



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION**  
REGION II  
245 PEACHTREE CENTER AVENUE NE, SUITE 1200  
ATLANTA, GEORGIA 30303-1257

April 30, 2013

Mr. David A. Heacock  
President and Chief Nuclear Officer  
Virginia Electric and Power Company  
Innsbrook Technical Center  
5000 Dominion Boulevard  
Glen Allen, VA 23060-6711

**SUBJECT: SURRY POWER STATION – NRC INTEGRATED INSPECTION REPORT  
05000280/2013002, 05000281/2013002**

Dear Mr. Heacock:

On March 31, 2013, the U. S. Nuclear Regulatory Commission (NRC) completed an inspection at your Surry Power Station Units 1 and 2. The enclosed inspection report documents the inspection findings which were discussed on April 4, 2013, with Mr. Kenneth Sloane and other members of your staff.

The inspection examined activities conducted under your licenses as they related to safety and compliance with the Commission's rules and regulations and with the conditions of your licenses. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel.

One self-revealing finding of very low safety significance (Green) was identified during this inspection. This finding was determined to involve a violation of NRC requirements. Additionally, one licensee-identified violation which was determined to be of very low safety significance is listed in this report. The NRC is treating these violations as non-cited violations (NCVs) consistent with Section 2.3.2 of the NRC Enforcement Policy. If you contest the violations or significance of these NCVs, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN.: Document Control Desk, Washington DC 20555-0001; with copies to the Regional Administrator Region II; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at the Surry Power Station.

If you disagree with a cross-cutting aspect assignment in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the Regional Administrator, Region II, and the NRC Resident Inspector at the Surry Power Station.

D. Heacock

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In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of the NRC's document system (ADAMS). ADAMS is accessible from the NRC Website at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

**/RA/**

Gerald J. McCoy, Chief  
Reactor Projects Branch 5  
Division of Reactor Projects

Docket Nos.: 50-280, 50-281  
License Nos.: DPR-32, DPR-37

Enclosure: Inspection Report 05000280/2013002, 05000281/2013002

w/Attachment: Supplemental Information

cc w/encl. (See next page)

D. Heacock

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w/Attachment: Supplemental Information

cc w/encl. (See page 3)

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Enclosure

D. Heacock

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Letter to David A. Heacock from Gerald J. McCoy dated April 30, 2013.

SUBJECT: SURRY POWER STATION - NRC INTEGRATED INSPECTION REPORT  
05000280/2013 AND 05000281/2013

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**U.S. NUCLEAR REGULATORY COMMISSION**

REGION II

Docket Nos.: 50-280, 50-281

License Nos.: DPR-32, DPR-37

Report No: 05000280/2013002, 05000281/2013002

Licensee: Virginia Electric and Power Company (VEPCO)

Facility: Surry Power Station, Units 1 and 2

Location: 5850 Hog Island Road  
Surry, VA 23883

Dates: January 1, 2013 through March 31, 2013

Inspectors: J. Heath, Acting Senior Resident Inspector  
J. Nadel, Resident Inspector  
P. Capehart, Senior Operations Engineer (Section 1R11)  
K. Schaaf, Operations Engineer (Section 1R11)

Approved by: Gerald J. McCoy, Chief  
Reactor Projects Branch 5  
Division of Reactor Projects

Enclosure

## SUMMARY OF FINDINGS

IR 05000280/2013002, 05000281/2013002; 01/01/2013–03/31/2013; Surry Power Station, Units 1 and 2: Event Follow-up.

The report covered a three month period of inspection by resident inspectors and three region based inspectors. One Green finding, which was determined to be to be a violation of NRC requirements, was identified. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process" (SDP). The cross-cutting aspect was determined using IMC 0310, "Components Within The Cross-Cutting Areas." Findings for which the SDP does not apply may be Green or be assigned a severity level after NRC management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process" Revision 4, dated December 2006.

### A. NRC Identified and Self-Revealing Findings

#### **Cornerstone: Mitigating Systems**

Green. A self-revealing NCV of Technical Specification 6.4.D was identified for the failure to follow procedure 2-MOP-SW-001, "Charging Pumps Service Water Pumps Removal from and/or Return to Service," Revision 3 . Specifically, the licensee incorrectly implemented procedure steps that directed the tagout of the Unit 2 'A' train charging pump service water pump, which resulted in the inoperability of the Unit 1 'A' train charging pump service water pump. The issue was documented in the licensee's corrective action program (CAP) as CR 501208.

The inspectors determined that the failure to follow procedure 2-MOP-SW-001 was a performance deficiency that was within the licensee's ability to foresee and correct and should have been prevented. The inspectors determined that the finding was more than minor because it was associated with the Mitigating Systems cornerstone attribute of Equipment Performance 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 closure of the Unit 1 'A' train charging service water pump discharge isolation valve resulted in the inoperability of that train and entry into the associated TS LCO. The inspectors screened this finding in accordance with IMC 0609, "Significance Determination Process," Attachment 4, "Initial Characterization of Findings," and IMC 0609, Appendix A, "SDP for Findings At-Power", and determined the finding was of very low safety significance (Green), since it did not cause a loss of operability or functionality of a single train for greater than its TS allowed outage time. The finding had a cross-cutting aspect in human performance, work practices, H.4(a), because inadequacies were identified associated with the pre-job brief, self-check practices, and proceeding in the face of unexpected circumstances. (Section 40A3.3)

Enclosure

B. Licensee Identified Violations

The inspectors reviewed one violation of very low safety significance (Green) that was identified by the licensee. Corrective actions taken or planned by the licensee have been entered into the licensee's corrective action program. This violation and its respective corrective actions are listed in Section 4OA7 of this report.



## REPORT DETAILS

### Summary of Plant Status

Unit 1 began the inspection period at approximately 100 rated thermal power (RTP) and remained there for the entire period.

Unit 2 began the inspection period at approximately 100 RTP and remained there for the entire period.

#### 1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

#### 1R01 Adverse Weather Protection

##### .1 Impending Adverse Weather Conditions

###### a. Inspection Scope

The inspectors performed a site specific weather related inspection due to anticipated adverse weather conditions, specifically a tornado watch, a severe thunderstorm warning, and cold weather conditions including icy precipitation on January 31, 2013. The inspectors walked down key structures (i.e, the turbine and auxiliary buildings, safeguards buildings, the emergency switchgear rooms, and emergency battery rooms) and verified HVAC systems were operating properly and that area temperatures remained within design requirements specified in the Updated Final Safety Analysis Report (UFSAR). The mitigating systems reviewed during this inspection include: the auxiliary feedwater systems, the refueling water storage tanks, emergency diesel generators, and emergency switchgear. The inspectors discussed specific measures with operations, and maintenance personnel to be taken when low ambient temperatures were experienced. Inspectors verified the performance of 0-OP-ZZ-021, Severe Weather Preparation, Rev 2.

###### b. Findings

No findings were identified.

