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RLB-93-045

March 11, 1993

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) 92-020, Revision 01, 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
QUAD CITIES NUCLEAR POWER STATION

R. L. Bax
Station Manager

RLB/TB/plm

Enclosure

c.: J. Schrage
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) Unit Two RCIC Inoperable Due To Failed EGM/EGR Controller

Event Date (5) 0 8 1 1 9 2
LER Number (6) 0 2 0 0 1
Report Date (7) 0 3 1 6 9 3
Other Facilities Involved (8)
Facility Names Docket Number(s)
0 5 0 0 0 1
0 5 0 0 0 1

OPERATING MODE (9) 4
POWER LEVEL (10) 1 0 0
THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10CFR (Check one or more of the following) (11)
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
20.405(a)(1)(iii) 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 Nick Radloff, Tech Staff, Ext. 2942
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
X	B N	C E	W 2 9 0	Y					

SUPPLEMENTAL REPORT EXPECTED (14)

Expected Submission Date (15) X NO
Yes (If yes, complete EXPECTED SUBMISSION DATE)

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

ABSTRACT:

On August 11, 1992, at 0930 hours, Unit Two was in the RUN mode at 100 percent rated core thermal power. While performing QCOS 1300-5, Quarterly Reactor Core Isolation Cooling (RCIC) Pump Operability Test, it was found that the RCIC pump could only achieve 265 gpm against a pump discharge pressure of 1120 psig and 4300 rpm. Normal pressure, flow and speed are 1250 psig, 416 gpm, and 4500 rpm. RCIC was declared inoperable retroactive to 0930 hours and QCOS 1300-2 was initiated. After extensive troubleshooting, the RCIC EGM, EGR and RG/SC were replaced. RCIC was subsequently declared operable.

The cause of this event is due to component failure. The exact reason for the failure is not known. After the failed EGM, EGR, and RG/SG components were removed, the components could not be located later in order to evaluate and determine the exact cause of failure.

Additional corrective actions include inspecting the governor valve and stem during the next available outage and monitoring the RCIC governor control loop for voltage drift during surveillance tests until it is determined that voltage drift within these components is acceptable.

This report is being submitted in accordance with 10CFR50.73(a)(2)(v)(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: Unit Two RCIC Inoperable Due To Failed EGM/EGR Controller.

A. CONDITIONS PRIOR TO EVENT:

Unit: Two Event Date: August 11, 1992 Event Time: 0930
Reactor Mode: 4 Mode Name: RUN Power Level: 100%

This report was initiated by Deviation Report D-4-02-92-108.

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 August 11, 1992, at 0930 hours, Unit Two was in the RUN mode at 100 percent rated core thermal power. The Unit Two Nuclear Station Operator (NSO) was performing QCOS 1300-5, Quarterly Reactor Core Isolation Cooling (RCIC) [BN] Pump Operability Test. The RCIC system normally achieves full pump [P] flow of 416 gallons per minute (gpm) against a pump discharge pressure of 1250 pounds per square inch gage (psig) and 4500 revolutions per minute (rpm). During this test; however, the RCIC system achieved 265 gpm, pump discharge pressure of 1120 psig, and 4300 rpm's. The turbine speed would not increase above 4300 rpm's. The U-2 NSO took the RCIC Flow Indicating Controller (FIC) [FC] to manual. He was able to reduce and increase turbine speed manually up to 4300 rpm's but was not able to achieve any higher turbine speed.

Operating and Mechanical Maintenance (MM) personnel observed the operation of the RCIC turbine governor valve [V] and controller while the U-2 NSO continued to reduce and increase turbine speed manually with the FIC. Both the governor valve and remote servo controller appeared to operate correctly without binding. The operator reported sounds of cavitation from the pump during operation. The U-2 NSO tripped and shutdown the system. At this time, the Shift Engineer (SE) declared the RCIC system inoperable retroactive to 0930 hours and initiated QCOS 1300-2, RCIC System Outage Report.

At 1021 hours, the NRC was notified of the event via the Emergency Notification System (ENS) in accordance with 10CFR50.72(b)(2)(iii)(D).

