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FACIL:50-316 Donald C. Cook Nuclear Power Plant, Unit 2, Indiana M 05000316
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BLIND,A.A. Indiana Michigan Power Co. (formerly Indiana & Michigan Ele
RECIP.NAME RECIPIENT AFFILIATION

SUBJECT: LER 92-010-00:on 921225,exceeded TS LCO as result of inaccuracies in control rod position indication.Caused by inherent sensitivity of RPIs to temp changes.Control Bank D rods were pulled out from 214 steps to 218.W/930125 ltr.

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TITLE: 50.73/50.9 Licensee Event Report (LER), Incident Rpt, etc.

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RIDS/ADDS

Indiana Michigan
Power Company
Cook Nuclear Plant
One Cook Place
Bridgman, MI 49106
616 465 5901

INDIANA MICHIGAN POWER

January 25, 1993

United States Nuclear Regulatory Commission
Document Control Desk
Rockville, Maryland 20852

Operating Licenses DPR-74
Docket No. 50-316

Document Control Manager:

In accordance with the criteria established by 10 CFR 50.73 entitled Licensee Event Report System, the following report is being submitted:

92-010-00

Sincerely,

A. A. Blind
Plant Manager

/sb

Attachment

c: A. B. Davis, Region III
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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)
D. C. COOK NUCLEAR PLANT - UNIT 2	0 5 0 0 0 3 1 6	1 OF 0 4

TITLE (4) EXCEEDED TECHNICAL SPECIFICATION LCO AS A RESULT OF INACCURACIES IN CONTROL ROD POSITION INDICATION

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 2	2 5	9 2	9 2	- 0 1 0	- 0 0	0 1	2 5	9 3		0 5 0 0 0

OPERATING MODE (9)	1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)			
POWER LEVEL (10)	0 9 7	20.402(b)	20.405(c)	50.73(a)(2)(iv)	73.71(b)
		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)	X 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
G. A. WEBER - PLANT ENGINEERING SUPERINTENDENT	6 1 6 4 6 5 - 5 9 0 1

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

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS
B	A A	Z I	M 0 2 0	N					
B	A A	Z I	M 0 2 0	N					

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)

On December 25, 1992 at 1300 hours with Unit 2 in Mode 1 (Power Operation) at 97 percent rated thermal power, the Rod Position Indication (RPI) for Rods H-12 and M-8 were found to be indicating greater than twelve steps from Demand Position Indication. With the Group Demand Position at 214 steps, the RPIs for H-12 and M-8 indicated rod positions of 230 and 231 steps, respectively. At 1428 hours, coil stack voltage measurements and calculations were completed which confirmed the H-12 and M-8 indications to be in error. With both of these rods in the same control group, the provisions of Technical Specification 3.1.3.2 were exceeded. This required entry into Technical Specification 3.0.3, which calls for initiation of Unit 2 shutdown within one hour. Actions were taken in an attempt to bring the indications both into the required range. At 1458 hours (30 minutes after the 3.0.3 entry), the RPI for Rod H-12 returned to within twelve steps of demand. This allowed exit from Technical Specification 3.0.3 and entry into the Action Statement for Technical Specification 3.1.3.2. In accordance with this Action Statement, the position of Rod M-8 was verified using the movable in-core detectors. This was performed at least once per eight hours, until 1148 hours on December 26, 1992 when M-8 also returned to within 12 steps of demand. This event was caused by temperature dependent drift of the LVDTs which provide input to the RPIs. The problem was corrected by Control Rod Drive Mechanism (CRDM) ventilation flow adjustments and Control Bank D rod adjustments. This event had no actual or potential impact on the health or safety of the public.

Conditions Prior to Occurrence:

Unit 2 in Mode 1 (Power Operation) at 97 percent Rated Thermal Power.

Description of Event:

On December 25, 1992, at 1300 hours, the Control Board Indication for Rods H-12 (EIIS:ZI/AA) and M-8 (EIIS:ZI/AA) were observed to be indicating greater than twelve steps from Demand Position Indication. With the Group Demand Position at 214 steps, the RPIs for H-12 and M-8 indicated rod positions of 230 and 231 steps, respectively. Plant Process Computer (PPC) position readings at this time did not indicate Rods H-12 and M-8 were greater than twelve steps from demand. The PPC indications for H-12 and M-8 were 223 and 226 steps respectively. Due to the discrepancies between the group demand position, the RPI meter indication, and the PPC, activities were initiated to determine rod position via coil stack voltage measurements.

Actions were also initiated to attempt returning the two RPIs back to within twelve steps of demand. Control Bank D was pulled out to 215 steps at 1345 hours and to 216 steps at 1415 hours. At 1355 hours, coil stack voltage measurements were taken to determine if it was a Control Board Meter problem, rod misalignment, or RPI problem. An additional CRDM Fan was started at 1428 hours. At 1428 hours, coil stack voltage calculations were completed which indicated that Rods H-12 and M-8 were both off scale high. At the same time Demand Position Indication was at 214 steps. Therefore, the RPIs for Rods H-12 and M-8 were considered inoperable. Since Rods H-12 and M-8 are both located within Control Bank D Group 2, the Action Statement for Technical Specification 3.0.3 was entered at 1428 hours. This Technical Specification required initiation of shutdown within one hour.

