

3150-0011

(PLEASE PRINT OR TYPE ALL REQUIRED INFORMATION)

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EVENT DESCRIPTION AND PROBABLE CONSEQUENCES (10)

CAUSE DESCRIPTION AND CORRECTIVE ACTIONS (27)

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BOSTON EDISON COMPANY  
PILGRIM NUCLEAR POWER STATION  
DOCKET NO. 50-293

Attachment to LER 83-048/OIT-0

On 9/29/83, during steady state operation, while conducting surveillances for "HPCI Steam Supply Isolation Valve Logic" and "HPCI Injection Valve Logic" control room annunciators were observed for "HPCI Turbine High Suction Pressure" and "HPCI Turbine Oil Cooler Discharge Hi Oil Temperature". While the control room operator was alleviating the high suction pressure condition by opening valves in the HPCI test return line (~1 minute) the following alarms were also observed: "250V Power Battery Ground", "23' El. Rx. Bldg. West" (smoke alarm) and "HPCI Turbine Room" (smoke alarm). Investigations into the cause of these alarms were immediately initiated with particular attention to the smoke alarms.

The smoke alarms were found to have been initiated by vapors from heated sections of non-lagged HPCI suction pipe and the battery ground caused by water from a ruptured gland seal condenser gasket spraying a limit switch. All alarms were cleared in a short time with the exception of the oil cooler discharge high oil temperature annunciator.

Following these initial investigations, a HPCI operability test was initiated. During the initial steps in the surveillance, the turbine stop valve failed to close on a remote signal and at this point HPCI was declared inoperable, redundant system surveillances initiated and the NRC notified.

Further investigation indicated that a feedwater pressure transient had occurred to the HPCI suction piping through a partially open injection check valve (2301-7) when both HPCI pump discharge valves (2301-8 and 2301-9) were inadvertently valved open during the aforementioned logic tests. It was postulated that, if feedwater pressure was allowed through the open check valve (2301-7) and through both the 2301-8 and 2301-9 discharge valves through the pump and into the suction piping, the pump might not be capable of producing its design pressure in the required time. At this time a Prompt Report was prepared and issued.

An analysis was performed which conservatively assumed that the entire piping system had been subjected to 1100 psig. It was determined that none of the piping exceeded yield but had stayed in the elastic region. In addition to this analysis, a system walkdown showed no visible damage to piping or supports. Therefore, it was concluded that the HPCI piping and supports were operable.

Root cause of this event has been determined to be a combination of three items. 1) A failed coil for the turbine stop valve control unit which caused the HPCI system to be declared inoperable. (It is believed this failure would have been found at the next scheduled HPCI surveillance.) 2) A miscommunication between station personnel which allowed both discharge valves to be opened at the same time; 3) A partially opened check valve which allowed a build-up of feedwater pressure beyond its seat which created the instantaneous pressure transient to flow through the inadvertently opened discharge valves.

The following corrective actions have taken place: 1) The coil was replaced in-kind and the stop valve returned to service; 2) An investigation was conducted at the request of the Vice President-Operations. The investigation revealed that root cause of the incident was verbal miscommunication between the control room operator and an I&C technician. Instructions for verbal communications were not followed. These instructions are being implemented at the station. 3) The suspect valve had been scheduled for replacement during the station wide valve betterment program.

Subsequent investigations have determined that the check valve was partially open due to pressure equalization across the seat. When the 2301-8 valve was opened the pressure spike occurred. The operator vented this pressure and, the check valve closed. An approved temporary procedure to test the valve was performed which monitored any build-up of pressure in the piping between the check valve and the 2301-8 discharge valve. After approximately 16 hours no pressure build-up was detected. In addition, the postulated event previously described would not occur because, on a HPCI system initiation, as the pump begins to turn the 2301-8 valve is opening and the minimum flow bypass valve is also opening, therefore, if a pressure build-up is present downstream of the 2301-8 valve it would be relieved through the bypass, the pump is then capable of attaining its design function and the system operable.

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WILLIAM D. HARRINGTON  
SENIOR VICE PRESIDENT  
NUCLEAR

October 14, 1983

BECO Ltr. #83-258

Regional Administrator, Region 1  
U. S. Nuclear Regulatory Commission  
631 Park Avenue  
King of Prussia, PA 19406

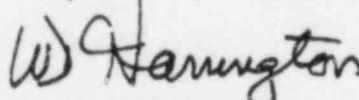
Docket Number 50-203  
License DPR-35

Dear Sir:

The attached Licensee Event Report 83-048/01T-0, "HPCI System Inoperable", is hereby submitted in accordance with the requirements of Pilgrim Nuclear Power Station Technical Specification 6.9.B.1.e.

If there are any questions on this subject, please contact us.

Respectfully submitted,

  
W. D. Harrington

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Enclosure: LER 83-048/01T-0

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