

LICENSEE EVENT REPORT (LER)

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| FACILITY NAME (1) Brunswick Steam Electric Plant Units 1 and 2 | DOCKET NUMBER (2) 0 5 0 0 0 3 2 5 | PAGE 1 OF 0 3 |
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TITLE (4)
Loss of Plant Emergency 4160 Vac Bus E-3

| 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) |
| 0 8 0 7 8 4 | 8 4 | 8 4 | — | 0 1 6 | — | 0 0 | 0 9 0 5 | 8 4 | Brunswick Unit 2 | | 0 5 0 0 0 3 2 4 |
| | | | | | | | | | | | 0 5 0 0 0 1 1 |

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|--------------------------------|--|-----------------|-------------------------------------|----------------------|--|--|--|--|--|--|
| OPERATING MODE (9) 1 | THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 5: (Check one or more of the following) (11) | | | | | | | | | |
| POWER LEVEL (10) 0 9 12 | 20.402(b) | 20.405(c) | <input checked="" type="checkbox"/> | 50.73(a)(2)(iv) | 73.71(b) | | | | | |
| | 20.405(a)(1)(i) | 50.38(c)(1) | | 50.73(a)(2)(v) | 73.71(c) | | | | | |
| | 20.405(a)(1)(ii) | 50.36(c)(2) | | 50.73(e)(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) | | TELEPHONE NUMBER | |
|--|--|----------------------------|---------------------------------------|
| NAME M. J. Pastva, Jr., Regulatory Technician | | AREA CODE 9 1 1 9 | 4 5 7 1 - 1 9 5 2 1 1 |

| 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 | |
| B | E K | 2 7 | B 4 5 5 | Yes | | | | | | |
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| 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 August 7, 1984, at 0134, while placing an equipment clearance to permit preventive maintenance on Unit 2 dc electrical battery bank 2A-2, the normal power supply feeder breaker, 2D, to plant 4160 Vac emergency bus E-3 automatically opened when the feeder breaker 125 Vdc control power supply was changed from the normal to the alternate power source. Unit 2 Group 6 and 8 isolations occurred. Within ten seconds plant emergency diesel generator No. 3 automatically started to reenergize E-3. The Control Building Emergency Air Filtration System isolated due to a spurious chlorine alarm. The Unit 2 Reactor Building Standby Gas Treatment Train 2B automatically started. Within eight minutes feeder breaker 2D was reclosed. At the time of this event, Unit 1 was at 92 percent power and Unit 2 was in a refuel/maintenance outage.

Feeder breaker 2D tripped as a result of a design misapplication of the degraded voltage relay devices of E-3. This problem also applies to plant emergency buses E-1, 2, and 4. In this case the E-3 devices' output trip relay contacts did not deenergize (reopen) before their respective trip coil relays timed out and tripped 2D.

Appropriate plant modifications will be implemented to install another type of undervoltage relay device on E-1 through E-4. Until installation of these modifications, appropriate administrative procedures will be utilized to disarm the devices for dc control power realignments.

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LICENSEL EVENT REPORT (LER) TEXT CONTINUATION

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| FACILITY NAME (1) Brunswick Steam Electric Plant Units 1 and 2 | DOCKET NUMBER (2) 0 5 0 0 0 3 2 5 | LER NUMBER (6) | | | PAGE (3) | | |
| | | YEAR | SEQUENTIAL NUMBER | REVISION NUMBER | | | |
| | | 8 4 | 0 1 6 | 0 0 | 0 2 | OF | 0 3 |

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

On August 7, 1984, at 0134, the normal power supply feeder breaker, 2D, of plant 4160 Vac emergency bus E-3 automatically opened. The E-3 bus undervoltage trip alarm annunciated in the Control Room. On Unit 2, Group 6 and 8 isolations occurred. Within ten seconds plant emergency diesel generator (DG) No. 3 automatically started and reenergized E-3. The Unit 2 Reactor Building Standby Gas Treatment System Train (SBGT) 2B automatically started. The Control Building Emergency Air Filtration (CBEAF) System isolated due to a spurious indication of chlorine detection. The deenergization of E-3 resulted in an interruption of 4160 ac power supply to the following Units 1 and 2 loads:

Unit 1

Residual Heat Removal (RHR) Pump Motor 1A
RHR Service Water Pump Motor 1A

Unit 2

Reactor Core Spray Pump Motor 2A
RHR Service Water Pump Motor 2A
RHR Pump Motor 2A
Nuclear Service Water Pump
Motor 2A
Conventional Service Water Pump
Motor 2A
Control Rod Drive Hydraulic Pump
Motor 2A

At the time of this event, Unit 1 was operating at 92 percent power and Unit 2 was in a refueling/maintenance outage.

