

**Virginia Electric And Power Company  
Surry Power Station  
5570 Hog Island Road  
Surry, Virginia 23883**

January 18, 2003

U. S. Nuclear Regulatory Commission  
Attention: Document Control Desk  
Washington, D. C. 20555-0001

Serial No.: 03-059  
SPS: JCS  
Docket No.: 50-281  
License No.: DPR-37

Dear Sirs:

Pursuant to 10CFR50.73, Virginia Electric and Power Company hereby submits the following Licensee Event Report applicable to Surry Power Station Unit 2.

Report No. 50-281/2002-003-00

This report has been reviewed by the Station Nuclear Safety and Operating Committee and will be forwarded to the Management Safety Review Committee for its review.

Very truly yours,



Richard H. Blount, Site Vice President  
Surry Power Station

Enclosure

Commitments contained in this letter:

1. A Root Cause Evaluation (RCE) was initiated to determine the cause of this event. Any approved recommendations from the RCE necessary to prevent recurrence will be implemented.

IE22

cc: United States Nuclear Regulatory Commission  
Region II  
Sam Nunn Atlanta Federal Center  
61 Forsyth Street, SW, Suite 23 T85  
Atlanta, Georgia 30303-8931

Mr. R. A. Musser  
NRC Senior Resident Inspector  
Surry Power Station

**LICENSEE EVENT REPORT (LER)**

(See reverse for required number of digits/characters for each block)

Estimated burden per response to comply with this mandatory information collection request. 50 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Records Management Branch (T-6 E6), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to bjs1@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202 (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

