10 CFR 50.73

BOSTON EDISON
Pilgrim Nuclear Power Station
Rocky Hill Road
Plymouth, Massachusetts 02360

February 25, 1993
BECo Ltr. 93-24

E. T. Boulette, PhD
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) 93-001-00, "High Pressure Coolant Injection System Declared Inoperable Due to No Flow Indication 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.

E.S. Kraft, Jr.
E. T. Boulette for
Senior Vice President Nuclear

RAG/bal

Enclosure: LER 93-001-00

cc: Mr. Thomas T. Martin
Regional Administrator, Region I
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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

LICENSEE EVENT REPORT (LER)

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

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
Pilgrim Nuclear Power Station	05000293	1 OF 5

TITLE (4) High Pressure Coolant Injection System Declared Inoperable Due to No Flow Indication During Surveillance

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
									N/A	05000
1	26	93	93	- 001 -	00	02	25	93	N/A	05000

OPERATING MODE (9): N

POWER LEVEL (10): 100

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)

	20.402(b)		20.405(c)		50.73(a)(2)(iv)		73.71(b)
	20.405(a)(1)(i)		50.36(c)(1)	X	50.73(a)(2)(v) (D)		73.71(c)
	20.405(a)(1)(ii)		50.36(c)(2)		50.73(a)(2)(vii)		OTHER (Specify in Abstract below and in Text, NRC Form 366A)
	20.405(a)(1)(iii)		50.73(a)(2)(i)		50.73(a)(2)(viii)(A)		
	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	TELEPHONE NUMBER (Include Area Code)
Robert A. Gay - Compliance Engineer	(508) 747-8047

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

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS		CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS

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 January 26, 1993, at 1004 hours, the High Pressure Coolant Injection (HPCI) System was declared inoperable and a seven day Technical Specification (3.5.C.2) Limiting Condition for Operation was entered. The HPCI System was declared inoperable because no flow was indicated at the HPCI pump flow indicating controller during a scheduled monthly operability surveillance test. All other parameters registered normal during the test. The HPCI System was returned to normal standby service during subsequent investigative and corrective action activities.

The cause was a blown power supply fuse located within the flow controller. The cause of the blown fuse could not be determined. Corrective action taken included replacing the blown fuse. The HPCI System was tested with satisfactory results and declared operable on January 26, 1993, at 1620 hours. While the HPCI System was declared inoperable, the applicable systems were verified operable as required by Technical Specifications. Further engineering evaluation has been requested.

The event occurred during power operation while at 100 percent reactor power. The reactor mode selector switch was in the RUN position. The Reactor Vessel (RV) pressure was 1025 psig with the RV water temperature at 545 degrees Fahrenheit. This report is submitted in accordance with 10 CFR 50.73(a`(2)(v)(D) and the event posed no threat to the public health and safety.

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

BACKGROUND

Plant Design Change 83-11 replaced GEMAC transmitters with Rosemount transmitters in September of 1983. Field Revision Notice 83-11-23 was written to lower the protective fuse amperage rating to 1/20 amp. due to zener diodes added to power supply and controller output by PDC 83-11. In March of 1984, FRN 83-11-30 was written to replace the fast blow fuses with slow blow fuses (Bussman MDL 1/32 amp.) due to fast blow fuses failing on circuit high in-rush current.

Maintenance Request 89-23-93 was written in October of 1989 to replace a blown fuse (Bussman MDL 1/32 amp.) located inside Flow Indicating Controller FIC-2340-1. The Flow Indicating Controller unit FIC-2340-1 was replaced in November of 1990 via Maintenance Request 90-23-92.

Engineering personnel involved with the Rosemount transmitter installation indicate at the time the slow blow fuse selection was made, it was done on a conservative judgment basis that focused on a design requirement to protect zener diodes rated for 50 mA steady state current. Based on the availability of the fuse, a 30mA fuse was selected to protect the zener diode.

The flow indicating controller responds to a pump flow demand signal and adjusts steam flow to accommodate varying reactor pressure. The controller can be operated in either manual or automatic modes. The flow indicating controller is normally in AUTO with its tape set at 4250 gpm. The operators utilize the flow indication from FIC-2340-1 as part of the pump and valve operability test to ensure the HPCI pump flow rate is in compliance with Technical Specifications.

EVENT DESCRIPTION

On January 26, 1993, at 1004 hours, the HPCI System was declared inoperable and a seven day Technical Specification (3.5.C.2) Limiting Condition for Operation (LCO) was entered. The system was declared inoperable because no pump flow was indicated at the flow indicating controller, FIC-2340-1, during a scheduled monthly operability surveillance test conducted in accordance with Procedure 8.5.4.1 (Rev. 41), "HPCI System Pump and Valve Monthly/Quarterly Operability". Even though no flow was detected on the flow controller, all other parameters registered as normal during the test. The HPCI System was returned to normal standby status for subsequent investigative and corrective action activities.

