

Licensee Event Report  
Reviewer Assignment Form

Revised 08/10/94

LER # 265\94-010

Date: August 29, 1994

Subject: Control Rod D-11 Unplanned Scram From Position 48 To 00 During Instrument  
Maintenance Surveillance.

Signatures of reviewers indicating review and approval of item:

Systems Eng. Supv:	<u>BR Stutzman</u> <sup>BAI 9-23-94</sup> Date <u>9-16-94</u>	<u>KH Fleming</u> <sup>BAI 9-23-94</sup> Date <u>9-16-94</u>
Operating Eng.:	<u>DA Clark</u> <sup>DC 9/23/94</sup> Date <u>9-16-94</u>	<u>[Signature]</u> <sup>NY 9-23-94</sup> Date <u>9-16-94</u>
Technical Supt.:	<u>[Signature]</u> Date <u>9/26/94</u>	<u>[Signature]</u> Date <u>9/28/94</u>

Approved:

[Signature]  
PORC Chairman  
(If not Station Manager)

19/28/94  
Date

Approved:

[Signature]  
Station Manager

1  
Date



**Commonwealth Edison**

Quad Cities Nuclear Power Station  
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GGC-94-119

September 28, 1994

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) 94-010, Revision 00, for Quad Cities Nuclear Power Plant 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.

The following commitments are being made by this letter:

An expansion of the sampling program of the diaphragms is being performed to gather more data. Material analysis will be performed by General Electric Co.

An accelerated repair/replacement program of all the suspect SSPV diaphragms on Unit 1 and 2 began September 28, 1994.

A supplement to this report will be issued when the results of the General Electric Co. analysis are received.

If there are any questions or comments concerning this letter, please refer them to Nick Chrissotimos, Regulatory Assurance Administrator at 309-654-2241, ext. 3100.

Respectfully,

COMMONWEALTH EDISON  
QUAD CITIES NUCLEAR POWER STATION

*for*   
G.G. Campbell  
Station Manager

GGC/TB/plm  
Enclosure

cc: J. Schrage  
C. Miller

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   5									
Title (4) Control Rod D-11 Unplanned Scram From Position 48 to 00 During Instrument Maintenance Surveillance																								
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 Name	Docket Number(s)													
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OPERATING MODE (9) 04			THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10CFR (Check one or more of the following) (11)																					
POWER LEVEL (10) 9   8			<input type="checkbox"/> 20.402(b)				<input type="checkbox"/> 20.405(c)				<input checked="" 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)				Other (Specify in Abstract below and in Text)									
			<input type="checkbox"/> 20.405(a)(1)(iii)				<input type="checkbox"/> 50.73(a)(2)(i)				<input type="checkbox"/> 50.73(a)(2)(viii)(A)													
			<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)													
			<input type="checkbox"/> 20.405(a)(1)(v)				<input type="checkbox"/> 50.73(a)(2)(iii)				<input type="checkbox"/> 50.73(a)(2)(x)													
LICENSEE CONTACT FOR THIS LER (12)																								
NAME Keven Floming, Regulatory Assurance, Ext. 2789										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															
B	A   A	S   O   L	A   6   1   0	Y																				
SUPPLEMENTAL REPORT EXPECTED (14)																								
<input checked="" type="checkbox"/> YES (If yes, complete EXPECTED SUBMISSION DATE)										Expected Submission Date (15)		Month	Day	Year										
<input type="checkbox"/> NO																								
ABSTRACT (Limit to 1400 spaces, i.e., approximately fifteen single-space typewritten lines) (16)																								

# ABSTRACT:

On 08-29-94, Unit 2 was in the run mode at 98% rated core thermal power. The Instrument Maintenance Department (IMD) was performing a monthly surveillance when a channel B 1/2 scram signal was intentionally inserted, and caused an unplanned scram of Control Rod Drive (CRD) [AA] D-11 from position 48 to 00.

