

LICENSEE EVENT REPORT (LER)

| | | |
|----------------------------------|-------------------|----------|
| FACILITY NAME (1) | DOCKET NUMBER (2) | PAGE (3) |
| NORTH ANNA POWER STATION, Unit 2 | 0 5 0 0 0 3 3 9 | 1 OF 0 4 |

TITLE (4)

Unit 2 Reactor Trip, March 23, 1985

| 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 3 | 2 3 | 8 5 | 8 5 | 0 0 5 | 0 1 | 0 4 | 2 3 | 8 5 | | | 0 5 0 0 0 |

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|--------------------|------------------|---|----------------------|---|------------------|--|--|--|--|--|--|
| OPERATING MODE (9) | 1 | THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR § (Check one or more of the following) (11) | | | | | | | | | |
| | | 20.402(b) | 20.406(c) | X | 50.73(a)(2)(iv) | 73.71(b) | | | | | |
| POWER LEVEL (10) | 1 1 0 1 0 | 20.406(a)(1)(i) | 50.36(c)(1) | | 50.73(a)(2)(v) | 73.71(c) | | | | | |
| | | 20.406(a)(1)(ii) | 50.36(c)(2) | | 50.73(a)(2)(vii) | OTHER (Specify in Abstract below and in Text, NRC Form 366A) | | | | | |
| 20.406(a)(1)(iii) | 50.73(a)(2)(i) | | 50.73(a)(2)(viii)(A) | | | | | | | | |
| 20.406(a)(1)(iv) | 50.73(a)(2)(ii) | | 50.73(a)(2)(viii)(B) | | | | | | | | |
| 20.406(a)(1)(v) | 50.73(a)(2)(iii) | | 50.73(a)(2)(ix) | | | | | | | | |

LICENSEE CONTACT FOR THIS LER (12)

| | |
|------------------|---------------------------------------|
| NAME | TELEPHONE NUMBER |
| E. Wayne Harrell | AREA CODE 7 1 0 3 8 9 4 1 - 5 1 5 1 1 |

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

| CAUSE | SYSTEM | COMPONENT | MANUFACTURER | REPORTABLE TO NPDs | CAUSE | SYSTEM | COMPONENT | MANUFACTURER | REPORTABLE TO NPDs |
|-------|--------|-----------|--------------|--------------------|-------|--------|-----------|--------------|--------------------|
| X | W I | 1 1 3 1 3 | N 0 1 0 1 7 | N | | | | | |
| X | F I K | 1 1 8 1 7 | G 0 1 8 1 0 | N | | | | | |

SUPPLEMENTAL REPORT EXPECTED (14)

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

ABSTRACT (Limit to 1400 spaces, i.e., approximately fifteen single-space typewritten lines) (16)

On March 23, 1985, at 2308 hours, Unit 2 was manually tripped from 100% power. The Unit 2 Control Room Operator (CRO) observed Individual Rod Position Indicators (IRPI) indicating that the shutdown and control banks were dropping into the core concurrent with a partial loss of Control Room lighting and a loss of several non-safety related parameter indications. Based on these indications, the Unit 2 CRO manually tripped the reactor and turbine in accordance with the immediate action requirements of the Reactor Trip or Safety Injection procedure (EP-0).

A loss of power occurred when the #5 switchyard transformer generated a fault signal which initiated a #2 500 KV bus isolation signal (see attached sketch). This resulted in a loss of power to the 2H and 1J 4160 Volt Emergency busses which caused a loss of power to the IRPIs for Unit 2. The 2H and 1J Emergency Diesel Generators automatically started and re-energized their respective busses and the primary plant was stabilized at no-load operating conditions.

Once the #5 switchyard transformer was isolated power was automatically restored to the #2 500 KV bus. The 1H bus was not affected and therefore the Unit 1 CRO did not lose IRPI indication. Unit 1 remained at 100% power throughout the event. Unit 2 was returned to criticality on March 24, 1985 at 0920 hours.

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LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

APPROVED OMB NO. 3150-0104

EXPIRES 8/31/85

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| FACILITY NAME (1) NORTH ANNA POWER STATION, Unit 2 | DOCKET NUMBER (2) 0 5 0 0 0 3 3 9 8 5 | LER NUMBER (6) | | | PAGE (3) | | |
| | | YEAR | SEQUENTIAL NUMBER | REVISION NUMBER | | | |
| | | 8 5 | — 0 0 5 — | 0 1 | 0 2 | OF | 0 4 |

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

On March 23, 1985, at 2308 hours, Unit 2 was manually tripped from 100% power. The Unit 2 Control Room Operator (CRO) observed Individual Rod Position Indicators (IRPI) indicating that the shutdown and control banks were dropping into the core concurrent with a partial loss of Control Room lighting and a loss of several non-safety related parameter indications. Based on these indications, the Unit 2 CRO believed a reactor trip was occurring and that the plant had lost a significant part of its power supply. Therefore, the Unit 2 CRO manually tripped the reactor and turbine in accordance with the immediate action requirements of the Reactor Trip or Safety Injection procedure (EP-0).

