



Commonwealth Edison

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

RLB-89-122

June 20, 1989

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

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

Enclosed is Licensee Event Report (LER) 89-005, 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)(v)(B): The licensee shall report any event or condition that alone could have prevented the fulfillment of the safety function of structures or systems that are needed to remove residual heat.

Respectfully,

COMMONWEALTH EDISON COMPANY
QUAD CITIES NUCLEAR POWER STATION

Raymond L. Baer
R. L. Baer
Station Manager

RLB/AAF/ad

Enclosure

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

2008H

8906270181 890620
PDR ADOCK 05000254
S PDC

IE22
11

LICENSEE EVENT REPORT (LER)

Form Rev 2.0

Facility Name (1)

Docket Number (2)

Page (3)

Quad Cities Unit One

0 5 0 0 0 2 5 4 1 of 0 4

Title (4)

Reactor Core Isolation Cooling System Inoperable Due to a Broken Steam Line High Flow Switch

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	8	9	8	9	0	5	0	0
0	5	2	8	9	8	9	0	5	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)	X 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	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
X	B	N	D P I S I	2 0 4	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)

At 1435 hours on May 22, 1989, Unit One was at 100 percent power. At this time, the Reactor Core Isolation Cooling (RCIC) system was declared inoperable due to a differential pressure switch used to isolate the system on steam line high flow, which failed to calibrate properly.

The cause of this event is a worn trip setpoint locking mechanism which prevented the switch from tripping at the correct setpoint. The locking screw broke while trying to recalibrate the switch, which rendered the switch inoperable.

The switch was replaced and the new switch calibrated and returned to service at 1800 hours on May 24, 1989.

This event will be discussed with maintenance personnel to stress the importance of caution and attention to detail when performing assigned tasks. This report is submitted to comply with 10CFR50.73(a)(2)(v)(B).

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)						Page (3)		
		Year	///	Sequential Number	///	Revision Number				
Quad Cities Unit One	0 5 0 0 0 2 5 4	8 9	-	0 0 5	-	0 0	0 2	OF	0 4	

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: Reactor Core Isolation Cooling System Inoperable Due to a Broken Steam Line High Flow Switch

A. CONDITIONS PRIOR TO EVENT:

Unit: One Event Date: May 22, 1989 Event Time: 1435
Reactor Mode: 4 Mode Name: RUN Power Level: 100%

This report was initiated by Deviation Report D-4-1-89-043.

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 1435 hours, on May 22, 1989, Unit One was operating in the RUN mode at 100 percent of rated core thermal power. Prior to this time, Instrument Maintenance (IM) personnel were in the process of performing QIS 18-1, Reactor Core Isolation Cooling (RCIC) [BN] Steam Line High Flow Calibration. During this calibration, it was discovered that one side of differential pressure indicating switch (DPIS) [PDIS] 1-1360-1B, which initiates a system isolation on a high flow condition, would not trip. The Instrument Mechanic attempted to recalibrate the switch, but the switch still failed to trip. The Instrument Mechanic notified the IM Foreman, who in turn notified the Shift Engineer of the switch failure.

Unit One RCIC was declared inoperable at 1435 hours on May 22, 1989, and QOS 1300-01, RCIC System Outage Report, was initiated. The RCIC turbine steam supply isolation valves [ISV], MO 1-1301-16 and 17, were taken out of service in the closed position in order to satisfy Technical Specification requirements for Primary Containment Isolation (PCI) [JM]. NRC notification of the event via the Emergency Notification System (ENS) was completed at 1535 hours on May 22, 1989, to comply with the requirements of 10CFR50.72.

Nuclear Work Request Q75912 was initiated to repair or replace the RCIC steam line high flow switch. At approximately 1530 hours on May 22, 1989, an IM was sent to the Unit One RCIC room to try to repair the switch. The IM removed the face of the switch and found that the switch setpoint locking mechanism was loose and allowing the switch to move.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

Form Rev 2.0

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			Page (3)		
		Year	///	Sequential Number	///	Revision Number	
Quad Cities Unit One	0 5 0 0 0 2 5 4	8 9	-	0 0 5	-	0 0	0 3 OF 0 4

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

The high flow switch consists of a microswitch mounted on a flat plate. The plate rotates around a central hub and has a slot cut into it and a locking screw installed to allow the switch position to be adjusted and secured in place. The switch contacts are activated by a cam which moves in relation to the differential pressure sensed. A washer, normally installed on the locking screw to hold the plate in place, was missing and the plate was held in place by the stem of the screw. The slot into which the screw was installed had become rounded and allowed the plate to slip over the stem of the screw. With the plate loose, the switch was not riding the cam properly.

