



Commonwealth Edison

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RLB-92-109

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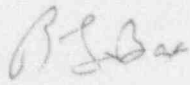
Reference: Quad Cities Nuclear Power Station
Docket Number 50-254. DPR-29, Unit One

Enclosed is Licensee Event Report (LER) 92-010, 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)(iv). The licensee shall report any event or condition that resulted in manual or automatic actuation of any Engineered Safety Feature.

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 II

Handwritten initials/signature

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 | 8
 Title (4) Loss Of Unit One 125 VDC Turbine Building Bus 1A And 1A-2 From Tripped Disconnects Due To Personnel Error

Event Date (5) Month: 0 | 4 | Day: 0 | 7 | Year: 9 | 2
 LER Number (6) Sequential Number: 0 | 1 | 0 | Revision Number: 0 | 0
 Report Date (7) Month: 0 | 5 | Day: 0 | 7 | Year: 9 | 2
 Other Facilities Involved (8) Facility Names: Quad Cities Unit Two
 Docket Number(s): 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)
 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) 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: Kevin R. Brohm, Technical Staff Engineer, Ext. 2149
 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)

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 April 7, 1992, at 1256 hours, Unit One was in the RUN mode at 100 percent of rated core thermal power when a total loss of 125 VDC occurred. On April 9, 1992, at 2258 hours, Unit One was in the RUN mode at 100 percent of rated core thermal power when a loss of the 125 VDC distribution panel 1A-2 occurred. Both of these events resulted in a loss of Unit One 125 VDC supply, causing a loss of all Unit One and common panel annunciators and the 1A recirculation pump to coast down to minimum speed.

The loss of the Unit One 125 VDC supply events were due to personnel error. On both occasions, contractors, working in the Unit One battery charger room, inadvertently actuated disconnect handles causing loss of 125 VDC supply.

Plexiglass covers were placed over the disconnects until work is complete in the charge rooms and the disconnects have been secured in position. In addition, a three phase contractor control and overview program has been established to enhance the work being performed by contractors.

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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: Loss of Unit One 125 VDC Turbine Building Bus 1A and 1A-2 from tripped disconnects due to personnel error.

A. CONDITIONS PRIOR TO EVENT:

Unit: One Event Date: April 7, 1992 Event Time: 1256
 Reactor Mode: 4 Mode Name: RUN Power Level: 100%

This report was initiated by Deviation Report D-4-1-92-030 and D-4-1-92-032.

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:

At 1256 hours on April 7, 1992, Unit One was in the RUN mode at 100 percent core thermal power and Unit Two was in Cold Shutdown for a scheduled refuel outage. An unanticipated loss of the Unit One 125 VDC [EJ] supply occurred when a contractor brushed the Bus 1A main feed disconnect handle while climbing down a ladder used for work associated with a modification to the 1/2 250 VDC batter charger, also located in the room. DC power to Division One on Unit One and Division Two on Unit Two was lost, causing the loss of Unit One and common panel annunciators [ANN].

The Unit One Nuclear Station Operator (NSO) noticed that reactor [RCT] power began decreasing and reactor water level began increasing, due to the 1A Recirculation Pump [P] coasting down when a loss of the Motor-Generator (MG) [MG] set lubrication oil pump occurred. The DC emergency oil pump then started, supplying oil to the bearings of the 1A MG set. The NSO entered QOA 6900-2, Total Loss of Unit One 125 VDC, and performed corrective actions as required. The Control Room dispatched an Equipment Operator (EO) to the Unit One battery charger [BYC] room to investigate the cause of the event.

At 1300 hours, the EO arrived at the Unit One battery charger room and found two contractor electricians in the room. The EO also found the 125 VDC Bus 1A supply fusible [FU] disconnect [DISC] on Battery Bus #1 in the open position. This fusible disconnect isolates the Unit One battery chargers and battery from bus 1A, which supplies DC power to Division One on Unit One and Division Two on Unit Two.

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The EO notified the Control Room of the cause for the loss of DC power. The Shift Engineer (SE) briefed the NSOs on the expected responses after re-energizing Bus 1A. After the briefing, the EO was told to close the 125 VDC Bus 1A supply disconnect. The 1A Reactor Recirculation MG set tripped from 34 percent speed upon closing the disconnect, as expected, due to energizing the pump trip relay [94].

