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RLB-90-317

December 21, 1990

U. S. Nuclear Regulatory Commission
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Reference: Quad Cities Nuclear Power Station
Docket Number 50-265, DPR-30, Unit Two

Enclosed is Licensee Event Report (LER) 90-012, 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): The licensee shall report 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 for
R. L. Bax
Station Manager

RLB/MJB/kas

Enclosure

cc: R. Stols
T. Taylor
INPO Records Center
NRC Region III

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LICENSEE EVENT REPORT (LER)

Form Rev 2.0

Facility Name (1) Quad Cities Unit Two Docket Number (2) 0 | 5 | 0 | 0 | 0 | 2 | 6 | 5 Page (3) 1 | of | 0 | 4
 Title (4) Failure of the Automatic Function of the HPCI Flow Controller Due to Unknown Causes

Event Date (5) 1 | 1 | 2 | 4 | 9 | 0 LER Number (6) 0 | 1 | 2 Report Date (7) 1 | 2 | 2 | 1 | 9 | 0 Other Facilities Involved (8)
 Month Day Year Year Sequential Number Revision Number Facility Names Docket Number(s)
1 | 1 | 2 | 4 | 9 | 0 0 | 1 | 2 1 | 2 | 2 | 1 | 9 | 0 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 | 9 | 7
 20.402(b) --- 20.405(c) --- 50.73(a)(2)(iv) --- 73.71(b) ---
 20.405(a)(1)(i) --- 50.36(c)(1) --- 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)(x) ---

LICENSEE CONTACT FOR THIS LER (12)
 Name N. J. Radloff, Tech Staff Engineer ext. 2942 TELEPHONE NUMBER 3 | 0 | 9 | 6 | 5 | 4 | - | 2 | 2 | 4 | 1
 AREA CODE 3 | 0 | 9

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
<u>X</u>	<u>B J</u>	<u>I F I C</u>	<u>Y O O 6</u>	<u>Y</u>					

SUPPLEMENTAL REPORT EXPECTED (14)
 Expected Submission Date (15) X | NO

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

ABSTRACT:

At 1622 hours on November 24, 1990, Unit Two was in the RUN mode at 97 percent power. The Nuclear Station Operator (NSO) discovered the High Pressure Coolant Injection (HPCI) Pump Flow Indicating Controller (FIC), 2-2340-1, in manual mode and the red FAIL lamp on the FIC lit. HPCI was declared inoperable and an outage report was initiated.

The power supply fuse was removed and reinstalled which returned the FIC to normal. The Unit One FIC was exchanged with the Unit Two FIC as a conservative action. The cause of the failure could not be determined.

NRC notification of the event via the Emergency Notification System (ENS) phone was made at 1747 hours on November 24, 1990, to comply with the requirements of 10CFR50.72(b)(2)(iii)(D).

HPCI was successfully tested following the exchange of the FIC. At 0120 hours on November 25, 1990, HPCI was declared operable and the outage report was terminated. Corrective actions include an investigation to consider installing alarms for when an FIC trips, and, contacting the manufacturer to determine whether the FIC should be replaced and/or re-programmed.

This report is being submitted in accordance with 10CFR50.73(a)(2)(v)(D).

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)				Page (3)		
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Wind Cities Unit Two	0 5 0 0 0 2 6 5	9 0	- 0 1 2	- 0 1 0	0 3	OF	0 4	

TEXT Energy Industry Identification System (EIIIS) codes are identified in the text as [XX]

At 0025 hours on November 25, 1990, QOS 2300-1, HPCI Monthly and Quarterly Test was initiated and at 0120 hours, the test was successfully completed. The SE declared the system operable and terminated the outage report.

C. APPARENT CAUSE OF EVENT:

This event is being reported according to 10CFR50.73(a)(2)(v)(D): the licensee shall report any event or condition that alone could have prevented the fulfillment of the safety functions of structures or systems that are needed to mitigate the consequences of an accident.

