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September 18, 2000

SVP-00-149

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555

Quad Cities Nuclear Power Station, Unit 2
Facility Operating License No. DPR-30
NRC Docket No.50-265

Subject: Supplemental Report Concerning High Pressure Coolant Injection Inoperability during Low Pressure Testing Due to Incomplete Maintenance Activities and Inadequate Venting

Enclosed is Licensee Event Report (LER) 265/00-005, 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)(v)(B). The licensee shall report any event or condition that could have prevented the removal of residual heat.

We are committing to the following actions:

Maintenance Administrative Procedures will be reviewed to determine whether to include them in Maintenance First-Line Supervisor Qualification Proficiency Training.

Incumbent Maintenance First-Line Supervisors will be verified to have been trained on daily work progressing, work completion processing and action request initiation.

Any other actions described in the submittal represent intended or planned actions by Commonwealth Edison (ComEd) Company. They are described for the NRC's information and are not regulatory commitments.

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Should you have any questions concerning this letter, please contact Mr. C.C. Peterson at (309) 654-2241, extension 3609.

Respectfully,

Joel P. Dimmette, Jr.
Site Vice President
Quad Cities Nuclear Power Station

cc: Regional Administrator – NRC Region III
NRC Senior Resident Inspector – Quad Cities Nuclear Power Station

NRC FORM 366 (6-1998) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB NO. 3150-0104
EXPIRES 06/30/2001

Estimated burden per response to comply with this mandatory information collection request: 50 hrs. Reported lessons learned are incorporated into the licensing process and fed back to industry. Forward comments regarding burden estimate to the information and Records Management Branch (t-6 f33), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, and to the Paperwork Reduction Project (3150-0104), Office Of Management And Budget, Washington, DC 20503. If an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
Quad Cities Nuclear Power Station, Unit 2	05000265	1 of 4

TITLE (4)
High Pressure Coolant Injection Inoperability during Low Pressure Testing Due to Incomplete Maintenance Activities and Inadequate Venting

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 NAME	DOCKET NUMBER
									N/A	05000
02	11	2000	2000	005	02	09	18	2000	FACILITY NAME: N/A	DOCKET NUMBER: 05000

OPERATING MODE (9)	2
POWER LEVEL (10)	004

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR § (Check one or more) (11)

	20.2201(b)		20.2203(a)(2)(v)		50.73(a)(2)(i)		50.73(a)(2)(viii)
	20.2203(a)(i)		20.2203(a)(3)(i)		50.73(a)(2)(ii)		50.73(a)(2)(x)
	20.2203(a)(2)(i))		20.2203(a)(3)(ii)		50.73(a)(2)(iii)		73.71
	20.2203(a)(2)(ii)		20.2203(a)(4)		50.73(a)(2)(iv)		OTHER
	20.2203(a)(2)(iii)		50.36(c)(1)	X	50.73(a)(2)(v)		Specify in Abstract below or in NRC Form 366A
	20.2203(a)(2)(iv)		50.36(c)(2)		50.73(a)(2)(vii)		

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER (Include Area Code)
Charles Peterson, Regulatory Assurance Manager	(309) 654-2241 ext 3609

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

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 15 single-spaced typewritten lines) **(16)**

On February 11, 2000, at 0258 hours, Unit 2 was in the Startup mode with reactor pressure between 150 and 180 psig, when the High Pressure Coolant Injection (HPCI) pump failed to start during startup surveillance testing. The surveillance was terminated, the system was restored to standby lineup, and reactor pressure was reduced below 150 psig to place the reactor in a condition where HPCI was not required to be operable. It was determined that work performed on HPCI during the refueling outage was not complete and the work package had been closed out in error. The work was subsequently completed and the startup was recommenced.

In addition, when the HPCI discharge piping was vented in preparation for re-testing of HPCI, air in the discharge piping exceeded procedural acceptance criteria. This indicated that a satisfactory vent had not been obtained on the discharge piping prior to the first test. The piping was subsequently filled and vented, reactor pressure was increased to between 150 and 180 psig, and HPCI was successfully tested.

The root cause of the failure to complete the maintenance was inadequate training concerning procedural requirements for work completion. The root cause of the failure to obtain a satisfactory vent of the discharge line prior to the first HPCI test was an inadequate venting procedure that did not require venting for a sufficient amount of time.

The safety significance of this event was minimal. The reactor pressure was less than 180 psig, and the automatic depressurization system and all low-pressure emergency core cooling systems were operable.

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] and are obtained from IEEE Standard 805-1984, IEEE Recommended Practice for System Identification in Nuclear Power Plants and Related Facilities.

EVENT IDENTIFICATION:

High Pressure Coolant Injection Inoperability during Low Pressure Testing Due to Incomplete Maintenance Activities and Inadequate Venting

A. PLANT CONDITIONS PRIOR TO EVENT:

Unit: 2 Event Date: February 11, 2000 Event Time: 0258
Reactor Mode: 2 Mode Name: Startup Power Level: 4%

Startup (2) - Mode switch in Startup/Hot Standby position with average reactor coolant temperature at any temperature.

B. DESCRIPTION OF EVENT:

On February 11, 2000, at 0258 hours, Unit 2 was in the Startup mode (Mode 2) with reactor vessel pressure between 150 and 180 psig. When the High Pressure Coolant Injection (HPCI) [BJ] motor speed changer was taken to the high speed stop as part of operability testing required by Technical Specifications surveillance requirement 4.5.A.3.b.1, the HPCI turbine [TRB] failed to operate. The surveillance was terminated and the system was restored to the standby lineup. At 0341 hours reactor pressure was reduced below 150 psig to place the reactor in a condition where HPCI was not required to be operable.

