Georgia Power Company
40 Inverness Center Parkway
Post Office Box 1295
Birmingham, Alabama 35201
Telephone 205 877 7279

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

Georgia Power
the southern electric system

HL-2228
003467

May 20, 1992

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
COMPONENT FAILURE RESULTS IN TRIP OF
RPS MOTOR GENERATOR SET AND ESF ACTUATIONS

Gentlemen:

In accordance with the requirements of 10 CFR 50.73(a) (2) (iv), Georgia Power Company is submitting the enclosed Licensee Event Report (LER) concerning a component failure which resulted in a trip of RPS motor generator set 'B' and ESF actuations. This event occurred at Plant Hatch - Unit 1.

Sincerely,

J. T. Beckham, Jr.

OCV/cr

Enclosure: LER 50-321/1992-010

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

IE22
1/1

NRC Form 366 (6-89) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO. 3150-0104
EXPIRES: 4/30/92

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
PLANT HATCH UNIT 1	0 5 0 0 0 3 2 1	1 OF 5

TITLE (4)
COMPONENT FAILURE RESULTS IN TRIP OF REACTOR PROTECTION SYSTEM MOTOR GENERATOR SET AND ESF ACTUATIONS

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)
											PLANT HATCH UNIT 2	0 5 0 0 0 3 6 6
0 4	2 3	9 2	9 2		0 1 0		0 0	0 5	2 0	9 2		0 5 0 0 0

OPERATING MODE (9)		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR (11)			
1		20.402(b)	20.405(c)	X 50.73(a)(2)(iv)	73.71(b)
POWER LEVEL		20.405(a)(1)(i)	50.36(c)(1)	50.73(a)(2)(v)	73.71(c)
1 0 0		20.405(a)(1)(ii)	50.36(c)(2)	50.73(a)(2)(vii)	OTHER (Specify in Abstract below)
		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	
	AREA CODE	
STEVEN B. TIPPS, MANAGER NUCLEAR SAFETY AND COMPLIANCE, HATCH	912	367-7851

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

CAUSE	SYSTEM	COMPONENT	MANUFAC-TURER	REPORT TO NPRDS		CAUSE	SYSTEM	COMPONENT	MANUFAC-TURER	REPORT TO NPRDS	
X	J E	M S T R	G 0 8 0	Y E S							

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

ABSTRACT (16)

On 04/23/92 at 2052 CDT, Unit 1 was in the Run mode at a power level of 2436 CMWT (100% rated thermal power). At that time, the output breakers for the 'B' Reactor Protection System (RPS) motor-generator (MG) set tripped. This caused a loss of power to the 'B' side of the following trip systems: RPS, Process Radiation Monitors, Neutron Monitoring, and the Primary Containment Isolation System (PCIS). These systems tripped on loss of power per design, resulting in a half scram signal in RPS channel 'B,' closure of various PCIS valves, and other ESF actuations. Licensed operations personnel restored power to RPS bus 'B' via its alternate supply by 2100 CDT, and all affected systems were restored to their normal configurations by 2130 CDT. RPS bus 'B' was returned to its normal supply through RPS MG set 'B' at approximately 0330 CDT on 04/24/92.

The cause of this event was component failure. The coil in the motor starter for the 'B' RPS MG set failed. As a result, the motor starter contacts supplying power to the MG set motor opened. As the MG set began coasting down, the output breakers of the MG set tripped on underfrequency per design, deenergizing RPS bus 'B.'

Corrective actions for this event include replacing the motor starter, functionally testing the RPS and the MG set and continuing an investigation into an increased component failure rate associated with the RPS power supply system.

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 4/23/92, at 2052 CDT, Unit 1 was in the Run mode at a power level of 2436 CMWT (100% rated thermal power). At that time, the 'B' Reactor Protection System (RPS, EIIS Code JE) motor-generator (MG) set tripped. This caused a loss of power to the 'B' side of the following trip systems: RPS, the Process Radiation Monitoring System (EIIS Code IL), the Neutron Monitoring System (EIIS Code IC) and the Primary Containment Isolation System (PCIS, EIIS Code JM). The "fail-safe" design of these systems results in their assuming the tripped state when power is interrupted or the control signal is lost.

The loss of power to the above named systems resulted in a half scram signal on RPS trip system 'B,' closure of various Group 2 PCIS valves, closure of one Group 5 PCIS valve which isolated the Reactor Water Cleanup (RWCU, EIIS Code CE) System, and closure of outboard small bore Group 1 isolation valves. The 'B' trains of Unit 1 and Unit 2 Standby Gas Treatment System (SGTS, EIIS Code BH) started, and both units' secondary containments isolated. Also, the Main Control Room Environmental Control (MCREC, EIIS Code VI) System automatically entered the pressurization mode, and the operating steam packing exhauster tripped. All affected systems responded per design.

When the trip occurred, licensed personnel entered abnormal operating procedure 34AB-OPS-066-1S, "LOSS OF RPS BUS," and aligned RPS bus 'B' to its alternate supply. By 2100 CDT, all affected systems except RWCU were restored to normal operation. The RWCU system was returned to service by 2130 CDT.

