

BOSTON EDISON

Pilgrim Nuclear Power Station
Rocky Hill Road
Plymouth, Massachusetts 02360

Ralph G. Bird
Senior Vice President — Nuclear

December 30, 1989
BECO Ltr 89-184

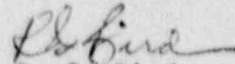
U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D.C. 20555

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

Dear Sir:

The enclosed Licensee Event Report (LER) 89-037-00, "Primary Containment/Traversing In-Core Probe (TIP) Ball Valve not Closed Contrary to Technical Specification", 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

GJB/bal

Enclosure: LER 89-037-00

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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LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) Pilgrim Nuclear Power Station										DOCKET NUMBER (2) 0 5 0 0 0 2 9 3 1 OF 0 4										PAGE (3) 1 OF 0 4																													
TITLE (4) Primary Containment/Traversing In-Core Probe (TIP) Ball Valve Not Closed Contrary to Technical Specification																																																	
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)												
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OPERATING MODE (9) N										THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 5: (Check one or more of the following) (11)																																							
POWER LEVEL (10) 0 9 4										20.402(b)										20.405(c)										50.73(a)(2)(iv)										73.71(b)									
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LICENSEE CONTACT FOR THIS LER (12)																																																	
NAME Gary J. Basileco, Senior Plant Engineer																				TELEPHONE NUMBER 5 0 8 7 4 7 - 8 5 3 4																													
COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)																																																	
CAUSE			SYSTEM			COMPONENT			MANUFACTURER			REPORTABLE TO NPDs			CAUSE			SYSTEM			COMPONENT			MANUFACTURER			REPORTABLE TO NPDs																						
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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)

While trouble-shooting the Traversing In-Core Probe (TIP) ball valve No. 45-300A on November 30, 1989 at approximately 1200 hours, it was discovered that the ball valve was partially open when it was thought to be in the closed position. The valve was being manually operated as part of trouble-shooting in accordance with station procedures.

The cause of the ball valve being partially open was damage to the valve stem. Stem damage likely occurred during previous manual manipulation of the valve (to allow TIP removal following solenoid failure and valve partial closure on the TIP cable). Corrective action included replacing the ball valve and actuator. The ball valve (plate number 73110-2) was manufactured by Consolidated Controls, Inc. The solenoid actuator (plate number 112C2391P001-21) was manufactured by General Electric Co.

The condition was discovered during power operation with the reactor mode selector switch in the RUN position. The Reactor Vessel (RV) temperature was approximately 540 degrees Fahrenheit and the RV pressure was 1025 psig. The RV power level was approximately 94 percent. This report is submitted in accordance with 10CFR50.73 (a)(2)(i)(B) and the event posed no threat to the health and safety of the public.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

FACILITY NAME (1) Pilgrim Nuclear Power Station	DOCKET NUMBER (2) 0 5 0 0 0 2 9 3	LER NUMBER (6)			PAGE (3)		
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
		8 9	— 0 3 7	— 0 0	0 2	OF	0 4

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

EVENT DESCRIPTION

During the performance of Temporary Procedure (TP) No. 89-112, "Manual Insertion of a Tip when Primary Containment Integrity is Required" on November 30, 1989 at approximately 1200 hours, the Traversing In-Core Probe (TIP) system ball valve No. 45-300A was inspected and manually operated. During this time, it was discovered that the valve was partially open when it was thought to be in the closed position. A significant rotation of the ball valve's roll pin (approximately 80 degrees) from the expected position was discovered (i.e., the valve was full open at 10 degrees from the normally closed position). This condition was documented on Failure and Malfunction Report 89-463.

The valve was shut, verified closed and deactivated by tagging with the valve actuator removed. The closing and deactivation of the valve is in accordance with Technical Specification 3.7.A.2.b for an inoperable automatic primary containment isolation valve.

Leading to this event was a previous condition identified on November 15, 1989. During that time, the TIP became stuck in the indexer while performing Procedure 9.5, "LPRM Calibration", Attachment 6. This condition was documented on F&MR 89-443. TP 89-112 was written to explore and trouble-shoot this condition.

The condition was discovered during power operation with the Reactor Mode Selector Switch in the RUN position. The Reactor Vessel (RV) temperature was 540° Fahrenheit and the RV pressure was 1025 psig. The reactor power level was approximately 94 percent.

BACKGROUND

The TIP System provides signals proportional to neutron flux in the reactor. The system enables the calibration of the Local Power Range Monitor (LPRM) signals by correlating TIP signals to the LPRM signals as the TIP is positioned in selected radial and axial locations in the core. The TIP System consists of a fission chamber attached to a flexible drive cable, which is driven by a gear box assembly. The flexible cable is contained by guide tubes that extend into the reactor core. The cable drive mechanism inserts and withdraws the TIP and its cable from the reactor and provides detector position indication signals.

