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Georgia Power

The southern electric system

HL-1628
001586

May 13, 1991

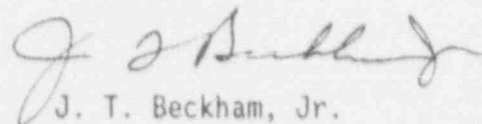
U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555

PLANT HATCH - UNIT 2
NRC DOCKET 50-366
OPERATING LICENSE NPF-5
LICENSEE EVENT REPORT
BLOWN FUSE RESULTS IN UNPLANNED
ACTUATION 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 a blown fuse which resulted in an unplanned actuation of engineered safety features. This event occurred at Plant Hatch - Unit 2.

Sincerely,



J. T. Beckham, Jr.

OCV/cr

Enclosure: LER 50-366/1991-010

cc: (See next page.)

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U.S. Nuclear Regulatory Commission

May 13, 1991

Page Two

cc: Georgia Power Company

Mr. H. L. Sumner, General Manager - Nuclear Plant

Mr. J. D. Heidt, Manager Engineering and Licensing - Hatch
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)

| | | | | | | | | | | | | | | |
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| FACILITY NAME (1) PLANT HATCH, UNIT 2 | | | | | | | | | | DOCKET NUMBER (2) 05000366 | | PAGE (3) 1 OF 6 | | |
| TITLE (4) BLOWN FUSE RESULTS IN ENGINEERED SAFETY FEATURES ACTUATION | | | | | | | | | | | | | | |
| 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 | | 05000321 | | | |
| 04 | 16 | 91 | 91 | 010 | 00 | 05 | 13 | 91 | | | 05000 | | | |
| OPERATING MODE (9) | | THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR (11) | | | | | | | | | | | | |
| 5 | | 20.402(b) | | | 20.405(c) | | | X | | 50.73(a)(2)(iv) | | 73.71(b) | | |
| POWER LEVEL | | 000 | | | 20.405(a)(1)(i) | | | | | 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 | | | | |
| STEVEN B. TIPPS, MANAGER NUCLEAR SAFETY AND COMPLIANCE, HATCH | | | | | | | | | | AREA CODE | | 912 367-7851 | | |
| 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 | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| SUPPLEMENTAL REPORT EXPECTED (14) | | | | | | | | | | EXPECTED SUBMISSION DATE (15) | | MONTH | DAY | YEAR |
| <input type="checkbox"/> YES (If yes, complete EXPECTED SUBMISSION DATE) | | | | | | | | | | <input checked="" type="checkbox"/> NO | | | | |

ABSTRACT (16)

On 4/16/91, at approximately 2140 CDT, Unit 2 was in a refueling outage with the reactor vessel flooded, and all fuel removed from the vessel. At that time, Instrument and Control (I&C) technicians were performing surveillance procedure 57SV-D11-008-2S, "REACTOR BUILDING EXHAUST VENT RADIATION MONITOR CHANNEL FUNCTIONAL TEST." This procedure requires the installation of a jumper in Control Room panel 2H11-P606A. As the technician was installing the jumper, he inadvertently brought one end of the jumper into contact with a grounded steel enclosure inside the panel. This resulted in a current surge which blew fuse 2C61-F20. This fuse supplies logic power to the Primary Containment Isolation System (PCIS, EIIS Code JM) which provides initiation signals to the "B" trains of the Unit 1 and Unit 2 Standby Gas Treatment Systems (SGTS, EIIS Code BH), isolation signals to both units' Secondary Containment dampers (EIIS Code JM) and to various PCIS valves. All systems responded as designed.

The root causes of this event were personnel error coupled with poor working conditions in the Control Room panel. The technician did not take sufficient steps to assure success, and the equipment involved added to the difficulty of the task.

Corrective actions for this event will include discussing the event in I&C Tool Box meetings which will stress the need for adequately preparing work areas and re-evaluating the task for potential changes in the kind of jumpers that are used in this surveillance application.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

| FACILITY NAME (1) | DOCKET NUMBER (2) | LER NUMBER (5) | | | PAGE (3) | | |
|---------------------|-------------------|----------------|---------|-----|----------|----|---|
| | | YEAR | SEQ NUM | REV | | | |
| PLANT HATCH, UNIT 2 | 05000366 | 91 | 010 | 00 | 2 | OF | 6 |

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 4/16/91, at 2140 CDT, Unit 2 was in a refueling outage with the reactor vessel flooded, and all fuel removed from the vessel. Unit 1 was in the Run mode at a power level of 2426 CMWT (99.5% of rated thermal power). At that time, Instrument and Control (I&C) technicians were performing surveillance procedure 57SV-D11-008-2S, "REACTOR BUILDING EXHAUST VENT RADIATION MONITOR CHANNEL FUNCTIONAL TEST." This procedure required the installation of a jumper in Control Room panel 2H11-P606A. The particular terminal in which the jumper was to be installed is located inside a small steel enclosure within the panel. The enclosure is affixed to the ceiling of the panel and is slightly less than eight feet off the floor. Once the lid of this small enclosure was removed, the I&C technician inserted one end of a banana plug jumper into the appropriate receptacle. When he proceeded to insert the other end of the jumper into the second receptacle (also located in the small steel enclosure), he inadvertently brought the exposed end of the banana plug in contact with the steel enclosure, grounding the jumper and blowing fuse 2C61-F20.

