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Georgia Power

the southern electric system

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

February 22, 1994

Docket No. 50-366

HL-4511

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

Edwin I. Hatch Nuclear Plant - Unit 2
Licensee Event Report
Failed Relay Coil Results in Unplanned
Actuations of Engineered Safety Features

Gentlemen:

In accordance with the requirements of 10CFR50.73(a)(2)(iv), Georgia Power Company is submitting the enclosed Licensee Event Report (LER) concerning a failed relay coil which resulted in unplanned actuations of several engineered safety features. This event occurred at Plant Hatch - Unit 2.

Sincerely,

J. T. Beckham, Jr.

JKB/cr

Enclosure: LER 50-366/1994-001

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

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LICENSEE EVENT REPORT (LER)

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (MNBB7714), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555-0001, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1) Edwin I. Hatch Nuclear Plant - Unit 2 DOCKET NUMBER (2) 050003661 PAGE (3) 4 OF 4

TITLE (4) Failed Relay Coil Results in Unplanned Actuations of Engineered Safety Features

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 NAME	DOCKET NUMBER(S)	
02	01	94	94	001	00	02	22	94		050003661	
									FACILITY NAME	DOCKET NUMBER(S)	
										050003661	

OPERATING MODE (9) 1

POWER LEVEL (10) 070

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

20.402(b)	20.405(c)	X	50.73(a)(2)(iv)	73.71(b)
20.405(a)(1)(i)	50.36(c)(1)		50.73(a)(2)(v)	73.71(c)
20.405(a)(1)(ii)	50.36(c)(2)		50.73(a)(2)(vi)	
20.405(a)(1)(iii)	50.73(a)(2)(i)		50.73(a)(2)(vii)(A)	OTHER (Specify in Abstract below and in Text, NRC Form 366A)
20.405(a)(1)(iv)	50.73(a)(2)(ii)		50.73(a)(2)(vii)(B)	
20.405(a)(1)(v)	50.73(a)(2)(iii)		50.73(a)(2)(ix)	

LICENSEE CONTACT FOR THIS LER (12)

NAME Steven B. Tipps, Nuclear Safety and Compliance Manager TELEPHONE NUMBER (include area code) 912 367-7851

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	JERLY	G080		Yes					

SUPPLEMENTAL REPORT EXPECTED (14)

YES (If yes, complete EXPECTED SUBMISSION DATE) X NO

EXPECTED SUBMISSION DATE (15)

ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-space typewritten lines) (16)

On 2/1/94 at 2025 EST, Unit 2 was in the Run mode at a power level of 1705 CMWT (70 percent of rated thermal power). At that time, the coil of relay 2A71-K57 failed, causing the relay to move to its deenergized state. In addition, when the coil failed, the fuse which supplies its power, 2A71B-F22, also blew. These events initiated several actuations of Engineered Safety Features, including closure of the outboard small-bore Group 1 Primary Containment Isolation System (PCIS) valves and closure of various outboard Group 2 PCIS valves. Licensed plant operations personnel inspected panels in the Main Control Room and discovered the failed relay coil. By 2116 EST, a lead had been lifted from the failed relay, and the blown fuse had been replaced. Subsequently, affected valves were reopened and their associated systems were placed back in service with the exception of the small-bore Group 1 PCIS valves mentioned above. By 2/3/94, the relay coil was replaced and the Group 1 PCIS valves were placed back in their normal system lineups.

The cause of this event was a failed coil in relay 2A71-K57.

Corrective actions for this event include replacing the blown fuse and failed relay coil and returning affected systems and valves to their normal lineups. These actions are complete.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST 500 HRS FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (MN887714), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555-0001 AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1) Edwin I. Hatch Nuclear Plant - Unit 2	DOCKET NUMBER (2) 0 5 0 0 0 3 6 6	LER NUMBER (6)			PAGE (3)	
		YEAR 9 4	SEQUENTIAL YEAR - 0 0 1	REVISION NUMBER - 0 0	2	OF 4

