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

December 17, 1996



Docket No. 50-321

HL-5277

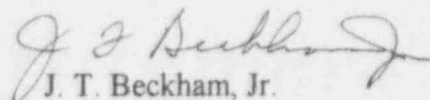
U.S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Washington, D.C. 20555

Edwin I. Hatch Nuclear Plant - Unit 1  
Licensee Event Report  
Failed Control Relay Results in an Automatic  
Primary Containment Isolation System Actuation

Gentlemen:

In accordance with the requirements of 10 CFR 50.73(a)(2)(i)(B) and (a)(2)(iv), Georgia Power Company is submitting the enclosed Licensee Event Report (LER) concerning a failed control relay which resulted in an automatic primary containment isolation system actuation.

Sincerely,

  
J. T. Beckham, Jr.

OCV/eb

Enclosure: LER 50-321/1996-015

cc: Georgia Power Company

Mr. H. L. Sumner, Nuclear Plant General Manager  
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. B. L. Holbrook, Senior Resident Inspector - Hatch

*Handwritten:* 1222  
11

NRC FORM 366 (5-92)		U.S. NUCLEAR REGULATORY COMMISSION		APPROVED OMB NO. 3150-0104 EXPIRES: 5/31/96 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 (MNB7714), 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																			
<b>LICENSEE EVENT REPORT (LER)</b>																							
FACILITY NAME (1) Edwin I. Hatch Nuclear Plant - Unit 1				DOCKET NUMBER (2) <div style="border: 1px solid black; padding: 2px; display: inline-block;">           5   0   0   0   3   2   1         </div>																			
TITLE (4) Failed Control Relay Results in an Automatic Primary Containment Isolation System Actuation																							
EVENT DATE (5) <div style="display: flex; justify-content: space-between;"> <div>MONTH DAY YEAR</div> <div>YEAR</div> </div> <div style="display: flex; justify-content: space-between;"> <div>1   1   1   9   9   6</div> <div>9   6</div> </div>		LER NUMBER (6) <div style="display: flex; justify-content: space-between;"> <div>YEAR SEQUENTIAL NUMBER REVISION NUMBER</div> <div></div> </div> <div style="display: flex; justify-content: space-between;"> <div>0   1   5</div> <div>0   0</div> </div>		REPORT DATE (7) <div style="display: flex; justify-content: space-between;"> <div>MONTH DAY YEAR</div> <div></div> </div> <div style="display: flex; justify-content: space-between;"> <div>1   2   1   7   9   6</div> <div></div> </div>																			
OPERATING MODE (9) 1		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 7: (Check one or more of the following) (11)																					
POWER LEVEL (10) 1   0   0		<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:33%;">20.402(b)</td> <td style="width:33%;">20.405(c)</td> <td style="width:33%; text-align: center;"><input checked="" type="checkbox"/></td> </tr> <tr> <td>20.405(a)(1)(i)</td> <td>50.36(c)(1)</td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> <tr> <td>20.405(a)(1)(ii)</td> <td>50.36(c)(2)</td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> <tr> <td>20.405(a)(1)(iii)</td> <td>50.73(a)(2)(i)</td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> </tr> <tr> <td>20.405(a)(1)(iv)</td> <td>50.73(a)(2)(ii)</td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> <tr> <td>20.405(a)(1)(v)</td> <td>50.73(a)(2)(iii)</td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> </table>				20.402(b)	20.405(c)	<input checked="" type="checkbox"/>	20.405(a)(1)(i)	50.36(c)(1)	<input type="checkbox"/>	20.405(a)(1)(ii)	50.36(c)(2)	<input type="checkbox"/>	20.405(a)(1)(iii)	50.73(a)(2)(i)	<input checked="" type="checkbox"/>	20.405(a)(1)(iv)	50.73(a)(2)(ii)	<input type="checkbox"/>	20.405(a)(1)(v)	50.73(a)(2)(iii)	<input type="checkbox"/>
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		OTHER (Specify in Abstract below and in Text, NRC Form 366A)																					
LICENSEE CONTACT FOR THIS LER (12) NAME Steven B. Tipps, Nuclear Safety & Compliance Manager				TELEPHONE NUMBER (include area code) <div style="display: flex; justify-content: space-between;"> <div>AREA CODE</div> <div>9   1   2   5   3   7   -   1   3   9   5</div> </div>																			
COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)																							
CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS																			
X	J   M	R   L   Y	G   0   8   0	Yes																			
SUPPLEMENTAL REPORT EXPECTED (14) YES (If yes, complete EXPECTED SUBM DATE) <input checked="" type="checkbox"/> NO																							
				EXPECTED SUBMISSION DATE (15)	MONTH DAY YEAR																		
ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-space typewritten lines) (16)																							

