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May 7, 2002

Docket No. 50-366 HL-6238

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

Edwin I. Hatch Nuclear Plant - Unit 2
Licensee Event Report
Component Failure in a Limit Switch Leads to
Inoperability of HPCI System

Ladies and Gentlemen:

In accordance with the requirements of 10 CFR 50.73(a)(2)(v)(B) and 10 CFR 50.73(a)(2)(v)(D), Southern Nuclear Operating Company is submitting the enclosed Licensee Event Report (LER) concerning a component failure in a limit switch which lead to the inoperability of the HPCI system.

Respectfully submitted,

Lewis Sumner

H. L. Sumner, Jr.

IFL/eb

Enclosure: LER 50-366/2002-001

cc: Southern Nuclear Operating Company
Mr. P. H. Wells, Nuclear Plant General Manager
SNC Document Management (R-Type A02.001)

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NRC FORM 366 (7-2001) U.S. NUCLEAR REGULATORY COMMISSION

LICENSEE EVENT REPORT (LER)

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

APPROVED BY OMB NO. 3150-0104 EXPIRES 7/31/2004

Estimated burden per response to comply with this mandatory information collection request: 50 hrs. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Records Management Branch (T-6 E6), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to bjs1(@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202 (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

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4. TITLE

Component Failure in a Limit Switch Leads to Inoperability of HPCI System

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER(S)
										05000
03	28	2002	2002	001	00	05	07	2002	FACILITY NAME	DOCKET NUMBER(S)
										05000

9. OPERATING MODE	1
10. POWER LEVEL	100

11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply)

20.2201(b)	20.2203(a)(3)(ii)	50.73(a)(2)(ii)(B)	50.73(a)(2)(ix)(A)
20.2201(d)	20.2203(a)(4)	50.73(a)(2)(iii)	50.73(a)(2)(x)
20.2203(a)(1)	50.36(c)(1)(i)(A)	50.73(a)(2)(iv)(A)	73.71(a)(4)
20.2203(a)(2)(i)	50.36(c)(1)(ii)(A)	50.73(a)(2)(v)(A)	73.71(a)(5)
20-2203(a)(2)(ii)	50.36(c)(2)	X 50.73(a)(2)(v)(B)	OTHER
20-2203(a)(2)(iii)	50.46(a)(3)(ii)	50.73(a)(2)(v)(C)	Specify in Abstract below or in NRC Form 366A
20.2203(a)(2)(iv)	50.73(a)(2)(i)(A)	X 50.73(a)(2)(v)(D)	
20.2203(a)(2)(v)	50.73(a)(2)(i)(B)	50.73(a)(2)(vii)	
20.2203(a)(2)(vi)	50.73(a)(2)(i)(C)	50.73(a)(2)(viii)(A)	
20.2203(a)(3)(i)	50.73(a)(2)(ii)(A)	50.73(a)(2)(viii)(B)	

12. LICENSEE CONTACT FOR THIS LER

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

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

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX
X	SB	SHV	R344	Yes					

14. SUPPLEMENTAL REPORT EXPECTED

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

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

On 03/28/2002 at 0300 EST, Unit 2 was in the Run mode at a power level of 2763 CMWT (100 percent rated thermal power). At that time, the High Pressure Coolant Injection (HPCI) system was rendered inoperable when personnel closed turbine exhaust line vacuum breaker isolation valve 2E41-F111. Personnel closed valve 2E41-F111, a primary containment isolation valve, per the requirements of Unit 2 Technical Specifications Condition 3.6.1.3.A following unsatisfactory operation of turbine exhaust line vacuum breaker isolation valve 2E41-F104 during a routine surveillance. Because valve 2E41-F104 is a primary containment isolation valve, its unsatisfactory operation required that Unit 2 Technical Specifications Condition 3.6.1.3.A be entered. Entry into Condition 3.6.1.3.A required that valve 2E41-F111 be closed to isolate the affected penetration, effectively isolating the turbine exhaust line vacuum breakers and preventing them from performing their intended function. As a result, the HPCI system was rendered inoperable.

