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RLB-91-139

May 17, 1991

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

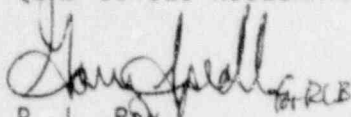
Reference: Quad Cities Nuclear Power Station
Docket Number 50-265, DPR-30, Unit Two

Enclosed is Licensee Event Report (LER) 91-006, 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 functions 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/MJB/jso

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 | 1 | of | 0 | 4 Page (3)

Title (4) HPCI Pump Operability Test Fell Into IST Required Action Range Due to Unknown Causes

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 4	2 0	9 1	9 1	0 0 6	0 0	0 5	1 6	9 1		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 0	<input type="checkbox"/> 20.402(b)	<input type="checkbox"/> 20.405(c)	<input type="checkbox"/> 50.73(a)(2)(iv)	<input type="checkbox"/> 73.71(b)
	<input type="checkbox"/> 20.405(a)(1)(i)	<input type="checkbox"/> 50.36(c)(1)	<input checked="" type="checkbox"/> 50.73(a)(2)(v)	<input type="checkbox"/> 73.71(c)
	<input type="checkbox"/> 20.405(a)(1)(ii)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(vii)	<input type="checkbox"/> Other (Specify in Abstract below and in Text)
	<input type="checkbox"/> 20.405(a)(1)(iii)	<input type="checkbox"/> 50.73(a)(2)(i)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)	
	<input type="checkbox"/> 20.405(a)(1)(iv)	<input type="checkbox"/> 50.73(a)(2)(ii)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)	
	<input type="checkbox"/> 20.405(a)(1)(v)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(ix)	

LICENSEE CONTACT FOR THIS LER (12)

Name: Mick Radloff, Tech Staff Engineer ext. 2942

TELEPHONE NUMBER: AREA CODE 3 | 0 | 9 | 6 | 6 | 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) NO

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

ABSTRACT:

At 1355 hours on April 20, 1991, Unit Two was in the RUN mode at 10 percent rated reactor core thermal power. While performing QCOS 2300-5, High Pressure Coolant Injection (HPCI) Pump Operability Test, the system failed to meet the Inservice Testing (IST) Pump Surveillance Acceptance Criteria portion of the test. An operability evaluation was completed and approved. Subsequently, HPCI was declared operable.

The cause of this event was due to an inadequate procedure that led to inconsistent data which caused HPCI to fall into the IST required action range.

The IST turbine speed requirements will be changed in QCOS 2300-5 to allow the turbine speed to be set at both the Motor Gear Unit and Motor Speed Changer high speed stops. This change will assist operations in setting consistent test conditions which will result in accurate test data that complies with both Technical Specifications and ASME Section XI.

Also, a new type of throttling valve will be installed which will help the operator in setting the pump discharge pressure more consistently.

This report is being submitted in accordance with 10CFR50.72(b)(2)(iii)(D).

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

PLANT AND SYSTEM IDENTIFICATION:

General Electric - Boiling Water Reactor - 2511 MWT rated core thermal power.

EVENT IDENTIFICATION: HPCI Pump Operability Test Fell Into IST Required Action Range Due to Unknown Causes.

A. CONDITIONS PRIOR TO EVENT:

Unit: Two	Event Date: April 20, 1991	Event Time: 1355
Reactor Mode: 4	Mode Name: RUN	Power Level: 10%

This report was initiated by Deviation Report D-4-2-91-043

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 1355 hours on April 20, 1991, Unit Two was in the RUN mode at 10 percent rated reactor core thermal power. At this time, the Unit Two Nuclear Station Operator (NSO) performed the Quarterly High Pressure Coolant Injection (HPCI)[BJ] Pump [P] Operability Test, QCOS 2300-5. During the first portion of the test, the system met Technical specification 4.5.C and Final Safety Analysis Report (FSAR) requirements successfully. During the second portion of the test, the system failed to meet the Inservice Testing (IST) Pump Surveillance Acceptance Criteria portion of the test.

The acceptable IST flow rate range of the pump was 3760 gallons per minute (gpm) to 4080 gpm with the pump pressure differential set at 1230 pounds per square inch differential (psid) and turbine speed set at 3900 revolutions per minute (rpm). The NSO recorded the pump flow at 4700 gpm, pump pressure differential 1230 psid, and turbine speed at 3900 rpm. This pump flow rate fell into the required action range per IST requirements.

