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

SUBJECT: LER 93-004-00:on 930408,rod position indication for Rods H-12 & M-8 found indicating greater than 12 steps from demand position indication.Caused by transformer sensitivity to temp changes.Position verified.W/930507 ltr.

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

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Power Company
Cook Nuclear Plant
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Bridgman, MI 49106
616 465 5901

INDIANA MICHIGAN POWER

May 7, 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:

93-004-00

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
0 4	0 8	9 3	9 3	- 0 0 4	- 0 0	0 5	0 7	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 8	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 April 8, 1993 at 0245 hours with Unit 2 in Mode 1 (Power Operation) with power being increased from 56 to 100 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 the Demand Position Indication. With the Group Demand Position at 215 steps, the RPIs for H-12 and M-8 each indicated rod positions of 230 steps. At 0327 hours, secondary coil stack voltage measurements were completed which corroborated the H-12 and M-8 RPI. 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 a unit shutdown within one hour. At 0416 hours, the RPI for Rod H-12 returned to within twelve steps of demand and the H-12 RPI was returned to service at 0427 hours. 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 every eight hours, until 2130 hours on April 8, 1993, when the M-8 RPI was within 12 steps of demand and was returned to service. The M-8 event was the result of a signal conditioning module being out-of-specification high. The H-12 event was caused by temperature dependent drift of the Linear Variable Differential Transformers, located at the top of the control rod drive mechanism, which provide input to the RPIs. 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) with power being increased from 56 to 100 percent Rated Thermal Power at a rate of 6 percent per hour.

Description of Event:

On April 8, 1993, at 0245 hours, the Control Board Indication for Rods H-12 (EIIS/ZI-AA) and M-8 (EIIS/ZI-AA) were found to be indicating greater than twelve steps from the Demand Position Indication. With the Group Demand Position at 215 steps, the RPIs for H-12 and M-8 each indicated rod positions of 230 steps. Due to the discrepancies between the group demand position and the RPI meter indication, activities were initiated to determine rod position via secondary coil stack voltage measurements.

At 0327 hours, secondary coil stack voltage measurements were taken which corroborated the H-12 and M-8 RPI. The secondary coil stack voltages indicated that Rod H-12 was at 227 steps and Rod M-8 was at 230 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 0327 hours. This Technical Specification requires initiation of shutdown activities within one hour.

Rod H-12 RPI returned to within twelve steps of Demand Position Indication at 0416 hours and was determined to be operable and was returned to service at 0427 hours. 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, which allows for continued operation with one inoperable RPI per rod group. In accordance with this Action Statement, the position of Rod M-8 was verified to be 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 2130 hours, on April 8, 1993, when Rod M-8 was declared operable.

Cause of Event:

The H-12 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 an effect on coil stack voltages which, in turn effect the input signal for the RPIs. The M-8 event is attributed to instrument drift. A signal conditioning module (EIIS/IMOD-AA) was found reading out-of-specification high. The signal conditioning module was recalibrated and the M-8 RPI was returned to service at 2130 hours on April 8, 1993.

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.

Technical Specification 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. Technical Specification 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, Technical Specification 3.0.3 was entered. Technical Specification 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 Technical Specification). Technical Specification 3.0.3 provides time limits allowing sufficient time for an orderly shutdown. A one hour time period is provided upon entry into Technical Specification 3.0.3 to initiate actions to place the plant in a mode in which the subject specification is not applicable.

One hour after entering Technical Specification 3.0.3, it was exited. Technical Specification 3.0.3 was exited when the Position Indicator Channel for H-12 returned to a normal state and provided proper indication. Having exited Technical Specification 3.0.3 compliance with Technical Specification 3.1.3.2 was achieved by the performance of an in-core flux maps every eight hours to determine the position of M-8. Technical Specification 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. The power change did not result in Rod M-8 moving in excess of 24 steps in any one direction. In-core flux maps were performed on Rod M-8 as required. The flux maps indicated that Rod M-8 was within 12 steps of demand position indication.

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 accidents is limited. Since the power change 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:

The RPI for Rod H-12 returned to within 12 steps at 0427 hours with no corrective action. A signal conditioning module for M-8 RPI, was found out-of-specification high and was recalibrated. 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 and returned to an operable status at 2130 hours, on April 8, 1992.

We could not determine if the continued power ascension, after Rod M-8 RPI initially indicated greater than 12 steps from demand, had any affect on the event. This operating practice will be evaluated to determine if there should be any additional action taken when a single RPI is in excess of the Technical Specification allowed values. This evaluation is scheduled to be completed by July 7, 1993.

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

Component Name: Signal Conditioning Module Rod Position Indication

Manufacturer: Westinghouse

Model: E-2786

EIIS Code: IMOD-AA

Previous Similar Events:

50-316/92-10-00