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RLB-92-228

November 6, 1992

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) 87-019, Revision 02, 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), which requires the reporting of any event or condition that resulted in the nuclear power 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
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INPO Records Center
NRC Region III

STMGR 474 190019

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LICENSEE EVENT REPORT (LER)

Facility Name (1)	Docket Number (2)	Page (3)
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Title (4) Piping Supports Outside Compliance With Safety Analysis Report Due to Design Error

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 5 0 0 0
1 2	0 8	8 7	8 7	0 1 9	0 2	1	0 9	9 2		0 5 0 0 0

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 8 8	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)	X 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	TELEPHONE NUMBER
Gary Tagatz, Technical Staff Engineer, Ext. 2165	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)	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)

On November 16, 1987, Quad Cities Unit Two was in the RUN mode at 92 percent thermal power. At 1645 hours, the Station was notified that three piping supports (two on Residual Heat Removal (RHR) and one on High Pressure Coolant Injection (HPCI)) did not comply with the Final Safety Analysis Report (FSAR) criteria for allowable stress. All systems were still operable. This event was reported via the Emergency Notification System at 1740 hours to comply with 10CFR50.72.

On December 8, 1987, at 1130 hours, the Station was notified that another piping support on HPCI did not comply with the above criteria. HPCI was still operable. NRC Region III was notified at 1300 hours per the agreement for the Piping Configuration Verification Program (PCVP).

The cause for this situation is design error during a modification in 1980 because as-built configurations were not accurately documented on drawings used for the original piping stress analysis.

Corrective actions involve adjustments to variable spring cans and installation of a rigid strut support or tube steel. The new modification program in effect should prevent recurrence. This report is provided per 10CFR50.73(a)(2)(ii).

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6) Year	Sequential Number	Revision Number	Page (3)
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TLXT					

PLANT AND SYSTEM IDENTIFICATION:

General Electric - Boiling Water Reactor - 2511 MWt rated core thermal power. Energy Industry Identification System (EIIS) codes are identified in the text as [XX].

EVENT IDENTIFICATION: Piping supports were found to be outside Safety Analysis Report for allowable stress due to design error.

A. CONDITIONS PRIOR TO EVENT:

Unit: Two Event Date: December 8, 1987 Event Time: 1030
Reactor Mode: Four (4) Mode Name: RUN Power Level: 88%

This report was initiated by Deviation Report D-4-2-87-061, Revision 2.

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:

April 1, 1987:

Commonwealth Edison (CECo) undertook the Piping Configuration Verification Program (PCVP) to verify the existence and location of pipe supports as well as the details utilized for the construction of branch connections with as designed/analyzed configurations for Quad Cities Units One and Two. The scope of the program consists of safety related piping, greater than four inches in diameter, which was analyzed by Architect/Engineers (A/E) as part of the Torus Attached Piping (TAP) Project in the Mark I Program during the early 1980's.

November 16, 1987:

At 1045 hours, Quad Cities Unit Two was in the RUN mode at approximately 92 percent reactor thermal power. At this time, the Station was notified by the Boiling Water Reactor (BWR) Engineering Department (BWRED) that piping supports [SPT] 1009A-M-207 located on Residual Heat Removal (RHR)[BO] line 2-1009A-16". and 1009A-W-208 located on RHR line 2-1009A-10" did not comply with the Final Safety Analysis Report (FSAR) criteria for allowable stress. These two supports are associated with the 2A loop of the Containment Cooling mode of RHR. In addition, High Pressure Coolant Injection (HPCI)[BJ] pump [P] suction line 2-2325-6" LX (in the vicinity of relief valve [RV] 2-2301-53) also failed to comply with the FSAR criteria for allowable stress.

The piping supports and piping systems affected by this event were analyzed and determined to be operable according to PCVP criteria used to determine operability. NRC notification via the Emergency Notification System was completed at 1740 hours to satisfy 10CFR50.72.

December 8, 1987:

At 1030 hours, Quad Cities Unit Two was in the Run mode at approximately 88 percent reactor thermal power. At this time, the station was notified by BWRED that piping support identified on support detail drawing M-1804-10 revision A located on High Pressure Coolant Injection (HPCI) Pump Suction line 2-2310-4"-LX did not comply with the Final Safety Analysis Report (FSAR) criteria for allowable stress.

The Piping supports and piping systems affected by this event were analyzed and determined to be operable according to PCVP criteria used to determine operability. NRC Region III was notified at 1300 hours as per the agreement with Piping Configuration Verification Program (PCVP).