The unplanned scram of CRD D-11 was due to instrument air leakage past the exhaust port diaphragm of the 117 scram solenoid pilot valve (SSPV) (SOL). This caused the 127 scram outlet valve to open when the channel B 1/2 scram signal was inserted.

Corrective actions included taking Hydraulic Control Unit (HCU) D-11 out-of-service, rebuilding the HCU SSPVs, and rebuilding the 127 scram outlet valve.

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Quad Cities Unit Two					0   5   0   0   0   2   6   5					9   4		-   0   1   0		-   0   0		2   OF   0   5	
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: Control Rod D-11 Unplanned Scram from position 48 to 00 during Instrument Maintenance Surveillance.

### A. CONDITIONS PRIOR TO EVENT:

Unit: Two                      Event Date: August 29, 1994                      Event Time: 0953  
Reactor Mode: 4                      Mode Name: Run                      Power Level: 98

This report was initiated by Licensee Event Report 265\94-010.

RUN (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 approximately 0953 on 08-29-94, Unit 2 was in the run mode at 98% rated core thermal power. The Instrument Maintenance Department (IMD) was performing Monthly Low and Low-Low Reactor Water Level Analog Trip System Calibration and Functional Testing (QCIS 200-3).

Per procedure, QCIS 200-3, a 1/2 scram signal was inserted on Reactor Protection System (RPS) [JC] channel B. When the channel B 1/2 scram was received, alarm A-3, ROD DRIFT, annunciated on the 902-5 panel and an unplanned scram of Control Rod Drive (CRD) [AA] D-11 (14-43) from position 48 to 00 was observed. The channel B 1/2 scram was reset at approximately 0954.

An Operator and Shift Foreman (SF) were dispatched to the CRD D-11 Hydraulic Control Unit (HCU) to investigate. The operator checked the scram solenoid pilot valves (SSPV) for air leaks, their associated fuses to determine if they were blown, ensured the solenoids were energized by using a solenoid tester, and measured the scram exhaust line temperature with a thermography gun. No abnormalities were noted; however, a Nuclear Work Request (NWR) deficiency tag was found on the 127 scram outlet valve stating water was leaking by the valve seat.

Immediate corrective actions included notifying the Unit Supervisor (US), Shift Engineer (SE), a Qualified Nuclear Engineer (QNE), and the System Engineer. The IMD surveillance was also suspended pending re-authorization by the US.

The QNE determined no immediate control rod movements were required to adjust neutron flux profile.

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

At approximately 1230, CRD D-11 HCU was taken out-of-service for Operations and electrically disarmed. The IMD surveillance was re-started at approximately 1250.

NWR Q17779 was initiated to rebuild the 117 and 118 SSPVs. Problem Identification Form (PIF) 94-2140 was initiated to investigate the event. An existing work request, Q16701, addressed the repair of the 127 scram outlet valve.

An Emergency Notification System (ENS) notification of this event was completed at 1259 hours on August 29, 1994 to comply with the requirements of 10 CFR 50.72 (b) (2) (ii).

There were no systems or components inoperable at the beginning of this event which could have contributed to this event.

C. CAUSE OF EVENT:

This report is being submitted in accordance with 10 CFR 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 (ESF) [JE], including the RPS.

The following is a summary of conclusions and Causal Factors (C/F) relating to problems which may have influenced and/or contributed to equipment malfunctions.

C/F: Equipment Specification, Manufacture and Construction

The unplanned scram of CRD D-11 was due to instrument air leakage past the exhaust port diaphragm of the 117 SSPV. This caused the 127 scram outlet valve to open when a channel B 1/2 scram signal was inserted.

SSPV 117 and 118 were rebuilt under NWR Q17779. All four diaphragms were hard and brittle; one was found to have a tear approximately 180 degrees around the circumference. Two others had minor defects on the surface. CRD D-11 SSPVs were last rebuilt in March of 1990.

