10 CFR 50.73



#### BOSTON EDISON

Pilgrim Nuclear Power Station Rocky Hill Road Plymouth, Massachusetts 02360

Ralph G. Bird Senior Vice President — Nuclear

> June 26, 1989 BECo Ltr. 89-087

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) 89-018-00, "Automatic Closing of the Outboard Primary Containment System Group 6 Isolation Valves", 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

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DWE/bal

Enclosure: LER 89-018-00

cc: Mr. William Russell 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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## EVENT DESCRIPTION

NRC Form 366A

On May 25, 1989 at 1705 hours, an automatic actuation of the outboard Reactor Water Cleanup (RWCU) System portion of the Primary Containment Isolation Control System (PCIS) occurred.

The actuation resulted in the automatic closing of the outboard Primary Containment System (PCS) Group 6 (six)/RWCU System isolation valves (MO-1201-5 and -80), a trip of the RWCU System pump 'A', and a temporary interruption in RWCU System operation. Concurrently, the Panel C-904 alarm, "Cleanup Lines Excess or Negative Flow", was received in the Control Room.

The RWCU System was walked down and inspected for integrity with satisfactory results. The inboard and outboard RWCU System flow sensing lines were backfilled with water. The PCIS logic circuitry was reset and the RWCU System was returned to service on May 25, 1989 at 1735 hours.

Failure and Malfunction Report 89-206 was written to document the event and the NRC Operations Center was notified on May 25, 1989 at 1753 hours.

This event occurred during a startup with the reactor mode selector switch in the STARTUP position. The control rods were in a partially withdrawn position. The Reactor Vessel (RV) pressure was approximately 18 psig and the RV water temperature was approximately 240 degrees Fahrenheit. The reactor power level was approximately one percent. The Recirculation System (Loops 'A' and 'B') was in service. The Residual Heat Removal System was not in service.

## CAUSE

The cause for the actuation was some air in the instrumentation line(s) of the RWCU System flow sensors (DPIS-1243 and DPIS-1244). The instrumentation lines to the flow sensors are connected to a section of the RWCU System supply piping that had been previously drained for leak rate testing (valves MO-1201-2 and -5). The instrumentation lines were also drained for the leak rate test. Some air was trapped in the flow sensing line(s) when the piping and instrumentation lines were refilled. The RWCU System was returned to service on May 24, 1989 at 1820 hours. On May 25, 1989 at 1650 hours, the RV head vent valves were closed and the pressure in the instrumentation lines increased when the Reactor Vessel pressure increased as expected during the startup. The increased pressure compressed the trapped air that subsequently caused the trip signal from the outboard RWCU System flow sensor (DPIS-1244).

## CORRECTIVE ACTION

The leak rate test procedure (8.7.1.5 - Rev. 30) will be revised. The revision will include a caution to ensure that the RWCU System flow sensors and instrumentation lines are free of air following leak rate testing of the valves MO-1201-2 and MO-1201-5.

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An Engineering Service Request (ESR 89-493) has been written to explore the possible installation of test connections to the RWCU System piping located upstream of the valve MO-1201-2. The connections would eliminate the use of the flow sensing instrumentation lines for a leak rate test of valves MO-1201-2 and MO-1201-5.

A modification (PDC 89-16) has been approved for the installation of a time delay to the circuitry for the RWCU System flow sensors (DPIS-1243 and DPIS-1244). The time delay would buffer the circuitry from minor RWCU System flow fluctuations and thereby preclude an unnecessary closing of the RWCU System isolation valve(s) and a temporary interruption(s) in RWCU System operation. The modification is scheduled for implementation during the mid cycle outage (in October 1989).

## SAFETY CONSEQUENCES

NAC Form 366A

The temporary interruption in RWCU System operation posed no threat to the public health and safety.

The automatic closing of PCS Group 6 (RWCU System) isolation valves results from any one of the following accident mitigating trip signals: low Reactor Vessel water level; cleanup (RWCU System) area high temperature; cleanup (RWCU System) inlet high flow (DPIS-1243 and DPIS-1244).

The RWCU System has a power generation design basis only. The objectives of the system are to: maintain high reactor water purity; remove corrosion products from the Reactor Vessel water; and, provide a method for decreasing Reactor Vessel water inventory (level) during heatup. The system purifies the water from the RV lower head drain line and a portion of Reactor Vessel recirculation flow from the suction pipe of the Recirculation System Loop 'A' pump, sending the water through the RWCU System filter demineralizer units for mechanical filtration and ion-exchange processes and returning the entire processed flow to the Reactor Vessel or a portion of the flow to the Main Condenser or Radwaste System.

