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RLB-93-042

March 4, 1993

U. S. Nuclear Regulatory Commission
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Reference: Quad Cities Nuclear Power Station
Docket Number 50-254, DPR-29, Unit One

Enclosed is Licensee Event Report (LER) 93-001, 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)(i)(B). The licensee shall report any operation or condition prohibited by the plant's Technical Specification.

Respectfully,

COMMONWEALTH EDISON COMPANY
QUAD CITIES NUCLEAR POWER STATION

R. L. Bax
Station Manager

RLB/TB/as

Enclosure

cc: J. Schrage
T. Taylor
INPO Records Center
NRC Region III

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LICENSEE EVENT REPORT (LER)

Form Rev 2.0

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Title (4)		

HPCI/RCIC Declared Inoperable Due to Missed Tech Spec Surveillance Requirement.

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
0 2	0 4	9 3	9 3	0 0 1	0 0	0 3	0 5	9 3	Quad Cities Unit Two
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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)	1 0 0	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
		20.405(a)(1)(iii)	X 50.73(a)(2)(i)	50.73(a)(2)(viii)(A)	in Abstract
		20.405(a)(1)(iv)	50.73(a)(2)(ii)	50.73(a)(2)(viii)(B)	below and in
		20.405(a)(1)(v)	50.73(a)(2)(iii)	50.73(a)(2)(x)	Text)

LICENSEE CONTACT FOR THIS LER (12)

Name	TELEPHONE NUMBER
Nick Radloff, Technical Staff Ext. 2942	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	MANUFAC-TURER	REPORTABLE TO NPRDS		CAUSE	SYSTEM	COMPONENT	MANUFAC-TURER	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)

ABSTRACT:

On February 4, 1993 at 1425 hours, Unit One and Two were in the RUN mode at 100 percent rated core thermal power. It was determined that the CCST low water level and Torus high water level switch contacts and logic circuitry were not functionally tested for both Unit One and Two HPCI and RCIC systems as required by Technical Specifications. Unit One and Two HPCI and RCIC systems were declared inoperable and Outage Reports were initiated.

While transferring the pump suction paths from the CCST to the Torus, the HPCI torus suction check valves were determined to be leaking. The check valves were repaired and the level switches successfully tested. Unit One and Two RCIC were declared operable and outage reports terminated on February 4, 1993 at 1818 hours and 2110 hours, respectively. Unit One and Two HPCI were declared operable on February 6, 1993 at 1200 hours.

This event was caused by inadequate testing of a Technical Specification surveillance requirement. The disk misalignment of both the HPCI system check valves was due to an inadequate maintenance procedure which did not provide any acceptance criteria for checking and aligning the valve disk assemblies.

This report is being submitted to comply with 10CFR50.73(a)(2)(i)(B).

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PLANT AND SYSTEM IDENTIFICATION:

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

EVENT IDENTIFICATION: HPCI/RCIC Declared Inoperable Due to Missed Tech Spec Surveillance Requirement.

A. CONDITIONS PRIOR TO EVENT:

Unit: One Event Date: February 4, 1993 Event Time: 1425
Reactor Mode: 4 Mode Name: Run Power Level: 100%

This report was initiated by Deviation Report D-4-1-93-007

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:

On February 4, 1993 at 1425 hours, Units One and Two were in the RUN mode at 100 percent rated core thermal power. At this time, it was determined that the Contaminated Condensate Storage [KA] Tank (CCST) low water level and Torus high water level switch [LS] contacts and logic circuitry were not functionally tested for both Unit One and Two High Pressure Coolant Injection (HPCI) [BJ] and Reactor Core Isolation Cooling (RCIC) [BN] systems as required by Technical Specifications 4.5.C.5 and 4.5.E.5. Unit One and Two HPCI and RCIC systems were declared inoperable and QCOS 1300-12 and QCOS 2300-2, RCIC and HPCI System Outage Reports, were initiated. Since both HPCI and RCIC systems were declared inoperable, Technical Specification 3.5.C.4 and 3.5.E.4 requires a reactor shutdown to be initiated and reactor pressure reduced to less than 150 pounds per square inch gage (psig) within 24 hours.

This problem was identified during a Quality Verification (QV) audit of the HPCI systems prior to this event. The CCST low water level and Torus high water level switches provide the capabilities to transfer the HPCI and/or RCIC pump [P] suction from the CCST to the Torus on sensing high water in the torus or low water level in the CCST. Both systems are normally lined up to take suction from the CCST.

