

LICENSEE EVENT REPORT (LER)

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-330), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, 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)

0 5 0 0 0 4 4 0 1 OF 0 3

PAGE (3)

TITLE (4)

Inadequate Procedure Results in Residual Heat Removal "A" Shutdown Cooling System Isolation.

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)															
1	1	1	6	9	0	9	0	0	0	3	2	0	0	1	2	1	4	9	0	0	5	0	0	0	0
OPERATING MODE (9)		5		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 5. (Check one or more of the following) (11)																					
POWER LEVEL (10)		0100		20.402(b)		20.405(e)		X		50.73(a)(2)(iv)		73.71(b)													
				20.405(a)(1)(ii)		50.36(a)(1)				50.73(a)(2)(v)		73.71(c)													
				20.405(a)(1)(iii)		50.36(a)(2)				50.73(a)(2)(vi)		OTHER (Specify in Abstract below and in Text, NRC Form 366A)													
				20.405(a)(1)(iv)		50.73(a)(2)(i)				50.73(a)(2)(vii)(A)															
				20.405(a)(1)(v)		50.73(a)(2)(ii)				50.73(a)(2)(viii)(B)															
				20.405(a)(1)(vi)		50.73(a)(2)(iii)				50.73(a)(2)(ix)															

LICENSEE CONTACT FOR THIS LER (12)

NAME

Henry L. Hegrat, Compliance Engineer, Extension 6855

TELEPHONE NUMBER

AREA CODE

2 1 1 6 2 1 5 9 - 1 3 1 7 1 3 1 7

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

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC

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 November 16, 1990, at approximately 2243, the performance of an inadequate procedure which required disconnecting wires to test relay contacts, resulted in a Residual Heat Removal (RHR) "A" shutdown cooling system isolation. The procedure was a work order to replace a control relay. Although the steps were performed in the sequence required by the work order, a step to remove a jumper was incorrectly sequenced. As a result of the jumper removal, an RHR "A" shutdown cooling system isolation was initiated. Control Room Operators discovered the RHR "A" pump tripped and responded in accordance with approved instructions to restore from the RHR "A" shutdown cooling system isolation.

The cause of this event is a procedure deficiency, inadequate instructions. The Instrumentation and Controls (I&C) personnel who planned and reviewed the work order did not notice that the step to remove the jumper was not in the proper sequence. This resulted in the jumper being removed when the conditions which could cause an RHR "A" shutdown cooling system isolation were still present.

The I&C personnel involved in this event have been involved in the investigation and have been adequately made aware of their errors. To prevent recurrence, I&C personnel involved with the planning and review of work orders will be trained to this event and to the importance of proper sequencing of actions in all work orders. Additionally, this event will be reviewed by all licensed operators during requalification training.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 600 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.

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		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		
Perry Nuclear Power Plant, Unit 1	0500044090	03	2	0	0	02 OF 03

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

On November 16, 1990, at approximately 2243, an inadequate procedure which required disconnecting wires to test relay contacts, resulted in a Residual Heat Removal [BO] (RHR) "A" shutdown cooling system isolation. At the time of the event, the plant was in Operational Condition 5 (Refueling) with no core alterations in progress. Reactor coolant temperature was approximately 89 degrees Fahrenheit with reactor vessel [RPV] pressure approximately 0 psig. The Fuel Pool Cooling and Cleaning [DA] (FPCC) system was being used to maintain reactor coolant temperature.

On November 16, 1990, at approximately 2100, Instrumentation and Control (I&C) technicians began to perform steps of Surveillance Instruction (SVI-E31-T0114-A) "Residual Heat Removal Equipment Area 1 Temperature High Channel A Functional for 1E31-N600A & 1E31-N6008A" as part of a work order to replace a control relay. During the performance of the work order, SVI-E31-T0114-A was performed in its entirety using specific steps in the work order to establish conditions where the control relay could be replaced and trip verifications made.

