10 CFR 50.73

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

Ralph G. Bird
Senior Vice President — Nuclear

October 13, 1990
BECo Ltr. 90-126

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) 90-015-00, "Unplanned Partial Isolations of the Hydrogen and Oxygen Analyzer System and the Reactor Coolant Pressure Boundary Leak Detection System During Jumper Installation", 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. G. Bird

BPL/bal

Enclosure: LER 90-015-00

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

Sr. NRC Resident Inspector - Pilgrim Station

Standard BECo LER Distribution

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(9-83)

U.S. NUCLEAR REGULATORY COMMISSION
APPROVED OMB NO. 3150-0104
EXPIRES: 8/31/88

LICENSEE EVENT REPORT (LER)

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TITLE (4) Unplanned Partial Isolations of the Hydrogen and Oxygen Analyzer System and the Reactor Coolant Pressure Boundary Leak Detection System During Jumper Installation.

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)
									N/A	0 5 0 0 0
0 9	1 3	9 0	9 0	0 1 5	0 0	1 0	1 3	9 0	N/A	0 5 0 0 0

OPERATING MODE (9)		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)			
N		20.402(b)	20.405(c)	X 50.73(a)(2)(iv)	73.71(b)
POWER LEVEL (10)	0 0	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 (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
	AREA CODE
Brian P. Lunn - Senior Compliance Engineer	5 0 8 7 4 7 - 8 0 4 1

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 fifteen single-space typewritten lines) (16)

On September 13, 1990 at 1640 hours, unplanned actuations of portions of the Primary Containment Isolation Control System (PCIS) caused partial isolations of the Hydrogen and Oxygen Analyzer System and the Reactor Coolant Pressure Boundary Leak Detection System. The isolations occurred while installing a grounding jumper required for the planned replacement of relay 16A-K29 in Panel C-941. While attempting to attach the grounding jumper to terminal number 14 of relay 16A-K17X in Panel C-941, terminals number 10 and number 12 were accidentally contacted which caused fuses PPFU1 and FU-RADA to blow. The accidental contact with terminals number 10 and number 12 during jumper installation was a result of an inadequate work plan. The location of the relay and arrangement of Panel C-941 made the jumper installation difficult and contributed to the event.

The event occurred while shutdown with the Reactor Mode Selector Switch in the REFUEL position for instrument checks. Reactor power level was zero percent, the Reactor Vessel (RV) pressure was zero psig and the RV water temperature was approximately 102 degrees Fahrenheit. This report is submitted in accordance with 10 CFR 50.73(a)(2)(iv).

The blown fuses were replaced and the valve lineups were returned to normal. A task force has been formed to determine the various problems that could occur when installing jumpers and to identify methods to minimize the potential for unplanned Engineered Safeguard Feature Actuations to occur when installing jumpers.

The event had no potential to adversely impact the public health and safety.

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

EVENT DESCRIPTION

On September 13, 1990 at 1640 hours, unplanned actuations of portions of the Primary Containment Isolation Control System (PCIS) caused partial isolations of the Hydrogen and Oxygen Analyzer System and the Reactor Coolant Pressure Boundary Leak Detection System. The event was annunciated in the Control Room by a loss of supply alarm for the Hydrogen and Oxygen Analyzer System and a trouble alarm for the Leak Detection System (Panels C-19 A/B).

The isolations occurred while attempting to install a grounding jumper per Maintenance Request (MR) 90-10-72. The grounding jumper was being installed for the replacement of relay 16A-K29 located in Panel C-941. Removal of the relay 16A-K29 would break the loop-through neutral wiring (daisy chain) in Panel C-941. The grounding jumper was necessary to prevent de-energizing the coils of other relays wired into the neutral loop.

The jumper was attached to the Panel C-941 ground bus (stranded copper cable). While attempting to attach the remaining end of the grounding jumper to (120 VAC) terminal number 14 of relay 16A-K17X located in Panel C-941, terminals number 10 and 12 of relay 16A-K17X were accidentally contacted. Connection of the energized (120 VAC) terminal number 10 to ground caused fuse PPFU1 in Panel C-904 to blow. Connection of the energized (120 VAC) terminal number 12 to ground caused fuse FU-RADA in Panel C-170 to blow.

The blown fuse PPFU1 resulted in the associated relays becoming deenergized and the following Primary Containment System (PCS)/Group 2 isolation valves closing; SV-5065-33A, SV-5065-26A, SV-5065-14A, SV-5065-11A and SV-5065-20B. Valves SV-5065-35B, SV-5065-25B and SV-5065-18A also received isolation signals but were in the closed position.

The blown fuse FU-RADA resulted in the associated relays becoming deenergized and the PCS/Group 2 isolation valve CV-5065-91 closed. Valves CV-5065-89 and CV-5065-87 also closed but are not PCS isolation valves.

The event occurred while shutdown with the Reactor Mode Selector Switch in the REFUEL position for instrument checks. Reactor power level was zero percent, the Reactor Vessel (RV) pressure was zero psig and the RV water temperature was approximately 102 degrees Fahrenheit.

REPORTABILITY

Failure and Malfunction Report 90-314 was written on September 13, 1990 and the NRC Operations Center was notified in accordance with 10 CFR 50.72 at 1815 hours.

