



Commonwealth Edison

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RLB-89-132

June 28, 1989

U. S. Nuclear Regulatory Commission
Document Control Desk
Washington, DC 20555

Reference: Quad Cities Nuclear Power Station
Docket Number 50-265, DPR-30, Unit Two

Enclosed is Licensee Event Report (LER) 89-003, 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)(i)(B): The licensee shall report any operation or condition prohibited by the plant's Technical Specifications.

Respectfully,

COMMONWEALTH EDISON COMPANY
QUAD CITIES NUCLEAR POWER STATION

R. L. Bax
R. L. Bax *for RLB*
Station Manager

RLB/AAF/eb

Enclosure

cc: R. Stols
R. Higgins
INPO Records Center
NRC Region III

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LICENSEE EVENT REPORT (LER)

Form Rev 2.0

Facility Name (1) Quad Cities Unit Two Docket Number (2) 0 | 5 | 0 | 0 | 0 | 2 | 6 | 5 Page (3) 1 | of | 0 | 4

Title (4) Loss of Secondary Containment During Search for Grounds on 125 VDC

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 5	2 9	8 9	8 9	0 0 3	0 0	0 6	2 8	8 9		0 5 0 0 0

OPERATING MODE (9) 4

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

<input type="checkbox"/> 20.402(b)	<input type="checkbox"/> 20.405(c)	<input type="checkbox"/> 50.73(a)(2)(iv)	<input type="checkbox"/> 73.71(b)
<input type="checkbox"/> 20.405(a)(1)(i)	<input type="checkbox"/> 50.36(c)(1)	<input type="checkbox"/> 50.73(a)(2)(v)	<input type="checkbox"/> 73.71(c)
<input type="checkbox"/> 20.405(a)(1)(ii)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(vii)	<input type="checkbox"/> Other (Specify
<input type="checkbox"/> 20.405(a)(1)(iii)	<input checked="" type="checkbox"/> 50.73(a)(2)(i)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)	in Abstract
<input type="checkbox"/> 20.405(a)(1)(iv)	<input type="checkbox"/> 50.73(a)(2)(ii)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)	below and in
<input type="checkbox"/> 20.405(a)(1)(v)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(x)	Text)

LICENSEE CONTACT FOR THIS LER (12)

Name: Rob Korneta, Technical Staff Engineer, Ext. 2158

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	MANUFAC-TURER	REPORTABLE TO NPRDS	CAUSE	SYSTEM	COMPONENT	MANUFAC-TURER	REPORTABLE TO NPRDS

SUPPLEMENTAL REPORT EXPECTED (14)

Yes (If yes, complete EXPECTED SUBMISSION DATE) NO

Expected Submission Date (15)

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

On May 29, 1989, Quad Cities Unit Two was operating in the RUN mode at 98 percent of rated core thermal power. At approximately 1930 hours, while performing a procedure for locating DC grounds, the Equipment Operator opened breaker 12 on the 125 VDC Reactor Building Distribution Panel 2, then closed the breaker. At 0015 hours, on May 30, 1989, the 647' elevation Turbine Building to Reactor Building interlock doors were found standing open. The doors were immediately closed, and it was determined that opening breaker 12 failed the power to the electromagnetic catches on these doors, allowing the differential pressure between the Reactor Building the Turbine Building to open the doors.

The procedure for locating DC grounds will be revised to include a caution concerning these doors, and the design of the doors will be evaluated. This report is submitted to comply with 10CFR50.73(a)(2)(i)(B).

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TEXT Energy Industry Identification System (EIIIS) 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: Loss of Secondary Containment During Search for Grounds on 125 VDC

A. CONDITIONS PRIOR TO EVENT:

Unit: Two Event Date: May 29, 1989 Event Time: 0015
 Reactor Mode: 4 Mode Name: RUN Power Level: 98%

This report was initiated by Deviation Report D-4-02-89-025.

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 May 29, 1989, Quad Cities Unit Two was operating in the RUN mode at approximately 98 percent of rated core thermal power. At 1828 hours, the Unit Two 125 VDC ground alarm was received in the Control Room. An Equipment Operator (EO) was sent to the battery charger room and found that the ground detector read 100 VDC in the positive ground detection mode and 20 VDC in the negative ground detection mode. Station procedures based on corporate guidelines require immediate action at a reading of + or - 72 VDC.

At this time, the Shift Engineer (SE) authorized initiation of QOP 6900-7, 125 Volt DC Ground Detection Unit Two, to locate the source of the ground. The procedure requires Operating to toggle various circuit breakers in an effort to isolate the ground. The first set of circuit breakers is labeled "Green," meaning that the SE can authorize their operation.

At approximately 1930 hours, the EO opened the 125 VDC Reactor Building Distribution Panel 2, Breaker 12 ("U-1/2 EL 647' RX/TURB BLDG INTLK"). This breaker is located in the Reactor Building at elevation 623'. Opening this breaker caused the electromagnetic catches on the 647' elevation Turbine Building to Reactor Building interlock doors to de-energize. Due to the differential pressure between the Reactor Building and the Turbine Building, the Unit Two Reactor Building door and the Turbine Building door came open. Having these two doors open at the same time constituted a violation of secondary containment.