The loss of power occurred when the #5 switchyard transformer generated a fault signal which initiated a #2 500KV bus isolation signal (see attached sketch). The isolation of #2 500KV bus resulted in a loss of power to #4 34.5KV bus. This de-energized A and B Reserve Station Service Transformers (RSST) causing a loss of power to the 1J and 2H 4160 Volt Emergency busses. The IRPIs are powered from the 2H 480 Volt Emergency Motor Control Center through a 480V/120V transformer.

The 2H and 1J Emergency Diesel Generators automatically started on the loss of power signal and re-energized their respective emergency busses approximately 10 seconds into the event. Substantial auxiliary steam loads, along with the initiation of Auxiliary Feedwater, caused a cooldown of the primary system. The Main Steam Trip Valves were closed and auxiliary steam loads shifted to Unit 1 to terminate the cooldown. Primary system temperature stabilized at approximately 530°F about 15 minutes into the event. Primary system pressure reached 1820 psig before stabilizing. Steam Generator Blowdown Trip Valve TV-BD-200D indicated mid-position after blowdown automatically isolated as a result of low steam generator level. Operations personnel verified that blowdown flow was isolated in that loop. A Work Request was submitted to correct the faulty indication problem (EIIIS component identifier 33).

Since A and B RSSTs lost power when the event began, the A and B Station Service busses also lost power when they transferred to Reserve Station Service after the reactor trip/turbine trip. Undervoltage signals caused A and B Reactor Coolant Pumps, A and B Main Feedwater Pumps, and A and B Condensate Pumps to trip. The C Main Feedwater Pump and C Condensate Pump automatically started. The C Reactor Coolant Pump remained in service throughout the event.

Once the #5 switchyard transformer was isolated power was automatically restored to the #2 500KV bus. The A and B RSSTs were subsequently re-energized. The 1H 4160 Volt Emergency bus was not affected, and therefore, the Unit 1 IRPI indication was not lost. Accordingly, the Unit 1 CRO did not see a trip condition and maintained the unit at 100% power throughout the event.

Virginia Power's Division Services personnel inspected the #5 transformer and found that it had not faulted. However, they did find that one of three Single Differential Trip (SDT) relays (EIIIS component identifier 87) actuated to initiate the event. All three of the SDT relays were replaced. A similar problem with this type of relay at a Virginia Power fossil power station occurred earlier in 1985. The relays that were removed are to undergo testing by Division Services personnel to determine the cause of the spurious actuation.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

APPROVED OMB NO. 3150-0104

EXPIRES: 8/31/85

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| FACILITY NAME (1) NORTH ANNA POWER STATION, Unit 2 | DOCKET NUMBER (2) 0 5 0 0 0 3 3 9 8 5 - 0 0 5 - 0 1 | LER NUMBER (6) | | | PAGE (3) | | |
| | | YEAR | SEQUENTIAL NUMBER | REVISION NUMBER | | | |
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TEXT (If more space is required, use additional NRC Form 366A's) (17)

An engineering evaluation has been requested to determine the feasibility of design modifications to the North Anna Switchyard that would keep the 500KV bus #2 energized in the case of a #5 switchyard transformer fault. The feasibility of alternate power supplies for the Individual Rod Position Indicators is also being investigated.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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DOCKET NUMBER (2)

LEM NUMBER (3)

PAGE (3)

