



Northern States Power Company

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April 16, 1990

10 CFR Part 50
Section 50.73

Director of Nuclear Reactor Regulation
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

Unit 2 Reactor Trip While
Troubleshooting Rod Control System

The Licensee Event Report for this occurrence is attached.

This event was reported via the Emergency Notification System in accordance with 10 CFR Part 50, Section 50.72, on March 16, 1990. Please contact us if you require additional information related to this event.

Thomas M Parker
Manager
Nuclear Support Services

c: Regional Administrator - Region III, NRC
NRR Project Manager, NRC
Senior Resident Inspector, NRC
MPCA
Attn: Dr J W Ferman

Attachment

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PDR ADOCK 05000306
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LICENSEE EVENT REPORT (LER)

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 500 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-530), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, 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 2

DOCKET NUMBER (2)

0 5 0 0 0 3 0 6 1 OF 0 4

PAGE (3)

TITLE (4)

Unit 2 Reactor Trip While Troubleshooting Rod Control System

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 NAMES		DOCKET NUMBER(S)						
0	3	1	6	9	0	9	0	0	0	0	3	0	6	1	OF	0	4
									Prairie Island Unit 1		0 5 0 0 0 2 8 2						
											0 5 0 0 0						

OPERATING MODE (9)		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 5 (Check one or more of the following) (11)									
POWER LEVEL (10)	1 0 0	20.402(b)	20.406(e)	XX	50.73(a)(2)(iv)	73.71(b)					
		20.406(a)(1)(i)	50.36(a)(1)	50.73(a)(2)(v)	73.71(c)						
		20.406(a)(1)(ii)	50.36(a)(2)	50.73(a)(2)(vi)	OTHER (Specify in Abstract below and in Text, NRC Form 366A)						
		20.406(a)(1)(iii)	50.73(a)(2)(i)	50.73(a)(2)(vii)(A)							
		20.406(a)(1)(iv)	50.73(a)(2)(ii)	50.73(a)(2)(viii)(B)							
		20.406(a)(1)(v)	50.73(a)(2)(iii)	50.73(a)(2)(ix)							

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER
Arne A Hunstad	AREA CODE 6 1 2 3 8 8 - 1 1 2 1

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

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC

SUPPLEMENTAL REPORT EXPECTED (14)

YES (If yes, complete EXPECTED SUBMISSION DATE)	NO	EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
<input checked="" type="checkbox"/>	<input type="checkbox"/>				

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

On March 16, 1990, Unit 2 was operating at 100% power. At 0921 a reactor trip occurred following the resetting of a Rod Control System Urgent Failure alarm which had been generated by connecting test equipment to the Rod Control System.

Electronic noise had been observed on temporary monitoring equipment installed on Unit 2 Rod Control System. In an attempt to identify or eliminate possible sources of this noise, an I&C technician planned to disconnect and reconnect various inputs to a recorder. The technician connected an oscilloscope to a point in the Rod Control System. When the oscilloscope was connected, the "V-ref" control signal was forced to a low value by the low input impedance of the oscilloscope. The "V-ref" signal for only two rods, E-03 and I-11, was affected and they dropped approximately 10 steps into the core as the Urgent Failure circuitry responded to prevent rod motion by applying "hold" current to the rod mechanisms. Approximately 10 seconds later, the Urgent Failure alarm was reset. While the Reset pushbutton was depressed, the "hold" current was removed from rods E-03 and I-11, and they began to drop into the core, resulting in a high negative flux rate reactor trip. Response to the trip was normal and correct. After evaluation of the event, the unit was returned to service at 0128 the next day.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 500 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (F-530), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1)

DOCKET NUMBER (2)

LER NUMBER (6)

PAGE (3)

YEAR	SEQUENTIAL NUMBER	REVISION NUMBER
90	003	00

Prairie Island Unit 2

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TEXT (If more space is required, use additional NRC Form 356A's) (17)

EVENT DESCRIPTION

On March 16, 1990, Unit 2 was operating at 100% power. At 0921 a reactor trip occurred following the resetting of a Rod Control System Urgent Failure alarm which had been generated by connecting test equipment to the Rod Control System.

