



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

February 2, 2016

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  
05000280/2015004 AND 05000281/2015004**

Dear Mr. Heacock:

On December 31, 2015, the United States Nuclear Regulatory Commission (NRC) completed an inspection at your Surry Power Station, Units 1 and 2. On January 13, 2016, the NRC inspectors discussed the results of this inspection with Mr. R. Simmons and other members of your staff. Inspectors documented the results of this inspection in the enclosed inspection report.

NRC inspectors documented four findings of very low safety significance (Green) in this report. These findings involved violations of NRC requirements. The NRC is treating these violations as non-cited violations (NCVs) consistent with Section 2.3.2.a of the NRC Enforcement Policy.

If you contest the violations or significance of any 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 Title 10 of the Code of Federal Regulations (CFR) 2.390, "Public Inspections, Exemptions, Requests for Withholding," of the NRC's "Agency Rules of Practice and Procedure," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC's Public Document Room or from the Publicly Available Records (PARS) component of the NRC's Agencywide Documents Access and Management System (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

*/RA/*

Steven D. Rose, Chief  
Reactor Projects Branch 5  
Division of Reactor Projects

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

Enclosure:  
IR 05000280/2015004, 05000281/2015004  
w/Attachment: Supplementary Information

cc Distribution via ListServ

D. Heacock

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D. Heacock

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Letter to David Heacock from Steven D. Rose dated February 2, 2016

SUBJECT: SURRY POWER STATION – NRC INTEGRATED INSPECTION REPORT  
05000280/2015003 AND 05000281/2015003

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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: 05000280/2015004, 05000281/2015004

Licensee: Virginia Electric and Power Company (VEPCO)

Facility: Surry Power Station, Units 1 and 2

Location: 5850 Hog Island Road  
Surry, VA 23883

Dates: October 1, 2015 through December 31, 2015

Inspectors: P. McKenna, Senior Resident Inspector  
C. Jones, Resident Inspector  
D. Bacon, Senior Operations Engineer (1R11.3)  
W. Loo, Senior Health Physicist (2RS8)  
R. Kellner, Senior Health Physicist (2RS1)  
A. Sengupta, Reactor Inspector (1R08)

Approved by: Steven D. Rose, Chief  
Reactor Projects Branch 5  
Division of Reactor Projects

Enclosure

## SUMMARY

IR 05000280/2015004, 05000281/2015004; 10/01/2015–12/31/2015; Surry Power Station Units 1 and 2: Maintenance Effectiveness, Identification and Resolution of Problems, and Follow-up of Events and Notices of Enforcement Discretion.

The report covered a three-month period of inspection by resident inspectors and region-based inspectors. Four self-revealing findings were identified and determined to be non-cited violations (NCVs) of very low safety significance. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process" (SDP), dated April 29, 2015. The cross-cutting aspects were determined using IMC 0310, "Components Within The Cross-Cutting Areas" dated December 4, 2014. All violations of NRC requirements are dispositioned in accordance with the NRC's Enforcement Policy, dated February 4, 2015. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 5.

### **Cornerstone: Initiating Events**

- **Green.** A self-revealing, Green non-cited violation (NCV) of Surry Technical Specification (TS) 6.4.A.7 was identified because 2-RC-PCV-2455A, the Unit 2 "A" pressurizer (PZR) spray valve, developed a body to bonnet mechanical joint leak as a result of the failure of the joint upper gasket to adequately seal the joint. The gasket inadequately sealed the body to bonnet joint due to a misalignment of the cage and the cage spacer assembly with the valve body. This misalignment caused the reactor coolant system (RCS) allowable unidentified leak rate to approach the TS limit on July 13, 2015, and subsequently required an unplanned Unit 2 shutdown. This issue was documented in the licensee's corrective action program (CAP) as condition report (CR) 1002302.

The inspectors concluded that the failure of the licensee to have the instructions necessary to successfully accomplish the purpose of 0-MCM-0414-13, "Copes-Vulcan 4 inch, 1500 pound Control Valve, Model D-1000 with Bellows Overhaul," Revision 3, as required by Dominion procedure SPAP-0504, "Technical Procedure Writers Guide," Revision 9, and to correctly measure and resolve the upper gasket crush on "A" PZR spray valve, was a performance deficiency (PD). Using IMC 0612, Appendix B, Issue Screening, dated September 7, 2012, the inspectors determined that the PD was more than minor because it was associated with the procedural quality attribute of the Initiating Events Cornerstone and adversely affected the cornerstone objective to limit the likelihood of events that upset stability and challenge critical safety functions during shutdown as well as power operations. Using IMC 0609.04, "Initial Characterization of Findings," Table 2, dated June 19, 2012; the finding was determined to affect the Initiating Events Cornerstone. The inspectors screened the finding using Manual Chapter 0609, Appendix A, "SDP for Findings at-Power," dated June 19, 2012, and determined that it screened as Green because the deficiency did not cause a loss of mitigation equipment relied upon to transition the plant to a stable shutdown condition. This finding has a cross-cutting aspect in the consistent process aspect of the human performance area, H.13, because the licensee did not use a systematic approach to evaluate all available data in deciding to return the "A" PZR spray valve to service during the spring 2014 refueling outage (RFO). (Section 1R12)

- Green. A self-revealing, Green NCV of Surry TS 6.4.A.7 was identified because the Unit 2 “H” emergency bus was lost during performance of 2-PT-2.33A, “Emergency Bus Undervoltage and Degraded Protection Test “H” Train,” on September 16, 2015. An inadequate procedure allowed steps in the procedure to continue without verification that a tripped relay had not reset. Specifically, 2-PT-2.33A did not have instructions necessary to validate the state of the normally energized undervoltage (UV) relays once power was restored to the relay. This allowed an UV relay to remain in a deenergized state when the next relay was tested. As a consequence, the two of three coincidence was met for the Unit 2 “H” emergency bus to deenergize and automatically start and load the #2 emergency diesel generator (EDG) onto the Unit 2 “H” bus. This issue was documented in the licensee’s CAP as CR 1009999.

The inspectors concluded that the failure of the licensee to have the instructions necessary to successfully accomplish the purpose of 2-PT-2.33A, as required by Dominion procedure SPAP-0504, was a PD. Using IMC 0612, Appendix B, “Issue Screening,” dated September 7, 2012, the inspectors determined that the performance deficiency was more than minor because it was associated with the procedural quality attribute of the Initiating Events Cornerstone and adversely affected the cornerstone objective to limit the likelihood of events that upset stability and challenge critical safety functions during shutdown as well as power operations. Using IMC 0609.04, “Initial Characterization of Findings,” Table 2, dated June 19, 2012; the finding was determined to affect the Initiating Events Cornerstone. The inspectors screened the finding using IMC 0609, Appendix A, “SDP for Findings at-Power,” dated June 19, 2012, and determined that it screened as Green because the deficiency did not involve the complete or partial loss of a support system that contributes to the likelihood, or cause, an initiating event and affected mitigation equipment. This finding has a cross-cutting aspect in the documentation aspect of the human performance area, H.7, because the licensee did not create and maintain complete and accurate documentation to validate that an emergency bus UV relay had been restored to its normal energized state during testing. (Section 1R12)

- Green. A self-revealing Green NCV of Surry TS 6.4.A.7 was identified because Unit 2 tripped during performance of 2-OP-TM-001, “Turbine – Generator Startup to 20% - 25% Turbine Power,” on July 21, 2015. An inadequate procedure allowed the main turbine (MT) governor valves to open rapidly during MT overspeed protection controller (OPC) testing, increasing MT first stage pressure above the P-2 and P-7 reactor protection system (RPS) permissive step points, and subsequently causing a reactor trip. Specifically, 2-OP-TM-001 did not have the minimum level of information needed to ensure that there was no speed error between MT speed and the setter position before initiating the OPC test. This allowed the test to be conducted with a speed error that caused the governor valves to open rapidly at the end of the test and subsequently cause a reactor trip. This issue was documented in the licensee’s CAP as CR 1003328.

The inspectors concluded that the failure of the licensee to have the minimum level of information needed to ensure task critical actions in 2-OP-TM-001 and for operators to avoid error traps in conducting the MT OPC test, as required by Dominion procedure SPAP-0504, was a PD. Using IMC 0612, Appendix B, “Issue Screening,” dated September 7, 2012, the inspectors determined that the performance deficiency was more than minor because it was associated with the procedural quality attribute of the Initiating Events Cornerstone and adversely affected the cornerstone objective to limit the likelihood of events that upset stability and challenge critical safety functions during

shutdown as well as power operations. Using IMC 0609.04, "Initial Characterization of Findings," Table 2, dated June 19, 2012; the finding was determined to affect the Initiating Events Cornerstone. The inspectors screened the finding using IMC 0609, Appendix A, "SDP for Findings at-Power," dated June 19, 2012, and determined that it screened as Green because the deficiency did not involve the complete or partial loss of a support system that contributes to the likelihood, or cause, an initiating event and affected mitigation equipment. This finding has a cross-cutting aspect in the documentation aspect of the human performance area, H.7, because the licensee did not create a complete procedure for testing the MT overspeed protection. (Section 40A3)

### **Cornerstone: Mitigating Systems**

- **Green.** A self-revealing Green NCV of Surry TS 6.4.D was identified because the preventative maintenance cleaning of the six inch service water (SW) piping upstream of the SW rotating strainers was deferred with insufficient technical justification. Specifically, the licensee did not follow procedure ER-AA-PRS-1010, "Preventative Maintenance Task Basis & Maintenance Strategy," and provide justification for a differing disposition when they deferred the cleaning of the six inch SW header three times. A lack of maintenance on this piping allowed excessive biofouling and subsequent blockage of the SW rotating strainer to occur. This was discovered when the Unit 1 and 2 "A" charging service water (CHSW) pumps experienced a zero flow rate during performance of 0-OPT-VS-001, "Control Room Air Conditioning System Pump and Valve Inservice Testing," Revision 43, on July 24, 2015. This issue was documented in the licensee's CAP as CR 1003878.

The inspectors concluded that the failure of the licensee to provide technical justification to defer the preventative maintenance of the six inch SW header was a PD. Using IMC 0612, Appendix B, "Issue Screening," dated September 7, 2012, the inspectors determined that the PD was more than minor because it was associated with the equipment performance attribute of the Mitigating Systems Cornerstone, and it adversely affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Using IMC 0609.04, "Initial Characterization of Findings," Table 2, dated June 19, 2012, the finding was determined to affect the Mitigating Systems Cornerstone. The inspectors screened the finding using IMC 0609, Appendix A, "SDP for Findings at-Power," dated June 19, 2012, and determined that it screened as Green because the deficiency did not affect the design or qualification of the charging pump service water pump system and it did not represent a loss of system safety function. This finding has a cross-cutting aspect in work management aspect of the human performance area, H.5, because the licensee did not implement a process of planning, controlling, and executing work activities such that nuclear safety is the overriding priority. Specifically, ER-AA-102, "Operability Determination," Revision 15 was not followed to ensure the management of risk commensurate to the work and the need for coordination with different groups was obtained. (Section 40A2)

## REPORT DETAILS

### Summary of Plant Status

Unit 1 operated at or near rated thermal power (RTP) from the beginning of the inspection period until October 13, 2015, when the reactor plant tripped initiated by a turbine trip by main generator trip. Unit 1 then entered an unplanned maintenance outage to repair the main generator exciter and rotor. It remained offline until November 18, when the main turbine was synchronized to the grid. On November 20, the unit reached RTP and operated there for the remainder of the inspection period.

Unit 2 operated at or near RTP from the beginning of the inspection period until October 19, 2015, when it was shutdown to begin a planned RFO. It remained offline until December 11, when the main turbine was synchronized to the grid. On December 18, the unit reached RTP and operated there for the remainder of the inspection period.

### 1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

#### 1R01 Adverse Weather Protection

##### .1 Seasonal Readiness Reviews for Cold Weather

###### a. Inspection Scope

The inspectors reviewed the licensee's preparations for seasonal cold weather. The inspection focused on verification of design features and implementation of the licensee's procedure for cold weather conditions 0-OSP-ZZ-001, "Cold Weather Preparation," Revision 18. The inspectors walked down key structures including the turbine and auxiliary buildings, safeguards buildings, the emergency switchgear rooms, and emergency battery rooms and verified heating, ventilation and cooling (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.

###### b. Findings

No findings were identified.

##### .2 Readiness for Impending Adverse Weather Conditions

###### a. Inspection Scope

The inspectors performed a site specific weather related inspection due to anticipated adverse weather conditions, specifically preparations for hurricane Joaquin. The inspectors reviewed the licensee's preparations for potential severe weather as well as severe weather procedure 0-OP-ZZ-021, "Severe Weather Preparation," Revision 11. The inspectors walked down site areas which included the electrical switchyard,

emergency diesel generators, emergency switchgear rooms, emergency service water pump house, and the turbine, safeguards, and auxiliary buildings. During the walkdown, the inspectors looked for loose items and/or debris that could become a missile hazard during high winds, verified flooding barriers were available and/or in place, and verified that the emergency equipment was available and in the required standby mode.

b. Findings

No findings were identified.

1R04 Equipment Alignment

.1 Partial Walkdown

a. Inspection Scope

The inspectors conducted three 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, USFAR, 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.

- EDGs 1 and 3 while an outage maintenance package was performed on EDG 2.
- Unit 1 Low Head Safety Injection (LHSI) system after "A" and "B" LHSI pump performance test.
- Unit 1 Motor Driven Auxiliary Feedwater (MDAFW) pumps after completion of the "B" MDAFW pump performance test.

b. Findings

No findings were identified.

