

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) Dresden Nuclear Power Station, Unit 3	DOCKET NUMBER (2) 0 5 0 0 0 2 4 9	PAGE (3) 1 OF 0 5
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TITLE (4)
**Reactor Scram Due to Loss of Normal Feedwater as a Result of 3C
Condensate Booster Pump Motor Failure**

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	1 2	8 7	8 7	0 1 1	0 0	0 6	0 3	8 7	Dresden Unit 2		0 5 0 0 0 2 3 7
									N/A		0 5 0 0 0

OPERATING MODE (9) N	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 8: (Check one or more of the following) (11)									
POWER LEVEL (10) 0 9 9	<input type="checkbox"/> 20.402(b)	<input type="checkbox"/> 20.405(a)	<input checked="" type="checkbox"/> 88.73(a)(2)(iv)	<input type="checkbox"/> 73.71(b)						
	<input type="checkbox"/> 20.405(a)(1)(i)	<input type="checkbox"/> 80.38(a)(1)	<input type="checkbox"/> 80.73(a)(2)(iv)	<input type="checkbox"/> 73.71(a)						
	<input type="checkbox"/> 20.405(a)(1)(ii)	<input type="checkbox"/> 80.38(a)(2)	<input type="checkbox"/> 80.73(a)(2)(vi)	OTHER (Specify in Abstract below and in Text, NRC Form 385A)						
	<input type="checkbox"/> 20.405(a)(1)(iii)	<input type="checkbox"/> 80.73(a)(2)(i)	<input type="checkbox"/> 80.73(a)(2)(vii)(A)							
	<input type="checkbox"/> 20.405(a)(1)(iv)	<input type="checkbox"/> 80.73(a)(2)(ii)	<input type="checkbox"/> 80.73(a)(2)(vii)(B)							
<input type="checkbox"/> 20.405(a)(1)(v)	<input type="checkbox"/> 80.73(a)(2)(iii)	<input type="checkbox"/> 80.73(a)(2)(viii)								

LICENSEE CONTACT FOR THIS LER (12)

NAME Anthony Anandappa Technical Staff Engineer (X-548)	TELEPHONE NUMBER 8 1 5 9 4 2 - 2 9 2 0
AREA CODE 8 1 5	9 4 2 - 2 9 2 0

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	S/D	M/O	G/O 80	Y					

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)

During normal operation at 99 percent power at 0209 hours on May 12, 1987, an automatic reactor scram and Group II and Group III Primary Containment isolations were received from a low reactor water level signal. Prior to the reactor scram the Reactor Feed Pumps (RFPs) had automatically tripped on low suction pressure. Reactor water level subsequently decreased to the low level setpoint, resulting in the automatic reactor scram and Primary Containment isolations. Upon investigation it was determined that the root cause of the event was an automatic 3C Condensate Booster Pump Trip on instantaneous motor overcurrent.

Corrective actions will include replacement of the 3C Condensate Booster Pump Motor, review of possible design changes, and review of this event with licensed personnel. The safety significance of this event was minimal because the automatic low reactor water level scram occurred as designed, thus ensuring sufficient inventory was maintained in the reactor vessel. The Emergency Core Cooling Systems (ECCS) were also available to provide reactor vessel makeup if necessary. A previous event involving a low reactor water level scram is recorded in Reportable Occurrence #87-8 on Docket #050249.

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TEXT (If more space is required, use additional NRC Form 388A's) (17)

PLANT AND SYSTEM IDENTIFICATION

General Electric - Boiling Water Reactor - 2527 Mwt rated core thermal power. Energy Industry Identification System (EIIS) codes are identified in the text as [XX].

EVENT IDENTIFICATION:

Reactor Scram Due to Loss of Normal Feedwater as a Result of 3C Condensate Booster Pump Motor Failure.

A. PLANT CONDITIONS PRIOR TO EVENT:

Mode: N - Run Reactor Power: 99% Reactor Pressure: 1005 psig

B. DESCRIPTION OF EVENT:

On May 12, 1987 at 0209 hours, during normal operations at 99% rated thermal power, an automatic reactor scram and Group II and Group III Primary Containment [JM] isolations were received from a low reactor water level signal [JE]. The 3A and 3C Reactor Feed Pumps (RFPs) [SK] had automatically tripped on a low suction pressure of 120 psig. Although the selected standby 3B RFP automatically started, it was unable to prevent a reactor water level decrease to the low level scram setpoint. The Group II and Group III Primary Containment isolations were also received from the low reactor water level signal.

The Reactor Operator responded to this event in accordance with Dresden Operating Abnormal (DOA) Procedure 600-1, Transient Level Control. He observed that the 3C Condensate Booster Pump [SD] had tripped; the selected standby 3D Condensate Booster Pump automatically started but it was unable to return RFP suction pressure above the low RFP suction pressure trip setpoint prior to the automatic RFP trip occurring. The Reactor Operator responded to the reactor scram in accordance with Dresden General Procedure (DGP) 2-3, Unit 2/3 Reactor Scram.

