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

Edwin I. Hatch Nuclear Plant - Unit 1
Licensee Event Report
Component Failure Results in Failure of Engineered Safety Feature to Actuate

Ladies and Gentlemen:

In accordance with the requirements of 10 CFR 50.73(a)(2)(iv), Southern Nuclear Operating Company is submitting the enclosed Licensee Event Report (LER) concerning the failure of a primary containment isolation logic relay to close when the relay coil de-energized upon receipt of a simulated isolation signal.

Respectfully submitted,

Lewis Sumner

H. L. Sumner, Jr.

OCV/sp

Enclosure: LER 50-321/2000-009

cc: Southern Nuclear Operating Company
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NRC FORM 366 (06-1998) U.S. NUCLEAR REGULATORY COMMISSION

LICENSEE EVENT REPORT (LER)

(See reverse for required number of digits/characters for each block)

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TITLE (4)
Component Failure Results in Failure of Engineered Safety Feature to Actuate

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)
09	20	2000	2000	009	00	10	16	2000		05000
										DOCKET NUMBER(S) 05000

OPERATING MODE (9)	1
POWER LEVEL (10)	97.5

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)

	20.2201(b)		20.2203(a)(2)(v)		50.73(a)(2)(i)		50.73(a)(2)(vii)
	20.2203(a)(1)		20.2203(a)(3)(i)		50.73(a)(2)(ii)		50.73(a)(2)(ix)
	20.2203(a)(2)(i)		20.2203(a)(3)(ii)		50.73(a)(2)(iii)		73.71
	20.2203(a)(2)(ii)		20.2203(a)(4)	X	50.73(a)(2)(iv)		OTHER
	20.2203(a)(2)(iii)		50.36(c)(1)		50.73(a)(2)(v)		Specify in Abstract below or in NRC Form 366A
	20.2203(a)(2)(iv)		50.36(c)(2)		50.73(a)(2)(vii)		

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER (Include Area Code)
Steven B. Tipps, Nuclear Safety and Compliance Manager, Hatch	(912) 367-7851

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

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX
X	JM	RLY	G080	Yes					

SUPPLEMENTAL REPORT EXPECTED (14)			EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
YES (If yes, complete EXPECTED SUBMISSION DATE)	X	NO				

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

On 9/20/2000 at 1215 EDT, Unit 1 was in the Run mode at a power level of 2695 CMWT (97.5% rated thermal power). At that time, inboard primary containment isolation valve 1G31-F001 failed to close as expected during the performance of surveillance procedure 34SV-G31-001-1S, "Reactor Water Cleanup Automatic Isolation LSFT." Specifically, the valve failed to close upon injection of a simulated isolation signal on high equipment room temperature/high differential temperature/high differential flow. Operations personnel declared inoperable the primary containment isolation function of valve 1G31-F001 and initiated Required Action Sheet 1-00-228 as required by Unit 1 Technical Specifications Limiting Condition for Operation 3.6.1.3, Condition A, and plant procedures. Outboard primary containment isolation valve 1G31 F004 was closed and de-activated under Clearance 1-00-0761 per Unit 1 Technical Specifications Limiting Condition for Operation 3.6.1.3, Required Action A.1.

The cause of this event was component failure. The normally-closed set of contacts in primary containment isolation logic relay 1A71-K26 failed to close when the relay coil de-energized upon receipt of the simulated isolation signal. This set of contacts must close in order to close valve 1G31-F001; therefore, its failure to close prevented valve 1G31-F001 from closing. The sliding contact arm on the relay was replaced; valve 1G31-F001 was verified to close on a simulated isolation signal per procedure 34SV-G31-001-1S; and the valve was returned to an operable status on 9/22/2000 at 1638 EDT.

