



**CENTERIOR  
ENERGY**

**PERRY NUCLEAR POWER PLANT**

10 CENTER ROAD  
PERRY, OHIO 44081  
(216) 259-3737

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**Robert A. Stratman**  
VICE PRESIDENT - NUCLEAR

August 2, 1993  
PY-CEI/NRR-1686 L

U.S. Nuclear Regulatory Commission  
Document Control Desk  
Washington, D.C. 20555

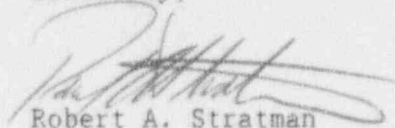
Perry Nuclear Power Plant  
Docket No. 50-440  
LER 93-014

Dear Sir:

Enclosed is Licensee Event Report 93-014 for the Perry Nuclear Power Plant.

If you have any questions or require additional information, please contact Kevin Donovan, Manager - Licensing and Compliance at (216) 259-3737 extension 5606.

Sincerely,



Robert A. Stratman

RAS:LKR:ss

Enclosure: LER 93-014

cc: NRC Project Manager  
NRC Resident Inspector  
NRC Region III

Operating Companies  
Cleveland Electric Illuminating  
Toledo Edison

050016

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PDR ADOCK 05000440  
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*Handwritten initials/signature*

**LICENSEE EVENT REPORT (LER)**

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

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 90.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (MNB 7714), 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) Perry Nuclear Power Plant, Unit 1		DOCKET NUMBER (2) 05000440	PAGE (3) 1 OF 4
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TITLE (4)  
RACS Power Supply Failure Causes Technical Specification 3.0.3 Entry

EVENT DATE (5)			LER NUMBER (6)			REPORT NUMBER (7)			OTHER FACILITIES INVOLVED (8)	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
07	03	93	93	014	00	08	02	93	FACILITY NAME	DOCKET NUMBER
										05000
									FACILITY NAME	DOCKET NUMBER
										05000

OPERATING MODE (9) 1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 4: (Check one or more) (11)			
	20.402(b)	20.405(c)	50.73(a)(2)(iv)	73.71(b)
POWER LEVEL (10) 100	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
	20.405(a)(1)(iii)	X 50.73(a)(2)(i)	50.73(a)(2)(viii)(A)	Specify in Abstract below and in Text, NRC Form 366A)
	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 Linda K. Routzahn, Compliance Engineer Extension 5781	TELEPHONE NUMBER (include Area Code) (216) 259-3737
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COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPROS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPROS

SUPPLEMENTAL REPORT EXPECTED (14)

YES (if yes, complete EXPECTED SUBMISSION DATE)	X NO	EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
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ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)

At 1530 hours on July 3, 1993 a power supply monitor in the Rod Control and Information System (RCIS) detected less than the required voltage from its power supply. This resulted in loss of control rod scram accumulator status information provided by the RCIS Rod Gang Drive Analyzer, and inhibited control rod motion. Control room operators entered the Technical Specifications for inoperable accumulators and for inoperable control rods. Since demonstration of Control Rod Drive Pump operability could not be accomplished via rod movement, operators entered Technical Specification 3.0.3, with a 7 hour shutdown statement.

Technicians adjusted the power supply monitor and returned RCIS to operable status. Applicable Technical Specifications were exited at 1/31 hours.

At 2003 hours RCIS again alarmed out of service, however accumulator status remained available. Technicians reset RCIS to demonstrate Control Rod Drive pump operability by rod motion. Subsequently, operators took RCIS out of service to replace the RACS power supply. After installation and adjustment of the power supply, the accumulators and RCIS were declared operable and applicable Technical Specifications were exited at 0443 hours on July 4, 1993.

LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (MNB 7714) 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)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
Perry Nuclear Power Plant, Unit 1	05000 440	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	2 OF 4
		93	014	00	

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

I. Introduction

At 1530 hours on July 3, 1993 a power supply monitor in the Rod Control and Information System detected less than the required voltage from its power supply. After adjustment of the power supply monitor to return RCIS to operable status, the power supply subsequently failed and necessitated replacement. Prior to the event the plant was operating at 100 percent power, with reactor pressure at 1034 psia and saturated conditions.

This event is reported pursuant to 10CFR50.73(a)(2)(B) due to the inability to comply with the action requirement of Technical Specification 3.1.3.3.a.2., which provides for verification of control rod drive pump operability by control rod motion.

II. Description of the Event

On July 3, 1993 at 1530 hours, with the plant at 100 percent power and no major evolutions planned or in progress, an alarm indicating "Rod Motion Inhibited/Rod Control and Information System (RCIS) [AA] out of service" was received in the Control Room. Operators entered Technical Specification (TS) 3.1.3.3 due to loss of control rod scram accumulator [AA] status indication from the RCIS Rod Gang Drive Analyzer and declared all 177 accumulators inoperable. All 177 control rods were also declared inoperable per the associated requirement of TS 3.1.3.3.a.2, with entry into TS 3.1.3.1 for control rod operability. TS action 3.1.3.3.a.2 also requires demonstration of a control rod drive pump operability, via rod motion, in lieu of accumulator operability. With rod motion inhibited, this action could not be met and operators entered TS 3.0.3, with a requirement to be in shutdown by 2230 hours. Accumulator pressures were verified by walkdown to be capable of control rod insertion.

