



**Commonwealth Edison**

Quad Cities Nuclear Power Station  
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RLB-92-192

September 10, 1992

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

Enclosed is Licensee Event Report (LER) 92-018, 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)(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.

Respectfully,

COMMONWEALTH EDISON COMPANY  
QUAD CITIES NUCLEAR POWER STATION

*R. L. Bax*  
R. L. Bax  
Station Manager

RLB/TB/plm

Enclosure

150048

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

STMOR 435

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PDR ADOCK 0500025A  
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LICENSEE EVENT REPORT (LER)

Form Rev 2.0

Facility Name (1) Quad Cities Unit One  
 Docket Number (2) 0 | 5 | 0 | 0 | 0 | 2 | 5 | 4  
 Page (3) 1 | of | 0 | 5  
 Title (4) Toxic Gas Analyzer Inoperable Due To A Failure Of The LCU In The Control Circuitry And Poor Electrical Connections On The Control Circuitry.

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   8	1   1	9   2	9   2	0   1   8	0   0	0   9	0   9	9   2	Quad Cities Unit Two	0   5   0   0   0   2   6   5

OPERATING MODE (9) 4  
 THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10CFR (Check one or more of the following) (11)  
 20.402(h) \_\_\_\_\_ 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)  
 20.505(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: Michael Harms, Ext. 2159  
 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 NPRDS		CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS	

SUPPLEMENTAL REPORT EXPECTED (14)

Expected Submission Date (15) \_\_\_\_\_  
 [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 August 11, 1992, at 1030 hours, Unit One and Unit Two were in the RUN mode at 75 and 100 percent of rated core thermal power, respectively. At this time, the Control Room [NA] (CR) ventilation toxic gas analyzer was declared inoperable. On August 21, 1992, at 1100 hours, Unit One and Unit Two were in the RUN mode at 70 and 98 percent of rated core thermal power. At this time, the toxic gas analyzer was declared inoperable.

The apparent cause of the first event was the failure of the local control unit (LCU) in the control circuitry for the analyzer. The apparent cause of the second event was poor workmanship on the electrical connections to the control circuitry for the analyzer.

The corrective actions taken for the first event included replacing the LCU. The corrective actions taken for the second event included repairing the poor electrical connections. One future corrective action for this event will be to provide training on methods that can be used to verify unique wiring connections.

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

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TEXT Energy Industry Identification System (EIIS) 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: Toxic Gas Analyzer Inoperable Due To A Failure Of The LCU In The Control Circuitry And Poor Electrical Connections On The Control Circuitry.

A. CONDITIONS PRIOR TO EVENT:

Unit: One                                      Event Date: August 11, 1992                      Event Time: 1030  
 Reactor Mode: 4                                      Mode Name: RIJN                                      Power Level: 75%

This report was initiated by Deviation Report D-4-01-92-085.

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 August 11, 1992, at 1030 hours, Unit One and Unit Two were in the RUN mode at 75 and 100 percent of rated core thermal power, respectively. During performance of QIS 79-2, "Chlorine Analyzer Functional Test Procedure," the chlorine analyzer did not provide an automatic Control Room [NA] (CR) ventilation isolation signal. The CR ventilation was manually isolated, QOS 5750-01, "Control Room Ventilation Toxic Gas Analyzer Inoperable Outage Report," was initiated, and Nuclear Work Request (NWR) Q02470 was written to investigate and repair the analyzer. At 1354 hours, an Emergency Notification System (ENS) phone call was made per 10CFR50.72(b)(2)(iii)(D).

On August 12, 1992, the Instrument Maintenance Department (IMD) began troubleshooting the analyzer. An IMD technician substituted an electronic probe simulator in place of the installed probe. The simulator did not provide the expected system response, thereby allowing the IMD to conclude that the analyzer problem was with the control circuitry that operates the analyzer and not with the installed probe. The IMD technician then proceeded to check the power supply [JX] and internal connections of the control circuitry and discovered no problems. The following day, the voltages of the control circuitry were checked and no problems were discovered. The results of the two days of troubleshooting enabled the IMD to establish that the problem must be a faulty component in the control circuitry, such as the local processing unit (LPU) or the local control unit (LCU).

On August 18, 1992, a vendor representative from Anacon, Inc. arrived on site to assist in further troubleshooting. Checks on the LPU and LCU revealed that the erasable/programmable read only memory (EPROM) in the LCU was not functioning properly. The LCU was replaced.

## LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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

On August 19, 1992, a calibration using QIS 79-1, "Chlorine Analyzer Calibration Procedure," and functional test using QIS 79-2 were performed on the analyzer. At 1645 hours, the analyzer was declared operable and QOS 5750-01 was closed out.

