

LICENSEE EVENT REPORT (LER)

Facility Name (1) QUAD-CITIES NUCLEAR POWER STATION, UNIT ONE										Docket Number (2) 0   5   0   0   0   2   5   4				Page (3) 1   of   0   4														
Title (4) FAILURE OF HPCI MINIMUM FLOW VALVE TO OPEN DUE TO AIR IN FLOW SWITCH SENSING LINES BECAUSE OF OUTAGE SCHEDULING DEFICIENCY																												
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)																	
1	2	2	8	7	8	7	---	0	3	1	---	0	0	0	1	1	4	8	7			0	5	0	0	0	1	1
OPERATING MODE (9)		4		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10CFR (Check one or more of the following) (11)																								
POWER LEVEL (10)		0   1   3		20.402(b)		20.405(c)		50.73(a)(2)(iv)		73.71(b)																		
				20.405(a)(1)(i)		50.36(c)(1)		X 50.73(a)(2)(v)		73.71(c)																		
				20.405(a)(1)(ii)		50.36(c)(2)		50.73(a)(2)(vii)		Other (Specify in Abstract below and in Text)																		
				20.405(a)(1)(iii)		50.73(a)(2)(i)		50.73(a)(2)(viii)(A)																				
				20.405(a)(1)(iv)		50.73(a)(2)(ii)		50.73(a)(2)(viii)(B)																				
				20.405(a)(1)(v)		50.73(a)(2)(iii)		50.73(a)(2)(ix)																				
LICENSEE CONTACT FOR THIS LER (12)																												
Name K. J. HILL, TECHNICAL STAFF ENGINEER, EXTENSION 2150										TELEPHONE NUMBER																		
										AREA CODE		3   0   9																
												6   5   4   -   2   2   4   1																
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)										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)																												

At 1310 hours, on December 23, 1987, Quad Cities Unit One was performing a valve operability test (QOS 2300-3) on the High Pressure Coolant Injection (HPCI) system as part of normal unit startup testing. During this test, HPCI was declared inoperable due to the failure of the HPCI pump minimum flow valve (MO-1-2301-14) to automatically open when the HPCI turbine inlet valve MO-1-2301-3 was opened. NRC notification of this event per 10 CFR 50.72 was completed at 1445 hours.

The cause of this problem was due to the presence of air in the sensing lines to the flow switch that controls the HPCI minimum flow valve. The sensing lines were backfilled and HPCI was deemed operable at 1450 hours after verifying proper valve operation. The root cause for this event is management deficiency because no method was used to ensure these instrument sensing lines were backfilled prior to unit restart. The Work Planning Department is to incorporate backfilling of HPCI instrument lines to Instrument Maintenance outage tasks. This report is provided per 10CFR50.73(a)(2)(v)(D).

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TEXT										

PLANT AND SYSTEM IDENTIFICATION:

General Electric - Boiling Water Reactor - 2511 MWt rated core thermal power. Energy Industry Identification System (EIIIS) codes are identified in the text as [XX].

EVENT IDENTIFICATION: Failure of HPCI minimum flow valve to open due to air in flow switch sensing lines because of an outage scheduling deficiency.

A. CONDITIONS PRIOR TO EVENT:

Unit: One                                      Event Date: December 23, 1987                      Event Time: 1310  
 Reactor Mode: 4                                      Mode Name: RUN                                      Power Level: 13%

This report was initiated by Deviation Report D-4-1-87-118.

RUN Mode(4) - In this position the reactor system pressure is at or above 825 psig, and the reactor protection system is energized, with APRM protection and RBM interlocks in service (excluding the 15% high flux scram).

B. DESCRIPTION OF EVENT:

At 1310 hours on December 23, 1987, Unit One was in the process of reactor startup with the unit in the RUN mode at approximately 13 percent reactor thermal power. Prior to this event, Unit One had been shutdown as part of a 12-week refuel outage. The Unit One Nuclear Station Operator (NSO) was in the process of performing QOS 2300-3, High Pressure Coolant Injection (HPCI) [BJ] Valve [20] Operability Surveillance, which is included in normal startup testing. As part of this surveillance, the HPCI steam supply valves [ISV], MO-1-2301-4 and MO-1-2301-5, are closed, the HPCI turbine inlet valve [ISV], MO-1-2301-3, is opened and the HPCI pump minimum flow valve [FCV], MO-1-2301-14, is verified to automatically open. This simulates a turbine initiation with low pump flow or "dead head" condition. After closing the steam supply valves and opening the turbine inlet valve, the NSO observed that the minimum flow valve remained in the closed position. The NSO was successful in opening and closing the minimum flow valve using the control switch at control room panel [PL] 901-3. At 1310 hours on December 23, 1987, the Unit One HPCI system was declared inoperable and QOS 2300-01, HPCI System Outage Report, was initiated. NRC notification via the Emergency Notification System (ENS) was completed at 1445 hours on December 23, 1987, to comply with the requirements of 10CFR50.72. Instrument Maintenance (IM) personnel were notified of the problem and asked to investigate. IM personnel inspected the HPCI pump [P] discharge low flow switch [FS], FS-1-2354, and found that the switch was in the reset, or normal pump flow, position. The flow instrumentation was isolated and the sensing lines were backfilled. The instrument lines were then re-opened and the low flow switch was observed to go to the tripped, or low pump flow, position.

