

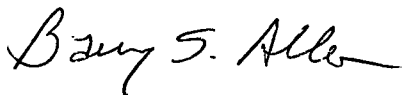
Bary S. Allen
Vice President440-280-5382
Fax: 440-280-8029September 07, 2007
PY-CEI/NRR-3060LUnited States Nuclear Regulatory Commission
Document Control Desk
Washington, D.C. 20555Perry Nuclear Power Plant
Docket No. 50-440

Ladies and Gentlemen:

Enclosed is Licensee Event Report (LER) 2007-002, "Shutdown Cooling Pump Trip Results in Operation Prohibited by Technical Specifications." There are no regulatory commitments contained in this letter. Any actions discussed in this document that represent intended or planned actions are described for the NRC's information, and are not regulatory commitments.

If you have questions or require additional information, please contact Mr. Jeffrey J. Lausberg, Manager – Regulatory Compliance, at (440) 280-5940.

Very truly yours



Vice President

Enclosure: LER 2007-002

cc: NRC Project Manager
NRC Resident Inspector
NRC Region IIIIE22

NRR

NRC FORM 366 (6-2004)	U.S. NUCLEAR REGULATORY COMMISSION	APPROVED BY OMB NO. 3150-0104 EXPIRES 6/30/2007	Estimated burden per response to comply with this mandatory collection request: 50 hrs. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Records and FOIA/Privacy Service Branch (T-5 F52), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to infocollects@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202 (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.
<h2 style="margin: 0;">LICENSEE EVENT REPORT (LER)</h2> <p style="margin: 0;">(See reverse for required number of digits/characters for each block)</p>			

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4. TITLE
Shutdown Cooling Pump Trip Results in Operation Prohibited by Technical Specifications

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO.	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
07	11	2007	2007	002	00	09	07	2007	FACILITY NAME	DOCKET NUMBER

9. OPERATING MODE 4	11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: <i>(Check all that apply)</i>			
10. POWER LEVEL 000	<input type="checkbox"/> 20.2201(b)	<input type="checkbox"/> 20.2203(a)(3)(i)	<input type="checkbox"/> 50.73(a)(2)(i)(C)	<input type="checkbox"/> 50.73(a)(2)(vii)
	<input type="checkbox"/> 20.2201(d)	<input type="checkbox"/> 20.2203(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(ii)(a)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)
	<input type="checkbox"/> 20.2203(a)(1)	<input type="checkbox"/> 20.2203(a)(4)	<input type="checkbox"/> 50.73(a)(2)(ii)(B)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)
	<input type="checkbox"/> 20.2203(a)(2)(i)	<input type="checkbox"/> 50.36(c)(1)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(ix)(A)
	<input type="checkbox"/> 20.2203(a)(2)(ii)	<input type="checkbox"/> 50.36(c)(1)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(iv)(A)	<input type="checkbox"/> 50.73(a)(2)(x)
	<input type="checkbox"/> 20.2203(a)(2)(iii)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(v)(A)	<input type="checkbox"/> 73.71(a)(4)
	<input type="checkbox"/> 20.2203(a)(2)(iv)	<input type="checkbox"/> 50.46(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(v)(B)	<input type="checkbox"/> 73.71(a)(5)
<input type="checkbox"/> 20.2203(a)(2)(v)	<input type="checkbox"/> 50.73(a)(2)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(v)(C)	<input type="checkbox"/> OTHER	
<input type="checkbox"/> 20.2203(a)(2)(vi)	<input checked="" type="checkbox"/> 50.73(a)(2)(i)(B)	<input type="checkbox"/> 50.73(a)(2)(v)(D)	Specify in Abstract below or in NRC Form 366A	

12. LICENSEE CONTACT FOR THIS LER

Kenneth Russell, Compliance Engineer, Regulatory Compliance	TELEPHONE NUMBER <i>(Include Area Code)</i> (440) 280- 5580
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13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT

CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX

14. SUPPLEMENTAL REPORT EXPECTED	15. EXPECTED SUBMISSION DATE	MONTH	DAY	YEAR
<input type="checkbox"/> YES <i>(If yes, complete EXPECTED SUBMISSION DATE).</i> <input checked="" type="checkbox"/> NO				

ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)

On July 11, 2007, at approximately 2313 hours, the Residual Heat Removal pump (RHR) B tripped off. At the time of the event, the plant was in Mode 4 (Cold Shutdown). With RHR B subsystem inoperable, an alternate method of decay heat removal for the RHR B subsystem could not be verified within one hour as required by Technical Specification Limiting Condition for Operation 3.4.10, Required Action A.1. Required Action A.1 was completed on July 12, 2007, at 0559 hours when the tripped RHR B pump was returned to standby.

The RHR B pump trip occurred when an Instrument and Control Technician performing Reactor Core Isolation Cooling (RCIC) surveillance testing unnecessarily loosened a wire connection from an electrical terminal, inducing a current from the RCIC circuitry into the electrically independent RHR B trip system. Modifications to separate the wiring and to install noise suppression diodes are being prepared for installation. Personnel actions were taken per the FENOC Performance Management Process.

This event was determined to be reportable as an operation or condition prohibited by Technical Specifications, 10CFR50.73(a)(2)(i)(B).

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

I. INTRODUCTION

On July 11, 2007, at approximately 2313 hours, the Residual Heat Removal pump (RHR) B [BO] tripped off. At the time of the event, the plant was in Mode 4 (Cold Shutdown). With RHR B subsystem inoperable, an alternate method of decay heat removal for the RHR B subsystem could not be verified within one hour as required by Technical Specification (TS) Limiting Condition for Operation (LCO) 3.4.10, Required Action A.1. This event is being reported in accordance with 10 CFR 50.73(a)(2)(i)(B) as a condition prohibited by Technical Specifications.

