D. R. Madison (Dennis)
Vice President - Hatch

Southern Nuclear Operating Company, Inc.
Plant Edwin I. Hatch
11028 Hatch Parkway, North
Baxley, Georgia 31513

Tel 912.537.5859
Fax 912.366.2077

SOUTHERN COMPANY
Energy to Serve Your World℠

April 9, 2007

Docket No.: 50-321

NL-07-0647

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

Edwin I. Hatch Nuclear Plant – Unit 1
Licensee Event Report
High Pressure Coolant Injection System Inoperable Due to Component Failures

Ladies and Gentlemen:

In accordance with the requirements of 10 CFR 50.73(a)(2)(v)(B), Southern Nuclear Operating Company is submitting the enclosed Licensee Event Report (LER) concerning two separate component failure events that caused the High Pressure Coolant Injection System to become inoperable.

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

Sincerely,

D. R. Madison
Vice President – Hatch
Edwin I. Hatch Nuclear Plant
11028 Hatch Parkway North
Baxley, GA 31513

DRM/OCV/phr

Enclosure: LER 1-2007-001

cc: Southern Nuclear Operating Company
Mr. J. T. Gasser, Executive Vice President
Mr. D. H. Jones, Vice President – Engineering
RTYPE: CHA02.004

U. S. Nuclear Regulatory Commission
Dr. W. D. Travers, Regional Administrator
Mr. R. E. Martin, 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 1	05000321	1 OF 5

4. TITLE
High Pressure Coolant Injection Inoperable Due To Component Failures

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
02	07	2007	2007	001	0	4	9	2007	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)			
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)	X 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 Specify in Abstract below or in NRC Form 366A
	20.2203(a)(2)(vi)	50.73(a)(2)(i)(B)	50.73(a)(2)(v)(D)	

12. LICENSEE CONTACT FOR THIS LER

FACILITY NAME	TELEPHONE NUMBER (Include Area Code)
Edwin I. Hatch / Kathy 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
X	BJ	IM	G080	Yes		X	BJ	20	A391	Yes

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

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

On 2/7/07 at 1640 EST, Unit 1 was in the Run mode at approximately 100 percent of rated thermal power. At that time, a control room operator was performing a control board walk-down when he noticed the position indicating light for the High Pressure Coolant Injection (HPCI, EIIS Code BJ) system's minimum flow control valve was extinguished. Further investigations discovered a degraded resistor on the position indicating light and a blown control power fuse in the valve's motor control center (MCC). As a result, the minimum flow valve was incapable of operating, rendering HPCI inoperable.

On 2/8/07 at 0431 EST, with Unit 1 in the Run Mode at approximately 100 percent of rated thermal power, operations personnel were performing a HPCI pump operability test when the turbine steam supply valve failed to open. As a result, turbine speed did not increase and the HPCI system did not initiate as required.

In each case, the HPCI system was declared inoperable and the appropriate Technical Specifications Required Action Statement was entered.

The cause of the failed minimum flow valve was a degraded resistor which resulted in a blown control power fuse in the valve's MCC. The turbine steam supply valve did not open due to a failed motor which investigations determined likely resulted from past bonnet pressurization events and thermal aging. Pressurization could occur if water enters the valve bonnet and is subsequently heated.

Corrective actions for the failed minimum flow valve included replacing the fuse and resistor. Also, resistors with indicating lamps for DC motor operated valves of the HPCI and RCIC systems will be checked and replaced as necessary. The failed steam supply valve motor was replaced and the HPCI procedure was revised to ensure any water is drained from the valve bonnet following events which result in the HPCI steam line being filled with water.

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 2/7/07 at 1640 EST, Unit 1 was in the Run mode at a power level of approximately 2804 CMWT (100 percent rated thermal power). At that time, a control room operator was performing a panel walk-down when he noticed the position indicating light for the High Pressure Coolant Injection (HPCI, EIIS Code BJ) system's minimum flow valve was extinguished. The valve was in its normal standby line-up, closed, at the time of discovery. The light bulb was immediately checked and, as is common practice, a new bulb was placed into the green indicating lamp socket. The bulb replacement did not correct the problem, and so the valve breaker was turned off and back on. Following this action, the reset pushbutton on the breaker door was depressed. However, the position indicating light did not illuminate.