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Because of the cavitation sounds coming from the pump during operation, the suction piping to the RCIC pump was visually inspected. The Shift Foreman (SF) and Equipment Attendant (EA) inspected the U-2 RCIC suction piping and vented the RCIC pump casing. They verified all suction valves were in their correct positions and that no air was trapped in the pump casing.

Discussions ensued with Technical Staff (TS), Instrument Maintenance (IM), Mechanical Maintenance (MM), Electrical Maintenance (EM), and Operating personnel. It was decided to run RCIC again to troubleshoot the problem using a strip chart recorder. RCIC testing was repeated six more times between 1700 hours on August 11, 1992, and 0530 hours on August 15, 1992. After extensive troubleshooting and communications with the vendor, the Electric Generating Magnetic Pickup (EGM), Electric Generator Remote (EGR), and Ramp Generator Signal Converter (RG/SC) were replaced.

On August 15, 1992, at 0530 hours, QCOS 1300-5 was completed successfully. At 0850 hours, the SE declared the RCIC system operable and terminated the outage surveillance.

C. APPARENT CAUSE OF EVENT:

This event is being reported in accordance with 10CFR50.73(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.

The cause of this event is component failure. The EGM and EGR on the RCIC turbine governor caused the governor valve to close satisfactorily but failed to open to increase turbine speed. The exact nature of the EGM, EGR, and RG/SC component failure could not be identified because the components were misplaced when being returned to the IM shop and could not be found in order to pursue further analysis.

D. SAFETY ANALYSIS OF EVENT:

The safety of the plant and personnel were not affected during this event. The RCIC system automatically initiates on low-low water level (-59 inches) [JE] and is designed to provide core cooling water in the event the reactor becomes isolated from the main condenser simultaneous with a loss of the reactor feedwater system [SJ].

Per Technical Specification 3.5.E, if RCIC is found to be inoperable, continued reactor operation is permissible for the next 14 days provided the High Pressure Coolant Injection (HPCI) system is operable. In addition to HPCI providing backup to RCIC, the Safe Shutdown Makeup Pump (SSMP) is a motor driven pump designed as a backup to RCIC as part of the station safe shutdown system. The SSMP and HPCI were available throughout this event.

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

If RCIC received an automatic system initiation, the system would still inject into the vessel. However, due to the reduced turbine speed during operation, the flow rate of coolant into the reactor would be reduced.

E. CORRECTIVE ACTIONS:

The immediate corrective action after RCIC could not meet Technical Specification requirements consisted of declaring the RCIC system inoperable and initiating the outage report.

After troubleshooting the problem, the EGM, EGR, and RG/SC were replaced. There were no problems found with the remote servo which is mechanically connected to the governor lever. The exact nature of the EGM, EGR and RG/SG component failure could not be identified because the components were misplaced when being returned to the IM shop and could not be found in order to pursue further analysis.

During system operation, the governor valve stem vibrated at intermittent times, creating a cavitation-like noise. This problem had already been identified and Work Request Q02553 was initiated to inspect the governor valve during the next available outage (NTS #2652009210802).

The vendor explained that the voltage signals within the EGM, RG/SC, and EGR may drift due to changes in ambient and operating temperatures during system operation. A strip chart recorder will be set up to monitor voltage drift during QCOS 1300-5 until it is determined that voltage drift in the EFM, RG/SC and EGR is within acceptable limits (NTS #2652009210803).

F. PREVIOUS EVENTS:

There have been two previous events at Quad Cities since 1988 where a RCIC system failure involved the RG/SC, EGM, or EGR controllers. These failures are documented below:

<u>LER#</u>	<u>DESCRIPTION</u>
254/91-018	RCIC inoperable to repair 125 VDC ground in the EGM controller.
265/88-003	RCIC inoperable due to failed EGR actuator.

There was no Nuclear Plant Reliability Data System (NPRDS) search generated because the specific nature of the component failure has not been identified.

G. COMPONENT FAILURE DATA:

The EGR, RG/SC, and EGM are manufactured by the Woodward Governor Company.