NRC Form 366
(9-83)

U.S. NUCLEAR REGULATORY COMMISSION
APPROVED OMB NO. 3150-0104
EXPIRES: 8/31/85

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
Quad-Cities Nuclear Power Station Unit 1	0 5 0 0 0 2 5 4	1 OF 0 3

TITLE (4)
Linear Indication on Reactor Recirculation System Welds

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 4	1 4	8 4	8 4	0 0 5	0 0	0 5	0 7	8 4	NA	0 5 0 0 0
									NA	0 5 0 0 0

OPERATING MODE (9)	2	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)			
POWER LEVEL (10)	0 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 in Abstract below and in Text, NRC Form 366A)
		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
	AREA CODE
Daryl G. Clark	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	A D	P S X	D 2 4 0	Y							

SUPPLEMENTAL REPORT EXPECTED (14)

		EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
X	YES (If yes, complete EXPECTED SUBMISSION DATE)		0 8	3 11	8 4
	NO				

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

On March 6, 1984, Quad-Cities Unit One was shutdown for refueling. On April 13, Induction Heat Stress Improvement (IHSI) procedures were performed on the Reactor Recirculation System welds as part of the Inservice Inspection Program for large bore stainless steel piping. Following the IHSI, visual and ultrasonic inspections revealed several weld areas with water seeping from small cracks. This report is an initial summation of those findings as of this reporting date, and does not present the complete results of the ongoing Inservice Inspection Program. A supplemental report will be submitted when all inspections and repairs have been completed.

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TEXT (If more space is required, use additional NRC Form 366A's) (17)

Event Description

On March 6, 1984, Quad-Cities Unit One was shutdown to begin the End of Cycle Seven Refueling Outage. On April 13, Induction Heat Stress Improvement (IHSI) procedures were initiated on 88 welds in the Reactor Recirculation System (AD). Following IHSI, the welds were visually and ultrasonically tested by Lambert, McGill and Thomas, Incorporated personnel as part of the Inservice Inspection Program for large bore stainless steel piping.

On April 14, visual examination revealed several welds with water seeping from small pinholes. A list of welds inspected so far, and found to contain defects is as follows:

Weld Number	Pipe Size	Location
02J-S4	12 inch	'J' Riser Pipe to Elbow
02K-S3	12 inch	'K' Riser Elbow to Pipe
02K-S4	12 inch	'K' Riser Pipe to Elbow
02J-F6	12 inch	'J' Riser Sweepolet to Pipe
02H-S4	12 inch	'H' Riser Pipe to Elbow
02H-S3	12 inch	'H' Riser Elbow to Pipe
02G-S3	12 inch	'G' Riser Elbow to Pipe
02J-S3	12 inch	'J' Riser Elbow to Pipe
02E-S4	12 inch	'E' Riser Pipe to Elbow
02C-S4	12 inch	'C' Riser Pipe to Elbow
02G-S4	12 inch	'G' Riser Pipe to Elbow
02D-S4	12 inch	'D' Riser Pipe to Elbow
02F-S4	12 inch	'F' Riser Pipe to Elbow
02M-S3	12 inch	'M' Riser Elbow to Pipe
02B-S10	22 inch	'B' Ring Header Pipe to Cap

The first nine welds listed were found to have water seeping out of pinholes or axial cracks in the heat-affected zone of the weld. The remaining six welds were found to have circumferential and/or axial indications in the heat-affected zone of the welds as determined by ultrasonic inspection.

Crack indications of this type tend to propagate at a slow rate. Therefore, a 100 percent through-wall crack could be easily detected using existing Primary Containment leakage monitoring systems before a complete failure would occur. During the current Operating Cycle, the allowable containment leakage rate has been reduced in order to expedite the investigation of potential leakage from stainless steel piping. No leakage was detected prior to the current refuel outage. This report does not present the complete results of the Inservice Inspection, but only the results as of this reporting date.

This report is being submitted to comply with the requirements of 10 CFR 50.73(a)(2)(ii).

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TEXT (If more space is required, use additional NRC Form 366A's) (17)

Cause

The exact cause of the crack indications has not been determined; but it is postulated that intergranular stress corrosion cracking is the probable mode of failure. The normal heat generated by welding causes a heat-affected zone at the weld to pipe interface. This, combined with coolant impurities, high operating temperatures, and stresses experienced in the weld area are factors encountered in the Reactor Recirculation System which are mechanisms necessary for intergranular stress corrosion cracking to occur.

All of the welds with water seeping from a pinhole or axial crack, with the exception of weld 02J-F6, were found after IHSI had been performed on these welds. The reversing of stresses within the weld during IHSI combined with an axial crack of greater than 50 percent through-wall depth caused the crack to propagate 100 percent through-wall. The result was a small pinhole or a short axial crack large enough to allow water to seep through. Weld 02J-F6 was found to be leaking after weld surface preparation and prior to IHSI.

Corrective Action

The initial inspection plan required no ultrasonic inspection of welds prior to IHSI application. After discovering three post-IHSI welds leaking, the inspection plan was revised to ultrasonic inspect every weld prior to IHSI. Welds found to contain axial indications were deleted from the IHSI schedule and scheduled for overlay repair without IHSI performance.

The crack indication evaluation and repair program will be performed by NUTECH Engineers, Incorporated. Indications will be evaluated based upon indication depth, length, direction, and applied stresses. The repair program will consist of either performing a weld overlay or leaving the weld "as-is". All inspections and repairs will be completed prior to Reactor startup.

A supplemental report will be submitted when all inspections and repairs have been completed.

Commonwealth Edison
Quad Cities Nuclear Power Station
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Cordova, Illinois 61242
Telephone 309/654-2241

NJK-84-162

May 7, 1984

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

Enclosed please find Licensee Event Report Number (LER) 84-005 for Quad-Cities Nuclear Power Station.

This report is submitted to you in accordance with the requirements of the Code of Federal Regulations, Title 10, Part 50.73(a)(2)(ii), to inform you of cracks found during the Quad-Cities Unit One Primary Coolant circuit NDE UT inspections, as they are being performed under the IGSCC Inspection and Repair Plan.

Respectfully,

COMMONWEALTH EDISON COMPANY
QUAD-CITIES NUCLEAR POWER STATION

N. J. Kalivianakis
Station Superintendent

NJK:JV/bb

Enclosure

cc B. Rybak
A. Morrongiello
INPO Records Center
NRC Region III

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