



BOSTON EDISON

Pilgrim Nuclear Power Station
Rocky Hill Road
Plymouth, Massachusetts 02360

George W. Davis
Senior Vice President - Nuclear

December 7, 1990
BECo Ltr 90-152

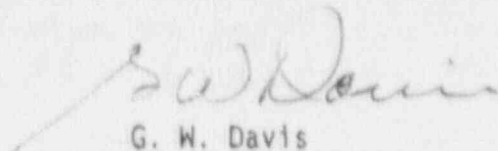
U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D.C. 20555

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

Dear Sir:

The enclosed Licensee Event Report (LER) 90-019-00, "Fire Dampers and Penetration Found Degraded in the Intake Structure", 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

GJB/bal

Enclosure: LER 90-019-00

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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LICENSEE EVENT REPORT (LER)

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-830), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555. AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1) Pilgrim Nuclear Power Station		DOCKET NUMBER (2) 0 5 0 0 0 2 9 3	PAGE (3) 1 OF 05
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TITLE (4)
Fire Dampers and Penetration Found Degraded in the Intake Structure

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)					
MONTH	DAY	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		MONTH	DAY	YEAR	FACILITY NAMES			DOCKET NUMBER(S)		
1	10	990	90	01	9	001	20	790	N/A			0 5 0 0 0		
									N/A			0 5 0 0 0		

OPERATING MODE (9) N

POWER LEVEL (10) 100

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 5. (Check one or more of the following) (11)

20.402(b)	20.405(e)	50.73(a)(2)(iv)	73.71(b)
20.405(a)(1)(ii)	50.36(c)(1)	50.73(a)(2)(v)	73.71(e)
20.405(a)(1)(iii)	50.36(c)(2)	50.73(a)(2)(vi)	OTHER (Specify in Abstract below and in Text, NRC Form 366A)
20.405(a)(1)(iv)	X 50.73(a)(2)(i) (B)	50.73(a)(2)(viii)(A)	
20.405(a)(1)(v)	50.73(a)(2)(ii)	50.73(a)(2)(viii)(B)	
20.405(a)(1)(vi)	50.73(a)(2)(iii)	50.73(a)(2)(ix)	

LICENSEE CONTACT FOR THIS LER (12)

NAME Gary Basilesco, Sr. Plant Engineer	TELEPHONE NUMBER AREA CODE 5 0 1 8 7 4 1 7 - 1 8 1 5 3 4
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COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC
X	I	C	D M P	A 1 2 4	N				

SUPPLEMENTAL REPORT EXPECTED (14)

YES (If yes, complete EXPECTED SUBMISSION DATE) 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 November 9, 1990 at 1630 hours, it was identified that the east wall of the "B" train Salt Service Water pump room in the Intake Structure was breached. The breach consisted of a 4 inch drain check valve (scupper) that was corroded in the open position. The wall is a Technical Specification fire barrier. The check valve was manufactured by J.B. Clow, Model No. F-3014. On November 10, 1990 at 1520 hours during a subsequent visual inspection of other fire barriers in the Intake Structure, six fire dampers were found with damaged closing springs rendering the dampers inoperable. Five of the dampers were located in Technical Specification fire barriers. The dampers, model No. 319ALV, were manufactured by Air Balance, Inc.

The cause of the breached barrier and damaged damper springs was the marine environment in the Intake Structure, which caused the closing springs to break and the drain check valve to corrode. Interim measures planned include replacing the drain check valve and replacing the broken springs with the same spring material, and increasing the damper surveillance frequency. Long term corrective action includes replacing the springs with springs having better corrosion resistance and grouting the drain pipe to eliminate the penetration.

The conditions were identified during power operation with the reactor mode selector switch in the RUN position. The reactor power level was 100 percent. The Reactor Vessel (RV) water temperature was 548 degrees Fahrenheit with the RV pressure at 1035 psig. This report is submitted in accordance with 10 CFR 50.73(a)(2)(i)(B) and the conditions posed no threat to the public health and safety.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 500 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (F-530), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20545, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

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TEXT (If more space is required, use additional NRC Form 386A's) (17)

EVENT DESCRIPTION

On November 9, 1990 at 1630 hours it was identified that the east wall (fire barrier 45.503A) of the "B" train Salt Service Water (SSW) pump room in the Intake Structure was breached. The breach consisted of a 4 inch drain check valve (scupper) that was corroded in the open position at penetration 45.503A-005. The wall is an Appendix R fire barrier that separates the safety-related SSW pump room from the non safety-related "A" circulating water pump enclosure, and is required to be operable per Technical Specification 3.12.F.