PLANT AND SYSTEM IDENTIFICATION

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

DESCRIPTION OF EVENT

On 9/20/2000 at 1215 EDT, Unit 1 was in the Run mode at a power level of 2695 CMWT (97.5% rated thermal power). At that time, inboard primary containment isolation valve (EIIS Code JM) 1G31-F001 failed to close as expected during the performance of subsection 7.2 of surveillance procedure 34SV-G31-001-1S, "Reactor Water Cleanup Automatic Isolation LSFT." This subsection tests the isolation logic for valve 1G31-F001 through the simulation of various isolation signals and the confirmation that required actions, including automatic closure of the valve, occur as designed. This testing is required by Unit 1 Technical Specifications Surveillance Requirements (SRs) 3.3.6.1.6 and 3.6.1.3.7 to be performed at least once every 18 months.

Valve 1G31-F001 failed to close as expected upon injection of a simulated isolation signal on high equipment room temperature/high differential temperature/high differential flow. Other expected actions, such as changes in light and computer relay status indication, occurred as designed. Operations personnel declared inoperable the primary containment isolation function of valve 1G31-F001 and initiated Required Action Sheet 1-00-228 as required by Unit 1 Technical Specifications Limiting Condition for Operation 3.6.1.3, Condition A, and plant procedures. Outboard primary containment isolation valve 1G31-F004, located in the same penetration as valve 1G31-F001, was closed and de-activated under Clearance 1-00-0761 per Unit 1 Technical Specifications Limiting Condition for Operation 3.6.1.3, Required Action A.1.

CAUSE OF EVENT

The cause of this event was component failure. The normally-closed set of contacts* in primary containment isolation logic (EIIS Code JM) relay 1A71-K26 failed to close when the relay coil de-energized upon receipt of the simulated isolation signal. This set of contacts must close in order to close valve 1G31-F001; therefore, its failure to close prevented valve 1G31-F001 from closing.

Mechanical binding and/or a weak spring could have prevented the normally-closed set of contacts from closing when relay 1A71-K26 was de-energized. The movement of a metal plate actuates a sliding relay contact arm. The metal plate is tack-welded to a small pivot rod and is moved toward the coil by the magnetic force generated by the energized relay coil. The movement of the plate toward the energized coil compresses a spring that forces the plate away from the coil when it is de-energized. The magnetic and

* Normally-closed refers to the position of the contacts when the relay is in the de-energized, or shelf, state. Thus, normally-closed contacts are open when the relay is energized and closed when it is de-energized. Normally-open contacts are the reverse.

spring forces, therefore, move the contact arm and contacts, via the metal plate, to the energized and de-energized positions, respectively. If the spring is weak or otherwise not able to develop sufficient force to overcome contact arm friction or binding, it may not move the metal plate and the attached contact arm far enough to close the normally-closed set of contacts when the relay is de-energized.

The relay was energized and re-tested within 45 minutes of the initial test failure. Although no work was performed on the relay, valve 1G31-F001 closed as expected when its isolation signal was simulated a second time. On 9/21/2000, Maintenance personnel, while manually actuating the relay, discovered that the sliding contact arm, under certain circumstances, could be stopped at a point where both the normally-closed and the normally-open sets of contacts were open. With relay 1A71-K26 in this state, all expected actions, except the closing of valve 1G31-F001, would have occurred.

Although the sliding contact arm showed no obvious signs of damage or deformation, Maintenance personnel cleaned the area where the sliding arm is located, replaced it and repeated the manual actuation of the relay. No binding of the contact arm was observed and the new contact arm could not be stopped at a mid-position. Resistance readings across the normally-closed contacts confirmed that they were closed with the relay coil de-energized. Since the removed sliding contact arm appeared undamaged, it is not clear whether its replacement and other work performed, such as the application of contact cleaner, eliminated a source of mechanical binding or merely reduced frictional forces to within the capacity of a weakened spring.

REPORTABILITY ANALYSIS AND SAFETY ASSESSMENT

This event is reportable per 10 CFR 50.73 (a)(2)(iv) because an engineered safety feature failed to actuate upon demand. Specifically, a primary containment isolation valve, part of the primary containment isolation system, an engineered safety feature system, failed to close upon receipt of a simulated containment isolation signal during routine testing. A failure of an engineered safety feature to actuate upon demand, per the guidance given in NUREG-1022, "Event Reporting Guidelines 10 CFR 50.72 and 50.73," Revision 1, is reportable under the requirements of 10 CFR 50.73 (a)(2)(iv).

