



Callaway Plant

December 6, 1989

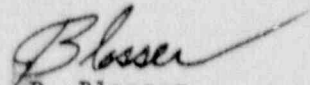
U. S. Nuclear Regulatory Commission  
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ULNRC-2119

Gentlemen:

DOCKET NUMBER 50-483  
CALLAWAY PLANT UNIT 1  
FACILITY OPERATING LICENSE NPF-30  
LICENSEE EVENT REPORT 89-013-00  
ENGINEERED SAFETY FEATURES ACTUATIONS  
DUE TO A FAILED POWER SUPPLY

The enclosed Licensee Event Report is submitted pursuant to 10 CFR 50.73(a)(2)(iv) concerning Engineered Safety Features Containment Purge Isolation, Control Room Ventilation Isolation, and Fuel Building Ventilation Isolation actuations which occurred due to a failed power supply.

  
J. D. Blosser  
Manager, Callaway Plant

TPS ~~216~~  
TPS/JKB:jlh

Enclosure

cc: Distribution attached

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## LICENSEE EVENT REPORT (LER)

|                                                                                 |        |                                                                                                              |                |                   |                 |                  |                 |           |                |                                                        |   |                                        |   |                 |                  |      |   |                                                              |             |                      |  |  |  |  |
|---------------------------------------------------------------------------------|--------|--------------------------------------------------------------------------------------------------------------|----------------|-------------------|-----------------|------------------|-----------------|-----------|----------------|--------------------------------------------------------|---|----------------------------------------|---|-----------------|------------------|------|---|--------------------------------------------------------------|-------------|----------------------|--|--|--|--|
| FACILITY NAME (1)<br>Callaway Plant Unit 1                                      |        |                                                                                                              |                |                   |                 |                  |                 |           |                | DOCKET NUMBER (2)<br>0 5 0 0 0 4 8 3                   |   |                                        |   |                 |                  |      |   |                                                              |             | PAGE (3)<br>1 OF 0 3 |  |  |  |  |
| TITLE (4)<br>Engineered Safety Features Actuations Due To A Failed Power Supply |        |                                                                                                              |                |                   |                 |                  |                 |           |                |                                                        |   |                                        |   |                 |                  |      |   |                                                              |             |                      |  |  |  |  |
| 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 NAMES |                                                        |   |                                        |   |                 | DOCKET NUMBER(S) |      |   |                                                              |             |                      |  |  |  |  |
| 1                                                                               | 1      | 0                                                                                                            | 9              | 8                 | 9               | 8                | 9               | 0         | 1              | 3                                                      | 0 | 0                                      | 1 | 2               | 0                | 6    | 8 | 9                                                            | 0 5 0 0 0 0 |                      |  |  |  |  |
| OPERATING MODE (9)                                                              |        | THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 5. (Check one or more of the following) (11) |                |                   |                 |                  |                 |           |                |                                                        |   |                                        |   |                 |                  |      |   |                                                              |             |                      |  |  |  |  |
| 1                                                                               |        | 20.402(b)                                                                                                    |                |                   |                 | 20.405(c)        |                 |           |                | <input checked="" type="checkbox"/> 60.73(a)(2)(iv)    |   |                                        |   | 73.71(b)        |                  |      |   |                                                              |             |                      |  |  |  |  |
| POWER LEVEL (10)                                                                |        | 20.405(a)(1)(i)                                                                                              |                |                   |                 | 60.36(c)(1)      |                 |           |                | 60.73(a)(2)(v)                                         |   |                                        |   | 73.71(c)        |                  |      |   |                                                              |             |                      |  |  |  |  |
| 1                                                                               |        | 0                                                                                                            |                |                   |                 | 20.405(a)(1)(ii) |                 |           |                | 60.36(c)(2)                                            |   |                                        |   | 60.73(a)(2)(vi) |                  |      |   | OTHER (Specify in Abstract below and in Text, NRC Form 366A) |             |                      |  |  |  |  |
|                                                                                 |        | 20.405(a)(1)(iii)                                                                                            |                |                   |                 | 60.73(a)(2)(i)   |                 |           |                | 60.73(a)(2)(vii)(A)                                    |   |                                        |   |                 |                  |      |   |                                                              |             |                      |  |  |  |  |
|                                                                                 |        | 20.405(a)(1)(iv)                                                                                             |                |                   |                 | 60.73(a)(2)(ii)  |                 |           |                | 60.73(a)(2)(vii)(B)                                    |   |                                        |   |                 |                  |      |   |                                                              |             |                      |  |  |  |  |
|                                                                                 |        | 20.405(a)(1)(v)                                                                                              |                |                   |                 | 60.73(a)(2)(iii) |                 |           |                | 60.73(a)(2)(k)                                         |   |                                        |   |                 |                  |      |   |                                                              |             |                      |  |  |  |  |
| LICENSEE CONTACT FOR THIS LER (12)                                              |        |                                                                                                              |                |                   |                 |                  |                 |           |                |                                                        |   |                                        |   |                 |                  |      |   |                                                              |             |                      |  |  |  |  |
| NAME<br>J. F. Hogg - Superintendent of Instruments & Controls                   |        |                                                                                                              |                |                   |                 |                  |                 |           |                | TELEPHONE NUMBER<br>AREA CODE<br>3 1 4 6 7 6 - 8 1 9 3 |   |                                        |   |                 |                  |      |   |                                                              |             |                      |  |  |  |  |
| COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)      |        |                                                                                                              |                |                   |                 |                  |                 |           |                |                                                        |   |                                        |   |                 |                  |      |   |                                                              |             |                      |  |  |  |  |
| CAUSE                                                                           | SYSTEM | COMPONENT                                                                                                    | MANUFACTURER   | REPORTABLE TO NRC |                 | CAUSE            | SYSTEM          | COMPONENT | MANUFACTURER   | REPORTABLE TO NRC                                      |   |                                        |   |                 |                  |      |   |                                                              |             |                      |  |  |  |  |
| X                                                                               | J      | E                                                                                                            | R              | J                 | X               | C                | 5               | 6         | 0              | Y                                                      |   |                                        |   |                 |                  |      |   |                                                              |             |                      |  |  |  |  |
|                                                                                 |        |                                                                                                              |                |                   |                 |                  |                 |           |                |                                                        |   |                                        |   |                 |                  |      |   |                                                              |             |                      |  |  |  |  |
| 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 (Limit to 1400 spaces, i.e., approximately fifteen single space typewritten lines) (16)