This fuse supplies power to Primary Containment Isolation System (PCIS, EIIIS Code JM) logic. The affected portion of PCIS logic, in turn, provides initiation signals to the "B" trains of the Unit 1 and Unit 2 Standby Gas Treatment Systems (SGTS, EIIIS Code BH). Additionally, it provides isolation signals to both units' Secondary Containment dampers (EIIIS Code JM), to the Unit 2 torus and drywell outboard vent valves, and to various other Unit 2 Group II PCIS valves; including those of the Hydrogen/Oxygen Sampling System (EIIIS Code IK), the Drywell Pneumatics System (EIIIS Code LD), and the Reactor Coolant Sampling System (EIIIS Code KN). Due to the fact that Unit 2 was in a refueling outage, some of the PCIS valves were already closed, and therefore did not reposition as a result of the signal. The "B" train of Unit 2 SGTS was out of service due to an equipment clearance on Motor Control Center (MCC) 2R24-S012, and therefore did not auto start. The Unit 1 SGTS functioned per design upon receipt of the initiation signal. Therefore, all automatic actuations occurred as expected given plant conditions at the time.

As a result of the blown fuse, both units' reactor building ventilation systems isolated, and the refueling floor isolated. The "B" train of the Unit 1 SGTS operated as designed to maintain a negative pressure on the Unit 1 reactor building and refueling floor. However, since the "B" train of the Unit 2 SGTS did not auto start, licensed operations personnel took conservative action and

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

| FACILITY NAME (1) | DOCKET NUMBER (2) | LER NUMBER (5) | | | PAGE (3) | |
|---------------------|-------------------|----------------|-----|-----|----------|--------|
| | | YEAR | SEQ | WOM | REV | |
| PLANT HATCH, UNIT 2 | 05000366 | 91 | 010 | | 00 | 3 OF 6 |

TEXT

manually started the unaffected "A" train with suction from the common refueling floor in order to help maintain a slight negative pressure in Unit 1 Secondary Containment. It should be noted that per Unit 2 Technical Specifications section 3.6.5.1 and 3.9.5.1, Unit 2 Secondary Containment Integrity was not required to be in effect at the time of the event.

By 0001 CDT on 4/17/91, I&C technicians investigating the event determined that fuse 2C61-F20 had been blown. This fuse was replaced by 0120 CDT. Subsequently, both units' SGTs were restored to the standby configuration and normal reactor building and refueling floor ventilation systems were returned to service on both units. Surveillance procedure 57SV-D11-008-2S was then successfully completed by 0210 CDT on 4/17/91.

CAUSE OF THE EVENT

The root causes of this event were personnel error and poor working conditions in the Control Room panel. The involved I&C technician was found to have been in error by not rearranging the work area to reduce the difficulty in making this jumper installation. Specifically, a table was partially blocking the door to the panel, preventing the door from being fully opened. The I&C technician should have moved the table before beginning the work. Secondly, due to the height of the enclosure, the technician was overreaching himself. He should have used a step ladder or stool to make the jumper installation easier, rather than reaching into the ceiling of the panel without assistance.

However, aside from the manner in which this specific task was performed, it was found that the awkward location and orientation of the jumper connection points substantially increased the probability that human performance errors would occur. Both jumper connections had to be made inside a small steel enclosure which was affixed to the ceiling of the panel, requiring jumper installation to be performed in an inverted orientation and in very close quarters. Also, a large bundle of wires is bound together just beneath the enclosure such that the technician must approach the connections at an angle rather than straight-on.

Finally, the kind of jumper which was used for this task was not well suited for the application. The jumper connections used a standard, uninsulated banana plug. In this event, one end of the jumper had been installed, thereby energizing the whole conductor. As the I&C technician was bringing up the other end, the exposed end of the banana plug contacted the enclosure, grounding the circuit, and blowing the fuse.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

| FACILITY NAME (1) | DOCKET NUMBER (2) | LER NUMBER (5) | | | PAGE (3) | |
|---------------------|-------------------|----------------|---------|-----|----------|------|
| | | YEAR | SEQ NUM | REV | | |
| PLANT HATCH, UNIT 2 | 05000366 | 91 | 010 | 00 | 4 | OF 6 |

TEXT

REPORTABILITY ANALYSIS AND SAFETY ASSESSMENT

This event is reportable per 10 CFR 50.73(a)(2)(iv) because an unplanned automatic actuation of an ESF occurred. Specifically, a blown fuse resulted in an automatic initiation signal being received by the "B" train of the Unit 2 SGTS and an automatic start of the "B" train of the Unit 1 SGTS. Additionally, isolation signals were received by both units' Secondary Containment dampers, the Unit 2 torus and drywell outboard vent valves, and various other Unit 2 Group II PCIS valves, including those of the Hydrogen/Oxygen Sampling System, the Drywell Pneumatics System, and the Reactor Coolant Sampling System.