The IM tried to tighten the screw but was unable to adjust the screw to hold the plate securely. The IM then tried to remove the screw when the tip of the screw broke off. The switch was replaced and QIS 18-1 was successfully completed. The Unit One RCIC system was declared operable and the Outage Report was terminated at 1800 hours on May 24, 1989.

C. APPARENT CAUSE OF EVENT:

This event is being reported according to 10CFR50.73(a)(2)(v)(B): the licensee shall report any event or condition that alone could have prevented the fulfillment of the safety function of structures or systems that are needed to remove residual heat.

The cause of this event is the failure of the RCIC steam line high flow switch due to a switch setpoint locking mechanism that had become severely worn and a washer that was missing. This prevented the switch from being securely fastened at the proper setpoint. It is not known how long the washer had been missing, although the wear on the plate and screw indicated that the mechanism had been adjusted several times without the washer installed.

A review of maintenance records for this switch showed no recent repairs to the switch since April 1, 1982, when the high side microswitch was replaced.

D. SAFETY ANALYSIS OF EVENT:

The safety significance of this event is minimal. Per Technical Specification Section 3.2, the RCIC system isolates at or below 300 percent of rated steam flow in order to prevent core uncover and release of fission products in the event of an RCIC steam line break.

The high flow instrumentation consists of two differential pressure indicating switches, DPIS 1360-1A and 1B. Each switch consists of two sets of contacts connected to two pressure sensing lines. One set of contacts is set to trip at +190 in. H₂O, and the other set of contacts is set to trip at -190 in. H₂O. A trip in the positive direction would indicate a steam line break, and a trip in the negative direction would indicate a break in one leg of the pressure sensing line to the switch. A trip of one contact on either switch will cause an RCIC system isolation.

In this event, one side of DPIS 1-1360-1B was found to have failed while one side of DPIS 1-1360-1B and both sides of DPIS 1-1360-1A were found to trip at acceptable levels. Isolation capability was still ensured by operation of the remaining operable switches.

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)						Page (3)		
		Year	///	Sequential Number	///	Revision Number				
Quad Cities Unit One	0 5 0 0 0 2 5 4	8 9	-	0 0 5	-	0 0	0 4	OF	0 4	

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

The RCIC system was inoperable for a total of 51 hours and 25 minutes for replacement of the switch. Upon declaring Unit One RCIC inoperable, Unit One High Pressure Coolant Injection (HPCI) [BJ] system was tested and proven to be operable at 1730 hours on May 22, 1989, and daily thereafter until RCIC was repaired and verified to be operable.

E. CORRECTIVE ACTIONS:

The immediate corrective action was to replace DPIS 1-1360-1B and return the instrumentation to service. Technical Staff personnel inspected all other accessible Barton differential pressure switches (Model 288, 288A, 289 and 289A) installed at the station. Of the total 52 switches inspected, five were found to have a missing washer on the locking screw and three were found to have an incorrect type of locking screw installed. None of these discrepancies made the switches inoperable but Work Requests were initiated to correct the discrepancies to protect against increased wear (NTS 2542008904302).

This event will be discussed with Instrument Maintenance personnel to make them aware of this type of problem and the value of identifying it early. Early identification of this type of problem would have allowed for scheduling of repair of the switch during a short reactor outage without affecting system availability (NTS 2542008904301).

F. PREVIOUS EVENTS:

There are no previous events at Quad Cities due to a worn setpoint locking mechanism on this type of differential pressure switch or of instrument drift due to a missing washer.

G. COMPONENT FAILURE DATA:

The switch involved in this event was manufactured by ITT Barton, Model Number 288. This switch was replaced with a new ITT Barton Model Number 288A differential pressure switch. This model is a like-for-like replacement for the previous switch.