

LICENSEE EVENT REPORT (LER)

Facility Name (1) QUAD-CITIES NUCLEAR POWER STATION, UNIT TWO						Docket Number (2) 0   5   0   0   0   2   6   5			Page (3) 1   of   0   4		
Title (4) HIGH PRESSURE COOLANT INJECTION INOPERABLE DUE TO ROOM COOLER LOSS FROM SHORT CIRCUIT OF CONTROL RELAY											
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   2	2   3	8   8	8   8	0   0   2	0   0	0   3	1   0	8   8			0   5   0   0   0
OPERATING MODE (9)		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10CFR (Check one or more of the following) (11)									
POWER LEVEL (10) 0   9   7		20.402(b)		20.405(c)		50.73(a)(2)(iv)		73.71(b)			
		20.405(a)(1)(i)		50.36(c)(1)		<input checked="" type="checkbox"/> 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)		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)(ix)					
LICENSEE CONTACT FOR THIS LER (12)											
Name J. DANIEL PACILIO TECHNICAL STAFF ENGINEER EXTENSION 2187						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	MANUFAC-TURER	REPORTABLE TO NPRDS	CAUSE	SYSTEM	COMPONENT	MANUFAC-TURER	REPORTABLE TO NPRDS		
X	B   J	R   L   Y	G   0   8   0	N							
SUPPLEMENTAL REPORT EXPECTED (14)									Expected Submission Date (15)		
[Yes (If yes, complete EXPECTED SUBMISSION DATE)]									X   NO		
ABSTRACT (Limit to 1400 spaces, i.e. approximately fifteen single-space typewritten lines) (16)											

On February 23, 1988, Unit Two was in the RUN mode at 97 percent thermal power. At 0945 hours, an alarm and a report of a burning smell in the Unit Two Reactor Building were received. An investigation revealed that the High Pressure Coolant Injection (HPCI) area room cooler fan control transformer at motor control center 29-2 was charred and the associated circuit breaker had automatically tripped. HPCI was declared inoperable and NRC notification of this event was completed at 1025 hours per 10CFR50.72.

The cause of this event was a short circuit which developed in the associated control relay which caused the control transformer to overheat and short. This event was caused by equipment failure.

The control relay and transformer were replaced and the associated auxiliary contacts were lubricated. HPCI was declared operable at 1530 hours on the same day. This report is supplied to satisfy 10CFR50.73(a)(2)(v).

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TEXT										

PLANT AND SYSTEM IDENTIFICATION:

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

EVENT IDENTIFICATION:

High Pressure Coolant Injection was inoperable due to room cooler loss from short circuit of the control relay.

A. CONDITIONS PRIOR TO EVENT:

Unit: Two                      Event Date: February 23, 1988              Event Time: 0945  
 Reactor Mode: 4                      Mode Name: Run                      Power Level: 97%

This report was initiated by Deviation Report D-4-88-007

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 February 23, 1988, Quad Cities Unit Two was in the RUN mode at approximately 97 percent rated thermal power. At 0945 hours, a "High Pressure Coolant Injectic (HPCI) Pump [BJ,P] Area Cooler Fan [FAN] Trip" alarm [ALM] was received on the 902-3 panel [PL] in the control room. A report of a burning smell in the Unit Two Reactor Building [NG] was received concurrently with the alarm. An investigation was initiated and as a result it was found that the control transformer [EC, XFMR] located in motor control center (MCC) [MCC] 29-1, compartment B3 (second floor Unit Two Reactor Building) had charred coil [CL] windings and the circuit breaker [52] was tripped. This caused the loss of the HPCI room cooler 2-5747. HPCI was declared inoperable at 0945 hours and the applicable surveillances were initiated per Technical Specification 3.5/4.5.C.2. There were no systems or components inoperable at the start of this event which contributed to the event. NRC notification of this event was completed at 1025 hours (February 23, 1988) to satisfy the requirements of 10CFR50.72.

