

## LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) PILGRIM NUCLEAR POWER STATION - Unit No. 1 DOCKET NUMBER (2) 0 5 0 0 0 2 9 3 1 OF 0 3

TITLE (4) HPCI System Inoperable

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	5	1	8	5	8	5	0	1	2	0	1	0	7	0	8	8	5	0	5	0	0	0

OPERATING MODE (9)		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 8: (Check one or more of the following) (11)									
POWER LEVEL (10)	1 0 0	20.402(b)	20.405(e)	30.73(a)(2)(iv)	73.71(b)						
		20.405(a)(1)(i)	30.38(c)(1)	30.73(a)(2)(v)	73.71(c)						
		20.405(a)(1)(ii)	30.38(c)(2)	30.73(a)(2)(vi)	OTHER (Specify in Abstract below and in Text, NRC Form 366A)						
		20.405(a)(1)(iii)	30.73(a)(2)(i)	30.73(a)(2)(vii)(A)							
		20.405(a)(1)(iv)	30.73(a)(2)(ii)	30.73(a)(2)(vii)(B)							
		20.405(a)(1)(v)	30.73(a)(2)(iii)	30.73(a)(2)(ix)							

LICENSEE CONTACT FOR THIS LER (12)  
NAME Gregory G. Belmonte - Plant Engineer TELEPHONE NUMBER 6 1 7 7 4 6 - 7 9 0 0  
AREA CODE

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	B	J	S	N	B	B	2	0	9	Y

SUPPLEMENTAL REPORT EXPECTED (14)  
YES (If yes, complete EXPECTED SUBMISSION DATE) X NO  
EXPECTED SUBMISSION DATE (15)

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

On 5/18/85, while performing a routine HPCI operability test (Ref.: Procedure 8.5.4.1), the HPCI turbine tripped followed by a rapid restart. Subsequently, a broken upper snubber, displaced concrete expansion anchors, and a bent piston rod on the lower snubber were identified on the HPCI turbine exhaust line.

Cause of the turbine trip was most probably due to transients during cold quick starts. Probable cause of the broken snubber, the concrete anchors being displaced, and bent piston rod is believed to be the result of an anomalous event (i.e., water hammer).

Corrective action was to restore the hanger arrangement to "as-built" with a modified base plate. To preclude recurrence, Procedure 8.5.4.1 was revised to require manual control of turbine speed during start.

On 6/6/85, the HPCI turbine tripped and isolated on high flow during surveillance testing. Cause was due to improper installation of a transducer on the HPCI control valve operating mechanism (relay piston). Corrective action was to remove the transducer.

Additional corrective action included a permanent design change to the control oil system to reduce transients during HPCI system starts. Additional long-term corrective action includes a plan to develop a modification to replace, modify, or install additional vacuum breakers.

A previous occurrence of a similar nature was discussed in LER 85-008.

## LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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			YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
						0 2	OF	0 3

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

On 5/18/85, while performing a routine HPCI (EIIS Code BJ) pump operability flow rate and valve test (Ref.: Procedure #8.5.4.1), the HPCI turbine tripped, followed several seconds later by a rapid restart of the system. At that time, a loud noise was heard by Operations personnel. Investigation revealed that a HPCI exhaust line upper snubber (EIIS Code SNB) was broken, concrete expansion anchors were displaced, and the lower snubber piston rod was bent. Reactor power was approximately 100% at the time of discovery.

Immediate corrective action was to declare HPCI inoperable and proceed with surveillance testing required for an inoperable HPCI system.

Cause of the turbine trip was most probably due to an unplanned transient during the cold quick start. In an attempt to determine root cause of the transient and to provide data for long-term plan development, instrumentation was installed per Temporary Modification (#85-31) to provide operational data on the HPCI system during surveillance testing. This instrumentation was installed between 5/24/85 and 6/3/85.

Cause of the broken and bent 20 KIP snubbers (Bergen Paterson Serial Nos. 2500-20-513 and 2500-20-514) and the displaced anchors is believed to be the result of an anomalous event (i.e., water hammer) which occurred following the turbine trip and quick restart of the HPCI system.

Corrective action was to rebuild the snubbers, enlarge the base plate (add gussets) and install four 1-1/4" x 15" Hilti super kwik bolts per FRN 83-198-220. This restored the support (#A8661) to its original design condition. In addition, an Engineering evaluation (NED #85-527) was performed on the HPCI turbine exhaust line torus penetration. Results of the analysis indicate that the penetration is operable.

On 5/23/85, while performing the HPCI operability test (Procedure 8.5.4.1), a high flow isolation was received. Probable cause of the isolation was due to air being induced into the high flow switch during extensive calibration for equipment qualification work performed on 5/20/85, combined with transients during a cold quick start of the HPCI system. Subsequently, the isolation was reset and the HPCI system was successfully tested three times on 5/23/85 at approximately 1122 hrs.

Interim corrective action to preclude recurrence of the unplanned transient and snubber damage was to revise the HPCI surveillance (Ref.: Procedure 8.5.4.1) on 5/24/85 to require manual control of turbine speed during start.

Additional corrective action included the development of a permanent design change (PDC #85-35) that would provide a by-pass around the EG/R actuator to provide hydraulic pressure downstream of the EG/R actuator's internal pump prior to turbine startup. (This modification reduces the severity of the HPCI system turbine start transients.)

## LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

APPROVED OMB NO. 3150-0104

EXPIRES 8/31/85

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		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
		8   5	—   0   1   2	—   0   1	0   3	OF	0   3

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

On 6/6/85, the HPCI system again tripped and isolated on high flow during surveillance testing. Investigation revealed that a portion of the instrumentation referenced in Paragraph 3 of this text was improperly installed on 6/3/85 and was causing binding of the turbine control valve linkage. The root cause of the trip and isolation was determined to be binding of the linkage.

Corrective action was to remove the transducer and conduct an investigation into the improper installation. The investigation results and corrective actions are documented in Memo #M-85-104 (Special NRC Inspection #85-16 also investigated the improper transducer installation).

On 6/9/85, the previously discussed design change, PDC 85-35, was implemented. Subsequently, the HPCI system was successfully tested and declared operable on 6/10/85.

Additional long-term corrective action includes a plan to develop a modification to replace, modify, or install additional vacuum breakers. This modification is intended to help preclude water hammers.

Redundant systems that were operable included LPCI, Core Spray, ADS, and RCIC.

A previous occurrence of a similar nature was discussed in LER 85-008.

This event did not impact the health and safety of the public.

BOSTON EDISON COMPANY  
800 BOYLSTON STREET  
BOSTON, MASSACHUSETTS 02199

WILLIAM D. HARRINGTON  
SENIOR VICE PRESIDENT  
NUCLEAR

July 8 , 1985  
BECO Ltr. #85- 123

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

Docket Number 50-293  
License DPR-35

Dear Sir:

The attached update Licensee Event Report 85-012-01, "HPCI System Inoperable," is hereby submitted in accordance with the requirements of 10CFR50.73.

If there are any questions on this subject, please do not hesitate to contact me.

Respectfully submitted,

*W D Harrington*  
W. D. Harrington

PH:caw

Enclosure: LER 85-012-01

cc: Dr. Thomas E. Murley  
Regional Administrator, Region I  
U.S. Nuclear Regulatory Commission  
631 Park Avenue  
King of Prussia, PA 19406

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