

**BOSTON EDISON**

Pilgrim Nuclear Power Station  
Rocky Hill Road  
Plymouth, Massachusetts 02360

September 17, 1992

BECo Ltr. 92-110

**Roy A. Anderson**

Senior Vice President - Nuclear


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

Docket No. 50-293  
License No. DPR-35

Dear Sir:

The enclosed Licensee Event Report (LER) 92-010-00, "Reactor Core Isolation Cooling System Made Inoperable Per Technical Specifications Due to Stripped Area Temperature Switch Terminal During Surveillance," is submitted in accordance with 10 CFR Part 50.73.

Please do not hesitate to contact me if there are any questions regarding this report.

  
R. A. Anderson

DWE/bal

Enclosure: LER 92-010-00

cc: Mr. Thomas T. Martin  
Regional Administrator, Region I  
U.S. Nuclear Regulatory Commission  
475 Allendale Rd.  
King of Prussia, PA 19406

Mr. R. B. Eaton  
Div. of Reactor Projects I/II  
Office of NRR - USNRC  
One White Flint North - Mail Stop 14D1  
11555 Rockville Pike

Sr. NRC Resident Inspector - Pilgrim Station

Standard BECo LER Distribution

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NRC FORM 366 (5-92)		U.S. NUCLEAR REGULATORY COMMISSION			APPROVED BY OMB NO. 3150-0104 EXPIRES 5/31/95  <small>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 (MNRB 7714), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20545-0001, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.</small>					
<b>LICENSEE EVENT REPORT (LER)</b>										
(See reverse for required number of digits/characters for each block)										
FACILITY NAME (1) <b>Pilgrim Nuclear Power Station</b>					DOCKET NUMBER (2) <b>05000293</b>			PAGE (3) <b>1 OF 6</b>		
TITLE (4) <b>Reactor Core Isolation Cooling System Made Inoperable Per Technical Specifications Due to Stripped Area Temperature Switch Terminal During Surveillance</b>										
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
8	18	92	92	010	00	9	17	92	N/A	05000
OPERATING MODE (9) <b>N</b>			THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 5: (Check one or more) (11)							
POWER LEVEL (10) <b>100</b>			20.402(b)			20.405(c)			50.73(a)(2)(iv)	
			20.405(a)(1)(i)			50.36(c)(1)			X 50.73(a)(2)(v) D	
			20.405(a)(1)(ii)			50.36(c)(2)			50.73(a)(2)(vii)	
			20.405(a)(1)(iii)			50.73(a)(2)(i)			50.73(a)(2)(vii)(A)	
			20.405(a)(1)(iv)			50.73(a)(2)(ii)			50.73(a)(2)(vii)(B)	
			20.405(a)(1)(v)			50.73(a)(2)(iii)			50.73(a)(2)(x)	
LICENSEE CONTACT FOR THIS LER (12)										
NAME <b>Douglas W. Ellis - Senior Compliance Engineer</b>								TELEPHONE NUMBER (Include Area Code) <b>(508) 747-8160</b>		
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	
B	BN	BLK	W172	Y						
SUPPLEMENTAL REPORT EXPECTED (14)										
YES <small>(If yes, complete EXPECTED SUBMISSION DATE)</small>					NO					EXPECTED SUBMISSION DATE (15)
					X					
ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)										
<p>On August 18, 1992, at 1230 hours, a seven day Technical Specification 3.5.D.2 Limiting Condition for Operation (LCO) was entered because the Reactor Core Isolation Cooling (RCIC) System was removed from service and made inoperable to repair an area temperature switch terminal block termination point that became stripped during a quarterly calibration and functional surveillance test.</p> <p>The cause of the stripped terminal was repeated torquing of the terminal screw during temperature switch calibrations. The terminal (Weidmuller type SAK6N) was replaced. Following the replacement of the terminal, the circuitry was functionally tested with satisfactory results. The RCIC System was declared operable and the seven day LCO was terminated on August 18, 1992 at 2300 hours. The High Pressure Coolant Injection System was operable during the period the RCIC System was inoperable. Corrective action planned to preclude recurrence includes changing the circuitry to make it more suitable for frequent calibration.</p> <p>This event occurred during power operation while at 100 percent reactor power. The reactor mode selector switch was in the "UN" position. The Reactor Vessel (RV) pressure was 1030 psig with the RV water temperature at 546 degrees Fahrenheit. This report is submitted in accordance with 10 CFR 50.73(a)(2)(v)(D) and this event posed no threat to the public health and safety.</p>										