.2 Complete Walkdown

a. Inspection Scope

The inspectors performed a detailed walkdown and inspection of the Unit 1 and Unit 2 main control room (MCR) chiller SW system to verify the systems were properly aligned and capable of performing their safety function, and to assess their material condition. During the walkdown, the inspectors verified breaker positions were in the proper alignment, component labeling was accurate, hangers and supports were functional, and local indications were accurate. Recent testing history was also reviewed to verify that standby components were performing within their design. The plant health report, system drawings, condition reports, the UFSAR, and TSs were reviewed and outstanding deficiencies were verified to be properly classified and not affect system operability and capability to perform its safety function. The inspectors reviewed the corrective action program to verify equipment alignment issues were being identified and resolved.

b. Findings

No findings were identified.

1R05 Fire Protection

.1 Quarterly Fire Protection Reviews

a. Inspection Scope

The inspectors conducted tours of the five 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 10, CM-AA-FPA-101, "Control of Combustible and Flammable Materials," Revision 8, and CM-AA-FPA-102, "Fire Protection and Fire Safe Shutdown Review and Preparation Process and Design Change Process," Revision 5. 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.

- Unit 2 Turbine Building Basement
- #3 EDG Room
- Fire Pump House
- Auxiliary Building
- Unit 2 Containment

b. Findings

No findings were identified.

1R06 Flood Protection Measures

a. Inspection Scope

The inspectors reviewed the internal flood protection measures and procedural controls established to address potential flooding in the Unit 1 and 2 turbine buildings, the emergency switchgear room (ESGR), and mechanical equipment rooms (MERs) 3 and 4 during a modification of the floor drain system backflow preventers in the ESGR and MER 3 and 4. The inspectors conducted a walk down of the affected areas to observe and assess the condition of the installed flood dikes, floor drain backflow preventers, the sealing of holes and penetrations between flood areas, the adequacy of water tight doors, the operability of flooding alarms, and the installed sump pumps. The inspectors reviewed the documentation on previous flood mitigation modifications made to these areas and reviewed the corrective action program to verify internal flooding related problems were being identified and properly addressed.

b. Findings

No findings were identified.

1R07 Heat Sink Performance

a. Inspection Scope

The inspectors reviewed the “C” and “D” component cooling (CC) heat exchangers (HXs) to determine their readiness and availability. The inspectors reviewed the system data maintained by the system engineer, maintenance rule information, specific commitments, and design basis information. The inspectors reviewed testing procedures and inspection results to confirm that the CCHXs were still able to perform their functions and that planned corrective actions were appropriate. The inspectors verified that significant heat exchanger performance issues were being entered into the licensee’s CAP and appropriately addressed.

b. Findings

No findings were identified.

1R08 Inservice Inspection Activities

a. Inspection Scope

Non-Destructive Examination Activities and Welding Activities

From October 26 - 30, 2015, the inspectors conducted an onsite review of the implementation of the licensee’s inservice inspection (ISI) program for monitoring degradation of the reactor coolant system boundary, risk-significant piping and component boundaries, and containment boundaries in Unit 2.

The inspectors either directly observed or reviewed the following non-destructive examinations (NDEs), mandated by the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (BPVC) (Code of Record: 2004 Edition) to evaluate compliance with the ASME code, Section XI and Section V requirements, and if any indications or defects were detected, to evaluate if they were dispositioned in accordance with the ASME Code or an NRC-approved alternative requirement. The code of record for the containment program is the 2001 Edition with 2003 Addenda. The inspectors also reviewed the qualifications of the NDE technicians performing the examinations to determine whether they were current, and in compliance with the ASME code requirements.

- Work Order (WO) 38103575886, Ultrasonic Testing (UT), Flow Accelerated Corrosion (FAC) 90 Degree Elbow 1-inch Line component 2-ES-PSF2-179, Extraction Steam (observed and reviewed)
- WO 38103538072, Penetrant Testing (PT), Supports H0003-1, 2, 3, 4, 12-SI-247, Safety Injection, Class 1 (observed and reviewed)
- WO 38103538072, Visual Testing (VT) 3, Spring Can Support 2-SI-H003B, 12-SI-247, Safety Injection, Class 1 (reviewed)

- WO 38103575886, UT, FAC, 2-CN-PPS-113, Straight Pipe Weld to Weld, Condensate System (reviewed)
- WO 38103538072, manual UT, Elbow Pipe, 4-RC-315/2-33, Reactor Coolant System, Pressurizer Spray, Class 1 (observed and reviewed)
- WO 38103575886, UT, FAC, 2-FW-PSF2-12, 90 degree Elbow, Feedwater System (reviewed)
- WO 38103538072, VT-2, N-722-1, Component 2-RC-R-1/BMI, Bottom Mounted Instrumentation, Reactor Coolant System, Class 1 (reviewed)
- WO 38103359427, Radiography Testing, 3-SI-366, Safety Injection, Class 2 (reviewed)
- WO 38103359427, UT, 3-SI-366, Safety Injection, Class 2 (reviewed)
- WO 38103359427, PT, 3-SI-366, Safety Injection, Class 2 (reviewed)

The inspectors either directly observed or reviewed the following welding activities, qualification records, and associated documents, in order to evaluate compliance with procedures and the ASME Code, Section XI and Section IX requirements. Specifically, the inspectors reviewed the WO, repair and replacement plan, weld data sheets, welding procedures, procedure qualification records, welder performance qualification records, and NDE reports.

- WO 38103359427, PT, 3-SI-366, Safety Injection, Class 2 (reviewed)
- WO 38103447368, 2-inch blind flange connector, 2-CH-1503, Charging Volume and Control System (CVCS), Class 2 (reviewed)

During non-destructive surface and volumetric examinations performed since the previous refueling outage, the licensee did not identify any relevant indications that were analytically evaluated and accepted for continued service; therefore, no NRC review was completed for this inspection procedure (IP) attribute.

#### Pressurized Water Reactor Vessel Upper Head Penetration Inspection Activities

The inspectors verified that for the Unit 2 vessel head, a bare metal visual examination and a volumetric examination were not required during this outage, in accordance with the requirements of ASME Code Case N-729-1 and 10 CFR 50.55a(g)(6)(ii)(D).

The licensee did not identify any relevant indications that were accepted for continued service. Additionally, the licensee did not perform any welding repairs to the vessel head penetrations since the beginning of the last Unit 2 RFO; therefore, no NRC review was completed for these IP attributes.

#### Boric Acid Corrosion Control Inspection Activities

The inspectors reviewed the licensee's boric acid corrosion control (BACC) program activities to determine if the activities were implemented in accordance with the commitments made in response to NRC Generic Letter 88-05, "Boric Acid Corrosion of Carbon Steel Reactor Pressure Boundary Components in PWR Plants," and applicable industry guidance documents. Specifically, the inspectors performed an onsite records review of procedures, and the results of the licensee's containment walkdown inspections performed during the current refueling outage. The inspectors also interviewed the BACC program owner, conducted an independent walkdown of

containment to evaluate compliance with licensee BACC program requirements, and verified that degraded or non-conforming conditions such as boric acid leaks, were properly identified and corrected in accordance with the licensee's BACC, and CAP.

The inspectors reviewed the following engineering evaluations completed for evidence of boric acid leakage, to determine if the licensee properly applied applicable corrosion rates to the affected components, and properly assessed the effects of corrosion-induced wastage on structural or pressure boundary integrity, in accordance with the licensee procedures.

- CR 1002524, Body to Bonnet Leak 2-RC-PCV-2455-A, Recirculation Spray (RS) HX
- CR 1001385, Body to Bonnet, Pressurizer Spray Valve, 2-RC-PCV-2455A
- CR 576750, Packing Leak, Charging Aux Spray, 2-CH-HCV-2311

The inspectors reviewed the following CRs and associated corrective actions related to evidence of boric acid leakage, to evaluate if the corrective actions completed were consistent with the requirements of the ASME Code and 10 CFR Part 50, Appendix B, Criterion XVI.

- CR 1015097, Boric Acid on 2-SI-124
- CR 1014392, 2-RC-ICV-3258 has BA Leak in fitting to the left of Valve
- CR 1014025, Through Wall Leak developed in 02-CW-PP-96.00-WC-PIPE-102-00
- CR 1006945, Indications of Leakby at 2-SI-500

#### Steam Generator Tube Inspection Activities

The inspectors verified that for the Unit 2 steam generator (SG) "B" tubes, no inspection activities were originally required for this refueling outage, in accordance with the requirements of the ASME Code, the licensee's TSs, and Nuclear Energy Institute (NEI) 97-06, "Steam Generator Program Guidelines." However, since during the inspection of SG "C" indications were found, the scope of the inspection was expanded to include 50% of SG B tubes. Required expansion scope is 20 %sample per the Electric Power Research Institute (EPRI) Steam Generator Examination Guidelines.

The inspectors reviewed the eddy current (EC) examination activities performed in Unit 2 SGs "A" and "C" during the current RFO, to verify compliance with the licensee's TSs, ASME BPVC Section XI, and NEI 97-06, "Steam Generator Program Guidelines."

The inspectors reviewed the scope of the EC examinations, and the implementation of scope expansion criteria, to verify that these were consistent with the EPRI Pressurized Water Reactor Steam Generator Examination Guidelines, Revision 7. The inspectors reviewed documentation for a sample of EC data analysts, probes, and testers to verify that personnel and equipment were qualified to detect the applicable degradation mechanisms, in accordance with the EPRI Examination Guidelines. This review included a sample of site-specific Examination Technique Specification Sheets (ETSSs) to verify that their qualification, and site-specific implementation were consistent with Appendix H or I of the EPRI Examination Guidelines. The inspectors also reviewed a sample of EC data for SG tubes A-R11C45, A-R40C26, C-R35C19, and C-R18C6, with a qualified data analyst to confirm that data analysis, and equipment configuration, were performed in accordance with the applicable ETSSs and site-specific analysis

guidelines. The inspectors verified that recordable indications were detected and sized in accordance with vendor procedures.

The inspectors selected a sample of degradation mechanisms from the Unit 2 Degradation Assessment report (i.e., anti-vibration bar wear), and verified that their respective in-situ pressure testing criteria were determined in accordance with the EPRI Steam Generator Integrity Assessment Guidelines, Revision 3. Additionally, the inspectors reviewed EC indication reports to determine whether tubes with relevant indications were appropriately screened for in-situ pressure testing. The inspectors also compared the latest EC examination results with the last Condition Monitoring and Operational Assessment report for Unit 2, to assess the licensee's prediction capability for maximum tube degradation, and number of tubes with indications. The inspectors verified that the licensee's evaluation was conservative, and that current examination results were bound by the Operational Assessment projections.

The inspectors assessed the latest EC examination results to verify that new degradation mechanisms, if any, were identified and evaluated before plant startup. The review of EC examination results included the disposition of potential loose part indications on the SG secondary side, to verify that corrective actions for evaluating and retrieving loose parts were consistent with the EPRI Guidelines. The inspectors also reviewed a sample of primary-to-secondary leakage data for Unit 2, to confirm that operational leakage in each SG remained below the detection or action level threshold during the previous operating cycle.

There were three indications of single circumferential cracking discovered in the "C" SG hot leg located 3.38 inches from the tube end. The following indications were plugged and stabilized: R6C41, R7C46, and R27C65. R20C62 was plugged preventively because of a dent in the tube and to avoid unnecessary dose during next outage inspection.

The inspectors' review included the implementation of tube repair criteria and repair methods, to verify they were consistent with plant TSs and industry guidelines. The inspectors verified that the licensee had selected the appropriate tubes for plugging based on the required plugging criteria. The inspectors reviewed the tube plugging procedure, and a sample of tube plugging results for tube C-R6C41, R7C46, R20C62, and R27C65 to determine if the licensee installed the tube plugs in accordance with the applicable procedures.

Furthermore, the inspectors interviewed licensee staff and reviewed a sample of inspection results for the inspection conducted in the secondary side internals of SGs "A" and "C" to verify that potential areas of degradation based on site-specific operating experience (OE) were inspected, and appropriate corrective actions were taken to address degradation indications. This review included the results of Foreign Object Search and Retrieval activities in both SGs, and an evaluation for a potential loose part in the secondary side of SGs "A" and "C."

#### Identification and Resolution of Problems

The inspectors reviewed a sample of ISI-related issues entered into the CAP to determine if the licensee had appropriately described the scope of the problem, and had initiated corrective actions. The review also included the licensee's consideration and

assessment of OE events applicable to the plant. The inspectors performed this review to ensure compliance with 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," requirements.

b. Findings

No findings were identified.

1R11 Licensed Operator Regualification Program

.1 Resident Inspector Quarterly Review

a. Inspection Scope

The inspectors observed and evaluated a licensed operator simulator exercise given on December 9, 2015. The scenario involved flooding in the turbine building basement due to a break in the Unit 1 "A" main condenser circulating water inlet isolation valve. The scenario involved a reactor trip and an alert emergency action declaration. 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 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.

- On October 16, Unit 1 reactor plant cooldown for the forced maintenance outage on the main generator exciter
- On October 18, Unit 2 reactor plant shutdown for a RFO
- On November 17, Unit 1 reactor startup
- On December 1, Unit 2 reactor startup

b. Findings

No findings were identified.

