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

At 2240 on January 15,1987 a Unit 2 Reactor Trip occurred due to a Reactor Coolant Resistance Temperature Detector (RTD) failure, concurrent with a previously tripped bistable required for a startup test procedure. Prior to the trip, an Initial Criticality/Low Power Physics Start-up test was in progress which required the Rector Coolant Loop D Over Temperature Delta Temperature OT $\Delta$ T and Over Temperature Delta Temperature Turbine Runback Rod Withdrawal Stop bistables to be tripped. During performance of the test the a Loop C Narrow Range RTD failed low. The combination of the previously tripped Loop D OT $\Delta$ T bistable and Loop C oT $\Delta$ T bistable trip due to the RTD failure, satisfied a 2/4 Reactor Trip logic coincidence for OT $\Delta$ T. Following the trip all systems responded as required. The event did not compromise plant and/or public safety as a more conservative plant condition resulted. The cause of the RID failure is unknown, and it was replaced by an installed spare. Further investigations will take place on Unit I RTD failures and the results will be reported in a supplement to this report.

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# A. PLANT CONDITIONS PRIOR TO EVENT:

MODE \_ \_ \_ Startup \_\_\_\_ Rx Power \_0% \_\_\_ RCS [AB] Temperature/Pressure Normal Operating

## B. DESCRIPTION OF EVENT:

At 2240 on January 15, 1987, while critical at 0% reactor power. Unit Two experienced a reactor trip [JG]. The primary system remained at normal operating temperature and pressure after the trip.

Prior to the trip, Initial Criticality/Low Power Physics Testing (procedure 2.32.83) was in progress. This procedure required the temporary installation of a Reactivity Computer for Core Physics Testing. In order to facilitate this the Nuclear Instrumentation System [IG] Power Range Channel N-44 had to be de-energized. Technical Specifications requires Loop D Over Temperature Delta Temperature (OT $\Delta$ T) and Over Temperature Delta Temperature Turbine Runback Rod Withdrawal Stop bistables to be tripped if channel N-44 is out of service. Concurrent with these described test requirements, a Loop C Narrow Range Resistance Temperature Detector (RTD)[AB-TIT], 2TE-431B, failed low. This produced a spurious delta temperature above the OT $\Delta$ T setpoint. The combination of the test required OT $\Delta$ T Reactor Trip bistable of the failed RTD resulted in a 2/4 Reactor Trip logic coincidence for OT $\Delta$ T and the subsequent Reactor Trip.

All plant systems responded as required. No other equipment failures contributed to or resulted from the event. The Reactor Coolant Sytem was borated to the required shutdown margin after the trip. This event is reportable pursuant to 10CFR50.73 (a)(2)(iv).

## C. CAUSE OF EVENT:

The intermediate cause of the trip was the Loop C cold leg temperature Narrow Range RTD failing to a low resistance. This resulted in a OT $\Delta$ T Reactor Trip bistable actuation in Loop C. A contributing factor to this event was the previously tripped Loop D OT $\Delta$ T Reactor Trip Bistable. The Loop D bistable was tripped to place it in a conservative state while one of its inputs (NIS Channel N-44) was de-energized. The root cause of the RTD failure is unknown. If a cause is determined as a result of efforts mentioned in the Corrective Action Section, it will be reported in a supplemental report.

An NPRDS search was conducted for similar RTD failures. The root cause for those events, which were similar, were typically indeterminate.

### D. SAFETY ANALYSIS:

The plant and public safety was not compromised by the event. As a result of the instrument failure the reactor was shutdown as designed, thus placing the plant in a more conservative configuration. The safety consequences would have been the same had this event occurred under different initial conditions.

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

#### E. CORRECTIVE ACTIONS:

The failed RTD, 2TE-431B, was replaced by installed spare 2TE-430B. The instrument loop was then recalibrated and returned to service. Nuclear Work Request B40815 was issued to replace the failed RTD during the next outage of sufficient duration. No further corrective action is planned at this time.

Byron Unit 1 has experienced several similar failures. During its first refueling (Spring 1987), these failed RTD's will be removed and inspected in an effort to determine their cause of failure. Any corrective action determined by this inspection will be considered for application on Unit 2. The results will be reported in a supplement to this report. This activity is tracked by Action Item Record 6-87-37.

## F. PREVIOUS OCCURRENCES:

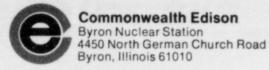
RTD failures have occurred previously on Unit 1, however they did not cause a reportable occurrence.

## G. COMPONENT FAILURE DATA:

a)	MANUFACTURER	NOMENCLATURE	MODEL NUMBER	MEG PART NUMBER	*
	RDFS-140	Resistance Thermal	21204	N/A -	4
		Detector			

#### b) RESULTS OF NPRDS SEARCH:

An NPRDS search yielded 54 Reactor Coolant RTD failures. These events have been reviewed for any information that may have aided our investigation. No trends in failure causes were determined.



February 13, 1987

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LTR: BYRON 87-0194

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) which requires a 30 day written report.

This report is number 87-001-00; Docket No. 50-455.

Very truly yours,

Alburio

R. E. Querio Station Manager Byron Nuclear Power Station

REQ/JL/bf

Enclosure: Licensee Event Report No. 87-001-00

cc: J. G. Keppler, NRC Region III Administrator J. Hinds, NRC Resident Inspector INPO Record Center CECO Distribution List

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