At 1450 hours, the sensing line was backfilled and the MO1-2301-14 was verified operable. The HPCI system was declared operable and the system outage report was terminated.

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TEXT

C. APPARENT CAUSE OF EVENT:

This event is being reported according to 10CFR50.73(a)(2)(v)(D), which requires the reporting of any event or condition that alone could have prevented the fulfillment of the safety function of structures or systems that are needed to mitigate the consequences of an accident.

The cause of this event is due to an outage activity scheduling deficiency. The pump low flow switch was not indicating actual pump flow due to the presence of entrapped air in the instrument sensing lines. The sensing lines most likely became drained during normal outage-related maintenance activities on the HPCI system. This condition is common to similar instrumentation such as feedwater heater [SM] level controllers [LC] and reactor vessel [RCT] instrumentation. The IM Department should have been scheduled to backfill the instrument lines after all maintenance activities were complete and prior to unit startup.

D. SAFETY ANALYSIS OF EVENT:

The safety of the plant and public was not affected during this event. The HPCI system is a standby safety system used to supply makeup water to the reactor vessel in the event of a loss of coolant or reactor isolation. The HPCI system will auto-initiate upon receiving either a low-low reactor water level (-59 inches) signal [JE] or a high drywell pressure (+2.5 psig) signal [JE]. During the time that the HPCI system was declared inoperable, neither of these two conditions ever occurred. Nor was the normal coolant supply, reactor feedwater [SJ], ever disrupted. If an emergency condition had occurred, the Automatic Depressurization System [SB] would have initiated to reduce vessel pressure so that the Low Pressure Coolant Injection System [BO] and the Core Spray System [BM] could supply makeup water to the vessel.

The HPCI Pump minimum flow valve is designed to provide an alternate path for pump discharge flow such that in the event the normal flow path to the vessel is not available, the pump is not damaged. If an actual HPCI initiation signal had occurred, the HPCI injection valves to the reactor would have opened immediately, thereby, providing a flowpath sufficient to prevent pump damage.

E. CORRECTIVE ACTIONS:

Quad Cities Station Work Planning Department will add the backfilling of the HPCI flow instrumentation sensing lines to the list of IM Department outage tasks and schedule it to be performed after all outage maintenance activities and prior to startup. This is currently done for similar instrumentation such as the feedwater heater level instrumentation and various reactor vessel instrumentation and has proven to be effective.

A review of similar safety systems will be performed to determine if other instrumentation exists which could be susceptible to this condition. Any instrumentation identified in this review as requiring backfilling will be added to the list of outage tasks along with the HPCI flow switch involved in this event. This will be tracked by Nuclear Tracking System number 2542008711801.

F. PREVIOUS EVENTS:

There are no previous reported events of a failure of the HPCI pump low flow switch to operate correctly due to entrapped air in the sensing lines.

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G. COMPONENT FAILURE DATA:

This event did not involve component failure.



**Commonwealth Edison**

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Cordova, Illinois 61242  
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RLB-88-12

January 12, 1988

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

Reference: Quad-Cities Nuclear Power Station  
Docket Number 50-254, DPR-29, Unit One

Enclosed please find Licensee Event Report (LER) 87-031, Revision 00, for Quad-Cities Nuclear Power Station.

This report is submitted in accordance with the requirements of the Code of Federal Regulations, Title 10, Part 50.73(a)(2)(v)(D), which requires the reporting of any event or condition that alone could have prevented the fulfillment of the safety function of structures or systems that are needed to mitigate the consequences of an accident.

Respectfully,

COMMONWEALTH EDISON COMPANY  
QUAD-CITIES NUCLEAR POWER STATION

R. L. Bax  
Station Manager

RLB/MSK/ekb

Enclosure

cc: I. Johnson  
R. Higgins  
INPO Records Center  
NRC Region III

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