##### .2 External Flooding

###### a. Inspection Scope

The inspectors performed walkdown inspections of the common Low Level Intake Structure, including doors, flood protection barriers, penetrations, and the integrity of the perimeter structure. These walkdowns were also associated with Temporary Instruction (TI) 2515/187, Inspection of Near-Term Task Force Recommendation 2.3 Flooding Walkdowns. The inspectors also reviewed the applicable UFSAR sections, Technical Specifications (TS), and other licensing basis documents regarding external flooding, flood protection, and the probable maximum hurricane (PMH); including specific plant

design features to mitigate the maximum flood level. Corrective Action Program (CAP) documents and work orders (WO) related to actual flooding or water intrusion events over the past five years were also reviewed by the inspectors to ensure that the licensee was identifying and resolving severe weather related issues that caused or could lead to external flooding of safety related equipment. Also reference section 4OA5.2 of this report.

b. Findings

No findings were identified.

1R04 Equipment Alignment

.1 Partial Walkdown

a. Inspection Scope

The inspectors conducted four equipment alignment partial walkdowns to evaluate the operability of selected redundant trains or backup systems, listed below, with the other train or system inoperable or out of service. The inspectors reviewed the functional systems descriptions, UFSAR, system operating procedures, and TS to determine correct system lineups for the current plant conditions. The inspectors performed walkdowns of the systems to verify that critical components were properly aligned and to identify any discrepancies which could affect operability of the redundant train or backup system.

- 'A' and 'B' train of the Unit 1 emergency diesel generator (EDG) fuel oil transfer system while EDG #3 was removed from service for a 12 year planned maintenance package
- 'A' and 'B' train of service water supply to the common main control room (MCR) ventilation chillers while the 'C' train was removed from service for planned maintenance
- Emergency service water pump (ESWP) 1-SW-P-1A while 1-SW-P-1C was OOS for planned maintenance
- 'A' train of Unit 1 motor driven auxiliary feedwater system while the 'B' train was removed from service for a planned maintenance package.

b. Findings

No findings were identified.

1R05 Fire Protection.1 Quarterly Fire Protection Walkdowna. Inspection Scope

The inspectors conducted tours of the six areas listed below that are important to reactor safety to verify the licensee's implementation of fire protection requirements as described in fleet procedures CM-AA-FPA-100, "Fire Protection/Appendix R (Fire Safe Shutdown) Program," Revision 6, CM-AA-FPA-101, "Control of Combustible and Flammable Materials," Revision 4, and CM-AA-FPA-102, "Fire Protection and Fire Safe Shutdown Review and Preparation Process and Design Change Process," Revision 3. The reviews were performed to evaluate the fire protection program operational status and material condition and the adequacy of: (1) control of transient combustibles and ignition sources; (2) fire detection and suppression capability; (3) passive fire protection features; (4) compensatory measures established for out-of-service, degraded or inoperable fire protection equipment, systems, or features; and (5) procedures, equipment, fire barriers, and systems so that post-fire capability to safely shutdown the plant is ensured. The inspectors reviewed the corrective action program to verify fire protection deficiencies were being identified and properly resolved.

- EDG #1 Room
- EDG #3 Room
- 'A' Fuel Oil Pump House
- 'B' Fuel Oil Pump House
- Unit 2 Containment Spray Pump House
- Fire Pump House

b. Findings

No findings were identified.

1R06 Flood Protection MeasuresAnnual Review of Electrical Manholesa. Inspection Scope

The inspectors reviewed and observed licensee periodic inspection of manholes 1-EP-MH-1 and 0-SE-MH-22, to assess the condition of electrical cables located inside the underground manholes as an additional annual sample. The inspectors verified by direct observation and review of the associated inspection documents that the cables, splices, support structures, and sump pumps located within the manholes appeared intact, and that the cables were not being impacted by water. In addition, the inspectors reviewed several past periodic licensee inspection results and the licensee's CAP database for each of the above mentioned manholes to ensure that any degraded conditions identified were appropriately resolved.

b. Findings

No findings were identified.

1R11 Licensed Operator Regualification Program and Licensed Operator Performance

.1 Resident Inspector Quarterly Review

a. Inspection Scope

The inspectors observed and evaluated a licensed operator simulator exercise given on January 29, 2013. The scenario involved a containment pressure transmitter failure, a failed open pressurizer spray valve, a large break loss of cooling accident, a failure of the containment spray pumps to auto start, and a recirculation mode transfer failure. This scenario was intended to exercise the entire operations crew and assess the ability of the operators to react correctly to multiple failures. The inspectors observed the crew's performance to determine whether the crew met the scenario objectives; accomplished the critical tasks; demonstrated the ability to take timely action in a safe direction and to prioritize, interpret, and verify alarms; demonstrated proper use of alarm response, abnormal, and emergency operating procedures; demonstrated proper command and control; communicated effectively; and appropriately classified events per the emergency plan. The inspectors observed the post training critique to determine that weaknesses or improvement areas revealed by the training were captured by the instructor and reviewed with the operators.

b. Findings

No findings were identified.

.2 Resident Inspector Quarterly Observation of Control Room Operations

a. Inspection Scope

During the inspection period, the inspectors conducted observations of licensed reactor operator activities to ensure consistency with licensee procedures and regulatory requirements. For the following activities, the inspectors observed the following elements of operator performance: (1) operator compliance and use of plant procedures including technical specifications; (2) control board component manipulations; (3) use and interpretation of plant instrumentation and alarms; (4) documentation of activities; (5) management and supervision of activities; and (6) control room communications.

- Observed Unit 1 control room operators perform a partial load reject of EDG #3.
- Observed Unit 1 control room operators start and load EDG #1 during quarterly surveillance testing.
- Observed Unit 1 control room operators perform a dilution.
- Observed Unit 2 control room operators start and stop the 1B containment spray pump for testing.

b. Findings

No findings were identified.

.3 Biennial Review of Licensed Operator Requalification Program

a. Inspection Scope

The inspectors reviewed the facility operating history and associated documents in preparation for this inspection. During the week of January 28, 2013, the inspectors reviewed documentation and observed the administration of operating tests associated with the licensee's operator requalification program. Each of the activities performed by the inspectors was done to assess the effectiveness of the facility licensee in implementing requalification requirements identified in 10 CFR Part 55, "Operators' Licenses." Evaluations were also performed to determine if the licensee effectively implemented operator requalification guidelines established in NUREG-1021, "Operator Licensing Examination Standards for Power Reactors," and Inspection Procedure 71111.11, "Licensed Operator Requalification Program." The inspectors also evaluated the licensee's simulation facility for adequacy for use in operator licensing examinations using ANSI/ANS-3-5-2009, "American National Standard for Nuclear Power Plant Simulators for use in Operator Training and Examination." The inspectors observed two crews during the performance of the operating tests. Documentation reviewed included written examinations, Job Performance Measures (JPMs), simulator scenarios, licensee procedures, on-shift records, simulator modification request records, simulator performance test records, operator feedback records, licensed operator qualification records, remediation plans, watchstanding records, and medical records. The records were inspected using the criteria listed in Inspection Procedure 71111.11. Documents reviewed during the inspection are documented in the Attachment.

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness

a. Inspection Scope

For the two equipment issues described in the condition reports listed below, the inspectors evaluated the effectiveness of the corresponding licensee's preventive and corrective maintenance. The inspectors performed a detailed review of the problem history and associated circumstances, evaluated the extent of condition reviews, as required, and reviewed the generic implications of the equipment and/or work practice problems. Inspectors performed walkdowns of the accessible portions of the system, performed in-office reviews of procedures and evaluations, and held discussions with system engineers.

