

LICENSEE EVENT REPORT (LER)															Form Rev. 2.0	
Facility Name (1) Quad Cities Unit 1							Docket Number (2) 0 5 0 0 0 2 5 4							Page (3) 1 of 0 4		
Title (4) High Pressure Coolant Injection (HPCI) Inoperable due to Manual Closure of a HPCI Steam Supply Isolation Valve																
Event Date (5)			LER Number (6)				Report Date (7)			Other Facilities Involved (8)						
Month	Day	Year	Year	Sequential Number	Revision Number	Month	Day	Year	Docket Number(s)							
0	9	07	1999	003	01	1	2	08	1999	0	5	0	0	0		
OPERATING MODE (9) 1		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10CFR (Check one or more of the following) (11)														
POWER LEVEL (10) 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									
	20.405(a)(1)(iii)		50.73(a)(2)(i)		50.73(a)(2)(viii)(A)		Abstract below and									
	20.405(a)(1)(iv)		50.73(a)(2)(ii)		50.73(a)(viii)(B)		in Text									
	20.405(a)(1)(v)		50.73(a)(2)(iii)		50.73(a)(2)(x)											
LICENSEE CONTACT FOR THIS LER (12)																
Name Charles Peterson, Regulatory Assurance Manager, ext. 3609							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 EPIX	CAUSE	SYSTEM	COMPONENT		MANUFACTURER		REPORTABLE TO EPIX			
X	B J	H	S	G	E	Y										
SUPPLEMENTAL REPORT EXPECTED (14)										Expected Submission Date (15)		Month	Day	Year		
<input type="checkbox"/> YES (If yes, complete EXPECTED SUBMISSION DATE)										<input checked="" type="checkbox"/> NO						
ABSTRACT (Limit to 1400 spaces, i.e. approximately fifteen single-space typewritten lines) (16)																

ABSTRACT:

On September 7, 1999, and on October 4, 1999, while at 100% power, the Unit 1 High Pressure Coolant Injection (HPCI) steam supply outboard containment isolation valve failed to close from the control room control switch. In accordance with Technical Specification (TS) 3.7.D, "Primary Containment Isolation Valves," Action 1, the redundant HPCI steam supply containment isolation valve was maintained closed, rendering HPCI inoperable. Following replacement of the HPCI steam supply isolation valve control switch on September 7, 1999, HPCI was declared operable. Following contactor replacement on October 7, 1999, HPCI was again declared operable.

The root cause of these events were inadequate instructions in the procedure used to refurbish this type of breaker, resulting in a failed close contactor at the valve breaker.

For each event, an ENS notification was made under 10CFR50.72(b)(2)(iii)(D).

The safety significance of this event was minimal. The redundant (inboard) HPCI steam supply isolation valve was operable during these events and primary containment isolation would have occurred upon receipt of an isolation signal. In each case, HPCI was inoperable for less than the TS allowed outage time, and the Automatic Depressurization System (ADS) and all low pressure core cooling, as well as the Reactor Core Isolation Cooling system, were operable throughout the event.

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TEXT Energy Industry Identification System (EIS) codes are identified in the text as [XX]																		

PLANT AND SYSTEM IDENTIFICATION:

General Electric - Boiling Water Reactor - 2511 MWt rated core thermal power.

EVENT IDENTIFICATION:

High Pressure Coolant Injection (HPCI) Inoperable due to Manual Closure of a HPCI Steam Supply Isolation Valve.

A. CONDITIONS PRIOR TO EVENT:

Unit:	1	Event Date:	September 7, 1999	Event Time:	0014 hours
Reactor Mode:	1	Mode Name:	Power Operation	Power Level:	100%

This report was initiated by Licensee Event Report 254/99-003

Power Operation (1) - Mode switch in the RUN position with average reactor coolant temperature at any temperature.

B. DESCRIPTION OF EVENT:

At 0014 hours on September 7, 1999, while at 100% power, the Unit 1 High Pressure Coolant Injection (HPCI) [BJ] steam supply outboard containment isolation valve [ISV] (1-2301-5) failed to close from the control room control switch [HS] during performance of the HPCI Steam Line High Flow Analog Trip System Calibration and Functional Test (QCIS 2300-4). In accordance with Technical Specification (TS) 3.7.D, "Primary Containment Isolation Valves," Action 1, the redundant HPCI steam supply containment isolation valve was manually closed and taken out of service. This action rendered the HPCI system inoperable. Investigation determined that the control switch had a high resistance on the close contacts, resulting in a lower voltage available at the contactor coil. The failed HPCI steam supply isolation valve control switch was subsequently replaced. The valve and switch were tested, the closed isolation valve was opened, and HPCI was declared operable.

