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AEP
INDIANA MICHIGAN POWER

July 24, 2000

United States Nuclear Regulatory Commission
Document Control Desk
Washington, DC 20555

Operating License 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:

LER 316/2000-006-00, "Failure to Comply with Requirements of Technical Specifications For Nuclear Instrumentation."

The following commitments were identified in this submittal:

- Prior to Mode 2 entry for Unit 1, industry practices will be benchmarked for the use of conservatism in calculations used to establish trip setpoints and resets.
- Prior to Mode 2 entry for Unit 1, D.C. Cook will request that the vendor validate the accuracy of vendor-provided input data used to calculate projected detector currents.
- Prior to Mode 2 entry for Unit 1, D.C. Cook will incorporate adequate conservatisms in the setpoint calculations to ensure the setpoints remain below 25 percent rated thermal power.
- An expanded extent of condition evaluation will be performed by October 1, 2000, to determine if other nuclear instrumentation setpoints were established without considering appropriate conservatisms.

If you have any questions, please contact Mr. Brian McIntyre, Acting Director, Regulatory Affairs, at 616/697-5806.

Sincerely,

A. Christopher Bakken, III
Site Vice President

/mbd
Attachment

IE22

Printed on recycled paper

c: J. E. Dyer, Region III
B. A. McIntyre
D. Hahn
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NRC Resident Inspector
Records Center, INPO

NRC Form 366 (6-1998) U.S. NUCLEAR REGULATORY COMMISSION

LICENSEE EVENT REPORT (LER)

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

APPROVED BY OMB NO. 3150-0104 EXPIRES 06/30/2001

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 (T-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

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TITLE (4)

Failure to Comply with Requirements of Technical Specifications For Nuclear Instrumentation

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
06	28	2000	2000	--	006	--	00	07	24	2000	FACILITY NAME	DOCKET NUMBER

OPERATING MODE (9)	2	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)							
			20.2201 (b)		20.2203(a)(2)(v)	X	50.73(a)(2)(i)		50.73(a)(2)(viii)
POWER LEVEL (10)	01		20.2203(a)(1)		20.2203(a)(3)(i)		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	TELEPHONE NUMBER (Include Area Code)
M. B. Depuydt, Regulatory Affairs	616 / 465-5901, x1589

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

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX

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 15 single-spaced typewritten lines) (16)

On June 22, 2000, low power physics testing commenced for Unit 2. Testing was performed using the special test exception of Technical Specification (TS) 3.10.3, "Physics Tests," which requires that thermal power not exceed 5 percent of rated thermal power (RTP), and the intermediate range and power range neutron flux low trip setpoints are set at less than or equal to 25 percent RTP. The trip setpoints were adjusted to 25 percent. On June 26, 2000, it was determined that the setpoints for all intermediate and power range instruments had been greater than 25 percent during low power physics testing, based on actual detector response. Additionally, the requirements of TS 2.2.1 and 3.3.1.1, which govern the setpoints and operability requirements during Modes 1 and 2, were not met, resulting in an unrecognized entry into TS 3.0.3. This LER is submitted in accordance with 10CFR50.73(a)(2)(i)(B), for a condition prohibited by TS.

The apparent cause for this event was the failure to recognize the need to apply uncertainty in the analysis that projects detector current versus thermal power and the conservatisms that will be required to maintain trip setpoints less than 25 percent RTP. All intermediate and power range instrument setpoints were adjusted to meet TS requirements. Prior to Unit 1 entering Mode 2, industry practice on conservatism used in determining these setpoints will be benchmarked and appropriate preventive actions developed, the vendor will be asked to validate detector current calulation inputs, and adequate conservatisms will be incorporated into the setpoint calculations. An expanded extent of condition will be performed to determine if other nuclear instrumentation setpoints were established without considering appropriate conservatisms.

Reactor power was continuously monitored and never exceeded 5 percent RTP, as required by the TS. The safety analysis assumes the trip from an event during low power physics testing occurs at 35 percent power, without fuel damage and without credit taken for the intermediate range instruments. Although greater than 25 percent, the setpoints on all 4 power range instruments were less than 30 percent, therefore, the safety significance for this event is minimal.

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

Conditions Prior to Event

Unit 2 was in Mode 2, Startup

Description of Event

On June 22, 2000, low power physics testing commenced for Unit 2, using the special test exception of Technical Specification (TS) 3.10.3, "Physics Tests." TS 3.10.3 states that the limitations of TS 3.1.1.4 (moderator temperature coefficient), 3.1.3.1 (full length rod group height), 3.1.3.5 (shutdown rod insertion limit), and 3.1.3.6 (control rod insertion limits) may be suspended during physics tests provided that thermal power does not exceed 5 percent of rated thermal power (RTP), and the reactor trip setpoints for the operable intermediate range neutron flux and the power range neutron flux low setpoints are set at less than or equal to 25 percent of RTP. The special test exception of TS 3.10.3 was used because it was known that TS 3.1.3.5 and TS 3.1.3.6 would be exceeded by the performance of rod worth measurements.

