

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



October 25, 2000

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

Operating Licenses DPR-58 and DPR-74  
Docket Nos. 50-315 and 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 315/1998-053-01, "Failure To Calibrate The Core Exit Thermocouples as Required By Technical Specifications."

No Commitments are identified in this submittal.

Should you have any questions regarding this correspondence, please contact Mr. Wayne J. Kropp, Director Regulatory Affairs, at 616/697-5056.

Sincerely,

A handwritten signature in black ink that reads 'Joseph E. Pollock'.

Joseph E. Pollock  
Plant Manager

/ram  
Attachment

c: J. E. Dyer, Region III  
D. Hahn  
B. A. McIntyre  
T. P. Noonan  
A. C. Bakken III  
R. P. Powers  
R. Whale  
NRC Resident Inspector  
Records Center, INPO

**LICENSEE EVENT REPORT (LER)**

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

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

FACILITY NAME (1) Donald C. Cook Nuclear Plant Unit 1		DOCKET NUMBER (2) 05000-315	PAGE (3) 1 of 3
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TITLE (4)  
Failure To Calibrate The Core Exit Thermocouples As Required By Technical Specifications

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	
11	30	1998	1998	-- 053 --	01	10	25	2000	Cook Plant Unit 2	05000-316	
									FACILITY NAME	DOCKET NUMBER	

OPERATING MODE (9) 5	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)										
POWER LEVEL (10) 000	20.2201 (b)				20.2203(a)(2)(v)			<input checked="" type="checkbox"/>	50.73(a)(2)(i)		50.73(a)(2)(viii)
	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 R. Meister, Regulatory Compliance								TELEPHONE NUMBER (Include Area Code) 616 / 465-5901, x1707			

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)  
This revision incorporates information from the root cause investigation and replaces Licensee Event Report (LER) 50-315/1998-053-00 in its entirety.

On November 9, 1998, Instrument and Control (I&C) personnel were performing cross-calibration checks on the Unit 1 core exit thermocouple indication. The I&C personnel found that the associated computer points were indicating high by 30 to 35 degrees Fahrenheit. Subsequently, it was identified that the core exit thermocouple indications on Unit 2 were also indicating abnormally high. In 1985, Donald C. Cook Nuclear Plant (CNP) implemented plant modifications that changed the type of thermocouples utilized to detect core exit temperatures. Between 1985, when the modification was installed, and November 9, 1998, the established testing practices for the core exit thermocouples did not meet the testing requirements of Technical Specifications 4.3.3.8 (Unit 1) and 4.3.3.6 (Unit 2). On November 30, 1998, this condition was determined to be reportable in accordance with 10 CFR 50.73(a)(2)(i)(B) as a condition prohibited by the plant's Technical Specifications due to missed surveillance testing.

The cause of this condition was a failure to control design basis requirements. Specifically, upon completion of the modification, CNP failed to incorporate the calibration requirements for the new core exit thermocouples into the calibration procedure. The calibration procedure has been revised and core exit thermocouples have been successfully calibrated. The corrective actions to prevent recurrence for the root cause of the generic inadequacies of the design control process are addressed through the corrective action process. Although the initial calibration procedure produced unacceptable results, the resultant calibration errors were conservative in nature. Therefore, this event had no safety significance.

**LICENSEE EVENT REPORT (LER)**  
**TEXT CONTINUATION**

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

**Conditions Prior to Event**

Unit 1 was in Mode 5, Cold Shutdown  
Unit 2 was in Mode 5, Cold Shutdown

**Description of Event**

In 1985, Donald C. Cook Nuclear Plant (CNP) implemented plant modifications that changed the type of thermocouples utilized to detect core exit temperatures. Because of the difference in thermocouple design, the calibration requirements for the thermocouples had changed. The original thermocouple calibration procedure, which had been developed prior to the 1985 modification, calibrated the output signal from the thermocouples as if it were a linear signal. The new type K-thermocouples provide a nonlinear output. The calibration procedure was not revised to address the new calibration requirements for the type K-thermocouples.