On 11/19/96, at 1643 EST, Unit 1 was in the Run mode at 2558 CMWT (100 percent of rated thermal power). At that time, a Primary Containment Isolation System (PCIS) signal was received resulting in several Primary Containment Isolation Valves (PCIVs) automatically closing. No plant conditions existed at the time that would have required the actuations. Electricians were dispatched to the Control Room to troubleshoot the PCIS control logic to identify the cause of the actuation. At 1723 EST, a blown fuse, 1A71B-F21, was found to have caused the actuation. The fuse could not be replaced nor the logic restored until the cause of the fuse actuation was determined. Consequently, troubleshooting activities continued. At 1738 EST, the cause of the fuse actuation had not been determined and the PCIVs were still closed. As a result, a reactor shutdown commenced as required by the Technical Specifications because several of the PCIVs being closed rendered the Reactor Coolant System (RCS) Leakage Detection Systems inoperable. A faulted coil on relay 1A71B-K56 was later found to be the cause. The relay was isolated and, at 1820 EST, the fuse was replaced. By 1835 EST, the logic was reset and a subsystem of the RCS Leak Detection Systems had been restored to operation allowing the reactor shutdown to be terminated. By 2320 EST, relay 1A71B-K56 had been replaced and the associated PCIVs restored to their pre-event positions. The cause of the event was a failed relay coil. Corrective actions included replacing the relay coil and the fuse and evaluating other relays for replacement in similar situations.

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

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INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD  
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**PLANT AND SYSTEM IDENTIFICATION**

General Electric - Boiling Water Reactor

Energy Industry Identification System Codes are identified in the text as (EIIS Code XX).

**DESCRIPTION OF EVENT**

On 11/19/96, at 1643 EST, Unit 1 was in the Run mode at 2558 CMWT (100 percent of rated thermal power). At that time, a partial Groups 1 and 2 Primary Containment Isolation System (PCIS, EIIS Code JM) signal was received resulting in several Primary Containment Isolation Valves (PCIVs) automatically closing. The affected PCIS valves were verified to be closed. No plant conditions existed at the time that would have required the PCIS actuation.

A non-licensed Instrument and Controls technician in the vicinity of PCIS panel 1H11-P622, which is located in the Main Control Room, reported to a licensed operator that he smelled what could be an overheated relay in the panel. The panel was inspected but no signs of an overheated relay were identified at that time. Electricians were subsequently dispatched to the Main Control Room to troubleshoot the PCIS control logic to identify the cause of the actuation.

At 1723 EST, fuse 1A71B-F21 located in panel 1H11-P622 was found to be blown. Fuse 1A71B-F21 provides power for the isolation logic for the inboard Group 2 and the inboard small-bore Group 1 PCIVs, the Steam Packing Exhausters (EIIS Code TC), and the Mechanical Vacuum Pump (EIIS Code SH). The logic is of a fail-safe design such that upon loss of power it generates a close/trip signal to the associated components. The PCIVs were verified to be closed following the actuation, and the Steam Packing Exhausters were verified to have received a trip signal. The Mechanical Vacuum Pump was not in operation at the time of the event. The fuse could not be replaced nor the logic restored until the cause of the fuse actuation was determined. Consequently, troubleshooting activities continued.

Three of the affected PCIVs provide automatic isolation capability for the lines serving the Reactor Coolant System (RCS) Leakage Detection Systems, including that of the Fission Product Monitoring (FPM, EIIS Code IJ) System and the Drywell Floor Drain Sump Monitoring (EIIS Code IJ) System. These lines penetrate Primary Containment and as such automatically isolate on a PCIS signal. With these valves closed, the Leak Detection Systems were no longer functional. In this condition, Technical Specifications 3.4.5 requires that Limiting Condition for Operation (LCO) 3.0.3 be entered. This LCO requires that within one hour actions be taken to shut down the reactor within the following time frames: Startup/Hot Standby within seven hours, Hot Shutdown within 13 hours,

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and Cold Shutdown within 37 hours. At 1738 EST, the cause of the fuse actuation had not been determined and the logic had not been restored. Consequently, at that time, reactor shutdown commenced with a reduction in Recirculation System (EIS Code AD) flow.