The inspectors compared the licensee's actions with the requirements of the Maintenance Rule (10 CFR 50.65), station procedures ER-AA-MRL-10, "Maintenance Rule Program," Revision 4, and ER-AA-MRL-100, "Implementing the Maintenance Rule," Revision 5.

- CR 505225, Alternate AC EDG 0-BSA-SV-1 lifting below setpoint and starting air system issues
- CR 503099, EDG #2 failed to start due to starting circuit #1 relay failure

b. Findings

No findings were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control

a. Inspection Scope

The inspectors evaluated, as appropriate, the six activities listed below for the following: (1) the effectiveness of the risk assessments performed before maintenance activities were conducted; (2) the management of risk; (3) that, upon identification of an unforeseen situation, necessary steps were taken to plan and control the resulting emergent work activities; and, (4) that maintenance risk assessments and emergent work problems were adequately identified and resolved. The inspectors verified that the licensee was complying with the requirements of 10 CFR 50.65(a)(4) and the data output from the licensee's safety monitor associated with the risk profile of Units 1 and 2. The inspectors reviewed the corrective action program to verify deficiencies in risk assessments were being identified and properly resolved.

- Unit 1 and Unit 2 risk when EDG #3 was removed from service for a 12 year maintenance package
- Unit 1 and Unit 2 risk when the Mechanical Equipment Room (MER) #3 duplex strainer, 2-SW-S-2B, was removed from service for replacement and both units were in a 24 hr TS LCO
- Unit 2 risk when reactor protection system (RPS) relay PRB-YA failed during logic testing
- Unit 2 risk for elevated Turbine Building flooding risk when turbine building sump pumps were out of service during preventative maintenance (tube cleaning) on 2-BC-E-1B
- Unit 1 and Unit 2 risk while Turbine Building sump pumps 1-PL-P-2A/B/C/D/E/F were tagged out of service for maintenance
- Unit 2 risk during performance of switchyard procedure SU-M-DCO-410 for planned relay maintenance on the 2047 line and circuit breakers 204702 and 290T2047.

b. Findings

No findings were identified.

1R15 Operability Evaluationsa. Inspection Scope

The inspectors reviewed the five operability evaluations listed below, affecting risk-significant mitigating systems, to assess as appropriate: (1) the technical adequacy of the evaluations; (2) whether continued system operability was warranted; (3) whether other existing degraded conditions were considered; (4) if compensatory measures were involved, whether the compensatory measures were in place, would work as intended, and were appropriately controlled; and (5) where continued operability was considered unjustified, the impact on TS Limiting Conditions for Operation and the risk significance. The inspectors' review included verification that operability determinations were made as specified in OP-AA-102, "Operability Determination," Revision 9. The inspectors reviewed the licensee's corrective action program to verify deficiencies in operability determinations were being identified and corrected.

- CR 501629, emergency service water pump 1A shows degrading vibration trend on point 15
- CR 503764, EDG #1 output breaker failed to trip remotely during surveillance testing
- CR 506533, RPS relay failure (2-RP-RLY-PRBYA) failed during surveillance testing on February 22
- CR 506876, EDG #1 lockout relay failed during testing on February 27
- CR 508934, gas void noted at 2-SI-179

b. Findings:

No findings were identified.

1R19 Post Maintenance Testinga. Inspection Scope

The inspectors reviewed six post maintenance test procedures and/or test activities for selected risk-significant mitigating systems listed below, to assess whether: (1) the effect of testing on the plant had been adequately addressed by control room and/or engineering personnel; (2) testing was adequate for the maintenance performed; (3) acceptance criteria were clear and adequately demonstrated operational readiness consistent with design and licensing basis documents; (4) test instrumentation had current calibrations, range, and accuracy consistent with the application; (5) tests were performed as written with applicable prerequisites satisfied; (6) jumpers installed or leads lifted were properly controlled; (7) test equipment was removed following testing; and (8) equipment was returned to the status required to perform in accordance with VPAP-2003, "Post Maintenance Testing Program," Revision 14.

- 0-OPT-SW-007, Rev 10, Emergency service water pump '1A' comprehensive test, following corrective maintenance
- 0-OPT-EG-009, Rev 50 -OTO 1, Number 3 emergency diesel generator major maintenance operability test

- 2-PT-18.8, Rev 34, Charging pump service water pump performance testing, following an open/inspect of the Unit 2 10B charging service water pump discharge check valve 2-SW-108
- 0-OPT-ZZ-008, Rev 9, ASME system pressure tests, following replacement of the MER #3 duplex strainer 2-SW-S-2B
- 1-OSP-SW-004, Rev 27, Measurement of macrofouling blockage of component cooling heat exchanger 1CC-E-1C, following corrective maintenance
- 1-OPT-EG-001, Rev 56, Emergency diesel generator #1 monthly start exercise test, following output breaker 15H3 control cable replacement

b. Findings

No findings were identified.

1R22 Surveillance Testing

a. Inspection Scope

For the four surveillance tests listed below, the inspectors examined the test procedures, witnessed testing, or reviewed test records and data packages, to determine whether the scope of testing adequately demonstrated that the affected equipment was functional and operable, and that the surveillance requirements of TS were met. The inspectors also determined whether the testing effectively demonstrated that the systems or components were operationally ready and capable of performing their intended safety functions.

In-Service Testing:

- 2-OPT-CS-002, Rev. 14, Containment spray system test

Other Surveillance Testing:

- 0-OSP-AAC-001, Rev. 40, Quarterly test of 0-AAC-DG-0M, alternate AC diesel generator
- 1-IPM-ER-REC-001, Rev. 4, Seismic instrumentation status check recording
- 1-OPT-EG-001/005, Rev. 55, Number 1 emergency diesel generator monthly start exercise test

b. Findings

No findings were identified.



## Cornerstone: Emergency Preparedness

### 1EP6 Drill Evaluation

#### Emergency Preparedness (EP) Drill

##### a. Inspection Scope

On March 26, 2013, the inspectors reviewed and observed a licensee EP drill involving a beyond design basis earthquake, loss of coolant accident, and unisolable containment air release. The inspectors assessed the licensee emergency procedure usage, emergency plan classifications, notifications, and protective action recommendation development. The inspectors evaluated the adequacy of the licensee's conduct of the drill and post-drill critique performance. The inspectors verified that the drill critique identified drill performance weaknesses and entered these items into the licensee's CAP.

##### b. Findings

No findings were identified.

#### 4. OTHER ACTIVITIES

### 4OA1 Performance Indicator (PI) Verification

##### a. Inspection Scope

The inspectors performed a periodic review of the six Unit 1 and 2 PIs to assess the accuracy and completeness of the submitted data and whether the performance indicators were calculated in accordance with the guidance contained in NEI 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6. The inspection was conducted in accordance with NRC Inspection Procedure 71151, "Performance Indicator Verification." Specifically, the inspectors reviewed the Unit 1 and Unit 2 data reported to the NRC for the period January 1, 2012 through December 31, 2012. Documents reviewed included applicable NRC inspection reports, licensee event reports, operator logs, station performance indicators, and related CRs.

