

#### UNITED STATES NUCLEAR REGULATORY COMMISSION REGION II 245 PEACHTREE CENTER AVENUE N.E., SUITE 1200 ATLANTA, GEORGIA 30303-1200

March 15, 2022

Mr. Daniel Stoddard Senior Vice President and Chief Nuclear Officer Virginia Electric and Power Company Innsbrook Technical Center 5000 Dominion Boulevard Glen Allen, VA 23060

#### SUBJECT: SURRY POWER STATION – NRC INSPECTION REPORT 05000280/2022010 AND 05000281/2022010

Dear Mr. Stoddard:

On February 4, 2022, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at Surry Power Station and discussed the results of this inspection with James Holloway and other members of your staff. The results of this inspection are documented in the enclosed report.

One finding of very low safety significance (Green) is documented in this report. This finding involved a violation of NRC requirements. We are treating this violation as a non-cited violation (NCV) consistent with Section 2.3.2 of the Enforcement Policy.

If you contest the violation or the significance or severity of the violation documented in this inspection report, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region II; the Director, Office of Enforcement; and the NRC Resident Inspector at Surry Power Station.

This letter, its enclosure, and your response (if any) will be made available for public inspection and copying at <u>http://www.nrc.gov/reading-rm/adams.html</u> and at the NRC Public Document Room in accordance with Title 10 of the *Code of Federal Regulations* 2.390, "Public Inspections, Exemptions, Requests for Withholding."

Sincerely,

43

 Signed by Baptist, James on 03/15/22

James B. Baptist, Chief Engineering Branch 1 Division of Reactor Safety

Docket Nos. 05000280 and 05000281 License Nos. DPR-32 and DPR-37

Enclosure: NRC Inspection Report (IR) 05000280/2022010, 05000281/2022010 w/attachment: Appendix G Phase II Screening

### SUBJECT: SURRY POWER STATION – NRC INSPECTION REPORT 05000280/2022010 AND 05000281/2022010 DATED MARCH 15, 2022

# **DISTRIBUTION**:

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### ADAMS ACCESSION NUMBER: ML22070A972

| X SUNSI Review |            | X Non-Sensitive<br>Sensitive |             | X Publicly Available   Image: Non-Publicly Available |  |
|----------------|------------|------------------------------|-------------|------------------------------------------------------|--|
| OFFICE         | RII:DRS    | RII:DRS                      | RII:DRS     | RII:DRS                                              |  |
| NAME           | T. Fanelli | C. Franklin                  | C. Cauffman | J. Baptist                                           |  |
| DATE           | 3/14/22    | 3/2/22                       | 3/2/22      | 3/15/22                                              |  |

OFFICIAL RECORD COPY

### U.S. NUCLEAR REGULATORY COMMISSION Inspection Report

| Docket Numbers:        | 05000280 and 05000281                                                                                              |
|------------------------|--------------------------------------------------------------------------------------------------------------------|
| License Numbers:       | DPR-32 and DPR-37                                                                                                  |
| Report Numbers:        | 05000280/2022010 and 05000281/2022010                                                                              |
| Enterprise Identifier: | I-2022-010-0019                                                                                                    |
| Licensee:              | Virginia Electric and Power Company                                                                                |
| Facility:              | Surry Power Station                                                                                                |
| Location:              | Surry, VA.                                                                                                         |
| Inspection Dates:      | January 31, 2022 to February 04, 2022                                                                              |
| Inspectors:            | C. Cauffman, Reactor Operations Engineer<br>T. Fanelli, Senior Reactor Inspector<br>C. Franklin, Reactor Inspector |
| Approved By:           | James B. Baptist, Chief<br>Engineering Br 1<br>Division of Reactor Safety                                          |

#### SUMMARY

The U.S. Nuclear Regulatory Commission (NRC) continued monitoring the licensee's performance by conducting a NRC inspection at Surry Power Station, in accordance with the Reactor Oversight Process. The Reactor Oversight Process is the NRC's program for overseeing the safe operation of commercial nuclear power reactors. Refer to <a href="https://www.nrc.gov/reactors/operating/oversight.html">https://www.nrc.gov/reactors/operating/oversight.html</a> for more information.

