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SOUTHERN COMPANY
Energy to Serve Your World℠

July 17, 2006

Docket No.: 50-366

NL-06-1334

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D. C. 20555-0001

Edwin I. Hatch Nuclear Plant
Licensee Event Report
High Pressure Coolant Injection System Inoperable Due To Leaking Check Valve

Ladies and Gentlemen:

In accordance with the requirements of 10 CFR 50.73(a)(2)(v)(D), Southern Nuclear Operating Company is submitting the enclosed Licensee Event Report (LER) concerning a leaking check valve which resulted in the High Pressure Coolant Injection System being inoperable.

This letter contains no NRC commitments. If you have any questions, please advise.

Sincerely,

L. M. Stinson

LMS/OCV/daj

Enclosure: LER 2-2006-003

cc: Southern Nuclear Operating Company
Mr. J. T. Gasser, Executive Vice President
Mr. D. R. Madison, General Manager – Plant Hatch
RTYPE: CHA02.004

U. S. Nuclear Regulatory Commission
Dr. W. D. Travers, Regional Administrator
Mr. C. Gratton, NRR Project Manager – Hatch
Mr. D. S. Simpkins, Senior Resident Inspector – Hatch

NRC FORM 366 (6-2004) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB: NO. 3150-0104 EXPIRES: 06/30/2007

Estimated burden per response to comply with this mandatory collection request: 50 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Records and FOIA/Privacy Service Branch (T-5 F52), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to infocollects@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 an 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.

LICENSEE EVENT REPORT (LER)

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

1. FACILITY NAME	2. DOCKET NUMBER	3. PAGE
Edwin I. Hatch Nuclear Plant - Unit 2	05000-366	1 OF 6

4. TITLE
High Pressure Coolant Injection Inoperable Due To Leaking Check Valve

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
05	16	2006	2006	003	0	7	17	2006	FACILITY NAME	DOCKET NUMBER(S) 05000

9. OPERATING MODE	11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply)			
Mode 1	20.2201(b)	20.2203(a)(3)(i)	50.73(a)(2)(i)(C)	50.73(a)(2)(vii)
	20.2201(d)	20.2203(a)(3)(ii)	50.73(a)(2)(ii)(A)	50.73(a)(2)(viii)(A)
	20.2203(a)(1)	20.2203(a)(4)	50.73(a)(2)(ii)(B)	50.73(a)(2)(viii)(B)
	20.2203(a)(2)(i)	50.36(c)(1)(i)(A)	50.73(a)(2)(iii)	50.73(a)(2)(ix)(A)
10. POWER LEVEL	20-2203(a)(2)(ii)	50.36(c)(1)(ii)(A)	50.73(a)(2)(iv)(A)	50.73(a)(2)(x)
	20-2203(a)(2)(iii)	50.36(c)(2)	50.73(a)(2)(v)(A)	73.71(a)(4)
100%	20.2203(a)(2)(iv)	50.46(a)(3)(ii)	50.73(a)(2)(v)(B)	73.71(a)(5)
	20.2203(a)(2)(v)	50.73(a)(2)(i)(A)	50.73(a)(2)(v)(C)	OTHER
	20.2203(a)(2)(vi)	50.73(a)(2)(i)(B) X	50.73(a)(2)(v)(D)	Specify in Abstract below or in NRC Form 366A

12. LICENSEE CONTACT FOR THIS LER

FACILITY NAME	TELEPHONE NUMBER (Include Area Code)
Edwin I. Hatch / Kathy A. Underwood, Performance Analysis Supervisor	(912) 537-5931

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
A	BJ	FCV	E095	Y						

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

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

On 5/16/2006 at approximately 9:38 EDT, Unit 2 was in the Run mode at a power level of approximately 2804 CMWT (100 percent rated thermal power). Quarterly testing of the High Pressure Coolant Injection (HPCI) system was in progress when leakage out of the bonnet on the pump discharge check valve was identified. Testing was halted and the leak was isolated.

This event was caused by personnel error in that the spacer ring for the graphite pressure seal was incorrectly installed. This seal creates a leak tight boundary for the bonnet of the pressure seal valve. Incorrect installation of the spacer ring allowed a greater amount of extrusion of the pressure seal resulting in lower gasket stress. As a result, slow degradation of the pressure seal occurred ultimately resulting in a leak through the mechanical joint of the valve bonnet. After replacement of the spacer ring and pressure seal the HPCI system was functionally tested. The HPCI system was declared operable at 05:45 EDT on 5/18/2006.

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 5/16/2006 at approximately 9:38 EDT, Unit 2 was in the Run mode at a power level of approximately 2804 CMWT (100 percent rated thermal power). Quarterly testing of the High Pressure Coolant Injection (HPCI), (HPCI, EIIS Code BJ), system was in progress when leakage out of the bonnet on the pump discharge check valve was identified. The leakage amount was estimated to be approximately 20 gallons per minute. As a result of the leak, the HPCI Room Instrument Sump HIGH and the HPCI Room Instrument Sump HIGH-HIGH annunciators were received. Testing was halted. The HPCI Room Instrument Sump HIGH-HIGH annunciator reset within six minutes. The leak was isolated from driving head created by pipe elevation changes, and the HPCI Room Instrument Sump HIGH annunciator reset within five minutes.

