



January 10, 2001

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 315/1998-055-01, "Retraction -- Procedural Deficiency Could Result in Rod Withdrawal Speeds Greater Than Design."

Changes from the original LER 315/1998-055-00 as submitted on January 6, 1999, are annotated by revision bars in the right-hand margin.

No commitments were identified in this submittal.

Should you have any questions regarding this correspondence, please contact Mr. Ronald Gaston, Manager Regulatory Affairs at 616/465-5901, extension 1366.

Sincerely,

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

Joseph E. Pollock
Plant Manager

/inj
Attachment

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

IE22

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)
Retraction - Procedural Deficiency Could Result in Rod Withdrawal Speeds Greater than Design

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	
12	07	1998	1998	-- 055 --	01	01	10	2001	Cook Plant Unit 2	05000-316	
OPERATING MODE (9) 5 POWER LEVEL (10) 000 THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)											
			20.2201 (b)		20.2203(a)(2)(v)			50.73(a)(2)(i)		50.73(a)(2)(viii)	
			20.2203(a)(1)		20.2203(a)(3)(i)			X 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 I. N. Jackiw, Compliance Engineer								TELEPHONE NUMBER (Include Area Code) 616 / 465-5901, x1602		

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 December 7, 1998, during a system readiness review of the rod control system, Indiana Michigan Power Company (I&M) personnel discovered that a procedural deficiency for calibration of the rod speed control circuits for the Rod Cluster Control Assemblies (RCCAs) could result in a rod cluster withdrawal at a maximum rate of 77 steps per minute (spm). This condition was contrary to Updated Final Safety Analysis Report (UFSAR) Section 3.1.2, Page 3.1-11, which states that "No single credible mechanical or electrical control system malfunction can cause a rod cluster to be withdrawn at a speed greater than 72 steps per minute." In accordance with 10CFR50.73(a)(2)(ii)(B), this LER was reported as a condition that is outside the design basis of the plant.

The root cause for this event was a lack of a thorough design review of the Precautions, Limitations and Setpoints (PLS) for the rod control system prior to system implementation by D.C. Cook (CNP). The original PLS provided by the vendor included the recommendation for a maximum automatic rod speed of 72 spm, that was supported by the accident analysis that postulated two banks of rods withdrawing at 72 spm. Implementation of these recommendations resulted in a maximum rod speed setpoint which did not include any margin with respect to the value assumed in the analysis. A subsequent assessment determined that there is sufficient conservatism in the existing safety analyses (i.e., reactivity insertion rates based upon the two highest worth sequential RCCA banks moving together at maximum speed with 100 percent overlap) such that rod withdrawal rates greater than 72 spm are acceptable and do not need additional analysis. A UFSAR change has been initiated to reflect the rod withdrawal rates contained in a Westinghouse failure mode and effects analysis report. Therefore, the current safety analysis remains valid for the rod withdrawal events and the condition reported on December 7, 1998 was not outside the design basis of the plant. As such, no reportable condition existed, and this LER is being retracted.

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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

On December 7, 1998, during a system readiness review of the rod control system, I&M personnel discovered that a procedural deficiency for calibration of the rod speed control circuits of the C and D shutdown banks Rod Cluster Control Assemblies (RCCAs) could result in a rod cluster withdrawal at a maximum rate of 77 steps per minute (spm). This condition is contrary to the Updated Final Safety Analysis Report (UFSAR) Section 3.1.2, Page 3.1-11, which states that "No single credible mechanical or electrical control system malfunction can cause a rod cluster to be withdrawn at a speed greater than 72 steps per minute." A subsequent review determined that a failure in the rod speed control system pulser could also result in rod speed greater than 72 spm.

An investigation of this condition identified additional deficiencies that could have the potential to withdrawal rods at greater than 72 spm with a single failure. These deficiencies included, in addition to the failure to calibrate the C and D shutdown banks speed, the failure to calibrate the pulser in the rod control equipment for the control banks and the A and B shutdown banks. A review of the tolerance allowances in the automatic rod control calibration procedures identified that rods could withdraw at 74 spm and still meet the procedure acceptance criteria. Additionally it was found, that in 1977 the vendor performed an extensive failure mode and effects analysis for the rod control system. This analysis is documented in WCAP-8976, "Failure Mode and Effects Analysis of the Solid State Full Length Rod Control System" and it concluded that a single failure in the pulser or reactor control system could cause the CRDMs to move at a maximum rate of 77spm.

