



Commonwealth Edison

Quad Cities Nuclear Power Station
22710 206 Avenue North
Cordova, Ill. 61242-9740
Telephone 309/654-2241

RLB-92-239

November 6, 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) 92-027, 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)(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 COMPANY
QUAD CITIES NUCLEAR POWER STATION

R. L. Bax
R. L. Bax
Station Manager

RLB/TB/plm

Enclosure

12-111

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

STMGR 485

9211130089 921106
PDR ADDCK 05000254
S PDR

SE22

LICENSEE EVENT REPORT (LER)

Form Rev. 2.0

Facility Name (1) Quad Cities Unit One										Docket Number (2) 0 5 0 0 0 2 5 4				Page (3) 1 of 0 5						
Title (4) Unit One HPCI Room Cooler Failed Beyond Design Margin Due To An Accumulation Of Silt And Debris																				
Event Date (5)			LER Number (6)					Report Date (7)			Other Facilities Involved (8)									
Month	Day	Year	Year	///	Sequential	///	Revision	Month	Day	Year	Facility Names				Docket Number(s)					
				///	Number	///	Number													
1 0	0 9	9 2	9 2		0 2 7		0 0	1 1	0 6	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)																	
2			20.402(b)					20.405(c)					50.73(a)(2)(iv)					73.71(b)		
POWER			20.405(a)(1)(i)					50.35(c)(1)					X 50.73(a)(2)(v)					73.71(c)		
LEVEL			20.405(a)(1)(ii)					50.36(c)(2)					50.73(a)(2)(vii)					Other (Specify		
(10)			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										TELEPHONE NUMBER										
Michael Ford, Ext. 2118										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	MANUFAC- TURER	REPORTABLE TO NPRDS	///	CAUSE	SYSTEM	COMPONENT	MANUFAC- TURER	REPORTABLE TO NPRDS	///	CAUSE	SYSTEM	COMPONENT	MANUFAC- TURER	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)																				

ABSTRACT:

At 1045 hours on October 9, 1992, Unit One was in the REFUEL Mode in the cold condition. An inspection of the High Pressure Injection System (HPCI) Room Cooler determined that the room cooler was fouled beyond design margin with silt and small debris.

The HPCI Room Cooler was primarily supplied cooling water from the non-safety related service water system. The constant supply of service water resulted in a high fouling rate and the blocking of the room cooler.

The room cooler was cleaned and re-inspected. Per the station commitment to Generic Letter 89-13, monitoring of the ECCS Room Coolers has been initiated. Trending of differential pressures and inspections will be continued and provide a basis for determining if a cooler is becoming blocked.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION												Form Rev 2.0	
FACILITY NAME (1)			DOCKET NUMBER (2)			LER NUMBER (5)				Page (3)			
						Year	Sequential Number	Revision Number					
Owen Clites Unit One			0 5 0 6 0 2 5 4			9 2	0 2 7	-	0 0	0 2 OF 0 5			
TEST Energy Industry Identification System (EIIS) codes are identified in the text as [XX]													

PLANT AND SYSTEM IDENTIFICATION:

Generic - Electric - Boiling Water Reactor - 2511 MWT rated core thermal power.

EVENT IDENTIFICATION: Unit One HPCI Room Cooler failed beyond design margin due to an accumulation of silt and debris.

A. CONDITIONS PRIOR TO EVENT:

Unit: One Event Date: October 9, 1992 Event Time: 1045
 Reactor Mode: 2 Mode Name: REFUEL Power Level: 00%

This report was initiated by Deviation Report D-4-1-92-110.

REFUEL Mode (2) - In this position interlocks are established so that one control rod only may be withdrawn when flux amplifiers are set at the proper sensitivity level and the refueling crane is not over the reactor. Also, the tr'p from the turbine control valves, turbine stop valves, main steam isolation valves, and condenser vacuum are bypassed. If the refueling crane is over the reactor, all rods must be fully inserted and none can be withdrawn.

B. DESCRIPTION OF EVENT:

Unit One was in the REFUEL Mode in the cold condition. Technical Staff personnel were performing inspections of safety related service water heat exchangers [HX] in accordance with the station commitment to Generic Letter (GL) 89-13, "Fouling of Safety Related Service Water Systems." These inspections found the High Pressure Coolant Injection (HPCI) [BJ] Room Cooler [CLR] fouled with silt and small debris.

On October 5, 1992 at 1500 hours, the HPCI Room Cooler was inspected by station Technical Staff personnel. A precleaning inspection was performed in accordance with the commitment to GL 89-13. This inspection determined that 7 out of 12 tubes [TBG] on the first pass were plugged and approximately 5 out of 12 on each consecutive pass were fouled with silt and debris.

This data was sent to the Nuclear Engineering Department (NED) to determine if sufficient margin existed for the cooler to remove its design heat load. On October 9, 1992 at 1045 hours, Engineering notified the station that the Unit One HPCI Room Cooler was fouled such that it exceeded the design margin.

At 1206 hours, an Emergency Notification System (ENS) call was made to inform the Nuclear Regulatory Commission (NRC) that the HPCI Room Cooler was inoperable.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION											Form Rev 2.0	
FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)						Page (3)				
		Year		Sequential Number		Revision Number						
Quad Cities Unit One	0 5 0 0 0 2 5 4	9 2		0 2 7	-	0 0	0 3	OF	0 5			
TEXT Energy Industry Identification System (EIIIS) codes are identified in the text as [XX]												

Following the initial inspection of the Unit One HPCI Room Cooler, the working group was directed to clean the room cooler. On October 29, 1992, a post-cleaning inspection was performed. This inspection determined that all tubes in the Unit One HPCI Room Cooler were clean and free of debris.