The exact cause of the FIC failure is not known. The controller alarm display on the side of the FIC indicated there was a "User Read Only Memory (ROM)" failure. The reason it did not return to the automatic mode is because of its design. The FIC is designed with an internal monitoring system which shuts down the automatic mode upon detection of a failure in the controller and switches it to manual mode. The FIC will remain in manual mode until it has been de-energized and re-energized. The controller's values just before the failure are maintained which allows the FIC to be reset to its original programming. Once in manual mode, the flow demand cannot be held for a long time.

This leads to a decreasing flow demand indication which must be constantly manipulated by the manual operation lever to maintain the desired flow demand.

In discussion with the manufacturer, it was found that there have been two other similar incidents with this type controller. The exact cause of these failures could not be determined. However, it is suspected that a problem exists with the Erasable Programmable Read Only Memory (EPROM). Repairs to these controllers were completed by replacing and/or re-programming the EPROM.

D. SAFETY ANALYSIS OF EVENT:

The safety of the plant and personnel was not affected by this event. The HPCI system is designed to provide adequate core cooling for all main steam [SB] line break sizes less those for which the Low Pressure Coolant Injection (LPCI) mode of the Residual Heat Removal (RHR) [BO] or Core Spray [BM] subsystems can adequately protect the core. In addition, the HPCI system provides a backup function to the Reactor Core Isolation Cooling (RCIC) [BN] system.

The relief valves [RV] of the Automatic Pressure Relief (APR) [SB] subsystem are a backup to the HPCI system. In the event of HPCI failure, the relief valves allow depressurization of the reactor vessel [RCT] rapidly enough to actuate the Core Spray subsystem and LPCI mode of the RHR system. The APR subsystem was fully operational at the time of the FIC failure.

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TEXT Energy Industry Identification System (EIS) codes are identified in the text as [XX]

Technical Specification 3.5.C.2 allows continued reactor operation for seven days in the event HPCI is found inoperable provided all active components of the APR subsystems, the Core Spray subsystems, LPCI mode of the RHR system, and the RCIC system are operable. The Operating Department initiated required testing of redundant systems upon declaring the HPCI system inoperable. This test was discontinued upon declaring the HPCI system operable. The failure of the automatic function of the FIC affected the ability of HPCI to automatically maintain 5600 gpm on an auto-initiation. The FIC switches instantly from automatic to manual mode when the controller fails, thus allowing manual initiation of the HPCI turbine. Once in manual mode, a constant flow from the HPCI turbine can be maintained, with constant manipulation of the manual operation lever on the FIC by an operator.

The NSO discovered the failure of the FIC at 1622 hours. The NSO had made an independent panel check at 1600 hours and found no problem with the FIC.

E. CORRECTIVE ACTIONS:

The corrective actions for the failure of the FIC consisted of declaring HPCI inoperable and initiating the system outage report. The IMs de-energized and re-energized the FIC which returned it to automatic mode. As a conservative action, Operating personnel decided to exchange the Unit Two FIC with the Unit One FIC. The system was successfully tested and declared operable after the exchange was completed.

IMs investigated the failure of the FIC, but could not determine the cause. Presently, an investigation is being performed to review the possibility of installing alarms on the FICs and is being tracked by NTS 2652009003101.

The manufacturer will be contacted to determine whether the EPROM should be replaced and/or re-programmed as necessary before the FIC is reinstalled in Unit One (NTS 2652009006701).

F. PREVIOUS EVENTS:

There has been one previous report involving a failure of this type. The failure involved the same FIC and occurred on June 2, 1990. The event is documented in License Event Report (LER) 90-008. Corrective actions for the previous event consisted of only de-energizing and re-energizing the FIC.

A search of the Nuclear Plant Reliability Data System (NPRDS) found one previous occurrence on June 6, 1990.

G. COMPONENT FAILURE DATA:

The HPCI FIC was manufactured by Yokogawa, series 80, model number SLPC-271.