The primary containment isolation instrumentation system initiates automatic closure of appropriate primary containment isolation valves. The primary containment isolation valves, in conjunction with other mitigation systems, limit fission product release during and following postulated transients, malfunctions, and design basis accidents. In particular for this event, Reactor Water Cleanup system (EIIS Code CE) area ventilation differential temperature instruments (EIIS Code IJ) are provided to monitor for a leak. These instruments automatically initiate isolation of the cleanup system by closing valves 1G31-F001 and 1G31-F004 if temperatures exceed a setpoint indicating a possible system leak. Although credit for these instruments, and the associated system isolation, is not taken in any transient or accident analysis, offsite dose limits may be reached if the leak is not isolated. Therefore, the Unit 1 Technical Specifications require these temperature instruments and automatic isolation logic to be operable and prescribe various periodic tests to be performed to ensure their proper functioning. One of the prescribed tests is a logic system functional test to be performed at least once every 18 months. This test is performed using procedure 34SV-G31-001-1S.

In this event, a relay in the Reactor Water Cleanup system isolation logic system failed to function properly when tested. The normally-closed set of contacts failed to close when the relay de-energized upon receipt of a simulated high equipment room temperature/high differential temperature/high differential flow isolation signal. These contacts must close in order for valve 1G31-F001 to close; their failure to function properly resulted in a failure of valve 1G31-F001, part of an engineered safety feature system, to close as required. However, no similar problem was found when the independent isolation logic system for valve 1G31-F004 was tested using the same procedure. Since these two valves are located in the same line, closure of only one is needed to isolate a leak in the Reactor Water Cleanup system. Because the relay failure affected only valves 1G31-F001 and 1G31-F004 and the relay's isolation logic system was confirmed to function properly, it can be concluded that a leak in the Reactor Water Cleanup system would have been isolated as required. Therefore, this event had no adverse impact on nuclear safety. This analysis applies to all operating conditions.

CORRECTIVE ACTIONS

The sliding contact arm on the relay was replaced and the area around it cleaned per Maintenance Work Order 1-00-2936 on 9/21/2000. Valve 1G31-F001 was verified to close on a simulated isolation signal by the successful completion of subsection 7.2 of surveillance procedure 34SV-G31-001-1S. Operations personnel returned the valve to an operable status and closed Required Action Sheet 1-00-228, on 9/22/2000 at 1638 EDT.

In order to eliminate a weakened spring as a potential cause or contributor to this event, relay 1A71-K26 was replaced per Maintenance Work Order 1-00-3189.

ADDITIONAL INFORMATION

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

2. Failed Components Information:

   Master Parts List Number: 1A71-K26
   Manufacturer: General Electric
   Model Number: CR120
   Type: Relay
   Manufacturer Code: G080

   EIIS System Code: JM
   Reportable to EPIX: Yes
   Root Cause Code: X
   EIIS Component Code: RLY

3. Commitments: No permanent commitments are created as a result of this report.

4. Previous Similar Events: A previous similar event in the last 2 years in which an engineered safety feature system failed to function when required was reported in Licensee Event Report 50-321/2000-002, dated 02/25/2000. In this event, the High Pressure Coolant Injection system (EIIS Code BJ), an engineered safety feature system, failed to trip on high water level following an automatic reactor shutdown. After extensive review, personnel concluded that a probable failure was caused by dirt on relay contacts. The suspect relays were removed, and visual examination and testing were performed. Although no problems were found, the relays were replaced. However, this corrective action could not have anticipated the failure of relay 1A71-K26 because the relays and their failure modes were different. The relays associated with the failure of the High Pressure Coolant Injection system to trip on high water level were not the same type as relay 1A71-K26. In particular, the former relays do not utilize sliding contact arms; their size, construction, and manufacturer also are different. Moreover, it was postulated that dirt prevented the relay contacts from completing the electrical circuit necessary to trip the High Pressure Coolant Injection system. The 1A71-K26 relay contacts, however, were verified through resistance checks not to be dirty.