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Georgia Power
the southern electric system

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Docket No. 50-321

HL-4614

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

Edwin I. Hatch Nuclear Plant - Unit 1
Licensee Event Report
High Pressure Coolant Injection System
Taken Out of Service for Repair

Gentlemen:

In accordance with the requirements of 10 CFR 50.73 (a)(2)(v), Georgia Power Company is submitting the enclosed Licensee Event Report (LER) concerning the removal of the High Pressure Coolant Injection system from service for repair. This event occurred at Plant Hatch, Unit 1.

Sincerely,

J. T. Beckham, Jr.

OCV/cr

Enclosure: LER 50-321/1994-006

cc: *Georgia Power Company*
Mr. H. L. Sumner, General Manager - Nuclear Plant
NORMS

U.S. Nuclear Regulatory Commission, Washington, D.C.
Mr. K. Jabbour, Licensing Project Manager - Hatch

U.S. Nuclear Regulatory Commission, Region II
Mr. S. D. Ebneter, Regional Administrator
Mr. L. D. Wert, Senior Resident Inspector - Hatch

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NRC FORM 366 (5-92) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO. 3150-0104
EXPIRES: 5/31/95
ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (MNBB7714), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555-0001, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
Edwin I. Hatch Nuclear Plant - Unit 1	0 5 0 0 0 3 2 1	1 OF 6

TITLE (4)
High Pressure Coolant Injection System Taken Out of Service for Repair

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)
0 5	1 5	9 4	9 4	0 0 6	0 0	0 6	1 3	9 4		0 5 0 0 0
									FACILITY NAME	0 5 0 0 0

OPERATING MODE (9)	1
POWER LEVEL (10)	1 0 0

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR ?: (Check one or more of the following) (11)

20.402(b)	20.405(c)	50.73(a)(2)(iv)	73.71(b)
20.405(a)(1)(i)	50.36(c)(1)	X 50.73(a)(2)(v)	73.71(c)
20.405(a)(1)(ii)	50.36(c)(2)	50.73(a)(2)(vii)	OTHER (Specify in Abstract below and in Text, NRC Form 366A)
20.405(a)(1)(iii)	50.73(a)(2)(i)	50.73(a)(2)(viii)(A)	
20.405(a)(1)(iv)	50.73(a)(2)(ii)	50.73(a)(2)(viii)(B)	
20.405(a)(1)(v)	50.73(a)(2)(iii)	50.73(a)(2)(x)	

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER (include area code)
Steven B. Tipps, Nuclear Safety And Compliance Manager	AREA CODE 9 1 2 3 6 7 - 7 8 5 1

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

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS		CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS
X	B J	T C	G 0 8 0	Y						

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 5/15/94 at 1640 EDT, Unit 1 was in the Run mode at a power level of 2436 CMWT (100 percent rated thermal power). At that time, the High Pressure Coolant Injection (HPCI) system was removed from service to repair flow controller 1E41-R612. During checks on 5/14/94, Operations personnel had discovered that the output signal from the controller was not upscale as expected. The controller output was adjusted on 5/15/94 and monitored for several hours to ensure it remained stable. Citing a recent instance of setpoint drift in the controller, Operations personnel declared the HPCI system inoperable on 5/15/94 at 1640 EDT to permit removal and examination of the controller. The controller was removed from service and failed components were identified and replaced. Surveillance testing was then performed successfully. At 1206 EDT on 5/17/94, the HPCI system was declared operable. On 5/20/94, questions arose as to the qualification of the replacement components installed on 5/17/94. HPCI was again declared inoperable and further testing was performed. By 5/22/94, an additional capacitor had been replaced and HPCI was returned to operable status at 1830 EDT.

The cause of this event was component failure. Two transistors and one capacitor within the flow control circuitry for the HPCI system failed, resulting in a slowly decreasing controller output signal.

The failed parts were replaced and the flow controller was satisfactorily tested in all modes.

PLANT AND SYSTEM IDENTIFICATION

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

DESCRIPTION OF EVENT

On 5/15/94 at 1640 EDT, Unit 1 was in the Run mode at a power level of 2436 CMWT (100 percent rated thermal power). At that time, the High Pressure Coolant Injection (HPCI, EIIS Code BJ) system was declared inoperable and removed from service to permit testing and repair of flow controller 1E41-R612. Operations personnel, during the shiftly performance of surveillance procedure 34SV-SUV-018-1S, "ECCS STATUS CHECK," on 5/14/94, had noted the output signal from the controller to be slightly below its expected value of greater than 100 percent. A deficiency card documenting this problem was written as required by plant administrative control procedures. However, the HPCI system was not declared inoperable at that time because the controller output signal is not part of the acceptance criteria for procedure 34SV-SUV-018-1S and the magnitude of the decrease was small.

Instrument and Control (I&C) personnel checked the flow controller on 5/15/94 per Maintenance Work Order (MWO) 1-94-2566 and found the output signal of the self-synchronizing control unit had drifted downward two to three milliamperes. I&C personnel monitored the control unit for about an hour and observed a further decrease of approximately one-half millivolt below the nominal output of 52 millivolts. After adjusting the output back to 52 millivolts per plant procedure 57IT-CAL-001-1S, "HPCI TURBINE CONTROL FT&C," they monitored the control unit output for four more hours and observed no further downward drift.

However, before I&C personnel completed work on the MWO, Operations personnel recalled another recent instance in which the same HPCI flow controller had experienced a similar downward drift in output signal (This was confirmed on MWO 1-94-2132, dated 4/7/94). Based on concerns raised by the apparent recurring nature of this problem, Operations personnel made the conservative decision to have the controller removed from service and tested more extensively in the I&C shop. Prior to removal of the flow controller, they declared the HPCI system inoperable and entered Limiting Condition for Operation (LCO) 1-94-162 as required by plant procedures and the Unit 1 Technical Specifications.