REQUIRED NUMBER OF DIGITS/CHARACTERS  
FOR EACH BLOCK

BLOCK NUMBER	NUMBER OF DIGITS/CHARACTERS	TITLE
1	UP TO 46	FACILITY NAME
2	8 TOTAL 3 IN ADDITION TO 05000	DOCKET NUMBER
3	VARIES	PAGE NUMBER
4	UP TO 76	TITLE
5	6 TOTAL 2 PER BLOCK	EVENT DATE
6	7 TOTAL 2 FOR YEAR 3 FOR SEQUENTIAL NUMBER 2 FOR REVISION NUMBER	LER NUMBER
7	6 TOTAL 2 PER BLOCK	REPORT DATE
8	UP TO 18 -- FACILITY NAME 8 TOTAL -- DOCKET NUMBER 3 IN ADDITION TO 05000	OTHER FACILITIES INVOLVED
9	1	OPERATING MODE
10	3	POWER LEVEL
11	1 CHECK BOX THAT APPLIES	REQUIREMENTS OF 10 CFR
12	UP TO 50 FOR NAME 14 FOR TELEPHONE	LICENSEE CONTACT
13	CAUSE VARIES 2 FOR SYSTEM 4 FOR COMPONENT 4 FOR MANUFACTURER NPRDS VARIES	EACH COMPONENT FAILURE
14	1 CHECK BOX THAT APPLIES	SUPPLEMENTAL REPORT EXPECTED
15	6 TOTAL 2 PER BLOCK	EXPECTED SUBMISSION DATE

NRC FORM 366A <small>(5-92)</small>		U.S. NUCLEAR REGULATORY COMMISSION		APPROVED BY OMB NO. 3150-0104 EXPIRES 5/31/95	
<b>LICENSEE EVENT REPORT (LER)</b> <b>TEXT CONTINUATION</b>				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 (IMRB 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)	
Pilgrim Nuclear Power Station		05000 293		YEAR	SEQUENTIAL NUMBER
				REVISION NUMBER	
				92	010 - 00
				PAGE (3) 2 OF 6	

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

Background

The Reactor Core Isolation Cooling (RCIC) System has four Torus Compartment area temperature switches. The temperature switches provide a RCIC turbine steam exhaust pipe break detection function. The temperature switches are designed to cause the automatic closure of the RCIC turbine steam supply isolation valves MO-1301-16 and -17 if a Torus Compartment area high temperature condition occurs. The logic circuitry is arranged in two channels with two Torus Compartment area temperature switches in each channel. Channel 'A' is comprised of temperature switches TS-1360-15C and -17C and Channel 'B' is comprised of temperature switches TS-1360-15D and -17D. The switches in each channel are connected in series, via electrical connections, such that one inoperable temperature switch makes the channel inoperable.

The calibration process of a temperature switch includes the replacement of the temperature switch with a spare calibrated temperature switch. The replacement includes the detorquing of the screws that secure the temperature switch leads to the terminal, removing the installed temperature switch and replacing it with the spare calibrated temperature switch, and torquing the terminal screws.

EVENT DESCRIPTION

On August 18, 1992, at 1230 hours, a seven day Technical Specification 3.5.D.2 Limiting Condition for Operation (LCO) was entered because the RCIC System was removed from service and made inoperable to repair a stripped terminal block termination point (terminal) for area temperature switch TS-1360-17C. The terminal became stripped during the performance of Procedure 8.M.2-2.6.3 (Rev. 18) Attachment 2, "RCIC Steam Line High Temperature Instrument Calibration and Functional Test". The test commenced on August 18, 1992, at approximately 0845 hours.

At step [70](b), terminal #4 for TS-1360-17C was found stripped when the installed temperature switch was being removed. The RCIC System was removed from service and made inoperable for the replacement of the terminal. Technical Specification Table 3.2.B Note 2 requires the closing of the RCIC System isolation valves with less than the minimum number (2) of area temperature instrument channels. This action was previously accomplished by the closing of the RCIC turbine steam supply line isolation valves at step [22].

Problem Report 92.9145 was written to document this event. The NRC Operations Center was notified in accordance with 10 CFR 50.72 on August 18, 1992, at 1315 hours. The High Pressure Coolant Injection (HPCI) System was verified operable in accordance with Technical Specification 3.5.D.2.



