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FACIL:50-263 Monticello Nuclear Generating Plant, Northern States 05000263
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RECIP.NAME RECIPIENT AFFILIATION

SUBJECT: LER 89-026-00:on 891004,incomplete inderstaing of non-coincident logic configuration results in RPS actuation.
W/8 ltr.

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A04

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Northern States Power Company

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November 3, 1989

Report Required by
10 CFR Part 50, Section 50.73

Director of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555

MONTICELLO NUCLEAR GENERATING PLANT
Docket No. 50-263 License No. DPR-22

Incomplete Understanding of Non-Coincident Logic Configuration Results in Reactor Protection System Actuation During Breaker Maintenance

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 October 4, 1989.

for Thomas M Parker
Manager
Nuclear Support Services

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

Attachment

IE22
1/1

NRC FORM 366 (6-89)

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO. 3150-0104
EXPIRES: 4/30/92

ESTIMATED BURDEN PER RESPONSE TO COMPLY WTH 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 (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
Monticello Nuclear Generating Plant	0 5 0 0 0 2 6 3	1 OF 0 3

TITLE (4) Incomplete Understanding of Non-Coincident Logic Configuration Results in Reactor Protection System Actuation During Breaker Maintenance

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 5 0 0 0
1 0	0 4	8 9	8 9	0 2 6	0 0	1 1	0 3	8 9		0 5 0 0 0

OPERATING MODE (9)		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)			
	N	20.402(b)	20.405(c)	X 50.73(a)(2)(iv)	73.71(b)
POWER LEVEL (10)	0 0 0	20.405(a)(1)(i)	50.36(c)(1)	50.73(a)(2)(v)	73.71(c)
		20.405(a)(1)(ii)	50.36(c)(2)	50.73(a)(2)(vii)	OTHER (Specify in Abstract below and in Text, NRC Form 366A)
		20.405(a)(1)(iii)	50.73(a)(2)(i)	50.73(a)(2)(viii)(A)	
		20.405(a)(1)(iv)	50.73(a)(2)(ii)	50.73(a)(2)(viii)(B)	
		20.405(a)(1)(v)	50.73(a)(2)(iii)	50.73(a)(2)(x)	

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER
	AREA CODE
Daniel G Wegener, Lead Nuclear Engineer	6 1 2 2 9 5 - 1 2 6 7

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

CAUSE	SYSTEM	COMPONENT	MANUFAC-TURER	REPORTABLE TO NPRDS		CAUSE	SYSTEM	COMPONENT	MANUFAC-TURER	REPORTABLE TO NPRDS	

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

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

With the plant shut down for refueling and fuel loading temporarily suspended, a Reactor Protection System trip occurred due to the de-energization of Reactor Protection System bus A. Reactor Protection System bus A was de-energized by the removal of the source breaker for Motor Control Center 111, which supplied power to Reactor Protection System Motor-Generator set A. The de-energization of Reactor Protection System bus A resulted in a full Reactor Protection System trip because the Reactor Protection System shorting links had been removed, enabling the Source Range Monitors to initiate a non-coincident Reactor Protection System trip. No control rod movement resulted because all operable control rods were fully inserted at the time of the trip. Reactor Protection System bus A was re-energized, and the trip was reset. Motor Control Center 111 source breaker removal had been allowed due to a lack of understanding of the full implications of Reactor Protection System shorting link removal. An Operations Memo was issued to inform Operations personnel of the implications of the removal of the Reactor Protection System shorting links. Plant procedures are being revised to ensure that all Operations personnel understand the implications of shorting link removal during future fuel handling operations. Training will be provided on the purpose of the Reactor Protection System shorting links and the effect of their removal.

DESCRIPTION

On October 4, 1989, during a refueling outage, the Reactor Protection System (RPS)(JC) Source Range Monitor (SRM)(IG)(MON) shorting links had been removed, enabling a single SRM to produce a full RPS trip (non-coincident mode). This was done to provide a more conservative reactor protection function during core alterations. This action was taken to minimize the consequences of potential inadvertent criticalities during refueling, and was prompted by industry initiatives in this area. The shorting link removal was performed in accordance with approved plant procedures. Fuel handling operations had been temporarily suspended at the time of this event. At 1620, control room alarms indicated that an RPS trip had occurred. An investigation into the cause of the trip revealed that the feeder breaker to Motor Control Center (MCC) 111 had been removed for maintenance. This removal was being performed in accordance with approved procedures. This removed the power source for RPS Motor-Generator (MG) set A, de-energizing RPS bus A. The de-energization of RPS bus A resulted in a channel A RPS trip and the de-energization of RPS relays 5A-K12A and 5A-K12C. The de-energization of these two relays (either one would have been sufficient) initiated a trip of RPS channel B through the non-coincident RPS trip logic, resulting in a full RPS trip.

CAUSE

The root cause of this event was personnel error due to a lack of understanding of the full implications of removing the RPS shorting links. This was a cognitive error on the part of both licensed operators and non-licensed technical support personnel. The major effect of the shorting link removal (ability of a single SRM to initiate a full trip) was fully understood; however, the secondary effects associated with the loss of power to a single RPS bus were not interpreted properly. With a full understanding of these effects, approval to remove of the MCC 111 feeder breaker would not have been granted, and the RPS trip would not have occurred. There were no unusual conditions associated with the feeder breaker removal itself. The removal of the RPS shorting links was unusual in that they had not been previously removed since the initial fuel loading in 1970. All work associated with this event was performed in accordance with approved plant procedures.

ANALYSIS

All control cells that contained one or more fuel bundles also contained a fully inserted operable control blade. Therefore, no control rod motion resulted from this trip. There were no deviations from normal plant procedures. Since all control rods in cells containing fuel were fully inserted at all times during this event, there were no consequences that affected the health and safety of the public.

This event could not have had more severe consequences. During non-refueling operations, the nuclear instrumentation trip logic requires the coincident trip of both RPS channels independently before a full RPS trip will occur. Therefore, the de-energization of a single RPS bus would result in only one-half of the RPS trip logic being satisfied and no RPS trip would occur.

CORRECTIVE ACTION

An Operations Memo was issued to reiterate the status of the RPS and to remind Operations personnel of the operational significance of removing the RPS shorting links. The refueling procedure used to control fuel movement within the reactor is being modified to inform Plant Operations personnel of the status of the RPS and the significance of shorting link removal during future refueling operations. The Operations Manual describing the RPS is being modified to more fully describe the effects of shorting link removal. Training will be provided to licensed operators on the purpose of the RPS shorting links and the effects of their removal.

ADDITIONAL INFORMATION

Failed Component Identification

There were no failed components associated with this event.

Previous Similar Events

There have been no similar events at Monticello.