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Georgia Power
the southern electric system

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Docket Nos. 50-321
50-366

HL-3109
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U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555

EDWIN I. HATCH NUCLEAR PLANT
LICENSEE EVENT REPORT
LOOSE CONNECTION IN POWER SUPPLY CABINET
RESULTS IN ENGINEERED SAFETY FEATURES 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 loose connection in a power supply cabinet which resulted in Engineered Safety Features actuations during a relay replacement activity. This event occurred at Plant Hatch - Units 1 and 2.

Sincerely,

J. T. Beckham, Jr.

JKB/cr

Enclosure: LER 50-366/1992-029

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

210099



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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 2 | 0 5 0 0 0 3 6 6 | 1 OF 4 |

TITLE (4)
LOOSE CONNECTION IN POWER SUPPLY CABINET RESULTS IN ENGINEERED SAFETY FEATURES 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 1 | 0 5 0 0 0 3 2 1 |
| 1 2 | 2 1 | 9 2 | 9 2 | 0 2 9 | 0 0 | 0 1 | 1 5 | 9 3 | | 0 5 0 0 0 |

| OPERATING MODE (9) | 1 | THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR (11) | | | | | |
|---|---|---|---|---|---|---|---|
| POWER LEVEL | 1 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) | | |
| | | 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 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | |
| | | | | | | | | | | | |

SUPPLEMENTAL REPORT EXPECTED (14)

| | | EXPECTED SUBMISSION DATE (15) | MONTH | DAY | YEAR |
|---|---|---|---|---|---|
| YES(If yes, complete EXPECTED SUBMISSION DATE) | X NO | | | | |

ABSTRACT (16)


On 12/21/92 at 0050 CST, Unit 1 was in the Run mode at a power level of 2436 CMWT (100 percent rated thermal power). At that time, the "B" bus of the Reactor Protection System (RPS) power supply tripped. This caused a loss of power to the "B" channels of the RPS, Process Radiation Monitoring System, Neutron Monitoring System, Primary Containment Isolation System (PCIS), and Offgas Radiation Monitoring System. These systems tripped on loss of power per design resulting in a half scram signal in RPS channel "B", closure of various PCIS valves, isolation of Unit 2 Secondary Containment, initiation of the 'B' trains of both units' Standby Gas Treatment Systems, and actuation of the pressurization mode of the Main Control Room Environmental Control System. By 0109 CST, licensed operations personnel restored power to RPS bus "B" via the motor generator (MG) set, which is the normal supply. Investigation revealed that electricians had inadvertently pulled a wire from its lug while replacing a relay in one of the RPS power supply cabinets . This resulted in deenergizing a relay which feeds the RPS MG set output to the RPS bus.

The cause of this event was a loosely connected wire in the RPS power supply cabinet. When electricians removed the relay from the cabinet, a corner of the relay came in contact with the neutral wire from an adjacent relay which was feeding the energized RPS bus. The wire was not securely fastened, however, and was pulled out of its lug, deenergizing the relay and tripping the bus.

Corrective actions for this event included completing the replacement of the involved relay, relanding and securing the loose wire, and returning the RPS power supply and all affected equipment to service.

PLANT AND SYSTEM IDENTIFICATION

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

DESCRIPTION OF EVENT

On 12/21/92 at 0050 CST, Unit 1 was in the Run mode at a power level of 2436 CMWT (100 percent rated thermal power). At that time, the "B" bus of the Reactor Protection System (RPS, EIIS Code JE) power supply tripped. This caused a loss of power to the "B" channels of the RPS, Process Radiation Monitoring System (EIIS Code IL), Neutron Monitoring System (EIIS Code IG), Primary Containment Isolation System (PCIS, EIIS Code JM), and Offgas Radiation Monitoring System (EIIS Code IL). These systems tripped on loss of power per design resulting in a half scram signal in RPS channel "B", closure of various PCIS valves, isolation of Unit 2 Secondary Containment, initiation of the 'B' trains of both units' Standby Gas Treatment Systems (EIIS Code BH) and actuation of the pressurization mode of the Main Control Room Environmental Control System (EIIS Code VI).

