

## LICENSEE EVENT REPORT (LER)

Form Rev. 2.0

Facility Name (1)

Docket Number (2)

Page (3)

Quad Cities Unit One

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Title (4) The control room emergency filtration system failed to maintain required airflow due to a cognitive personnel error, which allowed a flow instrument loop to be incorrectly calibrated.

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)																		
1	1	2	4	9	6	9	6	--	0	2	3	--	0	0	1	2	3	9	6	Quad Cities Unit 2	0	5	0	0	0	2	6	5
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 Abstract below and in Text)										
									20.405(a)(1)(iii)			X 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

Charles Peterson, Regulatory Affairs Manager, ext. 3602

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 NPRDS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS

## SUPPLEMENTAL REPORT EXPECTED (14)

YES (If yes, complete EXPECTED SUBMISSION DATE)	X	NO	Expected Submission Date (15)	Month	Day	Year

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

## ABSTRACT:

On November 24, 1996 at 1037 hours the control room emergency filtration system (CREFS) was declared inoperable because CREFS airflow was below the required minimum. A 4 hour ENS phone call was made on November 24, 1996, at 1312 hours. The event was caused by a cognitive personnel error, which allowed a flow instrument loop to be incorrectly calibrated. On November 25, testing demonstrated that the permanent plant instrument was indicating 2000 scfm while actual flow, as measured by pitot tube traverse, was 1607 scfm, which is less than the technical specification (TS) required airflow.

Follow-up action included adjusting CREFS airflow to meet the TS required airflow, and calibrating the permanent plant instrument loop. CREFS was declared operable on November 25 at 1540 hours.

The impact of this event was minimal, as it is very unlikely that, during a loss of coolant accident (LOCA), the control room (CR) personnel would have received radiation exposure in excess of the 30 rem to the thyroid limit of General Design Criterion (GDC) 19.

LER 254/96/023.WPF

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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: The control room emergency filtration system failed to maintain required airflow due to a cognitive personnel error, which allowed a flow instrument loop to be incorrectly calibrated.

A. CONDITIONS PRIOR TO EVENT:

Unit: One	Event Date: November 24, 1996	Event Time: 1037
Reactor Mode: 1	Mode Name: Power Operation	Power Level: 100%
Unit: Two	Event Date: November 24, 1996	Event Time: 1037
Reactor Mode: 1	Mode Name: Power Operation	Power Level: 99%

This report was initiated by Licensee Event Report 254\96-023.

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

B. DESCRIPTION OF EVENTS:

Problem Identification Form (PIF) # 96-3271 was initiated to document a discrepancy between the control room emergency filtration system (CREFS) airflow as recorded by QCOS 5750-02, "Control Room [NA]Emergency Filtration System Monthly Test," and Interim Procedure (IP) 96-0182, "Main Control Room Envelope Air In-Leakage Test." Airflow through the CREFS was recorded by QCOS 5750-02 as 2000 standard cubic feet per minute (scfm) at 1510 hours on November 2, 1996, using permanently installed gauge FI 1/2-5795-307. On the same date (precise time unknown), the airflow through the CREFS was recorded by IP 96-0182 as 1666 scfm, using a calibrated portable air data multimeter with a pitot tube traverse. (A pitot tube traverse using a calibrated test instrument is considered the prime standard for airflow measurement, as it takes an array of airflow readings across the duct). The instrument loop for FI 1/2-5795-307 was calibrated on November 14, 1996, but was not compared to actual flow as measured by a calibrated test instrument.

QCOS 5750-02 verifies CREFS airflow of 2000 scfm  $\pm$  10% as specified by technical specification (TS) 4.8.D.3.c, and also verifies that air pressure in the control room (CR) is 1/8" water gauge (w.g.) positive or greater with air flow of 2000 scfm or less. On November 18, 1996, it was recognized that QCOS 5750-02 is required to satisfy the technical specification (TS) requirement of 2000  $\pm$  10% scfm, and PIF #96-3271 was initiated. Airflow testing was performed on the CREFS on November 24, and it was determined that the permanently installed gauge FI 1/2-5795-307 was not displaying an accurate airflow reading and the CREFS airflow was not being maintained at 2000 scfm  $\pm$  10% as required by TS 4.8.D.3.c. As a result, the CREFS was declared inoperable at 1037 hours, November 24, 1996, and Quad Cities Nuclear Station (QCNS) (both units) entered a 7 day Limiting Conditions for Operation (LCO) as required by TS 3.8.D.1.

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After corrective actions were taken to adjust CREFS airflow to 1975 scfm, the CREFS LCO was exited at 1540 hours on November 25, 1996.

**C. APPARENT CAUSE OF EVENT:**

The root cause of this event was cognitive personnel error. Cognitive personnel failed to specify airflow loop calibration requirements to include a verification of actual airflow as compared to the flow indicator.