.3 Annual Review of Licensee Requalification Examination Results

a. Inspection Scope

On February 13, 2015, the licensee completed the annual requalification operating examinations required to be administered to all licensed operators in accordance with Title 10 of the Code of Federal Regulations 55.59(a)(2), "Requalification Requirements," of the NRC's "Operator's Licenses." The inspectors performed an in-office review of the overall pass/fail results of the individual operating examinations and the crew simulator operating examinations in accordance with IP 71111.11, "Licensed Operator Requalification Program." These results were compared to the thresholds established in Section 3.02, "Requalification Examination Results," of IP 71111.11.

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 problem(s). 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 6, and ER-AA-MRL-100, "Implementing Maintenance Rule," Revision 10.

- CR 1002302, Unit 2 "A" PZR spray valve body to bonnet leak
- CR 1009999, Unit 2 "H" emergency bus UV testing

b. Findings

.1 Insufficient Gasket Crush on Pressurizer Spray Valve Body to Bonnet Joint

Introduction: A self-revealing Green NCV of Surry TS 6.4.A.7 was identified because 2-RC-PCV-2455A, the Unit 2 "A" PZR spray valve, developed a body to bonnet mechanical joint leak as a result of the failure of the joint upper gasket to adequately seal the joint. The gasket inadequately sealed the body to bonnet joint due to a misalignment of the cage and the cage spacer assembly with the valve body. This misalignment caused the RCS allowable unidentified leak rate to approach the TS limit

on July 13, 2015, and subsequently required an unplanned Unit 2 shutdown. This issue was documented in the licensee's CAP as CR 1002302.

Description: On March 19, 2014, Unit 2 was shutdown when RCS unidentified leakage approached the TS limit of 1 gallon per minute (GPM) after an attempt to stop packing leakage on the "A" PZR spray valve by injecting a leak sealant compound into the packing gland area. The leak sealant repair was unsuccessful at power and was successfully completed with the unit shutdown for a two day forced maintenance outage from March 19 – 21, 2014. Unit 2 remained operating at RTP after starting up from the maintenance outage and the "A" PZR spray valve was permanently repaired during the spring 2014 Unit 2 RFO. This repair consisted of an overhaul of the valve internals and repacking of the valve. The "A" PZR spray valve was returned to service on May 15, 2014, after the repair was completed. Both Unit 2 PZR spray valves had previously been scheduled for replacement to a new design valve in the fall 2015 Unit 2 RFO.

On July 7, 2015, a body to bonnet leak was identified on the Unit 2 "A" PZR spray valve after a containment entry was made due to a step increase in Unit 2 RCS unidentified leak rate. A contractor was hired to install an enclosure around the "A" PZR spray valve body to bonnet mechanical joint and to inject a leak sealant compound into the enclosure. This was planned to be accomplished while Unit 2 was at RTP on July 10, but repeated attempts to get the leak sealant to harden were unsuccessful and the licensee decided to shutdown Unit 2 on July 13 to perform the leak sealant repairs. The body to body joint was successfully injected with leak sealant while Unit 2 was shutdown and Unit 2 returned on line on July 22.

The licensee conducted a root cause evaluation (RCE) and determined the direct cause of the PZR spray valve body to bonnet mechanical joint leak was the result of the failure of the gasket to adequately seal the joint. The inadequate seal of the joint was the result of the misalignment of the cage and the cage spacer assembly with the valve body. The misalignment caused less than full force to be applied on the body to bonnet joint upper gasket the entire 360 degrees of the seating surface. The licensee determine the root cause for the misalignment was that the procedure for the repair of the PZR spray valve, 0-MCM-0414-13, "Copes-Vulcan 4 inch, 1500 pound Control Valve, Model D-1000 with Bellows Overhaul," Revision 3, did not have sufficient detail and guidance to ensure the misalignment condition was resolved prior to placing the valve in service. The measurements to ensure that the gasket would crush sufficiently were taken 90 degrees apart around the components and then averaged together. This method allowed individual measurements to be out of specification at one quartile, but to be in specification overall. Thus, the procedure indirectly allowed insufficient gasket crush at one quartile. Additionally, the RCE also notes that when the maintenance personnel first attempted to take these measurements, it could not be accomplished in procedural order because of the "inability to get the cage and spacer on a level plane" (as documented in a licensee engineering log entry on May 13th).

The licensee also determined that a contributing cause was that there were opportunities for the licensee to make more conservative decisions based on information available during the overhaul of the "A" PZR spray valve during the spring 2014 RFO. Besides the "Inability to get the cage and space on a level plane," there was discussion of using a 0.175 inch gasket instead of a 0.125 inch gasket when the first set of averaged measurements were out of specification (this out of specification was resolved by taking a second set of independent measurements). Additionally, a CR was written (CR

549000) to document possible misalignment in the cage assembly as demonstrated by the post maintenance test (PMT) flow scan traces as the valve plug entered and exited the valve seating area. Once the valve was seated, the valve sealing characteristics were determined to be within specified tolerances.

Dominion procedure SPAP-0504, "Technical Procedure Writers Guide," Revision 9, states in section 6.3.9 that "each technical procedure shall contain the Instructions Section which provides the step-by-step instructions necessary to fulfill the purpose of the procedure." In procedure 0-MCM-0414-13, the purpose of the procedure is to provide instructions for the disassembly, inspection, rework or replacement, and assembly of Copes Vulcan 4 inch, 1500 pound control valves, Model D-1000 with bellows. The instructions section of 0-MCM-0414-13, section 6.7, "Valve Cleaning and Inspection," stated an acceptance criteria for "Upper Gasket Crushed Thickness" that was obtained through the average of four ninety degree measurements and ignored individual quartiles that were out of specification. Not evaluating the individual quartiles allowed the "A" PZR spray valve to be reassembled with insufficient crush on the upper gasket which eventually led to the valve body to bonnet leak.

Analysis: The inspectors concluded that the failure of the licensee to have the instructions necessary to successfully fulfill the purpose of 0-MCM-0414-13, as required by Dominion procedure SPAP-0504, and to correctly measure and resolve the upper gasket crush on "A" PZR spray valve, was a PD that was within the licensee's ability to foresee and correct. Specifically, 0-MCM-0414-13 did not have instructions necessary to evaluate all recorded valve dimensional data which would have diagnosed a cage and cage spacer misalignment with the valve body. This allowed the "A" PZR spray valve to be reassembled with insufficient upper gasket crush on the body to bonnet mechanical joint. As a consequence of the insufficient upper gasket crush, the "A" PZR spray valve experienced a body to bonnet mechanical joint leak that approached the TS allowable unidentified RCS leak rate on July 13, 2015, which subsequently required an unplanned shutdown of Unit 2. Using IMC 0612, Appendix B, "Issue Screening," dated September 7, 2012, the inspectors determined that the performance deficiency was more than minor because it was associated with the procedural quality attribute of the Initiating Events Cornerstone and adversely affected the cornerstone objective to limit the likelihood of events that upset stability and challenge critical safety functions during shutdown as well as power operations.

Using IMC 0609.04, "Initial Characterization of Findings," Table 2, dated June 19, 2012; the finding was determined to affect the Initiating Events Cornerstone. The inspectors screened the finding using IMC 0609, Appendix A, "SDP for Findings at-Power," dated June 19, 2012, and determined that it screened as Green because the deficiency did not cause a loss of mitigation equipment relied upon to transition the plant to a stable shutdown condition. This finding has a cross-cutting aspect in the consistent process aspect of the human performance area, H.13, because the licensee did not use a systematic approach to evaluate all available data in deciding to return the "A" PZR spray valve to service during the spring 2014 RFO.

Enforcement: Surry TS 6.4.A.7 requires, in part, that "detailed written procedures with appropriate instructions shall be provided for conditions that include: corrective maintenance operations which would have an effect on the safety of the reactor." These requirements are implemented, in part, by Dominion procedure 0-MCM-0414-13, "Copes-Vulcan 4 inch, 1500 pound Control Valve, Model D-1000 with Bellows Overhaul,"

Revision 3.” Contrary to the above, on May 15, 2014, after performing corrective maintenance to repair a packing leak that had been leak sealant injected, the “A” PZR spray valve was returned to service with insufficient upper gasket crush on the body to bonnet joint. This occurred because 0-MCM-0414-13 did not have appropriate instructions to evaluate all data measurements during the reassembly of the valve. Because the licensee entered the issue into their corrective action program as CR 1002302 and the finding is of very low safety significance (Green), this violation is being treated as an NCV, consistent with Section 2.3.2 of the NRC Enforcement Policy: NCV 05000281/2015004-01, Insufficient Gasket Crush on Pressurizer Spray Valve Body to Bonnet Joint.

## .2 Inadequate Testing Procedure Causes an Emergency Bus to Denergize

Introduction: A self-revealing Green NCV of Surry TS 6.4.A.7 was identified because the Unit 2 “H” emergency bus was lost during performance of 2-PT-2.33A, “Emergency Bus Undervoltage and Degraded Protection Test “H” Train,” Revision 5, on September 16, 2015. An inadequate procedure allowed steps in the procedure to continue without detecting that a tripped relay had not reset. This issue was documented in the licensee’s CAP as CR 1009999.

Description: On September 16, 2015, the licensee was conducting 2-PT-2.33A, the quarterly test to verify the UV and degraded voltage protection scheme of the Unit 2 “H” emergency bus as required by TS table 4.1-1. Performance of the UV portion of the test is controlled by the procedure which has the maintenance personnel open knife switches to denergize a UV relay, then close the knife switch to place the UV relay in its normal energized state. The maintenance personnel verify that the UV relays have been deenergized by an indicating light that is extinguished and then is illuminated when the relay is energized. There are three Westinghouse model ARD440UR relays installed for each emergency bus UV protection circuit, and two of these three relays must deenergize for the protective action of opening the off-site power supply breaker to the emergency bus and giving a start signal to an EDG. Upon reaching the UV setpoint for the 2H bus, the relays will deenergize.

When maintenance personnel performed step 6.3.5 of the procedure to deenergize the second UV relay after testing the first UV relay, the #2 EDG started and assumed the load of the Unit 2 “H” emergency bus through the closure of the 25H3 breaker. During the testing sequence the indicating light for the first UV relay test extinguished when the knife switch was opened and illuminated when the knife switch was closed. The indicating light had also extinguished when the second UV relay was tested. The licensee entered a seven day limiting condition for operation (LCO) for offsite power being inoperable to an emergency bus in accordance with TS 3.16.B.2 and also made an eight hour report to the NRC for a valid safety system actuation. As immediate corrective actions for the loss of the Unit 2 “H” emergency bus, the licensee conducted troubleshooting to diagnose the cause. During the troubleshooting the licensee found that UV relay 27AX-2H2, the first relay tested, would not reset upon energizing its associated relay coil and had remained denergized during the 2-PT-2.33A UV testing. When the next relay was denergized, per the procedure, the 2 of 3 coincidence was met to open the 25H8 breaker and start the #2 EDG. The licensee replaced the 27AX-2H2 relay, restored normal off-site power to the Unit 2 “H” emergency bus, and exited the LCO.

The licensee conducted an apparent cause evaluation (ACE) and determined the cause of the loss of the Unit 2 “H” bus and the automatic start of the #2 EDG was that procedure 2-PT-2.33A did not verify the position of individual contacts located on the UV relays. The indicating lights in the procedure, which were being used to verify the position of the relays, only verify that the associated relay coils are being supplied power. When the first UV relay remained deenergized in the procedure, its associated relay coil did get power and the indicating light did illuminate when the knife switch was closed. This allowed the 2 of 3 coincidence to be achieved when the second UV relay was deenergized in the next step of the procedure.

Dominion procedure SPAP-0504, “Technical Procedure Writers Guide,” Revision 9, states in section 6.3.9 that “each technical procedure shall contain the Instructions Section which provides the step-by-step instructions necessary to fulfill the purpose of the procedure.” In procedure 2-PT-2.33A, the purpose of the procedure is “to provide the step by step test of undervoltage and degraded voltage protection scheme as required by TS Table 4.1-1.” The instruction section of the procedure never actually verified the state of the UV relays when power was returned to the relays, because the indicating lights only verified that power was applied to the associated relay coils.

Analysis: The inspectors concluded that the failure of the licensee to have the instructions necessary to successfully fulfill the purpose of 2-PT-2.33A, as required by Dominion procedure SPAP-0504, was a PD that was within the licensee’s ability to foresee and correct. Specifically, 2-PT-2.33A did not have instructions necessary to validate the state of the normally energized UV relays once power was restored to the relay. This allowed an UV relay to remain in a deenergized state when the next relay was tested. As a consequence, the two of three coincidence was met for the Unit 2 “H” emergency bus to deenergize and automatically start and load the #2 EDG onto the Unit 2 “H” bus. Using IMC 0612, Appendix B, “Issue Screening,” dated September 7, 2012, the inspectors determined that the performance deficiency was more than minor because it was associated with the procedural quality attribute of the Initiating Events Cornerstone and adversely affected the cornerstone objective to limit the likelihood of events that upset stability and challenge critical safety functions during shutdown as well as power operations.

Using IMC 0609.04, “Initial Characterization of Findings,” Table 2, dated June 19, 2012; the finding was determined to affect the Initiating Events Cornerstone. The inspectors screened the finding using IMC 0609, Appendix A, “SDP for Findings at-Power,” dated June 19, 2012, and determined that it screened as Green because the deficiency did not involve the complete or partial loss of a support system that contributes to the likelihood, or cause, an initiating event and affected mitigation equipment. This finding has a cross-cutting aspect in the documentation aspect of the human performance area, H.7, because the licensee did not create and maintain complete and accurate documentation to validate that an emergency bus UV relay had been restored to its normal energized state during testing.

