



BOSTON EDISON

Pilgrim Nuclear Power Station
Rocky Hill Road
Plymouth, Massachusetts 02360

Ralph G. Bird
Senior Vice President — Nuclear

October 21, 1989
BECo Ltr. 89-155

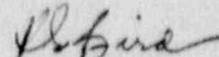
U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D.C. 20555

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

Dear Sir:

The enclosed Licensee Event Report (LER) 89-030-00 "Control Room High Efficiency Air Filtration System Flowrate Non-Conservative Due to Procedure Error" is submitted in accordance with 10 CFR Part 50.73.

Please do not hesitate to contact me if you have any questions regarding this report.


R.G. Bird

GJB/bal

Enclosure: LER 89-030-00

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

Sr. Resident Inspector - Pilgrim Station

Standard BECo LER Distribution

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LICENSEE EVENT REPORT (LER)

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TITLE (4) Control Room High Efficiency Air Filtration System Flowrate Non-Conservative Due To Procedure Error

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)
0 9	2 6	8 9	8 9	0 3	0	0 0	1 0	2 1	N/A		0 5 0 0 0 0
0 9	2 6	8 9	8 9	0 3	0	0 0	1 0	2 1	N/A		0 5 0 0 0 0

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §. (Check one or more of the following) (11)

OPERATING MODE (9) N	20.402(b)	20.406(c)	50.73(a)(2)(iv)	73.71(b)
POWER LEVEL (10) 0 1 7 1 5	20.406(a)(1)(i)	50.36(c)(1)	50.73(a)(2)(v)	73.71(c)
	20.406(a)(1)(ii)	50.36(c)(2)	X 50.73(a)(2)(vii) D	OTHER (Specify in Abstract below and in Text, NRC Form 366A)
20.406(a)(1)(iii)	X 50.73(a)(2)(i) B	50.73(a)(2)(viii)(A)		
20.406(a)(1)(iv)	50.73(a)(2)(ii)	50.73(a)(2)(viii)(B)		
20.406(a)(1)(v)	50.73(a)(2)(iii)	50.73(a)(2)(ix)		

LICENSEE CONTACT FOR THIS LER (12)

NAME Gary J. Basileco, Plant Engineer	TELEPHONE NUMBER 5 0 1 8 7 1 4 1 7 1 - 1 8 1 5 3 1 7
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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)

<input type="checkbox"/> YES (If yes, complete EXPECTED SUBMISSION DATE)	<input checked="" type="checkbox"/> NO	EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
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ABSTRACT (Limit to 1400 spaces, i.e., approximately fifteen single-space typewritten lines) (16)

On September 26, 1989 at approximately 1530 hours, a previous condition contrary to Technical Specifications 3.7.B.2.d and 4.7.B.2.a regarding the Control Room High Efficiency Air Filtration (CRHEAF) System was identified. The previous condition involved the flowrate of air for each of the two CRHEAF System Trains ('A' and 'B'). Specifically, the corrected flowrate, calculated at 862 cubic feet per minute (CFM), was less than the minimum specified value of 1000 CFM +/- 10 percent.

The cause has been attributed to a transcription error (from a drawing) that occurred during the process of revising a CRHEAF System surveillance test procedure. The error involved using the incorrect flow area when calculating the CRHEAF System flowrate in accordance with the procedure. Corrective action taken included revising the procedure and subsequently reperforming the test using the corrected procedure.

The condition was discovered during power operation with the reactor mode selector switch in the RUN position. The reactor power level was approximately 75 percent. The Reactor Vessel (RV) pressure was approximately 990 psig with the RV water temperature at 542 degrees. This report is submitted in accordance with 10 CFR 50.73 subparts (a)(2)(i)(B) and (a)(2)(vii)(D), and this condition posed no threat to the health and safety of the public.