On November 10, 1990 at 1520 hours during a subsequent visual inspection of other fire barriers in the Intake Structure, six fire dampers were found with damaged closing springs rendering the dampers inoperable. Five of the fire dampers (SSR-3, -4, -5, -6 and -7) are located within several Technical Specification fire barriers in the SSW pump rooms. The sixth damper (SSR-1) is located within a non-Technical Specification fire barrier in the same general area.

The conditions were documented on Failure and Malfunction Reports 90-385 and 90-386.

The conditions were identified during power operation with the reactor mode selector switch in the RUN position. The reactor power level was 100 percent. The Reactor Vessel (RV) pressure was approximately 1035 psig with the RV water temperature at 548 degrees Fahrenheit.

CAUSE

The cause of the drain check valve being corroded in the open position was corrosion resulting from the marine environment in the Intake Structure. While it is unclear when the drain check valve was initially opened, the penetration was satisfactorily inspected in December 1989 in accordance with Procedure 8.B.29, "Inspection of Fire Barriers". Controls are in place to post fire watches when a barrier is to be intentionally breached. Procedure 3.M.1-18, "Core Drilling" and fire protection station instructions provide detailed instruction whenever a new penetration is needed or an existing one is to be intentionally breached.

Investigation revealed that the penetration assembly (with drain valve closed) was not evaluated as meeting the requirements for a penetration seal configuration in an Appendix R fire barrier. While the penetration surveillance was performed satisfactorily in December 1989 for the grout seal around the drain pipe, the inside of the pipe and drain valve were not evaluated as part of the Fire Barrier Penetration upgrade that included a design basis walkdown of all fire barriers. The walkdowns, performed in the 1986 - 1987 time frame, resulted in the preparation of Fire Protection Engineering Evaluations (FPEE) to demonstrate compliance with 10 CFR 50 Appendix R, "Fire Protection Program". These evaluations were performed in accordance with the guidelines contained in NRC Generic Letter (G.L.) 86-10. The identification of the drain valve penetration as needing an evaluation was inadvertently missed during the walkdowns.

LICENSEE EVENT REPORT (LER)
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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.

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*EXT (if more space is required, use additional NRC Form 386A's) (17)

Since the drain valves were closed at the time of the walkdown, it was assumed that the penetrating pipes were capped. A capped pipe would have been an acceptable penetration seal and existing documentation indicates that the drain valves were identified as being capped. Two other drain check valve penetrations were also identified in two other fire barriers enclosing the other SSW pumps. Although the valves were closed, some evidence of corrosion existed. One of those drain check valves is part of an Appendix R fire barrier. The drain check valve, model no. F-3014, was manufactured by J.B. Clow.

The cause of the broken damper springs is believed to be chloride induced stress corrosion cracking. The spring material was not compatible with the environment in which it was installed. The Intake Structure, due to its proximity to Cape Cod Bay has a salt water/air environment. The standard material used for the damper closing springs is a stainless steel which is not suitable for prolonged exposure to such an environment. Discussions with the manufacturer have revealed that no other material is currently used for damper closing springs. The dampers were satisfactorily inspected during a previous surveillance in March of 1990 in accordance with Procedure B.B.17.2, "Inspection of Fire Damper Assemblies". The dampers were manufactured by Air Balance, Model No. 319ALV.

CORRECTIVE ACTION

Immediate compensatory measures were taken consisting of establishing a continuous fire watch in the SSW pump rooms where the degraded penetration and dampers exist. This action was taken in accordance with Technical Specification 3.12.F.

An FPEE was performed for the three drain check valves in the Intake Structure and it was determined that workable drain check valves provide adequate protection for existing fire hazards in the areas. Therefore, interim measures will include refurbishing the valves as required.

Although the drain check valves were installed to protect against flooding, preliminary investigation has revealed that they are not required for the worst case flooding in the Intake Structure. It was also determined that the valves are not required for any design basis event. Consequently, long term corrective action being considered includes eliminating the penetrations by grouting the openings to the thickness of the barrier. Except for the drain check valves in the Intake Structure, there are no other drain check valves installed in Technical Specification fire barriers. In addition, the PNPS fire barrier data base and station procedures are being reviewed to identify if other similar conditions exist (i.e., non rated penetration assemblies without an approved engineering evaluation). None have been identified to date.

