

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) PLANT VOGTLE - UNIT 2	DOCKET NUMBER (2) 0 5 0 0 0 4 2 5	PAGE (3) 1 OF 0 5
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TITLE (4)
FAULTY CIRCUIT CARDS RESULT IN ESF ACTUATIONS

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		
0 4	0 5	8 9	8 9	0 1 5	0 0	0 5	0 1	8 9	DOCKET NUMBER(S) 0 5 0 0 0		

OPERATING MODE (9) 2	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR § (Check one or more of the following) (11)							
POWER LEVEL (10) 0 0 4	20.402(b)	<input checked="" type="checkbox"/>	20.405(c)	<input 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, NRC Form 366A)	<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)(ix)	<input type="checkbox"/>			

LICENSEE CONTACT FOR THIS LER (12)

NAME R. M. ODOM, NUCLEAR SAFETY AND COMPLIANCE MANAGER	TELEPHONE NUMBER 4 10 8 82 16 1- 13 12 10 11
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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
B	JIG	CIPU	W1210	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)

On 4-5-89, a spurious trip of Main Feedwater Pump (MFP) "A" generated a Feedwater Isolation (FWI) signal and automatic actuation of the Auxiliary Feedwater (AFW) system. On 4-7-89, a FWI and AFW actuation occurred when a steam generator reached its high-high level setpoint during a test of a Main Feedwater Isolation Valve. On 4-9-89, a second spurious trip of MFP "A" generated a FWI and subsequent AFW actuation.

The cause of the 4-5-89 and 4-9-89 events was faulty circuit boards in the Solid State Protection System logic circuits. The 4-7-89 event, although not directly caused by a faulty circuit card, was a consequence of the valve lineup used to functionally test repairs made following the 4-5-89 event. The lineup of long-cycle recirculation was not properly restored prior to resumption of startup testing.

Corrective actions include replacing the faulty circuit boards and counseling plant operators regarding proper shift turnover of unusual plant configurations and the need for procedural compliance.

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LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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

A. REQUIREMENT FOR REPORT

This report is required per 10CFR50.73(a)(2)(iv) because the events resulted in automatic actuations of an Engineered Safety Feature (ESF).

B. UNIT STATUS AT TIME OF EVENT

At the time of the event on 4-5-89 the unit was in Mode 2 (Startup) at 4% rated thermal power. Main Feedwater Pump (MFP) "B" was in a tripped condition; MFP "A" was in a reset condition but was not in service; feedwater was being supplied by two Motor Driven Auxiliary Feedwater (MDAFW) pumps.

At the time of the event on 4-7-89 the unit was in Mode 1 (Power Operation) at 7% rated thermal power. Surveillance test procedure 14350-2, "Cold Shutdown Valve Inservice Test" was in progress for a stroke time test of loop 2 Main Feedwater Isolation Valve (MFIV). Steam Generator Bypass Feedwater Regulating Valve demand signals were: #1-60%, #2-30%, #3-30%, and #4-0%. The imbalance in demand signals was being investigated.

At the time of the event on 4-9-89, startup testing was in progress with the unit operating in Mode 1 (Power Operation). The unit was stabilized at 15% rated thermal power.

There was no inoperable equipment, other than that described in this report, which contributed to these events.

C. DESCRIPTION OF EVENTS

On 4-5-89, at approximately 2002 CDT, the unit experienced a spurious trip of MFP "A". Since "B" was already tripped this resulted in both MFPs being in a tripped condition which generated an AFW actuation signal. Both MDAFW pumps were already in operation; therefore, the AFW valves, which had been throttled, went full open. Steam generator levels increased to 53%, at which time control room operators restored steam generator levels to 50%. At 2232 CDT an attempt was made to reset MFP "B", but the pump did not reset. Investigation of the MFP trip began by trouble-shooting the Solid State Protection System (SSPS). In parallel with the investigation of the SSPS, plant operations personnel performed the normal evolutions of placing the unit in a stable low power configuration. This included re-establishing condensate long-cycle recirculation.

The investigation of the SSPS discovered that the SSPS MFP and Turbine Trip relay, from SG Hi-Hi level or Safety Injection, had energized.

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However, before further trouble-shooting could occur, the problem cleared and subsequent testing failed to identify a hardware problem. Although no problem could be identified, a conservative action was taken to replace the two circuit cards determined most likely to have resulted in actuation of the SSPS relay in question. After these circuit cards were replaced a functional test was performed. Preparations for the functional test included isolation of the condensate long-cycle recirculation path using FV-4499 (This is the flow control valve common to all steam generators). This method of isolation, although adequate for the functional testing performed, was contrary to procedural requirements for normal operation. With the SSPS work and functional testing completed, power escalation commenced on 4-6-89. Unnoticed by the operators, long-cycle recirculation was still isolated only by FV-4499. This allowed flow between steam generators through the long-cycle recirculation piping.