Electronic noise had been observed on temporary monitoring equipment installed on Unit 2 Rod Control System. In an attempt to identify or eliminate possible sources of this noise, an I&C technician planned to disconnect and reconnect various inputs to a recorder. He briefly discussed this with the control room operators and concluded that his actions might cause a momentary Urgent Failure alarm in the Rod Control System, which would "lock up" the system, but would not cause a reactor trip. After obtaining concurrence from the operators, he proceeded with the plans. The technician subsequently decided that some useful information concerning the nature of the noise might be obtained by observing the noise using an oscilloscope capable of responding to high speed transients. Such an oscilloscope had recently been rented to help determine the nature of noise or "spikes" on the Radiation Monitoring System. The technician obtained this oscilloscope and connected it to a point in the Rod Control System. When the oscilloscope was connected to the point in the Rod Control System, the "V-ref" control signal was forced to a low value by the low input impedance of the oscilloscope. The "V-ref" signal for only two rods, E-03 and I-11, was affected and they dropped approximately 10 steps into the core as the Urgent Failure circuitry responded to prevent rod motion by applying "hold" current to the rod mechanisms. The resulting drop in nuclear power was not sufficient to generate a reactor trip. Approximately 5 to 10 seconds after connecting the oscilloscope, the technician heard the reactor trip breakers open.

During the same time period, in the control room, an Urgent Failure alarm for the Rod Control System was received (it has been determined that this alarm was generated when the oscilloscope was connected). The operator acknowledged the alarm and, since the alarm was anticipated, depressed the Urgent Failure Reset pushbutton on the main control board. While the Reset pushbutton was depressed, the "hold" current was removed from rods E-03 and I-11, and they began to drop into the core, resulting in a high negative flux rate reactor trip. At this time the reactor tripped from high negative flux rate.

Response to the trip was normal and correct.

After evaluation of the event, the unit was returned to service at 0128 the next day.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-530), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (2150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1)

DOCKET NUMBER (2)

LER NUMBER (8)

PAGE (3)

Prairie Island Unit 2

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

CAUSE OF THE EVENT

Cause of the event was personnel error.

The I&C technician is highly experienced and has used oscilloscopes many times successfully in the past. The oscilloscope that caused the Urgent Failure is the first oscilloscope with a low input impedance that the technician has encountered.

Based on pre-work conversations, the control room operator was expecting to receive an Urgent Failure alarm due to anticipated technician actions. When the alarm was received, the operator reset the Urgent Failure, assuming that the expected alarm was momentary and that resetting the alarm would not cause the rods to drop. Procedures existing at the time of the trip did not adequately address resetting of the Urgent alarm failure.

After consultation with the Rod Control System vendor, a procedure was written to test the above conclusions. Performance of the test validated those conclusions.

The connection/disconnection of test leads was performed without a work request. Some I&C troubleshooting activities have been performed without work requests (or standing procedures) as standard practice. This instance was one where the requirement for a work request was borderline. It was unlikely that the use of a work request would have prevented this event. The level of detail necessary to have prevented the reactor trip is not consistent with the level of detail that was normally used in a troubleshooting work request.

CORRECTIVE ACTIONS

Temporary operating instructions were issued to not reset Urgent Failure alarms (except during performance of the routine control rod exercise surveillance procedure) until consulting with the I&C department. These instructions will be made permanent.

A process will be developed to assure that test equipment obtained for use at the plant will be reviewed for suitability for use in plant circuits. Improvements will be made to work instruction for the Instrument Technicians to clearly require the use of test equipment approved for use at Prairie Island in all testing and troubleshooting. Written instructions will be provided to the Instrument Technicians to clarify the conditions when it is acceptable to use test equipment in installed plant circuitry without a work request. The process

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YEAR SEQUENTIAL REVISION

NUMBER NUMBER NUMBER

Prairie Island Unit 2

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OF

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TEXT (If more space is required, use additional NRC Form 366A (2/1/77))

and written instructions will be in place and training provided to I&C technicians by September 1.

ANALYSIS OF THE EVENT

Since plant systems and personnel responded properly to this reactor trip, there was no effect on public health and safety.

This event is reportable pursuant to 10CFR50.73(a)(2)(iv) since this was an unplanned actuation of the reactor protection system.

FAILED COMPONENT IDENTIFICATION

None.

PREVIOUS SIMILAR EVENTS

One similar occurrence was reported as Unit 1 LER 86-010.