# List of Findings and Violations

| Failure to Verify DC Crosstie Design                                                                |                                  |               |           |  |
|-----------------------------------------------------------------------------------------------------|----------------------------------|---------------|-----------|--|
| Cornerstone                                                                                         | Significance                     | Cross-Cutting | Report    |  |
|                                                                                                     |                                  | Aspect        | Section   |  |
| Mitigating                                                                                          | Green                            | None (NPP)    | 71111.17T |  |
| Systems                                                                                             | NCV 05000280,05000281/2022010-01 |               |           |  |
|                                                                                                     | Open/Closed                      |               |           |  |
| The inspectors identified a Green finding and an associated NCV of 10 CFR 50 Appendix B             |                                  |               |           |  |
| Criterion III, Design Control, for the licensee's failure to verify that DC train crosstie circuits |                                  |               |           |  |
| were qualified to perform the required safety function and not fail under normal and design         |                                  |               |           |  |
| basis events specified by the postulated phenomena as outlined in IEEE 308-1974.                    |                                  |               |           |  |
|                                                                                                     |                                  |               |           |  |

### Additional Tracking Items

None.

### **INSPECTION SCOPES**

Inspections were conducted using the appropriate portions of the inspection procedures (IPs) in effect at the beginning of the inspection unless otherwise noted. Currently approved IPs with their attached revision histories are located on the public website at <a href="http://www.nrc.gov/reading-rm/doc-collections/insp-manual/inspection-procedure/index.html">http://www.nrc.gov/reading-rm/doc-collections/insp-manual/inspection-procedure/index.html</a>. Samples were declared complete when the IP requirements most appropriate to the inspection activity were met consistent with Inspection Manual Chapter (IMC) 2515, "Light-Water Reactor Inspection Program - Operations Phase." The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel to assess licensee performance and compliance with Commission rules and regulations, license conditions, site procedures, and standards.

### **REACTOR SAFETY**

#### 71111.17T - Evaluations of Changes, Tests, and Experiments

#### Sample Selection (IP Section 02.01) (27 Samples)

The inspectors reviewed the following evaluations, screenings, and/or applicability determinations for 10 CFR 50.59 from 1/31/2022 to 2/4/2022.

- (1) DCP-00-042, CW Canal Level Probe Missile Shield Replacement
- (2) DCP-02-029, FAC U1 Piping Replacement
- (3) DCP-04-051, RCP DP Transmitter Replacement
- (4) DCP-04-100, Replace Circuit Breakers and Verify Thermal Overload Settings for Control Room and Emergency Switchgear Room Air Handlers
- (5) DCP-05-025, Outside Recirculation Spray (ORS) Pump Test Loop Modifications
- (6) DCP-06-045, SW Carbon Steel Piping Replacement with Copper-Nickel
- (7) DCP-99-093, Replacement of Control Room Recorders with Paperless Recorders
- (8) SU-09-0036, Recirc Spray Heat Exchanger Service Water Monitoring System
- (9) SU-13-01053, EDG Data Acquisition System Quick Connect and Test Setup
- (10) SU-15-00006, Risk Release Reactor Coolant Pump 1-RC-P-1B Seal Face Change
- (11) SU-16-00108, Surry Unit 2 AFW MOV Hot Short Resolution
- (12) SU-16-00109, Surry Unit 1 AFW MOV Hot Short Resolution
- (13) SU-16-00115, Replacement/Modification of Two Pipe Supports on The Unit 2 Safety Injection System
- (14) SU-16-01064, DC Crosstie and UPS Feeder Circuit Breaker Replacement
- (15) SU-17-00104, MOV Hot Short MCC Wiring Modification
- (16) SU-18-00116, Stem and Disc Arm Replacement For 1-SI-MOV-1863a
- (17) SU-18-00173, Reconfiguration of U2 Pressurizer Heaters, 10, 33, and 50
- (18) SU-19-00110, "A" RCP Floating Ring Seal Removal
- (19) SU-21-00135, 1-RC-HCV-1556A & C-Valve Spring Hanger Support Modification
- (20) SU-17-00123, Installation of Swagelok Fittings on 2-SS-PP-0.38-Pipe
- (21) SU-09-00046, Turbine Supervisory Instrumentation Replacement
- (22) SU-13-00008, 18" CC-229-121 And 18" CC-235-121 Repairs
- (23) SU-18-00160, VFD Swap for 1-LW-P-12/13
- (24) SU-19-00156, Modify 8"-CC-70-151 Hanger
- (25) SU-18-00159, Temp Mod, Temporary Modification CERPI System Shutdown Bank A No7 and Position Indication Detector Secondary Winding Resistance Signal
- (26) SU-17-00122, Reconfigure Unit 2 Pressurizer Heaters
- (27) SU-19-00134, 2020 Unit 2 FAC Modifications