On November 9, 1998, Instrument and Control (I&C) personnel were performing a cross calibration of the core exit thermocouple output indication in accordance with a newly developed system calibration procedure. During the conduct of this calibration, it was discovered that the core exit thermocouple readings were indicating 30 to 35 degrees Fahrenheit higher than expected. Further investigation identified that the thermocouples had previously been calibrated incorrectly. As a result, the core exit thermocouple instrumentation was not tested in accordance with Technical Specifications (TS) 4.3.3.8 (Unit 1) and 4.3.3.6 (Unit 2) prior to use.

At the time this condition was identified, both units were in cold shutdown. During the time period from 1985 to 1998, both units had been in modes where the thermocouples were required to be operable. On November 30, 1998, this condition was determined to be reportable in accordance with 10 CFR 50.73(a)(2)(i)(B) as a condition prohibited by plant TS, since the thermocouples were tested utilizing an inadequate surveillance test procedure, resulting in a missed surveillance. On December 30, 1998, LER 50-315/1998-053-00 was submitted. LER 50-315/1998-053-01 is being submitted based on completion of the root cause investigation and replaces LER 50-315/1998-053-00 in its entirety.

**Cause of Event**

The root cause of the condition is a loss of design control. A programmatic root cause evaluation was performed on the design control process in 1999 that addresses the historical causes of the loss of design control.

**Analysis of Event**

A digital subcooling monitor in the control room is provided to display either the temperature or pressure margin available for the sub-cooled operating condition below the corresponding saturation pressure or saturation temperature. The device selects the highest temperature reading from eight core exit thermocouples and eight hot and cold leg thermocouples, and the lowest pressure reading from the two wide range pressure sensors, calculates the corresponding saturation conditions, and displays the available margin of subcooling below saturation in either temperature or pressure.

The plant computer can display the margin of subcooling temperature on an analog trending device in the control room. The hottest incore thermocouple or the average of the incore thermocouples can be selected as input devices for this display. This instrumentation display provided to the operator enables him/her to perform required manual safety functions and to assess plant conditions during and following an accident. The operators also had additional instrumentation available to identify and address the incorrectly calibrated instrumentation, if the need to use the instrumentation had arisen.

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

The failure to revise the calibration procedure resulted in an instrumentation miscalibration that was conservative and did not create a condition that had the potential to adversely impact the nuclear safety or the health and safety of the public.

**Corrective Actions**

The system calibration procedure was revised to ensure the appropriate testing methodology is utilized when calibrating the core exit thermocouple instrumentation.

The core exit thermocouple instrumentation was recalibrated in accordance with the requirements specified in the Technical Specifications.

As part of the Unit 2 Restart effort, system and programmatic assessments were performed during the Expanded System Readiness Reviews to reestablish and document the plant's design and licensing basis. CNP's March 19, 1999, response to Nuclear Regulatory Commission (NRC) letter, "Enforcement Actions 98-150, 98-151, 98-152 and 98-186 Reply to Notice Of Violation October 13, 1998," identified programmatic weaknesses in the plant design and licensing basis, and the training and qualification of plant personnel. CNP has established a design control process that encompasses design input and verification, calculations, design document control and vendor technical information, and controls to ensure the applicable plant operating procedures are established or revised.

**Previous Similar Events**

The following LERs are similar to this event:

- LER 50-316/2000-009-00, Common-Cause Ventilation Failure Results In Inoperable Auxiliary Feedwater Pumps
- LER 50-316/2000-003-00, Containment Internal Concrete Structures Do Not Meet Design Load Margins
- LER 50-316/2000-002-00, Operation Outside Design Bases And Entry Into Technical Specification (TS) 3.0.3 Due To Non-Conservative TS

The above represent three examples of CNP's failure to adequately control its design basis. Additional examples of CNP's failure to control its design basis have been reported. This event and the additional similar events occurred prior to the implementation of corrective actions to correct and prevent recurrence of the breakdown in the CNP design process.

- LER 50-316/2000-010-00, Failure To Verify Position Of Essential Service Water System Valves As Required By TS

Although this event occurred after the completion of CNP's design program enhancements, it did not reveal any new or uncorrected programmatic weaknesses.