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J. T. Beckham, Jr.  
Vice President—Nuclear  
Hatch Project



Georgia Power

The Southern Electric System

HL-2303  
003678

July 9, 1992

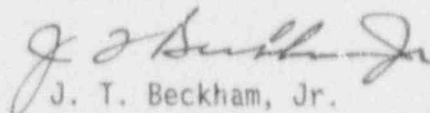
U.S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Washington, D.C. 20555

PLANT HATCH - UNIT 1  
NRC DOCKET 50-321  
OPERATING LICENSE DPR-57  
LICENSEE EVENT REPORT  
COMPONENT FAILURE RESULTS IN GROUP 5  
PRIMARY CONTAINMENT ISOLATION SYSTEM ACTUATIONS

Gentlemen:

In accordance with the requirements of 10 CFR 50.73(a)(2)(iv), Georgia Power Company is submitting the enclosed Licensee Event Report (LER) concerning a component failure which resulted in Group 5 primary containment system isolations. This event occurred at Plant Hatch - Unit 1.

Sincerely,

  
J. T. Beckham, Jr.

OCV/cr

Enclosure: LER 50-321/1992-015

cc: (See next page.)

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S PDR

*Handwritten initials/signature*

U.S. Nuclear Regulatory Commission  
July 9, 1992  
Page Two

cc: Georgia Power Company  
Mr. H. L. Sumner, General Manager - Nuclear Plant  
NORMS

U.S. Nuclear Regulatory Commission, Washington, D.C.  
Mr. K. Jabbour, Licensing Project Manager - Hatch

U.S. Nuclear Regulatory Commission, Region II  
Mr. S. D. Ebnetter, Regional Administrator  
Mr. L. D. Wert, Senior Resident Inspector - Hatch

**LICENSEE EVENT REPORT (LER)**

FACILITY NAME (1) <b>PLANT HATCH UNIT 1</b>	DOCKET NUMBER (2) <b>0 5 0 0 3 2 1</b>	PAGE (3) <b>1</b> OF <b>5</b>
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TITLE (4)  
**COMPONENT FAILURE RESULTS IN GROUP 5 PRIMARY CONTAINMENT ISOLATION SYSTEM ACTUATIONS**

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)																																																																																												
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LICENSEE CONTACT FOR THIS LER (12)

NAME		TELEPHONE NUMBER	
Steven B. Tipton, Manager Nuclear Safety and Compliance, Hatch		AREA CODE <b>912</b>	<b>367-7851</b>

COMPLETE ONE LINE FOR EACH FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORT TO NPRDS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORT TO NPRDS
E	CE	TIS	FO80	NO					

SUPPLEMENTAL REPORT EXPECTED (14)

<input type="checkbox"/> YES (If yes, complete EXPECTED SUBMISSION DATE)	<input checked="" type="checkbox"/> NO	EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
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ABSTRACT (16)

On 06/10/92 at 0702 CDT, Unit 1 was in the Run mode at a power level of 2436 CMWT (100% rated thermal power). At that time, the outboard Group 5 Primary Containment Isolation System (PCIS, EIIS Code JM) valve, 1G31-F004, automatically closed, resulting in a trip of the operating Reactor Water Cleanup (RWCU, EIIS Code CE) system pump, 1G31-C001A, per design. Instrument and Control technicians investigated the event and examined portions of the Group 5 PCIS logic, but were not able to identify the cause of the isolation. As a result, the RWCU system was returned to service by 1152 CDT. On 06/11/92 at 0116 CDT, with Unit 1 still in the Run mode at rated power, another isolation of 1G31-F004 occurred. This time, Instrument and Control technicians investigating the problem observed temperature switch 1G31-N008 exhibiting erratic and intermittent operation. The switch was replaced, and the RWCU system was returned to service by 1015 CDT.

The cause of these events was a failed component. The plastic case on temperature switch 1G31-N008 was found to be cracked, preventing proper mating of the connectors in the rear of the case. Bench testing the temperature switch with the connectors partially engaged reproduced the erratic behavior of the device. The case appeared to have been cracked during a previous installation by applying excessive torque to the screw holding the switch in the case.

Corrective actions for these events included replacing the failed temperature switch and discussing the events with Instrument and Control technicians in regularly scheduled Tool Box meetings. The first action is complete. The second action will be completed by 08/31/92.

**LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION**

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (5)			PAGE (3)	
		YEAR	SEQ NUM	REV		
PLANT HATCH UNIT 1	05000321	92	015	00	2	OF 5

TEXT

PLANT AND SYSTEM IDENTIFICATION

General Electric - Boiling Water Reactor  
Energy Industry Identification System codes are identified in the text as (EIS Code XX).

