

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

**Southern Nuclear
Operating Company, Inc.**
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May 7, 2007



Docket Nos.: 50-321

NL-07-0921

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

Edwin I. Hatch Nuclear Plant – Unit 1
Licensee Event Report
ATTS Card Failure Results in High Pressure Coolant Injection System Isolation

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 the failure of an Analog Transmitter Trip System trip unit which resulted in the isolation of the High Pressure Injection System.

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

Sincerely,

A handwritten signature in black ink that reads "Dennis Madison".

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

OCV/

Enclosure: LER 50-321/2007-002

cc: Southern Nuclear Operating Company
Mr. J. T. Gasser, Executive Vice President
Mr. D. R. Madison., Vice President – Hatch
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. J. A. Hickey, Senior Resident Inspector – Hatch

LICENSEE EVENT REPORT (LER)

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

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-6 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, NEOF-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.

1. FACILITY NAME
Edwin I. Hatch Nuclear Plant Unit 1

2. DOCKET NUMBER
05000321

3. PAGE
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4. TITLE
ATTS Card Failure Results In High Pressure Coolant Injection System Isolation

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)
03	07	2007	2007	002	00	05	07	2007	FACILITY NAME	DOCKET NUMBER(S) 05000
									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)
	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)
	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
	20.2203(a)(2)(vi)	50.73(a)(2)(i)(B)	50.73(a)(2)(v)(D)	Specify in Abstract below or in NRC Form 366A

12. LICENSEE CONTACT FOR THIS LER	
FACILITY NAME Edwin I. Hatch / Kathy Underwood, Performance Analysis Supervisor	TELEPHONE NUMBER (Include Area Code) 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	PB	G082	Y						

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

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

On March 7, 2007 at 8:50 pm EST Hatch Unit 1 was in the run mode at approximately 100 percent of rated thermal power. At that time during the performance of the Analog Transmitter Trip System (ATTS) panel Functional Test and Calibration procedure the High Pressure Coolant Injection (HPCI) inboard isolation valve 1E41-F002 closed. The HPCI system was declared inoperable and the appropriate Technical Specifications Required Action Statement was entered.

Troubleshooting of the HPCI isolation logic circuit was performed. The most probable cause of the valve closure was determined to be a faulty ATTS card, 1E41-N670A. The board was inspected and evidence of chipped insulation and fractured solder connections of the board's components were found. These faults contributed to an erroneous trip signal being sent, resulting in the valve closure.

The failed ATTS card and an associated ATTS card were replaced. In addition, related ATTS Agastat relays were replaced to avoid age-related problems or failures.

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

PLANT AND SYSTEM IDENTIFICATION

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

DESCRIPTION OF EVENT

On March 7, 2007 at 8:50 pm EST Hatch Unit 1 was in the run mode at approximately 100 percent of rated thermal power. At that time during the performance of the Analog Transmitter Trip System (ATTS) panel Functional Test and Calibration procedure the High Pressure Coolant Injection (HPCI) inboard isolation valve 1E41-F002 closed. The HPCI system was declared inoperable and the appropriate Technical Specifications Required Action Statement was entered. Troubleshooting of the HPCI isolation logic circuit was performed. The most probable cause of the valve closure was determined to be a faulty ATTS card, 1E41-N670A. The failed ATTS card and an associated ATTS card were replaced. In addition, related ATTS Agastat relays were replaced to avoid age-related problems or failures.

The circuitry was functionally tested and HPCI was declared operable on March 10, 2007, at 4:25 p.m. EST.

CAUSE OF EVENT

The most probable cause of the HPCI isolation was an erroneous trip signal being sent by ATTS card 1E41-N670A. 1E41-N670A serves as the ATTS master trip unit (MTU) for the 'A' channel of the HPCI area high temperature isolation, which causes closure of the inboard isolation valve, 1E41-F002.

As a part of the investigation, all inputs feeding into the HPCI 1E41-F002 closure logic were investigated. There are four different inputs that energize the applicable relays to initiate the HPCI isolation valve closure signal. Ten percent of the Unit 1 ATTS cards and ten percent of the Unit 2 ATTS cards have been inspected, with no other card damage noted. The inspections were initiated in 2006 to look for "tin whiskers". These inspections would identify the type of damage seen on the two E41 ATTS cards described in this LER. In addition the recent failure rate of ATTS cards is approximately 0.3 percent per year. It is concluded that the ATTS cards, on a whole, are highly reliable.

Visual inspections of ATTS cards 1E41-N670A and penetration room high temperature MTU 1E41-N671A revealed damage to components on the cards. For example, components found on card 1E41-N670A had fractured solder connections, and chipped insulation. Furthermore, relays 1E21-K361C and 1E21-K362C, which are Agastat relays located in the logic circuitry downstream of 1E41-N670A and 1E41-N671A, respectively, were bench-tested and noise was seen across the voltage signal of the relays. This disturbance is an early indication of aging.

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

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 (EISS 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, EISS Code BO) system and the Core Spray (CS, EISS Code BM) system. The CS 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 CS pumps in both subsystems start. Once ADS has reduced reactor pressure sufficiently, CS system flow begins.

LPCI is an operating mode of the Residual Heat Removal (EISS 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.

ADS consists of 7 of the 11 Safety Relief Valves (SRV). It is designed to provide depressurization of the Reactor Coolant System during a small break loss of coolant accident (LOCA), if HPCI fails or is unable to maintain required water level in the Reactor Pressure Vessel (RPV). ADS operation reduces the RPV pressure to within the operating pressure range of the low pressure Emergency Core Cooling System subsystems (CS and LPCI), so that these subsystems can provide coolant inventory makeup.

In this event, the HPCI system was declared inoperable when the 1E41-F002 inboard isolation valve closed. During the time the HPCI system was inoperable, the Reactor Core Isolation Cooling (RCIC, EISS 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 had exceeded the capacity of the RCIC system (400 gpm), 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 gpm, 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 replacement of the HPCI flow.

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17. NARRATIVE (If more space is required, use additional copies of NRC Form 386A)

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 LOCA is postulated to occur.

CORRECTIVE ACTIONS

ATTS cards 1E41-N671A and 1E41-N670A were replaced.

ATTS Agastat relays 1E21A-K361C and 1E21AK362C were replaced to avoid age-related problems or failures.

Inspection of all HPCI system ATTS cards will be performed during the next HPCI system outage. This will be tracked under the plant's Corrective Action Program.

Replacement of all ATTS Agastat relays is in progress and will be tracked under the plant's Corrective Action Program.

All ATTS cards are now inspected prior to installation into the plant.

ADDITIONAL INFORMATION

Other Systems Affected: None

Failed Components Information:

Master Parts List Number: 1E41-N670A
 Manufacturer: General Electric
 Model Number: 184C5988G101
 Type: Board, Printed Circuit
 Manufacturer Code: G082

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

Commitment Information:

This report does not create any permanent licensing commitments.

Previous Similar Events:

LER 2-2006-001 documents a similar event where the HPCI system was rendered inoperable due to the failure of an ATTS card.