Following immediate investigation, Maintenance Request 19300305 was issued. The fuse (Bussman MDL 1/32 amp.) was replaced and the HPCI System was returned to standby service on January 26, 1993, at 1620 hours after satisfactory post work testing.

Problem report 93.9020 was written to document the event. The NRC Operations Center was notified in accordance with 10 CFR 50.72 on January 26, 1993, at 1100 hours. The Reactor Core Isolation Cooling (RCIC) System was verified operable in accordance with Technical Specification 3.5.C.2.

The 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 1025 psig with the RV water temperature at 545 degrees Fahrenheit.

CAUSE

The cause of the no flow indication at the flow indicating controller FIC-2340-1 was due to a blown power supply fuse (Bussman MDL 1/32 amp.) located within the flow controller that is part of the circuitry related to the HPCI pump flow transmitter FT-2358. The root cause of the blown fuse could not be determined, but potential factors such as normal operating characteristics and ambient temperature in which it functions possibly caused the fuse failure. The fuse either failed due to an overcurrent surge condition or from a premature manufacturing deficiency failure. The methodology used to perform calibration, surveillance, troubleshooting and the uniqueness of using the controller's internal power supply for instrument loop power versus the majority of other instrument loops, suggested current surges and possible elevated temperature of the fuse were the key factors contributing to the blown fuse.

The fuse manufacturer (Bussman Division - Cooper Industries) indicated the blown fuse is typical of an overcurrent surge condition versus a dead short condition. The manufacturer noted the existing fuse is designed to handle two times rated current for about 12 seconds at 77 degrees Fahrenheit. The manufacturer indicated the fuse would degrade over time if surge currents in excess of specifications occurred.

Surge currents in this circuit have been documented in excess of 50 mA, and the rating of the fuse in this application should be derated due to elevated ambient temperature. Because the flow controller requires removal for calibration, it is evident surge currents are generated. The HPCI controller operates at full output and a higher temperature during standby service while the RCIC controller operates at zero output during standby service.

The Emergency and Plant Information Computer historical file for the HPCI pump flow transmitter FT-2358 data point HPC010 indicates the HPCI System would have exhibited no indicated flow if initiated from January 15, 1993, to the time of fuse replacement on January 26, 1993. This blown fuse did not inhibit automatic initiation or operation of the system but affects the ability to measure pump flow.

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

CORRECTIVE ACTION

Immediate corrective action taken included replacement of the blown fuse via Maintenance Request 19300305. The HPCI System was subsequently tested in accordance with Procedure 8.5.4.1 (Rev. 41), "HPCI System Pump and Valve Monthly/Quarterly Operability", with satisfactory results. The HPCI System was declared operable and the seven day LCO was terminated on January 26, 1993, at 1620 hours.

Engineering has been requested to evaluate the fuse failure and provide recommendations to preclude recurrence.

The HPCI and RCIC flow measuring loops can fail without easily being detected if the instrument loop fuse fails. This condition does not inhibit automatic initiation or operation of the system but affects the ability to measure pump flow. Engineering has been requested to evaluate adding the HPCI pump flow transmitter computer point (HPC010) and RCIC pump flow transmitter computer point (RCI010) on the computer alarm typer in the Main Control Room. This will provide prompt identification of future fuse failures.

The Nuclear Plant Reliability Data System (NPRDS) was reviewed for trending of fuse failures. NPRDS does not trend the failure of fuses.

SAFETY CONSEQUENCES

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

The blown fuse was not a component failure.

The Core Standby Cooling System (CSCS) consists of the HPCI System, Automatic Depressurization System (ADS), Core Spray System, and Residual Heat Removal System/Low Pressure Coolant Injection (LPCI) mode. Although not part of the CSCS, the RCIC System is capable of providing water to the Reactor Vessel for core cooling, similar to the HPCI System. During the period the HPCI System was declared inoperable, the RCIC, ADS, Core Spray, and RHR System/LPCI mode were verified operable in accordance with Technical Specification 3.5.C.2.

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

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6) YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	PAGE (3)
Pilgrim Nuclear Power Station	05000 293	93	- 001 -	00	5 OF 5

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

SIMILARITY TO PREVIOUS EVENTS

A review was conducted of Pilgrim Station Licensee Event Reports (LERs) submitted since January 1984. The review focused on LERs submitted in accordance with 10 CFR 50.73(a)(2)(v) that involved the HPCI System. This review did not identify any similar events.

ENERGY INDUSTRY IDENTIFICATION SYSTEM (EIIS) CODES

The EIIS codes for this report are as follows:

COMPONENTS	CODES
Control, Indicating, Flow (FIC-2340-1)	FIC
Fuse	FU

SYSTEMS	
High Pressure Coolant Injection (HPCI) System	BJ