### INSPECTION RESULTS

| Failure to Verify DC Crosstie Design                                                              |                                               |                       |                 |  |  |  |
|---------------------------------------------------------------------------------------------------|-----------------------------------------------|-----------------------|-----------------|--|--|--|
| Cornerstone                                                                                       | Significance                                  | Cross-Cutting         | Report          |  |  |  |
|                                                                                                   |                                               | Aspect                | Section         |  |  |  |
| Mitigating                                                                                        | Green                                         | None (NPP)            | 71111.17T       |  |  |  |
| Systems                                                                                           | NCV 05000280,05000281/2022010-01              |                       |                 |  |  |  |
|                                                                                                   | Open/Closed                                   |                       |                 |  |  |  |
| The inspectors ider                                                                               | tified a Green finding and an associated      | NCV of 10 CFR 50      | Appendix B      |  |  |  |
| Criterion III, Design                                                                             | Control, for the licensee's failure to verify | that DC train cros    | stie circuits   |  |  |  |
| were qualified to pe                                                                              | rform the required safety function and no     | t fail under normal   | and design      |  |  |  |
| basis events specif                                                                               | ied by the postulated phenomena as outli      | ned in IEEE 308-1     | 974.            |  |  |  |
| Description: Design                                                                               | n Change No. SU-16-01064 replaced the         | DC crosstie molde     | ed case circuit |  |  |  |
| breakers (MCCBs)                                                                                  | in Unit 1 (1A-22 and 1B-21) and Unit 2 (2     | B-19 and 2A-22).      | The existing    |  |  |  |
| two-pole MCCBs, N                                                                                 | B21200F, were replaced with three-pole        | MCCBs, HNB3120        | 00F. The        |  |  |  |
| manufacturer catalo                                                                               | og, No. V12-T3-43, specified that, DC qua     | alified MCCBs inclu   | iding the trip  |  |  |  |
| units are, "two-pole                                                                              | breakers supplied in three-pole frames w      | vith current carrying | g parts omitted |  |  |  |
| from center pole." T                                                                              | hree-pole MCCBs and trip units were spe       | ecified as "AC only   | ," [Alternating |  |  |  |
| Current only]. The I                                                                              | DC ratings were not applicable. The purch     | nase order (PO) No    | o. 4500398109   |  |  |  |
| ordered "250 vac, 1                                                                               | 200 amps, model HNB31200F with unit,          | magnetic trip, adju   | stable, model   |  |  |  |
| HNB312000TM." N                                                                                   | ot, DC qualified MCCBs. The PO neither        | specified the actua   | al DC           |  |  |  |
| application requirer                                                                              | nents nor the required DC amperes of inte     | errupting capacity    | (AIC). The      |  |  |  |
| HNB type MCCBs of                                                                                 | do not appear to have been formally quali     | fied for the designs  | s required AIC  |  |  |  |
| of more than 19,00                                                                                | 0A. The listed Underwriters Laboratory D      | C ratings for the tw  | o-pole HNB      |  |  |  |
| MCCBs was just 10                                                                                 | ),000A. Further, the design required one o    | of the MCCBs to be    | e in a reverse  |  |  |  |
| current flow condition                                                                            | on while cross tied. The Eaton HNB Appli      | cation Data, 29-16    | 0, states, in   |  |  |  |
| part, that "the NB a                                                                              | nd HNB breakers can be mounted in an i        | nverted position bu   | it are not      |  |  |  |
| approved for revers                                                                               | e feed." This could further adversely affe    | ct the AIC rating of  | the             |  |  |  |
| MCCB. The inspectors determined that the MCCBs were not designed to clear a fault and             |                                               |                       |                 |  |  |  |
| withstand the available short circuit currents in the DC crosstie design.                         |                                               |                       |                 |  |  |  |
|                                                                                                   |                                               |                       |                 |  |  |  |
| One of the applicable licensing basis design standards, Institute of Electrical and Electronics   |                                               |                       |                 |  |  |  |
| Engineers (IEEE) 308-1974, section 4.1, "General." stated, "the Class 1E power systems            |                                               |                       |                 |  |  |  |
| shall be designed to assure that no design basis event will cause: (1) A loss of electric power   |                                               |                       |                 |  |  |  |
| to a number of engineered safety features, surveillance devices, or protection system devices     |                                               |                       |                 |  |  |  |
| sufficient to jeopardize the safety of the station, and (2) A loss of electric power to equipment |                                               |                       |                 |  |  |  |
| that could result in a reactor power transient capable of causing significant damage to the fuel  |                                               |                       |                 |  |  |  |
| or to the reactor coolant system." And, Section 4.7, "Equipment Qualification." stated "each      |                                               |                       |                 |  |  |  |