Cause of Event

The root cause for this event was a lack of a thorough design review of the Precautions, Limitations and Setpoints (PLS) for the rod control system prior to system implementation by D.C. Cook (CNP). The original PLS provided by vendor included the recommendations for a maximum automatic rod speed setting of 72 spm, that was supported by the accident analysis that postulated two banks of rods withdrawing at 72 spm. This lack of an adequate design review led to the development of rod control procedures that did not include calibration of various components of the Rod Control System and included excessive tolerances on components that were calibrated. This condition has existed since initial start up of the plant.

A contributing factor was determined to be incomplete recommendations provided by the vendor for the Rod Control System. Implementation of these recommendations resulted in a maximum rod speed setpoint which did not include any margin with respect to the value assumed in the analysis.

Analysis of Event

The rod control system is designed to limit the rod speed to a maximum value of 72 spm under normal operating conditions. However, a review has determined that there are 2 types of failures that can cause rod speed to exceed 72 spm. If a failure should occur in the rod speed control system pulser, it is possible (according to the Vendor Technical Manual) that the control rods could be driven at a maximum stepping rate of one step every 780 milliseconds, or approximately 77 spm. Similarly, a procedural deficiency in the calibration of the rod speed control circuits could result in a rod cluster withdrawal rate of greater than 72 spm. The maximum rod withdrawal speed assumed in the safety analyses for both the RCCA withdrawal from subcritical (RWFS) and RCCA withdrawal at power (RWAP) accidents, as presented in the UFSAR is 72 spm.

In 1977, the vendor performed an extensive failure mode and effects analysis for the rod control system. This analysis is documented in WCAP-8976, "Failure Mode and Effects Analysis of the Solid State Full Length Rod Control System." The reactor control system is designed to limit the rod speed control signal output to a value that causes the pulser circuit to

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

drive the control rod drive mechanisms (CRDMs) at a maximum speed of 72 spm. WCAP-8976 concluded that a single failure in the pulser or reactor control system could cause the CRDMs to move at a maximum rate of 77spm.

The vendor has assessed (project letter AEP-99-082, dated March 5, 1999) the possible occurrence of maximum rod speeds as high as 77 steps per minute (spm) with respect to the CNP safety analyses (i.e., Updated Final Safety Analysis Report (UFSAR) Chapters 14.1.1 and 14.1.2) that assume a maximum rod speed of 72 spm. The assessment determined that there is sufficient conservatism in the existing safety analyses (i.e., reactivity insertion rates based upon the two highest worth sequential RCCA banks moving together at maximum speed with 100 percent overlap) such that rod withdrawal rates up to 77 spm are acceptable and do not need additional analysis. Therefore, the current safety analysis remains valid for the rod withdrawal events and the condition reported on December 7, 1998 was not outside the design basis of the plant. As such, no reportable condition existed, and this LER is being retracted.

Corrective Actions

Concerns regarding America Electric Power's (AEP) design control process and interfaces with outside contractors have been identified in Nuclear Regulatory Commission (NRC) inspection reports, AEP self-assessments and AEP audits over the past several years dating back to the NRC Design Inspection in September 1997.

To prevent further occurrences regarding this issue, AEP implemented initiatives to develop appropriate procedures for calculations, control of design inputs, and owner's acceptance reviews. Specifically, procedure 12 EHP 5043.OAR.001, "Owner's Acceptance Review," that became effective on August 2, 1999, provides guidance for AEP's review for acceptance of engineering work products prepared by outside contractors under their QA program. The issuance of these procedures represents significant progress in providing tools at the implementation level to effectively manage the AEP/outside contractor interface.

To address the procedural deficiencies for calibration of the rod speed control circuits of the C & D shutdown banks, the affected instrumentation and control procedures were evaluated and appropriate revisions were made to include calibration of various components of the rod control system. These procedure revisions were implemented prior to the Unit 2 start-up. Regarding a rod speed control system pulser failure scenario, actions have been initiated to revise the UFSAR to indicate that a single failure could cause rods to step to a maximum of 77 spm.

Previous Similar Events

None