This event was caused by component failure. The spring tension in the finger base sub-assembly of a limit switch had weakened, preventing proper electrical contact and causing the open position indication to malfunction. Because the valve's actual position was uncertain, it was declared inoperable. This required valve 2E41-F111 to be closed and the HPCI system to be rendered inoperable. Personnel adjusted the spring tension, completed successfully the valve test, and declared valve 2E11-F104 operable. After re-opening valve 2E41-F111 and completing scheduled maintenance work and the proper functional tests, the HPCI system was declared operable at 1322 EST on 03/28/2002.

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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 (EIIS Code XX).

DESCRIPTION OF EVENT

On 03/28/2002 at 0300 EST, Unit 2 was in the Run mode at a power level of 2763 CMWT (100 percent rated thermal power). At that time, the High Pressure Coolant Injection (HPCI, EIIS Code BJ) system was rendered inoperable when Operations personnel closed turbine exhaust line vacuum breaker isolation valve 2E41-F111. Personnel closed valve 2E41-F111, a primary containment isolation valve, per the requirements of Unit 2 Technical Specifications Condition 3.6.1.3.A following unsatisfactory operation of turbine exhaust line vacuum breaker isolation valve 2E41-F104 during the performance of a routine surveillance. The open (red) indication light illuminated as expected when Operations personnel began to open valve 2E41-F104 during the performance of surveillance procedure 34SV-E41-001-2S, "HPCI Valve Operability." However, the open indication light extinguished unexpectedly while the valve was opening and remained extinguished after completion of the expected opening stroke time and other indications showed the valve was open. Operations personnel conservatively declared valve 2E41-F104 inoperable due to their uncertainty regarding its actual position.

Because valve 2E41-F104 is a primary containment isolation valve, the unsatisfactory operation of its open position indication light required that Unit 2 Technical Specifications Condition 3.6.1.3.A be entered for an inoperable isolation valve. Entry into Condition 3.6.1.3.A required that valve 2E41-F111, a primary containment isolation valve located in the same line, be closed and deactivated in order to isolate the affected penetration flow path. Operations personnel closed and deactivated valve 2E41-F111 under Clearance 2-02-122. However, closure of valve 2E41-F111 effectively isolated the HPCI turbine exhaust line vacuum breakers, preventing them from performing their intended function of stopping suppression pool water from being drawn into the HPCI turbine exhaust line. As a result, the HPCI system was rendered inoperable. Operations personnel therefore entered Unit 2 Technical Specification Condition 3.5.1.C and initiated Required Action Sheet 2-02-064 as directed by the Technical Specifications and plant procedures.

CAUSE OF EVENT

This event was caused by component failure. The spring tension in the finger base sub-assembly for limit switch #8 had weakened, preventing proper electrical contact in one of the limit switches that indicate the position of valve 2E41-F104. This caused the open position indication (red light in the Main Control Room) to malfunction during performance of a periodic valve stroke test. Because they were uncertain of the valve's actual position, Operations personnel conservatively declared it inoperable. This required valve 2E41-F111 to be closed and the HPCI system to be rendered inoperable for the reasons described previously.

REPORTABILITY ANALYSIS AND SAFETY ASSESSMENT

This event is reportable per 10 CFR 50.73 (a)(2)(v) because an event occurred in which the HPCI system, a single train safety system, was rendered inoperable.

The HPCI system consists of a steam turbine-driven pump and the necessary piping and valves to transfer water from the suppression pool or the condensate storage tank (EIIS Code KA) to the reactor vessel. The system is designed to inject water to the reactor vessel over a range of reactor pressures from 160 psig through full rated pressure. The HPCI system starts and injects automatically whenever low reactor water level or high drywell pressure indicates the possibility of an abnormal loss of coolant inventory. The HPCI system, in particular, is designed to replace lost reactor coolant inventory in cases where a small line break occurs which does not result in full depressurization of the reactor vessel.