DESCRIPTION OF EVENT

On 06/10/92 at 0702 CDT, Unit 1 was in the Run mode at a power level of 2436 CMWT (100% rated thermal power). At that time, the outboard Group 5 Primary Containment Isolation System (PCIS, EIS Code JM) valve, 1G31-F004, automatically closed, resulting in a trip of the operating Reactor Water Cleanup (RWCU, EIS Code CE) system pump, 1G31-C001A, per design. Licensed shift personnel then manually closed the redundant Group 5 PCIS valve in the same penetration, 1G31-F001, by 0704 CDT. The only annunciators received in the Control Room were those that normally occur after a RWCU system trip. No annunciators were received which would have indicated the source of the trip signal.

The Group 5 PCIS is designed to give automatic closure of only 1G31-F004 on either of two conditions: initiation of the Standby Liquid Control (SBLC, EIS Code BR) system or high process fluid temperature downstream of the non-regenerative heat exchanger (NRHX) in the RWCU system. Neither of these conditions was valid at the time of the isolation. However, shift personnel noted that the trip signal for high temperature downstream of the NRHX comes from a different instrument than the annunciator for the same condition. Since the trip had occurred in the absence of any annunciators indicating abnormal process conditions, they concluded temperature switch 1G31-N008 was faulty. Instrument and Control technicians observed operation of the switch, but identified no problems with it. As a precautionary measure, however, they calibrated the switch per procedure 57CP-CAL-065-1S, "FENWAL TYPE 550/551/560 TEMPERATURE CONTROLLER." Technicians found the switch was working properly and was calibrated within its required acceptance band.

By 1055 CDT, when no cause for the trip could be identified, licensed personnel concluded that the trip had been spurious. Therefore, they reopened both Group 5 PCIS valves, and the RWCU system was returned to service by 1152 CDT.

On 06/11/92 at 0116 CDT, Unit 1 was in the Run mode at a power level of 2436 CMWT. At that time, 1G31-F004 again automatically closed and tripped the operating RWCU system pump. As in the previous isolation, no annunciators were received in the Main Control Room which would indicate any abnormal process condition in the RWCU system. Instrument and Control technicians were again dispatched to examine temperature switch 1G31-N008. Upon arriving at the remote panel where the switch is located, they observed the indicator on the switch alternately driving upscale and downscale and the red trip indicator flashing. The internal relay which feeds the isolation logic for 1G31-F004 could be heard slowly clattering. One of the technicians tapped on the front of the switch case, and the meter instantly stabilized at a temperature indication appropriate for the system conditions. The slow clatter of the trip relay also ceased.

LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (5)			PAGE (3)	
		YEAR	SEQ NUM	REV		
PLANT HATCH UNIT 1	0 5 0 0 0 3 2 1	9 2	0 1 5	1 0	3	OF 5

TEXT

Therefore, they concluded that the temperature switch was faulty, and initiated replacement of the switch with a new one from warehouse stock.

When replacement and calibration of the switch were complete, licensed shift personnel returned the RWCU system to service by 1015 CDT.

CAUSE OF EVENT

The cause of these events was a faulty temperature switch. Temperature switch 1G31-N008 has contacts in the isolation logic for the outboard Group 5 PCIS valve, 1G31-F004. When the switch contacts opened during intermittent operation, the valve isolated per design.

An Instrument and Control technician and an engineer from the Nuclear Safety and Compliance department performed separate bench tests on the failed switch after it was removed from service. The switch was found to operate properly in both tests; the calibration was also found to be satisfactory. However, upon close inspection, the plastic case on the temperature switch was observed to be cracked around the screw which holds the switch face into the case. Also, the matching nut on the plastic switch case was stripped out of its plastic socket and the case appeared to have been cracked by excessive torque being applied. The effect of the cracked switch case was to prevent the switch circuit board from fully engaging a set of connecting plugs in the rear of the case. With the plugs partially engaged, operation of the switch became erratic and intermittent. By emulating the faulty connection, bench testing reproduced the erratic behavior which had been observed following the second PCIS isolation, including the slow clattering of the internal trip relay.

It now appears that, at some time in the past, an unidentified technician cracked the plastic switch case when installing the switch. Subsequently, technicians who removed and reinstalled the switch were able to apply only enough force to barely touch the connecting plugs. The incomplete insertion of the switch plugs would not be immediately apparent to the technician because of the characteristics of its installation in the panel. Therefore, the switch appeared to be properly installed and the system appeared to be working normally when technicians completed their tasks. Normal RWCU system operation, however, subjects the switch to some vibration. It is believed that this vibration was sufficient to loosen the weak connection.

