



Commonwealth Edison

Quad Cities Nuclear Power Station
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RLB-92-229

November 6, 1992

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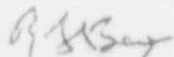
Reference: Quad Cities Nuclear Power Station
Docket Number 50-254, DPR-29, Unit One

Enclosed is Licensee Event Report (LER) 87-026, 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)(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.

Respectfully,

COMMONWEALTH EDISON COMPANY
QUAD CITIES NUCLEAR POWER STATION


R. L. Bak
Station Manager

RLB/TB/plm

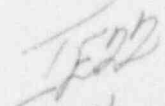
Enclosure

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

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LICENSEE EVENT REPORT (LER)														
Facility Name (1) QUAD-CITIES NUCLEAR POWER STATION, UNIT ONE										Docket Number (2) 0 5 0 0 0 2 5 4			Page (3) 1 of 1 0	
Title (4) PIPING SUPPORT OUTSIDE COMPLIANCE WITH SAFETY ANALYSIS REPORT DUE TO DESIGN/CONSTRUCTION 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)			
1 2	2 8	8 7	8 7	0 2 6	0 2	1 1	0 9	9 2			0 5 0 0 0 1 1			
OPERATING MODE (9)			THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10CFR (Check one or more of the following) (11)											
4			20.402(b)		20.405(c)		50.73(a)(2)(iv)		73.71(b)					
POWER LEVEL (10)			20.405(a)(1)(i)		50.36(c)(1)		50.73(a)(2)(v)		73.71(c)					
0 1 5			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 MIKE POMPEO, TECHNICAL STAFF ENGINEER, EXTENSION 2165										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)				
X Yes (If yes, complete EXPECTED SUBMISSION DATE)										X NO				
ABSTRACT (Limit to 1400 spaces, i.e., approximately fifteen single-space typewritten lines) (16)														

On December 28, 1987, Quad Cities Unit One was in the RUN mode at 15 percent reactor thermal power. At 1335 hours, the Station was notified that two piping supports located on Reactor Core Isolation Cooling (RCIC) suction line did not comply with the Final Safety Analysis Report (FSAR) criteria for allowable stress. However, the system was operable. This event was reported to NRC Region III in accordance with the agreement for the Piping Configuration Verification Program. Previously, in LER 254/87-026, Revision 00, a piping support on 1B Core Spray discharge line was found to be beyond FSAR criteria for allowable stress.

The cause of these conditions is construction/design error during a modification in 1980 because the as-built configuration was not in conformance with as-designed/engineered drawings used for the original piping stress analysis.

Corrective action was to shim the excess clearances between the piping lugs and the support's wide flange, strut removal and support relocation. The new modification program in effect should prevent recurrence. This report is provided per 10CFR50.73(a)(2)(11).

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Quad Cities Unit One EXT	10150002154	87	-	026	-	02					02 OF 10	

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 the Safety Analysis Report for allowable stress due to construction design error.

A. CONDITIONS PRIOR TO EVENT:

Unit: One Event Date: December 28, 1987 Event Time: 1335
Reactor Mode: 4 Mode Name: Run Power Level: 15%

This report was initiated by Deviation Report D-4-1-87-105, 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 30, 1987:

At 1130 hours, Quad Cities Unit One was in the REFUEL mode at zero percent reactor thermal power. At this time, the Station was notified by the Boiling Water Reactor Engineering Department (BWRED) that piping support (In-service Inspection (ISI) support number) [SPT] 1404-G-214 located on 1B Core Spray pump [BM, P] discharge line 1-1404-12" DX 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 1130 hours in accordance with PCVP agreement with the NRC.

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December 28, 1987:

At 1335 hours, Quad Cities Unit One was in the RUN mode at 15 percent reactor thermal power. At this time, the station was notified by the BWRED that piping supports identified on drawing number M-1603-05 and M-1603-06 located on Reactor Core Isolation Cooling (RCIC) pump [BN,P] suction line 1-1318-6"-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 1400 hours as per the agreement with Piping Configuration Verification Program (PCVP).

February 8, 1988:

At 1445 hours, Quad Cities Unit One was in the RUN mode at 91 percent reactor thermal power. At this time the Station was notified by the BWRED that piping support identified on drawing number M-1606-40 located on Residual Heat Removal [BO] IC/ID suction line 1-1024A-20"-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 1515 hours as per the agreement with Piping Configuration Verification Program (PCVP).

June 30, 1988:

At 1330 hours, Quad Cities Unit One was in the RUN mode at 97 percent reactor thermal power. At this time the Station was notified by the BWRED that five piping supports (In Service Inspection (ISI) support numbers) 2325-M-202, 2325-M-208, 2325-M-207, 2302-W-204 and 2302-M-203 located on the High Pressure Cooling Injection (HPCI) [BJ] pump suction lines 1-2325-6" and 1-2302-16" 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).

