



Commonwealth Edison

Quad Cities Nuclear Power Station
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RLb-92-122

May 27, 1992

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 is Licensee Event Report (LER) 92-015, 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)(ii). Any event or condition that resulted in the condition of the nuclear power plant, including its principal safety barriers, being seriously degraded, or that resulted in the nuclear plant being in a condition that was outside the design basis of the plant.

Respectfully,

COMMONWEALTH EDISON COMPANY
QUAD CITIES NUCLEAR POWER STATION

R. L. Bax
Station Manager

RLB/TB/plm

Enclosure

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

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LICENSEE EVENT REPORT (LER)

Form Rev 2.0

Facility Name (1) Quad Cities Unit One
 Docket Number (2) 0 | 5 | 0 | 0 | 0 | 2 | 6 | 5
 Page (3) 1 | of | 0 | 4

Title (4) LPCI And Core Spray Valve Yokes Outside FSAR Design Basis Due To Inadequate Design Control

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 4	2 7	9 2	9 2	0 1 5	0 0	0 5	2 7	9 2	Quad Cities Unit Two
									Docket Number(s) 0 5 0 0 0 2 6 5

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	<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 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 checked="" type="checkbox"/> 50.73(a)(2)(iii)	<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)(x)	

LICENSEE CONTACT FOR THIS LER (12)

Name: Tim Seppanen, Tech Staff Engineer, Ext. 2168
 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) _____

[Yes (If yes, complete EXPECTED SUBMISSION DATE)] NO

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

ABSTRACT:

On April 27, 1992 at 1630 hours, Quad Cities Station was notified by the Nuclear Engineering Department (NED) that 24 valve yokes would exceed FSAR allowable stress limits during a vessel blowdown to the Torus and simultaneous seismic event. Cause of the event is inadequate design control during the construction phase of Quad Cities Station. Corrective actions consist of replacing the valve yokes on 20 of the 24 valves. The other 4 valves are still undergoing analysis by NED to determine if original calculations were correct. Preliminary indications by NED are that no action is required and stress levels during the event would be below FSAR allowables on all Residual Heat Removal (RHR) Heat Exchanger Bypass Valves. This report is being submitted in accordance with 10CFR 50.73(a)(2)(i)(B).

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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: LPCI and Core Spray Valve Yokes outside FSAR design basis due to inadequate design control.

A. CONDITIONS PRIOR TO EVENT:

Unit: One	Event Date: April 27, 1992	Event Time: 1630
Reactor Mode: 4	Mode Name: RUN	Power Level: 100%

This report was initiated by Deviation Report D-4-1-92-042.

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 April 27, 1992 at 1630 hours, with Unit One operating at 100% percent core thermal power, and Unit Two in the shutdown mode for refueling, Nuclear Engineering Department (NED) notified Quad Cities Station that 24 valve yokes on the Residual Heat Removal (RHR) [BO] and Core Spray [BM] subsystems were too flexible and exceeded the FSAR allowable stresses for a Vessel blowdown to the Torus during a seismic event. The affected valves are:

- 1(2)-1001-7A, B, C, D - RHR Pumps Suction Valves
- 1(2)-1001-16A, B - RHR Heat Exchanger Bypass Valves
- 1(2)-1001-43A, B, C, D - Shutdown Cooling Suction Valves
- 1(2)-1402-3A, B - Core Spray Pumps Suction Valves

NED performed an operability assessment and determined that all of the valves were still operable. The Shift Control Room Engineer (S) made the required ENS Notification to the Nuclear Regulatory Commission in accordance with 10CFR.50.72(b)(1)(ii)(B). No immediate corrective actions were required and both units remained in their original stable conditions.

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C. APPARENT CAUSE OF EVENT:

This event is being reported in compliance with 10CFR50.73(a)(2)(11)(B), which requires the station to report any event that places the plant in a condition outside of design basis. The apparent cause of the event is due to inadequate design control during construction of the plant and incorrect engineering assumptions during the Mark I containment analysis. The original design for the valves specified manually operated valves. At some time during the construction phase of Quad Cities Station, the design of the valves was changed to incorporate Limitorque actuators. The manufacturer supplied the valves with Limitorque actuators, however, the yokes on the valves were unchanged. No analysis appears to have been performed during the construction phase to determine the adequacy of the yoke for the modified design. During the original Mark I containment analysis, it was determined that the forces applied to the yokes were acceptable, but because of updated methods of analysis, these yokes are now considered outside of FSAR allowables for seismic loading.

D. SAFETY ANALYSIS OF EVENT:

Nuclear Engineering Department performed an Operability Assessment per QE 40.1. NED determined that during a Vessel blowdown to the Torus, and a simultaneous seismic event, the forces on the valve yokes will exceed the allowable stresses in the FSAR, but would not exceed 2 times the yield point of the yoke material. Since this value will not be exceeded, a plastic hinge will not develop on the yoke. The Shutdown Cooling Suction Valves (MO's 1(2)-1001-43A, B, C and D) are normally closed, while the RHR Suction Valves (MO's 1(2)-1001-7A, B, C and D), RHR Heat Exchanger Bypass Valves (MO's 1(2)-1001-16A and B), and Core Spray Suction Valves (MO's 1(2)-1402-3A, B) all are normally open. In the event of a vessel blowdown to the Torus and a simultaneous seismic event, the Core Spray Suction Valves would not change position, and the RHR valves would still be capable of performing their necessary functions. Since all of the valves are considered to remain operable, redundancy of systems are not affected.

E. CORRECTIVE ACTIONS:

All of the affected valves are operable, therefore, no immediate corrective actions are necessary. Since NED has determined that the stresses on the yokes will exceed FSAR allowable stresses during a Vessel blowdown to the Torus and a simultaneous seismic event, determination of a long term solution for all of the valves has been started. The RHR Heat Exchanger Bypass Valves 1(2)-1001-16A and 16B are currently being re-analyzed to determine if the original calculations were inaccurate. The preliminary indication from NED is that the stresses do not exceed FSAR allowables and no actions are necessary. The station plans to replace 20 yokes, starting with the refuel outage after receipt of the valve yokes (NTS #2542009204201). The station has continuously revised its methods of design control. The present quality methods utilized by the station are adequate to prevent events from occurring, where components are replaced without a full, integrated analysis.

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F. PREVIOUS EVENTS:

Dresden Station was informed of 8 valves affected by the same assessment. There have been 3 design control events similar to this event at Quad Cities Station in the last 4 years.

1. RCIC and 1A Core Spray Pumps were declared inoperable because of a drain line check valve failure. Cause stated was poor original design, LER 01-90-023.
2. Secondary level undervoltage relay was determined to be nonconservative due to reconciliation between current load analysis and the original load analysis. LER 02-92-013.
3. 1/2 Diesel Generator was declared inoperable for having only 1 feed from 18-2 to the cubical cooler due to a reconciliation between the current design analysis and the original design analysis.

G. COMPONENT FAILURE DATA:

None of the components affected by the Engineering analysis are being reported due to component failures.

The 1(2)-1001-43A, B, C, D and 1(2)-1001-7A, B, C, D are 14 inch Crane Valves. The 1(2)-1001-16A, B and the 1(2)-1402-3A, B are 16 inch Crane valves.