When it was determined that the control transformer was damaged, Work Request Q64507 was written to repair as required. Under the work request, the control relay [RLY] and control transformer were both replaced. Lubrication of the auxiliary contacts [CNTR] was done under the same work request. The HPCI room cooler fan was tested for operation per the work request after the completion of the repair.

HPCI was declared operable at 1530 hours on February 23, 1988, after being inoperable for 5 hours and 45 minutes.

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TEXT							

C. APPARENT CAUSE OF EVENT:

This report is being submitted to satisfy the requirements outlined in 10CFR 50.73 (a)(2)(v). This requires the reporting of any event or condition that alone could have prevented the fulfillment of the safety function of structures or systems that are needed to remove residual heat and mitigate the consequences of an accident.

The cause of the HPCI room cooler trip was that the control transformer had charred coil windings and shorted out, tripping the circuit breaker. The control relay is suspected to have shorted out which would have caused the control transformer to overheat and short. The root cause of the shorted control relay could not be definitely determined. It is suspected it was a random failure.

D. SAFETY ANALYSIS OF EVENT:

There were minimal safety consequences from this event. HPCI was always capable of delivering 5600 gallons per minute (gpm) at 1150 psig which is the design criteria. Without the HPCI room cooler, prolonged operation of the system may have heated the HPCI room to a temperature which might have caused a high temperature isolation. In the event that HPCI isolated, Reactor Core Isolation Cooling (RCIC)[BN] and the Automatic Pressure Relief System [SB] were available as a backup to HPCI in the event of a line break. Also, the normal Feedwater System [SJ] was operating and available to inject large amounts of water. Technical Specifications allow unit operation with HPCI inoperable for a period of seven days.

E. CORRECTIVE ACTION:

The immediate action taken upon the tripping of the HPCI room cooler was to declare HPCI inoperable. The surveillances required by the Technical Specifications were initiated. After it was determined that the control transformer for the HPCI room cooler was damaged, Work Request Q64507 was written to repair as required. The transformer and control relay were replaced under the work request. The control relay shorted out which overloaded the control transformer causing the transformer damage. The auxiliary contacts for the room cooler were lubricated under the same work request for preventive maintenance measures. The lubrication of the auxiliary contacts ideally eliminates any possible contactor sticking.

Quad Cities Station has approximately 200 of the CR120A type relays installed in Safety Related applications. There have been four documented failures in the past five years. The percentage of failures is small enough to justify no further corrective action is required at this time.

F. PREVIOUS EVENTS:

There has been no other previous room cooler failures due to a control relay shorting out. There was one other HPCI room cooler failure (Licensee Event Report (LER) 265/85-004) on February 8, 1985, which was caused by a shorted motor winding. Relay coil failures at Quad Cities are documented in the following Licensee Event Reports (LER):

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LER

DESCRIPTION

254/83-10/03L 254/83-15/03L 254/85-013 254/87-012	Relay coil failures (CR120A) caused engineered safety feature (ESF)[JE] actuations
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254/87-020	ESF actuation due to apparent relay coil installation deficiency
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A Nuclear Plant Reliability Data System (NPRDS) search was done on the CR120A control relay. The search revealed only 71 similar relay coil failures industry wide.

G. COMPONENT FAILURE DATA:

General Electric manufactured both the control relay and the control power transformer that failed during this event.

The model numbers for the control relay and control power transformer are CR120A01122AA and 9T58B1805 respectively.



**Commonwealth Edison**

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Cordova, Illinois 61242  
Telephone 309/654-2241

RLB-88-83

March 10, 1988

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 please find Licensee Event Report (LER) 88-002, 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), which requires the  
reporting of any event or condition that alone could have prevented the  
fulfillment of the safety function of structures or systems that are needed to  
remove residual heat and mitigate the consequences of an accident.

Respectfully,

COMMONWEALTH EDISON COMPANY  
QUAD-CITIES NUCLEAR POWER STATION

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

RLB/MSK/ekb

Enclosure

cc: I. Johnson  
R. Higgins  
INPO Records Center  
NRC Region III

0370H/0183Z

*FERD.*  
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