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TEXT								

March 1, 1989:

At 1500 hours, Quad Cities Unit One was in the RUN mode at 98 percent reactor thermal power. At this time the Station was notified by the BWRED that three piping supports and one Embedded Plate identified on the following drawing numbers M-1608-07, M-1608-08 and M-1608-10 located on the Pressure Suppression System [BF] line numbers 1-1604-18"-LX and 1-1606-18"-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 1510 hours as per the agreement with Piping Configuration Verification Program (PCVP).

May 26, 1989:

At 1100 hours, Quad Cities Unit One was in the RUN mode at 97 percent reactor thermal power. At this the Station was notified by BWRED that one pipe support identified on drawing number M-1651 Sheets 1 and 2 located on the HPCI pump discharge minimum flow line 1-2340-4" 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 1245 hours as per the agreement with Piping Configuration Verification Program (PCVP).

August 22, 1989:

Quad Cities Unit One was in the RUN mode at 77 percent reactor thermal power. At 1330 hours the Station was notified by the BWRED that Pump Suction Relief Valve 1-2301-23 inlet/discharge line 1-2332-2" on the HPCI System 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 1345 hours as per the agreement with Piping Configuration Verification Program (PCVP).

C. APPARENT CAUSE OF EVENT.

This event is being reported according to 10CFR 50.73(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.

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November 30, 1987:

The apparent cause of this event was construction error involving A/E and contractor personnel. The PCVP walkdown and model review identified a discrepancy between support drawing M-1610-18, Revision B, ISI support number 1404-G-214, and the existing "as-built" configuration. The clearance specified between the piping lugs and the support's wide flange exceeds the specified tolerance. It appears that during the original TAP modification the construction contractor failed to build the support to the specified configuration. It also appears that the A/E failed to perform an as-built reconciliation of the drawings used in the original piping stress analysis. The re-analysis incorporated the results of the PCVP walkdown and model review and as a result of these differences, FSAR compliance was not achieved at this location.

December 28, 1987:

The apparent cause of this event was design error involving A/E personnel. The PCVP walkdown and model review identified discrepancies between support drawings M-1603-05, Revision B and M-1605-06, Revision B with the "as-built" configuration and location. The A/E originally modeled piping support M-1603-05 with a lower stiffness than the "as-built" configuration and piping support M-1603-06 in a different location than the "as-built" location. It appears that the A/E failed to perform an as-built reconciliation of the drawings used in the original piping stress analysis. The re-analysis incorporated the results of the PCVP walkdown and model review and as a result of these discrepancies, FSAR compliance was not achieved at these locations.

February 8, 1988:

The apparent cause of this event was construction error involving A/E and contractor personnel. Inaccurate design input was provided by the A/E to construction. The PCVP walkdown and model review identified a discrepancy between support drawing M-1606-40, Revision B and the "as built" configuration location. This pipe support was evaluated for increased loads which required resetting the load on the spring can. The re-analysis incorporated the results of the PCVP walkdown and the model review and as a result of these differences, FSAR compliance was not achieved at this location.

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June 30, 1988:

The apparent cause of this event was construction error involving A/E and contractor personnel. The PCVP walkdown and model review identified discrepancies with the following support drawings M-1604-09 Revision C, M-1604-10 Revision C, M-1604-13 Revision D, M-1604-03 Revision C and M-1604-05 Revision D and with the "as-built" configuration and location. The A/E did not include Mark 1 loads in the piping analysis. The increased loading required numerous repairs for the listed pipe supports. The re-analysis incorporated the results of the PCVP walkdown and model review and as a result of these differences, FSAR compliance was not achieved at these locations.

March 1, 1989:

The apparent cause of the event was construction error involving A/E and contractor personnel. The PCVP walkdown and model review identified discrepancies with the following support drawings M-1608-07, M-1608-08 and M-1608-10 and the "as built" configuration. The A/E incorrectly analyzed the piping system for the effect of the in-line bellows at Penetration X-26. Repairs to the pipe supports resulted. The re-analysis incorporated the results of the PCVP walkdown and model review and as a result of these differences, FSAR compliance was not achieved at these locations.

May 26, 1989:

The apparent cause of this event was construction error involving A/E personnel. The PCVP walkdown and model review identified discrepancies with support drawings M-1651 Sheet 1 Revision D and M-1651 Sheet 2 Revision A. The A/E revised their analysis increasing the loads on the boundary anchor support which resulted in adding a kicker to pipe support. The re-analysis incorporated the results of the PCVP walkdown and model review and as a result of these differences, FSAR compliance was not achieved at this location.