Investigation revealed that at the time of the trip, nonlicensed electricians were replacing relay 2C71-K2B in an RPS power supply cabinet. This cabinet contains several large relays which feed power from the normal and alternate sources to the "B" RPS bus. All the relays in this cabinet were being replaced with new ones, one at a time. The relay which was being replaced feeds power from the alternate source to RPS bus "B". At the time of the replacement, RPS bus "B" was being powered from its normal supply, the RPS motor-generator (MG) set. Therefore, the relay which was to be replaced was deenergized and electricians had already disconnected all wires and cables from the relay. As the relay was being removed from the cabinet, an upper corner of the relay base plate caught the neutral wire of an adjacent relay, 2C71-K1B, and pulled the wire out of its lug. This deenergized relay 2C71-K1B which feeds normal power from the MG set to RPS bus "B." Thus, when 2C71-K1B deenergized, RPS bus "B" lost power, resulting in the actuations described above.

When relay 2C71-K1B deenergized, the electricians immediately realized that a loss of power to RPS Bus "B" had occurred. However, since the actuations had already occurred, they proceeded with completing the removal of the old relay from the panel, installed the new relay, and relanded the loose wire in its lug. By 0109 CST, licensed operations personnel restored power to RPS bus "B" via the motor generator (MG) set, which is the normal supply, per procedure 34AB-C71-002-2S, "LOSS OF RPS BUS." The total time during which the RPS bus was tripped was less than twenty minutes.

CAUSES OF EVENT

The cause of this event was a loose connection in an RPS power supply cabinet. The relay which was being removed is large and weighs 42 pounds. When removing this relay from its cabinet, numerous obstructions were encountered, including wires, large power cables, and other relays. To assist in moving the relay past some large power cables beneath the relay, a second electrician stationed himself just below the first and guided the lower portion of the relay base plate. However, as the relay was brought out, an upper corner of the relay contacted the neutral wire of relay 2C71-K1B which feeds the output of the MG set to RPS bus "B". It is believed that the neutral wire of 2C71-K1B was loose in its lug because it pulled out of the lug with no detectable resistance. When the neutral wire came out of its lug, relay 2C71-K1B was deenergized which, in turn, resulted in loss of power to RPS bus "B". This further caused the instrumentation systems listed previously to lose power and actuate per design.

REPORTABILITY ANALYSIS AND SAFETY ASSESSMENT

This event is reportable per 10 CFR 50.73 (a)(2)(iv) because an event occurred in which Engineered Safety Feature (ESF) systems experienced unplanned, automatic actuations. Specifically, RPS power supply bus "B" tripped when a power supply relay was inadvertently deenergized during maintenance, causing actuations of the ESF systems mentioned previously.

The RPS power supply system is designed to provide stable 120-volt AC power to a variety of plant instrumentation systems including the Process Radiation Monitoring System, the Neutron Monitoring System, the RPS, the PCIS, and the Offgas Radiation Monitoring System. A high degree of power stability is achieved by using MG sets to condition the power supplied to the RPS. In this event, the "B" MG set was supplying power to the "B" RPS power supply bus per design when a relay which feeds power to the bus was inadvertently deenergized. Thus, the output of the "B" MG set was disconnected from the "B" RPS bus. The design of the instrumentation systems listed above is such that, upon loss of power, they fail to the "safe" condition (i.e., they initiate their emergency or accident functions). All systems affected by the loss of power to RPS bus "B" responded per design, and no other unexpected actuations occurred.

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 replacement of the relay was completed; the loose wire was relanded and secured; power to RPS bus "B" was restored from its normal supply through RPS MG set "B", and all affected equipment was returned to service.

ADDITIONAL INFORMATION

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

2. Failed Components Information: No failed components contributed to or resulted from this event.

3. Previous Similar Events: Events reported in the past two years in which less than adequate material condition resulted in unplanned actuations of Engineered Safety Features are described in the following Licensee Event Reports:

   50-321/1991-10, dated 6/14/91,
   50-321/1992-07, dated 4/9/92.

   Corrective actions for these events included counseling personnel, correcting the installation of improperly installed relay covers, and conducting departmental training meetings. These actions would not have prevented this event because they did not address the specific human factors and material condition problems which led to this event.