Subsequent investigations by Maintenance personnel found the control power fuse (1E41A-F202) for the breaker blown, resulting in a loss of power to the valve's motor control center (MCC). This rendered the minimum flow valve incapable of operating. Consequently, HPCI was declared inoperable and Technical Specifications (TS) Action statement 3.5.1.C entered.

The control power fuse was replaced and HPCI declared Operable on 2-7-07 at 2052 EST.

On 2/8/07 at 0431 EST, Unit 1 was in the Run mode at a power level of approximately 2804 CMWT (100 percent rated thermal power). Control room personnel were performing the HPCI pump Operability surveillance, a TS required surveillance which is performed once every 92 days. As operators attempted to initiate the system, the HPCI turbine steam supply valve, 1E41-F001, failed to open. A double indication was received as the operators positioned the 1E41-F001 switch to 'open', but the turbine did not come up to speed. Shortly thereafter, the 'HPCI Valve Overload' annunciator was received. At this time, the operators manually tripped the HPCI turbine. When the control switch for the steam supply valve was taken to the 'close' position, a ground was received on the 'B' station service 125/250 battery. Personnel in the HPCI turbine area reported that the motor was hot to the touch. They also noted a burnt odor in the area. Further investigations by Maintenance personnel confirmed that the valve motor had failed.

As is routinely done, the HPCI system had been administratively declared inoperable prior to beginning the HPCI pump operability surveillance. This is due to the HPCI to Condensate Storage Tank Test Valve, a normally closed valve, being placed in the open position before the test. Due to the problem with the steam supply valve, however, the HPCI system remained in TS Action Statement 3.5.1.C following the test.

Following replacement of the valve motor, HPCI was declared Operable on 2-13-07 at 0113 EST.

The failed motor and the valve were both inspected. Inspection of the motor revealed a portion of the armature winding had failed from apparent heat and smoke damage. Inspection of the valve discovered the packing bushing to be degraded and deformed. However, based on diagnostic testing performed on the steam supply valve with the degraded bushing installed, this does not appear to have caused the stem to bind and the subsequent motor failure. Further inspections of the valve revealed no significant problems. However, upon reassembly, while the packing was being consolidated, a light marring (rub mark) was found on the valve stem. Maintenance personnel discovered that the pressure seal bonnet was off-center. This likely resulted in the valve stem loading the packing bushing, resulting in its deformation. Further investigation revealed that the pressure seal gasket retainer ring was bent. According to the vendor, the most likely explanation for the bent ring was that the valve had been filled with a fluid and overpressurized.

Historical records also show that the motor had been exposed to various packing leaks over a number of years, which could have potentially accelerated motor thermal aging and degradation. The failed motor had been in service since 1987.

CAUSE OF EVENT

The likely cause of the failure of the minimum flow valve to open was a degraded resistor in the position indicating light circuit.

Investigations by the Maintenance staff discovered a blown control power fuse in the minimum flow valve's MCC. Additionally, the resistor on the back of the green open position indicating light was found blackened as if it had been burned. It is likely that this resistor had degraded with age. This resulted in an increase in the current flowing through the resistor and through the circuitry associated with the indicating lamp. The excess current caused the fuse to blow, resulting in a loss of power to the MCC.

The cause of failure of the HPCI turbine steam supply valve to open is a failure of the valve motor. The likely cause of failure of the motor is past bonnet pressurization events and thermal aging.

If water leaks into the turbine steam supply valve when the HPCI steam line is filled with water, the potential for bonnet pressurization exists. After water enters the bonnet, pressurization could occur on a subsequent heating of the piping, which would cause an expansion of the entrapped liquid. The steam supply valve is a parallel disk gate valve. Pressurization of the valve bonnet could cause the wedge disks to press tightly against the seats, resulting in binding of the disks. No water was found in the valve during this event. However, there have been past events where water may have entered the valve, for example a Unit 2 event in 2000 where water reached the steam lines. Also, in 2004 and 2006, in-service inspection pressure testing resulted in water entering the HPCI steam lines. As a result of these events, as well as thermal aging, the motor could have been degraded to a point such that it failed during this Operability test.

