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Dresden Nuclear Power Station
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April 11, 1992

CWS LTR #92-208

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

Licensee Event Report 92-09, Docket 050249 is being submitted as required by Technical Specification 6.6, NUREG 1022 and 10 CFR 50.73(a)(2)(iv).

L. J. Menner for 4/14/92

Charles W. Schroeder
Station Manager
Dresden Nuclear Power Station

CWS/lma

Enclosure

cc: A. Bert Davis, Regional Administrator, Region III
NRC Resident Inspector's Office
File/NRC
File/Numerical

(ZDVR/551)

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LICENSEE EVENT REPORT (LER)

Form Rev 2.0

Facility Name (1) Dresden Nuclear Power Station, Unit 3 Docket Number (2) 0 15 10 10 12 14 19 Page (3) 1 of 0 4

Title (4) Unplanned Reactor Scram During Bus Undervoltage Test Due to Spurious Average Power Range Monitor Spike

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	3	2	19	2	9	2	0	4	0	8	9	2	N/A	

OPERATING MODE (9) N

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10CFR (Check one or more of the following) (11)

20.402(b)	20.405(c)	<input checked="" type="checkbox"/>	50.73(a)(2)(iv)	<input type="checkbox"/>	73.71(b)
20.405(a)(1)(i)	50.36(c)(1)	<input type="checkbox"/>	50.73(a)(2)(v)	<input type="checkbox"/>	73.71(c)
20.405(a)(1)(ii)	50.36(c)(2)	<input type="checkbox"/>	50.73(a)(2)(vii)	<input type="checkbox"/>	Other (Specify in Abstract below and in Text)
20.405(a)(1)(iii)	50.73(a)(2)(i)	<input type="checkbox"/>	50.73(a)(2)(viii)(A)	<input type="checkbox"/>	
20.405(a)(1)(iv)	50.73(a)(2)(ii)	<input type="checkbox"/>	50.73(a)(2)(viii)(B)	<input type="checkbox"/>	
20.405(a)(1)(v)	50.73(a)(2)(iii)	<input type="checkbox"/>	50.73(a)(2)(x)	<input type="checkbox"/>	

LICENSEE CONTACT FOR THIS LER (12)

Name: David Baran, Technical Staff Engineer Ext. 2513

TELEPHONE NUMBER: AREA CODE 8 1 5 9 4 2 -2 9 10

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	I	G	M	O	N	G	O	B	O	Y

SUPPLEMENTAL REPORT EXPECTED (14)

Yes (If yes, complete EXPECTED SUBMISSION DATE) NO

Expected Submission Date (15)

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

On March 21, 1992, with Unit 3 in cold shutdown for a refuel outage, Special Procedure (SP) 92-3-57, Bus Undervoltage and ECCS Integrated Functional Test for Unit 2/3 Diesel Generator (Unit 3 Test Only) was in progress. While attempting to restore power to Reactor Protection System (RPS) Channel B, which was deenergized as a result of the test, a reactor scram signal was received upon receipt of a spurious RPS Channel A trip signal. A subsequent investigation by Control Room personnel determined that a spike on Average Power Range Monitor (APRM) Channel 2 generated the RPS Channel A trip signal. RPS Channel A was immediately reset, and Channel B was reset after power was restored to that channel in accordance with the SP. This event had minimal safety significance because the scram logic functioned as expected. No control rod motion took place, since the unit was shutdown with all rods in.

Troubleshooting of the APRM instrument drawer failed to identify the source of the APRM spiking. Additional troubleshooting efforts included performing plateaus on the Local Power Range Monitors associated with APRM Number 2. Bus undervoltage test procedures were reviewed and determined to provide sufficient guidance to minimize the time RPS busses are deenergized. The Special Procedure, however, was performed with the Reserve RPS Power Supply unavailable and the Unit was susceptible to an inadvertant full scram while the B RPS bus was deenergized by the test.

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

PLANT AND SYSTEM IDENTIFICATION:

General Electric - Boiling Water Reactor - 2527 Mwt rated core thermal power

Nuclear Tracking System (NTS) tracking code numbers are identified in the text as (XXX-XXX-XX-XXXXX)

EVENT IDENTIFICATION:

Unplanned Reactor Scram During Bus Undervoltage Test Due to Spurious Average Power Range Monitor [IG] Spike

A. CONDITIONS PRIOR TO EVENT:

Unit: 3 Event Date: March 21, 1992 Event Time: 1028 Hours
 Reactor Mode: N Mode Name: Shutdown Power Level: 0%
 Reactor Coolant System (RCS) Pressure: 0 psig

B. DESCRIPTION OF EVENT:

On March 21, 1992, with Unit 3 in the cold shutdown mode, Special Procedure (SP) 92-3-57, Bus Undervoltage and ECCS Integrated Functional Test for Unit 2/3 Diesel Generator (Unit 3 Test Only) was in progress. While attempting to restore power to Reactor Protection System (RPS) Channel B, which was deenergized as a result of the test, a reactor scram signal occurred upon receipt of a spurious RPS Channel A trip signal. A subsequent investigation by Control Room personnel determined that a spike on Average Power Range Monitor (APRM) Channel 2 had generated the RPS Channel A trip signal. Channel A was immediately reset and Channel B was reset after power was restored to that channel in accordance with the SP. APRM Number 2 was bypassed pending troubleshooting by the Instrument Maintenance Department under Work Request 07988. A Degraded Equipment Log entry was made to reflect the problem with APRM Number 2.