Enforcement: Surry TS 6.4.A.7 requires, in part, that “detailed written procedures with appropriate instructions shall be provided for conditions that include: preventative maintenance operations which would have an effect on the safety of the reactor.” These requirements are implemented, in part, by Dominion procedure 2-PT-2.33A, “Emergency Bus Undervoltage and Degraded Protection Test “H” Train,” Revision 5. Contrary to the above, on September 16, 2015, the Unit 2 “H” emergency bus was inadvertently

denergized and the #2 EDG auto started because 2-PT-2.33A did not have the appropriate instructions to evaluate if the UV relays being tested were in their normal energized state before testing the next UV relay. Because the licensee entered the issue into their corrective action program as CR 1009999 and the finding is of very low safety significance (Green), this violation is being treated as an NCV, consistent with Section 2.3.2 of the NRC Enforcement Policy: NCV 05000281/2015004-02, Inadequate Testing Procedure Causes an Emergency Bus to Denergize.

#### 1R13 Maintenance Risk Assessments and Emergent Work Control

##### a. Inspection Scope

The inspectors evaluated, as appropriate, the three 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.

- On October 16, Unit 1 and Unit 2 risk during Unit 1 unplanned reactor plant cooldown.
- On October 21, Unit 1 and Unit 2 risk during Unit 2 "H" Bus Logic testing and RCS at reduced inventory.
- On October 28, Unit 1 and Unit 2 risk during freeze seal isolation of CC to Unit 2 reactor coolant pump (RCP) seal water and non-regenerative heat exchanger.

##### b. Findings

No findings were identified.

#### 1R15 Operability Evaluations

##### a. Inspection Scope

The inspectors reviewed the seven 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 15. The inspectors reviewed the licensee's corrective action program to verify deficiencies in operability determinations were being identified and corrected. One sample included a review regarding the licensee's assessments and corrective actions for operator workarounds (OWAs). The inspectors reviewed the cumulative effects of the licensee's OWAs and

licensee procedure OP-AA-1700, "Operations Aggregate Impact," Revision 6 and evaluated OWAs against the requirements of the licensee's CAP as specified in PI-AA-200, "Corrective Action," Revisions 28, 10 CFR 50, Appendix B, and OP-AA-100, "Conduct of Operations," Revision 29.

- CR 1012368, Through-wall leak in MER-3 SW piping
- CR 1013671, Accumulation of lubricating oil in pan under #1 EDG
- CR 1016527, Unit 1 PZR power-operated relief valve RCS leakage
- CR464674, Unit 1 and 2 source range nuclear instrument response degradation
- CR1013674, 2-SW-REJ-205C, "C" RSHX SW discharge line expansion joint damaged
- CRs 532703/54069 Reactor Pressure Vessel support sliding foot broken cap screw
- Operator Workarounds

b. Findings:

No findings were identified.

1R18 Plant Modifications

.1 Permanent Modification SU-15-01063, "Reconfiguration of DC Circuit Breakers for Unit 2"

a. Inspection Scope

The inspectors reviewed the completed permanent plant modification design change package (DCP) SU-15-01063, "Reconfiguration of DC Circuit Breakers for Unit 2." The inspectors conducted walkdowns of the installation at various stages of completion, reviewed the 10 CFR 50.59 Safety Review/Regulatory Screening, technical drawings, test plans and the modification package to assess the TS implications. The inspectors also verified that the permanent modification was in accordance with licensee procedure CM-AA-DDC-201, "Design Changes," Revision 16. In addition, the inspectors reviewed calculations and conducted interviews with licensee personnel.

b. Findings

No findings were identified.

.2 Permanent Modification SU-15-01064, "Replacement of Station Backflow Preventers"

a. Inspection Scope

The inspectors reviewed the completed permanent plant modification DCP SU-15-01064, "Replacement of Station Backflow Preventers." The inspectors conducted walkdowns of the installation at various stages of completion, reviewed the 10 CFR 50.59 Safety Review/Regulatory Screening, technical drawings, test plans and the modification package to assess the TS implications. The inspectors also verified that the permanent modification was in accordance with licensee procedure CM-AA-DDC-201, "Design Changes," Revision 16. In addition, the inspectors reviewed calculations and conducted interviews with licensee personnel.

b. Findings

No findings were identified.

1R19 Post Maintenance Testinga. Inspection Scope

The inspectors reviewed four 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-ECM-1509-06, "Quicklook Testing for Quarter Turn Motor Operated Valves," Revision 29 on 2-CH-MOV-2115C, Unit 2 Letdown to CH Flow Control Valve after periodic inspection.
- 2-IPM-RC-PCV-2455A, "Pressurizer Spray Valve Instrumentation Testing and Maintenance," Revision 10 (OTO1), after Unit 2 "A" PZR spray valve replacement.
- 2-OPT-EG-009, Number 2 Emergency Diesel Generator Major Maintenance Operability Test, Revision 53 (OTO1), after maintenance outage.
- 2-ICM-RC-F-001, Reactor Coolant Flow Rescaling, Revision 5, and 2-NPT-RX-009, Calculating RCS Flow, Revision 9, after replacement of the Unit 2 RCPs.

b. Findings

No findings were identified.

1R20 Refueling and Other Outage Activities.1 Unit 1 Forced Outage due to Main Generator Exciter Fault and Replacement of "B" RCP Seal Packagea. Inspection Scope

The inspectors reviewed the station's work schedule and outage risk plan for the Unit 1 forced outage to repair the main generator exciter and rotor and to replace the "B" RCP seal package, which was conducted October 13 through November 17, 2015. The inspectors confirmed that the licensee had appropriately considered risk, industry experience, and previous site-specific problems in developing and implementing a plan that assured maintenance of defense-in-depth. The inspectors used IP 71111.20, "Refueling and Outage Activities," to observe portions of the maintenance and startup

activities to verify that the licensee maintained defense-in-depth commensurate with the outage risk plan and applicable TS. The inspectors monitored licensee controls over the outage activities listed below.

- Licensee configuration management, including daily outage reports, to evaluate maintenance of defense-in-depth for key safety functions and compliance with the applicable TS when taking equipment out of service.
- Implementation of clearance activities and confirmation that tags were properly hung and equipment appropriately configured to safely support the work or testing.
- Controls over activities that could affect reactivity.
- Monitoring of decay heat removal operations.
- Reactor coolant inventory controls, including flow paths, configurations, alternative means for inventory additions, and controls to prevent inventory loss.
- The control of containment penetrations and containment entries to verify that the licensee controlled those penetrations and activities in accordance with the appropriate TS and could achieve/maintain containment closure for required conditions.
- Startup and ascension to full power operation, tracking of startup prerequisites, and walkdown of the primary containment to verify that debris had not been left which could block emergency core cooling system strainers.
- Licensee identification and resolution of problems related to forced outage activities.

b. Findings

No findings were identified.

.2 Unit 2 Refueling Outage

a. Inspection Scope

The inspectors reviewed the station's work schedule and outage risk plan for the Unit 2 refueling outage, which was conducted October 19 through December 11, 2015, to confirm that the licensee had appropriately considered risk, industry experience, and previous site-specific problems in developing and implementing a plan that assured maintenance of defense-in-depth. The inspectors used IP 71111.20, "Refueling and Outage Activities," to observe portions of the maintenance and startup activities to verify that the licensee maintained defense-in-depth commensurate with the outage risk plan and applicable TS. The inspectors monitored licensee controls over the outage activities listed below.

- Licensee configuration management, including daily outage reports, to evaluate maintenance of defense-in-depth commensurate with the outage risk plan for key safety functions and compliance with the applicable TS when taking equipment out of service.
- Implementation of clearance activities and confirmation that tags were properly hung and equipment appropriately configured to safely support the work or testing.
- Controls over the status and configuration of electrical systems to ensure that TS and outage safety plan requirements were met, and controls over switchyard activities.
- Controls over activities that could affect reactivity.

- Monitoring of decay heat removal operations.
- Spent fuel cooling operations to verify that outage work was not impacting the ability of the operations staff to operate the spent fuel cooling system during and after core offload.
- Reactor coolant inventory controls, including flow paths, configurations, alternative means for inventory additions, and controls to prevent inventory loss.
- The control of containment penetrations and containment entries to verify that the licensee controlled those penetrations and activities in accordance with the appropriate TS and could achieve/maintain containment closure for required conditions.
- Refueling activities, including fuel handling and fuel receipt inspections.
- Startup and ascension to full power operation, tracking of startup prerequisites, and walkdown of the primary containment to verify that debris had not been left which could block emergency core cooling system strainers.
- Licensee identification and resolution of problems related to forced outage activities.

b. Findings

No findings were identified.

1R22 Surveillance Testing

a. Inspection Scope

For the five 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.

Surveillance Testing:

- 2-OPT-SI-002, "Refueling Test of the Low Head Safety Injection Check Valves to the Cold Legs," Revision 19
- 2-OPT-ZZ-001, "2H Bus Logic Testing," Revision 34 (OTO3)

RCS Leak Rate Determination

- 0-NSP-RC-004, "Establishing and Updating Reactor Coolant System (RCS) Unidentified Leakage Baseline," Revision 3, Unit 1, RCS Leakage due to degradation of "B" RCP seal

Appendix J Leak Rate Determination

- 2-OPT-CT-201, Containment Isolation Valve Local Leak Rate Testing (Type C Containment Testing), Revision 20, 2-RT-21 and 2-RT-25 SG "B" Recirculation and Transfer Isolation valve leak test.
- 2-NPT-CT-101, Reactor Containment Building Integrated Leak Rate Test (Type A Containment Testing), Revision 7 (OTO1)

b. Findings

No findings were identified.

2. RADIATION SAFETY

Cornerstones: Occupational Radiation Safety and Public Radiation Safety

2RS1 Radiological Hazard Assessment and Exposure Controls

a. Inspection Scope

Hazard Assessment and Instructions to workers: During facility tours, the inspectors observed labeling of radioactive material and postings for radiation areas, high radiation areas (HRA), locked HRAs (LHRA), very HRAs, radioactive material storage areas, and contaminated areas established within the radiological controlled area (RCA) of the Unit 1 and Unit 2 Auxiliary Buildings, Unit 2 containment, and radioactive waste processing and storage locations. The inspectors independently measured radiation dose rates or directly observed conduct of licensee radiation surveys for selected RCA areas in the auxiliary buildings and Unit 2 containment. The inspectors reviewed survey records for several plant areas including surveys for alpha emitters, airborne radioactivity, and pre-job surveys for selected Unit 2 refueling outage number 26 (U2R26) tasks. The inspectors also discussed changes to plant operations that could contribute to changing radiological conditions since the last inspection. For selected U2R26 outage jobs, the inspectors attended pre-job briefings and reviewed radiation work permit (RWP) details to assess communication of radiological control requirements and current radiological conditions to workers. Selected U2R26 work activities included reactor disassembly, thimble tube eddy current, RCP seal and impeller work, and scaffolding.

Hazard Control and Work Practices: The inspectors observed and evaluated access barrier effectiveness for selected LHRA and VHRA locations to include the U1 and U2 Auxiliary Buildings and U2 containment. Changes to procedural guidance for LHRA and VHRA controls were discussed with radiation protection (RP) supervisors. Controls and their implementation for storage of irradiated material within the spent fuel pool were reviewed and discussed in detail. Established radiological controls (including airborne controls) were evaluated for selected tasks, including reactor disassembly, thimble tube eddy current, reactor coolant pump seal and impeller work. In addition, licensee controls for areas where dose rates could change significantly as a result of refueling operations were reviewed, observed, and discussed including fuel transfer canal accessibility and controls during crud burst cleanup.

Occupational workers' adherence to selected RWPs and RP technician proficiency in providing job coverage were evaluated through direct observations and interviews with cognizant licensee staff. Electronic dosimeter (ED) alarm set points and worker stay times were evaluated against area radiation survey results. Worker response to select ED dose rate alarms were evaluated. For selected U2R26 HRA and LHRA tasks involving significant dose rate gradients, the use and placement of whole body and extremity dosimetry to monitor worker exposure was discussed with cognizant licensee staff.

Control of Radioactive Material: The inspectors observed surveys of material and personnel being released from the RCA and Unit 2 containment using portable radiation survey instruments, hand and foot monitors, small article monitors, personnel contamination monitors, and portal monitor instruments. The inspectors reviewed the last two calibration records for selected release point survey instruments and discussed equipment sensitivity, alarm setpoints, and release program guidance with cognizant RP staff. The inspectors also reviewed records of leak tests on selected sealed sources and discussed nationally tracked source transactions with cognizant RP staff.

Problem Identification and Resolution: Problem investigation program documents associated with radiological hazard assessment and control were reviewed and assessed. The inspectors evaluated the licensee's ability to identify and resolve the issues in accordance with procedure PI-AA-200, Corrective Action, Revision 28. The inspectors also evaluated the scope of the licensee's internal audit program and reviewed recent assessment results.

RP activities were evaluated against the requirements of UFSAR Section 11; TS 6.4; 10 CFR Parts 19 and 20; and approved licensee procedures. Licensee programs for monitoring materials and personnel released from the RCA were evaluated against 10 CFR Part 20 and IE Circular 81-07, Control of Radioactively Contaminated Material. Documents reviewed are listed in the attachment.

b. Findings

No findings were identified.