At 1303 hours, Unit One entered the instability region and the NSO immediately inserted control rods per QOA 202-4, Loss of Flow-Single Pump, to exit the region. The Shift Control Room Engineer (SCRE) calculated core flow per QOS 202-11, Calculation of Reactor Total Core Flow During One Recirculation Pump Operation, to determine what the flow control line limit would be for the current total core flow. Also at this time, the SE terminated all work in the battery charger room.

In addition to the recirculation pump trip, other automatic actions occurred. The 1-220-44 and 1-220-45 recirculation sample valves [SMV] closed. The 1/2 Diesel Generator (DG) [DG] control power auto-transferred to the Unit Two 125 VDC battery [BTKY], which is the reserve supply. The Unit Two Reactor Building (RB) Ventilation system [VA] tripped upon loss of the RB vent control power, however the Unit One RB ventilation system remained on line. DC power for the Unit One RB ventilation control cabinet is supplied by the Unit Two 125 V battery system. The 1/2 A Standby Gas Treatment System (SBGTS) [BH] was on prior to the loss of DC and remained running throughout the event for venting the Unit 2 drywell.

At 1305 hours, the loss of 125 VDC Bus 1A was classified as a Generating Station Emergency Plan (GSEP) Alert in accordance with QEP 200-T1, Quad Cities Emergency Action Levels, condition 3.1, Unplanned Loss of Most or All Annunciators on 901-3, 5, and 8 panels. At 1310 hours, the GSEP Alert was terminated because all annunciators on Unit One and common panels were restored.

At 1313 hours, Unit One exited the instability region of the power-flow map by reducing the flow control line with control rod insertion. Unit One was holding at 320 MWe with 1B Recirculation pump at 66% speed.

At 1315 hours, a Nuclear Accident Reporting System (NARS) call was made for GSEP Alert and termination. At 1341 hours, an Emergency Notification System (ENS) phone notification was completed as required by 10CFR50.72(a)(1)(i). The call was made on commercial lines when it was discovered that the ENS phone was not working. The ENS call was to notify the Nuclear Regulatory Commission (NRC) of the loss of annunciators, loss of ENS telephone system, Recirculation system sample valve closure, and GSEP Alert.

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At 1412 hours, the 1A recirculation pump was restarted and the NSO was instructed to increase reactor power to full load. At 1558 hours, additional information was supplied to the NRC on the ENS telephone on the closure of Unit 2 Reactor Building Ventilation Dampers and loss of both Diesel Generators to Unit Two for four minutes while Unit One 125 VDC power was lost. The Unit Two Diesel Generator control power is supplied by the Unit One 125 VDC battery. The 1/2 Diesel Generator (DG) auto-start capability was out of service to Unit Two.

Prior to continuing work in the Unit One batter charger room, a plexiglass cover was built over the disconnect handles on Battery Bus #1 to prevent reoccurrence of the event. In addition, it was decided that scaffolding was to be built to avoid the use of a portable step ladder.

On April 9, 1992, at 2258 hours, Unit One was in the RUN mode at 100 percent of rated core thermal power when a loss of all Unit One and common panel annunciators occurred.

The 1A Recirculation Pump started to coast down due to a loss of the 1A MG set lubrication oil pump and the emergency oil pump started to supply lubrication oil to the bearings of the 1A MG set. The Unit One NSO responded per procedure QOA 202-4 and inserted control rods until the flow control line on the power/flow map had been reduced to 80 percent or less to exit the region of potential instability. An EO was dispatched to the Unit One battery charger room to investigate.

At 2305 hours, the loss of annunciators was classified as a GSEP Alert based upon QEP 200-T1. The EO found the fusible disconnect to 125 VDC distribution panel 1A-2, located on Bus 1A, in the open position. This panel is located next to Battery Bus #1 and feeds the Unit One and common panel annunciators, 4KV Bus 11 which feeds the 1A Recirculation MG set, and the Unit One Reactor Core Isolation Cooling (RCIC) [BN] system logic panel located in the Auxiliary Electric room. With the loss of DC power to the RCIC logic, RCIC auto-start capability is operable. It was indicated to the EO that during the construction of scaffolding in the battery charger room, the main disconnect to distribution panel 1A-2 was caught in a contractor's pants pocket. When the contractor bent down to assist in the scaffolding installation, the disconnect was tripped.