- Unit 1 Unplanned Scrams per 7000 Critical Hours
- Unit 2 Unplanned Scrams per 7000 Critical Hours
- Unit 1 Unplanned Power Changes per 7000 Critical Hours
- Unit 2 Unplanned Power Changes per 7000 Critical Hours
- Unit 1 Unplanned Scrams With Complications
- Unit 2 Unplanned Scrams With Complications

##### b. Findings

No findings were identified.

## 4OA2 Identification and Resolution of Problems

### .1 Daily Reviews of Items Entered into the Corrective Action Program:

#### a. Inspection Scope:

As required by NRC Inspection Procedure 71152, "Identification and Resolution of Problems," and in order to help identify repetitive equipment failures or specific human performance issues for follow-up, the inspectors performed a daily screening of items entered into the licensee's CAP. This review was accomplished by reviewing daily CR report summaries and periodically attending daily CR Review Team meetings.

#### b. Findings

No findings were identified.

### .2 Annual Follow-up of Selected Issues

#### a. Inspection Scope

The inspectors selected CR 488299 following the EDG #3 failure to run on December 6, 2012. The condition report documented a cumulative review of EDG Data Acquisition System (DAS) equipment issues. The inspectors reviewed the condition report to ensure that the full extent of the issues were identified, an appropriate evaluation was performed, and appropriate corrective actions were specified and prioritized. The inspectors also evaluated the CR against the requirements of the licensee's CAP as specified in procedure, PI-AA-200, "Corrective Action Program," Revision 20 and 10 CFR 50, Appendix B.

#### b. Findings

No findings of significance were identified. In general, the inspectors verified that the licensee had identified problems at an appropriate threshold and entered them into the CAP database, and had proposed or implemented appropriate corrective actions.

### .3 Semi-Annual Trend Review

#### a. Inspection Scope

The inspectors performed a review of the licensee's correction action program documents to identify trends that could indicate the existence of a more significant safety issue. The inspectors' review was focused on repetitive equipment and corrective maintenance issues, but also considered the results of daily inspector corrective action program item screening discussed in Section 4OA2.1. The review included issues documented outside the normal correction action program in system health reports, corrective maintenance work orders, component status reports, site monthly meeting reports, and maintenance rule assessments. The inspectors' review nominally

considered the six month period of July through December, 2012, although some examples expanded beyond those dates when the scope of the trend warranted.

The inspectors compared and contrasted their results with the results contained in the licensee's latest integrated quarterly assessment report. Corrective actions associated with a sample of the issues identified in the licensee's trend report were reviewed for adequacy.

b. Assessment and Observations

No findings of significance were identified. In general, the licensee has identified trends and has addressed the trends with their corrective action program. Inspectors noted that adverse trends were identified in Operations human performance errors and EDG reliability over the subject time period. Although some corrective actions for these trends had been identified, some actions were still in development and many had not been in place long enough to assess effectiveness. No new adverse trends were identified this period that had not already been identified by the licensee.

4OA3 Event Follow-up

.1 (Closed) Licensee Event Report (LER) 05000281/2013-001-00, Bird Contacting Power Line Results in Emergency Diesel Generator Auto-Start

At 8:03 on December 29, 2012, with both Unit 1 and Unit 2 operating at 100%, the supply breaker to the B reserve station service transformer (RSST) tripped open on an instantaneous over-current of the B and C phases. An under-voltage auto start signal was generated, and EDG #2 started and loaded on the Unit 2 H emergency bus as designed. The licensee's evaluation determined that a pelican observed in the intake canal flew up into the overhead lines extending from the switchyard to the B RSST traverse. The licensee's corrective actions included visual inspection of the overhead lines, supply breaker and B RSST and an initiative to install diverters on the live high voltage lines that extend over the intake canal. The inspectors reviewed the LER, the licensee's apparent cause analysis, and corrective action documents to verify the accuracy of the LER and that the corrective actions were appropriate. This LER is in the licensee's corrective action program as CR501077. No findings or violations were identified.

.2 (Closed) Licensee Event Report (LER) 050000280, 281/2013-001-00, Lack of Established Method Results in Detached Lead and Inoperable Emergency Diesel Generator

On December 6, 2012, at 11:15 a.m., with Unit 1 at 100 and Unit 2 at 98 percent power, the monthly start test for EDG#3 found the incoming voltage higher than expected. Following an unsuccessful attempt to lower voltage, the diesel was secured at 11:37 a.m. The licensee's investigation revealed a disconnected lead in the remote excitation cabinet that impacted the voltage regulator circuit and that the most probable cause was the inadvertent disconnection of the lead during removal of a data acquisition system following a previous run of EDG #3 on November 3, 2012. The inspectors reviewed the

LER, the licensee's root cause analysis, and corrective action documents to verify the accuracy of the LER and that the corrective actions were appropriate. This LER is in the licensee's corrective action program as CR499318. The enforcement aspects of this event are discussed in Section 40A7.

### .3 Personnel Performance

#### a. Inspection Scope

Operator performance was evaluated the following unplanned event and resultant transient listed below. For the unplanned event, the initiating cause was examined as well as the response to determine if the response was appropriate and in accordance with procedures.

- Mis-positioning of isolation valve 1-SW-114 during tagout of charging pump service water pump 2-SW-P-10A results in auto-start of charging pump service water pump 1-SW-P-10B.

#### b. Findings

Introduction: A self-revealing Green NCV of TS 6.4.D was identified for failure to follow procedure 2-MOP-SW-001, "Charging Pumps Service Water Pumps Removal from and/or Return to Service," Revision 3. Specifically, the licensee incorrectly implemented procedure steps that directed the tagout of the Unit 2 'A' train charging pump service water pump, which resulted in the inoperability of the Unit 1 'A' train charging pump service water pump.

Description: On December 31, 2012, Operations identified a 200 DPM leak from a tee connection downstream of the Unit 2 'A' train charging pump service water pump. As a result of the leak, the licensee declared the affected 'A' train and pump inoperable. The decision was made to tag out the pump in order to perform corrective maintenance on the degraded piping connection. Operations initiated performance of procedure 2-MOP-SW-001, "Charging Pumps Service Water Pumps Removal from and/or Return to Service," Revision 3. The procedure steps directed the closure and tagging of 2-SW-114, the Unit 2 'A' train charging pump service water pump discharge isolation valve. The associated Unit 1 valve, 1-SW-114, is located adjacent to 2-SW-114 within mechanical equipment room (MER) #4. While performing the steps to close valve 2-SW-114, the operator did not check the equipment mark number tag on the valve and instead relied on a legacy pipe sticker; incorrectly closing 1-SW-114 as a result. Upon closing the wrong valve, the operator heard flow noise in the pipe and then reopened the valve. When 1-SW-114 was closed, the Unit 1 'B' train charging pump service water pump auto-started on low pressure and the MCR received an associated annunciator. Control room operators investigated with the plant computer system and verified that flow had momentarily reached zero gpm. The tag out was later re-performed by other operators and verified by a peer check. Senior operators later identified that, although it did cover expected system responses and self-check expectations, the pre-job brief did not cover the close proximity of the identical Unit 1 'B' train charging pump service water pump discharge isolation valve.