2RS8 Radioactive Solid Waste Processing and Radioactive Material Handling, Storage, and Transportation

a. Inspection Scope

Waste Processing and Characterization: During inspector walk-downs, accessible sections of the liquid and solid radioactive waste processing systems were assessed for material condition and conformance with system design diagrams. Inspected equipment included radioactive waste storage tanks; resin transfer piping, resin and filter packaging components; and abandoned evaporator equipment. The inspectors discussed component function, processing system changes, and radioactive waste program implementation with cognizant licensee representatives.

The radionuclide characterizations for 2014 and 2015 selected waste streams were reviewed and discussed with radioactive material control (RMC) staff. For primary resin, reactor coolant system filters, and dry active waste, the inspectors evaluated analyses for hard-to-detect nuclides, reviewed the use of scaling factors, and examined quality assurance comparison results between licensee waste stream characterizations and outside laboratory data. Waste stream mixing and concentration averaging methodology for resins and filters was evaluated and discussed with RMC staff. The inspectors also reviewed the licensee's procedural guidance for monitoring changes in waste stream isotopic mixtures.

Radioactive Material Storage: During walk-downs of indoor and outdoor radioactive material storage areas, the inspectors observed the physical condition and labeling of storage containers and the posting of radioactive material areas. The inspectors also reviewed licensee procedural guidance for storage and monitoring of radioactive material.

Transportation: There were no significant shipments during the week of inspection; however, the inspectors did review shipping procedure requirements and discussed preparation of shipping documents, package marking and labeling, and interviewed shipping technicians regarding Department of Transportation (DOT) regulations.

Selected shipping records were reviewed for consistency with licensee procedures and compliance with NRC and DOT regulations. The inspectors reviewed emergency response information, DOT shipping package classification, waste classification, radiation survey results, and evaluated whether receiving licensees were authorized to accept the packages. Licensee procedures for handling shipping containers were compared to certificate of compliance requirements and manufacturer recommendations. In addition, training records for selected individuals currently qualified to ship radioactive material were reviewed.

Radioactive waste processing activities and equipment configuration were reviewed for compliance with the licensee's process control program and UFSAR, Chapter 11. Waste stream characterization analyses were reviewed against regulations detailed in 10 CFR Part 20, 10 CFR Part 61, and guidance provided in the Branch Technical Position on Waste Classification (1983). Radioactive material and waste storage activities were reviewed against the requirements of 10 CFR Part 20. Transportation program implementation was reviewed against regulations detailed in 10 CFR Part 20, 10 CFR Part 71, 49 CFR Parts 172-178, as well as the guidance provided in NUREG-1608. Training activities were assessed against 49 CFR Part 172 Subpart H. Documents reviewed during the inspection are listed in the attachment.

Problem Identification and Resolution: The inspectors reviewed CRs in the area of radioactive waste processing and transportation. The inspectors evaluated the licensee's ability to identify and resolve the issues in accordance with procedure PI-AA-200, Corrective Action, Rev. 28. The inspectors also evaluated the scope of the licensee's internal audit program and reviewed recent assessment results. Licensee CAP documents reviewed are listed in the attachment.

b. Findings

No findings were identified.

4. OTHER ACTIVITIES

Cornerstones: Initiating Events, Mitigating Systems (MSs), Barrier Integrity, Emergency Preparedness, Public Radiation Safety, and Occupational Radiation Safety

#### 40A1 Performance Indicator (PI) Verification

##### a. Inspection Scope

The inspectors performed a periodic review of the six following 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 7. 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 October 1, 2014 through September 30, 2015. Documents reviewed included applicable NRC inspection reports, licensee event reports, operator logs, station performance indicators, and related CRs.

- Units 1 & 2 High Pressure Injection MSPI
- Units 1 & 2 Residual Heat Removal MSPI
- Units 1 & 2 Cooling Water MSPI

##### b. Findings

No findings were identified.

#### 40A2 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 Sample: Review of CR 1002289 Corrective Actions for Unit 1 RCP Seal Package Replacement

##### a. Inspection Scope

The inspectors performed a review regarding the licensee's assessments and corrective actions associated with CR 1002289, "1-RC-P-1B Seal Degradation." Specifically, on May 31, 2015, Flowserve N-9000 seal, installed during the April 2015 RFO, showed evidence of degradation in the form of declining delta pressure (DP) across the #1 seal. The DP continued to decline and subsequently the #3 seal DP began to decline on June 19. On July 10, Unit 1 was shutdown for a planned maintenance outage to replace the seal package. The inspectors assessed the licensee's problem identification threshold, cause analyses, extent of condition reviews, compensatory actions, and the prioritization

and timeliness of the licensee's corrective actions to determine whether the licensee was appropriately identifying, characterizing, and correcting problems associated with this issue and whether the planned or completed corrective actions were appropriate. The inspectors compared the actions taken to the requirements of the licensee's CAP as specified in procedure, PI-AA-200, "Corrective Action Program," Revision 28 and 10 CFR 50, Appendix B. In addition, the inspectors reviewed the corrective action program for similar issues, and interviewed engineering personnel to assess the effectiveness of the implemented corrective actions.

b. Findings

No findings were identified.

The licensee determined that the root cause was lack of rigor in the process of flushing, foreign material exclusion and verification during construction like activities in established piping systems. Surry plant processes did not provide the craft with specific flushing and cleanliness criteria to prevent foreign material from entering the "B" RCP seals. The inspectors verified that the licensee had identified problems with this issue at an appropriate threshold and entered them into the CAP; and had proposed or implemented appropriate corrective actions. The inspectors noted that during the Unit 1 RCP replacement project planning meetings operating experience involving foreign material exclusion control from seal package replacements was appropriately discussed; however, these discussions were not translated properly into procedural controls. The inspectors also noted that the "B" RCP third stage seal showed signs of degradation after the replacement of the seal package in the July 2015 maintenance outage. The "B" RCP seal package was again replaced during the October 2015 forced outage for repair of the Unit 1 main generator exciter. The ACE conducted for the October replacement had a cause of damage to the stationary face of the third stage seal. Inspection of the seal package did not find any foreign material present. The inspectors determined that the corrective actions developed as a result of the root cause analysis were reasonable commensurate with the safety significance of the reactor coolant system.

.3 Annual Sample: Review of CR1003878, MER 4 Service Water System Blockage

a. Inspection Scope

The inspectors performed an in-depth review regarding the licensee's evaluation and corrective actions associated with CR 1003878, "Degraded SW Conditions Resulted in Entry into 0-AP-12." Specifically, on July 24, 2015, the Unit 1 and 2 "A" CHSW pumps (1-SW-P-10A and 2-SW-P-10A) experienced a zero flow rate during performance of 0-OPT-VS-001, "Control Room Air Conditioning System Pump and Valve Inservice Testing," Revision 43. The inspectors assessed the licensee's problem identification threshold, cause analyses, extent of condition reviews, compensatory actions, and the prioritization and timeliness of the licensee's corrective actions to determine whether the licensee was appropriately identifying, characterizing, and correcting problems associated with this issue and whether the planned or completed corrective actions were appropriate. The inspectors compared the actions taken to the requirements of the licensee's CAP as specified in procedure, PI-AA-200, "Corrective Action Program," Revision 28 and 10 CFR 50, Appendix B. In addition, the inspectors reviewed the CAP for similar issues, and interviewed engineering personnel to assess the effectiveness of the implemented corrective actions.

b. Findings and Observations

The licensee determined that the root causes were biofouling in the SW supply piping to the rotating strainers due to the deferral of the pipe cleaning preventative maintenance without sufficient technical justification and isolation of backwash to the rotating strainers during performance of the post maintenance testing. The licensee's corrective actions involved revising the preventative maintenance program and operations procedure, cleaning the SW supply headers, and evaluating the addition of additional chemical injection into the system. The inspectors reviewed the corrective actions and all condition reports associated with the CHSW pump failures to verify that the corrective actions taken were effective. The inspectors determined the licensee's evaluation of the issue appropriately identified the root causes. Additionally, the inspectors determined that the corrective actions developed as a result of the root cause analysis were reasonable commensurate with the safety significance of the CHSW pumps. The inspectors identified the following self-revealing violation.

Introduction: A self-revealing Green NCV of Surry TS 6.4.D was identified because the preventative maintenance cleaning of the six inch SW piping upstream of the SW rotating strainers was deferred with insufficient technical justification. A lack of maintenance on this piping allowed excessive biofouling and subsequent blockage of the SW rotating strainer to occur. This was discovered when the Unit 1 and 2 "A" CHSW pumps (1-SW-P-10A and 2-SW-P-10A) experienced a zero flow rate during performance of 0-OPT-VS-001, "Control Room Air Conditioning System Pump and Valve Inservice Testing," Revision 43, on July 24, 2015.

Description: On July 24, 2015, the Unit 1 and 2 "A" CHSW pumps (1-SW-P-10A and 2-SW-P-10A) were in service and operating with a normal flowrate. The "B" and "C" MCR chillers were secured. The "A" MCR chiller pump was started in accordance with 0-OPT-VS-001 to perform a post maintenance test on the "B" chiller condenser outlet check valve and subsequently the CHSW pumps experienced a zero flow rate. The licensee entered abnormal procedure 0-AP-12.00, "Service Water System Abnormal Conditions," the "B" train of CHSW pumps was aligned to supply CHSW, and the "A" CHSW pumps were declared inoperable. The licensee entered a dual unit shutdown 72 hour limiting condition for operation. Operators determined that the "A" CHSW pumps had drawn a vacuum on the service water header and suspected a clogged rotating strainer upstream of the pumps was the cause of the problem. After restoring the SW alignment to a pre-event condition and venting the CHSW pumps, the "A" train of the CHSW pumps was declared operable and placed back in service. This issue was documented in the licensee's CAP as condition report CR 1003878.

The licensee conducted a RCE of the event and as part of the evaluation reviewed the history of the preventative maintenance performed on the six inch SW header upstream of the clogged rotating strainer. The header was on a preventative maintenance cleaning schedule of every three years with the most recent cleaning performed in November of 2010. The scheduled cleaning was deferred three times using recurring task evaluations (RTEs) with insufficient technical justification.

Dominion procedure ER-AA-102, "Preventative Maintenance Program," Revision 8, step 3.3, gives instructions on how to perform a RTE. This includes engineering review and technical evaluation with routing through engineering supervision, project management

and the manager of nuclear maintenance. Substeps 3.3.18 and 3.3.19 state, "If the manager nuclear maintenance final disposition differs from the engineering recommendations, then attempt to resolve this difference. If resolution is not obtained, then refer to ER-AA-PRS-1010, "Preventative Maintenance Task Basis & Maintenance Strategy," Revision 7, Attachment 1 and document the justification for the differing disposition." The first SW header cleaning deferral (RTE-338742) was denied by engineering and overridden by the maintenance department with eventual deferral of the PM from May 2014 to September 2014. The second deferral (RTE-340103) requested deferment to March 2015, but this was also rejected by Engineering. Maintenance overrode the rejection and rescheduled the PM to March 2015. The maintenance department's reasoning for the deferrals was due to lack of resources and provided a justification that the probability of failure was unlikely due to the installed chemical injection system. Both of these deferrals provided insufficient technical justification and did not follow the guidelines of ER-AA-PRS-1010. The licensee's RCE also commented that the SW piping being deferred was upstream of the chemical injection system. The third deferral (RTE-342359) was approved by both maintenance and engineering to a deferred date of December 2015 and used a justification of the limited length of piping affected and no recent fouling issues with the rotating strainers. This technical justification was also insufficient in that it did not comment or evaluate on the change in reasoning from the previous two deferral rejections by engineering.

Analysis: The inspectors concluded that the failure of the licensee to provide technical justification to defer the preventative maintenance of the six inch SW header was a PD that was within the licensee's ability to foresee and correct. Specifically, the licensee did not follow procedure ER-AA-PRS-1010 and provided insufficient technical justification for a differing disposition when they deferred the cleaning of the six inch SW header for a third time. Using IMC 0612, Appendix B, "Issue Screening," dated September 7, 2012, the inspectors determined that the PD was more than minor because it was associated with the equipment performance attribute of the Mitigating Systems Cornerstone, and it 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 lack of preventative maintenance on the six inch SW header caused the blockage of the CHSW pump supply lines. As a result, on July 24, 2015, the Unit 1 and 2 "A" CHSW pumps (1-SW-P-10A and 2-SW-P-10A) were declared inoperable after the rotating strainer clogged during post maintenance testing of the MCR chillers.

Using IMC 0609.04, "Initial Characterization of Findings," Table 2, dated June 19, 2012, the finding was determined to affect the Mitigating Systems Cornerstone. The inspectors screened the finding using IMC 0609, Appendix A, "SDP for Findings at-Power," dated June 19, 2012, and determined that it screened as Green because the deficiency did not affect the design or qualification of the charging pump service water pump system and it did not represent a loss of system safety function. This finding has a cross-cutting aspect in work management aspect of the human performance area, H.5, because the licensee did not implement a process of planning, controlling, and executing work activities such that nuclear safety is the overriding priority. Specifically, ER-AA-102 was not followed to ensure the management of risk commensurate to the work and the need for coordination with different groups was obtained.