August 22, 1989:

The apparent cause of this event was construction error involving A/E personnel. The PCVP walkdown and model review identified a discrepancy with the Pump Suction Relief Valve 1-2301-23 inlet/discharge line 1-2332-2" on the HPCI System which required installing two additional pipe supports (M-3096-H1, M-3096-H2). Due to re-analysis of the large bore model shifted the Mark 1 cut-off point adding Mark 1 loads to the small bore piping four inch and less. The re-analysis incorporated the results of the PCVP walkdown and model review and as a result of these differences, FSAR compliance was not achieved at these locations.

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D. SAFETY ANALYSIS OF EVENTS:

November 30, 1987:

The safety of the plant and personnel were not affected during this event. The formal re-analysis of model Q1.10.2, Core Spray pump 1A/B Discharge line has demonstrated operability for this system 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 28, 1987:

The safety of the plant and personnel were not affected during this event. The formal re-analysis of model Q1.03, RCIC pump suction has demonstrated operability for this system even though FSAR criteria was not met.

February 8, 1988:

The safety of the plant and personnel were not affected during this event. The formal re-analysis of model Q1.06, RHR 1C/1D suction line 1-1024A-20"-LX has demonstrated operability for this system even though FSAR criteria was not met.

June 20, 1988:

The safety of the plant and personnel were not affected during this event. The formal re-analysis model Q1.04, HPCI pump suction lines 1-2325-6" and 1-2301-16" had demonstrated operability for this system event though FSAR criteria was not met.

March 1, 1989:

The safety of the plant and personnel were not affected during this event. The formal re-analysis of model Q1.08, Vacuum Relief System lines 1-1606-18" and 1-1604-18" had demonstrated operability for this system even though FSAR criteria was not met.

May 26, 1989:

The safety of the plant and personnel were not affected during this event. The formal re-analysis of model Q1.09.1, HPCI Pump Discharge Minimum flow line 1-2340-4" had demonstrated operability for this system even though FSAR criteria was not met.

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August 22, 1989:

The safety of the plant and personnel were not affected during this event. The formal re-analysis of model Q1.04, HPCI Pump Suction Relief Valve (1-2301-23 inlet/discharge line 1-2332-2" had demonstrated operability for this system even though FSAR criteria was not met.

E. CORRECTIVE ACTION:

November 30, 1987:

The corrective action to return piping support, ISI support number 1404-G-214 on 1B Core Spray discharge line to FSAR compliance was to shim the excess clearance between the piping lugs and the support's wide flange. The work was completed on December 18, 1987 under Nuclear Work Request (NWR) Q62124.

December 28, 1987:

The corrective actions to return piping supports to FSAR compliance are: for support M-1603-05, delete a horizontal strut under Nuclear Work Request (NWR) Q63018; and for support M-1603-06, relocate the existing supporting configuration to the design location of record under NWR Q63017. These NWRs will be tracked to completion by Nuclear Tracking System (NTS) Number 2542008710501.

February 8, 1988:

The corrective action to return piping support M-1606-40 to FSAR compliance was to reset spring can load setting under Nuclear Work Request (NWR)Q64149.

June 30, 1988:

The corrective actions to return the following piping supports to FSAR compliance was to add an additional Z-Strut in the horizontal direction for support M-1604-03 under NWR Q67993. For support M-1604-05 was to remove the existing integrally attached stanchion and install alternate vertical restraint under NWR Q67994. Replace the existing angles providing lateral restraint with larger angles for support M-1604-09 under NWR Q67995. For support M-1608-10 a demolition was required which removed the Z-Direction strut, under NWR Q67996 and for support M-1604-13 was a demolition that removed the existing integrally attached stanchion under NWR Q68380.

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March 1, 1989:

The correction actions to return the following piping supports to FSAR compliance for support M-1608-C7 and the related Embedment Plate was to add kickers to the support and reinforce Embedment Plate under Nuclear Work Requests Q74018 and Q94972. Support M-1608-08 was to replace rod hanger with strut stanchion Under NWR Q74017 and for support M-1608-10 was to remove existing shear lugs off support under NWR Q76072.

May 26, 1989:

The corrective action to return piping support M-1651 on the HPCI pump discharge minimum flow line to FSAR compliance was to add a kicker under NWR Q76072.

August 22, 1989:

The corrective actions to return the HPCI Pump Suction Relief Valve 1-2301-23 Inlet/Discharge Line 1-2332-2" to FSAR compliance was to weld stanchion to base plate to form an anchor on support M-3096-H1 under NWR Q77925 and for support M-3096-H2, add new support to replace existing support under NWR Q77925.

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:

<u>LER NUMBER</u>	<u>TITLE</u>
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.

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- 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.
- 265/87-019 Piping Supports Outside Compliance with Safety Analysis Report Due to Design Error.

G. COMPONENT FAILURE DATA:

There was no component failure identified in this event.