Analysis: The inspectors determined that the failure to follow procedure 2-MOP-SW-001 was a performance deficiency that was within the licensee's ability to foresee and correct and should have been prevented. The inspectors determined that the finding was more than minor because it was associated with the Mitigating Systems cornerstone attribute of Equipment Performance 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 closure of the Unit 1 'A' train charging service water pump discharge isolation valve resulted in the inoperability of that train and entry into the associated TS LCO. The inspectors screened this finding in accordance with IMC 0609, "Significance Determination Process," Attachment 4, "Initial Characterization of Findings," and IMC 0609, Appendix A, "SDP for Findings At-Power", and determined the finding was of very low safety significance, Green, since it did not cause a loss of operability or functionality of a single train for greater than its TS allowed outage time. The finding had a cross-cutting aspect in human performance, work practices, H.4(a), because inadequacies were identified associated with the pre-job brief, self-check practices, and proceeding in the face of unexpected circumstances.

Enforcement: Surry Technical Specification 6.4.D requires, in part, that "procedures described in section 6.4.A shall be followed." Surry Technical Specification 6.4.A.7 requires, in part, that "detailed written procedures with appropriate instructions shall be provided for conditions which include: corrective maintenance operations which would have an effect on the safety of the reactor." These requirements are implemented, in part, by Dominion procedure 2-MOP-SW-001, "Charging Pumps Service Water Pumps Removal from and/or Return to Service," Revision 3. Contrary to the above, on December 31, 2012, dominion personnel failed to follow procedure 2-MOP-SW-001. Specifically, an operator failed to perform procedure steps directing the tagging of valve 2-SW-114, and instead incorrectly closed valve 1-SW-114. Because of very low safety significance, this violation is being treated as an NCV, consistent with Section 2.3.2 of the NRC Enforcement Policy. The violation was entered into the licensee's corrective action program as condition report (CR) 501208. NCV 0500281/2013002-01, Failure to Follow Procedure Results in Inoperability of One Train of Charging Pump Service Water.

#### 4OA5 Other Activities

##### .1 Quarterly Resident Inspector Observations of Security Personnel and Activities

###### a. Inspection Scope

During the inspection period, the inspectors conducted observations of security force personnel and activities to ensure that the activities were consistent with the licensee security procedures and regulatory requirements relating to nuclear plant security. These observations took place during both normal and off-normal plant working hours.

These quarterly resident inspector observations of security force personnel and activities did not constitute any additional inspection samples. Rather, they were considered an integral part of the inspectors' normal plant status review and inspection activities.

b. Findings

No findings were identified.

2. (Closed) NRC Temporary Instruction (TI) 2515/187, Inspection of Near-Term Task Force Recommendation 2.3 Flooding Walkdowns

a. Inspection Scope

Inspectors verified that licensee walkdown packages SU-F-2012-011-00, "Interior and Exterior Walls, Floors and Penetration at Emergency Service Water Pump House," and SU-F-2012-080-00, "Dike at Emergency Service Water Pump House," and SU-F-2012-154-00, "Unit 1 and Unit 2 Cable Vaults," contained the elements as specified in NEI 12-07 Walkdown Guidance document.

The inspectors accompanied the licensee on their walkdown of the Unit 1 and Unit 2 Cable Vaults and manholes 1-EP-MH-1 and 1-EP-MH-2 and verified that the licensee confirmed the following flood protection features:

- Visual inspection of the flood protection feature was performed if the flood protection feature was relevant. External visual inspection for indications of degradation that would prevent its credited function from being performed was performed.
- Reasonable simulation, if applicable to the site
- Critical SSC dimensions were measured
- Available physical margin, where applicable, was determined.
- Flood protection feature functionality was determined using either visual observation or by review of other documents.

The inspectors independently performed their walkdown of the Low Level Intake Structure and Emergency Service Water Pump House and verified that the above flood protection features were in place. Additionally, the following flood protection features were verified:

- Equipment is properly staged and in a condition that would allow its use should it be needed for its intended purpose, or that sufficient time is available after a flood warning to move the equipment to an appropriate location was verified.
- All connections necessary to hook up the temporary equipment to allow performance of its flood protection function will work in their intended application and that any supplies, seals, fasteners, etc., are of sufficient quantity, in good condition, properly staged, inventoried regularly, and subject to periodic condition assessment were confirmed.
- Manual actions required to install the feature within the required time considering the conditions expected during a licensing basis flood (i.e., concurrent adverse weather conditions) were assessed.
- Walk-through of a procedure or activity to verify the procedure or activity can be executed as specified/written.

- Any credited time dependent activities can be completed in the time required. Time-dependent activities include detection (some signal that the event will occur, has occurred, or is occurring), recognition (by someone who will notify the plant), communication (to the control room), and action (by plant staff).
- Specified equipment/tools are properly staged and in good working condition, verification that connection/installation points are accessible.

The inspectors verified that non-compliances with current licensing requirements, and issues identified in accordance with the 10 CFR 50.54(f) letter, Item 2.g of Enclosure 4, were entered into the licensee's corrective action program. In addition, issues identified in response to Item 2.g that could challenge risk significant equipment and the licensee's ability to mitigate the consequences will be subject to additional NRC evaluation.

b. Findings

No findings were identified.

.3 Licensee Strike Contingency Plans (IP 92709)

a. Inspection Scope

The inspectors reviewed the content of the licensee's strike contingency plans in response to the labor contract agreement between Dominion Virginia Power and the International Brotherhood of Electrical Workers set to expire on April 1, 2013, to determine if reactor operations, facility security, and fire protection were to be maintained consistent with site technical specifications and regulatory requirements in the event of a strike. Interviews were conducted with operations, maintenance, security, emergency preparedness, and fire brigade personnel to determine if the minimum number of qualified personnel would be available as required for the proper operations and safety of the facility.

b. Findings

No findings were identified.

.4 (Closed) Unresolved item (URI) 05000280.281/2012004-01, Follow-up for NOED 12-2-003, Surry Power Station Uni1 and 2, Technical Specification 3.16 Emergency Power System, Specific to Emergency Diesel Generator (EDG) 02-EE-ED-1

a. Inspection Scope

The inspectors reviewed the facts of the URI and performed inspections which included a review of the events leading up to the NOED request, the licensee's root cause (RCE 1086), and both operability and extent of condition evaluations for EDGs #1 and #3. Inspectors also reviewed a root cause performed by an independent third party (Ricardo Engineering) and a whitepaper issued by the EMD diesel owner's group. The licensee determined the root cause, in accordance with RCE 1086, of the wrist pin bearing failure in EDG #2 to be: "Bearing material relocation in the oil grooves caused by repeated

engine starts under marginal lubrication conditions.” The direct and contributing causes identified in the RCE further elaborate that the design of the wrist pin bearings and that of the wrist pin bearing oil cooling system was what led to the material relocation and ultimate damage. The residents reviewed the above mentioned documents and concluded that sufficient evidence was not found to establish direct causality between the failed bearing and any one of the multiple possible root and contributory causes identified by both the licensee and third parties. The true cause either did not have sufficient presentation in the evidence or it was an unknowable combination of the identified possible causes. No performance deficiency was identified as a result. More information can be found in section 4OA5.5 of this report.

b. Findings

No findings were identified.