II. EVENT DESCRIPTION

On July 11, 2007, the Perry Nuclear Power Plant (PNPP) was in Mode 4 due to a maintenance outage to replace a reactor recirculation (RRC)[AD] pump motor. Surveillance testing of the Reactor Core Isolation Cooling (RCIC)[BN] system high steam flow instrumentation was in progress.

Both RHR pumps A and B were available for shutdown cooling with B in service. RHR A and B, Low Pressure Core Spray [BM] and High Pressure Core Spray [BJ] were the available Emergency Core Cooling Systems. The Division 1 and 2 Emergency AC Diesel Generators (EDG) [EK] were available. Division 3 EDG was inoperable for maintenance. The primary containment equipment access hatch was open to support the RRC motor replacement. Containment closure controls were in effect. RRC pumps A and B were shutdown. Control Rod Drive Pump (CRD) A [AA] was in service with B available. The CRD system normally supplies 50 to 67 gpm makeup water flow to the Reactor Pressure Vessel (RPV). Reactor Water Cleanup (RWCU)[CE] was in service to provide a RPV drain flow path and was available to provide decay heat removal although it was not capable of providing full decay heat removal. Additional alternate methods of RPV flooding were also available.

At 2313 hours, a control room annunciator was received indicating that the operating RHR pump B had tripped off. Control room operators entered the appropriate off-normal instruction for the loss of shutdown cooling. Preparations were commenced to start the previously non-operating RHR A pump in shutdown cooling and RPV level was raised to promote natural recirculation. At 2350 hours, the RWCU system was placed in the Alternate Decay Heat Removal Mode. Although the cooling capacity is not adequate to remove all decay heat early in a shutdown, RPV heatup rate is decreased by placing the RWCU system in this mode. Following checks to ensure a common failure mode would not impact the remaining shutdown cooling system, the RHR A system was placed in shutdown cooling mode on July 12, 2007, at 0110 hours. Following initial troubleshooting of the RHR B pump breaker and fill and vent of the system, the RHR B system was placed in standby and made available at 0559 hours.

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TS LCO 3.4.10 Required Action A.1 is to verify an alternate method of decay heat removal is available for the tripped (inoperable) RHR shutdown cooling subsystem within one hour. This action was not completed in the one hour completion time. The action was completed on July 12, 2007, at 0559 hours when the tripped RHR B pump was returned to standby. This event was determined to be reportable as an operation or condition prohibited by TS, as required by 10CFR50.73(a)(2)(i)B).

III. CAUSE OF EVENT

The RHR B pump trip occurred when an Instrument and Control (I&C) Technician did not follow a step in a surveillance instruction correctly and unnecessarily loosened a wire connection from an electrical terminal in the RCIC circuitry. The RHR B circuitry is electrically independent of the RCIC circuitry. When the wire was loosened from the terminal in the RCIC circuit, relays in the RCIC circuit provided current which was inductively coupled to the RHR wires that were bundled with the RCIC wires. The induced current caused an optical isolator in the RHR B system to turn on. When the optical isolator turned on it energized the RHR Pump B Trip Relay. This completed the trip circuit of the RHR B pump.

IV. EVENT ANALYSIS

This event was of very low safety significance

The design basis for the most limiting single failure for the RHR system (shutdown cooling mode) is one heat exchanger loop is lost and the plant is shut down using the capacity of a single RHR heat exchanger loop and related service water capability. In this event, the plant had been shutdown for approximately 12 days following a limited operating history for the fuel. RWCU was placed in Alternate Decay Heat Removal Mode about 37 minutes following the trip of the operating shutdown cooling system. The standby RHR A loop was put in service in less than two hours.

The time for the bulk of the reactor water to boil was conservatively calculated at over four hours. This calculation did not include heat removed by RWCU or losses to the ambient environment. The temperature when the RHR A loop was placed in service was about 139 degrees Fahrenheit. Based on a plant design in which one loop of RHR is adequate for design decay heat removal and a loop being available and placed in service, this event was evaluated to be of very low safety significance.

V. CORRECTIVE ACTIONS

Actions have been taken for the Technician who inappropriately loosened the RCIC wire connection, in accordance with the FENOC Performance Management Process.

The surveillances directing the testing of the RCIC circuit will be revised to incorporate

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industry standards for decisions steps.

A plant modification is being prepared to install noise suppression diodes across coils for the affected relays.

A plant modification is being prepared to separate the wires for RCIC and RHR that were bundled together to eliminate the potential to inductively couple noise between the two systems.

VI. PREVIOUS SIMILAR EVENTS

A review of PNPP Licensee Event Reports and the corrective action program data base for the past five years did not identify any events that occurred as a result of an issue due to inductive coupling between different systems.

LER 2004-001 identified a condition prohibited by Technical Specification 3.4.10. On May 21, 2004, Emergency Service Water (ESW) pump A was declared inoperable due to a pump shaft coupling failure. A power reduction was ordered to shutdown the plant to complete repairs. MODE 4 (cold shutdown) was entered on May 23, 2004. Since ESW A was inoperable, RHR A shutdown cooling was not operable and the required action for Technical Specification 3.4.10 was not met. The cause of this LER was an ESW pump shaft coupling failure. The corrective actions from LER 2004-001, installation of a redesigned pump shaft coupling, could not have prevented LER 2007-002.

VII. COMMITMENTS

There are no regulatory commitments contained in this report. Actions described in this document represent intended or planned actions, are described for the NRC's information, and are not regulatory commitments.

Note: Although this LER has been reviewed and approved by site management, the associated condition report's root cause evaluation is expected to receive an internal "collegial" review by the site's corrective action review board after the LER has been submitted to the NRC.