The calculation of the detector current equivalent to 25 percent RTP was performed using projected detector current response based on the previous operating cycle detector response and present core design data. This analytically derived value was then used to calibrate the instrument response for low power physics testing. Within 12 hours prior to low power physics testing, a channel functional test was performed as required on all intermediate and power range channels. On June 25, 2000, after entering Mode 1, it was recognized that one of the intermediate range instruments was inoperable due to a setpoint greater than the TS 2.2.1 allowable setpoint of 30 percent RTP, as determined by calorimetric. The instrument was declared inoperable and adjusted to a setpoint of 25 percent RTP.

On June 26, 2000, a Condition Report (CR) was generated as a result of questions asked by the NRC Resident Inspector. The CR stated that two of the four power range instruments had required adjustment to match actual power. When adjusted, the power range instruments were found to have a setpoint greater than the 26 percent RTP (calorimetric) allowed by TS 2.2.1. and represents a failure to meet the requirements of TS 3.3.1.1 (reactor trip system instrumentation) and an unrecognized entry into TS 3.0.3.

On July 10, 2000, it was determined that the allowable setpoint stated in TS 2.2.1 could not be applied to TS 3.10.3, as there is no apparent link between the two TS. This determination resulted in a post-event declaration that the intermediate and power range instruments, all of which had setpoints greater than 25 percent RTP during low power physics testing, were not in compliance with the requirements of TS 3.10.3. As none of the instruments had setpoints less than or equal to 25 percent RTP, this represents a failure to meet the requirements of TS 3.10.3, "Physics Tests," and an unrecognized entry into TS 3.0.3.

This LER is submitted in accordance with 10CFR50.73(a)(2)(i)(B), for an event or condition prohibited by TS, for failure to comply with the requirements of TS 3.10.3, 2.2.1, 3.3.1.1, and 3.0.3.

Cause of Event

The apparent cause for this event was the failure to recognize the need to apply uncertainty in the analysis that projects detector current versus thermal power and the conservatisms that will be required to maintain trip setpoints less than 25 percent RTP.

This best estimate methodology to project detector current response has been in use for many years and is widely used in the industry.

Analysis of Event

The primary function of nuclear instrumentation is to safeguard the reactor by monitoring the neutron flux and generating appropriate trips and alarms for various phases of reactor operation and shutdown conditions. It also provides a secondary

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

control function and indicates reactor status during startup and power operation. The nuclear instrumentation system uses information from three separate types of instrumentation channels to provide three discrete protection levels. Each range of instrumentation – source, intermediate, and power – provides the necessary overpower reactor trip protection required during operation in that range. The overlap of instrument ranges provides reliable continuous protection beginning with source level through the intermediate and power levels. Various types of neutron detectors, with appropriate solid-state electronic circuitry, are used to monitor the leakage neutron flux from a completely shutdown condition to 120 percent of full power.

Because of the wide range of neutron flux, monitoring with several ranges of instrumentation is necessary. The lowest range – source range – covers six decades of leakage neutron flux. The next range – intermediate range – covers eight decades. Detectors and instrumentation are chosen to provide overlap between the higher portion of the source range and the lower portion of the intermediate range. The highest range of instrumentation – power range – covers approximately two decades of the total instrumentation range. This is a linear range that overlaps with the higher portion of the intermediate range. The power range channels are capable of recording overpower excursions up to 200 percent of full power.

TS 3.10.3 requires that RTP be maintained less than 5 percent during physics testing. As recorded in the data sheets for 12 EHP 6040.PER.357, "Initial Criticality, All Rods Out Boron Concentration and Nuclear Heating Level," and 2 EHP 6040.PER.359, "Zero Power and Power Ascension Tests for Post-Refueling Startups," power level never exceeded the 5 percent RTP limit during physics testing.

The safety analysis, Updated Final Safety Analysis Report (UFSAR) Chapter 14.1.1, "Uncontrolled RCCA Withdrawal from a Subcritical Condition," assumes a 10 percent error for the nuclear instrumentation setpoint. The analysis assumes the trip occurs at 35 percent RTP, and that no damage occurs. Further, the analysis does not take credit for the intermediate range trips.

Although greater than 25 percent, the setpoints on all 4 power range instruments were less than 30 percent RTP, thereby ensuring that the trip would occur before the 35 percent assumed in the accident analysis. Taking these factors into account, this event had minimal safety significance.

Corrective Actions

All intermediate and power range nuclear instrumentation setpoints were adjusted to 25 percent RTP in accordance with TS values.

No interim preventive actions are required. Low power physics testing is performed only during the first startup after refueling, and will not be performed again on Unit 2 until after the next refueling.

Industry practices will be benchmarked for the use of conservatisms in calculations used to establish trip setpoints and resets. In addition, D.C. Cook will request Westinghouse to validate the accuracy of the vendor-provided input data used to calculate projected detector currents. D. C. Cook will incorporate adequate conservatisms in the setpoint calculations to ensure the setpoints remain below 25 percent RTP. These actions will be completed prior to Mode 2 entry for Unit 1, and will be applied to Unit 1 and subsequent post-refueling testing on both units.

An expanded extent of condition evaluation will be performed by October 1, 2000, to determine if other nuclear instrumentation setpoints were established without considering appropriate conservatisms.

Previous Similar Events

None