.5 (Closed) Confirmatory Action Letter (CAL) No. 2-12-003, Surry Power Station Unit nos. 1 and 2, Commitments Regarding Emergency Diesel Generators 1 and 3

a. Inspection Scope

In a letter dated March 20, 2013, Dominion made commitments to the NRC regarding actions to be taken on EDGs #1 and #3 based on an evaluation an evaluation of EDG #2 wrist pin bearing failure. Specifically, Dominion committed to “Declare EDG #1 or #3 inoperable and replace the power packs for the diesel with a confirmed lube oil sample indicating silver concentration greater than or equal to 0.1 ppm” and to “Replace EDG #3 power packs in January 2013 and EDG #1 power packs in February 2013.”

In the first quarter of 2013, NRC inspectors observed and independently reviewed selected activities that were indicative of the actions the licensee committed to accomplish which included surveillance testing, power pack replacement, and post-maintenance testing. The replacement of the EDG #1 and #3 power packs utilizing the new bronze “rocking pin” design was completed by the licensee to meet the above commitments and restore the full qualification of the EDGs.

b. Findings

No findings were identified.

4OA6 Meetings, Including Exit

On April 4, 2013, the inspection results were presented to Mr. K. Sloane and other members of his staff, who acknowledged the findings. The inspectors asked the licensee whether any of the material examined during the inspection should be considered proprietary. No proprietary information was identified.



#### 40A7 Licensee-Identified Violation

The following violation of very low safety significance (Green) was identified by the licensee and is a violation of NRC requirements which meet the criteria of Section 2.3.2 of the NRC Enforcement Policy, for disposition as a NCV.

- Surry Technical Specification 6.4.A.2 requires, in part, that “detailed written procedures with appropriate instructions shall be provided for conditions which include: calibration and testing of components involving nuclear safety of the station.” These requirements are implemented, in part, by Dominion procedure 0-ECM-0704-03, “EDG Data Acquisition System (DAS),” Rev. 34.

Contrary to the above, since 1998, Dominion procedure 0-ECM-0704-03 has been inadequate to ensure the continued operability of the emergency diesel generators. Specifically, the level of detail in the procedure steps was not consistent with the complexity of the installation and removal of the DAS equipment to ensure the as-left condition of the EDG automatic voltage regulator (AVR) control cabinet was acceptable following disconnection of the EDG DAS such that the EDG would remain operable. Specifically, EDG No. 3 was inoperable for 33 days due to a lifted lead in the AVR cabinet that was inadvertently removed from its landed position during the disconnection of the DAS on November 3, 2012. The inspectors determined that the finding was more than minor because it was associated with the Mitigating Systems cornerstone attribute of Equipment Performance and adversely affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Because EDG No. 3 is the swing diesel, this issue affects both Surry Unit 1 which was operating at full reactor power during this period, as well as Surry Unit 2 which was in a refueling outage. The finding was to have impact to short term and long term decay heat removal and required further risk evaluation in accordance with IMC 0609 Appendix A “Significance Determination Process (SDP) for Findings At-Power” for Unit 1 and 0609 Appendix G “Shutdown Operations Significance Determination Process” for Unit 2. A detailed SDP risk evaluation was performed by a regional SRA per NRC IMC 0609 Appendix A and G guidance using the NRC’s SPAR risk model for Surry and the Sapphire 8 risk code. Input was also used from the licensee’s full scope Surry risk model and the Surry Individual Plant Examination of External Events and Fires. The analysis used a 33 day exposure period and no recovery credit was assumed for EDG No. 3. The dominant core damage sequences included Loss of Offsite Power (LOOP) leading to a Loss of Reactor Coolant Pump Seal Cooling and Failure of High Pressure Injection and a LOOP leading to Station Blackout. The risk was mitigated by the availability of the alternate EDG and the Station Blackout Diesel. The result of the risk evaluation was an increase in core damage frequency of  $<1E-6$  per year for both Unit 1 and 2. The finding was determined to be of very low safety significance (Green) finding and has been entered into the licensee’s CAP as CR 499318.

ATTACHMENT: SUPPLEMENTAL INFORMATION

Enclosure

## **SUPPLEMENTAL INFORMATION**

### **KEY POINTS OF CONTACT**

#### **Licensee Personnel**

S. Biedenbach, Lead LORP Instructor  
P. Blasioli, Director, Nuclear Protection Services & Emergency Preparedness  
L. Baker, Supervisor, Nuclear Engineering  
E. Collins, Manager, Emergency Preparedness  
J. Eggart, Manager, Radiation Protection & Chemistry  
B. Garber, Supervisor, Station Licensing  
L. Hilbert, Manager, Outage and Planning  
B. Hoffner, Manager, Nuclear Fleet Emergency Preparedness  
R. Johnson, Manager, Operations  
B. Jurewicz, Senior Nuclear Instructor  
L. Lane, Site Vice President  
D. Lawrence, Director, Station Safety and Licensing  
C. Olsen, Director, Station Engineering  
P. Orrison, Senior Nuclear Instructor  
R. Philpot, Supervisor Nuclear Training  
L. Rollings, EP Staff  
K. Sloane, Plant Manager (Nuclear)\*  
M. Smith, Manager, Nuclear Oversight  
R. Soderholm, Simulator Support coordinator  
J. Spence, Training Manager  
W. Thompson, EP Staff  
N. Turner, Supervisor, Emergency Preparedness  
M. Wilda, Supervisor, Auxiliary Systems

#### **\*Interim Plant Managers**

R. Johnson,  
R. Scanlan  
C. Olsen

**LIST OF ITEMS OPENED, CLOSED AND DISCUSSED**Opened

None

Opened and Closed

05000280,281/2013002-01	NCV	Failure to Follow Procedure Results in Inoperability of One Train of Charging Pump Service Water (Section 4OA3.3)
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Closed

05000281/2013-001-00	LER	Bird Contacting Power Line Results in Emergency Diesel Generator Auto-Start (Section 4OA3.1)
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05000280, 281/2013-001-00	LER	Lack of Established Method Results in Detached Lead and Inoperable EDG (Section 4OA3.2)
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TI 2515/187	TI	Inspection of Near-Term Task Force Recommendation 2.3 Flooding Walkdowns (4OA5.2)
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05000280, 281/2012004-01	URI	Follow-up for NOED 12-2003, Surry Power Station Units 1 and 2, Technical Specification 3.16 Emergency Power System, Specific to EDG 02-EE-EG-1 (Section 4OA5.4)
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05000280, 281/2-12-003	CAL	No. 2-12-003, Surry Power Station Unit nos. 1 and 2, Commitments Regarding Emergency Diesel Generators 1 and 3 (Section 4OA.5)
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Discussed

None

## List of Documents Reviewed

### Section 1R04: Equipment Alignment

#### Procedures

- 2-MOP-SW-001, Charging Pumps Service Water Pumps removal from and/or return to Service, Rev 3.
- 2-OP-FW-001A, Auxiliary Feedwater System Valve Alignment, Rev. 6
- 0-OP-EG-001A, Fuel Oil Storage Outside Area, Rev. 14
- 1-OP-51.5A, Charging Pump CC and SW Systems Valve Alignment, Rev. 19

#### Drawings

- 11548-FM-068A, Flow/Valve Operating Numbers Diagram, Feedwater System, Rev. 60
- 11448-FB-038A, Flow/Valve Operating Numbers Diagram, Fuel Oil Lines, Rev. 49
- 11448-FM-071B, Flow/Valve Operating Numbers Diagram, Circulating and Service Water System, Rev. 59

