



**Commonwealth Edison**

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RLB-93-007

January 8, 1993

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) 92-030, 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 III

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LICENSEE EVENT REPORT (LER)

Form Rev 2.0

Facility Name (1) Quad Cities Unit One  
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 Page (3) 1 of 0 5  
 Title (4) 1B Reactor Recirculation Pump Trip While Performing Automatic Depressurization System Logic Testing Due To Personnel Error

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)
1   2	1   3	9   2	9   2	0   3   0	0   0	0   1	0   8	9   3		0   5   0   0   0
										0   5   0   0   0

OPERATING MODE (9) 2  
 THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10CFR (Check one or more of the following) (11)  
 POWER LEVEL (10) 0 | 0 | 0  

<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)	<input type="checkbox"/> 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: Richard J. Swart, RR System Engineer, Ext. 2115  
 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

SUPPLEMENTAL REPORT EXPECTED (14)

[Yes (If yes, complete EXPECTED SUBMISSION DATE)]  NO  
 Expected Submission Date (15) Month | Day | Year

ABSTRACT (Limit to 1400 spaces, i.e. approximately fifteen single-space typewritten lines) (16)

ABSTRACT:

This report is being submitted in accordance with 10CFR50.73(a)(2)(iv).

On December 13, 1992, at 0048 hours, Unit One was in the REFUEL mode for a scheduled refuel outage. Temporary Procedure 8209, Unit 1 Automatic Pressure Relief Actuation Surveillance was being performed as a ground check evolution to verify that 125 VDC and 250 VDC grounds that were received during the same surveillance two days earlier had been properly identified and repaired. At this time, the 1B Reactor Recirculation pump tripped due to inadequate relay logic blocks associated with the procedure.

The root cause of this event is Personnel Error as a result of inadequate communications. This lead to Procedural Inadequacy due to inadequate review.

Corrective actions include suspension of the test, discussion of the event with personnel involved and at department safety meetings. Additionally a revision will be made to the surveillance procedure for both Unit 1 and Unit 2.



## LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)						Page (3)		
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Quad Cities Unit One	0   5   0   0   0   2   5   4	9   2	-   0   3   0	-	0   0	0   3	OF	0   5		

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

An Operating Engineer (OE) decided that portions of the logic test should be performed again to verify that the grounds associated with the low-low level signal were properly identified and repaired. Following the terminal repairs, the RR pumps were in operation. In order to minimize unnecessary RR pump transients, the procedure was to be revised to block the pump trip signals.

An OE and the Shift Control Room Engineer (SCRE) began to review electrical drawings to determine what blocks would be required to prevent the trips. The logic was traced backwards from the RR system circuitry to the Low Pressure Coolant Injection [BO] (LPCI) loop select logic circuitry. The logic was traced to a point where three sets of two parallel contacts enable the LPCI loop select sequence (Figure 2). One of the two contacts in each set is from the 10A-K17A(b) relays, which are denoted as Vessel Low Level on the drawing. The other contacts in each set are from the 10A-K9A(B) and 10A-K10A(B) relays which are denoted as High Drywell Pressure on the drawing. Since the test simulated only a low-low level, the operating coils for the 10A-K17A(B) relays were located and verified to energize on the simulated signal. All contacts of the 10A-K17A(B) relays were to be blocked to prevent the trip of the RR pumps. However, contacts for the 10A-K44A(B) relays provide an interlock between the operating coils on the 10A-K17A(B) relays and the 10A-K9A(B) and 10A-K10A(B) relays (Figure 1). The 10A-K44A(B) contacts close on low reactor pressure, which was present during the test. Thus, the simulated signal would cause all contacts associated with initiation of the LPCI loop select sequence to close, but only the contacts for the 10A-K17A(B) relays would be blocked. The parallel contacts from the 10-K9A(B) and 10A-K10A(B) relays would initiate the loop select sequence. This interlock was not identified by the SCRE or the OE during their review of the drawings.

The OE contacted a Technical Staff (TS) Group Leader (GL) in order to have the test director called in to have the temporary procedure prepared to block the pump trip signals. The OE stated that one trip signal had been identified but a review should be performed to verify that no other trips would occur. The TS GL located an Electrical Engineer (EE) in TS to review the electrical prints and prepare the temporary procedure. The TS GL told the TS EE to verify that the blocks associated with the 10A-K17A(B) relays were correct and that no additional trips signals were present. The TS EE understood his duty to be to determine that the 10A-K17A(B) blocks were adequate to prevent the trip and that actuation of the 10A-K9A(B) and 10A-K10A(B) relays had already been ruled out by the OE and SCRE. This was not clarified with the TS GL.

The TS EE verified that the blocks on contacts of the 10A-K17A(B) relays would prevent the initiation of the LPCI loop select sequence. The TS EE also noted the designation on the drawings for Low Vessel Level and High Drywell Pressure associated with the different contacts, and did not expect that the parallel signal path would close. He also assumed that the SCRE and the OE had verified that these contacts would not close. The TS EE then prepared the temporary procedure and turned the information over to the TS test director when he arrived on site.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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Quad Cities Unit One	0   5   0   0   0   2   5   4	9   2	-   0   3   0	-   0   0	0   4	OF	0   5	

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

The test director reviewed the procedure changes and reviewed the prints to verify that the blocks on the 10A-K17A(B) relays would prevent a pump trip. The test director did not verify that any other trip signals would be present. Temporary procedure (TP) 8209 was then routed for approval.

