

Georgia Power Company
40 Inverness Center Parkway
Post Office Box 1296
Birmingham, Alabama 35201
Telephone 205 877-7270

J. T. Beckham, Jr.
Vice President—Nuclear
Hatch Project



the southern gas and electric

HL-2062
002967

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

PLANT HATCH - UNIT 1
NRC DOCKET 50-321
OPERATING LICENSE DPR-57
LICENSEE EVENT REPORT
FAILURE OF SOLENOID OPERATED VALVES
CAUSES LOSS OF EMERGENCY EQUIPMENT ROOM COOLERS

Gentlemen:

Georgia Power Company is submitting the enclosed voluntary Licensee Event Report (LER) due to the potential industry interest in the event. This event occurred at Plant Hatch - Unit 1.

Sincerely,


J. T. Beckham, Jr.

JKB/cr

Enclosure: LER 50-321/1992-003

cc: (See next page.)

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U.S. Nuclear Regulatory Commission

Page Two

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. Ebnetter, Regional Administrator
Mr. L. D. Wert, Senior Resident Inspector - Hatch

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) **PLANT HATCH, UNIT 1** DOCKET NUMBER (2) **05000321** PAGE (3) **1** OF **5**

TITLE (4) **FAILURE OF SOLENOID OPERATED VALVES CAUSES LOSS OF EMERGENCY EQUIPMENT ROOM COOLERS**

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)	
MONTH	DAY	YEAR	YEAR	SEQ NUM	REV	MONTH	DAY	YEAR	FACILITY NAMES	DOCKET NUMBER(S)
01	21	92	92	003	00	02	20	92		05000
										05000

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR (11)

OPERATING MODE (9)	1	20.402(b)	20.405(c)	50.73(a)(2)(iv)	73.71(b)
POWER LEVEL (10)	100	20.405(a)(1)(i)	50.36(c)(1)	50.73(a)(2)(v)	73.71(c)
		20.405(a)(1)(ii)	50.36(c)(2)	50.73(a)(2)(vi)	X OTHER (Specify in Abstract below) VOLUNTARY
		20.405(a)(1)(iii)	50.73(a)(2)(i)	50.73(a)(2)(vii)(A)	
		20.405(a)(1)(iv)	50.73(a)(2)(ii)	50.73(a)(2)(vii)(B)	
		20.405(a)(1)(v)	50.73(a)(2)(iii)	50.73(a)(2)(x)	

LICENSEE CONTACT FOR THIS LER (12)

NAME: **STEVEN B. TIPPS, MANAGER NUCLEAR SAFETY AND COMPLIANCE, HATCH** TELEPHONE NUMBER: **367-7851**
AREA CODE: **912**

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

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORT TO NRC	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORT TO NRC
X	BI	FSV	A610	Y					

SUPPLEMENTAL REPORT EXPECTED (14)

EXPECTED SUBMISSION DATE (16): YES (If yes, complete EXPECTED SUBMISSION DATE) NO
MONTH: **08** DAY: **03** YEAR: **92**

ABSTRACT (16)

On 1/21/92 at 0900 CST, Unit 1 was in the Run mode at a power level of 2436 CMWT (100% rated thermal power). At that time, valves 1P41-F039A and B, air operated cooling water supply valves to Emergency Equipment Room coolers 1E41-B002A and B, failed to open automatically as required during the routine performance of the Core Spray pump operability test. These valves are designed to open automatically to provide cooling water to the room coolers to maintain the temperature below 148 degrees F when the Core Spray and/or Residual Heat Removal pumps are in operation. With both the normal and standby coolers for this room inoperable, Core Spray pump 1E21-C001A and Residual Heat Removal pumps 1E11-C002A and C were declared inoperable. Limiting Condition for Operation (LCO) 1-92-045 was initiated per Unit 1 Technical Specifications sections 3.5.A.3 and 3.5.B.3. At 1535 CST, a temporary modification was implemented to place valves 1P41-F039A and B in the open position to assure a supply of cooling water to the Emergency Equipment Room coolers. This restored the coolers to an operable status and LCO 1-92-045 was then terminated.

The cause of this event is component failure. The cooling water supply valves failed to open because the solenoid operated valves (SOVs) in the air supply lines to these valves failed to reposition when given a signal to do so. As a result, air pressure was maintained on the air operators for valves 1P41-F039A and B and they could not actuate. However, the cause of the failure of the SOVs to reposition has not yet been determined.

Corrective actions for this event include replacing the SOVs and continuing the investigation to determine the cause of their failures.

**LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION**

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (5)			PAGE (3)		
		YEAR	SEC NUM	REV			
PLANT HATCH, UNIT 1	0 5 0 0 0 3 2 1	9 2	0 0 3	0 0	2	of	5

TEXT

PLANT AND SYSTEM IDENTIFICATION

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

DESCRIPTION OF EVENT

On 1/21/92 at 0900 CST, Unit 1 was in the Run mode at a power level of 2436 MWt (100% rated thermal power). At that time, valves 1P41-F039A and B, the air operated Plant Service Water (EIIIS Code BI) supply valves to Emergency Equipment Room coolers 1T41-B002A and B, failed to open automatically as required. These valves, one per room cooler, are designed to open automatically to supply cooling water to the room coolers to maintain the ambient temperature in the room below 148 degrees F when the Core Spray (EIIIS Code BM) and/or Residual Heat Removal (EIIIS Code BO) pumps are in operation. However, they failed to open as required when Core Spray pump 1E21-C001A was manually started per surveillance procedure 34SV-E21-001-1S, "Core Spray Pump Operability."

Emergency Equipment Room coolers 1T41-B002A and B provide cooling to the pumps in the "A" loops of the Core Spray and Residual Heat Removal systems, pumps 1E21-C001A and 1E11-C002A and C, respectively. (Coolers 1T41-B003A and B provide cooling to the pumps in the "B" loops.) Each cooler is 100% capacity. Since both the coolers were not capable of performing their intended function because of the failure of their cooling water supply valves to open, Core Spray pump 1E21-C001A and Residual Heat Removal pumps 1E11-C002A and C were declared inoperable. Limiting Condition for Operation (LCO) 1-92-045 was initiated per the requirements of Unit 1 Technical Specifications sections 3.5 A.3 and 3.5 B.3.

Temporary modification TMM 1-92-007 was written to position valves 1P41-F039A and B in the open position in order to assure a supply of cooling water to Emergency Equipment Room coolers 1T41-B002A and B. These two valves are normally closed, fail open, air operated valves. Therefore, TMM 1-92-007 consisted simply of disconnecting the air supply lines at the air operators for the two valves. (It had been found earlier that valves 1P41-F039A and B would open when the air supply was interrupted indicating correct performance of the valves themselves.) With the air supply removed, the two valves would open per their design. At 1535 CST on 1/21/92, TMM 1-92-007 was implemented. Valves 1P41-F039A and B opened as expected thereby providing a supply of cooling water to coolers 1T41-B002A and B. This restored the coolers to an operable status and LCO 1-92-045 was terminated at that time.

Investigation of this event revealed the cooling water supply valves failed to open because the solenoid operated valves (SOVs) in the air supply lines to these valves failed to reposition when given a signal to do so. As a result, air pressure was maintained on the air operators for valves 1P41-F039A and B and the valves could not actuate. Consequently, the two SOVs were replaced per Maintenance Work Order 1-92-336 on 1/22/92. The air supply lines were reconnected to the valve air operators.

**LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION**

FACILITY NAME (1) PLANT HATCH, UNIT 1	DOCKET NUMBER (2) 75000321	LER NUMBER (5)			PAGE (3)	
		YEAR	SEQ NUM	REV		
		92	003	00	3	OF 5

TEXT

CAUSE OF EVENT

The cause of this event is component failure. As stated above, valves 1P41-F039A and B failed to open because the SOVs in the air supply lines to the valves failed to reposition. However, the cause of the failure of the SOVs to reposition has not yet been determined.

Both SOVs were replaced and the old valves retained for inspection. One valve was disassembled by plant personnel and inspected. No obvious problems that would have resulted in the SOV not repositioning were found.

In general, the valve and its internals were in good condition. All moving parts (the solenoid core, valve lever, discs, and springs) appeared to move freely. There was no blockage or obstruction in any of the valve ports. Age did not appear to be a factor as both SOVs had been in service only 23 months, having been replaced on 2/24/90. (The coil and elastomeric components are qualified for 10 years; the rest of the valve is qualified for 40 years.) The SOV is a normally energized valve, therefore, self-heating was considered. However, no detrimental effects from self-heating were found.

GPC will continue to investigate the failure of the SOVs to reposition. The other SOV which failed has not been disassembled. It was left undisturbed for disassembly and inspection by offsite personnel (e.g., a laboratory). Also, site and industry experience in SOV failures in general and this model number in particular is being reviewed for trends and other pertinent information. A supplement to the LER will be provided when the investigation is completed.

