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ComEd

April 28, 2000

SVP-00-066

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

Quad Cities Nuclear Power Station, Unit 2
Facility Operating License Nos. DPR-30
NRC Docket Nos. 50-265

Enclosed is Licensee Event Report (LER) 265/00-05, Revision 01, 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.

We are committing to the following actions:

Appropriate station procedures will be reviewed and revised as necessary to clarify supervisory responsibilities, to provide specific guidance for job status in the Electronic Work Control System (EWCS) and to clarify the EWCS role as the sole work status tool.

The Maintenance first-line supervisor training is being revised to include additional emphasis on supervisory responsibilities pertaining to EWCS data entry.

Residual Heat Removal and Core Spray venting procedures are being revised as necessary to ensure adequate venting of the system.

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.

IE22

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

LICENSEE EVENT REPORT (LER) Form Rev. 2.0

Facility Name (1)	Docket Number (2)	Page (3)
Quad Cities Unit 2	0 5 0 0 0 2 6 5	1 of 0 5

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 Names	Docket Number(s)
0 2	1 1	2000	2000	0 0 5	0 1	0 4	2 8	2000		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)					
2						
POWER LEVEL (10) 0 0 4	20.402(b)	20.405(c)		50.73(a)(2)(iv)		73.71(b)
	20.405(a)(1)(i)	50.36(c)(1)	X	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)(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
Charles Peterson, Regulatory Affairs Manager, ext. 3609	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
P	B J	S C	G 0 8 0	Y					

SUPPLEMENTAL REPORT EXPECTED (14)		Expected Submission Date (15)	Month	Day	Year
☐ YES (If yes, complete EXPECTED SUBMISSION DATE)	☒ NO				

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

ABSTRACT:

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 failure to follow procedures that require the responsible supervisor to ensure all steps are complete prior to closing the work package. 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.

EVENT IDENTIFICATION:

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

A. CONDITIONS PRIOR TO EVENT:

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

This report was initiated by Licensee Event Report 265/00-005

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, after having finished 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. This exceeded procedural acceptance criteria. The discharge piping was filled and vented, reactor vessel pressure was increased to between 150 and 180 psig, and HPCI was successfully tested.

C. CAUSE OF THE EVENT:

The root cause of the failure to complete the adjustment on the Interlock Dump Valve is failure to follow procedures. Station procedures require that the responsible supervisor ensure that all steps requiring sign-off are complete prior to closing out the work package. This was not performed in this case due to insufficient training, ineffective verbal communications, insufficient written communications, and inadequate quality review of documentation.

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.

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 discharge piping and 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.

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

Appropriate station procedures will be reviewed and revised as necessary to clarify supervisory responsibilities, to provide specific guidance for job status in the Electronic Work Control System (EWCS) and to clarify the EWCS role as the sole work status tool.

The Maintenance first-line supervisor training is being revised to include additional emphasis on supervisory responsibilities pertaining to EWCS data entry.

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

RHR and CS venting procedures are being revised as necessary to ensure adequate venting of the system.

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.