On 11/9/89 at 0531 CST, Engineered Safety Features (ESF) Containment Purge Isolation, Control Room Ventilation Isolation, and Fuel Building Ventilation Isolation actuated. The cause was determined to be a failed 15VDC power supply (P/S) located on board PS-4 in the 'B' train ESF cabinet, SA036E. The P/S board (Consolidated Controls, Part #KYE-1900-1) was replaced and the ESF actuation systems were restored to their normal standby lineup at 0840. The plant was in Mode 1 - Power Operations, at 100% reactor power during this event.

This P/S (Semiconductor Circuits Incorporated, Model # UM48-15S2000) is encapsulated and consequently the cause of failure cannot be determined. Infrared Thermography was performed on the redundant safety train ESF cabinets. The heat distribution patterns and circuit loadings were found to be normal. An evaluation to replace this type of P/S with a more reliable model has been in progress since the event documented in LER 89-010-01 and will be completed by February 16, 1990.



## LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

APPROVED OMB NO. 3150-0104  
EXPIRES: 8/31/88

|                                                |                                                        |                |                   |                 |          |    |       |
|------------------------------------------------|--------------------------------------------------------|----------------|-------------------|-----------------|----------|----|-------|
| FACILITY NAME (1)<br><br>Callaway Plant Unit 1 | DOCKET NUMBER (2)<br><br>0   5   0   0   0   4   8   3 | LER NUMBER (6) |                   |                 | PAGE (3) |    |       |
|                                                |                                                        | YEAR           | SEQUENTIAL NUMBER | REVISION NUMBER |          |    |       |
|                                                |                                                        | 8   9          | —   0   1   3     | —   0   0       | 0   2    | OF | 0   3 |