### Section 1R05: Fire Protection

- ETE-CEP-2011-1002, Fire Protection Program, Rev. 0.
- Surry Power Station Appendix R Report, Rev. 33
- Calculation SEO-245, August 8, 1989

#### Procedures:

- 0-FS-FP-121, Diesel Generator Room Number 1 Elevation 27 Feet – 6 Inches, Rev. 1
- 0-FS-FP-123, Diesel Generator Room Number 3 Elevation 27 Feet – 6 Inches, Rev. 1
- 0-FS-FP-186, Fuel Oil Pump House A Elevation 16 Feet, Rev. 0
- 0-FS-FP-187, Fuel Oil Pump House B Elevation 16 Feet, Rev. 0
- 0-FS-FP-199, Electric Fire Pump Room Elevation 27ft – 6 inches, Rev 1

#### Condition Reports

- |  |  |
|--|--|
| CR458803, 1-FP-P-2 target speed RPM elevated                       | CR496503, 1-FP-P-2   |
| CR458805, Fuel oil level in 1-FP-TK-1 low                          | CR496505, ~10dpm leak from sprinkler head downstream of 1-FP-289           |
| CR459006, Multiple lights non-functional in the Fire Pump House    | CR501077, Bird strike causes loss of 'E' transfer bus and 2H emergency bus |
| CR 61547, Leak on B.5.b 1-FP-P-4 discharge                         | CR501581, Fire pump house damper thermostat needs adjustment               |
| CR463262, Fire pump diesel batteries in Alert                      | CR502547, Security/EQ & Fire Door latch not engaging                       |
| CR493507, Fire protection valve system leakage downstream 1-FP-124 | CR507261, EDG #3 door latch not operating properly                         |
| CR493967, PM data recorded on 1-FP-P-4                             |  |

### Section 1R06: Flood Protection

- Letter 12-208G, Virginia Electric and Power Company Surry Power Station Units 1 and 2 Report in Response to March 12, 2012 Information Request Regarding Flooding Aspects of Recommendation 2.3, November 27, 2012

## **Section 1R11: Licensed Operator Regualification Program**

### Records:

License Reactivation Packages (2 RO, 3 SRO Records Reviewed)  
 LORP Training Attendance records (5 Records Reviewed)  
 Medical Files (20 Files Reviewed)  
 Remedial Training Records (5 Records Reviewed)  
 Remedial Training Examinations (3 Records Reviewed)  
 Feedback Summaries (2 Records Reviewed)

### Written Examinations:

RQ-12.2-XB-1, Rev. 0  
 RQ-12.2-XB-2, Rev. 0  
 RQ-12.2-XB-3, Rev. 0

### Procedures:

CO-PROC-000-TRCP-0012, Rev. 5, NRC Licensing Administration  
 CO-PROC-000-VPAP-2702, Rev. 17, Reactor Operator Training and Licensing  
 SU-PROCSU-ADM-OP-AA-103, Rev. 3, Operator Qualifications  
 SU-PROCSU-ADM-SA-AA-122, Rev. 4, Medical Evaluation  
 SU-PROCSU-ADM-TR-AA-100, Rev. 9, Analysis  
 SU-PROCSU-ADM-TR-AA-101, Rev. 1, Conduct of Training  
 SU-PROCSU-ADM-TR-AA-300, Rev. 7, Development  
 SU-PROCSU-ADM-TR-AA-310, Rev. 1, Just in Time Training  
 SU-PROCSU-ADM-TR-AA-400, Rev. 10, Implementation  
 SU-PROCSU-ADM-TR-AA-410, Rev. 8, OJT and TPE  
 SU-PROCSU-ADM-TR-AA-500, Rev. 13, Training Evaluation  
 SU-PROCSU-ADM-TR-AA-710, Rev. 3, NRC Exam Security Requirements  
 SU-PROCSU-ADM-TR-AA-730, Rev. 4, LO Biennial and Annual Requal Exam  
 LORP TR-AA-0300-TPG Rev 1, Change 2, Training Program Guide  
 TR-AA-SIM-100, Rev. 4, Simulator Modification Process  
 TR-AA-SIM-101, Rev. 1, Simulator Config Control Commit  
 TR-AA-SIM-200, Rev. 3, Simulator Hardware Management  
 TR-AA-SIM-300, Rev. 2, Simulator Software Management  
 TR-AA-SIM-400, Rev. 3, Simulator Performance Testing

### Simulator Steady State Tests:

O-SPS-ANSI-04, Rev. 2, "Operability Test – 25% Steady State One-Hour Run"  
 O-SPS-ANSI-08, Rev. 2, "Operability Test – 75% Steady State One-Hour Run"  
 O-SPS-ANSI-09, Rev. 2, "Operability Test – 100% Steady State One-Hour Run"

### Simulator Normal Evolution Tests:

O-SPS-ANSI-03, Rev. 2, "Operability Test – Nuclear Startup to Rated Power"

### Simulator Transient Tests:

O-SPS-ANSI-10, Rev. 2, "Operability Test – Manual Reactor Trip"

O-SPS-ANSI-14, Rev. 2, "Trip of Single Reactor Coolant Pump"

O-SPS-ANSI-16, Rev. 2, "Maximum Ramp (100% to 75% to 100%) at Ramp Rate of 5%/min"

O-SPS-ANSI-18, Rev. 2, "Unisolable Main Steam Line Rupture"

O-SPS-ANSI-19, Rev. 2, "LOCA to Saturated Conditions (AMSAC, SI & CLS Signals Failed)"

Simulator Scenario Based Tests:

RQ-11.1-SE-7, Rev. 1, 01/13/11, "Surry Simulator Scenario Based Testing Checklist"

RQ-11.1-SE-8, Rev. 1, 01/13/11, "Surry Simulator Scenario Based Testing Checklist"

Condition Reports (CRs):

CR425917, Simplex Locksets

CR431583, Analysis for 2RFO23 Ops Perf Issues

CR431765, Need for Trng for S&L Communicators

CR434830, NRC Form 396s Contain Health Info.pdf

CR449700, LORP Team Failed Eval Scen Crit Task

CR458105, LO Failed Annual Walkthru Exam

CR459064, JPM invalidated due to setup error

CR460601, LO Failed Walkthru Op Eval

CR463987, LO Failed Biennial Written Exam

CR465096, LO Failed RTP Biennial Written

CR471094, Annual Op Ex & Biennial Written Results

CR479917, LORP Exam Results

CR481653, Individual failed LORP 12.5 Written Exam

CR486511, Procedure from Sim Exam left in Simulator

List of Ops Clock HU Reset Corrective Actions 1

List of Ops Clock HU Reset Corrective Actions 2

Scenario Packages:

RQ-13.1-SE-7-DRR, Rev. 0

RQ-13.1-SE-8-DRR, Rev. 0

JPM Packages:

Job Performance Measure LO13-04B, Rev. 10

Job Performance Measure 26.01, Rev. 16

Job Performance Measure 38.10A, Rev. 0

Job Performance Measure 52.10, Rev. 17

Job Performance Measure 81.04, Rev. 17

Job Performance Measure 88.15, Rev. 10

Self Assessment Reports:

SAR 1330 Training Review Boards Documentation

SAR 1544 Self-Assessment of Training Programs on Operator Fundamentals

SAR 1742 Training Impact Report Process

SAR 1934 Evaluation of Failure Rates in Accredited Initial Training Program

**Section 1R12: Maintenance Effectiveness**

0-DRP-SBO, Station Blackout Diesel Instrumentation Setpoints, Ranges, and Tolerances, Rev. 1

Maintenance Rule Evaluation 011993

Apparent Cause Evaluation 378102

Apparent Cause Evaluation 403870

**Section 1R13 Maintenance Risk Assessments**

CR50338, Unit 1 Tave Control loop (1-RC-LOOP-T-1408) troubleshooting due to pressurizer level spike decrease

WO 38103340011, Investigate Tave Control Loop

0-OSP-PL-003, Turbine building Sump Pump Status Verification, Rev 4.