At 2330 hours on December 12, 1992, the test began. At 0048 on December 13, 1992, step H.2.a, was performed to simulate a low-low level at vessel level instruments 263-72A and 263-72C. At this time, LPCI logic initiated a trip of the 1B RR pump by sending a close signal to the RR discharge valve 1-202-5B. No alarm is received immediately upon a pump trip, and the Nuclear Station Operator (NSO) was observing system actuations and verifying that no grounds had occurred. The signal was then removed from the vessel level instruments. Following this, alarms indicating the pump trip annunciated and the test was suspended. The 1A RR pump did not trip because the simulated level signal was removed before the 1B RR pump coasted down. At 0132 hours, the 1B RR pump was restarted. At 0241 hours, an Emergency Notification System phone notification was made in accordance with 10CFR50.72(b)(2)(ii).

C. APPARENT CAUSE OF EVENT:

This report is being submitted to satisfy the requirements of 10CFR50.73(a)(2)(iv), which requires the licensee to report any event or condition that resulted in manual or automatic actuation of any engineered safety feature.

The root cause of this event is personnel error as a result of inadequate communications during project turnovers. The extent of the electrical review desired by the OE was not understood by the TS engineer who ultimately revised the procedure. Had the intent of the review been fully understood, a more detailed analysis of logic functions would have been performed. This led to Procedural Inadequacy due to inadequate review of TP 8209.

D. SAFETY ANALYSIS OF EVENT:

The safety significance of this event was minimal. The RR pumps are not required to be operable in the REFUEL mode. The pumps are operated primarily to help reduce temperature stratification in the vessel and to aid in efficient heat removal and cleanup of reactor coolant. With one RR pump remaining operable during the event, sufficient recirculation of reactor coolant was available to perform these functions. Had both RR pumps tripped, the pumps associated with the heat removal and cleanup systems would have provided the flow required to maintain proper coolant limits. Additionally, the RR pumps would be immediately available for restart following the reset of the LPCI trip signal.

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E. CORRECTIVE ACTIONS:

The immediate corrective action in this event was the suspension of testing activities. TP 8209 was then rechecked against the electrical prints and the cause of the trip was identified. The 1B RR pump was then restarted.

This event has been discussed with all personnel involved in the preparation of the TP. This event will be discussed at TS and Operations safety meetings. Emphasis will be placed on the need for a complete review of electrical drawings associated with any procedure changes or design changes and the need for better communications at project turnovers (NTS# 2542009214201).

QCTS 310-2 and QTP 110-4, Unit 2 Automatic Pressure Relief Actuation Surveillance will be revised to prevent recurrence of this event. This report will be a reference document listed in the procedure. An option will be included to perform the test with the RR pumps off or to correctly block the LPCI signals from initiating a RR pump trip (NTS# 2542009214202).

F. PREVIOUS EVENTS:

In the past five years, there have been three Licensee Event Reports generated due to Personnel Errors as a result of miscommunications.

LER 265-87-010 Inadvertent draining of the reactor resulting in a reactor scram while attempting to lower level through the RHR system.

LER 254-88-007 "A" SGBT suction from the reactor building blocked from plastic draped over the intake bell due to personnel error.

LER 254-90-014 Missed RETS sample following reactor power increase due to poor communications.

No trend is evident based on these previous events.

G. COMPONENT FAILURE DATA:

There was no component failure associated with this event.

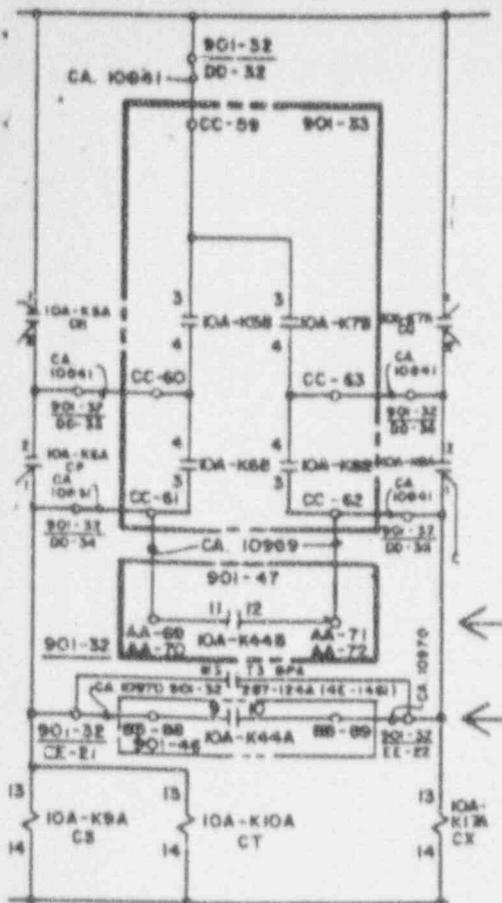


FIGURE 1 RESIDUAL HEAT REMOVAL SYSTEM LOGIC (4E-1438C). Contacts of 10A-K44A(B) relay not identified during reviews. Closed contacts cause 10A-K9A(B) and 10A-K10A(B) to energize when 10A-K17A(B) energizes.