REPORTABILITY ANALYSIS AND SAFETY ASSESSMENT

This event is reportable per 10 CFR 50.73(a)(2)(iv) because two unplanned automatic actuations of an Engineered Safety Feature (ESF) occurred. Specifically, Group 5 PCIS valve 1G31-F004 closed twice in response to false indications of high process fluid temperature downstream of the RWCU system non-regenerative heat exchanger.

**LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION**

FACILITY NAME (1)  PLANT HATCH UNIT 1	DOCKET NUMBER (2)  05000321	LER NUMBER (5)			PAGE (3)	
		YEAR	SEQ NUM	REV		
		92	015	00	4	OF 5

TEXT

The purpose of the Group 5 PCIS is to isolate the line leading from the Primary Containment to the Reactor Water Cleanup system when certain process conditions are sensed. These conditions include high ambient temperature in the RWCU heat exchanger room, high differential temperature in the ventilation system ducts entering and leaving the RWCU heat exchanger room, low reactor water level (Level 2) in the Reactor Pressure Vessel, high differential flow in the lines entering and leaving containment, initiation of SBLC, and high process fluid temperature downstream of the RWCU NRHX. The latter two conditions do not affect the inboard Group 5 PCIS valve, 1G31-F001; they are designed to close only the outboard PCIS valve, 1G31-F004. The purpose of the Group 5 PCIS isolation on high temperature following the non-regenerative heat exchanger is to prevent hot reactor water from damaging the resin in the RWCU system filter demineralizers, which could result in intrusion of the resin into the reactor coolant system. The purpose of the isolation on SBLC initiation is to prevent removal of the boron solution injected by SBLC.

In the events addressed in this report, a cracked plastic case on a temperature switch resulted in the isolation logic for 1G31-F004 twice receiving an invalid indication of high temperature following the NRHX. Each time, the logic system responded per design by initiating automatic isolation of the outboard Group 5 PCIS valve, 1G31-F004. Each PCIS valve closure further resulted in a trip of the operating RWCU pump, 1G31-C001A, per design. No other systems were affected by the isolations. In both cases, the system fulfilled its design function by isolating when the appropriate logic signal was present. If a design basis accident had occurred during either of these events, the automatic isolation of the outboard PCIS valve would have had no effect on the capability of the inboard valve to close and, in fact, the penetration would have already been isolated. The system would have responded per design, however, and completed the isolation with both valves. If the switch had failed such that it was unable to trip, and a design basis event occurred, the other inputs to the valves isolation logic (leak detection, low reactor water level) would have produced an isolation of 1G31-F004. Since the logic systems for the two redundant group 5 valves are independent of each other, the 1G31-F001 valve was unaffected by the failure of switch 1G31-N008 and was thus capable of being isolated by any valid isolation signal.

Based on this analysis, it is concluded that these events had no adverse impact on nuclear safety. This analysis is applicable to all power levels.

CORRECTIVE ACTIONS

The cracked temperature switch was replaced with a new unit from stock. This action is complete.

These events will be discussed with all Instrument and Control technicians in regularly scheduled Tool Box meetings. This action will be completed by 08/31/92.

**LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION**

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (5)			PAGE (3)		
		YEAR	SEQ NUM	REV			
PLANT HATCH UNIT 1	05000321	92	015	00	5	OF	5

TEXT

ADDITIONAL INFORMATION

1. Other Systems Affected: No systems were affected other than those mentioned in this report.
2. Previous Similar Events: Events reported in the past two years in which failed components resulted in Group 5 PCIS isolations are described in the following LERs:

50-321/1991-014, dated 09/09/91,  
 50-321/1991-016, dated 09/30/91,  
 50-321/1991-019, dated 10/18/91,  
 50-366/1991-015, dated 09/18/91,  
 50-366/1991-020, dated 12/02/91.

Corrective actions from these events included replacing failed components, issuing operating orders on the operation of the Standby Gas Treatment System (SGTS, EIIS Code BH), performing engineering reviews to evaluate SGTS design and component application, calibrating RWCU system flow instruments, repairing a leaking valve in the RWCU system, sending a sample of light bulbs to the manufacturer for failure analysis, and performing an engineering review to evaluate the application of a circuit breaker in the Reactor Protection System (RPS, EIIS Code JE). These corrective actions would not have prevented the events described in this report because they addressed the specific failures peculiar to each event. Moreover, none of the component failures reported in the previous events resulted from the kind of physical damage which led to the present event.

3. Failed Components Identification:

Master Parts List Number: 1G31-N008  
 Manufacturer: Fenwal Electronics Corporation  
 Type: Temperature Switch  
 Model Number: Type 551  
 Manufacturer Code: F080  
 EIIS System Code: CE  
 EIIS Component Code: TIS  
 Root Cause Code: E  
 Reportable to NPRDS: No