On March 18, 1988:

At 1130 hours, Quad Cities Unit Two was in the RUN mode at approximately 90 percent reactor thermal power. At this time the Station was notified by BWRED that piping supports identified on support detail drawings M-1811-36 Revision B and M-1808-18 Revision C located on RHR 2C/2D discharge line number 2-1012B-16" -DX and addition, Containment Vacuum Relief [BF] line number 2-8706-4"-L did not comply with the FSAR criteria for allowable stress.

The Piping supports and piping systems affected by this event were analyzed and determined to be operable according to PCVP criteria used to determine operability. NRC Region III was notified at 1150 hours as per the agreement with Piping Configuration Verification Program (PCVP).

On April 22, 1988:

At 1400 hours, Quad Cities Unit Two was in the RUN mode at 0 percent reactor thermal power. At this time the Station was notified by BWRED that piping supports identified on support detail drawings M-1806-10 Revision C and M-1806-11 Revision C, located on the RHR 2C/2D suction line 2-1024B-20" did not comply with the FSAR criteria for allowable stress.

The Piping supports and piping systems affected by this event were analyzed and determined to be operable according to PCVP criteria used to determine operability. NRC Region III was notified at 1415 hours as per the agreement with Piping Configuration Verification Program (PCVP).

On August 2, 1988:

At 0900 hours, Quad Cities Unit Two was in the RUN mode at 0 percent reactor thermal power. At this time the Station was notified by BWRED that five piping supports identified on following support detail drawings M-1807-04 Revision D, M-1807-05 Revision C, M-1807-06 Revision D, M-1807-12 Revision C and M-1807-15 Revision D, located on the Low Pressure Core Spray [BM] 2A/2B suction line numbers 2-1402-18"-LX, 2-1424A-12"-LX and 2-1401-18"-LX did not comply with the FSAR criteria for allowable stress.

The Piping supports and piping systems affected by this event were analyzed and determined to be operable according to PCVP criteria used to determine operability. NRC Region III was notified at 0915 hours as per the agreement with Piping Configuration Verification Program (PCVP).

December 19, 1988:

At 1600 hours, Quad Cities Unit Two was in the RUN mode at approximately 96 percent reactor thermal power. At this time the Station was notified by BWRED that five piping supports identified on following support detail drawing numbers M-1808-10 Revision D, M-1808-13 Revision C, M-1808-14 Revision C, M-1808-15A Revision A and M-1808-15 Revision C located on the Containment Vacuum Relief system line numbers 2-1606-18"-LX, 2-8706-8"-LX and 2-1604-18"-LX did not comply with the FSAR criteria for allowable stress.

The Piping supports and piping systems affected by this event were analyzed and determined to be operable according to PCVP criteria used to determine operability. NRC Region III was notified at 1615 hours as per the agreement with Piping Configuration Verification Program (PCVP).

June 28, 1990:

At 1030 hours, Quad Cities Unit Two was in the RUN mode at approximately 97 percent reactor thermal power. At this time the Station was notified by BWRED that the steel gallery beam in the RHR corner room to which piping support M-1806-06 Revision D is attached and located on the RHR 2C/2D suction line number 2-1019-20" did not comply with the FSAR criteria for allowable stress.

The Piping supports and piping systems affected by this event were analyzed and determined to be operable according to PCVP criteria used to determine operability. NRC Region III was notified at 1100 hours as per the agreement with Piping Configuration Verification Program (PCVP).

C. APPARENT CAUSE OF EVENT:

This event is being reported according to 10CFR50.73(a)(2)(ii)(B), which requires the reporting of any event or condition that resulted in the nuclear power plant being in a condition that was outside the design basis of the plant.

The apparent cause of these events was design error involving A/E and contractor personnel. The PCVP walkdown and investigation identified discrepancies in pipe segment lengths and support locations used for the original piping analysis. It appears that during the original TAP modification the A/E failed to reconcile as-built with as-designed and engineered configurations on drawings that were used for the original piping stress analysis. The re-analysis incorporated the results of the PCVP walkdown and investigation and as a result of these changes, FSAR compliance was not achieved at these locations.

D. SAFETY ANALYSIS OF EVENT:

November 16, 1987:

The safety of the plant and personnel were not affected during this event. The formal re-analysis of model Q2.04, HPCI pump suction and model Q2.09.3 RHR 2A/2B discharge line has demonstrated operability for these systems even though FSAR criteria was not met. FSAR compliance requires that stresses and/or pipe support reactions satisfy established code allowables, whereas a somewhat less conservative acceptance criteria is permitted for the purpose of an operability assessment. FSAR compliance analysis considers the piping stresses and support reactions acting at those locations under analysis whereas, operability compliance analysis considers the overall effect on the piping system due to the stresses encountered.