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

PLANT AND SYSTEM IDENTIFICATION

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

DESCRIPTION OF EVENT

On 2/1/94 at 2025 EST, Unit 2 was in the Run mode at a power level of 1705 CMWT (70 percent of rated thermal power). At that time, the coil of relay 2A71-K57 failed, causing the relay to spring return to its deenergized position. In addition, when the coil failed, the fuse which supplies its power, 2A71B-F22, also blew. The failure of the relay to its deenergized position caused automatic closure of the small-bore outboard Group 1 Primary Containment Isolation System (PCIS, EISS Code JM) valves 2B21-F019 and 2B31-F020. The blown fuse deenergized several relays which caused isolation of various Group 2 PCIS valves including several primary containment vent valves, the drywell equipment drain sump isolation valves, and other valves which tripped the Fission Product Monitoring System (FPM, EISS Code IJ) and the containment atmosphere hydrogen and oxygen analyzers (H₂/O₂ Analyzers, EISS Code IK). Licensed plant operations personnel inspected panels in the Main Control Room and discovered the failed relay coil. By 2116 EST, the failed relay was electrically isolated by lifting a wire to the coil, and the blown fuse was replaced. Subsequently, valves affected by the blown fuse were reopened and their associated systems were placed back in service. However, since the small-bore Group 1 PCIS valves mentioned above are controlled by the failed relay, they were left closed at that time. By 2/3/94, the failed relay coil was replaced, returning the relay to service, and the small-bore Group 1 PCIS valves were then placed back in their normal system lineups.

CAUSE OF EVENT

This event was caused by failure of the coil in relay 2A71-K57, which caused two small bore Group 1 PCIS valves to close. When the coil failed, it caused fuse 2A71B-F22 to blow, which resulted in further actuations of Group 2 PCIS valves.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (MNB87714), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555-0001, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

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		YEAR 9 4	SEQUENTIAL YEAR - 0 0 1	REVISION NUMBER - 0 0		

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

REPORTABILITY ANALYSIS AND SAFETY ASSESSMENT

This event is reportable per 10 CFR 50.73.(a)(2)(iv) because unplanned actuations of Engineered Safety Features occurred. Specifically, Group 1 and Group 2 PCIS valves automatically closed in response to a failed relay coil and a blown fuse.

The PCIS is designed to automatically close certain Primary Containment Isolation Valves (PCIVs) to provide protection against accidents involving the release of radioactive material from the fuel or nuclear process barriers. Group 1 systems communicate directly with the reactor coolant system and isolate when process conditions such as low-low-low reactor water level indicate the presence of leakage from the reactor pressure boundary. Group 2 systems are generally those systems whose lines do not communicate directly with the reactor coolant system, but penetrate the Primary Containment and communicate with the free space inside it. Even though Group 1 and Group 2 PCIS valves generally have their own isolation logic, their logic systems occasionally share a power supply. This was the case with the logic affected by this event. The relay which failed is located in a section of logic which controls both Group 1 and Group 2 PCIS valves. The particular relay which failed controls two Group 1 valves, but the fuse supplying power to the relay also supplies power to several other relays which control Group 2 PCIS valves.

In this event, the coil failed in relay 2A71-K57 causing the relay armature to spring return to its deenergized position. When the contacts changed states, the Group 1 valves controlled by the relay moved to their isolated positions per design. The failed relay coil also blew fuse 2A71B-F22. The blown fuse caused several other relays to deenergize, sending isolation signals to various Group 2 PCIS valves. All affected valves responded as designed given the signals introduced by the failed relay and blown fuse. The design of the logic in which this relay was located is "fail-safe," that is, a loss of power or control signal causes the affected components to assume their emergency positions. This is exactly what happened in this event. Therefore, if a design basis accident had occurred concurrently with the failure of this relay, all affected systems would already have been in their safe condition.

Based on this analysis, it is concluded that this event did not result in any adverse effect on nuclear safety. This analysis is applicable to all power levels.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

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FACILITY NAME (1)

DOCKET NUMBER (2)

LER NUMBER (6)

PAGE (3)

YEAR	SEQUENTIAL YEAR	REVISION NUMBER
94	001	00

Edwin I. Hatch Nuclear Plant - Unit 2

05000366

94-001-00

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

CORRECTIVE ACTIONS

The blown fuse 2A71B-F22 was replaced and all Group 2 PCIS valves and associated systems were restored to normal service. This action has been completed.

The coil of relay 2A71-K57 was replaced with a new coil, functionally tested, and the Group 1 PCIS valves affected by it were restored to their normal system lineups.

Georgia Power Company is continuing to investigate the cause of the failed relay coil and will confer with the manufacturer of the relay as necessary.

ADDITIONAL INFORMATION

1. Other Systems Affected: No systems were affected by this event other than those already mentioned in this report.

2. Failed Equipment Information:

Master Parts List Number: 2A71-K
Type: Relay
Manufacturer: General Electric Company
Model Number: CR120A06022AA
Manufacturer Code: G080

EIIS System Code: JE
EIIS Component Code: RLY
Root Cause Code: X
Reportable to NPRDS: Yes

3. Previous Similar Events: Events reported in the past two years in which General Electric type CR120 relays failed are described LERs 50-321/1992-004, dated 02/26/92, and 50-366/1992-028, dated 01/11/93. Corrective actions for these event included replacing failed relays and functionally testing affected circuits or systems. These actions would not have prevented this event because the relays and circuits were different from those affected by this event.