REPORTABILITY AND SAFETY ASSESSMENT

This report is being submitted voluntarily because it may be of interest to other utilities using SOVs in this application.

Emergency Equipment Room coolers are provided to maintain the temperature in the room below a specified limit when the emergency equipment is in operation. This helps assure long-term operation of the equipment by keeping room temperatures at or below the maximum allowable component operating temperatures. Each Emergency Equipment Room has two, 100% capacity coolers. Each room cooler has a fan and cooling coils supplied by Plant Service Water. Core Spray pump 1E21-C001A and Residual Heat Removal pumps 1E11-C002A and C are located in one room cooled by Emergency Equipment Room coolers 1T41-B002A and B. These pumps comprise the 100% capacity "A" loops of the Core Spray and Residual Heat Removal systems, respectively. The redundant, 100% capacity "B" loop Core Spray and Residual Heat Removal system pumps are located in a separate room also cooled by two, 100% capacity coolers, 1T41-B003A and B.

Normally, the cooler fans are off with the cooling water supply valves closed. Upon automatic or manual start of one or more of the pumps in the room, the two Emergency Equipment Room cooler fans start. When the fans start, the SOVs for

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (5)			PAGE (3)	
		YEAR	SEQ NUM	REV		
PLANT HATCH, UNIT 1	05000321	92	003	00	4	OF 5

TEXT

the cooling water supply valves de-energize. When the SOVs de-energize, the two SOV discs reposition, the air supply to the air operated cooling water supply valves is isolated and the air operator is vented. Spring force then opens the cooling water supply valves thereby providing Plant Service Water to the coolers.

In this event, the SOVs for cooling water supply valves 1P41-F039A and B failed to reposition when the solenoids de-energized. Consequently, valves 1P41-F039A and B could not open to supply cooling water to room coolers 1T41-B002A and B, respectively. This rendered inoperable the "A" loops of the Core Spray and Residual Heat Removal systems. However, the redundant, 100% capacity "B" loops of the Core Spray and Residual Heat Removal systems were unaffected by this event and were available to perform their intended function had they been required to do so. Their Emergency Equipment Room coolers are not supplied Plant Service Water through valves 1P41-F039A and B. Their cooling water is supplied through valves 1P41-F036A and B which were proven operable on 1/22/92 during the operability test of Core Spray pump 1E21-C001B. It is reasonable to conclude that they have been operable prior to this time as well.

Based on the above, it is concluded that this event had no adverse effect on nuclear safety. This analysis is applicable to all operating conditions.

CORRECTIVE ACTIONS

Temporary modification TMM 1-92-007 was implemented to disconnect the air supply to valves 1P41-F039A and B so they would fail in the open position thereby supplying cooling water to the room coolers. This was done on 1/21/92 at 1535 CST, returning the coolers and their associated pumps to an operable status.

The SOVs for valves 1P41-F039A and B were replaced per Maintenance Work Order 1-92-366 on 1/22/92. The air supply to valves 1P41-F039A and B was reconnected.

One of the failed SOVs was disassembled and inspected on 1/22/92; however, no obvious problems which would have resulted in the valve failing to reposition were noted. Investigation of the failure of these SOVs will continue; a supplement to this LER will be issued following the conclusion of the investigation. The supplement, expected to be issued by 8/3/92, will include the results of the investigation and additional corrective actions, if any, based on these results.

ADDITIONAL INFORMATION

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

**LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION**

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (5)			PAGE (3)	
		YEAR	SEQ NUM	REV		
PLANT HATCH, UNIT 1	05000321	92	003	00	5	OF 5

TEXT

There has been one previous similar event reported in the last two years in which SOVs failed to reposition when de-energized. That event was reported in LER 50-366/1991-019 dated 10/9/91. In that event, oil intrusion into the internals of two SOVs caused the ethylene propylene discs to swell and stick to the internals of the SOV valve body. The oil came from in-line lubricators designed to supply lubricating oil to the piston operators for the valves served by the SOVs. The discs for the SOVs for valves 1P41-F039A and B are composed entirely of metal. They are, therefore, not subject to swelling as are the ethylene propylene discs. Consequently, corrective actions to prevent ethylene propylene disc swelling could not have prevented this event.

Failed Component Information:

Master Parts List Number: 1P41-F039A and B
 Manufacturer: Automatic Switch Company
 Model Number: NP2063803FMO
 Type: Solenoid Operated Valve
 Manufacturer Code: A610
 EHS System Code: B1
 Reportable to NPRDS: Yes
 Root Cause Code: X
 EHS Component Code: FSV