Troubleshooting by Instrumentation and Control (I&C) technicians detected that the power supply monitor for the input isolator in a cabinet in the Rod Action Control Subsystem (RACS) of RCIS had detected low voltage from its 5 volt power supply [RIX]. This caused one of two RACS channels to be inoperable, resulting in the RCIS out of service indication. The power supply monitor setpoint was adjusted down approximately 10 mV, RGDS was reset, and the "Inhibit Rod Motion/RCIS out of service" annunciator cleared. After verifying rod positions as indicated on the full core display at the main control console were consistent with rod pull sheets, operators performed TS 3.1.3.3.a.2 action, and exited applicable technical specifications at 1731 hours. Preliminary planning for potential replacement of the RACS cabinet power supply also began.

LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 80.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (MNBB 7714), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20585-0001, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

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

At 2003 hours, "Inhibit Rod Motion/RCIS out of service" was again received. Attempted rod movement was unsuccessful, but accumulator status was available. Operators re-entered TS 3.1.3.1 for Control Rod operability at 2003 hours. I&C technicians performed actions needed to reset the "Rod Motion Inhibited/RCIS out of service" condition to prepare for planned entry into TS 3.1.3.3 for RACS cabinet power supply replacement. After verifying control rod drive pump operability via rod motion, operators entered TS 3.1.3.3 and RCIS was taken out of service. A new 5 volt power supply was installed and adjusted in the RACS cabinet, and the "Rod Motion Inhibited/RCIS out of service" annunciator cleared. Scram accumulators and RCIS were declared operable and operators reset TS 3.1.3.1 and TS 3.1.3.3 at 0443 hours on July 4, 1993.

III. Cause of Event

The event was caused by the failure of the 5 volt power supply in the RACS cabinet. The RCIS imposes rod withdraw and insert blocks under certain plant conditions. The rod block logic circuitry is arranged as two redundant and separate logic circuits which are part of RACS. Each logic circuit receives input trip signals from a number of trip channels and each logic circuit can provide a separate rod block to inhibit rod movement. The two signals in RACS are compared in the Rod Gang Drive Rod Gang Drive subsystem of RCIS and rod blocks applied if either signal is a trip signal. Rod movement is permitted only if the output of the two RACS signals agree at all times with no rod blocks generated. Any RCIS failure that interrupts the signals transmitted to the Hydraulic Control Units will prevent further control rod motion. When the RACS power supply failed, rod motion was inhibited and a voltage fault generated. In the two occurrences of power supply failure the voltage faults were generated by two different voltage comparators. In the 1530 hours event the voltage fault resulted in RCIS lockup, such that rod motion was inhibited and accumulator status was unavailable. In the 2003 hours event the voltage fault was internal to the RACS channel, inhibiting rod motion due to RACS channel disagreement, but not affecting accumulator status indication due to the fault being internal to the channel.

IV. Analysis of Event

When it is desired to move a control rod or gang of rods, the operator selects the applicable rod(s) using the rod select module and then requests insertion or withdrawal of these rods. This request is sent to the two channels of RACS. Each RACS channel generates a command for movement based on this request and if allowed by plant status and the rod pattern controller, the command is sent to the RGDS.

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The RGDS compares the command from each RACS channel and if they are identical, a rod motion command signal is routed to the transponders for the control rod drive hydraulic control units (HCU). If the signals are not identical and the discrepancy not resolved in a series of checks, rod motion is inhibited and alarmed. The analyzer also monitors and indicates HCU status.

The RCIS does not include any of the circuitry or devices used to automatically or manually scram the reactor or the mechanical devices of the control rod drives and the control rod hydraulic system. The Rod Gang Drive Analyzer does continuously scan and provide status for the scram accumulators to provide indication of whether the accumulator has stored sufficient energy to fully insert a control rod at any vessel pressure.

Based on availability of the scram accumulators, as verified by walkdown, this event is not considered to be safety significant.

V. Previous Similar Events

A previous similar event occurred at Perry in January of 1991, as reported by LER 91-005. During the 1991 event, accumulators and control rods were declared inoperable due to replacement of power supplies in RCIS. However, LER 91-005 documents that operators did not initially recognize the applicability of technical specification 3.0.3. Corrective action at that time included personnel counseling and including instruction on the event in operator requalification training. In addition a Technical Specification Change Request was submitted per letter PY-CEI/NRR-1381L on September 23, 1991 to provide an alternate method to verify control rod drive pump operability under these conditions.

VI. Corrective Actions

Corrective action for this event consisted of replacing the 5 volt power supply in the RACS cabinet. Additionally, all licensed and non-licensed plant operators will receive training on this event as part of requalification training.

Energy Industry Identification Codes are Identified in the text as [XX].