Within approximately four minutes of the event SBGT 2B and the CBEAF were returned to standby. Within eight minutes E-3 feeder circuit breaker 2D was reclosed and DG No. 3 was secured and returned to standby.

The event resulted from placing an equipment clearance to permit routine preventive maintenance on Unit 2 dc electrical battery bank 2A-2. The circuit breaker of the 125 Vdc alternate control power supply to 4160 Vac emergency bus E-3 switchgear was closed. The respective circuit breaker of the 125 Vdc normal control power supply to the E-3 switchgear was opened. By design, when normal power supply voltage to the 125 Vdc control power bus decreased to 70 percent of its normal value, transfer of the power supply to the 125 Vdc alternate control power supply began. The subject transfer occurred within a time frame of 50-75 milliseconds after the 70 percent value was reached. When the 125 Vdc normal control power supply circuit breaker was opened, the output trip electrical contacts of the E-3 degraded voltage relay devices closed. This, by design, formed part of the trip circuit for the E-3 normal feeder circuit breaker 2D. Following completion of the transfer of normal to alternate 125 Vdc control power supply to E-3 switchgear, the output trip contacts, by design, opened within a time frame of 16-48 milliseconds (1-3 cycles). At the same time the auxiliary trip relay of feeder circuit breaker 2D, by design, actuated within 8 milliseconds of the subject transfer and the 2D feeder circuit breaker trip coil actuated within 23-30 milliseconds of the transfer.

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As a result of the inherent time response characteristics of the involved E-3 protective devices, the investigation of this event concluded the output trip electrical contacts of the E-3 degraded voltage relay devices did not reopen within 16 milliseconds after the transfer before the 2D feeder circuit breaker trip coil relay initiated a trip of 2D.

The same degraded voltage relay protective devices utilized on E-3, 27DVA, 27DVB, and 27DVC, ITE-Brown Boveri Model No. 211B4175, are also utilized for the same function on plant 4160 Vac emergency buses E-1, E-2, and E-4. These devices were installed as part of Plant Modification 77-327.

The presently installed degraded voltage relay protective devices on plant emergency buses E-1 through E-4 result in a situation of unpredictable transfers involving the 125 Vdc control power to the switchgear of those buses. Therefore, appropriate plant modifications will be implemented to replace the presently installed devices with another type of device which is better suited to this particular design application.

Until installation of these modifications, appropriate plant administrative controls will be utilized to ensure that the presently installed subject protective devices are deactivated prior to restoring or transferring between the normal and alternate 125 Vdc control power to the E-1 through E-4 switchgear.

As a result of the findings obtained from the investigation of this event, a similar past event, which was reported in LER 2-84-2, will be appropriately supplemented.

CP&L

Carolina Power & Light Company

Brunswick Steam Electric Plant
P. O. Box 10429
Southport, NC 28461-0429
September 5, 1984

FILE: B09-13510C
SERIAL: BSEP/84-1925

NRC Document Control Desk
U. S. Nuclear Regulatory Commission
Washington, DC 20555

BRUNSWICK STEAM ELECTRIC PLANT, UNIT 1
DOCKET NO. 50-325
LICENSE NO. DPR-71
LICENSEE EVENT REPORT 1-84-16

Gentlemen:

In accordance with Title 10 to the Code of Federal Regulations, the enclosed Licensee Event Report is submitted. This report fulfills the requirement for a written report within thirty (30) days of a reportable occurrence and is in accordance with the format set forth in NUREG-1022, September 1983.

Very truly yours,



C. R. Dietz, General Manager
Brunswick Steam Electric Plant

MJP/dgr/LETDR1

Enclosure

cc: Mr. J. P. O'Reilly

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