REPORTABILITY ANALYSIS AND SAFETY ASSESSMENT

These events are reportable under the provisions of 10 CFR 50.73(a)(2)(v)(B) in that, in each case, an event occurred which could have prevented fulfillment of a safety function. Specifically, a failed minimum flow control valve and a failed turbine steam supply valve could have, separately, prevented operation of the HPCI system.

The HPCI system is designed to provide adequate core cooling to limit fuel clad temperature in the event of a small break in the nuclear supply system that does not result in rapid depressurization of the reactor vessel. The Automatic Depressurization System (ADS, EIIS Code JE) is the back-up for the HPCI system and is initiated on a low reactor water level condition coincident with a Primary Containment high pressure condition. Upon initiation of ADS, the reactor is depressurized to a point where either the Low Pressure Coolant Injection (LPCI, EIIS Code BO) system or the Core Spray (CS, EIIS Code BM) system can operate to maintain adequate core cooling.

In one event described in this LER, the HPCI minimum flow valve was incapable of functioning properly. The minimum flow valve is designed to provide a flow path to a centrifugal pump during a low flow condition, such as the normal discharge valve being closed, or the pump otherwise operating at its shutoff head. In those situations, the minimum flow path provides cooling to the pump, preventing damage to the pump internals that could result from overheating.

The other event involves a failure of the turbine steam supply valve to open, which would prevent the HPCI turbine from coming up to speed, rendering the HPCI system unavailable.

However, the ADS, CS, and LPCI systems were all Operable during these events. Consequently, had a small break Loss of Coolant Accident occurred during the time the HPCI system was unavailable, these systems were available to provide adequate core cooling.

Furthermore, the Reactor Core Isolation Cooling system (RCIC, EIIS Code BN) is a steam turbine driven system similar to the HPCI system. It (RCIC) is designed to provide core cooling to the reactor pressure vessel upon a loss of the feedwater/condensate supply. The RCIC system is not a credited accident mitigation system and is a much lower volume system (approximately 400 gpm vs. 4000 gpm for HPCI). However in the event of a loss of feedwater event both the HPCI and RCIC systems are designed to automatically initiate. Had a loss of feedwater occurred with the HPCI system inoperable, the RCIC system was Operable at the time, capable of alone providing adequate core cooling.

CORRECTIVE ACTIONS

The degraded resistor and the blown fuse were replaced.

The resistance of the resistors associated with indicating lamps for DC motor operated valves of the HPCI and RCIC systems with wiring similar to that of the HPCI minimum flow valve will be checked. If any values are found less than the rating of the resistors, they will be replaced. This action will be completed by 7-31-07.

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Edwin I. Hatch Nuclear Plant - Unit 1	05000-321	2007	-- 001	-- 00	5 OF 5

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

The failed motor for the 1E41-F001 valve was replaced.

The Unit 1 and Unit 2 procedures 34SO-E41-001, "High Pressure Coolant Injection (HPCI) System," have been revised to require stroking the E41-F001 valve after water has been drained from the steam line. This will allow any water that may have gotten into the valve to drain out.

ADDITIONAL INFORMATION

Other Systems Affected:

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

Failed Components Information:

Master Parts List Number: 1E41-F001
Manufacturer: Anchor Darling
Model Number: E-6550-1-1
Type: 20
Manufacturer Code: A391

EIIS System Code: BJ
Reportable to EPIX: Yes
Root Cause Code: X
EIIS Component Code: 20

Master Parts List Number: 1E41-F202
Manufacturer: General Electric
Model Number: 165A7844P3
Type: Modifier, Current
Manufacturer Code: G080

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

Commitment Information: There are no commitments provided in this Licensee Event Report.

Previous Similar Events:

There were no previous events in the past two years, where a HPCI system resistor failed resulting in a blown control power fuse or where bonnet pressurization resulted in a pressure lock situation resulting in an inability to cycle the steam supply valve.