TEXT (If more space is required, use additional NRC Form 366A's) (17)

Basis for Reportability

On 11/9/89 at 0531 CST, Engineered Safety Features (ESF)<sup>(1)</sup> Containment Purge Isolation (CPIS), Control Room Ventilation Isolation (CRVIS), and Fuel Building Ventilation Isolation (FBIS) actuated when a power supply (P/S)<sup>(2)</sup> in the 'B' train ESF cabinet<sup>(3)</sup> failed. The details of this event are submitted pursuant to 10CFR50.73(a)(2)(iv) to report these ESF actuations. During this event, the unit was in Mode 1 - Power Operations, at 100% reactor power and normal operating pressure and temperature.

Description of Event

On 11/9/89 at 0531, the 'B' train CPIS, CRVIS, and FBIS actuated. Subsequent troubleshooting by utility Instrument & Control personnel determined the cause to be a failed 15VDC P/S located on board PS-4 in the SA036E ESF cabinet. The 'B' train ESF actuation system was declared inoperable and Technical Specification 3.3.2 actions for items 3c, 6c, 6h, and 9c were taken. At 0718, ESF cabinets SA036E and SA036B were down-powered and a new P/S board was installed. Power was restored to the cabinets at 0833 and the ESF actuation systems were restored to their normal standby lineup at 0840.

Root Cause

The root cause of the ESF actuations was attributable to the failed 15VDC P/S (Semiconductor Circuits Incorporated, Model # UM48-15S2000) located on board PS-4 (Consolidated Controls, Part #KYE-1900-1) in ESF cabinet, SA036E. The P/S board was installed on 9/5/89 following a similar failure (reference LER 89-010-01). Because the P/S is encapsulated, the cause of failure cannot be determined.

Corrective Actions

- 1) Infrared Thermography was performed on the redundant safety train ESF cabinets. The heat distribution patterns and circuit loadings were found to be normal.
- 2) An evaluation to replace this type of P/S (Semiconductor Circuits Incorporated, Model # UM48-15S2000) with a more reliable model in ESF cabinets SA036 A-E has been in progress since the event documented in LER 89-010-01. This evaluation will be completed by February 16, 1990.

Safety Significance

The CPIS, CRVIS, and FBIS dampers<sup>(4)</sup> and fans<sup>(5)</sup> actuated to their proper safeguards positions following the P/S failure. These actuations were generated within the ESF logic and not by actual plant conditions. The plant continued normal full power operation throughout the event. This event posed no threat to the public health and safety.

## LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

APPROVED OMB NO. 3150-0104

EXPIRES: 6/31/86

|                                                |                                                                       |                |                      |                    |          |  |  |
|------------------------------------------------|-----------------------------------------------------------------------|----------------|----------------------|--------------------|----------|--|--|
| FACILITY NAME (1)<br><br>Callaway Plant Unit 1 | DOCKET NUMBER (2)<br><br>0 5 0 0 0 4 8 3 8 9 - 0 1 3 - 0 0 0 3 OF 0 3 | LER NUMBER (6) |                      |                    | PAGE (3) |  |  |
|                                                |                                                                       | YEAR           | SEQUENTIAL<br>NUMBER | REVISION<br>NUMBER |          |  |  |
|                                                |                                                                       |                |                      |                    |          |  |  |

TEXT (If more space is required, use additional NRC Form 365A's) (17)

Previous Occurrences

LER 84-032-00, ULNRC 930 dated 9/19/84.

LER 87-014-00, ULNRC 1579 dated 8/14/87.

LER 87-025-00, ULNRC 1638 dated 10/5/87.

LER 89-010-01, ULNRC 2085 dated 10/3/89.

These LER's describe similar P/S failures in ESF cabinets SA036D and SA036E.  
The cause of these failures is unknown.

Footnotes

The system and component codes listed below are from IEEE Standards 805 and 803A, respectively.

- (1) System - JE
- (2) System - JE, Component - RJX
- (3) System - JE, Component - CAB
- (4) System - JE, Component - DMP
- (5) System - JE, Component - FAN