At 1458 hours, the Unit One and Two HPCI/RCIC pump suctions were transferred from the CCST to the Torus. However, per technical specifications when HPCI or RCIC is lined up to take suction from the torus, the jockey fill pump [P] is required to be lined up to both the HPCI and RCIC systems to ensure the pump discharge piping remain filled of water. Also, the discharge piping is required to be vented from the high point of the system every 24 hours.

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At 1638 hours on February 4, 1993, the NRC was notified of the event via the Emergency Notification System (ENS) in order to comply with the requirements of 10CFR50.72(b)(2)(iii)(D).

At 1818 hours, Unit One RCIC system was finished being lined up to the jockey fill pump and the pump discharge line was vented successfully. The Shift Engineer (SE) declared RCIC operable and terminated the RCIC outage report, thus exiting the Tech. Spec. 24 hour reactor shutdown requirement for Unit One.

At 1940 hours, both Unit One and Two HPCI systems were unable to be pressurized when the jockey fill pump was lined up to each of the systems. When each of the systems were vented, no water flow was observed through the vent line site glass. Flow through the site glass verifies that the pump suction and discharge piping is completely filled of water. This acceptance criteria was required by QCOS 2300-8, HPCI 24 Hour Vent Verification When Suction Lined Up From Torus surveillance. Also, the HPCI pump suction and discharge gages were reading approximately 15 psig. The Unit One and Two Nuclear Station Operators (NSO) each closed the Motor Operated (MO) 1(2)-2301-35(36) valves were then opened and pressure returned to approximately 15 psig. This was repeated again, with the same results. The check valve 1(2)-2301-39, HPCI Torus Pump Suction Check Valves, became suspect of possible backleakage. The jockey fill pump was valved out from Unit One and Two HPCI and both systems were returned to taking suction from the CCST. The systems remained administratively inoperable and Nuclear Work Requests (NWR) #Q05735 and Q05736 were initiated to inspect the 1(2)-2301-39 check valves for proper disk seating.

At 2110 hours, the Unit Two RCIC system was lined up to the jockey fill pump and was also vented successfully. The SE declared RCIC operable and terminated the RCIC outage report, thus exiting the Tech. Spec. 24 hour reactor shutdown requirement for Unit Two.

At 1045 hours on February 5, 1993, a supplemental ENS phone call notification was made to the NRC concerning Unit One and Two HPCI 1(2)-2301-39 check valves being unable to seat properly.

At 2215 hours on February 5, 1993, Technical Staff (TS) and Operating personnel successfully completed IP-042, Interim Procedure for CCST/Torus level Switch Functional Test for Unit One and Two.

At 0450 hours on February 6, 1993, Unit One and Two RCIC systems were lined up to take suction from the CCST. The systems were filled and vented and the jockey pump was valved out.

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Mechanical Maintenance (MM) personnel disassembled and inspected the 1(2)-2301-39 check valves. The disk to seat check valve interfaces for both systems were found misaligned. MM corrected the misalignment and reassembled the valves. Afterwards, Operations transferred Unit One and Two HPCI suction paths from the CCST to the torus and verified the pump suction and discharge lines were able to be pressurized. Both systems held pressure successfully. The HPCI systems were then lined back up to the CCST.

At 1200 hours on February 6, 1993, the SE declared Unit One and Unit Two HPCI systems operable and terminated the outage reports.

C. APPARENT CAUSE OF EVENT:

This report is being submitted to comply with 10CFR50.73(a)(2)(i)(B) which requires the licensee report any operation or condition prohibited by the plant's Technical Specifications.

This event was caused by inadequate testing of a Technical Specification surveillance requirement. Per Technical Specification 3.5.C.5 and 3.5.E.5, a logic system functional test shall be performed on the HPCI and RCIC systems once per refuel outage. The Technical Specification definition of "logic system functional test" means a test of all relays and contacts of a logic circuit from sensor to activated device such that each component operates per design intent. The CCST low level and Torus high level switches, 1/2-2350(A-D) and 1(2)-2351(A and B), were not tested from the level switch's float for each level switch to the 1(2)-2330-150 and 151 relays [RLY]. QCEMS 350-3 and 350-4, RCIC and HPCI Logic Functional Test, tests the logic circuitry from the relays to each required component. IP-042 test procedure functionally tested each level switch per Technical Specification requirements.

The cause of the inability to pressurize the HPCI systems when the systems were lined up to the torus was due to an inadequate maintenance procedure. QCMMS 2300-1, HPCI Torus Suction Check Valve Disassembly and Testing, did not provide adequate acceptance criteria for checking and aligning the valve disk assembly. The check valves were inspected during Q2R11 and Q1R12 outages, however, there was no verification done to assure the disk and seat were properly aligned.