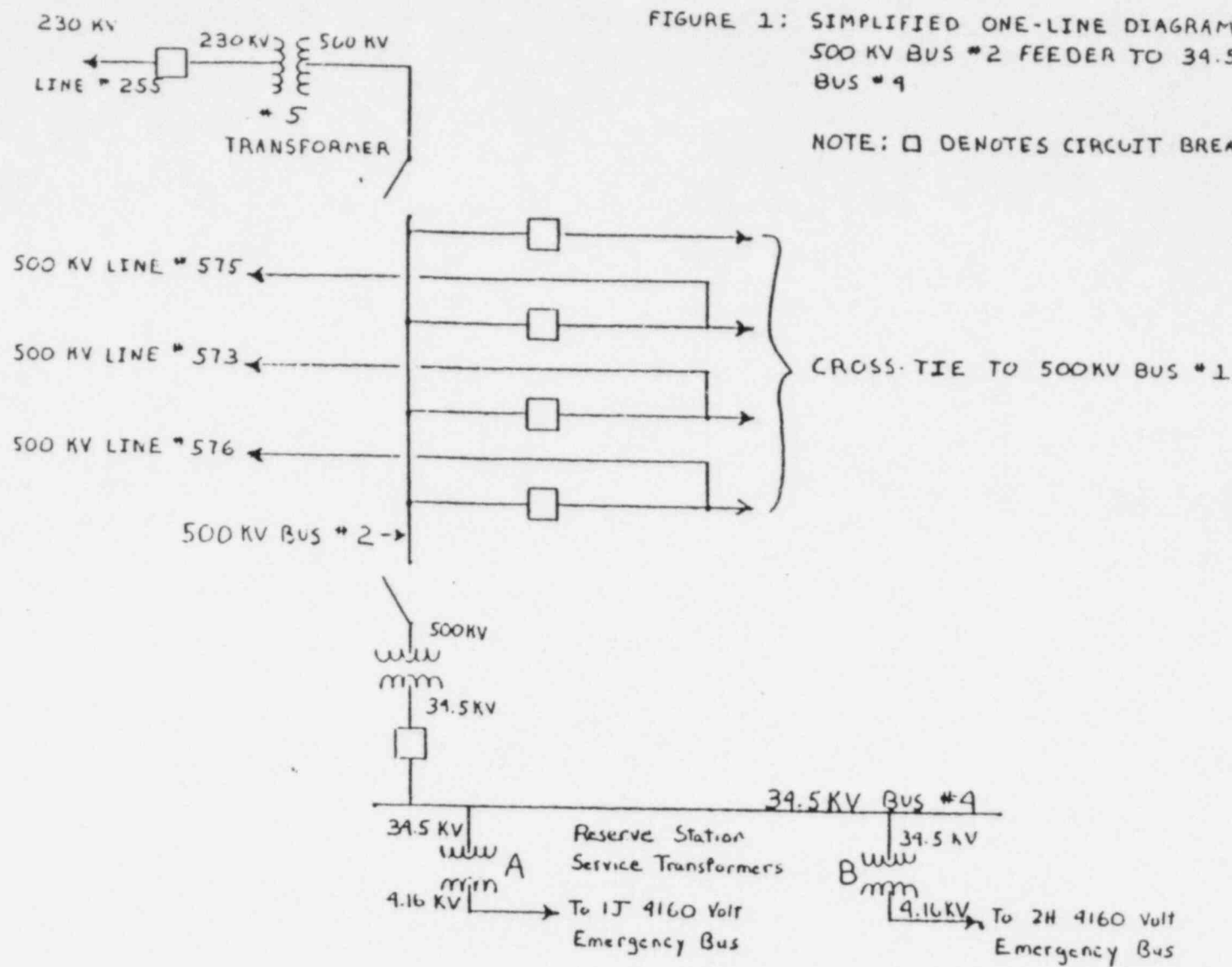
North Anna Power Station, Unit 2

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| 0 | 5 | 0 | 0 | 0 | 3 | 3 | 9 | 8 | 5 | YEAR | SEQUENTIAL NUMBER | REVISION NUMBER | OF | | | | | |
| | | | | | | | | | | 0 | 2 | 5 | 0 | 1 | 0 | 4 | 0 | 4 |

TEXT (If more space is required, use additional NRC Form 204a (7/1/77))

FIGURE 1: SIMPLIFIED ONE-LINE DIAGRAM —
500 KV BUS #2 FEEDER TO 34.5 KV
BUS #4

NOTE: □ DENOTES CIRCUIT BREAKER



April 23, 1985



U. S. Nuclear Regulatory Commission
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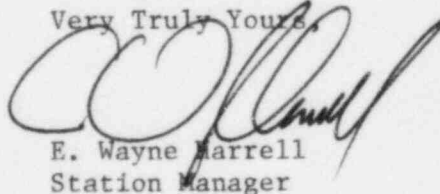
Dear Sirs:

The Virginia Power Company hereby submits the following updated Licensee Event Report applicable to North Anna Unit No. 2. This update includes component failure data that was inadvertently omitted from page 1 of LER-85-005-00.

Report No. LER 85-005-01

This report has been reviewed by the Station Nuclear Safety and Operating Committee and will be forwarded to Safety Evaluation and Control for their review.

Very Truly Yours,



E. Wayne Marrell
Station Manager

Enclosures (3 copies)

cc: Dr. J. Nelson Grace, Regional Administrator
U. S. Nuclear Regulatory Commission
Region II
101 Marietta Street, Suite 2900
Atlanta, Georgia 30303

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11