C. APPARENT CAUSE OF EVENT:

The automatic reactor scram and Group II and III Primary Containment isolations resulted from a loss of normal feedwater flow from the RFPs. The automatic trip of the RFPs on low (120 psig) RFP suction pressure was caused by an automatic trip of the 3C Condensate Booster Pump on an instantaneous overcurrent signal. Although the selected standby 3D Condensate Booster Pump had started on decreasing RFP suction pressure (160 psig), it was unable to restore RFP suction pressure above the 120 psig low RFP suction pressure trip setpoint.

Investigation by Electrical Maintenance personnel revealed that the 3C Condensate Booster Pump motor had developed an internal electrical short which resulted in the automatic overcurrent trip.

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Investigation into the scram included the following concerns:

- 1) The automatic start of the selected standby RFP and Condensate Booster Pump was verified to occur properly by checking the operation of the appropriate pressure switches.
- 2) As a result of a previous event on May 3, 1987 (Reportable Occurrence #87-16 on Docket #050237) firmware changes have been planned to help prevent feedwater level control databus disturbances.

This report is submitted in accordance with 10 CFR 50.73(a)(2)(iv) requirements.

D. SAFETY ANALYSIS OF EVENT:

The safety significance of this event was judged to be minimal since the automatic low reactor water level scram and Primary Containment isolations occurred as designed, ensuring that sufficient inventory was maintained in the reactor vessel. Numerous redundant ECCS components were available to provide reactor vessel makeup if necessary.

E. CORRECTIVE ACTIONS:

The failed 3C Condensate Booster Pump motor is being replaced. The motor failure is believed to be an isolated case and no further corrective actions are planned regarding the motor. However, the following actions are in progress in order to help prevent recurrence of this type of event.

- 1) Review of possible modifications concerning the automatic RFP low suction pressure trip including the adding of a time delay or changing the setpoint. This request has been submitted to the Station Nuclear Engineering Department in Action Item Record (A.I.R.) No. 12-87-14.
- 2) Review of possible modifications to the standby Condensate Booster Pump automatic start circuitry including a higher setpoint such that the standby pump would start sooner, thus providing additional time to restore RFP suction pressure. This review is also to be performed in accordance with A.I.R. No. 12-87-14.
- 3) Review of possible modifications to the Feedwater Level Control System such that it would automatically transfer from three element flow control (based on steam flow and feedwater flow in addition to reactor water level inputs) to single element flow control (based solely on reactor water level inputs) following a reactor scram. A modification request is being submitted by the Instrument Maintenance Department for this work.

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TEXT (If more space is required, use additional NRC Form 366A's) (17)

- 4) Implementation of a Feedwater Level Control System firmware upgrade to help prevent databus disturbances. This work is scheduled for the next outage of sufficient duration.
- 5) Review of this event with all licensed Operators attending the routine training schedule, including RFP restart guidelines. This action has been initiated by the Training Department.

The pressure switches for the automatic RFP low suction pressure trip and standby Condensate Booster Pump automatic start were also checked by Instrument Maintenance personnel to verify proper operation.

F. PREVIOUS OCCURRENCES:

LER Number/Docket

Title

87-16/050237

Reactor Scram Occurred While at 31% Power Due to an Automatic Reactor Feed Pump Trip on High Reactor Water Level and Subsequent Level Decrease to the Low Level Scram Setpoint.

This resulted from a feedwater regulating valve locking up in the full open position during testing of the feedwater level control system. A firmware change was implemented to help prevent future recurrence.

87-8/050249

Reactor Scram While Unit was Shut Down Due to Low Reactor Water Level Resulting from Procedural Inadequacy and Component Failure.

Corrective actions were to initiate a procedural change to add a provision for partially opening the reactor feedwater pump discharge valves just prior to starting the pump and to secure the manual engagement lever for the "B" reactor feedpump discharge valve.

84-10/050249

Reactor Scram During Normal Operation Due to Low Reactor Water Level Caused by "A" Feedwater Regulating Valve Failing Closed Due to Vibration.

Corrective actions were to drill holes into the regulating valve coupling block and install set screws to secure the valve stem and valve operator to the coupling block.

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84-9/050237

Reactor Scram Due to Reactor Low Water Level
Caused by "A" Feedwater Regulating Valve Failing
Closed Due to Vibration.

Corrective action was to reconnect the valve
operator and stem with sheet metal locktabs
to prevent the locknuts from vibrating loose.

G. COMPONENT FAILURE DATA:

Manufacturer: General Electric

Nomenclature: Motor

Model: SK831166A7

Type: K

An industry-wide NPRDS data search has been performed and 16 failures of this type
of motor were listed.



Commonwealth Edison
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June 3, 1987

EDE LTR #87-361

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

Licensee Event Report #87-011-0, Docket #050249 is being submitted as required by
Technical Specification 6.6, NUREG 1022 and 10 CFR 50.73(a)(2)(iv).

E.D. Eenigenburg
Station Manager
Dresden Nuclear Power Station

EDE/kjl

Enclosure

cc: A. Bert Davis, Regional Administrator, Region III
File/NRC
File/Numerical

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