December 8, 1987:

The safety of the plant and personnel were not affected during this event. The formal re-analysis of model Q2.04, HPCI pump suction has demonstrated operability for this system even though FSAR criteria was not met.

March 18, 1988:

The safety of the plant and personnel were not affected during this event. The formal re-analysis of model Q2.11.2, RHR 2C/2D discharge line and model Q2.08, Vacuum Relief line has demonstrated operability for these systems even though FSAR criteria was not met.

April 22, 1988:

The safety of the plant and personnel were not affected during this event. The formal re-analysis of model Q2.06, RHR 2C/2D suction line has demonstrated operability for this system even though FSAR criteria was not met.

August 2, 1988:

The safety of the plant and personnel were not affected during this event. The formal re-analysis of model Q2.07, RHR 2A/2B suction line has demonstrated operability for this system even though FSAR criteria was not met.

December 19, 1988:

The safety of the plant and personnel were not affected during this event. The formal re-analysis of model Q2.08, Containment Vacuum Relief System has demonstrated operability for this system even though FSAR criteria was not met.

June 28, 1990:

The safety of the plant and personnel were not affected during this event. The formal re-analysis of model Q2.6, RHR 2C/2D suction line has demonstrated operability for this systems even though FSAR criteria was not met.

E. CORRECTIVE ACTION:

November 16, 1987:

The corrective action to return piping supports 1009A-M-207 and 1009A-W-208 on the RHR lines to FSAR compliance is to reset spring cans to revised load settings. The work will be accomplished under Nuclear Work Requests (NWR) Q62003 and Q62004. The corrective action to return HPCI pump suction line 2-2325-6" LX to FSAR compliance is to install a rigid strut support in the vicinity of RV-2-2301-53 under NWR Q62005.

December 8, 1987:

The corrective action to return piping support M-1804-10 on HPCI line to FSAR compliance is to install tube steel to laterally reinforce the present U-bolt support. The corrective work was accomplished under Nuclear Work Request (NWR) Q62441.

March 18, 1988:

The corrective action to return piping supports M-1811-36 and M-1808-18 on the RHR 2C/2D discharge and Vacuum Relief lines to FSAR compliance was to reset spring can on support M-1811-36 to the revised load setting and for support M-1808-18 was to remove and relocate anchor. This work was completed under NWR's Q65256, Q65255.

April 22, 1988:

The corrective action to return piping supports M-1806-10 and M-1806-11 on the RHR 2C/2D suction line to FSAR compliance was to reset spring can on support M-1806-10 to the revised load setting and for support M-1806-11 was to replace struts. This work was completed under NWR's Q66106, Q66105.

August 2, 1988:

The corrective action to return piping supports M-1807-04, M-1807-05, M-1807-06, M-1807-12 and M-1807-15 on the Core Spray lines to FSAR compliance was to upgrade support steel on all these supports. This work was completed under NWR's Q68643, Q68542, Q68641, Q68640, Q68639.

December 19, 1988:

The corrective action to return piping supports M-1808-10, M-1808-13, M-1808-14, M-1808-15A and M-1808-15 on the Vacuum Relief lines to FSAR compliance was to make the following repairs. Replace existing snubber on support M-1808-10 with a strut; for support M-1808-13 replace existing tube steel with cut sway strut. Changeout of strut for snubber on support M-1808-14, demolish existing support M-1808-15A and install new support M-1808-15 to replace demolished support. This work was completed under NWR's Q72288, Q72286, Q72287, Q74015, Q72289.

June 28, 1990:

The corrective action to return piping support M-1806-06 on the RHR 2C/2D suction line to FSAR compliance was to reinforce steel gallery beam in which pipe support is attached. This work was completed under NWR Q83908.

To prevent recurrence of this event, BWRED now requires a dimensional verification be performed by a certified quality control inspector for all Safety Related modifications involving the installation or modification of Safety Related load carrying members. Resolution of deficiencies will be accomplished before the modification test may be signed off as completed. This is part of the new modification program implemented in April, 1987.

F. PREVIOUS EVENTS:

LER NUMBER	TITLE
254/86-022	Containment Atmospheric Monitoring Line does not meet code allowable stress limits.
254/86-024	U-1 and U-2 Residual Heat Removal Service Water Piping Supports exceed code stress allowable limits.
254/86-025	Torus Attached Small Bore Piping does not meet code allowable limits.
254/87-008	1C Residual Heat Removal Service Water Pump piping in excess of allowable stress due to sheared anchor bolts.
254/87-011	Residual Heat Removal Support Embedment Plate in excess of allowable stress due to improper anchor strap spacing.
254/87-026	Core Spray Pump discharge line in excess of allowable stress.

G. COMPONENT FAILURE DATA:

There was no component failure identified in this event.