A relay in the PCIS logic was later found with a faulted coil: relay 1A71B-K56. The relay was electrically isolated and, at 1820 EST, the fuse was replaced. With the fuse replaced, the logic was reset. Subsequently, the systems that were served by this logic were restored with the exception of those served by relay 1A71B-K56.

By 1835 EST, the FPM system had been restored to operation. With this system in operation, LCO 3.0.3 no longer applied and the shutdown was terminated. By 1950 EST, reactor power had been returned to 100 percent rated thermal power.

By 2320 EST, relay 1A71B-K56 had been replaced and the associated PCIVs restored to their pre-event positions.

**CAUSE OF EVENT**

The cause of the event was age-related shorting in the coil of relay 1A71B-K56. This shorting produced excessive current in the associated circuit. The current was sufficient to result in the actuation of fuse 1A71B-F21, which is designed to protect circuit components. This relay is a GE CR120 type relay which has experienced age-related failures in the past throughout the industry. The problem has been addressed in GE Service Information Letter (SIL) 229, "GE Type CR120A Relay Aging," and its supplement. In response to GE SIL 229, Supplement 1, thermography of normally energized, safety related relays was being performed on accessible relays. Relay 1A71B-K56 is not easily accessed using the thermography equipment. Because of its location in the panel, a special extension apparatus would be needed for performing thermography on it. However, because of the sensitivity of the panel, the extension could not be used and, consequently, this relay was not being checked during thermography.

**REPORTABILITY ANALYSIS AND SAFETY ASSESSMENT**

This report is required pursuant to 10 CFR 50.73(a)(2)(i)(B) and (a)(2)(iv) because an unplanned actuation of an engineered safety feature occurred and it resulted in entry into a condition that was prohibited by the Technical Specifications. Specifically, a failed relay coil resulted in several PCIVs automatically closing. With the valves closed, the RCS Leakage Detection Systems were rendered



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inoperable, requiring entry into LCO 3.0.3 which is by definition a condition prohibited by the Technical Specifications.

The Primary Containment Isolation System provides automatic isolation capability of Primary Containment penetrations to preclude the release of radioactive material and the loss of reactor coolant inventory in the unlikely event of an accident. In this event, shorting of a control relay coil resulted in a loss of power to a PCIS initiation circuit. The PCIS circuit is of a fail-safe design in that upon a loss of power to the circuit an isolation signal is generated. Consequently, a partial PCIS isolation occurred resulting in several PCIVs automatically closing. Several of the valves were already closed prior to the event, that being their normal positions.

The RCS Leakage Detection Systems are designed to monitor reactor coolant pressure boundary leakage and to provide licensed operators with the necessary leakage information such that appropriate actions can be taken in a timely manner in the unlikely event a leak in the boundary develops. These systems include the Fission Product Monitoring System and the Drywell Floor Drain Sump Monitoring System. These systems were isolated and therefore rendered inoperable as a result of the PCIS actuation. Per the Technical Specifications, LCO 3.0.3 was entered, requiring the reactor to be shutdown in a controlled manner. Had a leak occurred at this time, actions were already in progress to place the reactor in a condition in which such a leakage problem could be mitigated. Prior to reaching a shutdown condition, the problem was resolved and a subsystem of the Leakage Detection Systems was returned to service. Consequently, as allowed by the Technical Specifications, LCO 3.0.3 was exited.

Based on the above information, it is concluded that this event had no adverse impact on nuclear safety. This assessment applies to all operating conditions.

**CORRECTIVE ACTIONS**

Fuse 1A71B-F21 and the coil of relay 1A71B-K56 were replaced and the PCIS and Leakage Detection Systems were returned to the pre-event line-up.

Other normally energized, safety related CR120 relays that are nonaccessible for thermography will be identified and evaluated for initial and periodic replacement. The evaluations will be completed by 2/28/97.

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ADDITIONAL INFORMATION

No systems other than those previously identified in this report were affected by this event.

Two similar events have occurred in the previous two years in which a failed control relay coil resulted in an engineered safety features actuation. The events were addressed in the following reports:

50-366/94-09, dated 1/13/95, and  
50-321/96-03, dated 4/5/96.

As stated in the cause of the event, thermography was being performed in part in response to GE SIL 229 and in association with the above noted reports. However, thermography was not performed on the relay involved in this event because of its inaccessibility with regard to the thermography equipment.

## Failed Components Information:

Master Parts List Number: 1A71B-K56

Type: Relay

Manufacturer: General Electric

Model Number: CR120

Manufacturer Code: G080

EIIIS System Code: JM

EIIIS Component Code: RLY

Root Cause Code: X

Reportable to NPRDS: Yes