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J. T. Beckham, Jr.
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Georgia Power
the southern electric system

May 10, 1996

Docket No. 50-321

HL-5159

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

Edwin I. Hatch Nuclear Plant - Unit 1
Licensee Event Report
Loss of Power to Reactor Protection System
Bus Results in Actuations of Engineered Safety Features

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 the loss of power to a reactor protection system bus which resulted in actuations of engineered safety features.

Sincerely,

J. T. Beckham, Jr.

IFL/eb

Enclosure: LER 50-321/1996-005

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. B. L. Holbrook, Senior Resident Inspector - Hatch

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

APPROVED OMB NO. 3150-0104
EXPIRES: 5/31/96
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 5

TITLE (4)
Loss of Power to Reactor Protection System Bus Results in Actuations of Engineered Safety Features

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 4	1 4	9 6	9 6	– 0 0 5	– 0 0	0 5	1 0	9 6	Plant Hatch, Unit 2	0 5 0 0 0 3 6 6
									FACILITY NAME	0 5 0 0 0

OPERATING MODE (9)	5	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR ?: (Check one or more of the following) (11)					
POWER LEVEL (10)	0 0 0	20.402(b)	20.405(c)	X	50.73(a)(2)(iv)		73.71(b)
		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)(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, Hatch	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

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 singlo-space typewritten lines) (16)

On 4/14/96 at 1510 EDT, Unit 1 was in the Refueling mode with core reload in progress. At that time, the supply breaker for 4160V/600V Station Service Transformer "1D" opened de-energizing 600V bus 1R23-S004. This bus supplies power to Reactor Protection System (RPS) bus "B" through motor-generator set 1C71-S001B; therefore, power was lost to the RPS bus. Logic systems powered by the RPS bus include the RPS trip logic, the Main Control Room Environmental Control System (MCRECS) and the Standby Gas Treatment System (SGTS) initiation logic, Secondary Containment Isolation System trip logic, Primary Containment Isolation System (PCIS) trip logic, and Steam Packing Exhauster trip logic. All affected systems responded per design on the loss of power, which caused a half scram signal, SGTS initiation, several PCIS valve isolations, Shutdown Cooling isolation, and other actuations. The MCRECS did receive a pressurization mode initiation signal; however, it did not enter this mode due to loss of power from bus 1R23-S004. One train of the Unit 1 SGTS did not start, also due to loss of power from the bus. Licensed personnel re-energized bus 1R23-S004 from its alternate supply and returned the affected systems to normal.

This event was caused by personnel error. Personnel miswired part of the current transformer circuit. As a result, the transformer protection circuit sensed a differential overcurrent condition resulting in the supply breaker opening. The error was corrected and the transformer returned to service. The involved personnel were counseled.

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 4/14/96 at 1510 EDT, Unit 1 was in the Refueling mode with core reload in progress. At that time, the supply breaker for 4160V/600V Station Service Transformer "1D" (EIIS Code EA) opened de-energizing 600V bus 1R23-S004 (EIIS Code EA). This bus supplies power to motor-generator set 1C71-S001B (EIIS Code EC) which, in turn, supplies power to Reactor Protection System (RPS, EIIS Code JC) bus "B". Therefore, power was lost to the RPS bus. Logic systems powered by the RPS bus include the RPS trip logic, the Main Control Room Environmental Control System (MCRECS, EIIS Code VI) initiation logic, the Standby Gas Treatment System (SGTS, EIIS Code BH) initiation logic, Secondary Containment Isolation System trip logic, Primary Containment Isolation System (PCIS, EIIS Code JM) trip logic, and Steam Packing Exhauster (EIIS Code TC) trip logic. Trip or initiation signals were generated upon loss of power to the RPS bus per the "fail-safe" design of the logic systems. All affected systems responded per design on the loss of power, which caused a half scram signal, Unit 1 and Unit 2 SGTS initiation, several PCIS valve isolations, resulting in Shutdown Cooling (SDC) isolation, and Secondary Containment isolation.

The Division II logic of the MCRECS received a pressurization mode initiation signal due to the loss of power to RPS bus "B". However, it did not enter the pressurization mode because its initiation logic is "energize-to-initiate"; with 600V bus 1R23-S004 de-energized, the logic could not energize to place the MCRECS in the pressurization mode. Only Division II received an initiation signal since power was not lost to RPS bus "A"; consequently, the Division I logic of the MCRECS did not receive an initiation signal. When power was restored to bus 1R23-S004, and before the initiation signal could be reset, the MCRECS entered the pressurization mode as expected.

Fan "1B" of the Unit 1 SGTS did not start due to loss of power from the 600V bus, although it received an initiation signal as designed. The "1B" fan is powered from bus 1R23-S004; therefore, it had no power to start. When power was restored to bus 1R23-S004 and before the initiation signal could be reset, fan "1B" started as expected.

Licensed personnel re-energized 600V bus 1R23-S004 from 4160V/600V Station Service Transformer "1CD", its alternate power supply, by 1525 EDT. Affected systems were returned to normal. SDC was restored to service by 1625 EDT. No reactor coolant temperature increase occurred during the time SDC was out of service due to the relatively low decay heat load at this

point in the refueling outage and the fact the alternate Decay Heat Removal (EIIS Code KE) system remained in service during this event.