The Shift Engineer (SE), Assistant Superintendent of Operations (ASO), and Operating Engineer (OE) reviewed QCOS 2300-5. HPCI was declared inoperable and IPCI Outage Report, QCOS 2300-2, was initiated.

Technical Staff (TS) personnel performed an Operability Evaluation per QAP 300-39 (evaluation #91-14) to determine operability of the HPCI system.

At 1715 hours, the operability evaluation was reviewed and approved. HPCI was then declared operable and the HPCI Outage Report was terminated.

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

The NRC was notified of the event via the Emergency Notification System (ENS) at 1722 hours in order to comply with the requirements of 10CFR20.72(b)(2)(iii)(D).

C. APPARENT CAUSE OF EVENT:

This report is provided to satisfy the requirements of 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 cause of this event is due to procedure inadequacies. During the IST portion of this test, the NSO was required to maintain a turbine speed of 3900 rpm, set a pump pressure differential of 1230 psid, and to record the resulting flow rate. Because of pressure transients in the system, the analog pump discharge pressure indicator (PI 2-2340-2) fluctuates making it difficult for the NSO to throttle motor operated (MO) valve 2-2301-10 (HPCI test return line valve) to the required pump pressure differential. If the pressure differential across the pump or the turbine speed is not set precisely to the baseline conditions, the actual flow rate of the system will change.

The composite head/capacity curves for the HPCI booster and main pump shows that an 18 psid difference across the pumps can change the flow rate demand by as much as 700 GPM.

Also, the IST baseline data requirements for the HPCI pump were changed from 4000 rpm to 3900 rpm with the incorporation of new surveillance procedures in January, 1991. This requires the NSO to set the turbine speed consistently each time.

The new set flow rate was 4000 gpm corresponding to a constant pump differential pressure of 1230 psid and 3900 rpm. This corresponded to the pump analysis curve and therefore, no pump degradation was determined.

D. SAFETY ANALYSIS OF EVENT:

The safety of the plant and personnel was not affected in the event. Technical Specification 3.5.C.2 allows continued reactor operation for fourteen 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. All of these systems were operable throughout the event.

The HPCI system is designed to provide adequate core cooling for all line breaks less than those for which the Low Pressure Coolant Injection (LPCI) mode of the Residual Heat Removal (RHR) [BO] or Core Spray [BM] subsystem can adequately protect the core. The relief valves [RV] of the Automatic Pressure Relief (APR) [SB] subsystem provides a backup to the HPCI system. In the event of HPCI being inoperable, the relief valves would allow depressurization of the reactor vessel [RCT] rapidly enough to actuate the Core Spray subsystem and LPCI mode of the RHR system.

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

The HPCI system fully met Technical Specification 4.5.C.3 and Final Safety Analysis Report (FSAR) pump flow rate requirements. Technical Specifications and FSAR require HPCI to deliver a minimum of 5000 gpm against a corresponding reactor pressure greater than 1150 psig. Therefore, HPCI would have been able to perform its intended safety function providing it would have received an auto-initiation signal. The HPCI system only failed to meet the IST guidelines set in American Society of Mechanical Engineers (ASME) section XI codebook.

The operability evaluation determined that the pump had not degraded after reviewing the IST trending data and the composite head/capacity curves for the pump.

E. CORRECTIVE ACTIONS:

The immediate corrective actions for the HPCI pump high flow rate consisted of declaring HPCI inoperable and initiating a system outage report. An operability evaluation was completed to ensure that HPCI was still able to meet its intended safety function.

QCOS 2300-5 was revised to record test data when the turbine speed is at the Motor Gear Unit and the Motor Speed Changer high speed stops as opposed to having the NSO set the turbine speed. This will provide for better repeatability of the pump's test conditions prior to data collection.

Also, the MO 2-2301-10 valve will be replaced during the Q2R11 outage with a new multi-stage, multi-path globe valve. This valve will provide better throttling capabilities to the operator and reduce the severe cavitation problems which can cause pressure gauge oscillations. This work will be performed under Modification PQ4-2-90-054 (NTS 2542008909701). This modification has already been installed in Unit One.

F. PREVIOUS EVENTS:

There have been no previous events involving the HPCI pump operability flow rate being in the required action range for this station. No search of the Nuclear Plant Reliability Data System (NPRDS) was performed as there was no specific component failure identified in this event.

G. COMPONENT FAILURE DATA:

No specific component failure could be identified in this event.