A contributing cause adding to the insufficient check valve performances was the failure to identify and test the closed safety function of the 1(2)-2301-39 check valves. The IST program identified the check valves as only having an open safety function, and therefore were never tested in the closed direction.

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D. SAFETY ANALYSIS OF EVENT:

The safety of the plant and personnel was not affected in this event. When the CCST and Torus level switches were determined to be inadequately tested, both Unit One and Two HPCI and RCIC pump suction paths were immediately transferred over to the Torus, which is the seismic class I, primary source of water for each of the systems during a Design Basis Accident (DBA). When the Unit One and Two HPCI systems were lined up to the Torus and the systems could not be pressurized from the Jockey Keep Fill Pump, the system's pump suction paths were returned to the CCST line up.

Both Unit One and Two RCIC systems would have been able to fulfill its intended safety function. Both Unit One and Two HPCI systems would also have been able to fulfill its intended safety function providing the systems remained taking suction from the CCST. Per Technical Specification 3.5.G.3, the filled discharge piping for HPCI and RCIC systems is ensured by maintaining the level in the CCST at or above 9.5 feet. The levels in the CCST's are normally at 19-21 feet. Once the HPCI pump suction paths were lined up to the Torus, maintaining the filled discharge piping could not be ensured due to the backleakage from the check valves. However, Operating personnel would be able to determine the check valve degradation due to the Technical Specification surveillance procedure, QCOS 2300-8, and take immediate corrective actions.

Also, per Technical Specification 3.5.C.3, if HPCI is found inoperable, reactor operation is allowed for fourteen days provided all active components of the Automatic Pressure Relief (APR) [SB] subsystems, the Core Spray (CA) [BM] subsystems, Low Pressure Coolant Injection (LPCI) [BO] mode of Residual Heat Removal (RHR) system, and Reactor Core Isolation Cooling (RCIC) [BN] system are operable. These systems were available throughout this event.

E. CORRECTIVE ACTIONS:

The immediate corrective actions were to declare both Unit One and Two HPCI and RCIC systems inoperable and initiate outage reports for all the systems. This placed Unit One and Two reactors in a 24 hour LCO. Afterwards, the pump suction paths for Unit One and Two RCIC systems were lined up to the torus, ending the 24 hour Limiting Condition for Operating (LCO).

TS personnel performed IP-42, CCST/Torus Level Switch Functional Test for Unit One and Two successfully, verifying proper operation of the level switches.

When both the HPCI systems could not be pressurized using the jockey pump, the systems remained administratively inoperable, and both system pump suction paths were lined up to the CCST again. After troubleshooting the problem, NWR #Q05735 and Q05736 were written to inspect 1(2)-2301-39, HPCI torus suction check valves.

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Mechanical Maintenance personnel disassembled and inspected both check valves. The disk to seat check valve interfaces for both valves were discovered misaligned. The disks were realigned and both check valves reassembled. Afterwards, the check valves were successfully tested and Work Requests #Q05735 and Q05736 were closed out.

In order to ensure the CCST and Torus level switches are properly tested in accordance with Technical Specifications, Operating will create a surveillance procedure that will test these switches once a refuel cycle (NTS #2652009300701).

Mechanical Maintenance personnel will revise QCMMS 2300-1, HPCI Torus Suction Check Valve Disassembly and Testing surveillance, to provide acceptance criteria ensuring the disk and seat are properly aligned (NTS #2542009300702). Also, the In-Service Testing (IST) program will include a full closure verification test on the 1(2)-2301-39 check valves (NTS #2542009300703).

The IST coordinator has reviewed check valves in the program that have only an open test verification and will incorporate any additional testing requirements such as a closure verification test for valves determined to have a closing function important to safety (NTS #2652009300704).

An investigation will be performed determining generic acceptance criteria guidance for check valves during disassembly and inspections. The check valve coordinator will review and implement any necessary corrective actions (NTS #2652009300705).

Also, the station has implemented a Safety Related Contact Program which is reviewing safety related contacts to ensure the contacts are meeting acceptable Technical Specification testing requirements.

F. PREVIOUS EVENTS:

A Nuclear Plant Reliability Data System (NPRDS) search was not conducted because there is no component failure associated with this event.

There were 2 previous Deviation Reports (DVR) similar to this event in the past five years where a Technical Specification surveillance requirement was inadequately implemented. These events are listed below:

DVR 04-02-88-063 - Missed Tech. Spec. surveillance due to incomplete Tech. Spec. change and inadequate procedure implementation.

DVR 04-01-92-027 - Missed Tech. Spec. surveillance requirements due to an inadequate procedure.

No significant trend exists from the previous occurrences.

G. COMPONENT FAILURE DATA:

There was no component failure associated with this event.