1-ICP-RC-T-005, Delta T/Tave Temperature Control Auctioneered Tave and Delta T, Rev 9.

**Section 1R15: Operability Evaluations**

2-PT-8.1, Reactor Protection System Logic, Rev 33.

Temporary Modification Number S2-13-122, TM to install electrical jumper in support of relays 2-RP-RLY-PRB-XA and 2-RP-RLY-PRB-YA replacement, Rev 0.

WO38103341897, EDG No. 1 post-maintenance test data sheet

1-EMP-P-RT-33, Protective Relay maintenance for Breaker 15H3 Emergency Generator No. 1 Feed to Bus "1H", Rev 10-OTO1.

Drawing No. 11448-FE-21Q, Elementary Diagram 4160V Bus 1H BKR 15H3 & 15H8 – Unit 1, Rev 9.

CR477566, Failed conductor in Cable 1EG89

VTM 38-J304-00001

Technical Report ME-0180, Rev. 2

**Section 1R19: Post Maintenance Testing**

1-OSP-SW-004 Measurement of Macrofouling Blockage of Component Cooling Heat Exchanger, Rev 27.

0-OPT-SW-001, Emergency Service Water Pump 1-SW-P-1A, Rev 48.

R501356, "C" CCHX Macrofouling results unsat in the inoperable range

CR503764, Closed light out for EDG#1 output breaker "15H3"

CR503981, Work Order for troubleshooting 15H3 cable and conductor damage

Dwg. No. 11448-FE-21Q, 4160V bus 1H Bkr 15H3 & 15H8 – Unit 1, Rev 9.

0-FCA-12.00, Emergency diesel generator operation, Rev 15.

CR506779, emergency diesel generator #1 lockout did not operate

1-EMP-P-RT-33, Protective Relay Maintenance for Breaker 15H3 Emergency Generator #1 Feed to Bus "1H", Rev 10.

**Section 4OA5(2): Other Activities****Procedures**

ER-SU-BDB-FLD-001, Walkdown of Flood Protection Features, Rev. 0

**Beyond Design Basis Walkdown Packages**

SU-F-2012-001-00	SU-F-2012-004-00	SU-F-2012-007-00
SU-F-2012-002-00	SU-F-2012-005-00	SU-F-2012-008-00
SU-F-2012-003-00	SU-F-2012-006-00	SU-F-2012-009-00
SU-F-2012-010-00	SU-F-2012-040-00	SU-F-2012-103-00
SU-F-2012-011-00	SU-F-2012-041-00	SU-F-2012-104-00
SU-F-2012-012-00	SU-F-2012-042-00	SU-F-2012-105-00
SU-F-2012-013A-00	SU-F-2012-043-00	SU-F-2012-122-00
SU-F-2012-013B-00	SU-F-2012-044-00	SU-F-2012-123-00
SU-F-2012-013C-00	SU-F-2012-045-00	SU-F-2012-127-00
SU-F-2012-013D-00	SU-F-2012-046-00	SU-F-2012-128-00
SU-F-2012-013E-00	SU-F-2012-047-00	SU-F-2012-133-00
SU-F-2012-013F-00	SU-F-2012-048-00	SU-F-2012-134-00
SU-F-2012-015-00	SU-F-2012-049-00	SU-F-2012-135-00
SU-F-2012-026-00	SU-F-2012-050-00	SU-F-2012-140-00
SU-F-2012-027-00	SU-F-2012-051-00	SU-F-2012-147-00
SU-F-2012-028-00	SU-F-2012-052-00	SU-F-2012-148-00
SU-F-2012-029-00	SU-F-2012-053-00	SU-F-2012-149-00
SU-F-2012-030-00	SU-F-2012-055-00	SU-F-2012-150-00
SU-F-2012-031-00	SU-F-2012-056-00	SU-F-2012-151-00
SU-F-2012-032-00	SU-F-2012-057-00	SU-F-2012-152-00
SU-F-2012-033-00	SU-F-2012-058-00	SU-F-2012-153-00
SU-F-2012-034-00	SU-F-2012-059-00	SU-F-2012-154-00
SU-F-2012-035A-00	SU-F-2012-060-00	SU-F-2012-155-00
SU-F-2012-035B-00	SU-F-2012-061-00	SU-F-2012-156-00
SU-F-2012-035C-00	SU-F-2012-079-00	SU-F-2012-157-00
SU-F-2012-036-00	SU-F-2012-080-00	SU-F-2012-161-00
SU-F-2012-037-00	SU-F-2012-098-00	SU-F-2012-162-00
SU-F-2012-038-00	SU-F-2012-099-00	
SU-F-2012-039-00	SU-F-2012-102-00	

**Condition Reports**

CR484512, BDB 2.3 Flooding Walkdown: Small Margin for ESWPH Doors' Flood Gates



**LIST OF ACRONYMS**

ADAMS	Agencywide Document Access and Management System
ALARA	As Low As Reasonably Achievable
ANS	Alert and Notification System Testing
CA	Corrective Action
CAP	Corrective Action Program
CFR	Code of Federal Regulations
CR	Condition Report
DEP	Emergency Response Organization Drill/Exercise Performance
DOT	Department of Transportation
EAL	Emergency Action Level
EDG	Emergency Diesel Generator
ERO	Emergency Response Organization
HP	Health Physics
HPT	Health Physics Technician
HPAP	Health Physics Administrative Procedure
HRA	High Radiation Area
IMC	Inspection Manual Chapter
ISFSI	Independent Spent Fuel Storage Installation
JPM	Job Performance Measures
LHSI	Low Head Safety Injection
NCV	Non-cited Violation
NEI	Nuclear Energy Institute
NRC	Nuclear Regulatory Commission
OD	Operability Determination
PARS	Publicly Available Records
PCP	Process Control Program
PI	Performance Indicator
PS	Planning Standard
RAB	Reactor Auxiliary Building
RCE	Root Cause Evaluation
RCP	Reactor Coolant Pump
RCS	Reactor Coolant System
RFO	Refueling Outage
RP	Radiation Protection
RTP	Rated Thermal Power
RWP	Radiation Work Permit
SDP	Significance Determination Process
SR	Surveillance Requirements
TDAFWP	Turbine Driven Auxiliary Feedwater Pump
TS	Technical Specifications
UFSAR	Updated Final Safety Analysis Report
URI	Unresolved Item
VEPCO	Virginia Electric and Power Company
VHRA	Very High Radiation Area
VPAP	Virginia Power Administrative Procedure
WO	Work Order