|  |        |  |                |                    |                 |                 |        |           |                               |   |  |                               |  |       |     |      |
|--|--------|--|----------------|--------------------|-----------------|-----------------|--------|-----------|-------------------------------|---|--|-------------------------------|--|-------|-----|------|
| FACILITY NAME (1)<br><b>SURRY POWER STATION, Unit 2</b>  |        |  |                |                    |                 |                 |        |           |                               | DOCKET NUMBER (2)<br><b>05000 - 281</b>                       |  | PAGE (3)<br><b>1 OF 3</b>     |  |       |     |      |
| TITLE (4)<br><b>Reactor Trip Due to Turbine Electro-Hydraulic Control Circuitry Failure</b>    |        |  |                |                    |                 |                 |        |           |                               |   |  |                               |  |       |     |      |
| 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 NAME                 |   |  | DOCUMENT NUMBER               |  |       |     |      |
| 11   | 23     | 2002   | 2002           | 003                | 00              | 01              | 18     | 2003      | FACILITY NAME                 |   |  | DOCUMENT NUMBER               |  |       |     |      |
| THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply) (11) |        |  |                |                    |                 |                 |        |           |                               |   |  |                               |  |       |     |      |
| OPERATING MODE (9)   |        | <input type="checkbox"/> 20.2201(b) <input type="checkbox"/> 20.2203(a)(3)(ii) <input type="checkbox"/> 50.73(a)(2)(ii)(B) <input type="checkbox"/> 50.73(a)(2)(ix)(A)                                 |                |                    |                 |                 |        |           |                               |   |  |                               |  |       |     |      |
| POWER LEVEL (10)   |        | <input type="checkbox"/> 20.2201(d) <input type="checkbox"/> 20.2203(a)(4) <input type="checkbox"/> 50.73(a)(2)(iii) <input type="checkbox"/> 50.73(a)(2)(x)   |                |                    |                 |                 |        |           |                               |   |  |                               |  |       |     |      |
| 85%  |        | <input checked="" type="checkbox"/> 20.2203(a)(1) <input type="checkbox"/> 50.36(c)(1)(i)(A) <input checked="" type="checkbox"/> 50.73(a)(2)(iv)(A) <input type="checkbox"/> 73.71(a)(4)               |                |                    |                 |                 |        |           |                               |   |  |                               |  |       |     |      |
|  |        | <input type="checkbox"/> 20.2203(a)(2)(i) <input type="checkbox"/> 50.36(c)(1)(ii)(A) <input type="checkbox"/> 50.73(a)(2)(v)(A) <input type="checkbox"/> 73.71(a)(5)                                  |                |                    |                 |                 |        |           |                               |   |  |                               |  |       |     |      |
|  |        | <input type="checkbox"/> 20.2203(a)(2)(ii) <input type="checkbox"/> 50.36(c)(2) <input type="checkbox"/> 50.73(a)(2)(v)(B) <input type="checkbox"/> OTHER  |                |                    |                 |                 |        |           |                               |   |  |                               |  |       |     |      |
|  |        | <input type="checkbox"/> 20.2203(a)(2)(iii) <input type="checkbox"/> 50.46(a)(3)(ii) <input type="checkbox"/> 50.73(a)(2)(v)(C) <input type="checkbox"/> Specify in Abstract below or in NRC Form 366A |                |                    |                 |                 |        |           |                               |   |  |                               |  |       |     |      |
|  |        | <input type="checkbox"/> 20.2203(a)(2)(iv) <input type="checkbox"/> 50.73(a)(2)(i)(A) <input type="checkbox"/> 50.73(a)(2)(v)(D)   |                |                    |                 |                 |        |           |                               |   |  |                               |  |       |     |      |
|  |        | <input type="checkbox"/> 20.2203(a)(2)(v) <input type="checkbox"/> 50.73(a)(2)(i)(B) <input type="checkbox"/> 50.73(a)(2)(vii)   |                |                    |                 |                 |        |           |                               |   |  |                               |  |       |     |      |
|  |        | <input type="checkbox"/> 20.2203(a)(2)(vi) <input type="checkbox"/> 50.73(a)(2)(i)(C) <input type="checkbox"/> 50.73(a)(2)(viii)(A)  |                |                    |                 |                 |        |           |                               |   |  |                               |  |       |     |      |
|  |        | <input type="checkbox"/> 20.2203(a)(3)(i) <input type="checkbox"/> 50.73(a)(2)(ii)(A) <input type="checkbox"/> 50.73(a)(2)(viii)(B)  |                |                    |                 |                 |        |           |                               |   |  |                               |  |       |     |      |
| LICENSEE CONTACT FOR THIS LER (12)   |        |  |                |                    |                 |                 |        |           |                               |   |  |                               |  |       |     |      |
| NAME<br><b>Richard H. Blount, Site Vice President</b>  |        |  |                |                    |                 |                 |        |           |                               | TELEPHONE NUMBER (Include Area Code)<br><b>(757) 365-2000</b> |  |                               |  |       |     |      |
| COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)                     |        |  |                |                    |                 |                 |        |           |                               |   |  |                               |  |       |     |      |
| CAUSE  | SYSTEM | COMPONENT  | MANUFACTURER   | REPORTABLE TO EPIX |                 | CAUSE           | SYSTEM | COMPONENT | MANUFACTURER                  | REPORTABLE TO EPIX  |  |                               |  |       |     |      |
| X  | SB     | IMOD   | W120           | Y                  |                 |                 |        |           |                               |   |  |                               |  |       |     |      |
| SUPPLEMENTAL REPORT EXPECTED (14)  |        |  |                |                    |                 |                 |        |           |                               |   |  |                               |  |       |     |      |
| YES (If yes, complete EXPECTED SUBMISSION DATE)  |        |  |                |                    |                 |                 |        |           |                               | NO  |  | EXPECTED SUBMISSION DATE (15) |  | MONTH | DAY | YEAR |
|  |        |  |                |                    |                 |                 |        |           |                               |   |  |                               |  |       |     |      |

**ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)**

On November 23, 2002, at 0332 hours, Unit 2 was at 85% power for the performance of the Turbine Governor Valve Freedom Test. During the performance of the test, while closing # 3 Turbine Governor Valve, the Turbine Valve Limiter failed to zero causing all four governor valves to close. The Control Room received a Low Low Steam Generator Level signal resulting in an automatic reactor trip. This is reportable under 10CFR50.73(a)(2)(iv)(A), as an event that resulted in the manual or automatic actuation of any engineered safety feature, including the reactor protection system.

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

|   |                              |                     |                                    |                                 |                           |
|---|------------------------------|---------------------|------------------------------------|---------------------------------|---------------------------|
| FACILITY NAME (1)<br><b>SURRY POWER STATION</b> | DOCKET<br><b>05000 - 281</b> | LER NUMBER (6)      |                                    |                                 | PAGE (3)<br><b>2 OF 3</b> |
|   |                              | YEAR<br><b>2002</b> | SEQUENTIAL<br>NUMBER<br><b>003</b> | REVISION<br>NUMBER<br><b>00</b> |                           |

NARRATIVE (If more space is required, use additional copies of NRC Form 366A) (17)