Enforcement: Surry TS 6.4.D requires, in part, that “All procedures described in Specifications 6.4.A shall be followed.” Surry TS 6.4.A.7 requires, in part, that “detailed written procedures with appropriate instructions shall be provided for conditions that include: preventative maintenance operations which would have an effect on the safety of the reactor.” These requirements are implemented, in part, by Dominion procedure ER-AA-102, “Preventative Maintenance Program.” Contrary to the above, on June 5, 2014 and September 29, 2014, the licensee did not document a differing disposition for a RTE and deferred the preventative maintenance cleaning on the 6 inch SW header. This resulted in the Unit 1 and 2 “A” CHSW pumps (1-SW-P-10A and 2-SW-P-10A) being declared inoperable on July 24, 2015 when the SW rotating strainer clogged during post maintenance testing of the MCR room chillers. Because the licensee entered the issue into their corrective action program as CR 1003878 and the finding is of very low safety significance (Green), this violation is being treated as an NCV, consistent with Section 2.3.2 of the NRC Enforcement Policy: NCV 05000280, 281/2015004-03, Charging Pump Service Water Pump Failure due to Inadequate Preventative Maintenance.

.3 Annual Sample: Review of CR 577346, Corrective Action for Biological Fouling in RS SW Supply Piping

a. Inspection Scope

The inspectors performed an in-depth review regarding the licensee’s evaluation and corrective actions associated with CR 577346, “1C 48 inch SW Header Inspection Results.” Specifically, on April 21, 2015, during the inspection of 1C 48 inch SW header line, engineering observed approximately 200 oysters in the pipe ranging in size from 2 to 4 inches. The inspectors assessed the licensee’s problem identification threshold, cause analyses, extent of condition reviews, compensatory actions, and the prioritization and timeliness of the licensee’s corrective actions to determine whether the licensee was appropriately identifying, characterizing, and correcting problems associated with this issue and whether the planned or completed corrective actions were appropriate. The inspectors compared the actions taken to the requirements of the licensee’s CAP as specified in procedure, PI-AA-200, “Corrective Action Program,” Revision 28 and 10 CFR 50, Appendix B. In addition, the inspectors reviewed the corrective action program for similar issues, and interviewed engineering personnel to assess the effectiveness of the implemented corrective actions.

b. Findings and Observations

No findings were identified.

The licensee conducted an engineering evaluation and concluded that the oysters that were not firmly adhered to the SW piping would not have exceeded the 10% blockage limit of the Recirc Spray Heat Exchangers (RSHXs) during a design basis accident. The engineering evaluation also reaffirmed that the 18 month cleaning periodicity of the 48 inch SW headers upstream of the RS SW supply valves was necessary. The licensee conducted this inspection on the 2A SW header in December, 2015 and found biological fouling present, but less than the 1C SW header. The inspectors determined that the corrective actions developed as a result of the engineering evaluation were reasonable

commensurate with the safety significance of the SW system. Additionally, the inspectors conducted a walkdown of the Unit 2 thirty-inch RS SW supply line after the piping was cleaned and coated during the Unit 2 RFO.

4OA3 Follow-up of Events and Notices of Enforcement Discretion (71153 – 2 Samples)

.1 (Closed) Licensee Event Report (LER), 05000-281/2015-002-00, Unanticipated Start of the EDG 2 during Testing

a. Inspection Scope

On September 16, 2015 at 2014 hours with Units 1 and 2 operating at 100 power, #2 EDG automatically started and assumed power to the Unit 2 “H” emergency bus. The event occurred during quarterly performance of 2-PT-2.33A, “Emergency Bus Undervoltage and Degraded Protection Test “H” Train.” The direct cause of the event was the defective “A” single phase relay sticking and preventing the relay contacts from changing state. 2-PT-2.33A has been revised to physically validate the state of the emergency bus relays prior to testing additional relays. The inspectors reviewed the Licensee Event Report (LER), the associated RCE and corrective actions, interviewed the license staff, and walked down associated components. This LER is closed.

b. Findings

A self-revealing non-cited violation is reported in section 1R12 of this report.

.2 (Closed) Licensee Event Report, 05000281/2015-001-00, U2 Reactor Trip During Turbine Testing

a. Inspection Scope

On July 21, 2015, with Unit 2 at approximately 6% power, Unit 2 experienced a reactor trip initiated from a turbine trip during performance of the main turbine OPC system circuitry testing. The turbine trip was caused by governor valves rapidly opening due to a speed error which had accumulated between the turbine speed and reference setpoint resulting in a rapid increase in impulse pressure. The root cause of this event was inadequate instruction in the overspeed protection control testing section of the operating procedure. The testing has been removed from the operating procedure and placed in a test procedure that is not performed as part of routine turbine startup. The inspectors reviewed the LER, the associated RCE and corrective actions, interviewed the license staff, and walked down associated components. This LER is closed.

b. Findings

Introduction: A self-revealing Green NCV of Surry TS 6.4.A.7 was identified because Unit 2 tripped during performance of 2-OP-TM-001, “Turbine – Generator Startup to 20% – 25% Turbine Power”, Revision 55, on July 21, 2015. An inadequate procedure allowed the main turbine (MT) governor valves to open rapidly during MT OPC testing, increasing MT first stage pressure above the P-2 and P-7 RPS permissive step points, and subsequently causing a reactor trip. This issue was documented in the licensee’s CAP as CR 1003328.

Description: On July 21, 2015, the licensee was conducting 2-OP-TM-001, to startup the MT and generator from operation on the turning gear with reactor power at 6%. In accordance with 2-OP-TM-001, the operators adjusted the speed setting of the MT to 550 rpm and pressed the “Go” pushbutton and the MT slowly increased speed. The MT limiter was set at 10% per procedure. The operator took the overspeed switch to “Overspeed Simulation” and the governor and intercept valves went closed as expected. While the valves were shut the valve position limiter engaged and the reactor operator requested and was given permission to move the limiter. He subsequently moved the limiter to 30%. The operator returned the overspeed switch to the “In Serv” position. At this point, with turbine speed at approximately 140 rpm, the governor valves responded by opening rapidly, reaching the limiter of 30%, in an effort to achieve MT speed of 550 rpm. MT first stage pressure increased to 138 psid, which was greater than 20% power. This satisfied the turbine trip logic to the RPS. The MT tripped because power was greater 15% with the MT output breaker open (P-2 setpoint) and the reactor tripped because the MT tripped above 10% power (P-7 setpoint).

The licensee conducted a RCE and determined the cause of the reactor trip was inadequate procedure instructions. The initial plant and test conditions established by 2-OP-TM-001 were modified by past procedural changes, which introduced the potential to generate a MT speed error. The OPC test is required by Nuclear Electric Insurance Limited (NEIL) to be performed once per fuel cycle. This test was placed in 2-OP-TM-001 as part of the MT startup procedure. The test procedure was revised to set a terminal speed of 550 rpm and to depress the “Go” pushbutton if the MT rolled off the turning gear due to governor valve leak by while the intercept valves were open. This revision increased the possibility of generating a speed error during OPC testing, as now the speed setting was entered immediately after latching the MT with no provision to wait until speed was stable. The licensee’s review of all previous MT OPC testing on Units 1 and 2 after this revision, indicated that operators waited for speed to stabilize at 550 rpm or be at slightly higher speed than reference, therefore no speed error signals were generated during past OPC testing.

The MT valve position limiter was set at 10% during the OPC test procedure, but moved to 30% during the OPC test because operators have been trained not to have the MT governor valves run up against the limiter. There was no 2-OP-TM-001 procedural guidance for operation of the limiter after an initial setting was made. The licensee investigated this action during the RCE and determined that the adjustment of the limiter to 30% was not causal in the MT trip, even though the governor valves hit the limiter with the large speed error generated. The licensee could not demonstrate that the operation of the limiter either caused or would have prevented the observed impulse pressure spike.

Dominion procedure SPAP-0504, “Technical Procedure Writers Guide,” Revision 9, states in section 6.2.2, in part, under “Level of Detail,” that “a minimum level of information is needed to ensure task critical actions are included and the user avoids error traps.” A revision was made to 2-OP-TM-001 that did not have adequate detail to prevent a speed error during MT OPC testing. This introduction of the possibility of generating a speed error caused the MT to trip above the P-2 and P-7 RPS setpoints on July 21, 2015, because the operators did not initiate the OPC test when MT speed was stable. The error signal generated when MT speed was significantly below its “Setter” setpoint caused the governor valves to open rapidly enough to cause a pressure spike in MT first stage pressure when the operators returned to the “In Serv” position.

Analysis: The inspectors concluded that the failure of the licensee to have the minimum level of information needed to ensure task critical actions in 2-OP-TM-001 and for operators to avoid error traps in conducting the MT OPC test, as required by Dominion procedure SPAP-0504, was a PD that was within the licensee's ability to foresee and correct. Specifically, 2-OP-TM-001 did not have the minimum level of information to ensure that there was no speed error between MT speed and the setter position before initiating the OPC test. This allowed the test to be conducted with a speed error that caused the governor valves to open rapidly at the end of the test and subsequently cause a reactor trip. Using IMC 0612, Appendix B, "Issue Screening," dated September 7, 2012, the inspectors determined that the performance deficiency was more than minor because it was associated with the procedural quality attribute of the Initiating Events Cornerstone and adversely affected the cornerstone objective to limit the likelihood of events that upset stability and challenge critical safety functions during shutdown as well as power operations.

Using IMC 0609.04, "Initial Characterization of Findings," Table 2, dated June 19, 2012; the finding was determined to affect the Initiating Events Cornerstone. The inspectors screened the finding using IMC 0609, Appendix A, "SDP for Findings at-Power," dated June 19, 2012, and determined that it screened as Green because the deficiency did not involve the complete or partial loss of a support system that contributes to the likelihood, or cause, an initiating event and affected mitigation equipment. This finding has a cross-cutting aspect in the documentation aspect of the human performance area, H.7, because the licensee did not create a complete procedure for testing the MT overspeed protection.

Enforcement: Surry TS 6.4.A.7 requires, in part, that "detailed written procedures with appropriate instructions shall be provided for conditions that include: preventative maintenance operations which would have an effect on the safety of the reactor." These requirements are implemented, in part, by Dominion procedure 2-OP-TM-001, "Turbine – Generator Startup to 20 percent - 25 percent Turbine Power," Revision 56. Contrary to the above, on July 21, 2015, Unit 2 reactor tripped due to a MT trip because 2-OP-TM-001 did not have the appropriate instructions for testing the MT overspeed control. Because the licensee entered the issue into their corrective action program as CR 1003328 and the finding is of very low safety significance (Green), this violation is being treated as an NCV, consistent with Section 2.3.2 of the NRC Enforcement Policy: NCV 05000281/2015004-04, Inadequate Procedure Causes Main Turbine and Reactor Trip.

#### 4OA6 Meetings, Including Exit

##### Exit Meeting Summary

On January 13, 2016, the inspection results were presented to Mr. R. Simmons 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.

ATTACHMENT: SUPPLEMENTARY INFORMATION

## **SUPPLEMENTARY INFORMATION**

### **KEY POINTS OF CONTACT**

#### Licensee Personnel

J. Ashley, Licensing Engineer  
L. Baker, Training Manager  
L. Black, Supervisor, Emergency Preparedness  
D. Cobb, Manager, Nuclear Oversight  
J. Eggart, Manager, Radiation Protection & Chemistry  
B. Garber, Supervisor, Station Licensing  
M. Haduck, Manager, Outage and Planning  
R. Hanson, Manager, Protection Services  
P. Harris, Supervisor, Radiological Analysis and Instrumentation  
R. Johnson, Manager, Operations  
P. Jurewicz, Boric Acid Corrosion Control Program Owner  
L. Lane, Site Vice President  
D. Lawrence, Director, Station Safety and Licensing  
T. Mayer, Surry SGISI Program Owner  
L. Ragland, HP Operations Supervisor  
M. Ringler, Site Welding Engineer  
J. Rosenberger, Director, Station Engineering  
R. Scanlan, Manager, Maintenance  
R. Simmons, Plant Manager  
M. Smith, Manager, Nuclear Organizational Effectiveness  
W. Terry, Supervisor HP Technical Services  
E. Turko, ISI Supervisor

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

#### Opened and Closed

|                          |     |  |
|--------------------------|-----|--|
| 05000281/2015004-01      | NCV | Insufficient Gasket Crush on Pressurizer Spray Valve Body to Bonnet Joint (Section 1R12)           |
| 05000281/2015004-02      | NCV | Inadequate Testing Procedure Causes an Emergency Bus to Deenergize (Section 1R12)                  |
| 05000280, 281/2015004-03 | NCV | Charging Pump Service Water Pump Failure due to Inadequate Preventative Maintenance (Section 4OA2) |
| 05000281/2015004-04      | NCV | Inadequate Procedure Causes Main Turbine and Reactor Trip (Section 4OA3)                           |

#### Closed

|                      |     |   |
|----------------------|-----|---|
| 05000281/2015-001-00 | LER | Unit 2 Reactor Trip During Turbine Testing (Section 4OA3.2)   |
| 05000281/2015-002-00 | LER | Unanticipated Start of #2 EDG During Testing (Section 4OA3.1) |

## LIST OF DOCUMENTS REVIEWED

### **Section 1R01: Adverse Weather Protection**

#### Procedures

0-OP-ZZ-021, Severe Weather Preparation, Rev. 11

#### Condition Reports

|         |         |         |         |         |         |
|---------|---------|---------|---------|---------|---------|
| 1019306 | 1019529 | 1019533 | 1019534 | 1019535 | 1019536 |
| 1019545 | 1019719 | 1019720 | 1019721 | 1019722 | 1019723 |
| 1019724 | 1019931 | 1019932 | 1019950 | 1020282 |         |

#### Other Documents

15-491, Temporary Modification of Interim Compensatory Measures for Order EA-02-104, 10/1/15