that could result in a reactor power transient capable of causing significant damage to the fuel or to the reactor coolant system." And, Section 4.7, "Equipment Qualification." stated "each type of Class 1E power equipment shall be qualified by analysis, successful use under similar conditions, or by actual test to demonstrate its ability to perform its function under normal and design basis events." The design basis events specified included, in part, the following postulated phenomena: Fires; Fire-protection system operation; Accident generated flooding, sprays, or jets; Postulated loss of the preferred power supply combined with any of the above; Single equipment malfunction; Single act, event, component failure, or circuit fault that can cause multiple equipment malfunctions; and a Single equipment maintenance outage.

The inspectors determined that the HNB circuit breakers were not qualified to crosstie the two Class 1E DC trains while preventing a loss of electric power as specified in the design standard.

Corrective Actions: The licensee entered this issue into the corrective action program and placed danger/warning tags on the circuit breakers to prevent their use during outage operations.

Corrective Action References: **CR1190494** Performance Assessment:

Performance Deficiency: The licensing basis design standard IEEE 308-1974, required Surry to ensure that each type of Class 1E power equipment shall be qualified to demonstrate its ability to perform its function under normal and design basis events as specified by the postulated phenomena. The failure to verify that DC train crosstie circuits were qualified to perform the required safety function and not fail under normal and design basis events specified by the postulated phenomena as outlined in IEEE 308-1974 was a performance deficiency.

Screening: The inspectors determined the performance deficiency was more than minor because it was associated with the Design Control attribute of the Mitigating Systems cornerstone and adversely affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the performance deficiency could cause a loss of DC power to both trains causing a loss of required mitigating systems.

Significance: The inspectors assessed the significance of the finding using Appendix G, "Shutdown Safety SDP." The inspectors initial Phase I screening required a phase II SDP to be performed. Attached is the completed SDP IMC 0609 Appendix G, attachment 2, Phase II screening completed by a Region II SRA, which characterizes this finding as GREEN.