Regarding the fire dampers, additional inspections were conducted. The inspections included other dampers in the Intake Structure and approximately twenty-five dampers in other areas of the plant. The results of the inspections revealed that no other dampers contained broken springs. The damper manufacturer, Air Balance, Inc., has been contacted regarding the broken springs and is pursuing the production of a new spring using a more corrosion resistant material. Until such time that the new springs are available, interim measures will include replacing the damper springs with the same spring material and increasing the surveillance frequency for dampers in the Intake Structure.

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

SAFETY CONSEQUENCES

The condition of the fire barriers posed no threat to the health and safety of the public.

The east wall of the SSW cubicle (fire barrier 45.503A) separates the SSW train "B" pumps (P-208D and P-208E) from the "A" Circulating Water Pump enclosure, which contains no systems or cabling necessary for achieving safe shutdown. The Nuclear Engineering Department has determined that based on the low combustible loading and equivalent fire severity, the open drain check valve would not have allowed the passage of a fire between the two areas. Due to the lack of continuity and low level of combustibles, safe shutdown equipment (SSW pumps) would not have been threatened when considering a worst case fire.

The barriers in the Intake Structure containing the dampers with broken springs provide separation between the SSW train "A" and "B" pumps, as well as the common SSW pump (P-208C). While it is probable that the dampers would not have closed properly, the low combustible loading in the areas and the general arrangement of the ductwork would have prevented the propagation of a fire between the SSW pump rooms. The spread of a fire between these areas, with or without fire dampers is not a credible event. Therefore, the redundant trains of SSW pumps would not have been adversely affected.

This report is submitted in accordance with 10 CFR 50.73(a)(2)(i)(B) because the open drain check valve and inoperable dampers could have compromised the functional requirements of Technical Specification 3.12.F.

SIMILARITY TO PREVIOUS EVENTS

A review was conducted of Pilgrim Station Licensee Event Reports (LERs) since January 1984. The review focused on LERs submitted in accordance with 10 CFR 50.73(a)(2)(i) involving fire barrier penetration seals and/or fire dampers. The review identified similar events in LERs 50-293/84-007-01, 85-034-00, 86-020-01 and 87-020-00.

For LER 84-007-01, during a once-per-cycle fire barrier penetration seal surveillance test, twelve barriers were found incapable of performing their required function. The cause was a lack of adequate control over activities which could affect or degrade fire barriers and seals. The discovery occurred on May 15, 1984 with the reactor mode selector switch in the SHUTDOWN position and the reactor power level at zero percent.

For LER 85-034-00, 21 fire dampers were found with discrepancies that lessened the required 3 hour fire resistance rating. The discrepancies were caused by insufficient installation instructions and an improper revision to a design change during modification work. The discrepancies were identified on December 31, 1985 with the reactor mode selector switch in the RUN position and the reactor power level at 100 percent.

LICENSEE EVENT REPORT (LER)
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TEXT (If more space is required, use additional NRC Form 386A's) (17)

For LER 86-020-01, the south wall of the "A" 4160V switchgear room was not listed in fire barrier walkdown procedures as a Technical Specification barrier. The wall provides separation of redundant trains of safe shutdown equipment and consequently the required surveillances were not performed. The cause was a failure to identify the fire barrier in the appropriate station surveillance procedures. The discovery occurred on August 20, 1986 at 1100 hours during cold shutdown with the reactor mode selector switch in the SHUTDOWN position. The reactor power level was zero percent.

For LER 87-020-00, three fire dampers were actuated when their fusible links were inadvertently energized during the performance of a surveillance test. Following the test, it was identified that the dampers failed to fully close due to the orientation of the clover hooks used to attach the fusible link to the damper. Corrective action included changing the physical orientation of the clover hooks to allow proper damper closing. The event occurred during an outage on December 17, 1987 at 1015 hours with the reactor mode selector switch in the SHUTDOWN position.

ENERGY INDUSTRY IDENTIFICATION SYSTEM (EIIS) CODES

The EIIS codes for this report are as follows:

<u>COMPONENTS</u>	<u>CODES</u>
Fire Damper	DMP
Penetration	PEN
 <u>SYSTEM</u>	
Fire Protection/Detection	IC