



Commonwealth Edison
Byron Nuclear Station
4450 North German Church Road
Byron, Illinois 61010

March 30, 1990

Ltr: BYRON 90-0296


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

Dear Sir:

The enclosed Licensee Event Report from Byron Generating Station is being transmitted to you in accordance with the requirements of 10CFR50.73(a)(2)(iv).

This report is number 90-002; Docket No. 50-454.

Sincerely,


R. Pleniewicz
Station Manager
Byron Nuclear Power Station

RP/dm

Enclosure: Licensee Event Report No. 90-002

cc: A. Bert Davis, NRC Region III Administrator
W. Kropp, NRC Senior Resident Inspector
INPO Record Center
CECo Distribution List

0545R/0065R

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LICENSEE EVENT REPORT (LER)

Form Rev 2.0

Facility Name (1)

Docket Number (2)

Page (3)

Byron, Unit 1

0151010145141 of 03

Title (4) Reactor Trip on OTΔT Due to the Failure of a Resistance Temperature Detector Card Coincident with One Channel in Test.

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)
01	03	01	91	09	01	01	03	21	79	01
									NONE	0151010145141

OPERATING MODE (9) 2

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
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

AREA CODE

A. Javorik, Assistant Technical Staff Supervisor Ext. 2106

8115213415141

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	A	B	A	M	P	W	1	2	0

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 March 1, 1990, at 0939, while in Mode 2, a Unit 1 reactor trip occurred when the 2 out of 4 coincidence was satisfied on Over Temperature Delta Temperature (OTΔT). The failure of the loop 1B Reactor Coolant Resistance Temperature Detector amplifier card concurrent with the previously tripped loop 1A bistables, which was necessary to accommodate low power physics testing, satisfied the trip logic.

The failed card was replaced, but the root cause of the failure is indeterminate.

All systems responded as required, and the Unit was stabilized in Mode 3. This event is reportable per 10CFR 50.73 (a)(2)(iv) for an event that resulted in automatic actuation of an Engineered Safety Feature including the Reactor Protection System.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

Form Rev 2.0

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)						Page (3)		
		Year	///	Sequential	///	Revision				
				Number		Number				
Byron, Unit 1	0 5 0 0 0 4 5 4	9 0	-	0 0 2	-	0 0	0 2	Of	0 3	

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

A. PLANT CONDITIONS PRIOR TO EVENT:

Event Date/Time 03/01/90 / 0939

Unit 1 MODE 2 - Startup Rx Power 0% RCS [AB] Temperature/Pressure Normal Operating

B. DESCRIPTION OF EVENT:

On March 1, 1990, at 0939, with Unit 1 in Mode 2 at 10^{-7} amperes on Intermediate Range, a reactor trip occurred due to a Reactor Coolant [AB] Resistance Temperature Detector (RTD) amplifier card failure concurrent with previously tripped bistables required to accommodate low power physics testing. Per BVS XPT-4 "Initial Criticality After Refueling and Nuclear Heating Levels", the reactivity computer was connected to a Nuclear Instrumentation Power Range channel. Nuclear Instrumentation (NR) [IG] channel N41 was taken Out-of-Service, which resulted in loop 1A bistables TB411C (Over Temperature Delta Temperature Reactor Trip), and TB411D (Over Temperature Delta Temperature Turbine Runback Rod Withdrawal Stop) being tripped. Limiting Condition for Operation Action Requirement (LCOAR) 1BOS 3.1-1a was in effect for the tripped channel. The loop 1B amplifier card (1TY-0421A) failure, coincident with loop 1A channel in test satisfied the logic on an Over Temperature Delta Temperature (OTΔT) reactor trip.

Following the reactor trip signal, all rods fully inserted, and the plant was stabilized in Mode 3. All plant systems responded as required. Operator actions were correct and aided in the immediate recovery and stabilization of the Unit.

This event is reportable pursuant to 10CFR 50.73 (a)(2)(iv) for an event that resulted in an automatic actuation of an Engineered Safety Feature including the Reactor Protection System.

C. CAUSE OF EVENT:

The intermediate cause of the reactor trip was the loop 1B hot leg RTD amplifier card temporarily failing high. The spurious failure resulted in loop 1B OTΔT Reactor Trip bistable actuation. The failure mechanism is indeterminate because the card returned to a normal operating condition. The root cause of the failure is believed to be heat related based on previous failure history, although troubleshooting did not identify a failure mechanism. A contributing factor was the previously tripped loop 1A OTΔT bistables while Power Range Channel N41 was Out-of-Service to accommodate low power physics testing.

D. SAFETY ANALYSIS:

Plant and public safety were not jeopardized by this event. All safety systems operated as designed in response to the trip signal. At no time did actual conditions exist in the reactor core which would cause the OTΔT setpoint to be exceeded. The safety systems would have shutdown the plant under more severe circumstances such as an actual OTΔT transient at full power operation.

E. CORRECTIVE ACTIONS:

The failed RTD amplifier card was replaced and the replacement calibrated under NWR B74473. A replacement for this model of card is not being pursued at this time.

As a conservative measure, the Reactivity Computer was reconnected to Power Range channel N42 (loop 1B) to preclude another spurious trip.

No further corrective actions are planned.
(0545R/0065R)

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								
Byron, Unit 1	0 5 0 0 0 4 5 4	9 0	-	0 0 2	-	0 0								
TEXT	Energy Industry Identification System (EIIS) codes are identified in the text as [XX]												0 3	OF 0 3

F. PREVIOUS OCCURRENCES:

A similar event is documented in LER 87-001 (Docket 455), "Reactor Trip due to 2 out of 4 Logic on Over Temperature channel - 1 channel Out for Required Reactivity Computer, 1 Channel out due to failed Reactor Coolant Resistance Temperature Detector with unknown Cause".

A Total Job Management (TJM) search of the station's maintenance history identified the same card had been replaced on 1/19/90 due to an out of tolerance found during calibration.

In addition Problem Analysis Data Sheet (PADS) 89-109 identified the high incidence of failure of these cards.

G. COMPONENT FAILURE DATA:

a. MANUFACTURER	NOMENCLATURE	MFG PART NUMBER
Westinghouse	RTD Amplifier Card	2837A15G01

b. Results of NPRDS search:

A Nuclear Plant Reliability Data System (NPRDS) search of this model card identified 124 events of failures or out of tolerances. Of these failures, 4 similar events occurred on Unit 1 and 8 similar events occurred on Unit 2. The Component Failure Analysis Report (CFAR) showed a comparable failure rate on Unit 1 as compared to the industry failure rate, and a higher failure rate on Unit 2 when compared to the industry. A review of the NPRDS search did not reveal a common mode failure mechanism.