Cross-Cutting Aspect: Not Present Performance. No cross-cutting aspect was assigned to this finding because the inspectors determined the finding did not reflect present licensee performance.

Enforcement:

Violation: Title 10 CFR 50, Appendix B, Criterion III, "Design Control," required, in part, "design control measures shall provide for verifying or checking the adequacy of design, such as by the performance of design reviews, by the use of alternate or simplified calculational methods, or by the performance of a suitable testing program."

Contrary to the above, the licensee failed to provide design control measures for verifying or checking the adequacy of the DC train crosstie circuit design, such as by the performance of design reviews, by the use of alternate or simplified calculational methods, or by the performance of a suitable testing program. Specifically, the licensee failed to verify that DC train crosstie circuits were qualified to perform the required safety function and not fail under normal and design basis events specified by the postulated phenomena as outlined in IEEE 308-1974.

Enforcement Action: This violation is being treated as a non-cited violation, consistent with Section 2.3.2 of the Enforcement Policy.

### EXIT MEETINGS AND DEBRIEFS

The inspectors verified no proprietary information was retained or documented in this report.

• On February 4, 2022, the inspectors presented the NRC inspection results to James Holloway and other members of the licensee staff.

### **DOCUMENTS REVIEWED**

| Inspection<br>Procedure | Туре         | Designation               | Description or Title                                                                                                                          | Revision or<br>Date |
|-------------------------|--------------|---------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|---------------------|
| 71111.17T               | Calculations | 01039.0810-E-<br>011      | Cable Sizing for 480V MCC Loads Related to DCP 90-15-3                                                                                        | 0-00A               |
|                         |              | 12846.36-NPB-<br>4093-X12 | Pipe Stress Analysis Problem 4093 of The Service Water System                                                                                 | 4                   |
|                         |              | 12846.39-NPN-<br>4091-X12 | Pipe stress evaluation of line 8"-WS-489-21X as the class of the piping changed from 151 (Carbon steel) to 21X (Cu-Ni) per DCP 06-045, SPS 2. | 1                   |
|                         |              | 14937.53-NPB-<br>007-XE   | Pipe Stress Analysis: Service Water Piping In Valve Pit, Lines<br>8"-WS-481, 482-21X Turbine / Service Building                               | 0                   |
|                         |              | EE-0499                   | DC Vital Bus Short Circuit Current                                                                                                            | 2                   |
|                         |              | ME-0791                   | Sizing of ORS Pump Test Loop Piping                                                                                                           | 0                   |
|                         |              | SU-CALC-PSP-<br>2681      | Safety Injection – Show Cause Support/Restraint & Baseplate                                                                                   | 5                   |
|                         | Drawings     | S-05025-2-<br>2FM084B     | Flow/Value Operating Numbers Diagram Recirculation Spray<br>System Surry Power Station Unit 2 Virginia Power                                  | 2                   |
|                         | Engineering  | DC-02-029                 | 2003 FAC U1 Replacement / Surry/ Unit 1                                                                                                       | 11/07/2002          |
|                         | Changes      | DCP SU-18-<br>00116       | Design Equivalent Change Package                                                                                                              | 1                   |
|                         |              | SU-06-045                 | SW Carbon Steel Piping Replacement with Copper-Nickel /<br>Surry / Units 1 & 2                                                                | 03/12/2007          |
|                         |              | SU-09-00046               | Turbine Supervisory Instrumentation Replacement I Surry I<br>Unit I                                                                           | 01/21/2010          |
|                         |              | SU-09-0036                | Recirc Spray Heat Exchanger Service Water Monitoring System                                                                                   | 04/22/2010          |
|                         |              | SU-13-00008               | 18" CC-229-121 and 18" CC-235-121 Repairs                                                                                                     | 07/15/2013          |
|                         |              | SU-15-00006               | Risk Release Reactor Coolant Pump 1-RC-P-1B Seal Face<br>Change                                                                               | 07/15/2015          |
|                         |              | SU-16-00115               | Replacement/Modification of two pipe supports on the Unit 2<br>Safety Injection System                                                        | 3                   |
|                         |              | SU-17-00122               | Reconfigure Unit 2 Pressurizer Heaters                                                                                                        | 0                   |
|                         |              | SU-17-00123               | Installation of Swagelok Fittings on 2-SS-PP-0.38-SS-PIPE-<br>304-1CN9                                                                        | 1                   |

