1092A and the corresponding Unit 2 procedure SP 2092A prior to their next use.*

Please contact us if you require additional information related to this event.

Michael D Wadley  
Plant Manager  
Prairie Island Nuclear Generating Plant

c: Regional Administrator - Region III, NRC  
NRR Project Manager, NRC  
Senior Resident Inspector, NRC  
Kris Sanda, State of Minnesota

Attachment

150016

9603150153 960311  
PDR ADDOCK 05000282  
S PDR

LICENSEE EVENT REPORT (LER)

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

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS MANDATORY INFORMATION COLLECTION REQUEST: 50.0 HRS. REPORTED LESSONS LEARNED ARE INCORPORATED INTO THE LICENSING PROCESS AND FED BACK TO INDUSTRY. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (1-6 F33), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555-0001, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1) Prairie Island Nuclear Generating Plant Unit 1	DOCKET NUMBER (2) 05000 282	PAGE (3) 1 OF 4
---	--------------------------------	--------------------

TITLE (4)  
High Head Safety Injection Water Flow Rates Outside the Technical Specification Limits

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
02	08	96	96	-- 04 --	00	3	11	96	FACILITY NAME	DOCKET NUMBER 05000
									FACILITY NAME	DOCKET NUMBER 05000

OPERATING MODE (9) N

POWER LEVEL (10) 0

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 5: (Check one or more) (11)

20.2201(b)	20.2203(a)(2)(v)	X	50.73(a)(2)(i)	50.73(a)(2)(viii)
20.2203(a)(1)	20.2203(a)(3)(i)	X	50.73(a)(2)(ii)	50.73(a)(2)(x)
20.2203(a)(2)(i)	20.2203(a)(3)(ii)		50.73(a)(2)(iii)	73.71
20.2203(a)(2)(ii)	20.2203(a)(4)		50.73(a)(2)(iv)	OTHER
20.2203(a)(2)(iii)	50.36(c)(1)		50.73(a)(2)(v)	Specify in Abstract below or in NRC Form 366A
20.2203(a)(2)(iv)	50.36(c)(2)		50.73(a)(2)(vii)	

LICENSEE CONTACT FOR THIS LER (12)

NAME Eugene Eckholt	TELEPHONE NUMBER (include Area Code) 612-388-1121
------------------------	--

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPROS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPROS

SUPPLEMENTAL REPORT EXPECTED (14)

YES (If yes, complete EXPECTED SUBMISSION DATE).	X NO	EXPECTED SUBMISSION	MONTH	DAY	YEAR
---	------	---------------------	-------	-----	------

ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)

While Unit 1 was shutdown for refueling, the high head safety injection flow path verification surveillance procedure was performed for the Unit 1 safety injection pumps. It was identified during the performance of this test that flow balance requirements were not within the required Technical Specification acceptance values. The test was completed and declared inconclusive due to the method of data acquisition. It was observed that the local pump discharge pressure gauges and computer flow readouts fluctuated significantly around an "average value". Due to the fluctuations in the flow readouts in the original test, a second test was performed using a one minute time average data point set up in the computer for pump discharge pressure along with reactor vessel and cold leg flows. In addition, flows were allowed to stabilize after valve manipulations prior to recording flow and pump pressure data. After completion of the second test, it was determined that the original flow values were beyond those allowed by Technical Specifications. The Unit 1 Safety Injection System was subsequently balanced using one minute averaged flow values after the system conditions stabilized. This method produced consistent, reproducible data.

LICENSEE EVENT REPORT (LER)

TEXT CONTINUATION

FACILITY NAME (1)	DOCKET	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Prairie Island Nuclear Generating Plant 1	05000 282	96	-- 04	-- 00	2 OF 4

TEXT (If more space is required, use additional copies of NRC Form 366A) (17)

EVENT DESCRIPTION

On January 13 and 14, 1996, while Unit 1 was shutdown for refueling, SP 1092A, "Safety Injection Check Valve Test (Head Off) Part A: High Head Safety Injection Flow Path Verification", was performed for the Unit 1 safety injection pumps. It was identified during the performance of this test that flow balance requirements were not within the required acceptance values of Technical Specification 4.5.B.3.h.1 for all valve configurations with 11 or 12 safety injection pump in operation. The test was completed and declared inconclusive due to the method of data acquisition. It was observed by the system engineer that the local pump discharge pressure gauges and Emergency Response Computer System (ERCS) flow readouts fluctuated significantly around an "average value".

