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RI 9-91-257

October 28, 1991

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
Docket Number 50-265, DPR-30, Unit Two

Enclosed is Licensee Event Report (LER) 91-019, 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). 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
Station Manager

RLB/TB/plm

Enclosure

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

STMGR 215

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LICENSEE EVENT REPORT (LER) Form Rev 2.0

Facility Name (1)	Docket Number (2)	Page (3)
Quad Cities Unit One	0 5 0 0 0 2 5 4	1 of 0 4

Title (4) "B" Train CR HVAC Emergency Filtration Unit Unable To Attain Proper dT Across Heater And Proper dP Across Filter Train Due To Improper Equipment Configuration And Partially Fouled HEPA Filters.

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)
									Quad Cities Unit Two	0 5 0 0 0 2 6 5
1 0	0 5	9 1	9 1	0 1 9	0 0	1 0	2 8	9 1		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)			
4		20.402(b)	20.405(c)	50.73(a)(2)(iv)	73.71(b)
POWER LEVEL (10)		20.405(a)(1)(i)	50.36(c)(1)	X 50.73(a)(2)(v)	73.71(c)
8 0 %		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)(x)	

LICENSEE CONTACT FOR THIS LER (12)

Name	TELEPHONE NUMBER
	AREA CODE
Michael Harms, Ext. 2159	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 NPRDS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	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:

On October 5, 1991 at 1255 hours, Unit One was in the RUN mode at 80 percent of rated core thermal power. Unit Two was in the SHUTDOWN mode. At this time the Control Room [VI] (CR) "B" Train Air Filtration Unit (AFU) was declared inoperable. During surveillance testing, the heater [EHTR] failed to attain a 15 degree Fahrenheit differential temperature (dT). Also, the differential pressure (dP) across the filter train exceeded 6 inches of water. An Emergency Notification System (ENS) phone call was completed at 1358 hours per 10CFR50.72(b)(2)(iii)(D).

The apparent causes of this event were a design deficiency involving the thermowells of the Resistance Temperature Devices (RTD) used to measure dT across the heater, and HEPA filters [FLT] that were partially fouled due to normal usage.

Corrective actions included filling the thermowells with thermally conductive oil and replacing the HEPA filters.

This report is being submitted to comply with 10CFR50.73(a)(2)(v).

PLANT AND SYSTEM IDENTIFICATION:

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

EVENT IDENTIFICATION: "B" Train CR HVAC Emergency Filtration Unit Unable To Attain Proper dT Across Heater And Proper dP Across Filter Train Due To Improper Equipment Configuration And Partially Fouled HEPA Filters.

A. CONDITIONS PRIOR TO EVENT:

Unit: One Event Date: October 5, 1991 Event Time: 1255
Reactor Mode: 4 Mode Name: RUN Power Level: 80%

This report was initiated by Deviation Report D-4-1-91-127.

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 October 5, 1991 at 1255 hours Unit One was in the RUN mode at 80 percent of rated core thermal power. Unit Two was in the SHUTDOWN mode. While performing QOS 5750-2, "Control Room Emergency Filtration System Monthly Test," a 14.8 degree Fahrenheit differential temperature (dT) was recorded across the heater [EHT] for the Air Filtration Unit (AFU). A differential pressure (dP) of 6.2 inches of water was also observed across the AFU. A dT of 15 degrees or greater and a dP of less than 6 inches of water must be obtained to comply with Technical Specification 4.8.H.2.b. The "B" Train of Control Room [VI] (CR) HVAC was declared inoperable and QOS 5750-02, "Control Room Emergency Filtration System Inoperable Outage Report," was initiated. An Emergency Notification System (ENS) phone call was completed at 1358 hours per 10CFR50.72(b)(2)(iii)(D). The flow of the AFU at the time the readings were taken was recorded as 2000 Standard Cubic Feet per Minute (SCFM). However, at 1500 hours, the flow of the AFU was checked and found to be 2100 SCFM. The Operations Department adjusted the flow to 2000 SCFM and the dP was reduced to 5.8 inches of water. However, the dT across the heater was still below the 15 degree requirement.

On October 8, 1991, representatives from Nuclear Consulting Services, Inc., (NUCON) used a manometer to measure the dP across each individual component of the AFU to verify the accuracy of the existing dP indication. The results of these measurements showed that the existing dP indication was functioning correctly. Later, the Mechanical Maintenance Department (MMD) removed the Rough Prefilters, the Pre-HEPA filters and the Post-HEPA filters [FLT] under Nuclear Work Requests (NWRS) Q95810, Q95809, and Q95811, respectively. This was done so that the NUCON representatives could inspect the inside of the AFU to see if internal problems existed. Their inspection proved that the AFU was not internally damaged and was functioning properly. However, during the inspection, the representatives observed that the Resistance Temperature Devices (RTD) used to measure the dT across the heater were mounted inside of thermowells. The NUCON representatives advised checking the wells to ensure that they were properly filled with thermal conducting grease or oil. Without this oil, the measurement accuracy of the RTD could decline significantly.