A contributing factor to this event was the unavailability of the Reserve RPS Power Supply during the bus undervoltage test. This alternate power source to the RPS busses was out-of-service to support a modification to its voltage regulator. When available, the Reserve RPS Power Supply is used to maintain the B RPS bus energized throughout the Diesel Generator [EK] 2/3 ECCS auto start and loading test. Immediately after the ECCS input signal is removed, the B RPS Channel half scram is reset to minimize the possibility of an inadvertent full scram signal.

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C. APPARENT CAUSE OF EVENT:

This event is being reported in accordance with 10 CFR Part 50 Section 73(a)(2)(iv), which requires reporting of any event or condition that resulted in manual or automatic actuation of any Engineered Safety Feature, including the Reactor Protection System, if the actuation was not part of a preplanned sequence during testing or reactor operation.

In an attempt to determine the cause of the APRM spiking, the Instrument Maintenance Department performed troubleshooting in accordance with Dresden Administrative Procedure (DAP) 15-07, Electrical/Instrument Maintenance Troubleshooting Procedure. This maintenance activity checked the APRM Number 2 drawer for loose cards and connections, and verified the output of the instrument power supplies.

In the ten days prior to this event two other instances of spiking on Unit 3 APRMs resulted in half scrams. All of these events exhibited a similar symptom in that no Local Power Range Monitor (LPRM) [IG] upscale light indication was received. This symptom is characteristic of short duration LPRM spikes due to voltage breakdowns from the impurity related growth of metallic whiskers. Dresden Instrument Procedure (DIP) 0700-15, Local Power Range Monitor Detector Plateaus, was performed on the LPRMs associated with APRM Number 2. This procedure was used to identify and remove potential sources of spiking. Three LPRM traces exhibited voltage breakdowns which could be attributed to metallic whiskers.

D. SAFETY ANALYSIS OF EVENT:

The purpose of the Reactor Protection System is to monitor the critical parameters of reactor operation to protect against conditions that could degrade the fuel barriers and the reactor coolant pressure boundary. A flux indication exceeding the Hi-Hi setpoint on any APRM will cause a trip of its associated RPS channel and a simultaneous trip of both RPS channels results in a full scram. In this event, the APRM Hi-Hi signal was not neutron flux induced and the other RPS channel was deenergized as a result of testing in progress. The Unit was in the cold Shutdown mode with all rods fully inserted at the time of the scram. Due to the Unit status and the fact that all systems performed as designed, the safety significance of this event is minimal.

E. CORRECTIVE ACTIONS:

Work Request 07988 was generated to investigate the cause of the APRM spike. APRM Number 2 was maintained bypassed pending the results of the investigation. No positive cause for the spiking was identified other than the possible voltage breakdown as described above. Following testing in accordance with Dresden Instrument Surveillance (DIS) 0700-05, APRM Setdown Functional Test/Calibration, and Dresden Operating Surveillance (DOS) 0500-03, APRM Rod Block and Scram Functional Test, APRM Number 2 was returned to service and declared operable.

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Further troubleshooting and corrective measures were performed through the performance of DIP 0700-15 for the LPRMs associated with APRM Number 2 under Work Request 08288. Traces for three detectors exhibited voltage breakdowns characteristic of the spike experienced in this event. Although all the corrective actions taken failed to identify a definitive source of the APRM spiking, the monitor was thoroughly checked from detector to drawer, and actions were taken to prevent possible recurrence from LPRM spiking. Based on the actions taken and the fact that the anomaly has not repeated itself on APRM Number 2, no further troubleshooting has been deemed necessary at this time.

The following Dresden Operating Surveillances (DOS) were reviewed and it was determined that they provide sufficient guidance to minimize the time RPS busses are deenergized during bus undervoltage tests:

- DOS 6600-03 Bus Undervoltage and ECCS Integrated Functional Test for Unit 2/3 Diesel Generator (Unit 3 Test Only)
- DOS 6600-04 Bus Undervoltage and ECCS Integrated Functional Test for Unit 3 Diesel Generator
- DOS 6600-05 Bus Undervoltage and ECCS Integrated Functional Test for Unit 2 Diesel Generator
- DOS 6600-06 Bus Undervoltage and ECCS Integrated Functional Test for Unit 2/3 Diesel Generator (Unit 2 Test Only)

F. PREVIOUS OCCURENCES:

A similar event has been previously reported in:

LER/Docket Numbers Title

89-004/0500237 Unexpected Reactor Scram During Bus Undervoltage Test Due to Spurious Intermediate Range Monitor Spike

In this event, a noise induced Intermediate Range Monitor spike resulted in a full scram while the opposite RPS bus was deenergized for the bus undervoltage test.

G. COMPONENT FAILURE DATA:

<u>Manufacturer</u>	<u>Nomenclature</u>	<u>Model Number</u>	<u>Mfg. Part Number</u>
General Electric	Average Power Range Monitor	N/A	N/A

An industry wide NPRDS data base search revealed 355 events of APRMs exhibiting unusual characteristics including spiking. Most of these events were due to Local Power Range Monitor problems, loose connections, and unknown causes.