An investigation determined that a work package for work performed on the HPCI system during the refueling outage had been closed out in error by a Mechanical Maintenance (MM) supervisor. An adjustment still needed to be made on the Interlock Dump Valve [V] to make HPCI operable. These actions were completed and the startup was recommenced.

It was subsequently determined that during the time that the HPCI system was inoperable due to the Interlock Dump Valve adjustment not being made, it was also inoperable due to inadequate venting of the pump discharge line. In preparation for re-testing HPCI on February 11, 2000, following the Interlock Dump Valve adjustment but before raising reactor pressure vessel pressure above 150 psig, the HPCI pump discharge piping was vented. During this venting, air was seen to exit the vent line for greater than 10 seconds indicating that there had been air in the HPCI discharge line. The discharge piping fill and vent was completed, reactor vessel pressure was increased to between 150 and 180 psig, and HPCI was successfully tested.

C. CAUSE OF EVENT:

The root cause of the failure to complete the adjustment on the Interlock Dump Valve was inadequate training concerning procedural requirements for work completion. Station procedures require that the responsible

supervisor ensure that all steps requiring sign-off are complete prior to closing out the work package. Maintenance First-Line Supervisor Qualification Proficiency Training did not address this procedural requirement.

The root cause of the failure to obtain a proper vent of the discharge line prior to the first HPCI test is inadequate procedures. Neither QCOP 2300-01, "HPCI Preparation For Standby Operation," or QCOS 2300-09, "HPCI Monthly Vent Verification," contain instructions on how long to vent the HPCI discharge piping in order to ensure that all of the air has been evacuated. These procedures require verification of water flow at the vent sight-glass. Since the HPCI high point vent pipe is approximately 130 feet long and typical water flow velocity is 6 feet per second, it is possible to observe water flow for more than 20 seconds without ever evacuating any potential air from the HPCI discharge pipe in the Main Steam Isolation Valve (MSIV) Room.

D. SAFETY ANALYSIS

During the time that HPCI was inoperable and required to be operable (reactor vessel pressure was above 150 psig from 0118 hours until 0341 hours on February 11, 2000), the reactor vessel pressure was less than 180 psig. The automatic depressurization system and all low-pressure emergency core cooling systems (ECCS) [B] were operable. At that reactor vessel pressure, low-pressure ECCS pumps [P] could inject into the vessel. Also, there is very little driving pressure for a pipe break and the resulting leakage. Therefore, the safety significance of this event was minimal.

E. CORRECTIVE ACTIONS:

Corrective Actions Completed for Failure to Adjust the Interlock Dump Valve:

A comprehensive review of all significant MM work packages for the refuel outage (Q2R15) was performed. In addition, a random sampling of completed work packages from the other maintenance disciplines was performed. One other completed package had previously been identified as being improperly closed earlier in the outage by the same MM Supervisor, and had been corrected. No other improperly closed work packages were identified.

The event has been presented to the Maintenance first-line supervisors to reinforce the necessity for ensuring proper documentation of work, and the potential for impact on safety-related equipment operability.

The event has been included in a human performance training course being presented to all Maintenance Department personnel.

Maintenance First-Line Supervisor Qualification Proficiency Training has been revised to include daily work progressing, work completion processing and action request initiation.

Corrective Actions Completed for the Failure to Obtain a Proper Vent:

The maintenance was completed, the discharge piping was filled and vented, and HPCI was successfully tested.

The operating procedures for Safe Shutdown (SSD), HPCI, Reactor Core Isolation Cooling (RCIC), Residual Heat Removal (RHR), and Core Spray (CS) were reviewed to ensure adequate venting is achieved.

The SSD Pump venting procedures are adequate to ensure a proper vent is obtained.

The appropriate HPCI and RCIC procedures (including QCOP 2300-01, discussed below) have been revised to require venting from the high point vent for at least 35 seconds when filling the system piping, and to require the operator in attendance at the venting sight-glass during monthly venting to observe water flow for at least 35 seconds or until the piping is noticeably hot due to water originally in the MSIV Room reaching the sight-glass.

RHR and CS venting procedures have been revised as necessary to ensure adequate venting of the system.

Corrective Actions to be Completed for the Failure to Adjust the Interlock Dump Valve:

Maintenance Administrative Procedures will be reviewed to determine whether to include them in Maintenance First-Line Supervisor Qualification Proficiency Training.

Incumbent Maintenance First-Line Supervisors will be verified to have been trained on the daily work progressing, work completion processing and action request initiation.

F. PREVIOUS OCCURRENCES:

The following LER associated with failure to vent was identified:

LER 2-96-002, High Pressure Coolant Injection Inoperable Due to Inadequate Venting.
Corrective actions for this event included (all complete):

- Revising QCOP 2300-01 to properly fill the highest piping on the discharge of the HPCI pump.
- Revising QCOS 2300-09 to include acceptance criteria.
- Revising other surveillance procedures for HPCI to require performance of QCOS 2300-09 after certain valving operations.
- Checking and revising RCIC and SSD system procedures to ensure proper filling of all of the system's piping.
- Performing a calculation to determine if the amount of air found in the discharge piping during this event would have caused water hammer problem upon system start-up.

The corrective actions to prevent recurrence from this event were not effective because they did not address the fact that water flow should be observed for at least 35 seconds prior to assuming that all the air has been removed from the discharge piping. The reason that this was not recognized is that QCOP 2300-01 assumes that if the HPCI discharge piping is drained, the vent piping will also be drained. If the vent piping from the MSIV room to the Core Spray room had not been drained, as in this case, QCOP 2300-01 would have been inadequate to prevent this event (see above for recent revision to QCOP 2300-01).

G. COMPONENT FAILURE DATA:

The HCPI Interlock Dump Valve is a part of the HPCI Turbine Front Standard. The HPCI Turbine is a model DRV-231 manufactured by General Electric.