The backup for the HPCI system is the Automatic Depressurization System (ADS) together with two low pressure injection systems: the Low Pressure Coolant Injection (LPCI, EIIS Code BO) system and the Core Spray (EIIS Code BM) system. The Core Spray system is composed of two independent, redundant, 100 percent capacity subsystems. Each subsystem consists of a motor driven pump, its own dedicated spray sparger located above the core, and piping and valves to transfer water from the suppression pool to the sparger. Upon receipt of an initiation signal, the Core Spray pumps in both subsystems start. Once ADS has reduced reactor pressure sufficiently, Core Spray system flow begins.

LPCI is an operating mode of the Residual Heat Removal (EIIS Code BO) system. There are two independent, redundant, 100 percent capacity LPCI subsystems, each consisting of two motor driven pumps and piping and valves to transfer water from the suppression pool to the reactor vessel. Upon receipt of an initiation signal, all four LPCI pumps automatically start. Once ADS has reduced reactor pressure sufficiently, the LPCI flow to the reactor vessel begins. The divisionally separated initiation logic systems for LPCI and Core Spray incorporate "crossover" circuitry allowing each division to trigger an initiation of the other division. With this design, any one operable division of logic can produce a full actuation in both divisions of all the pumps and valves necessary for injection to the reactor vessel.

In this event, the HPCI system was rendered inoperable when personnel closed valve 2E41-F111, effectively isolating the HPCI turbine exhaust line vacuum breakers and preventing them from performing their intended function. During the time the HPCI system was inoperable, however, the Reactor Core Isolation Cooling (RCIC, EIIS Code BN) system was available to inject high pressure water into the reactor vessel. Although not an emergency core cooling system, the RCIC system is designed, maintained, and tested to the same standards and requirements as the HPCI system and therefore should reliably inject water into the reactor vessel when required. If a break exceeded the capacity of the RCIC system (400 gallons per minute), the ADS was available to depressurize the reactor vessel to the point that either the Core Spray or LPCI systems could have been used to provide water to the reactor core. The capacity of one loop of the Core Spray system is equal to that of the HPCI system (4250 gallons per minute each); the capacity of one loop of the LPCI system is approximately three times that of the HPCI system. Therefore, any one of the

four loops of the low pressure injection systems would have provided sufficient injection capacity for a small break loss-of-coolant accident.

Based on this analysis, it is concluded that this event had no adverse impact on nuclear safety. This analysis is applicable to all power levels and operating modes in which a loss-of-coolant accident is postulated to occur.

CORRECTIVE ACTIONS

Maintenance personnel adjusted the limit switch finger base sub-assembly spring tension per Maintenance Work Order 2-02-00513. Operations personnel stroked the valve to ensure proper operation of the position indication lights. They then completed successfully the periodic valve stroke test and declared valve 2E11-F104 operable at 0905 EST on 03/28/2002. After valve 2E41-F111 was re-opened and previously scheduled, but unrelated, maintenance work and the proper functional tests were completed, Operations personnel declared the HPCI system operable at 1322 EST on 03/28/2002.

ADDITIONAL INFORMATION

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

Failed Components Information:

Master Parts List Number: 2E41-F104
Manufacturer: Limitorque Corp.
Model Number: 10158
Type: Switch, Position
Manufacturer Code: L200

EIIS System Code: BJ
Reportable to EPIX: Yes
Root Cause Code: X
EIIS Component Code: 33

Commitment Information: This report does not create any permanent licensing commitments.

Previous Similar Events: Previous similar events in the last two years in which a single-train safety system was rendered inoperable were reported in the following Licensee Event Reports:

50-321/2001-001, dated 05/03/2001,
50-321/2000-007, dated 09/27/2000, and
50-321/2000-005, dated 09/15/2000.

In the first event, the HPCI system was rendered inoperable when a battery charger fuse failure caused voltage fluctuations on a power supply bus, resulting in brief losses of power to the HPCI system flow controller. In the second event, the HPCI system was rendered inoperable when its flow control input

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signal resistor failed causing erratic operation of the controller. In the third event, the HPCI system was rendered inoperable when its turbine stop valve stuck in the open position. Corrective actions for these previous events could not have prevented this event because the previous failures involved different and unrelated components and failure modes.