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

EVENT DESCRIPTION

On September 26, 1989 at approximately 1530 hours, a previous condition contrary to Technical Specifications 3.7.B.2.d and 4.7.B.2.a regarding the Control Room High Efficiency Air Filtration (CRHEAF) System was identified. The previous condition involved the flowrate of air for each of the two CRHEAF System Trains ('A' and 'B'). Specifically, the corrected flowrate, calculated at 862 cubic feet per minute (CFM), was less than the minimum specified value of 1000 CFM +/- 10 percent.

Leading to the discovery was an operability test of the CRHEAF System Train 'B'. The test was being conducted on September 19, 1989 (at approximately 2022 hours) prior to removing the CRHEAF System Train 'A' from standby service for a planned maintenance activity. The test was being performed in accordance with procedure 8.7.2.7 (Rev. 11), "Measure Flow and Pressure Drop Across (CRHEAF) System". At Procedure step 6.2.9, the corrected calculated flowrate (862 CFM) was discovered to be less than the acceptance criteria (1000 CFM +/- 10 percent).

The discovery was made when a Mechanical Maintenance Supervisor, who had previously performed measurements for flow area in the CRHEAF System, noticed that the procedure (8.7.2.7 Rev. 11) incorrectly identified the flow area as one square foot instead of 10x10 inches (0.694 square foot).

Failure and Malfunction Report 89-357 was written to document the problem with CRHEAF System Train 'B' flowrate. Subsequent investigation revealed that the problem also involved the CRHEAF System Train 'A' flowrate.

The condition was identified during power operation with the reactor mode selector switch in the RUN position. The reactor power level was approximately 75 percent. The Reactor Vessel (RV) pressure was approximately 990 psig with the RV water temperature at 542 degrees Fahrenheit.

BACKGROUND

The CRHEAF System consists of two separate, manually controlled trains. Each train is designed to provide and maintain filtered air to the Main Control Room at a pressure greater than the air pressure in areas that are adjacent to the Control Room if the normal supply of monitored air becomes contaminated. In addition, each train consists of an air operated damper, a filter unit, a supply fan, and a manually adjustable damper that establishes the CRHEAF System flowrate of air to the Control Room. As a result of a manual start of a CRHEAF System train(s), the normal air supply is diverted by the automatic repositioning of the air operated dampers, operation of the CRHEAF System supply fan(s), and the introduction of (high efficiency particulate and charcoal) filtered air to the Control Room at a positive pressure (relative to the adjacent areas).

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

CAUSE

A critique was conducted on September 28, 1989 and was attended by personnel that included the Mechanical Maintenance Supervisor, Procedures Project Engineer and appropriate Systems Engineering Division personnel. The critique was conducted to determine the circumstances leading to the condition and the root cause.

The root cause was a validation/review process (procedure TP 88-07) that was less than adequate at the time procedure 8.7.2.7 (Rev. 9) was previously revised (to Rev. 10). The use of a drawing as part of the procedure validation (Procedure TP 88-07) process was an approved method for procedure validation at the time the procedure (8.7.2.7) was revised and approved (on July 14, 1988).

The procedure (8.7.2.7) incorrectly identified the flow area as 12" x 12" (one square foot) instead of the actual flow area 10" x 10" (0.694 square foot). The incorrect flow area was introduced into the procedure during the procedure revision (from Rev. 9 to Rev. 10). The revision was made by responsible Systems Engineering Division Engineers to improve the procedural documentation of the flowrate calculation process that includes the use of flow area. [Prior to the revision, the value used for the flow area, though measured as part of the flowrate calculation process, was not specifically documented in the procedure.] The error was introduced during the procedure revision process as a result of a transcription error while using a correct heating, ventilation and air conditioning drawing (M-322). The drawing was used to identify the flow area. The drawing included two adjacent ducts, one 10x10 inches (0.694 square foot) and the other 12x12 inches (i.e., one square foot). As a result of the transcription error, the procedure incorrectly identified the flow area as one square foot instead of 0.694 square foot. The error was not detected during the subsequent procedure review and approval process.