This event was initially classified as not reportable. Subsequently, at 1937 hours on September 21, 1999, an ENS notification was made for this event. The notification was made in accordance with 10CFR50.72(b)(2)(iii)(D).

At 2355 hours on October 4, 1999, the HPCI steam supply isolation valve again failed to close on a signal from the control room control switch during performance of valve testing. During troubleshooting, the valve was closed. Subsequent attempts to close it from the control room control switch were successful. The ENS notification was made in accordance with 10CFR50.72(b)(2)(iii)(D) at 0252 hours on October 5, 1999.

Following the October 4, 1999, failure, an investigation team was chartered to determine the root cause. The root cause of this event was determined to be inadequate instructions in the electrical maintenance (EM) procedure used to refurbish this type of breaker. This resulted in a failed close contactor at the valve breaker. The failed contactor was replaced on October 7, 1999. After completion of the required testing to exit from the planned maintenance work that was performed during this Limiting Condition for Operation (LCO), the HPCI subsystem was declared operable at 2018 hours on October 7, 1999. The rest of the contactors, maintained per the same EM procedure,

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will be reviewed to determine if replacement or repair is required. The breaker preventive maintenance procedure, QCEPM 0400-02, will be revised to include detailed re-assembly instructions.

C. CAUSE OF THE EVENT:

During the investigation, a visual inspection of the close contactor for the valve breaker showed that the "roll pin" of the pivot point was out of its guide. The effort required to close the contactor with the roll pin out of position was compared to that of a spare contactor. There did not appear to be a difference in force required to close between the "faulted" contactor and the spare contactor. However, there was more force required to close the contactor after the spare contactor had its roll pin rotated out of the guide slot.

Procedure QCEPM 0400-02, which provides guidance for the preventive maintenance on the 250 VDC cubicles of this type, was analyzed with task analysis methodology. It was found that, although step I.9.d gave directions for removing the lever shaft and lubricating the shaft, the procedure did not give any guidance on how to replace the shaft, nor did it provide torquing instructions for the nut and lock nut.

Interviews revealed that re-assembly practices were not consistent. Some electricians torqued the nut, which squeezed the lever shaft support bracket arms together and could result in binding if any dust, dirt, or debris were in the vicinity of the lever arm shaft. A new contactor assembly was inspected, which showed there was some gap between the support bracket and the lever arm assembly; enough so that there was noticeable play when moving the lever arm. The manufacturer representative agreed that the contactor issue could be attributed to mechanical binding caused by the roll pin phenomenon described earlier.

Therefore, the root cause of this event was that the contactor maintenance procedure, QCEPM 0400-02, was inadequate in that re-assembly of the lever arm pivot was not specified, resulting in occasional mechanical binding of the contactor lever arm and failure of the I-2301-5 valve to close when required. A contributing cause to this event was the control switch (1-2330-302 on the 901-3 panel) that had a high resistance on the close contacts, which would result in a lower voltage available at the contactor coil and failure to close the valve when required. This contributing cause was repaired after the September 7, 1999, event.

D. SAFETY ANALYSIS:

Failure of the HPCI steam supply outboard containment isolation valve to close is not safety significant. This valve is normally open to provide a steam pathway for the HPCI system. In addition, its redundant primary containment isolation valve was operable during the event. Following closure of the HPCI steam supply inboard containment isolation valve, HPCI was rendered inoperable. For each event, HPCI was inoperable for less than the TS allowed outage time. Also, the Automatic Depressurization System (ADS) and all low pressure core cooling [BM][BO], as well as the Reactor Core Isolation Cooling (RCIC) system [BN], were operable. For these reasons, this event was not safety significant.

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E. CORRECTIVE ACTIONS:

Corrective Actions Completed:

1. When the 1-2301-5 valve was declared inoperable, the 1-2301-4 valve was closed as required by Technical Specifications Section 3/4.7.D.
2. The 1-2330-302 control switch for the 1-2301-05 valve was replaced on September 7, 1999.
3. Open and close contactors in cubicle G02 of MCC-1A (1-2301-5 valve cubicle) were replaced on October 7, 1999.

Corrective Actions to be Completed:

1. The rest of the contactors maintained per QCEPM 0400-02 will be reviewed to determine if replacement or repair is required.
2. The failed contactor will be inspected and a determination will be made concerning the need for further failure analysis.
3. QCEPM 0400-02 will be revised to include directions for installing the lever arm bolt, nuts, and roll pin and to include information on the new contactors that do not require lubrication.

F. PREVIOUS OCCURRENCES:

No previous LERs concerning failure of the HPCI steam supply containment isolation valve to close were identified.

G. COMPONENT FAILURE DATA:

The replaced switch is an SBM type switch manufactured by General Electric, with model number 209A6001. The replaced contactor assembly was manufactured by Cutler-Hammer, with a model number of 6002H347B.