CAUSE OF EVENT

The cause of this event was personnel error. Contractor personnel miswired part of the current transformer circuit for the 4160V/600V Station Service Transformer "1D" circuit. As a result, the transformer protection circuit sensed a differential overcurrent condition and opened the supply breaker.

During implementation of Design Change Request (DCR) 94-044, a cable in the current transformer (CT) circuit for 4160V/600V Station Service Transformer "1D" was re-routed. The cable was re-routed to eliminate the need to wrap it in fire barrier material. When the four conductors (Phase 1, Phase 2, Phase 3, and neutral) in the cable were re-landed on the CT, contractor personnel miswired the Phase 1, Phase 3, and neutral wires. They failed to find the wiring error when the conductors were checked ("red-lined") following completion of the DCR work.

4160V Phase 1 normally is wired through a differential overcurrent relay to 600V Phase 1; the same is true for 4160V and 600V Phases 2 and 3. If a differential overcurrent condition exists between like 4160V and 600V phases, a problem may exist and the respective relay will cause the 4160V/600V Station Service Transformer "1D" supply breaker to open to prevent equipment damage. As a result of the wiring error, different 4160V and 600V phases were wired to each other through the differential overcurrent relays. When the transformer was returned to service at 1417 EDT on 4/14/96, and as loads were placed on 600V bus 1R23-S004, the increasingly different phase currents resulting from loading on the phases caused some of the protection relays to sense a differential overcurrent condition. The relays then tripped and opened the transformer supply breaker.

REPORTABILITY ANALYSIS AND SAFETY ASSESSMENT

This event is reportable per 10 CFR 50.73 (a)(2)(iv) because unplanned actuations of engineered safety feature (ESF) systems occurred. Specifically, several ESF systems actuated in response to a loss of power to RPS bus "B".

The RPS power supply system is designed to supply stable, 120-volt AC power to a variety of plant instrumentation systems including the Process Radiation Monitoring System, the Neutron Monitoring System, the Reactor Protection System, the Primary Containment Isolation System, and the Offgas Radiation Monitoring System. A high degree of power stability is achieved by using two

motor-generator sets to condition the power supplied by the RPS power supply system. The motor-generator sets receive power from 600V busses 1R23-S003 and 1R23-S004. Upon loss of power or control signal, systems powered by the RPS bus de-energize to their "safe" configuration (i.e., they initiate their emergency or accident functions).

In this event, the power supply to the motor-generator set for RPS bus "B" was lost when the supply breaker to 4160V/600V Station Service Transformer "1D" opened, de-energizing 600V bus 1R23-S004 and RPS bus "B". All systems affected by this event responded per design for a loss of 600V bus 1R23-S004 and no unexpected actuations occurred. It should be noted the plant is analyzed for loss of a 600V bus. Had an actual event occurred, Division I systems and components powered from 600V bus 1R23-S003 would have been available to respond to, and mitigate the consequences of, the event. These systems and components are completely redundant to those powered from 600V bus 1R23-S004 and would have been sufficient to combat any analyzed transient or accident up to and including the Design Basis Accident: a Loss of Coolant Accident in conjunction with a complete Loss of Offsite Power.

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

The wiring error was corrected per Maintenance Work Order 1-96-1393 on 4/15/96 and the transformer returned to service. Responsible personnel have been counseled regarding their error and its adverse consequences.

ADDITIONAL INFORMATION

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

No failed components caused or resulted from this event.

Previous similar events in the past two years in which RPS power supply trips resulted in unplanned ESF system actuations were reported in the following Licensee Event Reports:

50-321/1994-005, dated 05/25/94, 50-321/1994-008, dated 08/08/94,
50-321/1995-002, dated 03/14/95, 50-321/1995-003, dated 06/12/95,
50-321/1995-004, dated 07/17/95, 50-366/1995-007, dated 11/28/95.

The previous similar events were caused by problems with the motor-generator set powering the RPS bus or by faults which caused the 600V supply breaker to the motor-generator set to open. All of these problems were equipment-related and not a result of personnel error. Corrective actions for the previous events could not have prevented this event because their causes were different.

There have been no previous similar events in the past two years in which a wiring error resulted in an unplanned ESF system actuation.

motor-generator sets to condition the power supplied by the RPS power supply system. The motor-generator sets receive power from 600V busses 1R23-S003 and 1R23-S004. Upon loss of power or control signal, systems powered by the RPS bus de-energize to their "safe" configuration (i.e., they initiate their emergency or accident functions).

In this event, the power supply to the motor-generator set for RPS bus "B" was lost when the supply breaker to 4160V/600V Station Service Transformer "1D" opened, de-energizing 600V bus 1R23-S004 and RPS bus "B". All systems affected by this event responded per design for a loss of 600V bus 1R23-S004 and no unexpected actuations occurred. It should be noted the plant is analyzed for loss of a 600V bus. Had an actual event occurred, Division I systems and components powered from 600V bus 1R23-S003 would have been available to respond to, and mitigate the consequences of, the event. These systems and components are completely redundant to those powered from 600V bus 1R23-S004 and would have been sufficient to combat any analyzed transient or accident up to and including the Design Basis Accident: a Loss of Coolant Accident in conjunction with a complete Loss of Offsite Power.

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.

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