| Inspection | Туре          | Designation       | Description or Title                                         | Revision or |
|------------|---------------|-------------------|--------------------------------------------------------------|-------------|
| Procedure  |               |                   |                                                              | Date        |
|            |               | SU-18-00159       | Temporary Modification CERPI System Shutdown Bank A N07      | 0           |
|            |               |                   | Rod Position Indication Detector Secondary                   |             |
|            |               |                   | Winding Resistance Signal                                    |             |
|            |               | SU-19-00110       | "A" RCP Floating Ring Seal Removal                           | 1           |
|            |               | SU-19-00156       | Modify 8" CC-70-151 Hanger                                   | 0           |
|            |               | SU-21-00135       | 1-RC-HCV-1556A & C-Valve Spring Hanger Support               | 0           |
|            | Modification  |                   | Modification                                                 |             |
|            |               | SU-DCP-000-38-    | Replace Circuit Breakers and Verify Thermal Overload         | 03/01/2005  |
|            |               | DCP-04-100        | Settings for Control Room and                                |             |
|            |               |                   | Emergency Switchgear Room Air Handlers/Surry/Unit 1 & 2      |             |
|            |               | SU-DCP-000-38-    | ORS Pump Test Loop Modification/Surry/Unit2                  | 04/27/2006  |
|            |               | DCP-05-025        |                                                              |             |
|            |               | TM S2-17-150      | Reconfiguration of Pressurizer Heaters                       | 0           |
|            | Engineering   | DC-SU-15-00006    | 50.59/72.48 Screen                                           | 7/15/15     |
|            | Evaluations   | SU-09-00046       | 50.59/72.48 Screen                                           | 01/06/2010  |
|            |               | SU-13-01053       | EDG Data Acquisition System Quick Connect and Test Setup     | 14          |
|            |               | SU-13-01053       | 50.59/72.48 Screen                                           | 0           |
|            |               | SU-18-00116       | Stem and Disc Arm Replacement for 1-SI-MOV-1863A             | 1           |
|            |               | SU-19-00110       | 50.50/72.48 Screen                                           | 1           |
|            |               | SU-19-00156       | Design Equivalent Change Package                             |             |
|            | Miscellaneous | Eaton 27.3-43     | Molded-Case Circuit Breakers & Enclosures, Application Data, | 04/01/2016  |
|            |               |                   | Table 27.3-13. Reverse-Feed Applications—Eaton's Circuit     |             |
|            |               |                   | Breakers                                                     |             |
|            |               | Eaton Application | AB DE-ION® Circuit Breakers, Standard Type NB, and MARK      | 12/01/1988  |
|            |               | Data 29-160       | 75® 700-1200 Amperes, 600 Volts Ac, 250 Volts Dc,CD 2 and    |             |
|            |               |                   | 3 Poles Type NBY 240 Volts Ac, 700-1200 Amperes              |             |
|            |               | Eaton Catalog     | Molded-Case Circuit Breakers, Volume 12, Aftermarket,        | 02/01/2019  |
|            |               | V12-T3-1          | Renewal Parts and Life Extension Solutions                   |             |
|            |               | EP-0026           | Surry Unit 1, 2003 Refueling Outage Results of Secondary     | 0           |
|            |               |                   | Piping & Component Inspection Program                        |             |
|            |               | IEEE Standard     | IEEE Standard Criteria for Class 1E Power Systems for        | 03/14/1975  |
|            |               | 308-1974          | Nuclear Power Generating Stations                            |             |
|            |               | Licensee          | Surry Power Station – 10CFR 50.59 Inspection Supplemental    | 02/09/2022  |
|            |               | Response          | Information on DC Cross Tie Breakers                         |             |