Disassembly of the pump discharge check valve (2E41-F005) was performed and identified an incorrectly installed spacer ring and degraded pressure seal. After these components were replaced, procedure 34SV-E41-002-2, HPCI Pump Operability, was performed. Required Action Statement (RAS) 2-06-088 was terminated and HPCI was declared operable at 05:45 EDT on 5/18/2006.

CAUSE OF EVENT

This event was caused by personnel error in that the spacer ring for the graphite pressure seal was incorrectly installed. This seal creates a leak tight boundary for the bonnet of the pressure seal valve. Incorrect installation of the spacer ring allowed a greater amount of extrusion of the pressure seal resulting in lower gasket stress. As a result, slow degradation of the pressure seal occurred ultimately resulting in a leak through the mechanical joint of the valve bonnet. After replacement of the spacer ring and pressure seal, the HPCI system was functionally tested and declared operable at 05:45 EDT on 5/18/2006.

Installing the spacer ring in the incorrect configuration (narrow side toward pressure seal) allowed a gap to exist between the graphite pressure seal and the spacer ring. When the tolerances are too large, the graphite pressure seal will extrude into the gaps causing a loss of gasket stress reducing the effectiveness of the sealing area. As pressure was placed on the valve, the bonnet was forced up, pushing the graphite pressure seal through the gaps, degrading the pressure seal.

Review of past work history revealed that the last pressure seal installation on 2E41-F005 was performed in May of 2003. The applicable procedure at that time, 51GM-MNT-023-0, Maintenance of Check Valves, step 7.9.7.2.5 states "Install composite pressure seal spacer ring with the wide flanged end facing down ..." This step provided the correct orientation of the spacer ring when installed. Had the procedure been followed, the top gap would have been minimized, maintaining gasket stress and preventing the graphite pressure seal from extruding.

Review of procedure 51GM-MNT-023-0 also revealed a contributing weakness. The procedure did not require that the composite pressure seal be retorqued after the system was placed in service. Valve 2E41-F005 is only pressurized when the HPCI system is in service. When the system is not in service, valve 2E41-F005 is isolated by valve 2E41-F006 which is normally closed. Therefore, when not in service the valve is under lower pressure conditions. Failure to retorque after pressurization would allow the bonnet to relax (fall down into the valve) when pressure is not applied since the bolts were not retorqued to retain the gasket load. This would, in turn, allow the bonnet of the valve to be lifted further (applying more load) onto the graphite gasket causing it to extrude through the gap created when the spacer ring was installed incorrectly.

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 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 (CS, 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.

ADS consist of 7 of the 11 Safety Relief Valves (SRV). It is designed to provide depressurization of the Reactor Coolant System during a small break LOCA if HPCI fails or is unable to maintain required water level in the Reactor Pressure Vessel. ADS operation reduces the Reactor Pressure Vessel pressure to within the operating pressure range of the low pressure Emergency Core Cooling System (ECCS) subsystems (CS and LPCI), so that these subsystems can provide coolant inventory makeup. Each of the SRVs used for automatic depressurization is equipped with one air accumulator and associated inlet check valves. The accumulator provides the pneumatic power to actuate the valves.

In this event, the leakage was through a mechanical joint with an estimated leakage of 20 gallons per minute which is small in comparison with the normal flow rate of 4250 gallons per minute. The HPCI system was conservatively declared inoperable when 2E41-F005, High Pressure Coolant Injection (HPCI) Pump Discharge Valve began to leak. 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 replaced the spacer ring and pressure seal and performed a retorque during the subsequent HPCI operability testing. Operations personnel performed procedure 34SV-E41-002-2, HPCI Pump Operability, and declared HPCI operable at 05:45 EDT on 5/18/2006.

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

Since the work performed on this valve in 2003, procedure 51GM-MNT-023-0, Maintenance of Check Valves, has been replaced by 51GM-MNT-055-0, Maintenance of Rockwell Edwards Tilting Disk Check Valves. Furthermore, this procedure has been revised to provide enhanced identification of proper spacer ring installation and a sign off for the action. The procedure has also been revised to require retorque of the valve after it is under normal operating system pressure.

Procedure 51GM-MNT-023-0 will also be revised to change it from a "Reference use" procedure to a "Continuous use" procedure. A Reference use procedure requires the user to have the procedure in "close proximity". The Continuous use procedure requires the procedure to be in the user's presence at all times during the work activity. The procedure will be revised by 8/15/2006.

Maintenance GM and PM procedures will be reviewed for the need to change their classification. This review will be completed by 12/15/2006.

The two individuals involved in the installation of the spacer ring were counseled by the Maintenance Manager. In this session, the importance of individual actions and the consequences of the failure to meet expectations were emphasized.

Training for maintenance personnel on this issue has been provided. Maintenance Shop bulletins were issued on general procedure compliance and on this specific event. These bulletins were issued to Maintenance Shop personnel on 6-16-06 and 6-26-06 respectively.

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-F005
Manufacturer: Rockwell Edwards
Model Number: B970JNY
Type: Valve, Control, Flow
Manufacturer Code: E095

EIIS System Code: BJ
Reportable to EPIX: Yes
Root Cause Code: A
EIIS Component Code: FCV

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

Previous Similar Events in the past two years in which a single-train safety system was rendered inoperable were reported in the Following Licensee Event Report:

LICENSEE EVENT REPORT (LER)

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
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17. NARRATIVE *(If more space is required, use additional copies of NRC Form 366A)*

2-2006-001, Component Failure in an ATTS Card Leads to Inoperability of HPCI System