Due to the fluctuations in the flow readouts in the original test, a second test was performed under work order 9600798. The second test was performed using a one minute time average data point set up in the Emergency Response Computer System for pump discharge pressure along with reactor vessel and cold leg flows. In addition, text was included in the test procedure to allow flows to stabilize after valve manipulations prior to recording flow and pump pressure data. After completion of the second test on February 8, 1996, it was determined that the original flow values were beyond those allowed by Technical Specification 4.5.B.3.h.1. The following flow balance requirements were not satisfied:

A. Technical Specification 4.5.B.3.h.1.(b) requires that the flow rates in each leg shall be within 20 gpm of each other with one pump in operation. Surveillance procedure SP 1092A requires this differential flow to be within 16 gpm.

The Train A and B Cold Leg differential flows were found to be 24 gpm for Safety Injection Pump 11 and 30 gpm for Safety Injection Pump 12.

B. Technical Specification 4.5.B.3.h.1.(a) requires that flow through all four injection lines plus mini-flow shall not exceed 835 gpm with one pump in operation. Surveillance procedure SP 1092A requires pump flow to be less than or equal to 819 gpm.

The flow through all four injection paths and the mini-flow was found to be 845 gpm for Safety Injection Pump 12.

The required flow values specified in surveillance procedure SP 1092A are more conservative than those required by Technical Specification 4.5.B.3.h.1 to account for instrument inaccuracies.

LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET	LER NUMBER (6)			PAGE (3)	
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		
Prairie Island Nuclear Generating Plant 1	05000 282				3	OF 4
		96	-- 04	-- 00		

TEXT (If more space is required, use additional copies of NRC Form 366A) (17)

CAUSE OF EVENT

Surveillance Procedure SP 1092A was revised after baseline data was recorded in June of 1994. Baseline data was being obtained to meet new ASME Section XI requirements in the OM-6 code. The safety injection system flow imbalance is judged to be caused by the fluctuations in the test instrumentation from past tests. These fluctuations made it difficult to determine the true mean flow values to allow the system flows to be balanced. Further contributing to the cause was no specific procedural guidance to allow system flow and pressure readings to stabilize prior to recording test values. Previous system flow adjustments would have been made with a best estimate of the mean of the flow values which were not necessarily repeatable. Due to the tight acceptance criteria, it is believed that the flow averaging used during the second test is necessary to accurately balance the system flows.

ANALYSIS OF THE EVENT

The most recent analysis methods used to determine ECCS performance provides information that shows the safety injection system has more than adequate margin to operate as designed.

Among several conservatisms built into models used to analyze ECCS performance is only one safety injection pump in operation which is degraded by 5%. A review of the latest pump performance plot for both 11 and 12 safety injection pumps show that there is no evidence of pump degradation compared to the site test curve. This conservatism alone is more than adequate margin for the safety injection system to have performed its intended function during an accident at the as found system imbalance.

Therefore the health and safety of the public was not affected by this event.

This event is reportable pursuant to 10 CFR 50.73(a)(2)(i)(B) and 10 CFR 50.73(a)(2)(ii)(B).

CORRECTIVE ACTION

The Unit 1 Safety Injection System was balanced per work order 9600886 using one minute averaged flow values after the system conditions stabilized. This method produced consistent, reproducible data.

Requirements for the use of one minute time averaging, and for allowing system stabilization after valve manipulations, will be incorporated into surveillance procedure SP 1092A and the corresponding Unit 2 procedure SP 2092A prior to their next use. These changes will allow performance of surveillance procedures SP 1092A and SP 2092A with a high degree of repeatability.

LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET	LER NUMBER (6)			PAGE (3)		
FACILITY NAME (1)	DOCKET	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	4	OF	4
Prairie Island Nuclear Generating Plant 1	05000 282	96	-- 04	-- 00			

TEXT (If more space is required, use additional copies of NRC Form 366A) (17)

FAILED COMPONENT IDENTIFICATION

There were no failed components.

PREVIOUS SIMILAR EVENTS

No previous Prairie Island LERs are similar to this event.