| Inspection | Туре        | Designation                                                                 | Description or Title                                                                                                    | Revision or |
|------------|-------------|-----------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|-------------|
| Procedure  |             |                                                                             |                                                                                                                         | Date        |
|            |             | SU-PO-MAT-<br>4500398109-<br>00002-<br>000000264325<br>_42276061            | Incoming Insp. for GR for Purchase Order                                                                                | 0           |
|            | Procedures  | 1K-A6, Batt Bus<br>1A/1B                                                    | Tie Bkr Closed                                                                                                          | 3           |
|            |             | 2K-A6, Batt Bus<br>1A/1B                                                    | Tie Bkr Closed                                                                                                          | 1           |
|            |             | ER-AA-FAC-1001                                                              | Flow-Accelerated Corrosion (FAC) Susceptibility Analysis & Modeling                                                     | 6           |
|            |             | ER-AA-FAC-1003                                                              | Flow-Accelerated Corrosion (FAC) Operational Experience<br>Reviews                                                      | 6           |
|            |             | ER-AA-FAC-102                                                               | Flow-Accelerated Corrosion (FAC) Inspection and Evaluation Activities                                                   | 1           |
|            |             | ER-AA-FAC-104                                                               | Crossover/Crossunder Inspection & Evaluation Activities                                                                 | 1           |
|            |             | STD-GN-0033                                                                 | Secondary Piping and Component Inspection Program                                                                       | 9           |
|            |             | SU-PROC-000-1-<br>MOP-EP-030                                                | Removal from Service and Return to Service of Station Battery 1A                                                        | 16          |
|            |             | SU-PROC-000-1-<br>MOP-EP-031                                                | Removal From Service And Return To Service Of Station<br>Battery 1B                                                     | 16          |
|            |             | VPAP-0807                                                                   | Secondary Piping and Component Inspection Program                                                                       | 2           |
|            | Work Orders | 00524235 02                                                                 | Replace Circuit Breakers and Verify Thermal Overload<br>Settings Control Room and Emergency Switch Gear Air<br>Handlers | 02/20/2006  |
|            |             | 00524235 03                                                                 | Replace Circuit Breakers and Verify Thermal Overload<br>Settings Control Room and Emergency Switch Gear Air<br>Handlers | 02/20/2006  |
|            |             | 38077408903,<br>38077408902,<br>38072198008,<br>00774089-01,<br>00721980-01 |                                                                                                                         |             |

### IMC 0609 Appendix G Phase II Screening

Performance Deficiency: The licensing basis design standard IEEE 308-1974, required Surry to ensure that each type of Class 1E power equipment shall be qualified to demonstrate its ability to perform its function under normal and design basis electrical failure events. The failure to ensure that the DC crosstie circuit breakers could meet the fault duty required by the design basis electrical failure events was a performance deficiency.

Safety Consequence: DC breakers will not provide fault protection as designed and could result in an unrecoverable Loss of All DC as the fault would not be cleared/isolated and both DC buses would be damaged and not be recoverable. DC bus cross connection is only allowed in Mode 5 by Tech Specs. Loss of DC power would remove all Control Power for Pumps and Valves and remove all remote indications and alarms.

Note: Procedure 1-MOP-EP-030, Removing 1A Battery may only be performed in Refueling shutdown (POS III), however 1-MOP-EP-031, Removing 1B Battery may be performed in Cold shutdown or refueling shutdown (POS I, POS II, or POS III). DC buses being cross connected is limited to 7 days due to a TS LCO for the non-outage unit

Bottom Line Screen to Green in phase II, may re-exit with a Green NCV. Since the report was not issued no SDP clocks were started for the TBD AV.