This report is submitted in accordance with 10 CFR 50.73(a)(2)(iv) because the actuations were not a preplanned part of the replacement of relay 16A-K29.

CAUSE

The accidental contact of the grounding jumper with terminal number 10 and number 12 of relay 16A-K17X in Panel C-941 was caused by an inadequate work plan associated with the installation of the jumper per MR 90-10-72. Although the prescribed jumper connections were technically correct, the location of the equipment and panel design made the jumper installation difficult. Relay 16A-K17X is flush mounted (type HFA) and is located near the floor in Panel C-941. To land the grounding jumper, it was necessary for the engineer to lay on his stomach with his arm at near full extension. The intended landing terminal number 14 on relay 16A-K17X is located behind terminal number 12 and adjacent to terminal number 10, such that, all three terminals are located within a circle with a diameter of approximately one inch. Any possible approach to terminal number 14 would put the jumper connector within very close proximity to terminal number 10 and number 12 especially when judged from full arms length distance. Hence, the tightly packed array of flush mounted relays in Panel C-941 in combination with the specific location of the required jumper landing terminal necessitated more explicit instructions to the engineer performing the task. Additionally, the loop-through neutral wiring in Panel C-941 which made the installation of the grounding jumper necessary for the relay replacement was an indirect contributor to the event.

INITIAL ACTIONS TAKEN

- Fuses PPFU1 and FU-RADA were replaced and the affected valves were restored to their normal position.
- Critique 90-17 was held to determine the cause of the event and appropriate corrective actions.
- The work plan was revised and the jumper connections for the relay replacement were installed satisfactorily as follows:
  - One end of the jumper was connected to terminal 14 at relay 16A-K17X and the connection was double verified.
  - A voltage and resistance check was made between the free end of the grounding jumper to ground.
  - The free end of the grounding jumper was connected to the ground bus in Panel C-941.

CORRECTIVE ACTIONS INITIATED

- A task force has been assigned to determine the potential problems that could occur when installing jumpers and to identify methods to minimize the potential for problems to occur while installing jumpers.
- The possibility for design improvements to neutral circuits located in the Primary Containment Isolation System/Reactor Building Isolation Control System and Reactor Protection System Panels is to be investigated as part of the Long Term Plan (Item 119).

- A copy of this report has been provided to the Training Department for possible use in the Maintenance Training Program.

SAFETY CONSEQUENCES

There were no adverse safety consequences as a result of the event.

Both the Hydrogen and Oxygen Analyzer System and the Reactor Coolant Pressure Boundary Leak Detection System have pipelines that penetrate the primary containment and communicate directly with the primary containment free space. These pipelines have two in-series isolation valves located outside primary containment. The purpose of these isolation valves is to contain radioactive material within the primary containment in the unlikely event of a breach of the reactor coolant pressure boundary. The valves are designed to receive an isolation signal and close, if open, upon high drywell pressure or low reactor water level.

The partial isolations of the Hydrogen and Oxygen Analyzer System and the Reactor Coolant Pressure Boundary Leak Detection System, which occurred due to blown fuses, placed the affected valves in the safe (isolated) position. If a breach of the primary coolant pressure boundary had occurred, the valves were in a position to perform their designed accident mitigating function.

There was no potential to adversely impact the public health and safety.

SIMILARITY TO PREVIOUS EVENTS

A review was conducted of Pilgrim Station Licensee Event Reports (LERs) written since January 1984. The review focused on LERs submitted in accordance with 10 CFR 50.73(a)(2)(iv) for events that occurred during the installation of jumpers. The review identified previous events reported in LERs 50-293/89-035-00 and 87-015-00.

For LER 89-035-00, an inadvertent actuation of a portion of channel 'A' of the Reactor Building Isolation Control System (RBIS) occurred on November 11, 1989 at 1411 hours during a semi-annual surveillance test (procedure 8.M.2-1.5.8.1). A procedural step required installing a jumper to contacts 9 and 10 of relay RPWA in Panel C-7. After connecting the jumper to contact number 10, the other end of the jumper was being connected to contact number 9. The minor force exerted by the jumper to contact number 10 during the jumper installation to contact number 9 was sufficient for contact number 10 to become disconnected from contact number 9 and thereby result in the event. The cause for the actuation was the location of the relay (RPWA) that adversely affected the ability to install the jumper to relay contacts for the test.

For LER 87-015-00, an unplanned isolation of the Residual Heat Removal System Shutdown Cooling suction piping isolation valves occurred on December 7, 1987 at 1428 hours. The event occurred when an Instrument and Control technician was installing a jumper necessary to perform a hydrostatic test. When the termination screws were loosened to install a jumper at terminals DD-47 and DD-48 in Panel C-941, the leads lost contact and caused a false high pressure isolation signal to close the isolation valves MO-1001-47 and -50. The cause for the actuation was that the hydrostatic test procedure did not adequately address how the jumper was to be installed and lacked a cautionary note to make the technician aware of the potential for an isolation.

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

ENERGY INDUSTRY IDENTIFICATION SYSTEM (EIIS) CODES

The EIIS codes for this report are as follows:

COMPONENTS	CODES
Fuse	FU
Relay	RLY
Valve, Isolation	ISV

SYSTEMS

Containment Environmental Monitoring System	IK
Containment Isolation Control System	JM
Engineered Safety Feature Actuation System (PCIS)	JE