C. APPARENT CAUSE OF EVENT:

This report is being submitted in accordance with the requirements of the Code of Federal Regulations, Title 10, Part 50.73(a)(2)(v)(D) which requires the reporting of any condition that could have prevented the fulfillment of the safety system to mitigate the consequences of an accident.

The Unit One HPCI Room Cooler was fouled beyond its design margin due to accumulation of sediment and debris. The fouling consisted primarily of small sticks and debris blocking over 50 percent of the tube in the first pass and approximately 40 to 50 percent on each successive pass.

Prior to March 1992 the HPCI Room Cooler was primarily supplied cooling water from the non-safety related service water (SW) system. This water provided flow to the cooler continuously, even when the cooler was not in operation. In March of 1992, the non-safety related SW supply to the HPCI Room Cooler was isolated. After this isolation the HPCI Room Cooler only received cooling water flow during Diesel Generator Cooling Water (DG CW) [LB] pump [P] operation.

In February of 1992, collection and trending of differential pressure (DP) measurements across the ECCS coolers was initiated. This trending monitored an initial increase while the non-safety related SW was valved in. After isolation, monthly DP readings leveled and remained constant indicating no further degradation.

Operating history for the HPCI Room Coolers has seen fouling to a lesser extent in the past. The primary blockage was macro-fouling obstructing the tube entrance. The continuous supply of service water is considered to be the primary cause of the high amount of debris accumulation.

D. SAFETY ANALYSIS OF EVENT:

The safety consequences of this event were minimal. The degradation of the HPCI Room Cooler would not have prevented the HPCI pump and valves from performing their immediate design safety function. There was no damage to the HPCI system, plant operating parameters or to station personnel.

The partial plugging of a room cooler would still allow some heat removal from the room. Flow rates recorded during monthly operation indicated that the cooler was receiving design flow rate. A gradual temperature increase could occur due to inadequate heat removal. This would mean that the HPCI system would have been available for a period of time before the room temperature reached the upper limit.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION										Form Rev 2.0											
FACILITY NAME (1)		DOCKET NUMBER (2)				LER NUMBER (6)				Page (3)											
						Year	Sequential Number	Revision Number													
Quad Cities Unit One		0	5	0	0	0	2	5	4	2	0	2	7	-	0	0	0	4	Of	0	5
TEXT Energy Industry Identification System (EIIIS) codes are identified in the text as [XX]																					

E. CORRECTIVE ACTIONS:

The immediate correction action was to direct the working group to clean the room cooler. A review of the operating performance and maintenance history for the Unit Two HPCI Room Cooler was performed to determine if an inspection and cleaning were required.

The Unit Two HPCI Room Cooler had been cleaned in March of 1992. The cooler has only been in operation for seven months and during this time has only seen cooling water flow during surveillances or when the DGCW pump was placed in operation. Differential pressure indications have remained consistent during the recent operating period. This review determined that the Unit Two cooler does not require immediate inspection.

After the Unit One HPCI Room Cooler was cleaned a post cleaning inspection was performed. This inspection determined that all the tubes were clean and free of debris. The isolation of the non-safety related SW reduces the total amount of water passing through the cooler over an operating cycle. This reduces the total amount of macro-fouling that can accumulate.

The HPCI Room Cooler was unique in its operation and design. The horizontal multiple pass design is similar to the other ECCS Room Coolers except that they have never received continuous SW supply. These coolers have not exhibited the high macro-fouling rate.

Procedures to monitor and analyze differential pressure across ECCS Coolers have been implemented per the stations commitment to GL 89-11. Different types of fouling (silt, biological, debris) result in a wide range of DP effects. The station will continue to perform visual inspections to collect empirical data as to the fouling mode and rate, then compare it to DP trending results. The room coolers will continue to be inspected and cleaned each refuel outage or as indicated by DP trending results.

Continued monitoring and inspection of ECCS Coolers will provide indication of fouling. The isolation of service water to the HPCI Room Cooler insures that the cooler is able to perform its design function over the operating cycle.

F. PREVIOUS EVENTS:

Licensee Event Report (LER) 92-007 and 92-008 document fouling beyond design margin of the Unit Two and Unit One RHR Corner Room Cooler respectively. The RHR Coolers had not previously been inspected or cleaned in over ten years at the time of these events. Routine inspections and cleanings are now being performed per the station commitment to GL 89-13.

LER 92-023 documents failure of the RHR Heat Exchanger to meet its design heat transfer due to fouling. The RHR Heat Exchanger was able to be cleaned by increasing flow rate, indicative of micro fouling verses debris accumulation.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION											Form Rev 2.0	
FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)					Page (3)					
		Year	///	Sequential	///	Revision						
			///	Number	///	Number						
Quad Cities Unit One	0 5 0 0 0 2 5 4	9 2		0 2 7	-	0 0	0 5	of	0 5			
TEXT Energy Industry Identification System (EIIS) codes are identified in the text as [XX]												

G. COMPONENT FAILURE DATA:

There was no component failure associated with this event.