During bench testing, I&C personnel found that two transistors in the control amplifier and one capacitor in the self-synchronizing control unit within the HPCI system flow control circuitry had failed, resulting in the slowly decreasing controller output signal. Appropriate components in the flow controller were replaced per MWO 1-94-2566 by 5/17/94. Operations personnel then performed surveillance procedure 34SV-E41-002-1S, "HPCI PUMP OPERABILITY," and verified the controller operated properly in both the automatic and manual modes. At 1206 EDT on 5/17/94, Operations personnel declared the HPCI system operable and closed LCO 1-94-162.

On 5/20/94, questions arose regarding the safety classification/qualification of the replacement electronic components that were installed on 5/17/94. As a result, HPCI was declared inoperable and the original Technical Specification action statement was reentered (via LCO 1-94-175). That is, HPCI was considered to have been inoperable since 5/15/94. Additional testing was performed to verify the capability of the replacement components. During this testing, a bad capacitor was identified and replaced. However, the capacitor affected only the manual mode of HPCI operation. Thus, it was concluded that HPCI had been capable of automatically performing its intended safety function since 5/17/94. At 1830 EDT on 5/22/94, Operations personnel declared the HPCI system operable and closed LCO 1-94-175.

CAUSE OF EVENT

The cause of this event was component failure. Two transistors in the control amplifier and one capacitor in the self-synchronizing control unit within the HPCI system flow control circuitry failed resulting in a slowly decreasing controller output signal. No reason for these failures was apparent.

REPORTABILITY ANALYSIS AND SAFETY ASSESSMENT

This report is required by 10 CFR 50.73(a)(2)(v) because a single failure occurred which alone could have prevented the fulfillment of a safety function designed to mitigate the consequences of an accident. Specifically, the HPCI system, a single train Emergency Core Cooling System (ECCS), was declared inoperable and removed from service to permit repair of a faulty flow controller. With the output signal from the controller below its usual value of greater than 100 percent, it could not be assured that the HPCI system could have automatically reached its design reactor vessel injection flow rate of 4250 gallons per minute.

The HPCI system is designed to replace lost reactor coolant inventory in cases where a small line break occurs which does not result in full or rapid depressurization of the reactor vessel. The HPCI system injects water to the reactor vessel at a flow rate of 4250 gallons per minute (gpm) over a range of reactor pressures from approximately 160 psig to rated pressure. The HPCI system automatically starts and injects cooling water whenever a reactor vessel water level decrease or a drywell pressure increase indicates the possibility of an abnormal loss of coolant inventory.

The backup for the HPCI system is the Automatic Depressurization System together with the Low Pressure Coolant Injection (LPCI, EIIS Code BO) system and the Core Spray (EIIS Code BM) system. If a small line break loss-of-coolant accident (LOCA) occurs and the HPCI system is not available, the Automatic Depressurization System will automatically depressurize the reactor pressure vessel to the suppression pool through safety relief valves, lowering pressure to the point where the LPCI and Core Spray systems can add cooling water to the vessel. Both the LPCI and Core Spray systems contain two fully independent and redundant, 100 percent capacity loops for a total of four low pressure injection loops.

In this event, the HPCI flow controller's output signal had decreased below its expected value of greater than 100 percent. Since the relationship between controller output and actual system performance is nonlinear, the architect/engineer (A/E) was consulted to analyze the effect of this condition on HPCI system performance. The A/E concluded that the system would have reached its rated flow of 4250 gpm and that any effect on the time response of the system would have been negligible. This conclusion was based, in part, on the fact that the drift in the control unit was of the same magnitude as the designed instrument calibration tolerances. Therefore, prior to its being removed from service for repair, the HPCI system was capable of performing its designed safety function.

In addition to the above considerations, the Unit 1 Final Safety Analysis Report conservatively assumes that the HPCI system will not be available to inject any water to the reactor vessel. The NRC-approved SAFER/GESTR LOCA analysis for Hatch Units 1 and 2 shows that no core damage will result from various LOCA events with the HPCI system out of service and only the Automatic Depressurization System and two of four low pressure injection loops available. The Automatic Depressurization System and all four low pressure injection loops were available during the time the HPCI system was out of service for repair. Therefore, for the reasons described in the above paragraphs, the plant remained well within the bounds of existing transient and accident analysis at all times during this event.

Based on this analysis, it is concluded that this event did not adversely impact nuclear safety. This analysis is applicable to all power levels.

CORRECTIVE ACTIONS

The failed transistors and capacitor were replaced per Maintenance Work Order 1-94-2566. The flow controller was satisfactorily tested in both the automatic and manual modes per plant surveillance procedure 34SV-E41-002-1S and the HPCI system was returned to service on 5/17/94 at 1206 EDT.

ADDITIONAL INFORMATION

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

2. Failed Component Identification:

   Master Parts List Number: 1E41-R612
   Type: Flow Controller
   Manufacturer: General Electric
   Model Number: 547-01
   Manufacturer Code: G080

   EIIS System Code: BJ
   EIIS Component Code: TC
   Root Cause Code: X
   Reportable to NPRDS: Yes

3. Previous Similar Events: Events reported in the last two years in which the HPCI system was inoperable are described in the following Licensee Event Reports:

   50-321/1993-015, dated 12/21/93
   50-366/1992-028, dated 01/11/93
   50-366/1993-008, dated 11/30/93
   50-366/1994-002, dated 03/29/94

   Corrective actions for those events would not have prevented this event because the causes and, hence, the corrective actions, were different. None of the previous events was caused by or resulted from a problem with the flow controller. Consequently, the corrective actions for those events could not have prevented a future failure of the flow controller.