### 1.0 DESCRIPTION OF THE EVENT

At 0303 hours on 11/23/02, a Unit 2 Turbine Control Valve Freedom Test was initiated. By 0327 hours, testing of the #1 and #2 Turbine Governor and Stop Valves [EIS-SB-FCV] was completed. Both of these tests were completed with no problems observed. At 0332 while closing the #3 governor valve, the Main Control Room (MCR) [EIS-NA] staff observed several unexpected alarms when the #3 governor valve reached approximately 20% open. The alarms received indicated a loss of turbine load was in progress. The Unit 2 Reactor Operator (RO) observed that the 8 Main Steam Dump Valves [EIS-SB-VTV] had opened in response to the loss of load. The main turbine operator conducting the governor valve testing observed that the turbine valve position limiter [EIS-SB-ACV] had failed to zero. Multiple alarms annunciated during the transient, and at 03:32:51 hours Unit 2 experienced an automatic reactor trip. The first out annunciator received was "Steam Generator Low Low Level," due to two of three channels of low low level on the Unit 2 "C" Steam Generator (S/G) [EIS-SG]. This is reportable under 10CFR50.73(a)(2)(iv)(A), as an event that resulted in the manual or automatic actuation of any engineered safety feature, including the reactor protection system.

### 2.0 SIGNIFICANT SAFETY CONSEQUENCES AND IMPLICATIONS

The shutdown margin for Unit 2 was determined to be satisfactory. Auxiliary feedwater [EIS-BA] automatically initiated as designed on low low steam generator level. All three Main Steam Trip Valves [EIS-SB-FCV] were manually closed due to inability to verify full closed indication on #1 Turbine Stop Valve. Primary RCS [EIS-AB] temperature decreased to approximately 547 degrees following the reactor trip.

No primary safety or power operated relief valves [EIS-AB-RV] were actuated during the event. No indication of primary to secondary leakage existed and, therefore, no adverse radiological consequences resulted from this event.

All electrical busses transferred properly following the trip and all emergency diesel generators [EIS-EK] were operable.

There were no significant safety consequences or implications associated with this event.

### 3.0 CAUSE

The low low S/G level trip was the result of a sudden loss of turbine load. The cause of the loss of turbine load has been attributed to a failure of the turbine valve position limiter. The failure of the turbine valve position limiter can be attributed to an electrical failure in the Unit 2 EHC control cabinet. A Root Cause Evaluation (RCE) has been initiated to determine the cause of the failure, suspected to be a card failure [EIS-SB-IMOD].

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

|   |                              |                     |                                    |                                 |                           |
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|   |                              | YEAR<br><b>2002</b> | SEQUENTIAL<br>NUMBER<br><b>003</b> | REVISION<br>NUMBER<br><b>00</b> |                           |

NARRATIVE (If more space is required, use additional copies of NRC Form 366A) (17)

**4.0 IMMEDIATE CORRECTIVE ACTION(S)**

I&C personnel performed initial as-found system checks in the Unit 2 Analog Electro-Hydraulic (AEH) Control Cabinet in accordance with the appropriate procedure. A Work Order was issued to initiate troubleshooting and repairs to the Unit 2 AEH Control Cabinet circuits.

I&C personnel measured the as found voltages for the output of the Digital/Analog (D/A) converter in the valve position limiter circuit. The measured voltage at test point #2 was found to be low. I&C personnel removed and inspected the turbine valve position limit Up/Down Counter circuit card and the D/A Converter card with no abnormalities noted. I&C personnel then contacted Turbine Control Service Associates personnel and it was recommended that both cards in the circuit, the D/A converter card and the Up/Down counter card, be replaced. Troubleshooting was then completed by monitoring the valve position limiter circuit both prior to and following replacement of the Up/Down Counter and D/A Converter circuit cards.

**5.0 ADDITIONAL CORRECTIVE ACTIONS**

The D/A converter and Up/Down counter cards are being sent to Westinghouse for failure analysis.

**6.0 ACTIONS TO PREVENT RECURRENCE**

Any actions deemed necessary to prevent recurrence as determined by the RCE will be tracked through the Corrective Action System. The RCE will be completed when the results of the failure analysis are available.

**7.0 SIMILAR EVENTS**

None

**8.0 MANUFACTURER/MODEL NUMBER**

A/D Converter - Westinghouse Part # 398409  
UP/DOWN Counter - Westinghouse Part # 2822A2G01

**9.0 ADDITIONAL INFORMATION**

None