On October 9, 1991 the Instrument Maintenance Department (IMD) found the thermowells of the RTDs void of thermal conducting oil. The IMD filled the thermowells with this oil under NWR Q95767. The MMD replaced the Pre-HEPA and Post-HEPA filters in the AFU with new filters under NWRs Q95809 and Q95811, respectively. Upon restarting the AFU, the NUCON representatives noted that the system dP was still above 5 inches of water, but below 6. They stated that a total system dP in this range is considered normal for serpentine styled systems such as the "B" train AFU. Also at this time, the dT across the heater was measured and found to be approximately 16.3 degrees Fahrenheit.

On October 10, 1991 the Dioctyl Phthalate (DOP) aerosol test for the HEPA filters was performed and completed successfully.

On October 11, 1991, QOS 5750-2, "Control Room Emergency Filtration System Monthly Test," was performed and completed successfully at 2030 hours. The "B" Train was declared operable and QOS 5750-02, "Control Room Emergency Filtration System Inoperable Outage Report," was completed.

C. APPARENT CAUSE OF EVENT:

This report is being submitted in accordance with 10CFR50.73(a)(2)(v). Technical Specification Section 3.8.H.1 requires that the CR Emergency Filtration System, including at least one booster fan [FAN], be operable at all times when secondary containment integrity is required. Technical Specifictiation 4.8.H.2.b requires that the AFU demonstrate a heater dT of 15 degrees Fahrenheit or greater and a dP across the filter train of less than 6 inches of water at a flow rate of 2000 SCFM (+/- 10%).

There were two apparent causes of this event. The first cause was a design deficiency involving the thermowells of the RTDs used to measure the dT across the heater. In the original design documentation for the RTD thermowells, there was no mention of thermal conducting grease or oil. According to the NUCON representatives, this information should have been included in the initial design and construction of the system. The second cause was the HEPA filters that were partially fouled due to normal usage.

D. SAFETY ANALYSIS OF EVENT:

The safety significance of this event was minimal. After filling the thermowells of the RTDs, it was discovered that the heater was adequately meeting the dT at 2000 SCFM that is required by Technical Specifications. Realizing this, it can safely be assumed that the AFU was functioning properly, except for the temperature instrumentation, which was reading in the conservative direction of low. Therefore, the charcoal adsorber efficiency would not have been degraded during the event or a design basis accident (DBA), and CR dose rates would not have exceeded allowable General Design Criterion (GDC) 19 limits. Also, after throttling down the system flow from 2100 to 2000 SCFM, the system dP was measured to be 5.8 inches of water, which is less than 6 inches as required by Technical Specification 4.8.H.2.b.1. Replacement of the HEPA filters provided additional margin, as the system dP was then measured to be 5.6 inches of water. Since the dP across the combined filters never exceeded 6 inches of water at 2000 SCFM, the removal efficiency of the AFU would not have been affected during the event or a DBA.

E. CORRECTIVE ACTIONS:

The immediate corrective actions were to declare the "B" Train of the Control Room HVAC inoperable and initiate the appropriate Outage Report.

Additional corrective actions included: 1) The IMD filling the thermowells of the RTDs with thermal conducting oil. 2) NUCON representatives measuring system dP to verify proper system operation. 3) NUCON representatives performing an internal system inspection to verify proper system operation. 4) The MMD department replacing the HEPA filters. 5) TS performing the DOP aerosol tests on the HEPA filter. 6) Operations performing QOS 5750-2, "Control Room Emergency Filtration System Monthly Test," successfully and declaring the "B" Train operable. All of these corrective actions have been completed.

F. PREVIOUS EVENTS:

Two previous events where the required 15 degree dT was not met have been documented. One of these events also involved a high system dP. The first event was DVR 4-1-90-048 (LER 90-12). The cause of this event was believed to be a defective heater but was never substantiated by data that would point to this conclusion. Checks on the heater performed by the Electrical Maintenance Department (EMD) proved that the heater was functioning properly. The second event was DVR 4-1-91-110 (LER 91-17). The cause of this event was believed to be a marginally sized heater for the dT required, and a broken dP indicator.

G. COMPONENT FAILURE DATA:

There were no component failures associated with this event.