The following sequence of actions was established by the work order and performed by the I&C Technicians:

1. Steps of SVI-E31-T0114-A necessary to bypass the RHR "A" shutdown cooling system isolation and to deenergize the control relay were performed.
2. Steps in accordance with the work order were then performed to remove and replace the control relay and the relay was tested as follows:
 - a. A jumper was installed to prevent the RHR "A" shutdown cooling system isolation when wires were disconnected in the next step.
 - b. Wires were disconnected from a relay terminal and measuring and test equipment (M&TE) was installed to monitor relay contact operation.
 - c. The relay was energized and then deenergized while relay contact operation was monitored using the installed M&TE.
 - d. The jumper was then removed and the RHR "A" shutdown cooling isolation occurred.
 - e. Wires were reconnected to the relay terminal and M&TE was removed.
3. In accordance with the work order, the SVI-E31-T0114-A was completed satisfactorily and the instrumentation restored to service.

Although the steps were performed in the sequence required by the work order, the step to remove the jumper (step 2.d above) was incorrectly sequenced. The jumper should have been removed after the wires were reconnected to the relay terminal (step 2.e above). As a result of the jumper removal, an RHR "A" shutdown cooling system isolation was initiated on November 16, 1990 at approximately 2243. The isolation was not readily identified to control room operators or I&C technicians because the annunciator "RCIC & RHR ISOL RHR RM A/B TEMP HI" was already alarming as expected by SVI-E31-T0114-A. Additionally the FPCC system was being used to maintain reactor coolant temperature, and the isolation had no effect on reactor coolant temperature. The "RHR PUMP A TRIP" annunciator was not immediately noticed and on November 16, 1990, at approximately 2300, Control Room Operators

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TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 800 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.

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

discovered the RHR "A" pump tripped and took the appropriate actions to restore from the RHR "A" shutdown cooling system isolation.

The cause of this event is inadequate instructions. An I&C planner was responsible for assembling materials and constructing the work order, and within it, the job traveler which provided the step-by-step procedure for testing, changing the relay, and retesting the relay. Additionally an I&C Supervisor and I&C Engineer reviewed the package to ensure that it could be worked as written. The I&C personnel who were responsible for the planning and reviewing of the work order did not notice that the step to remove the jumper was not in the proper sequence. This resulted in the jumper being removed when the conditions which could cause an RHR "A" shutdown cooling system isolation were still present.

Leak Detection System [IJ] dual element thermocouples are installed in the RHR "A" equipment area and in the inlet and outlet ventilation ducts to the RHR "A" equipment room for sensing high ambient or high differential temperature. Either of these high temperatures would be indicative of a reactor coolant leak in the RHR "A" equipment room. High ambient and high differential temperature are alarmed in the control room and provide trip signals for closure of isolation valves for RHR "A" to isolate the reactor coolant leak. When the jumper installed by the work order was removed, the logic for RHR "A" Equipment Area High Differential Temperature was completed to initiate the RHR "A" shutdown cooling system isolation and the system responded in accordance with its design.

The RHR shutdown cooling mode of operation is designed to remove decay heat from the reactor pressure vessel during shutdown conditions. The plant had entered Operational Condition 4 (Cold Shutdown) approximately seventy days prior to this event and was in Operational Condition 5 (Refueling) as part of a refueling outage when this event occurred. Prior to this event, RHR "A" had been operating in the shutdown cooling mode with all flow bypassed around the RHR "A" heat exchanger and FPCC system removing decay heat from the reactor. The RHR "A" shutdown cooling system was promptly restored by Control Room Operators and reactor coolant temperature did not increase noticeably. Therefore, this event is not considered to be safety significant.

Previous events of RHR shutdown cooling system isolations have been documented by LER 86-032, 86-034, 86-048, 86-088, 87-025, 87-049, 87-068, and 88-005, however, none of these events have been caused by a deficiency in a work order.

The I&C personnel involved in this event have been involved in the investigation and have adequately been made aware of their errors. To prevent recurrence, I&C personnel involved with the planning and review of work orders will be trained to this event and to the importance of proper sequencing of actions in all work orders. Additionally, all licensed plant operators will review this event during requalification training, with particular emphasis on the monitoring of plant conditions during work activities which disable annunciator functions.

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