At 1430 hours, Control Bank D rods were pulled out to 218 steps. At 1458 hours, Rod H-12 RPI returned to within twelve steps of Demand Position Indication while Rod M-8 remained greater than twelve steps from Demand Position Indication. With only one RPI greater than twelve steps from Demand Position Indication, it was possible to exit Technical Specification 3.0.3 and enter the Action Statement for Technical Specification 3.1.3.2. In accordance with this Action Statement, the position of Rod M-8 was verified within twelve steps of demand and not misaligned by use of the movable in-core detectors. Verification of this rod position was repeated at least once per eight hours until 1148 hours, on December 26, 1992. At this time, Rod M-8 was declared operable.

Cause of Event:

This event is attributed to the inherent sensitivity of the RPIs to temperature changes at the Linear Variable Differential Transformers (LVDT) located at the top of the CRDMs. Experience has shown that temperature changes at the detector have a significant effect on coil stack voltages which, in turn effect the accuracy of RPIs. During the investigation it was determined that the Control Bank D rods were moved in approximately 9.5 steps over the course of eight hours prior to this event. These rod movements

Cause of Event continued:

occurred between approximately 0422 hours and 1240 hours on December 25, 1992 and would contribute to the fluctuating RPI readings by changing the temperatures in the vicinity of these rods. No repairs were required to correct the subject RPI event.

This investigation did identify that the Plant has had a history of similar problems, in that, RPIs occasionally will drift out of specification greater than twelve steps from demand. However, the evaluator did not discover any evidence of another event with two RPIs out of specification in the same control group at the same time.

Analysis of Event:

This event is being reported per 10CFR50.73(a)(2)(i)(B) as a condition prohibited by the Plant's Technical Specifications (TS).

TS 3.1.3.2, Position Indicator Channels, requires all shutdown and Control Rod Position Indicator Channels and the Demand Position Indicator System to be operable and capable of determining the rod positions within plus or minus twelve steps. TS 3.1.3.2 also provides action for a maximum of one Rod Position Indicator Channel per group to be inoperable; however, no action is provided for more than one Position Indicator Channel in a group being inoperable. When it was confirmed that the two Rod Position Indicator Channels in the same group were inoperable, TS 3.0.3 was entered. TS 3.0.3 delineates the measures to be taken for those circumstances not directly provided for in the Action Statement and whose occurrence would violate the intent of the specification (condition prohibited by TS). TS 3.0.3 provides time limits allowing sufficient time for an orderly shutdown. A one hour time period is provided upon entry into TS 3.0.3 to initiate actions to place the plant in a mode in which the subject specification is not applicable.

Thirty minutes after entering TS 3.0.3, it was exited. TS 3.0.3 was exited when the Position Indicator Channel for H-12 returned to a normal state and provided proper indications. Having exited TS 3.0.3 compliance with TS 3.1.3.2 was achievable by the performance of an in-core flux map to determine the position of M-8 prior to 2228 hours on December 25, 1992. TS 3.1.3.2 allows the determination of an inoperable Position Indicator Channel's rod to occur once per eight hours or after any motion of the non-indicting rod which exceeds twenty-four steps in any one direction. Normal power operation did not result in Rod M-8 moving in excess of 24 steps in any one direction. An in-core flux map was performed on Rod M-8. The flux map was complete at 1743 hours on December 25, 1992. The data from the flux map indicated that the rod was in the correct position.

Operability of the Position Indicator Channels is required to determine rod positions and thereby ensure compliance with the rod alignment and insertion limits. The rod alignment and insertion limits in turn ensure that: 1) acceptable power distribution limits are maintained, 2) the minimum shutdown margin is maintained, and 3) the potential effect of rod ejection

Analysis of Event continued:

accidents is limited. Since normal power operation did not require excessive rod movement and since the rod positions were known to be correct prior to losing indication and confirmed to be correct shortly thereafter, this event did not have any actual or potential adverse impact on the health and safety of the public.

Corrective Actions:

Actions were taken to attempt returning the two RPIs back to within twelve steps of demand. Control Bank D rods were pulled out from 214 steps to 218 steps between 1345 hours and 1430 hours. At 1428 hours, an additional CRDM Ventilation Fan was started. The temperature at the CRDM Fan was monitored and dropped from 155.5 degrees F to 153 degrees F in three minutes.

The RPI for Rod H-12 returned to with 12 steps at 1458 hours. The position of Rod M-8 was periodically verified by use of the movable in-core detectors until the RPI for M-8 was verified to be within 12 steps of Demand Position Indication at 1148 hours, on December 26, 1992.

Failed Component Identification:

Component Name: Reactor Core Location H-12 Control Rod Position Indicator Detector

Manufacturer: Magnetics, Inc.

Model: K-8805-12

EIIS Code: ZI/AA

Component Name: Reactor Core Location M-8 Control Rod Position Indicator Detector

Manufacturer: Magnetics, Inc

Model: K-8805-12

EIIS Code: ZI/AA

Previous Similar Events:

None.