



**Commonwealth Edison**

Quad Cities Nuclear Power Station  
22710 206 Avenue North  
Cordova, Illinois 61242-9740  
Telephone 309/654-2241

RLB-90-169

July 2, 1990

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) 90-007, 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)(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  
Station Manager

RLB/MJB/jso

Enclosure

cc: R. Stols  
T. Taylor  
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  
 Title (4) Partial Loss of RPIS Due to Blown Fuse  
 Docket Number (2) 0 | 5 | 0 | 0 | 0 | 2 | 6 | 5 | 1 | of | 0 | 4  
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Partial Loss of RPIS Due to Blown Fuse.

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	3	1	9	0	9	0	0	0	0
0	5	3	1	9	0	9	0	0	0	0

OPERATING  
MODE (9)

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

POWER LEVEL (10)	1	0	0	4	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
					20.405(a)(1)(iii)	50.73(a)(2)(i)	50.73(a)(2)(viii)(A)	in Abstract
					20.405(a)(1)(iv)	50.73(a)(2)(ii)	50.73(a)(2)(viii)(B)	below and in
					20.405(a)(1)(v)	50.73(a)(2)(iii)	50.73(a)(2)(x)	Text)

## LICENSEE CONTACT FOR THIS LER (12)

Name M. Brown Regulatory Assurance Ext. 3102  
 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	
X	E	E	I	F	U	X	9	9	9	N	

## 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)

## ABSTRACT:

On May 31, 1990 at 1615 hours, Unit Two was in the RUN mode at 100 percent of rated core thermal power. At this time, the following alarms were received on the 902-5 panel: A-3, ROD DRIFT; B-3, ROD WORTH MIN. BLOCK; E-3, ROD OVERTRAVEL; AND G-5, RPIS INOPERATIVE. Rod position indication (RPIS) had been lost on the lower half of the full core display and 4 rod display. An Equipment Operator (EO) was dispatched to the 902-27 and 28 panels to investigate.

The cause of the event was found to be due to a blown power supply fuse in the 902-27 panel.

Immediate corrective action involved the Unit Operator monitoring average and local power range monitors (APRM) (LPRM) to ensure steady state power levels were maintained. The blown fuse was replaced at 1643 hours which restored full rod position indication. Further corrective action will include submitting a Technical Specification change and upgrading and existing procedure.

This report is being submitted in accordance with 10 CFR 50.73(a)(2)(i)(B).

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			Page (3)	
		Year	Sequential Number	Revision Number		
Quad Cities Unit Two	0   5   0   0   0   2   6   5	9   0	-   0   0   7	-   0   0	0   2	OF 0   4
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: Partial Loss of RPIS Due to Blown Fuse.

A. CONDITIONS PRIOR TO EVENT:

Unit: Two                      Event Date: May 31, 1990                      Event Time: 1615  
Reactor Mode: 4                      Mode Name: RUN                      Power Level: 100%

This report was initiated by Deviation Report D-4-2-90-030

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 31, 1990 at 1615 hours, Unit Two was in the RUN mode at 100 percent of rated core thermal power. At this time, the following alarms [ALM] were received on the 902-5 panel [PL] [IB]: A-3, ROD DRIFT; B-3, ROD WORTH MIN. BLOCK; E-3, ROD OVERTRAVEL; and, G-5, RPIS INOPERATIVE. Rod position indication (RPIS) [AA] was lost on full core display for rods [ROD] in rows 1 through 8 except for R-7 and R-8. Also, RPIS for the aforementioned rods was lost on the 4 rod display. Rod drift lights [IL] came up for all rods that had lost position indication on the full core display.

Due to the nature of the failure, a blown fuse was immediately suspected as the cause and an Equipment Operator (EO) was dispatched to the 902-27 and 28 panels [PL] to investigate. The Unit Nuclear Station Operator (NSO) began monitoring average power range monitoring (APRM) [IG] and local power range monitoring (LPRM) [IG] to ensure steady state power was maintained. Procedure QOA 900-5-G (G-5), RPIS INOPERATIVE, was entered. The Shift Control Room Engineer (SCRE) notified the Shift Engineer (SE) of the event. No other abnormal plant conditions were observed.

At 1643 hours, 28 minutes after the event occurred, fuse [FU] F-1 in the 902-27 panel junction box [JBX] was found blown. The fuse was replaced like-for-like and full RPIS was restored and alarms cleared. Fuse F-1 is a 30 ampere rated fuse with the electric power supply [JX] coming from the 120 volt AC (VAC) Essential Service [EC] System. When the fuse blew, this resulted in the loss of RPIS.

Upon RPIS restoration, a verification of control rod positions was performed. The verification was completed by comparing current control rod positions, OD-7, with control rod positions prior to the event from OD-17, Core Performance Calculations (CPC). No control rod movement had occurred.



FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)				Page (3)			
		Year	/	Sequential Number	/	Revision Number			
Quad Cities Unit Two	0   5   0   0   0   2   6   5	9   0	-	0   0   7	-	0   0	0   3	OF	0   4
TEXT: Energy Industry Identification System (EIIS) codes are identified in the text as [XX]									

Work Request Q85103 was written to investigate the fuse failure.

There were no other structures, systems, or components inoperable or degraded at the start of this event that could have contributed to the event.

#### C. APPARENT CAUSE OF EVENT:

This report is being submitted in accordance with 10 CFR 50.73(a)(2)(i)(B): The licensee shall report any operation or condition prohibited by the plant's Technical Specification.

Technical Specification 3.3.A.3. covers determining the position of a single control rod from RPIS. If the position of a control rod cannot be determined from the RPIS, such control rod shall be moved to a known position or fully inserted, scrammed and considered inoperable. As this event dealt with the loss of more than one control rod, Technical Specification 3.0.A. applied. The Shift Engineer was preparing to manually scram the unit within one hour if the problem could not be found.

The cause of this event was due to a blown fuse. The fuse failure is being attributed to random component failure. The system was checked for an overcurrent condition and none was found.

It is believed a contributing cause of the fuse failure was due to the panel cooling fan [FAN] failing. During the performance of work request Q85103, it was discovered that the panel cooling fan had failed, resulting in a higher than normal panel temperature. This higher panel temperature contributed to the failure of the fuse.

#### D. SAFETY ANALYSIS OF EVENT:

This event involved the loss of RPIS indication to approximately half of the control rods. No alternate method was available for determining the positions of these control rods. The Rod Worth Minimizer (RWM) and the Core Performance Calculation Program were unavailable during the event since both require known control rod positions. Although these rods had not moved, their drift lights were all lit. The LPRMs and APRMs were used to detect rod drifts by monitoring for power changes in the core.

The safety consequences of this event were minimal. This event occurred at full power with nearly steady state xenon conditions and lasted for less than one half hour. Although rod pattern adjustments were not possible, the reactor could be manually scrammed at any time and brought safely to a cold shutdown condition. Even with more severe initial conditions such as operating the unit at full power after a large load increase, the loss of RPIS for an extended period of time would still have minimal safety consequences. A large load increase could result in a large reactivity addition to the core with the xenon transient taking place. This reactivity addition could be easily monitored using the LPRMs and APRMs.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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FACILITY NAME (1)  Quad Cities Unit Two	DOCKET NUMBER (2)  0   5   0   0   0   2   6   5   9   0   -   0   0   7   -   0   0	LER NUMBER (6)			Page (3)  0   4   OF   0   4
		Year	Sequential Number	Revision Number	
TEXT      Energy Industry Identification System (EIIS) codes are identified in the text as [XX]					

This monitoring would also help detect rod drifts. A slow change in an LPRM reading would indicate a change in reactivity due to xenon while a step change would indicate a rod drift. Thus, with the continued monitoring, the chance of fuel damage was minimal. The loss of RPIS prevented control rod movement using the Reactor Manual Control System; however, at no time was there a loss of ability to scram the reactor and bring the unit safely to a cold shutdown condition. At no time was there any increase in the probability for a rod drift. The LPRMs and APRMs were available at all times to monitor any reactivity additions to the core.

**E. CORRECTIVE ACTIONS:**

The immediate corrective actions included: dispatching an EO to the panel to investigate, the NSO monitoring APRMs and LPRMs to verify steady state power, and entering procedure QOA 900-5-G. The blown fuse was replaced like-for-like and normal RPIS was restored. Control rod positions before and after the event were compared and no rod movement had occurred. The panel cooling fan was replaced and other fuses in the panel inspected and found adequate.

During the course of this event, it was discovered that a specific procedure needed to be written to cover a loss of RPIS for more than 1 rod. A procedure is in the process of being written and QOA 900-5-G (G-5) will be enhanced (NTS 2652009003001).

A Technical Specification change will be requested to clarify the loss of RPIS specification (NTS 2652009003002).

**F. PREVIOUS EVENTS:**

There were 2 other similar reportable events that dealt with fuses failing due to random component failure. LER 265/88-015 was written because of a partial Group II Engineered Safety Feature (ESF) actuation due to a blown fuse. There was no known reason for the fuse blowing. LER 254/85-021 was written as a result of a fuse blowing due to normal end-of-life. This resulted in RCIC being inoperative.

No other documented events were found that involved a blown fuse with RPIS.

A discussion with the NPRDS Coordinator revealed that an NPRDS search would not be appropriate for this event due to the RPIS system not being an NPRDS reportable system and fuses not being a reportable item.

Based on the corrective actions, no further action is deemed necessary.

**G. COMPONENT FAILURE DATA:**

The fuse is a 30 amp, Buss MIN-30.