The operator at the ground detector during this surveillance reported no change in the reading. The EO then closed breaker 12 (restoring power to the door interlock circuit) and continued with the green switches per procedure. Because the door was already open, restoring power to the electromagnetic catches did not affect its position. The green switches were completed at approximately 1940 hours.

The interlock doors were discovered open by an Operator during performance of plant rounds at 0015 hours on May 30, 1989. The Operator immediately closed the doors restoring secondary containment and notified the SE. It is estimated that secondary containment was lost for 4 hours and 45 minutes.

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C. APPARENT CAUSE OF EVENT:

This event is being reported according to 10CFR50.73(a)(2)(i)(B): The licensee shall report any operation or condition prohibited by the plant Technical Specifications.

The cause of this event was inadequate design of the 647' elevation interlock doors. The current design at this location allows both the Turbine Building door and the Reactor Building doors to swing open in the direction of the Reactor Building. Also, the springs which provide the closing force for these doors are not strong enough to oppose the differential pressure normally present between the Reactor Building and Turbine Building. These conditions together allow the doors to go open during a loss of 125 VDC. Other interlock doors in the plant which utilize the 125 VDC control circuit have doors which swing open in opposing directions preventing a differential pressure on either side of the interlock from opening both doors simultaneously.

D. SAFETY ANALYSIS OF EVENT:

The loss of secondary containment was significant due to the length of time it went undetected. The event occurred at a time when traffic in the plant was low. Plant rounds are performed once per shift, usually at the beginning of each shift. The event occurred after the 3 p.m. to 11 p.m. shift had already performed their rounds.

The Control Room had no direct indication of the loss of secondary containment. No annunciators or fan trips occurred. This indicates that negative Reactor Building differential pressure was never lost.

The effect on public safety was minimal due to the fact that the power to the electromagnetic catches was off for only a few minutes. After the power was restored, any accident resulting in a release would have caused a trip of the Reactor Building ventilation fans allowing the differential pressure between the Reactor Building and the Turbine Building to decrease. Without the differential pressure to hold the doors open, the closing springs would have been able to close the doors, and they would have stayed closed due to the electromagnetic catches being re-energized.

E. CORRECTIVE ACTIONS:

The immediate corrective action was for the Operator to close the interlock doors and notify the SE.

On May 30, 1989, a mechanical block was installed on the 647' elevation Turbine Building interlock door. This prevents this event from recurring until the interlock door design can be reviewed.

Temporary procedure changes were initiated on May 30, 1989, for procedures QOP 6900-6, 125 Volt DC Ground Detection Unit One, and QOP 6900-7, 125 Volt DC Ground Detection Unit Two. The changes added a note which alerts the Operator that de-energizing breaker 12 could cause the interlock doors to open; therefore, personnel should be stationed at the doors to prevent this from occurring. These temporary procedure changes were also submitted as permanent procedure changes. Similar changes were made to the steps involving the other interlock door circuit breakers (NTS 2652008902501).

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The interlock doors were designed as part of Modification M-4-1/2-74-014 and installed in August of 1978. Corporate Engineering was contacted to research the original design specification for the interlock doors. They provided the station with recommendations for modifications to the 647' Turbine/Reactor Building interlock doors to insure the doors meet the design of the FSAR and the design requirements of the containment interlock door purchase specifications. The station has initiated modifications to correct the discrepancy (NTS 2652008902502).

A permanent procedure change was initiated on May 31, 1989, for QOA 6900-2, Loss of Unit One 125 VDC Supply. A step was added which alerts Control Room personnel that the loss of the Unit One 125 VDC supply can cause a possible loss of secondary containment due to failure of Reactor/Turbine Building interlock doors. A second step was also added to station an Operator at the Unit 1/2 elevation 647' Reactor/Turbine Building interlock and the Unit One elevation 595' Reactor/Turbine Building interlock to ensure that secondary containment is maintained. Similar changes were made to QOA 6900-4, Loss of Unit Two 125 VDC Supply (NTS 2752008902503).

F. PREVIOUS EVENTS:

No previously documented events have occurred at the Quad Cities Station where loss of 125 VDC power has caused both interlock doors to swing open simultaneously. However, there have been events in the past where two interlock doors have been open at the same time. These events are documented in the following Deviation Reports:

- 4-2-88-039 Secondary Containment Interlock Door Malfunction Due to Design Problem
- 4-1-88-022 1/2 Diesel Generator Area Interlock Failure Due to Jammed Electric Strike
- 4-1-87-112 Door Closure Mechanism Out of Adjustment Between 1/2 Diesel Generator and Reactor Building
- 4-1-87-093 Secondary Containment Door Malfunction Due to Being Out of Adjustment and Design Problem
- 4-1-87-012 High Pressure Coolant Injection Interlocks and 1/2 DG/Reactor Building Interlocks Out of Adjustment

G. COMPONENT FAILURE DATA:

This event was not due to a component failure.