The SE instructed the EO to reclose the main disconnect to panel 1A-2. All Unit One and common panel annunciators were restored and the 1A Recirculation pump tripped, as expected, from 32 percent speed. At 2310 hours, the GSEP Alert was terminated due to restoration of the Unit One annunciators. At 2313, the NARS notification was made for the GSEP Alert.

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At 2339 hours, the Station Manager issued a complete stop work order for all contractor personnel. At 2354 hours, a one hour ENS call was made for the GSEP Alert in accordance with 10CFR50.72(a)(1)(1). The NRC was also notified about the loss of the Unit One RCIC auto-start capability for the duration panel 1A-2 was de-energized. At 0320 hours, the 1A Recirculation Pump was restarted and at 0530 hours, the NSO was instructed to increase reactor power.

C. APPARENT CAUSE OF EVENT:

This report is being submitted in accordance with 10CFR50.73(a)(2)(iv) and 10CFR50.73(a)(2)(v)(D): Any event or condition that resulted in manual or automatic actuation of any Engineered Safety Feature (ESF), including the Reactor Protection System (RPS) and 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 root cause of these events are personnel error. On April 7, a contractor was descending a step ladder after performing modification work in the battery charger room when his foot came off the ladder and brushed a fusible disconnect on Battery Bus #1 causing it to open.

A contributing cause to the event is that the location in the battery charger room where the contractor was working is a congested area where attention to detail is important and attentiveness is required.

On April 9, during construction of scaffolding, a contractor caught his pants pocket on the disconnect handle and opened the disconnect. The contractor had been briefed on the sensitivity of the job and the importance of not bumping the equipment in the room. He apparently lost track of his location in relation to the fusible disconnects.

A contributing factor is that the fusible disconnects on Bus 1A were not protected. Contractor and Operating personnel performed a walkdown of the battery charger room prior to commencement of work on April 9, 1992. An Operations Shift Foreman suggested installing plexiglass covers over the disconnect handles on Bus 1A similar to that performed earlier on Battery Bus #1. However, upon further discussion, all walkdown participants mutually agreed not to install protective covers over the disconnect handles prior to the erection of the scaffolding.

D. SAFETY ANALYSIS OF EVENT:

The safety to the public and plant personnel was not affected by this event. Technical Specification 3.9.C.3 allows continued reactor operation for 3 days in the event one of the two 125 V battery systems is made or found inoperable. The Unit Two 125 V battery was operable during the events. Shutdown of Unit One, if required, may be performed without Unit One 125 V supply in accordance with QOA 6900-2.

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If a simultaneous Loss of Coolant Accident (LOCA) and Loss of Offsite Power (LOOP) had occurred during the April 7 event, 4KV switchgear 14 and 14-1 would still have been available to supply power to the "B" loops of the Residual Heat Removal (RHR) [BO] and Core Spray (CS) [BM] systems. The Unit One DG would have been available to supply power to Buses 14 and 14-1. One loop of RHR and CS is sufficient to bring the reactor to a safe condition, if required. Unit Two was in cold shutdown when its division 2 of 125 VDC was lost. However, 4kv switchgear 23 and 23-1 would still have been available to supply power to the "A" loops of RHR and CS. The 1/2 DG auto-start to Unit Two, though defeated due to undervoltage modification installation, could have been started and loaded manually, if required, to supply emergency power to Bus 23-1 and 23.

The Unit One RCIC auto-start capability was inoperable during both events when DC power was lost to the 901-48 panel. The HPCI system was operable during these two events because DC power for the auto-start logic is provided by the Unit Two 125 VDC supply. In addition, RCIC was capable of manual initiation in accordance with QCOP 1300-9, RCIC Local Manual Operation.