NRC Reply to 15-491, Temporary Modification of Interim Compensatory Measures for Order EA-02-104, 10/2/15

### **Section 1R04: Equipment Alignment**

#### Procedures

0-OP-EG-001A, EDG 3 System Alignment, Rev. 15

1-OP-EG-001A, EDG 1 System Alignment, Rev. 13

1-OP-FW-001A, Auxiliary Feedwater System Valve Alignment, Rev. 7

1-OP-SI-001A, Safety Injection System Alignment, Rev. 19

1-OPT-SI-005, LHSI Pump Test, Rev. 32

OP-49.1B, Service Water System – CR Chillers and Supply Strainers Valve Alignment, Rev. 29

#### Condition Reports (\*NRC Identified)

\*1012044   \*1013671   \*1016162   \*1018177   \*1022117

#### Drawings

11448-FB-038A SH 2, Flow/Valve Operating Numbers Diagram Fuel Oil Lines System Unit 1, Rev. 49

11448-FB-046A SH 1, Flow/Valve Operating Numbers Diagram Emergency Diesel Generator #1 Unit 1, Rev. 22

11448-FB-046A SH 2, Flow/Valve Operating Numbers Diagram Emergency Diesel Generator #1 Unit 1, Rev. 16

11448-FM-068A SH 3, Flow/Valve Operating Numbers Diagram Feedwater System Unit 1, Rev. 16

11448-FM-071D SH 2, Flow/Valve Operating Numbers Diagram Circulating and Service Water System Unit 1, Rev. 15

11448-FM-089A SH 1, Flow/Valve Operating Numbers Diagram Safety Injection System Unit 1, Rev. 61

11548-FM-071A SH 3, Flow/Valve Operating Numbers Diagram Circulating and Service Water System Unit 2, Rev. 95

### **Section 1R05: Fire Protection**

#### Procedures

0-LSP-FP-045, Fire Extinguisher Annual Maintenance, Rev. 2

0-FS-FP-123, Diesel Generator Room Number 3 Elevation 27 Feet – 6 Inches, Rev. 2

0-FS-FP-198, Diesel Fire Pump Room Elevation 27 Feet – 6 Inches, Rev. 1  
 0-FS-FP-199, Electric Fire Pump Room Elevation 27 Feet – 6 Inches, Rev. 2  
 1-FS-FP-157, Charging Pumps – Unit 1 Auxiliary Building Elevation 13 Feet – 0 Inches and  
 2 Feet – 0 Inches, Rev. 3  
 1-FS-FP-159, Auxiliary Building – General Area Unit 1 Elevation 13 Feet, Rev. 2  
 2-FS-FP-134, Containment Unit 2 Elevation 47 Feet – 4 Inches (Subatmospheric), Rev. 1  
 2-FS-FP-135, Containment Unit 2 Elevation 18 Feet – 4 Inches (Subatmospheric), Rev. 1  
 2-FS-FP-136, Containment Unit 2 Elevation (-)3 Feet – 6 Inches (Subatmospheric), Rev. 1  
 2-FS-FP-137, Containment Unit 2 Elevation (-)27 Feet – 7 Inches (Subatmospheric), Rev. 1  
 2-FS-FP-157, Charging Pumps – Unit 2 Auxiliary Building Elevation 13 Feet – 0 Inches and  
 2 Feet – 0 Inches, Rev. 3  
 2-FS-FP-159, Auxiliary Building – General Area Unit 2 Elevation 13 Feet, Rev. 2  
 2-FS-FP-168, Turbine Building Basement - Unit 2 Elevation 9 Feet – 6 Inches, Rev. 1

Condition Reports (\*NRC Identified)

\*1010870      \*1019480

Drawings

11448-FAR-205 SH 1, Equipment Location – Appendix ‘R’ Auxiliary Building Plan – EL 2’- 0”  
 Unit 1 & 2, Rev. 18  
 11448-FAR-205 SH 2, Equipment Location – Appendix ‘R’ Auxiliary Building Plan – EL 13’- 0”  
 Unit 1 & 2, Rev. 18  
 11448-FAR-205 SH 3, Equipment Location – Appendix ‘R’ Auxiliary Building Plan – EL 27’- 6”  
 Unit 1 & 2, Rev. 14  
 11448-FAR-206 SH 6, Equipment Location – Appendix ‘R’ Service Building Part. Plan  
 El. 27’-0”– Unit 1, Rev. 8  
 11448-FAR-208 SH 3, Equipment Location – Appendix ‘R’ Turbine Area Plan Ground Floor–  
 Unit 2, Rev. 17  
 11448-FAR-212, Equipment Location – Appendix ‘R’ Fire Pump House Plan - El. 27’-0” Unit 1,  
 Rev. 7  
 11448-FAR-306 SH 14, Fire Barrier Penetrations Service Building Sections - El. 27’-0” Unit 1,  
 Rev. 0  
 11448-FAR-312, Fire Barrier Penetrations Fire Pump House Plan & Section - El. 27’-0” Unit 1,  
 Rev. 0

**Section 1R06: Flood Protection**

Condition Reports

1017527      1017529      1019637

Other Documents

DC 93-012-3, Mechanical Equipment Room No. 3 Watertight Door, Rev. 4  
 DCP SU-74-055, Flooding Control of Safety Related Equipment, Rev. 8  
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### **Section 1R07: Heat Sink Performance**

#### Procedures

0-MCM-0812-01, CC Heat Exchanger Inspection and Cleaning, Rev. 20  
0-OP-ZZ-008, Assessment of Maintenance Activities for Potential Flooding of Turbine Building and Associated Areas, Rev. 12  
1-OSP-SW-003, Measurement of Macrofouling Blockage of Component Cooling Heat Exchanger 1-CC-E-1B, Rev. 33  
1-OSP-SW-004, Measurement of Macrofouling Blockage of Component Cooling Heat Exchanger 1-CC-E-1C, Rev. 31  
1-OSP-SW-005, Measurement of Macrofouling Blockage of Component Cooling Heat Exchanger 1-CC-E-1D, Rev. 32

#### Condition Reports

577834

#### Work Orders

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#### Other Documents

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### **Section 1R08: Inservice Inspection Activities**

#### Procedures

0-NPT-PR-005, Snubber Service Life, Rev. 3  
0-NSP-RC-003, Visual Examination of Reactor Pressure Vessel Bottom Mounted Instrumentation (BMI), Rev. 3  
0-CPT-SG-003, Steam Generator Primary to Secondary Leakage, Rev. 4  
0-OSP-RC-002, Steam Generator Primary to Secondary Leakage, Rev. 16  
2-NPT-PR-001, Snubber Selection for Functional Testing, Rev. 8  
2-NPT-PR-002, Snubber Visual Inspection, Rev. 16  
2-NPT-PR-004, Mechanical Snubber Functional Test, Rev. 5  
8-QPP-761-003, Multi-frequency Eddy Current Examination of Steam Generator Tubing, Rev. 0  
CH-99-600, Secondary Chemistry Program, Rev. 12  
DNES-VA-MAT-1010, Protective Coatings Program, Rev. 3  
ER-AP-BAC-10, Boric Acid Corrosion Control Program, Rev. 11  
ER-AP-BAC-101, Boric Acid Corrosion Control Program Inspections, Rev. 10  
ER-AP-BAC-102, Boric Acid Corrosion Control Program Evaluations, Rev. 10  
ER-AA-FAC-1002, Flow-Accelerated Corrosion (FAC) Inspection and Evaluation Activities, Rev. 10  
ER-AA-MAT-10, Reactor Coolant System Coatings Program, Rev. 3  
ER-AA-NDE-RT-400, Radiographic Examination Procedure, Rev. 0  
ER-AA-NDE-UT-701, Ultrasonic Thickness Measurement Procedure, Rev. 6  
ER-AA-NDE-UT-802, Ultrasonic Examination of Austenitic Piping Welds in accordance with ASME Section XI, Appendix VIII, Rev. 3  
ER-AA-NDE-VT-603, VT-3 Visual Examination Procedure, Rev. 4  
ER-AA-NDE-PT-300, ASME Section XI Liquid Penetrant Examination Procedure, Rev. 7

ER-AA-NDE-VT-607, IWE VE Examination of Pressure Retaining Welds in Class 1 Components Fabricated with Alloy 600/82/182 Materials, Rev. 1  
 NS-WKI-000006-004, Mechanical Plug Stabilization Procedure, Rev. 0  
 PI-AA-100-1004, Self-Assessment Procedure, Rev. 12  
 SRY-SGPMS-002, Surry Site Specific Eddy Current Analysis Guidelines Procedure, Rev. 23

#### Self-Assessments

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 ETE-SU-2015-0063 Steam Generator Degradation Assessment, 2015, Rev. 0  
 SAR000486, Welding Program Fleet Self-Assessment, 2014  
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#### Work Orders

38103575886, Ultrasonic Testing, FAC, Extraction Steam 90 degree Elbow 1-inch Line Component 2-ES-PSF2-179  
 38103538072, Penetrant Testing, Support H0003-1, 2, 3, 4, 12-SI-247, Safety Injection  
 38103538072, Visual Testing (VT-3), Spring Can Support 2-SI-H003B, 12-SI-247, Safety Injection  
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 38103538072, Visual Testing (VT-2), N-722-1, Component 2-RC-R-1/BMI, Bottom Mounted Instrumentation, Reactor Coolant System  
 38103359427, Radiography Testing, 3-SI-366, Safety Injection  
 38103359427, Ultrasonic Testing, 3-SI-366, Safety Injection  
 38103359427, Penetrant Testing, 3-SI-366, Safety Injection  
 38103359427, Penetrant Testing, 3-SI-366, Safety Injection  
 38103447368, 2 inch blind flange connector, 2-CH-1503, CVCS  
 38103493072, Snubber Fluid Level Evaluation, 02-FW-HSS-1  
 38103537342, Packing Adjust Equipment #02-DG-PCV-200-VALVE, PDTT CLR Inlet Hdr Pressure Control Valve

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CR 1015816, Boric Acid Found on 2-RC-ICV-3112  
 CR 1015817, Boric Acid Found on 2-RC-FC-2482A  
 CR 1015823, Corrosion on CC Piping  
 CR 1016189, Snubber Program  
 CR 1016192, Corrosion Control

CR 1016162, Snubber 2-SI-HSS-101 Possible Interference  
 CR 1018671, SG Program  
 CR 1018647, Review on IN 2010-05  
 CR 1018984, While Performing FOSAR in 2-RCE-1 a small piece of wire was found

#### Condition Reports

CR 1002524, Body to Bonnet Leak 2-RC-PCV-2455-A, RS Heat Exchanger  
 CR 1001385, Body to Bonnet, Pressurizer Spray Valve, 2-RC-PCV-2455A  
 CR 576750, Packing Leak, CH Aux Spray, 2-CH-HCV-2311  
 CR 1015097, Boric Acid on 2-SI-124  
 CR 1014392, 2-RC-ICV-3258 has BA Leak in fitting to the left of Valve  
 CR 1014025, Through Wall Leak developed in 02-CW-PP-96.00-WC-PIPE-102-00  
 CR 1006945, Indications of Leakby at 2-SI-500  
 CR 1016009, ISI VT-3 Examination Rejection, Missing Locknut, on Support 2-SI-H003B  
 CR 1015481, Improper Thread Engagement at One Location on 2-CH-P-1A Pump Base  
 CR 1018297, Five Tubes Have Been Identified for Plugging in SG "C"  
 CR 547012, Missing Weld Discovered During a scheduled arranged VT-3 Examination  
 CR 547345, Coating Defects Observed in 2-SW-MOV-201A Upstream Pipe Flange Area  
 CR 529252, IN13-20 Steam Generator Channel Head and Tubesheet  
 CA 271493, CA to Engineering to Review NRC IN2013-20 and Initiate Actions as Required  
 CA 250094, CA to Engineering to Evaluate Loose Part for Potential Source and Initiate Action  
 CR 497159, Loose Part Identified in "C" Steam Generator during RFO24 Post Lance Inspection  
 CR 547297, Loose Part Wear in 3C in SG B

#### Welder Qualifications

Record of Welder Performance Qualification Test – L. Martin, J. Rowe, R. Dunn, H. Coats,  
 A. Allen, and D. Bare

#### Visual Acuity Exam Record

C. Pride, J. Kilpela, J. Hacker, R. Sisteck, B. Baker, L. Humphrey, P. Whiteley, P. Jurewics,  
 A. Stevermer, C. Meyer, B. Lagston, and J. Shelton

#### Certificate of Qualification for Non-destructive Examinations Examiner

C. Pride, J. Kilpela, J. Hacker, R. Sisteck, B. Baker, L. Humphrey, P. Whiteley, P. Jurewics,  
 A. Stevermer, C. Meyer, B. Lagston, and J. Shelton

#### Other Documents

12-487, Proper Technical Specification Adopt TSTF-510, July 2012  
 51-9194308-000, Dominion Surry S2R24 Reactor Vessel Upper Head Bare Metal Visual Report  
 03-1025, Certificate of Conformance for ReVasp ECT Software, July 2009  
 Certificate of NDE Personnel Qualification (Eddy Current): A3502, A9608, B2687, B4260  
 B5371, C3274, C9055, C9309, G2886, H6377, J5670, K2858, L3237, L7871, M9715, N9952,  
 R3716, S4373, S7752, T3673, W9098, and Z7387  
 Certificate of Vision Examination: A3502, A9608, B2687, B4260 B5371, C3274, C9055, C9309,  
 G2886, H6377, J5670, K2858, L3237, L7871, M9715, N9952, R3716, S4373, S7752, T3673,  
 W9098, and Z7387  
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 I0004-07-000007, Eddynet System Checkout Instruction, Rev. 4,  
 Mechanical Plug Stabilization results, 11/2015  
 Miz-80iD Installation and Operation Manual, 2006

