10 CFR 50.73

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

George W. Davis
Senior Vice President — Nuclear

May 30, 1991
BECo Ltr. 91-071

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) 91-008-00, "Three Automatic Group 1 Isolations due to False High Reactor Water Level Signals While Shutdown", 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.

G. W. Davis

TFM/bal

Enclosure: LER 91-008-00

cc: Mr. Thomas T. Martin
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Standard BECo LER Distribution

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NRC FORM 366 (6-89) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO. 3150-0104
EXPIRES: 4/30/92

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-530), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
Pilgrim Nuclear Power Station	0 5 0 0 0 2 9 3	1 OF 0 4

TITLE (4) Three Automatic Group 1 Isolations due to False High Reactor Water Level Signals While Shutdown

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 4 3 0	9	1	9 1	0 0 8	0 0	0 5	3 0	9 1	N/A	0 5 0 0 0

OPERATING MODE (9)	N	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)			
POWER LEVEL (10)	0 0 0	20.402(b)	20.405(c)	X 50.73(a)(2)(iv)	73.71(b)
		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
Thomas F. McElhinney - Senior Compliance Engineer	5 0 8 7 4 7 - 8 4 6 5

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
X YES (If yes, complete EXPECTED SUBMISSION DATE)	NO		0 9	0 2	9 1

ABSTRACT (Limit to 1400 spaces, i.e., approximately fifteen single-space typewritten lines) (16)

On April 30, 1991 three automatic Primary Containment Isolation Control System (PCIS) Group 1 isolations occurred while shutdown at 0116 hours, 0933 hours, and 1037 hours, respectively, due to a false high Reactor Vessel (RV) water level signal. The actuations resulted in the automatic closing of the related Primary Containment System isolation valves.

The Group 1 isolations were initiated by the reactor water level trip units downstream of reference leg condensing chamber 12B. The plant information computer traces showed the reactor water level rapidly increasing above the trip setpoint and then returning to the original level. The reactor water level trip units downstream of reference leg condensing chamber 12A also exhibited level spiking.

An investigation to determine the cause of the false high reactor water level indications was ongoing when this report was submitted. This report will be updated to provide the results of the investigation.

These events occurred when in the hot shutdown mode of operation with the reactor mode selector switch in the SHUTDOWN position. The reactor power level was zero percent. The RV pressures and RV water temperatures for the three events were as follows: first event, 60 psig and 308 degrees Fahrenheit; second event, 12 psig and 248 degrees Fahrenheit; third event, 3 psig and 168 degrees Fahrenheit. This report is submitted in accordance with 10 CFR 50.73(a)(2)(iv) and these events posed no threat to the health and safety of the public.

EVENT DESCRIPTION

On April 30, 1991, three automatic Primary Containment Isolation Control System (PCIS) Group 1 isolations occurred due to a false high Reactor Vessel (RV) water level signal. The reactor had been shutdown on April 29, 1991 at 1912 hours. The reactor was shutdown due to the "B" recirculating pump seal leak that is discussed in LER 50-293/91-007-00. The three Group 1 isolations are discussed separately for clarity.

FIRST GROUP 1 ISOLATION

The first automatic Group 1 isolation occurred on April 30, 1991 at 0116 hours. The RV water level was at +35 inches as indicated on control room instruments LI-640-29A and -29B. The operators noted a spike on Control Room level recorder LR1001-604B to +47 inches. The indicated RV water level then returned to +35 inches. The high water level Group 1 isolation setpoint is calibrated at approximately +45 inches.

The Group 1 isolation signal resulted in the following designed responses. The inboard and outboard Main Steam Isolation Valves (MSIVs) automatically closed. The inboard and outboard Reactor Water Sample Valves automatically closed. The inboard Main Steamline drain valve automatically closed. The outboard Main Steamline drain valve remained open because it is controlled by circuitry not associated with the affected sensors. The isolation signal was reset and the MSIVs and the Main Steamline drain valve were reopened on April 30, 1991 at 0144 hours to facilitate decay heat removal.

Failure and Malfunction Report 91-124 was written to document the event. The NRC Operations Center was notified in accordance with 10 CFR 50.72 on April 30, 1991 at 0157 hours. This event occurred during the hot shutdown mode of operation with the Reactor Mode Selector Switch (RMSS) in the SHUTDOWN position. The reactor power level was zero percent with the control rods fully inserted. The RV pressure was approximately 60 psig with the RV water temperature at approximately 308 degrees Fahrenheit.