The Unit One NSO immediately realized that the 1A Recirculation M-G set and Pump had tripped and promptly began to execute QOA 202-4 in order to prevent experiencing flux oscillations. If instability had developed, the immediate actions of the NSO would have suppressed the oscillations. In the event oscillations had developed on the Average Power Range Monitors (APRMS) or Local Power Range Monitors (LPRMs), the NSO would have manually scrammed the reactor in accordance with QOA 202-4, thus placing the reactor in a safe condition. A review of the APRM chart recorder after both events confirmed that no flux oscillations occurred.

E. CORRECTIVE ACTIONS:

The immediate corrective actions for both occurrences was to reclose the respective fusible disconnects and restore 125 VDC to the equipment and divisions that were de-energized. The NSO exited the region of potential instability by inserting control rods to reduce the flow control line. On April 8, 1992, a safety meeting was held and in attendance was the contract electrician group, Engineering and Construction (ENC) personnel, and the Production Superintendent. The root cause, action taken to correct the event, and corrective actions to prevent recurrence were addressed. After the second event, all work being performed by contractors was terminated until a plan of action for heightened contractor control was established. Discipline was administered to the contractor personnel involved in the two incidents.

To prevent further unplanned manipulations of the disconnects, plexiglass covers have been placed over all the disconnects in the Unit One battery charger room until the modification work, which was in progress when these events occurred, is completed. Also, the disconnect handles have been secured in position on both Units.

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A corrective action program on contractor control has been established. The first phase was completed during the termination of contractor work and involved drawing on shift operating experience to aid in pointing out the potential problem areas in the plant on specific job sites.

Phase two was implemented on April 22, 1992 as directed by a letter from the Production Superintendent to Operations Shift Personnel (GFS-92-002). This phase requires that Station personnel overview contractor activities on a shift basis. Operating support for pre-job walkdowns for sensitive areas of the plant including the battery and battery charger rooms, auxiliary electric room, main Control Room, diesel generator rooms, and instrument racks. These walkdowns require an Operations Department cognizant to approve that adequate guidance and precautions have been provided to allow the work to proceed. The Operations shift will continue to be cognizant on planned contractor activities each shift at the shift briefing meeting and is encouraged to overview contractor activities to the extent necessary to ensure that work is progressing in satisfactory manner.

A final long term plan which incorporates permanent changes to the contractor control program will be implemented as phase three. This phase will be based on the review of the overview activities during the first two phases (NTS 2542009203001).

Finally, the Operations department will revise the scaffold request procedure to add a note that will remind the reviewers of scaffold requests that they are also assessing the dangers associated with work of actually installing the scaffold (NTS 2542009203002).

F. PREVIOUS EVENTS:

There were nine LERs in the past five years due to inattention to detail personnel errors:

- 1) 254/91-020 Missed Technical Specification Surveillance for Recombiner Outlet Temperature/Reactor Power.
- 2) 254/90-024 Missed Technical Specification Surveillance for continuous fire watch.
- 3) 265/90-011 Full reactor scram from IRM 13 and 16 HI-HI.
- 4) 254/90-019 Missed Technical Specification surveillances on the main steam line radiation monitors due to operators misjudgements.
- 5) 254/898-020 Full Reactor scram during transfer of the 24/48V distribution panels during Out-of-Service work.

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- 6) 265/89-005 Unit Two full Reactor scram from main stop valve closure.
- 7) 265/88-019 Reactor Building vent isolation while taking valve 2-1601-56 Out of Service.
- 8) 254/88-010 Drywell atmosphere thermocouple splices found not environmentally qualified.
- 9) 265/87-011 Full Reactor scram from reactor low level and Group 2 and 3 isolations while performing QIS 11-2.

There were two previous events regarding loss of the Control Room annunciators. Deviation Report 04-02-92-016 reported that all annunciators for Unit Two were lost due to a main fuse failure on the 902-34 panel during modification to enhance the annunciator system. LER 254/92-006 reported loss of Unit One annunciators due to a power surge during a lightning strike blowing a fuse in the main annunciator panel. The station is currently reviewing its lightning protection for future enhancements.

G. COMPONENT FAILURE DATA:

This event did not involve equipment failure.