This type of material degradation has been identified in General Electric Company (G080) Rapid Information Communication Services Information Letter (RICSIL) NO. 069 dated May 2, 1994. SSPVs that may contain the suspect diaphragm kits have been identified. The diaphragms from a sample of the identified SSPVs have been examined and showed increased hardness.

Scram outlet valve 127 was rebuilt under NWR Q16701. It was determined the leakage did not contribute to this event.



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		Year		Sequential Number		Revision Number		
		9   4	-	0   1   0	-	0   0		

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

**D. SAFETY ANALYSIS OF EVENT:**

1. The safety significance with having CRD D-11 inadvertently scram is considered minimal. Because the rod scrambled into "00", there were no control rod blade tip enhancement problems.

The scram of D-11 provided negative reactivity. However, if the rod were required to scram on a full-core scram, it would have performed its function. Therefore, there was no shutdown margin concern for this event.

2. This failure mode of diaphragm degradation can also result in the failure of a control rod to scram on an individual scram signal. If a SSPV failure caused the failure of a control rod to scram, the backup scram valves would ensure the control rod would insert into the core on a manual or automatic full core scram signal.
  - There have been two failures to scram since December 3, 1993. Actions have been implemented to expedite replacement of the suspect SSPV diaphragms to reduce the likelihood of further failures.
  - All of the 1990 and 1991 vintage suspect SSPVs have recently experienced hot scram timing. Unit One scram timing was completed 9-2-94. Unit Two scram timing was completed 8-30-94. All of the CRDs with suspect SSPV diaphragms meet the Technical Specification scram time requirements.
  - There has been no indication of an adverse trend of the overall Technical Specification average scram insertion times due to SSPV degradation.
  - Based on a sample of diaphragms provided by Quad Cities, General Electric reports that the hardness of the Quad Cities SSPV diaphragms were not as severe as that reported by other plants experiencing scram anomalies. General Electric also reports that we should not expect to see a marked increase in the failure rate.

**E. CORRECTIVE ACTIONS COMPLETED:**

The immediate corrective actions involved the Operations Department sending an operator and Shift Foreman to visually inspect HCU D-11. The operator checked the SSPVs for air leaks, checked for blown fuses, ensured the solenoids were energized, and checked for flow in the scram exhaust line. No abnormalities were noted; however a deficiency tag was found on the 127 scram outlet valve stating water was leaking by the valve seat.

CRD D-11 was taken out-of-service and electrically disarmed.

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

The SSPVs, 117 and 118, were rebuilt under NWR Q17779; this included the replacement of the diaphragms. The scram outlet valve, 127, was rebuilt under NWR Q16701. This work was completed and CRD D-11 was successfully tested and declared operable on 09-04-94.

CORRECTIVE ACTIONS TO BE COMPLETED:

An expansion of the sampling program of the diaphragms is being performed to gather more data. Material analysis will be performed by General Electric Co. (NTS# 26518094001001).

An accelerated repair/replacement program of all the suspect SSPV diaphragms on Unit 1 and 2 began September 28, 1994. (NTS# 26518094001002).

A supplement to this report will be issued when the results of the General Electric Co. analysis are received. (NTS# 26518094001003).

F. PREVIOUS EVENTS:

General Electric Company RICSIL 069 Rev. 1 has identified this as an industry wide problem.

The Nuclear Tracking System data base listed one LER involving CRD drift or scram at Quad Cities Station for the period from January 1, 1989 to present.

- LER 254/94-001, dated 1-24-94, Rod Drift of Control Rod H-1 From Position 48 to 14 During Instrument Maintenance Surveillance

G. COMPONENT FAILURE DATA:

This event is reportable to the Nuclear Plant Reliability Data System (NPRDS).

The SSPVs are manufactured by the Automatic Switch Company (ASCo) (A610) with manufacturer part number HVA90-405-2J.

The rebuild kits for the ASCo valves are manufacturer part number 204-137.