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 (MNRB 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)
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Pilgrim Nuclear Power Station	05000 293	92	- 010	- 00	3 OF 6

TEXT (If more space is required, use additional copies of NRC Form 36CA) (17)

This event occurred during power operation while at 100 percent reactor power with the reactor mode selector switch in the RUN position. The Reactor Vessel (RV) pressure was 1030 psig with the PV water temperature at approximately 546 degrees Fahrenheit.

CAUSE

The cause of the stripped terminal was previous, repeated torquing of the terminal screw as part of the quarterly calibration process. The torquing of the screw during the quarterly calibrations weakened the terminal (Weidmuller type SAK6N).

Previous investigation determined the torquing requirements of 5 to 7 inch-pounds specified in Procedure 8.M.2-2.6.3 Attachment 2 is consistent with the manufacturer's recommendation. Therefore, overtightening during the calibrations was eliminated as a cause of the stripped terminal.

CORRECTIVE ACTION

The stripped terminal for TS-1360-17C was replaced. Following the replacement, the Channel 'A' portion of the circuitry for TS-1360-17C was functionally tested in accordance with Procedure 8.M.2-2.6.3 Attachment 2 with satisfactory results. The RCIC System was declared operable and the seven day LCO was terminated on August 18, 1992, at 2300 hours.

Corrective action to preclude recurrence is part of the Long Term Plan (LTP 224). The plan includes changing the circuitry to make it more suitable for frequent calibration. The change includes the replacement of applicable terminal blocks and/or the installation of electrical connectors that do not require the loosening or torquing of terminal block screws for safety-related area temperature switch calibrations. The changes were planned to be implemented during the next scheduled calibration of the temperature switches or during planned maintenance. The changes included the HPCI System, RCIC System, Equipment Area Cooling System, Main Steam System, and Reactor Water Cleanup System. The HPCI System circuitry was changed during planned maintenance on August 13-14, 1992. The lessons learned during the planned maintenance for the HPCI System prompted a change to the work plan for the RCIC System circuitry. The performance of Procedure 8.M.2-2.6.3 was due by August 19, 1992 and before the RCIC System work plan changes were completed. Consequently, the RCIC System changes had not been implemented prior to the performance of Procedure 8.M.2-2.6.3 on August 18, 1992. The changes to eight of the 12 RCIC area temperature switches are expected to be completed in September 1992. The other RCIC System changes are expected to be completed by the end of the mid-cycle 1992 outage.

**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 20555-0001, 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 365A) (17)

**SAFETY CONSEQUENCES**

This event posed no threat to the public health and safety.

The RCIC System area temperature switches were operable prior to the event. The RCIC System area temperature switches were recently functionally tested in accordance with Procedure 8.M.2-2.6.3 (Rev. 18) Attachment 2. The functional test of TS-1360-17C was completed with satisfactory results on June 18, 1992.

The HPCI System was operable during the period the RCIC System was inoperable.

This report is submitted in accordance with 10 CFR 50.73(a)(2)(v)(D) because the RCIC System was made inoperable.

**SIMILARITY TO PREVIOUS EVENTS**

A review was conducted of Pilgrim Station Licensee Event Reports (LERs) submitted since January 1984. The review focused on LERs involving terminal failures. The review identified similar problems with terminals reported in LERs 50-293/89-019-00, 91-004-00, and 92-007-00.

For LER 89-019-00, the RCIC System was made inoperable during power operation on June 9, 1989, at 0500 hours, in accordance with Technical Specification Table 3.2.B. The system was made inoperable due to the discovery of a lifted lead during a functional test of the RCIC System area temperature switches. The lifted lead for the RCIC System valve station area temperature switch TS-1360-14D would have prevented the Channel 'B' valve station area temperature switches from providing the pipe break detection function. The lead was lifted because the terminal (Weidmuller type SAK6N) was accidentally broken during the May 14, 1989 temperature switch calibration. The procedure (8.M.2-2.6.3) was signed off as completed without the lifted lead being noted in the procedure. Corrective actions included the following: the terminal was replaced; the responsible I&C Supervisor received specific training regarding lifted leads and jumpers; other I&C and Electrical Maintenance personnel received similar training; and approximately 379 other completed surveillance test procedures were reviewed for discrepancies which could affect operability of the tested system. This review identified no discrepancies affecting the operability of the tested system.

LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 60.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (INBB 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)
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TEXT (if more space is required, use additional copies of NRC Form 366A) (17)

For LER 91-004-00, the RCIC System was made inoperable during power operation on March 19, 1991, at 2345 hours in accordance with Technical Specification Table 3.2.B. The system was made inoperable due to a terminal stripped during the performance of Procedure 8.M.2-2.6.3 (Rev. 18) Attachment 2. The terminal was stripped as an installed RCIC System valve station area temperature switch (TS-1360-14C) was being replaced with a previously calibrated temperature switch. The cause of the stripped terminal was repeated torquing. The repeated torquing during the quarterly calibrations weakened the terminal (Weidmuller type SAK6N). The stripped terminal for TS-1360-14C was replaced with an installed spare. The stripped terminal was inserted into the spare terminal's location and a Maintenance Request (MR 19101961) was written to replace the stripped terminal. Following the March 19, 1991 replacement of the terminal, the Channel 'A' circuitry was tested in accordance with Procedure 8.M.2-2.6.3 Attachment 2 with satisfactory results. The RCIC System was declared operable and the seven day LCO was terminated on March 20, 1991, at 0450 hours. The stripped terminal was replaced with a new terminal and MR 19101961 was closed on September 11, 1991.

For LER 92-007-00, the RCIC System was removed from service and made inoperable during power operation on June 18, 1992, at 1900 hours, in accordance with Technical Specification Table 3.2.B. The system was made inoperable due to a terminal that became loose during a functional test performed in accordance with Procedure 8.M.2-2.6.3 (Rev. 18) Attachment 1. The terminal for TS-1360-16C became loose when the junction box cover for the RCIC System valve station area Channel 'A' temperature switches TS-1360-14C and -16C was being reinstalled after a satisfactory functional test of the temperature switches. The cause of the loose terminal was previous, repeated torquing of the terminal screw as part of the calibration process that involves temperature switch replacement. Corrective action taken included the replacement of the loose terminal. The RCIC System was declared operable and the seven day LCO was terminated on June 19, 1992, at 0200 hours. Corrective action planned to preclude recurrence included changing the circuitry to make it more suitable for frequent calibration.

# 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 (MNBB 7714), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20545-0001, 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)

For LER 91-004-00, the RCIC System was made inoperable during power operation on March 19, 1991, at 2345 hours in accordance with Technical Specification Table 3.2.B. The system was made inoperable due to a terminal stripped during the performance of Procedure 8.M.2-2.6.3 (Rev. 18) Attachment 2. The terminal was stripped as an installed RCIC System valve station area temperature switch (TS-1360-14C) was being replaced with a previously calibrated temperature switch. The cause of the stripped terminal was repeated torquing. The repeated torquing during the quarterly calibrations weakened the terminal (Weidmuller type SAK6N). The stripped terminal for TS-1360-14C was replaced with an installed spare. The stripped terminal was inserted into the spare terminal's location and a Maintenance Request (MR 19101961) was written to replace the stripped terminal. Following the March 19, 1991 replacement of the terminal, the Channel 'A' circuitry was tested in accordance with Procedure 8.M.2-2.6.3 Attachment 2 with satisfactory results. The RCIC System was declared operable and the seven day LCO was terminated on March 20, 1991, at 0450 hours. The stripped terminal was replaced with a new terminal and MR 19101961 was closed on September 11, 1991.

For LER 92-007-00, the RCIC System was removed from service and made inoperable during power operation on June 18, 1992, at 1900 hours, in accordance with Technical Specification Table 3.2.B. The system was made inoperable due to a terminal that became loose during a functional test performed in accordance with Procedure 8.M.2-2.6.3 (Rev. 18) Attachment 1. The terminal for TS-1360-16C became loose when the junction box cover for the RCIC System valve station area Channel 'A' temperature switches TS-1360-14C and -16C was being reinstalled after a satisfactory functional test of the temperature switches. The cause of the loose terminal was previous, repeated torquing of the terminal screw as part of the calibration process that involves temperature switch replacement. Corrective action taken included the replacement of the loose terminal. The RCIC System was declared operable and the seven day LCO was terminated on June 19, 1992, at 0200 hours. Corrective action planned to preclude recurrence included changing the circuitry to make it more suitable for frequent calibration.



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

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS  
INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD  
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TEXT (if more space is required, use additional copies of NRC Form 366A) (17)

ENERGY INDUSTRY IDENTIFICATION SYSTEM (EIIS) CODES

The EIIS codes for this report are as follows:

COMPONENTS

Block  
Switch, Temperature

CODES

BLK  
TS

SYSTEMS

Leak Monitoring System  
Reactor Core Isolation Cooling (RCIC) System  
Temperature Monitoring System

IJ  
BN  
IM