LICENSEE EVENT REPORT (LER)

Facility Name (1)	Docket Number (2)	Page (3)
QUAD-CITIES NUCLEAR POWER STATION, UNIT TWO	0 5 0 0 0 2 6 5	1 of 2 3

Title (4) REACTOR WATER CLEANUP SYSTEM VALVE CLOSURE DUE TO LIGHTNING CAUSING ELECTRIC BUS TRIP

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 0 0 0
0 5	2 0	8 7	8 7	0 0 7	0 0	0 6	0 8	8 7		0 5 0 0 0

OPERATING MODE (9)	4
POWER LEVEL (10)	0 9 0

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

___ 20.402(b)	___ 20.405(c)	x 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	TELEPHONE NUMBER
K. J. HILL, Technical Staff Engineer, Ext. 2150	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)	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)

On May 20, 1987, at 0350 hours, Quad Cities Unit Two was operating in the RUN mode at approximately 90 percent core thermal power. At this time, the Reactor Water Cleanup System (RWCU) isolated (Group III) and several Group II inboard isolation valves automatically closed due to 480 VAC Feed to Bus 28 tripping. At 0405 hours, normal power to Bus 28 was restored, the RWCU System was returned to normal and the Group II isolation valves which closed were reopened.

The cause for this event is attributed to an electrical storm in the area which resulted in a lightning strike to a meteorological tower. The power surge from the lightning bolt backfed to Bus 28 causing the main breaker for that bus to trip. The relay which initiates RWCU system isolation valve closure on high water temperature lost power when Bus 28 tripped and this caused the RWCU isolation. The Group II valves that closed during this event did not close due to a valid isolation signal, but due to a loss of power to the trip logic for the valves.

The local power transformer and distribution panel circuit breakers were found damaged and were replaced. An evaluation was performed to determine if the breaker tripping sequence was proper. It was determined the breaker trip setting coordination was proper but a recommendation to trip check the associated breakers is to be performed when conditions permit. This report is submitted to comply with the requirements of 10 CFR 50-73 (a)(2)(iv).

IE22

PLANT AND SYSTEM IDENTIFICATION:

General Electric - Boiling Water Reactor - 2511 MWt rated core thermal power. Energy Industry Identification System (EIIS) codes are identified in the text as [XX].

EVENT IDENTIFICATION:

The Unit Two Reactor Water Cleanup System isolation valves closed due to loss of Bus 28 during electrical storm.

A. CONDITIONS PRIOR TO EVENT:

Unit: Two Event Date: May 20, 1987 Event Time: 0350
Reactor Mode: 1 Mode Name: RUN Power Level: 90%

This report was initiated by Deviation Report D-4-2-87-031

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).

DESCRIPTION OF EVENT:

On May 20, 1987, at 0350 hours, Quad Cities Unit Two was operating in the RUN mode at approximately 90 percent core thermal power. At this time, the main 480 VAC Feed circuit breaker to 480 VAC switchgear Bus 28 [ED] tripped. Bus 28 is an Engineered Safeguards System, Division I bus. This trip was immediately followed by closure of the Group III Reactor Water Cleanup (RWCU) [CE] isolation valve [JM] 1-1201-5. The 1-1201-80 valve also closed as designed (although it is not a Group III isolation valve). The other Group III isolation valve did not close because its power supply was lost as a result of the Bus 28 trip. An alarm "Group III ISO NOT RESET" was received, and several inboard isolation valves [JM] normally associated with a Group II isolation (Pressure Suppression System [JM] and Oxygen Analyzer System [IK]) also closed. A Shift Foreman and Equipment Attendant were dispatched to Bus 28 and discovered undervoltage relays 227-1 and 227-2 had tripped. The two relays were reset and at 0405 hours, the Unit Operator successfully restored normal power to Bus 28. The "GROUP III ISO NOT RESET" alarm was reset, the Reactor Water Cleanup System (RWCU) was returned to normal, and the Group II isolation valves which closed were reopened.

C. APPARENT CAUSE OF EVENT:

This report is submitted in accordance with the Code of Federal Regulations, Title 10, Part 50.73 (a)(2)(iv), which required the reporting of "any event or condition that results in manual or automatic actuation of any Engineered Safety Feature, including the Reactor Protection System."

The apparent cause of this event has been attributed to an electrical storm which was in the vicinity of the plant at the time of the event. It is suspected that a bolt of lightning hit the meteorological tower [IS] which is located approximately 1000 feet northeast of the plant. This tower is fed from Motor Control Center (MCC) 28-3 which is fed from Bus 28. The power surge from the lightning bolt backfed to Bus 28 causing the main breaker for that bus to trip.