**D. SAFETY ANALYSIS OF EVENT:**

The health and safety of the public was not impacted by this event. Gaseous releases to the environment are controlled by the primary and secondary containments, the off-gas and standby gas systems, and other systems. The CR heating, ventilation, and air conditioning (HVAC) system does not mitigate or contribute to gaseous releases to the environment.

The potential impact of the event on CR personnel is that, had a loss of coolant accident (LOCA) occurred, releasing radiation to the environment, the CREFS would have supplied a lesser amount of filtered air to the CR emergency zone (the CR emergency zone consists of the CR, cable spreading room, aux electric room, and the CREFS equipment room). During the first 1 hour and 50 minutes of a LOCA, the CREFS is assumed to not be operating (reference the updated final safety analysis report (UFSAR) section 15.6.5.5.3.3), allowing unfiltered air into the CR emergency zone. A CREFS airflow of less than the 1800 scfm minimum would provide less turnover of air in the CR emergency zone, allowing the unfiltered air that entered the CR emergency zone before CREFS startup to remain in the CR emergency zone longer.

The design basis of the CREFS is specified in UFSAR section 6.4.1, which states "the control room habitability systems are designed so that radiation exposure of control room personnel does not exceed the limits of NUREG 0800, Standard Review Plan (SRP) 6.4, or of General Design Criterion (GDC) 19 of Appendix A to 10CFR50." These references require radiation protection under design basis accident (DBA) conditions such that dose rates are limited to less than 5 rem whole body, 30 rem exposure to the thyroid, with the thyroid dose being the limiting factor from an occupancy exposure consideration. Scientific NUS Sensitivity Calculation No. 6200.001-M-04, Rev 0, dated 11/01/96, "Analysis of CR Dose as a Function of Infiltration using Revised Dose Analysis Methodology," demonstrated that the 30 day, 30 rem thyroid limit of CR personnel is not exceeded with an unfiltered infiltration rate as high as 9260 scfm. With a total airflow of 25,650 scfm to the CR emergency zone, an unfiltered in leakage of 9260 scfm is extremely improbable.

The recirculation mode of the CREFS (entered automatically upon detection of toxic gas) was not affected by this event. In addition, the smoke purge mode of the CREFS was not affected by this event.

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Year 9   6		Sequential Number 0   2   3	Revision Number -   0   0				

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**E. CORRECTIVE ACTIONS:**

Corrective Actions Completed:

1. IP 96-0188, "Control Room Emergency Filtration System Airflow Test," was initiated and performed and the CREFS airflow was adjusted to 1975 scfm.
2. The instrument loop for gauge FI 1/2-5795-307 was calibrated to reflect actual airflow, and was verified by a pitot tube traverse.
3. QCTS 0440-01, "Control Room HVAC Air Filtration Unit In-Place Leak Test of the HEPA Filters," was performed and verified the HEPA filter leak rate at an airflow of 2000 scfm  $\pm$  10%.
4. QCTS 0440-02, "Control Room HVAC Air Filtration Unit In-Place Charcoal Adsorber Leak Rate Test," was performed and verified the charcoal filter leak rate at an airflow of 2000 scfm  $\pm$  10%.

Corrective Actions to be Completed:

1. Initiate a predefine model work request which initiates a periodic maintenance procedure to perform a loop calibration for the loop of gauge FI 1/2 5795-307 which includes calibrating the reading of the permanent gauge to actual airflow as determined by a pitot tube traverse. Actions to be completed by February 28, 1997. (NTS # 2541809602301; Maintenance Department).
2. Perform a review of all predefine calibrations that support technical specification requirements and utilize calibration procedures QIP 100-11, QIP 100-17, QIP 100-18, and QIP 100-19. This review will ensure that the calibrations are being properly performed. Actions to be completed by June 2, 1997. (NTS # 2541809602302, Maintenance Department).
3. Revise the existing process for post-surveillance data review to ensure that technical specification requirements are being satisfied. Actions to be completed by March 3, 1997. (NTS # 2541809602303; Work Control Department)

**F. PREVIOUS EVENTS:**

The following similar Licensee Event Reports (LERs) have occurred since 1994 regarding cognitive personnel error:

- |            |  |
|------------|--|
| 265\95-002 | "Wrong PT fuse drawer opened on Bus 24 due to inadequate work practices"   |
| 254\96-006 | "5 entries into TS LCO 3.0A for primary containment breeches to support scheduled LLRTs on M01-1001-36A/B and M01-1001-37A/B and also for seat leakage check of 1-1001-68A with the Rx>212 degrees and/or Rx critical" |

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254\96-018

"U-1 Rx Mode Switch moved to S/U Hot Standby prior to required surveillances being completed due to the wrong assumptions being made"

G. COMPONENT FAILURE DATA:

None.