The August 21, 1992, at 1100 hours, Unit One and Unit Two were in the RUN mode at 70 and 98 percent of rated core thermal power, respectively. At this time, the chlorine analyzer was declared inoperable due to a data loss alarm [ALM] on the analyzer. This alarm provides indication that the analyzer is not capable of monitoring the CR ventilation for chlorine gas due to a problem with the control circuitry for the analyzer. The CR ventilation was manually isolated, QOS 5750-01 was initiated and NWR Q02607 was written to investigate and repair the analyzer. At 1238 hours, an ENS phone call was made per 10CFR50.72(b)(2)(iii)(D). During troubleshooting that afternoon, an IMD technician noted that the wires between the LPU and LCU did not appear to be making proper contact with their respective terminal strips. These wires had been lifted and relanded during troubleshooting and repairs of the LCU a few days earlier. The technician repaired the wire ends, some of which appeared frayed, and relanded them. The data loss alarm cleared and remained cleared. A successful functional test was performed using QIS 79-2.

On August 22, 1992, an analyzer calibration using QIS 79-1 and another functional test using QIS 79-2 were successfully completed. The station decided at this time to leave the CR ventilation isolated until the station was confident that the analyzer was operating properly.

On August 29, 1992, NWR Q02607 was completed, QOS 5750-01 was closed out at 0515 hours, and the toxic gas analyzer was declared operable.

C. APPARENT CAUSE OF EVENT:

This report is being submitted in accordance with 10CFR50.73(a)(2)(v), which requires the licensee to 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.

The apparent cause of the first event was a failure of the EPROM in the LCU of the control circuitry for the chlorine analyzer. The EPROM displayed no signs of external damage and has never been repaired or replaced since the toxic gas analyzer was declared operable on March 27, 1985. Discussions with Anacon, Inc. revealed that this component had reached or exceeded its normal life expectancy and that the failure was apparently a normal end of useful life failure.

The apparent cause of the second event was poor workmanship in making the electrical connections for the wires between the LPU and LCU. The connections between the LPU and LCU are unique in that it is an open stranded wire that fits into a socket and then a screw tightens down to hold the wire in place. The poor connections were made during repairs for the first event.



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

D. SAFETY ANALYSIS OF EVENT:

The safety significance of the chlorine analyzer inability to provide an automatic isolation of the CR ventilation was minimal. The chlorine analyzer has been proven by recent chemical surveys of the site boundary and surrounding areas to provide a function that is not necessary for the safety of CR personnel. These surveys have shown that the system can be removed from operation with no ill effects on CR personnel safety. Since the analyzer is not needed, a Technical Specification change is currently awaiting approval to remove the analyzer from the plant license and allow for its physical removal. Therefore, the fact that the chlorine analyzer was not able to perform its function of automatically isolating the CR ventilation poses a negligible threat to the safety of the CR personnel.

The safety significance of the data loss alarm annunciating on the chlorine analyzer was also minimal. The design function of this alarm is to warn personnel of a potential problem with the analyzer so that appropriate actions may be taken. The appropriate action in this event, a manual isolation of the CR ventilation, was performed immediately upon discovering the problem. Additionally, the chlorine analyzer is visually inspected once every shift. Therefore, the alarm would be discovered within an 8 hour shift and the CR ventilation would be manually isolated.

E. CORRECTIVE ACTIONS:

The immediate corrective actions for the event involving the failure of the chlorine analyzer to provide an automatic isolation of the CR ventilation were to declare the toxic gas analyzer inoperable, manually isolate the CR ventilation, initiate QOS 5750-01, and initiate NWR Q02470.

Additional corrective actions were to troubleshoot the analyzer with a vendor representative from Anacon, Inc. The LCU was replaced and a successful calibration using QIS 79-1 and functional test using QIS 79-2 were performed. At 1645 hours on August, 1992, the toxic gas analyzer was declared operable and QOS 5750-01 was closed out.

One future corrective action will be to perform an evaluation to determine what preventative maintenance needs to be done to the LCU and other components of the control circuitry for the analyzer (NTS #2542009208501).

The immediate corrective actions for the event involving the data loss alarm on the chlorine analyzer were to declare the toxic gas analyzer inoperable, manually isolate the CR ventilation, initiate QOS 5750-01, and initiate NWR Q02607.

Additional corrective actions were to troubleshoot and repair the poor electrical connections between the LPU and LCU. A successful calibration using QIS 79-1 and functional test using QIS 72-2 were performed. At 0515 hours on August 29, 1992, the toxic gas analyzer was declared operable and QOS 5750-01 was closed out.

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All departments that perform lead lifts and lands will be trained on this event. Emphasis will be placed on methods that can be used to verify that leads are properly landed when unique wiring connections exist (NTS #2542009208502).

F. PREVIOUS EVENTS:

There are no previous Licensee Event Reports (LER) where the CR ventilation toxic gas analyzer was made inoperable due to a failure of the control circuitry for the analyzer.

There are two previous LERs where a poor electrical connection was made by a maintenance technician.

LER 04-01-87-017 (LER 87-003), RCIC Inoperable Due to a Loose Cold Solder Joint in the Setpoint Tape Chassis Section of the Electronic Controller."

DVR 04-02-91-057 (LER 91-08), "Closure of A.O. 2-220-45 Due to Defective Connections in the Control Circuitry."

G. COMPONENT FAILURE DATA:

The LCU with its associated EPROM is manufactured by Anacon, Inc., Part #170030.