A valve system is provided on each guide tube entering the primary containment. A ball valve and a cable shearing valve are mounted in the guide tubing just outside of the primary containment (drywell). The valves are provided to prevent the loss of reactor coolant in the event of a guide tube rupture inside the reactor vessel. The ball valve is normally closed and opens when the related probe is being inserted. The in-series shear valve is normally open and is used only if a leak occurs when the TIP is beyond the ball valve and a loss of power to the related TIP system drive mechanism fails. The shear valve, controlled by a remote manual key-locked switch, can cut the cable and close off the guide tube. The shear valves are actuated by detonation squibs. The continuity of the squib circuits is monitored by indicator lights in the control room.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)		
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
Pilgrim Nuclear Power Station	0 5 0 0 0 2 9 3	8 9	— 0 3 7	— 0 0 0	3	OF	0 4

TEXT (If more space is required, use additional NRC Form 306A's) (17)

CAUSE

The cause of the rotation of the roll pin from the expected position has been determined to be a damaged valve stem. The cause of the damaged stem appears to be manual manipulation of the stem which was done to allow the removal of the TIP cable and probe from the inserted position.

The TIP System mechanism 'A' (C-730A) was in service on November 15, 1989 for determining the neutron flux distribution within the reactor core. This action was being conducted in accordance with Procedure 9.5 (Rev. 19) "LPRM Calibration", Attachment 6 (six). When the drive cable and detector for C-730A were being withdrawn, the ball valve unexpectedly attempted to close automatically even though the cable and detector had not fully retracted. The ball valve is electrically opened by a solenoid and closes by a spring. Subsequent investigation revealed that the solenoid of the ball valve's actuator had become de-energized. Because of primary containment and ALARA considerations, the ball valve stem was manually rotated in accordance with a Maintenance Request to open the ball valve sufficiently to complete the retraction of the drive cable/detector. After the retraction, the ball valve was allowed to self close (spring action) to what was believed to be the closed position. However, on November 30, 1989 during subsequent troubleshooting of the ball valve and actuator, the ball valve stem was discovered to be permanently distorted. The distortion resulted in an offset for the ball valve position such that the valve was unknowingly not fully closed by the operation of the actuator's spring.

The ball valve (plate number 73110-2) was manufactured by Consolidated Controls, Inc. The solenoid actuator (plate number 112C2391P001-21) was manufactured by General Electric Company.

CORRECTIVE ACTION

The ball valve and solenoid actuator were replaced while shutdown on December 11, 1989 in accordance with Procedure No. 3.M.2-5.6.3 (Rev. 5), "T.I.P. Ball Valve Replacement". The valve was tested with satisfactory results in accordance with Procedure No. 8.7.1.5, "Local Leak Rate Testing of Primary containment Penetrations and Isolation Valves".

Engineering analysis is currently underway to further categorize the failure mode of the valve stem. If this analysis reveals information contrary to the contents of this report, a supplement will be submitted. Otherwise, corrective action will be expanded to address the valve stem damage as part of the Instrumentation and Control plant status update training program.

SAFETY CONSEQUENCES

The event posed no threat to the health and safety of the public

With the ball valve inoperable, the in-series shear valve was capable of providing the primary containment isolation function if necessary.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

APPROVED OMB NO. 3150-0104

EXPIRES: 8/31/86

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)	
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		
Pilgrim Nuclear Power Station	0500029389	0	37	00	04	OF 04

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

The ball valve ('A') was not in the fully closed position from November 15, 1989 until November 30, 1989 (discovery). During that period, the ball valve, although de-energized, was not in the closed position contrary to Technical Specification 3.7.A.2.b. During that period secondary Containment was operable and available if a release of radioactive material from the Drywell into the Reactor Building (via the guide tube containing the open ball valve) would have occurred.

In the unlikely event that such an event were to occur, detection was available via the area radiation detector located directly above the TIP system mechanisms. The detector provides output to a Control Room Panel C-911 area radiation monitor (unit number 8). The setpoint for the monitor is approximately 5 milli-rem per hour. The monitor is connected to Control Room Panel C-903R for an alarm ("Reactor Building H1 Radiation") when the setpoint is reached. The in-series shear valve, although in the normally open position, was operable for the isolation function via its key-locked, manually operated control switch. The automatic primary containment isolation function for each of the other three TIP System mechanisms (C-730B, C-730C, C-730D) was not affected by this event.

This report is submitted in accordance with 10 CFR 50.73(a)(2)(i)(B) because the ball valve was not in the closed position and Technical Specification Section Limiting Condition for Operation 3.7.A.2.b for an inoperable automatic isolation valve was not met.

SIMILARITY TO PREVIOUS EVENTS

A review conducted of Pilgrim Station Licensee Event Reports (LERs) submitted since January 1984 involving a TIP System ball valve(s), revealed no similar events.

ENERGY INDUSTRY IDENTIFICATION SYSTEM (EIIS) CODES

The EIIS codes for this report are as follows:

COMPONENTS

Valve, Isolation
Solenoid

CODES

ISV
SOL

SYSTEMS

In-core Monitoring System (TIP System)
Primary Containment System (PCS)

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