CORRECTIVE ACTION

The following corrective actions have been taken or planned:

- The procedural error (flow area) was immediately corrected after verifying that the flow area was 100 square inches (0.694 square foot) instead of one square foot. The procedure changes (SROs 89-190 and 89-191) were made in accordance with Technical Specification 6.8.C.
- The CRHEAF System Train 'B' adjustable damper was adjusted in accordance with procedure (8.7.2.7 Rev. 11) step 8.1 and a new balance sticker was affixed to the damper's lever arm in accordance with procedure step 6.2.21. The CRHEAF System Train 'B' testing was performed in accordance with the corrected procedure and was completed with satisfactory results on September 20, 1989 at 0114 hours.

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TEXT (If no. 1 space is required, use additional NRC Form 366A's) (17)

- After completing the planned maintenance activity, the CRHEAF System Train 'A' adjustable damper was similarly adjusted in accordance with the corrected procedure and a new balance sticker was affixed to the damper's lever arm. The CRHEAF System Train 'A' was tested with satisfactory results on September 21, 1989 at 1900 hours.
- Changes to the procedure process are in progress. Procedure No. 1.3.4-4 (Rev. 1) "Validation Process" (procedure TP 88-07 successor) is currently being revised to strengthen the detail and degree of independence in the review/validation process. These changes are expected to reduce the likelihood of a similar procedure revision error.

SAFETY CONSEQUENCES

The previous condition posed no threat to the public health and safety.

The CRHEAF System is required to be operable whenever the reactor is critical and during refueling operations. The procedural error existed from July 14, 1988 to September 19, 1989. During that period, no refueling operations were conducted. The first reactor criticality in 1988 occurred on December 30, 1988. From December 30, 1988 to September 19, 1989 the reactor was critical on 172 days. Prior to December 30, 1988 the procedure (8.7.2.7 Rev. 10) was conducted to demonstrate the operability of the CRHEAF System on October 15, 1988. On that occasion, the acceptance criteria were met including positive air pressure (using the smoke stick method). The smoke stick method was also used during the September 19, 1989 test that revealed the problem with the CRHEAF System Train 'B' flowrate. On that occasion, the smoke stick method was used and demonstrated that the Control Room air pressure was at a positive pressure (relative to the adjacent areas). In addition, the pressure drop across the CRHEAF System Trains 'A' and 'B' filtration units VCRF-101A and -101B, during the October 15, 1988 and September 19, 1989 surveillances was within acceptable limits (i.e., less than six inches of water gauge). Therefore, the CRHEAF System operability tests conducted on October 15, 1988 and September 19, 1989 in accordance with Procedure 8.7.2.7, although in error for flow area and consequently flowrate, provide reasonable assurance that the CRHEAF System was capable of fulfilling its safety function if needed.

This report is submitted in accordance with 10 CFR 50.73 (a)(2)(i)(B) because the CRHEAF System flowrate was less than the minimum specified value of 900 CFM (1000 CFM +/- 10 percent). This report is also submitted in accordance with 10 CFR 50.73(a)(2)(vii)(D) because the procedural error adversely affected the flowrate for both trains of the CRHEAF System.

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TEXT (If more space is required, use additional NRC Form 366A's) (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 that involved the CRHEAF System.

The review identified a related condition reported in LER 50-293/88-021-00. For that report, a problem involving the possible inability of two CRHEAF System solenoid operated valves (SOVs) to operate against supply air pressure was identified on July 19, 1988. The problem was similar to those identified in NRC Information Notice No. 88-24. The SOVs were determined to have a manufacturer's maximum operating pressure differential (MOPD) rating that was, or could have been, less than the pressure supplied to the air portion of the SOVs if an air supply pressure regulator upstream of the SOV(s) had failed open because of a ruptured diaphragm. The SOVs (SV-L-5 and SV-L-6) controlled the position of the air operated dampers located in Trains 'A' and 'B' of the CRHEAF System. The cause was attributed to an incorrect assumption regarding a failure of the nonsafety-related air system.

ENERGY INDUSTRY IDENTIFICATION SYSTEM (EIIS) CODES

The EIIS codes for this report are as follows:

COMPONENTS

Damper

CODES

DMP

SYSTEMS

Control Complex Environmental Control (CRHEAF) System VI