An interruption in RWCU System operation during a startup affects the ability to decrease the Reactor Vessel water inventory (level) that increases due to the expansion of the water during heatup.

If an interruption in RWCU System operation had occurred during power operation, the reactor water chemistry would degrade progressively over time. Depending upon the length of time of the interruption, the degradation could possibly result in unsatisfactory Reactor Vessel water chemistry values and thereby lead to a plant shutdown.

Control Room operator actions for response to RWCU System alarms or malfunctions are addressed in written procedures. The procedures include "Alarm Response Procedure", ARP-904C (Center), ARP-904R (Right) and 2.4.27, "Reactor Water Cleanup System Malfunctions". LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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This report is submitted in accordance with 10 CFR 50.73(a)(2)(iv) because the outboard RWCU System portion of the PCIS logic circuitry was actuated by an (false) accident mitigating signal.

# SIMILARITY TO PREVIOUS EVENTS

A review was conducted of Pilgrim Station Licensee Event Reports (LERs) submitted since January 1984. The review was focused to LERs submitted in accordance with 10 CFR 50.73(a)(2)(iv) involving flow sensors DPIS-1243 or DPIS-1244. The review identified events reported in LERs 50-293/87-018-00, 88-008-00, 89-006-00, and 89-009-00.

For LER 87-018-00, an automatic closing of the inboard PCS/RWCU System isolation valve (MO-1201-2) occurred during an outage on November 23, 1987. The cause was attributed to partially clogged pressure gauge snubbers on the high and low sides of DPIS-1243 together with the start of two Residual Heat Removal System (RHRS) pumps (in the shutdown cooling configuration) while the RWCU System was in service. An automatic closing of the outboard PCS/RWCU System isolation valves (MO-1201-5 and -80) occurred during an outage on November 26, 1987. The cause was attributed to a partially clogged pressure gauge snubber (high side) and no adjustment pin in the low side snubber for DPIS-1244 together with a flow fluctuation in the RWCU System when one RHRS pump was in service in the shutdown cooling (SDC) configuration. At the time of the events, the Reactor Vessel (RV) pressure was zero psig. The RHRS/SDC suction piping and the RWCU System supply piping are connected to the Recirculation System Loop 'A' pump suction pipe via a common pipe line.

For LER 88-008-00, an automatic closing of one (MO-1201-5) of the two outboard PCS/RWCU System isolation valves (MO-1201-5 and -80) occurred during an outage. The cause was attributed to a momentary flow fluctuation in the RWCU System. At the time of the event, the RV water was being let down to the Main Condenser through the RWCU System via gravity induced flow. The other outboard isolation valve (MO-1201-80) was in the closed position. The RHRS was in the SDC mode of operation. The RV pressure was zero psig. Investigative testing was performed with the RWCU System and RHRS configured similar to the configuration existing at the time of the MO-1201-5 closing. The test confirmed that a momentary flow surge (fluctuation) and corresponding pressure spike can result in a trip signal from one RWCU System flow sensor (DPIS-1243 or DPIS-1244) and not the other.

For LER 89-006-00, an automatic closing of the inboard PCS/RWCU System isolation valve (MO-1201-2) occurred during a startup. The cause was attributed to some air in the instrumentation line(s) to the RWCU System flow sensors. The air was trapped in the flow sensing line(s) during a (dry) calibration of the flow sensors and caused a trip signal from the inboard flow sensor when the RV pressure increased during the startup. At the time of the event, the RV pressure was 15 psig and the Recirculation System pumps (Loops 'A' and 'B') were in service.

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For LER 89-009-00, an automatic closing of the two outboard PCS/RWCU System isolation valves (MO-1201-5 and -80) occurred during a startup. The cause was attributed to a RWCU System flow fluctuation. The fluctuation occurred when a RWCU System suction valve (MO-1201-85), located upstream of the inboard and outboard RWCU System flow sensors, was throttled to the closed position. The position of valve MO-1201-85 controls the proportion of flow to the RWCU System from the RV drain line and the Recirculation System Loop 'A' pump suction pipe. At the time of the event, the RV pressure was 740 psig and the Recirculation System pumps (Loops 'A' and 'B') were in service.

# ENERGY INDUSTRY IDENTIFICATION SYSTEM (EIIS) CODES

The EIIS codes for this report are as follows:

COMPONENTS		CODES
Switch, Differential, Press	ure (DPIS-1244)	PDS
Valve, Isolation (MO-1201-5	and -80)	ISV
SYSTEMS		
Containment Isolation Contr	ol System (PCIS)	JM
Engineered Safely Features	Actuation System (PCIS)	JE
Primary Containment System	(PCS)	JM
Reactor Water Cleanup (RWCU	) System	CE