The Standby Gas Treatment Systems are designed to limit the release of radioactivity to the environment following a release of radioactivity into the Secondary Containment. The systems automatically filter the exhaust air from the Secondary Containment following an accident, and discharge it via the Main Stack. Each unit's SGTS consists of two identical, redundant, parallel air filtration trains containing the necessary heaters, filters and exhaust fans. Each redundant train is a 100% capacity system.

The PCIS and the Group 2 isolation valves described in this report are designed to limit the release of radioactive materials from the Primary Containment in the event of an accident. PCIS valves automatically isolate the lines entering and leaving the Primary Containment upon receipt of signals indicating an abnormal condition (e.g., low reactor water level or high drywell pressure).

In the event described in this report, both units' SGTSs received an automatic initiation signal resulting from a blown fuse in the Unit 2 PCIS logic. The blown fuse affected the "B" train of the Unit 2 PCIS and SGTS logic. However, the "B" train of the Unit 2 SGTS was out of service due to a clearance, and thus did not start. Licensed operations personnel manually started the "A" train of SGTS on Unit 2, which operated per design thereafter. The "B" train of the Unit 1 SGTS initiated and functioned per design. Due to the fact that Unit 2 was in a refueling outage at the time of the event, Secondary Containment Integrity was not required to be in effect per Unit 2 Technical Specifications section 3.6.5.1 and 3.9.5.1. Unit 1 Secondary Containment Integrity was required, however, and was maintained at all times during the event. Manual initiation of the "A" train of Unit 2 SGTS was a conservative action on the part of licensed operations personnel. If the event had occurred at a time when Unit 2 Secondary Containment Integrity was required to be in effect, the unaffected "A" train of SGTS was still available.

The Unit 2 PCIS also received a signal to one logic channel as a result of the blown fuse. In this case, the signal should have caused isolation of the various PCIS valves enumerated above. No required actuations were observed to have failed to occur, and no unanticipated actuations were observed to have occurred. The Unit 1 PCIS was not affected by the blown fuse.

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

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|--|-----------------------------------|----------------|---------|-----|----------|----|---|
| FACILITY NAME (1) PLANT HATCH, UNIT 2 | DOCKET NUMBER (2) 05000366 | LER NUMBER (5) | | | PAGE (3) | | |
| | | YEAR | SEQ NUM | REV | | | |
| | | 91 | 010 | 00 | 5 | OF | 6 |

TEXT

Based on the above analysis, it is concluded that this event had no adverse impact on nuclear safety. The analysis is applicable to all power levels.

CORRECTIVE ACTION

Corrective actions for this event will include the following.

1. The event will be discussed with all I&C personnel in Tool Box meetings. These discussions will stress the need for adequately preparing work areas prior to executing a job. This action will be complete by 7/1/91.
2. An evaluation will be performed to determine if the use of a different type of jumper would significantly reduce the probability of recurrence of this event. At least two specific jumper types will be considered. The first will incorporate an in-line switch, and the other will incorporate a retractable insulating sleeve which surrounds the banana plug. Although this action does not specifically address the arrangement of the work space in Control Room panel 2H11-P606A, it is believed that using an improved jumper design could reduce the risks inherent in installing jumpers in this and other control room panels. This evaluation will be completed by 7/15/91, and if indicated, new type jumpers will be be procured and used.

ADDITIONAL INFORMATION

1. Other Systems Affected:

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

2. Previous Similar Events:

Events occurring in the past two years in which opening links or installing jumpers resulted in ESF actuations were reported in the following LERs:

50-321/1990-016, dated 09/13/90
50-321/1991-006, dated 03/25/91
50-321/1991-007, dated 03/27/91

Corrective actions for these events included counseling involved personnel, replacing failed components and fuses, revising procedures and conducting an exhaustive inspection of Control Room panels for unrestored temporary

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

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|--|-----------------------------------|----------------|---------|-----|----------|------|
| FACILITY NAME (1) PLANT HATCH, UNIT 2 | DOCKET NUMBER (2) 05000366 | LER NUMBER (5) | | | PAGE (3) | |
| | | YEAR | SEQ NUM | REV | | |
| | | 91 | 010 | 00 | 6 | OF 6 |

TEXT

electrical modifications. These corrective actions would not have prevented this event because counseling personnel is an action which is designed to instill a sense of caution in those plant personnel specifically involved in the event. Replacing failed components and revising procedures would not have prevented this event because no component failures or procedural inadequacies contributed to the event. Inspecting the Control Room panels for unrestored temporary electrical modifications would not have prevented this event because no preexisting modification contributed to this event.

2. Failed Components Identification:

No failed components contributed to this event.