Maintenance and Engineering personnel who were requested to investigate the cause of the RPS trip found the coil in the MG set motor starter had failed. The contacts in this starter feed electrical power to the MG set motor. When the coil failed, the contacts opened and deenergized the motor. The output breakers on the MG set then tripped when underfrequency was sensed as the MG set speed decreased.

The motor starter was replaced with a new assembly from warehouse stock. After appropriate functional tests were satisfactorily completed, the MG set was returned to service by approximately 0330 CDT on 4/24/92.

CAUSE OF EVENT

The immediate cause of the RPS trip was the failure of the coil in the motor starter for RPS MG set 'B.' When this coil failed, the motor starter contacts opened, deenergizing the MG set motor. Subsequently, the MG set output breakers opened when underfrequency was sensed, deenergizing RPS bus 'B.'

The reason for the failure of the coil in the motor starter has not yet been determined. In the past year, an increased component failure rate in the RPS power supply system has been experienced which may be related to the age of components. Engineering personnel have contacted the manufacturer in order to obtain data on the life expectancy of the components used in the MG set and its associated control and protection circuitry. However, in the case of the failed coil, the manufacturer could not provide the information. Investigation is continuing into the root causes of this event and related events involving component failures in the RPS.

REPORTABILITY ANALYSIS AND SAFETY ASSESSMENT

This event is reportable per 10 CFR 50.73 (a)(2)(iv) because unplanned actuations of several Engineered Safety Features (ESFs) occurred. Specifically, the coil in the motor starter for RPS MG set 'B' failed, causing the 'B' RPS bus to deenergize.

The Reactor Protection System ensures the integrity of the fuel cladding and nuclear system process barriers by initiating a scram when certain process conditions exist. These conditions include, among others, low reactor water level, high reactor pressure, and high radiation in the main steam lines. Electrical power for the RPS is normally supplied through the RPS MG sets. The 'A' MG set supplies power to the 'A' RPS bus and the 'B' MG set supplies power to the 'B' bus.

The Reactor Protection System is designed to supply stable electrical power to a variety of plant instrumentation systems, including the Process Radiation Monitoring System, the Neutron Monitoring System, RPS, and PCIS. The RPS requires a high degree of power stability to ensure that instrumentation powered by the bus performs as designed. This is achieved by using motor generator sets to condition the power supplied to the RPS. Should the power output from the MG sets drift outside specified voltage and frequency parameters, protective breakers are designed to trip. Alternate power supplies are available to RPS and are fed through essential cabinets via other protective breakers.

In addition to a half scram signal, loss of power to one RPS bus results in trip signals being sent to one division of several other plant systems, including Group 1, 2, and 5 PCIS valves, SGTS, and the MCREC System. All of these systems are designed to "fail safe," (i.e., they initiate their emergency actions upon

interruption of power or loss of signal) and functioned per design given the trip signal introduced when the RPS bus lost power. These trips were in place for about eight minutes until the alternate power supply was aligned to feed RPS. Alternate power to the 'B' RPS bus was then used for approximately six and a half hours until the motor starter was replaced and the MG sets and RPS were functionally tested. RPS was then restored to its normal configuration with power being supplied through the MG sets. The 'A' MG set and related systems were not affected by this event.

In the event that a design basis accident had occurred during the eight minutes when the 'B' RPS bus was tripped, the unaffected 'A' system would have tripped as designed. Since the 'B' system was already in the tripped state, a full scram signal would have been generated per design. If an accident had occurred while the 'B' RPS was energized from its alternate supply, both the 'A' and 'B' RPS systems would have tripped per design.

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.

CORRECTIVE ACTIONS

1. The motor starter was replaced with a new assembly from warehouse stock. The MG sets and RPS were then functionally tested and returned to service by 0330 CDT on 4/24/92.

2. Investigation into the causes of RPS-related component failures will continue.

ADDITIONAL INFORMATION

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

2. Previous Similar Events: Events reported in the past two years in which component failures occurred in the Reactor Protection System were described in the following LERs:

   50-321/1991-014, dated 09/09/91,
   50-321/1991-015, dated 09/18/91,
   50-321/1992-005, dated 03/18/92,
   50-366/1991-020, dated 12/02/91, and
   50-366/1992-005, dated 05/19/92.

Corrective actions for these events included replacing failed components, issuing an operating order to augment control of the Standby Gas Treatment System, performing a design review of a protective relay in the RPS, performing a design review of SGTS, performing a failure analysis on a representative sample of light bulbs, adjusting RPS output voltage, performing a design review of circuit breakers in the RPS, and counseling involved personnel.

These corrective actions would not have prevented this event because they addressed only the specific causes of particular events. However, in view of the increased component failure rate experienced with the RPS power supply system in the past year, potential common causes for component failures are presently being investigated.

3. Failed Components Identification:

Master Parts List Number: 1C71-S001B
Manufacturer: General Electric
Type: Motor Starter
Model Number: CR106E0
Manufacturer Code: G080
EIIS System Code: JE
EIIS Component Code: MSTR
Root Cause Code: X
Reportable to NPRDS: Yes