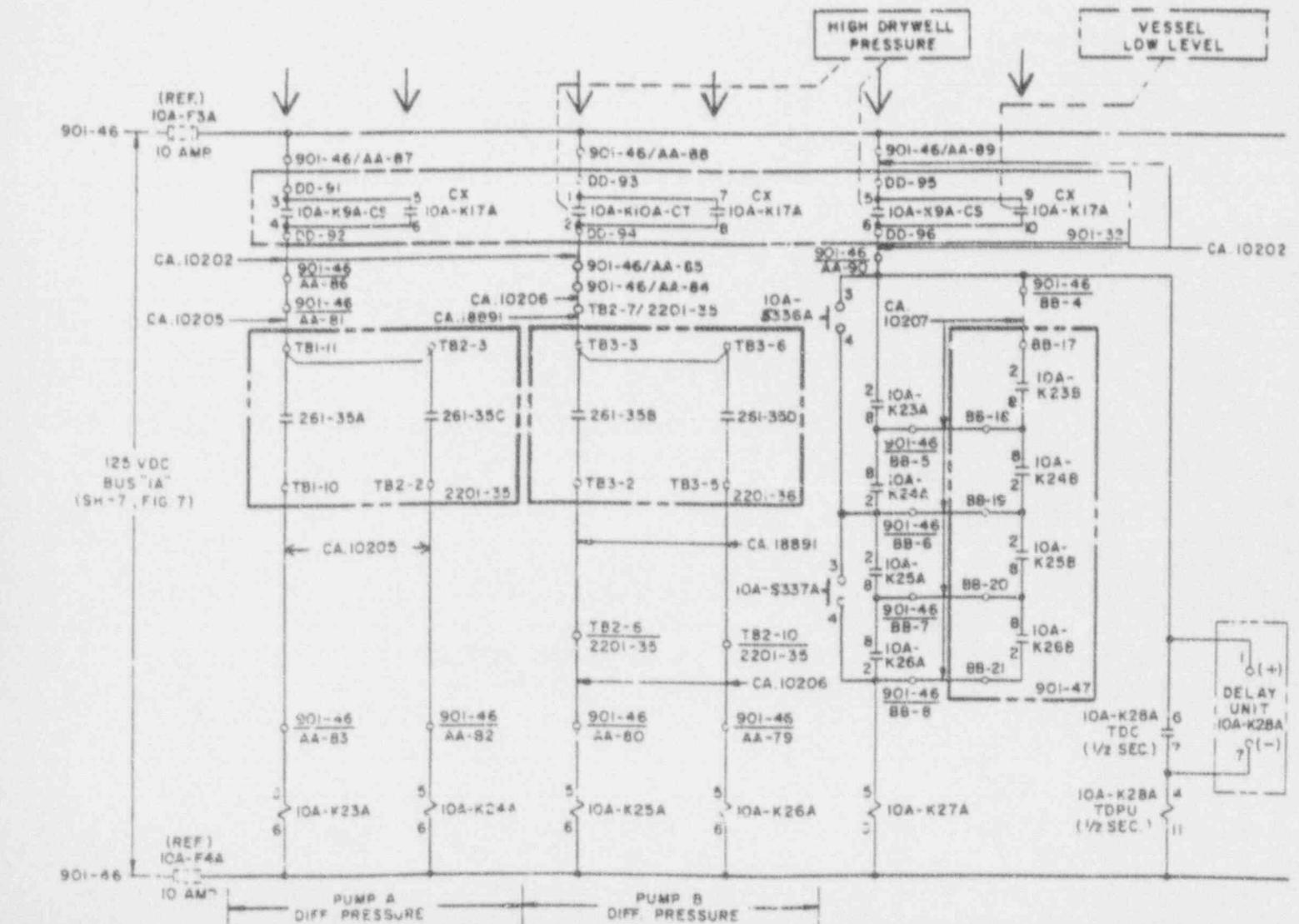


FIGURE 2 LPCI LOOP SELECT INITIATION LOGIC (4E-1438D). Blocks installed on 10A-K17A(B) contacts. Parallel 10A-K9A(B) and 10A-K10A(B) contacts not blocked.

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OPERATING MODE (9) 2  
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<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)	in Abstract
<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)	below and in
<input type="checkbox"/> 20.405(a)(1)(v)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(x)	Text)

LICENSEE CONTACT FOR THIS LER (12)

Name: Richard J. Swart, RR System Engineer, Ext. 2115  
 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) \_\_\_\_\_  
 Yes (If yes, complete EXPECTED SUBMISSION DATE)  NO

ABSTRACT (Limit to 1400 spaces, i.e., approximately fifteen single-space typewritten lines) (16)