SECOND GROUP 1 ISOLATION

The second automatic Group 1 isolation occurred on April 30, 1991 at 0933 hours. The "A" RHR pump was in the SDC mode of operation with the indicated RV water level at +36 inches. The indicated RV water level spiked to approximately + 50 inches. The indicated RV water level then returned to +36 inches. The Group 1 isolation signal resulted in the expected designed responses as described for the first event. The isolation signal was reset and the MSIVs and the Main Steamline drain valve were reopened at 1002 hours to facilitate decay heat removal.

Failure and Malfunction Report 91-125 was written to document this event. This event occurred with the RV pressure at approximately 12 psig and RV water temperature at approximately 248 degrees Fahrenheit. The RMSS was in the SHUTDOWN position.

THIRD GROUP 1 ISOLATION

The third automatic Group 1 isolation occurred on April 30, 1991 at 1037 hours. The "A" RHR pump was in the SDC mode of operation with the indicated RV water level at +38 inches. The indicated RV water level spiked to approximately +48 inches. The Group 1 isolation signal resulted in the expected designed responses as described for the first event. The indicated RV water level then returned to +38 inches. The isolation signal was reset and a decision was made to leave the MSIVs and Main Steamline drain valve closed using the RHR System for plant cooldown.

Failure and Malfunction Report 91-127 was written to document this event. The NRC Operations Center was notified in accordance with 10 CFR 50.72 of the second and third events on April 30, 1991 at 1039 hours. This event occurred with the RV pressure at approximately 3 psig and the RV water temperature at approximately 168 degrees Fahrenheit. The RMSS was in the SHUTDOWN position.

CAUSE/CORRECTIVE ACTION

The Group 1 isolations were initiated from the Reactor Water Level trip units LIS-263-58A and LIS-263-58B. These trip units received false high RV water level signals from level transmitters LT-263-58A and LT-263-58B that are both connected via instrument piping to common condensing chamber 12B. A review of the plant information computer traces shows that trip unit LIS-263-57A along with LIS-263-58A and -58B tripped during the second event. Trip units LIS-263-57A and -57B receive a signal from LT-263-57A and -57B, respectively, that are connected via instrument piping to condensing chamber 12A. This indicates that although the "B" side trip units caused the Group 1 isolations, the "A" side also experienced some spiking. However, the "A" side spiking began later in the RV cooldown than the "B" side spiking and was lower in amplitude.

An investigation of the false RV water level spikes was ongoing when this report was submitted. This report will be updated to provide the results of the investigation and the appropriate corrective actions.

SAFETY CONSEQUENCES

These events posed no threat to the public health and safety.

The isolations were the designed response to a high RV water level signal. The PCIS provides timely protection against the gross release of radioactive materials from the fuel, nuclear system process barrier and from the primary containment. The purpose of the RV high water level isolation is to protect against rapid depressurization due to a malfunction of the pressure regulator system during startup when RV pressure is below approximately 880 psig. This isolation is only in effect during a startup or a shutdown. For these events, a false high RV water level signal occurred. The isolation signals were reset promptly. The PCIS was able to fulfill its safety functions for each event.

This report is submitted in accordance with 10 CFR 50.73(a)(2)(iv) because the Group 1 portion of the PCIS logic circuitry actuated.

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)(iv) that involved PCIS Group 1 actuations due to false high RV water level signals. Two similar events were identified in LERs 50-293/84-019-00 and 50-293/90-003-00.

LER 84-019-00 documents a Group 1 isolation signal that occurred when reactor water level indication from the "A" level instrumentation trended up to +45 inches. The cause was excess cooling in the area of the "A" reference leg. Corrective action, related to the response of Generic Letter 84-23, included installing new reference legs outside the Drywell, minimizing the vertical piping drop inside the drywell and replacing the former reactor water level instrumentation with transmitters and electronic switching devices. The installations were completed during Refueling Outage number seven.

LER 90-003-00 documents a Group 1 isolation signal that occurred when reactor water level indication from the "B" level instrumentation rapidly increased from +25 inches to +50 inches for approximately thirty seconds. The cause was believed to be trapped air in the reference leg sensing lines. Corrective action included backfilling the sensing lines with demineralized water to minimize the amount of trapped air in the sensing lines. A station procedure was developed that provided the necessary instructions for backfilling. Additionally, certain surveillance procedures were revised to minimize the possibility of introducing air into the system.

ENERGY INDUSTRY IDENTIFICATION SYSTEM (EIIS) CODES

COMPONENTS	CODES
Valve, Isolation (MSIVs)	ISV
Recorder, Level	LR
Transmitter, Level	LT
Switch, Level	LIS

SYSTEMS	
Containment Isolation Control System (PCIS)	JM
Engineered Safety Feature Actuation System (PCIS)	JE
Incore//Excore Monitoring System (RV Water Level)	IG