On 4-7-89, at approximately 0311 CDT, with Main Feedwater in service on the Bypass Feedwater Regulating Valves (BFRV), Procedure 14850-2 was performed on the #2 SG MFIV as a functional test. Operators had been briefed to expect a rise in SG level as the MFIV was opened and to ensure that the BFRV modulated closed to compensate when the MFIV was opened. Level in the SG increased as anticipated and the BFRV modulated closed (slowly), however, SG level continued to rise. The control room operator took manual control of the BFRV and closed it. At approximately 70% SG level the operator closed the MFIV. However, due to the SGs being cross connected through the long-cycle recirculation system, level continued to increase to the Hi-Hi level setpoint causing a Feedwater Isolation (FWI) and MFP turbine trip. Level stopped increasing when the Bypass Feedwater Isolation Valve was closed. Both MDAFW pumps started and power was reduced to approximately 2%. With the plant stabilized, investigation of the incident resulted in the discovery of the open long-cycle recirculation valves. After closure of the long-cycle recirculation isolation valves, power escalation and turbine startup was commenced.

On 4-9-89, at 0703 CDT, a second spurious MFP turbine trip occurred from the same relay in the SSPS that caused the event on 4-5-89. This resulted in a FWI and an AFW actuation. Both MDAFW pumps were actuated and power was successfully reduced from 15% to approximately 3%, and a reactor trip was averted. Trouble-shooting immediately began, and the fault was found to be present on two SSPS logic cards. The two failed logic cards in the SSPS were replaced (bench testing confirmed their failure). Operations surveillance Procedure 14420-2 "Solid State Protection System Train A (B) Operability Test" was performed as a functional test for the work completed.

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D. CAUSE OF EVENTS

The direct cause of the 4-5-89 and 4-9-89 events was card failures in the "A" Train SSPS. The direct cause of the 4-7-89 event was inadequate isolation of the long-cycle recirculation system after the functional test for the card replacement.

Component failure was the root cause of the 4-5-89 and 4-9-89 events. The root cause of the 4-7-89 event was inadequate procedure implementation aggravated by an inadequate turnover of long-cycle recirculation status.

E. ANALYSIS OF EVENT

When FWI occurred, the feedwater regulating and isolation valves closed, isolating either main feed or the long-cycle recirculation of the feedwater system, as appropriate. AFW started as required and plant operators responded correctly to ensure SG level control and plant stabilization. Because FWI acts independent of reactor power, it is ensured that had this event occurred at a higher power level, the FWI function would have actuated to protect the plant. Based on these considerations, there was no adverse affect to plant safety or public health and safety as a result of this event.

F. CORRECTIVE ACTIONS

1. Failed SSPS cards were replaced and functionally tested.
2. Supervisors and operators involved in the 4-7-89 event were counseled on the need for detailed turnover and procedural compliance. A night order was also issued on these subjects.
3. A policy on Unit Operating Procedure usage was disseminated via a night order.

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G. ADDITIONAL INFORMATION

1. Failed Components

Universal Circuit Board Card
Part No. 6081D70G01
Supplied by Westinghouse

2. Similar Events

There have been events experienced by Unit 1 addressed in LERs 50-424/1987-06, 11, 24, 34 and 64. These LERs involved AFW actuations from MFP trips. However, none of these events were caused from failure of circuit cards.

3. Energy Industry Identification System Code.

- o Auxiliary Feedwater System - BA
- o Feedwater/Steam Generator Water Level Control System - JB
- o Engineered Safety Features Actuation System - JE
- o Solid State Control System - JG

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May 1, 1989

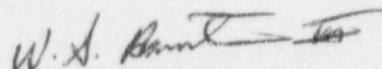
U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D. C. 20555

PLANT VOGTLE - UNIT 2
NRC DOCKET 50-425
OPERATING LICENSE MPF-81
FAULTY CIRCUIT CARDS RESULT
IN ESF ACTUATIONS

Gentlemen:

In accordance with 10 CFR 50.73, Georgia Power hereby submits the enclosed report relating to events which occurred on April 5, 7 and 9, 1989.

Sincerely,


W. G. Hairston, III

LRZ/PAH/gm

Enclosure: LER 50-425/1989-015

xc: Georgia Power Company

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Mr. C. K. McCoy
Mr. G. Bockhold, Jr.
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