ANALYSIS

 This is a Conditional Finding so IELs from IMC 0609 Appendix G Attachment 2 Table 5, Initiating Even Likelihoods (IELs) for Condition Findings – PWRs. Assume exposure period of 7 days (column 2)

LOOP 2 LORHR 2 LOI 3 LOLC 2 (2 for all exposure periods)

- 2. Use the DC bus Faulting basic event from the SPAR Model DCP-BDC-LP-1A (B) (FAILURE OF 125V DC BUS 1A (B)) = 5.108 E-6 events/year
- 3. IEL for DC bus failure during exposure period: (DCP-BDC-LP-1A <u>OR</u> DCP-BDC-LP-1B) x exposure time = (5.108 E-6 + 5.108 E-6) x (7/365) = 1.9E-7
- 4. Conditional so Add IEL + IE for DC Bus Failure to get Conditional IEL

LOOP 2 + 7 = 9 LORHR 2 + 7 = 9 LOI 3 + 7 = 10 LOLC 2 +7 =9

 IMC 0609 Appendix G Attachment 2 worksheets 1-7 are applicable for shutdown initiating event LOLC, LOOP, and LOI in a 3 Loop Westinghouse PWR. Worksheets 8 and 9 are used for a LORHR for a 4 loop Westinghouse plant. (Conservatively used in this case despite it being a 3 loop Westinghouse)

- 6. Worksheet 1 LOLC POS I
  - a. LOLC-SG-RHR-R-RWSYMU 9
  - b. LOLC-SG-Feed & Bleed 9
- 7. Worksheet 2 LOLC POS II
  - a. LOI-RHR-R-RWSTMU 10
  - b. LOI-Feed 10
- 8. Worksheet 3 LOOP POS I
  - a. LOOP-EAC-SGSBO-RLOOP3 -9 + 1 = 10
- 9. Worksheet 4 LOOP POS II
  - a. LOOP-EAC-RLOOP18 9 + 1 =10
  - b. LOOP-EAC-Gravity- RLOOP4 9 + 1 = 10
- 10. Worksheet 5 LOI POS I
  - a. LOI-SG-RHR-R-RWSTMU 10
  - b. LOI-SG-BLEED -10
  - c. LOI-LEAKSTOP-RWSTMU –10
  - d. LOI--FEED-SG 10
  - e. LOI-FEED-LEAKSTOP –10
- 11. Worksheet 6 LOI POS II
  - a. LOI-RHR-R-RWSTMU 10
  - b. LOI-LEAKSTOP-RWSTMU- 10
  - c. LOI-FEED –10
- 12. Worksheet 7 LOI POS III
  - a. LOI-RHR-R-10
  - b. LOI-RHR-LEAKSTOP-10
  - c. LOI-FEED- 10
- 13. Worksheet 8 LORHR POS I
  - a. LORHR RHR-S SG RHR-R- RWSTMU -9
  - b. LORHR RHR-S SG FEED&BLEED 9
- 14. Worksheet 9 LORHR -POS II
  - a. LORHR RHR-S RHR-R RWSTMU 9
  - b. LORHR RHR-S FEED 9

Totals 1-MOP-EP-031 (B Battery disconnected) (POS I, II, and III ) 16 x 10 6 x 9

Counting Rule: 10s: 16/3 (round down)=5 9s: (6+5)/3 (round down)=3 8s: (3+2)/3 (round down) = 1 7s: (0+1)/3 (round down =0 6s: 0 therefore **GREEN** 

1-MOP-EP-030 (A Battery disconnected) (POS III only) 3 X 10

Counting Rule: 10s 3/3 (round down) = 1 9s (1+0)/3 (round down) =0 8s: 0 7s: 0 6s: 0 therefore **Green**