The relay which initiates Reactor Water Cleanup (RWCU) isolation valve closure on high water temperature lost power when Bus 28 tripped. This trip is intended to prevent damage to the RWCU demineralizer resins due to high temperatures. The loss of power simulated a high temperature condition and caused isolation of the RWCU system. The valve closure then resulted in the Control Room receiving a "GROUP III ISOLATION NOT RESET" alarm. The closure of several Group II isolation valves was not caused by a Group II isolation signal, but loss of power to the trip logic for the valves.

D. SAFETY ANALYSIS OF EVENT:

The safety of the public and plant personnel was never affected during this event. Normal Group III isolation occurs upon receipt of a reactor low water level signal (+8 inches). In this situation, the RWCU system isolation was not a result of abnormal reactor operation. RWCU system isolation does not affect safe operation of the reactor but may result in increased reactor water conductivity if isolated for a prolonged length of time. The short amount of time that the system was isolated did not result in any noticeable increase in reactor water conductivity.

E. CORRECTIVE ACTIONS:

The local power transformer and distribution panel circuit breakers for the meteorological tower were found to be damaged by the lightning strike and were replaced. There was no damage to MCC 28-3 or Bus 28. The Station Electrical Engineering Department was contacted to evaluate the trip setting coordination of the main feed circuit breakers for MCC 28-3 and Bus 28 since the main feed circuit breaker for Bus 28 tripped before the main feed circuit breaker for MCC 28-3 or the feed breaker to the meteorological tower tripped. The results of their review indicated that the coordination was proper, however it was recommended that Bus 28, MCC 28-3 feed breaker, and the meteorological tower feed breaker be trip checked to verify their correct operation. This action will be scheduled for an appropriate opportunity and will be tracked under Action Item #26578087007.

F. PREVIOUS EVENTS:

There are no previous reportable events involving RWCU system isolation as a result of a breaker trip from an electrical storm.

G. COMPONENT FAILURE DATA:

Not applicable.

Commonwealth Edison

DEVIATION REPORT

OVR NO. 4 - 2 - 87 - 031
STA UNIT YEAR NO.

PART 1 TITLE OF DEVIATION

GROUP III ISOLATION

OCCURRED 5/20/87 DATE 0350 TIME

SYSTEM AFFECTED: 1200

PLANT STATUS AT TIME OF EVENT: MODE RUN, POWER(%) 90

WORK REQUEST NO.:

TESTING: ☐ YES ☒ NO

DESCRIPTION OF EVENT

Received Group III isolation and ½ grp. I & II, and A channel scram, because Bus 28 was lost. Lightning is the suspected culprit.

POTENTIALLY SIGNIFICANT EVENT PER NSO DIRECTIVE A-07 ☐ YES ☒ NO

10CFR50.72 NRC RED PHONE NOTIFICATION MADE ☐ 1 HOUR ☒ 4 HOUR 0615 TIME ☐ NO

RESPONSIBLE SUPERVISOR: D.C. Bucknell DATE: 5/20/87

PART 2 OPERATING ENGINEER'S COMMENTS

The Gr. III isol. was a result of the loss of the 2ARPS bus. This caused a false reactor water cleanup system high temperature signal and subsequent cleanup system isolation.

☐ NON REPORTABLE EVENT

☒ 30 DAY REPORTABLE/10CFR 50.73 (a) (2) (IV)

☐ 5 DAY REPORT PER 10CFR21

☐ ANNUAL/SPECIAL REPORT REQUIRED

A.I.R. #

L.E.R. # 87-007

NOTIFICATION REGION III DATE TIME

NSO DATE TIME

☐ CECO CORPORATE NOTIFICATION MADE IF ABOVE NOTIFICATION IS PER 10CFR21

TELECOPY CECO CORPORATE OFFICER DATE TIME

PRELIMINARY REPORT COMPLETED AND REVIEWED H.G. Lihou OPERATING ENGINEER 5/20/87 DATE

INVESTIGATION REPORT & RESOLUTION ACCEPTED BY STATION REVIEW

RESOLUTION APPROVED AND AUTHORIZED FOR DISTRIBUTION STATION MANAGER 6-12-87 DATE

88-5178 3-1-85 (FORM 15-52-1)

Commonwealth Edison
Quad Cities Nuclear Power Station
22710 206 Avenue North
Cordova, Illinois 61242
Telephone 309/654-2241

RLB-87-150

June 8, 1987

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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 please find Licensee Event Report (LER) 87-007, 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), which requires the reporting of any event or condition that results in manual or automatic actuation of any Engineered Safety Feature, including the Reactor Protection System.

Respectfully,

COMMONWEALTH EDISON COMPANY
QUAD-CITIES NUCLEAR POWER STATION

R. L. Bax
Station Manager

RLB/MSK/rk

Enclosure

cc: I. Johnson
R. Higgins
INPO Records Center
NRC Region III

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