Procedure Qualification Record (PQR) for Welding, 801, 830, and 831  
 S000152.01, EPRI App. H/I Eddy Current Technique Validation, Unit 2, 2R26  
 S000152.01-WKP-000001, Surry SG Inspection Plan, Unit 2, 2R26, 2015  
 S000152.01-WKP-000003-001, Surry Secondary Side Inspection and Test Plan,  
 Rev. 0  
 S000152.01-WKI-000003-001, Surry Steam Generator Water Lancing Site Execution Inspection  
 and Test Plan, Rev. 0  
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 Gap Screw Degradation  
 Unit 2 Inservice Examination, Testing, and Service Life Monitoring Program Plan for Snubbers,  
 5th Inspection Interval, May 2014 – May 2020  
 Welding Technique Sheet for Welding Technique Number 801, GTAW Manual Welding

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

#### Procedures

RQ-15.7-AG-2, Simulator Scenario, Rev. 0  
 RQ-15.7-ST-1, Simulator Exercise Guide, Rev. 0

### **Section 1R12: Maintenance Effectiveness**

#### Procedures

0-MCM-0414-13, Copes-Vulcan 4 inch, 1500 Pound Control Valve, Model D-1000 with Bellows  
 Overhaul, Rev. 3  
 2-PT-2.33A, Emergency Bus Undervoltage and Degraded Protection Test "H" Train, Rev. 5  
 ER-AA-10, Equipment Reliability Process, Rev. 2  
 ER-AA-PRS-1003, Equipment Reliability Component Classifications, Rev. 6

#### Condition Reports

|         |         |         |        |        |         |
|---------|---------|---------|--------|--------|---------|
| 439693  | 453752  | 545868  | 549000 | 559229 | 1009996 |
| 1009999 | 1010008 | 1002302 |        |        |         |

#### Work Orders

|             |             |
|-------------|-------------|
| 38102258307 | 38103591612 |
|-------------|-------------|

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 ETE-S-08-0052, Body to Bonnet Leaks on Copes-Vulcan Valves Surry 1&2  
 ETE-SU-2014-0047, Technical Justification for using a 0.175 inch Thick Spiral Wound Gasket  
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 LER 2015-002-00, Unanticipated Start of EDG 2 during Testing, 9/16/15  
 RCE 3002174, 2-RC-PCV-2455A Body-to-Bonnet Leak/Unit 2 Forced Shutdown, 9/16/15  
 WCAP-14129, Reliability Assessment of Westinghouse Type AR Relays Used as SSPS Slave  
 Relays, 07/94

### **Section 1R13: Maintenance Risk Assessments and Emergent Work Control**

#### Drawings

11448-FM-072E SH1, Flow/Valve Operating Numbers Diagram Component Cooling Water  
 System Unit 1, Rev. 20

Work Orders

|             |             |             |             |
|-------------|-------------|-------------|-------------|
| 38103032782 | 38103621145 | 38103622300 | 38103646489 |
| 38103646490 |             |             |             |

Other Documents

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 10/28/2015

**Section 1R15: Operability Determinations and Functionality Assessments**Procedures

OP-AA-100, Conduct of Operations, Rev. 29  
 OP-AA-1700, Operations Aggregate Impact, Rev. 6

Condition Reports

|         |         |         |         |         |         |
|---------|---------|---------|---------|---------|---------|
| 464674  | 502305  | 532703  | 530267  | 546069  | 554524  |
| 568990  | 578887  | 1001951 | 1004797 | 1008009 | 1012368 |
| 1013671 | 1014381 | 1014605 | 1014614 | 1015735 | 1016244 |
| 1016495 | 1016527 | 1017107 | 1019195 | 1019202 | 1019265 |
| 1019520 | 1020493 | 1021146 |         |         |         |

Other Documents

AREVA Calculation 51-9232810-001, Analytical Input Summary for Surry Units 1 and 2 Reactor Vessel Sliding Support Analysis, 4/03/15  
 CA/QCE 3013336, Leakby of Pressurizer PORVs as Indicated by Tailpipe Temperatures, 11/10/2015  
 CA 3009790, CA to Engineering to Determine and Initiate Required Actions to Systematically Inspect MER 3 & MER 4, Rev. 0  
 CA 3011947, Potential Leak in SW Piping Discovered During Systematic Inspection, Rev. 0  
 CA 3013552, Schedule Existing W/O's to Remove Degraded and Abandoned Supports in MER 3, Rev. 0  
 CEM-0142, Evaluation of Revised LOCA loads for Surry Units 1 and 2 RPV Sliding Foot Supports, Rev. 1  
 ET-S-09-0137, Internal Tube Repair of the 02-CW-REJ-200C Expansion Joint, Rev. 0  
 ETE-SU-2014-0034, Evaluation of Reactor Vessel Sliding Foot Assembly Cap Screws, Rev. 0  
 ETE-SU-2015-0006, RV Support Sliding Foot Assembly Cap Screws Evaluation for Elimination, Rev. 0  
 ETE-SU-2015-0091, Repair of Recirculation Spray Heat Exchanger 2-RS-E-1C Discharge Line Expansion Joint 2-SW-REJ-205C Flange, Rev. 1  
 OD 000471, SRNI Reduced Detector Response, Rev. 0  
 OD 000565, Surry Unit 1 – RPV Support Sliding Foot Inspection, Rev. 0  
 OD 000584, Surry Unit 2 – RPV Support Sliding Foot Inspection, Rev. 0  
 SU-VTM-000-38-G465-00001, Garlock Expansion Joints Installation and Maintenance, Rev. 33  
 U1/U2 Operations Aggregate Impact Report, 12/16/15

**Section 1R18: Plant Modifications**Procedures

0-ECM-0306-01, Distribution Panel Breaker Maintenance, Rev. 22

Work Orders

|             |             |             |             |
|-------------|-------------|-------------|-------------|
| 38103564388 | 38103564412 | 38103564418 | 38103564422 |
| 38103636015 | 38103636016 | 38103656145 |             |

Other Documents

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DCU SU-15-01064, Replacement of Station Backflow Preventers, Rev. 3

ETE-SU-2015-0069, Design Basis for Backflow Preventers in Charging Pump Cubicles, MER-3, MER-4, MER-5, Rev. 0

EWR 90-178, BS Flood Control Dikes and MER Drain Backflow Preventers, Rev. 1

**Section 1R19: Post Maintenance Testing**Procedures

0-ECM-1509-06, Rising Stem Motor Operated Valve Quicklook Testing, Rev. 29

0-EPM-1503-01, Motor Operated Valve Operator Inspection, Rev. 8

0-ICM-AOV-001, Diagnostic Testing on Air Operated Valves, Rev. 15

2-ICM-RC-F-001, Reactor Coolant Flow Rescaling, Rev. 5

2-NPT-RX-009, Calculating RCS Flow, Rev. 9

2-IPM-RC-PCV-2455A, Pressurizer Spray Valve Instrumentation Testing and Maintenance, Rev. 10 {OTO1}

2-IPM-RC-PCV-2455B, Pressurizer Spray Valve Instrumentation Testing and Maintenance, Rev. 10 {OTO1}

2-OPT-EG-009, Number 2 Emergency Diesel Generator Major Maintenance Operability Test, Rev. 53 {OTO1}

2-OSP-EG-001, Number 2 Emergency Diesel Generator Local Alarm Panel Functional Test, Rev. 13 {OTO1}

GMP-009, Swagelok Fitting Removal and Installation, Rev. 12

Condition Reports

|         |         |         |         |         |         |
|---------|---------|---------|---------|---------|---------|
| 1015924 | 1017462 | 1018055 | 1019568 | 1019815 | 1020087 |
| 1021321 |         |         |         |         |         |

Drawings

11548-FM-086B SH 1, Flow/Valve Operating Numbers Diagram Reactor Coolant System Unit 2, Rev. 32

Work Orders

|             |             |             |             |
|-------------|-------------|-------------|-------------|
| 38102683304 | 38103018232 | 38103311394 | 38103471592 |
| 38103472792 | 38103554904 | 38103554915 | 38103554926 |
| 38103598514 | 38103598515 | 38103598516 | 38103646611 |

Other Documents

2-CH-MOV-2115C Engineer Evaluation of Quicklook Testing, 10/28/15

ETE-CME-2015-1005, Surry Power Station Unit 1 Spring 2015 Reactor Coolant System Volumetric Flow Acceptance Criteria, Rev. 0

SU-14-01164, Unit 2 RCP Replacement, Rev. 2

**Section 1R20: Refueling and Outage Activities**Procedures

- 1-OP-RX-006, Withdrawal of the Control Banks to Critical Conditions, Rev. 36
- 2-GOP-2.7, Unit Shutdown, Power Decrease from Allowable Power to Unit Offline for Refueling Outage, Rev. 28
- 2-OP-RX-006, Withdrawal of the Control Banks to Critical Conditions, Rev. 34

Condition Reports (\*NRC Identified)

|          |          |          |          |          |          |
|----------|----------|----------|----------|----------|----------|
| 1014173  | *1015045 | *1015048 | *1015850 | *1015852 | *1015853 |
| *1015854 | 1016216  | 1016749  | 1016754  | 1016977  | 1017054  |
| 1017528  | 1017588  | *1018179 | 1018575  | 1018852  | 1019342  |
| 1019946  | *1019973 | 1020180  | 1021199  | 1021356  |          |

**Section 1R22: Surveillance Testing**Procedures

- 0-NPT-CT-107, Data Collection during Type A Test, Rev. 5
- 2-NPT-CT-101, Reactor Containment Building Integrated Leak Rate Test (Type A Containment Testing), Rev. 7 (OTO1)
- 2-NPT-CT-102, Inspection of Containment Structure, Rev. 2
- 2-NPT-CT-104, AS Found Type A Tests Analysis, Rev. 4
- 2-NPT-CT-115, Superimposed CILRT Verification Test, Rev. 3
- 2-OPT-CT-102, Preparation, Alignment, and Restoration for Type A Test, Rev. 24
- 2-OPT-CT-201, Containment Isolation Valve Local Leak Rate Testing (Type C Containment Testing), Rev. 20
- 2-OPT-SI-002, Refueling Test of the Low Head Safety Injection Check Valves to the Cold Legs, Rev. 19
- 2-OPT-SI-007, Refueling Test of the High Head Safety Injection Check Valves to the Cold Legs, Rev. 18
- 2-OPT-SI-009, Refueling Test of the LHSI Check Valves to the Hot Legs, Rev. 12
- 2-OPT-ZZ-001, ESF Actuation with Undervoltage and Degraded Voltage – 2H Bus, Rev. 34 {OTO 4}
- 2-OSP-CT-001, Instruction to Find Leakage during a CILRT, Rev. 3

Work Orders

38102256378                      38103505844

**Section 2RS1: Radiological Hazard Assessment and Exposure Controls**Procedures, Guidance Documents, and Manuals

- HP-1031.124, Performing Effective Dose Equivalent (EDE) Calculations, Rev. 4
- HP-1032.110, Standard Radiation Monitoring and Dose Rate Trending, Rev. 1
- HP-1033.015, Contamination Monitoring Instrumentation Control, Rev. 22
- HP-1033.545, THERMO SCIENTIFIC RADEYE GX: Calibration and Operation, Rev 4
- HP-1033.711, Eberline Personnel Monitor Model PM-7, Calibration and Operation, Rev. 6
- HP-1033.742, Calibration of Canberra ARGOS-5PAB Personnel Contamination Monitor, Rev. 1
- HP-1033.744, Canberra CRONOS Contamination Monitor: Calibration and Operation, Rev. 0
- HP-1061.360, Final Containment Washdown and Sump Decontamination, Rev. 2
- HP-1071.021, Storing Radioactive Material Outside the Protected Area, Rev. 11
- RP-AA-105, External Radiation Exposure Control Program, Rev. 1
- RP-AA-111-1005, External Radiation Exposure Control Program Review, Rev. 0

RP-AA-111-1006, Radiological Work Control Program Review, Rev. 0  
 RP-AA-101, Radiological Protection Organization and Administration, Rev. 2  
 RP-AA-400, Portable Survey Instrumentation, Rev. 3  
 RP-AA-401, Non-Portable Contamination Monitors, Rev. 0  
 RP-AA-201, Access Controls for High and Very High Radiation Areas, Rev. 8  
 RP-AA-202, Radiological Posting, Rev. 8  
 RP-AA-220, Radiological Survey Scheduling, Rev. 2  
 RP-AA-222, Radiation Surveys, Rev. 3  
 RP-AA-225, Unrestricted Release of Material, Rev. 5  
 RP-AA-274-2001, RWP Writer's Guide, Rev. 0  
 RP-AA-275, Radiological Risk Assessment Process, Rev. 2  
 0-HPT-LKTEST-001, Health Physics Source Leak Test, Rev. 6  
 0-HPT-TRKSOURCE-001, Inventory of Nationally Tracked Sources by Health Physics, Rev. 4  
 0-HSP-BACF-001, Beta Activity Conversion Factor, Rev. 0  
 0-HSP-CRUDBURST-001, Hydrogen Peroxide Crud Burst, Rev. 3  
 0-HSP-LHRA DOOR-001, LHRA/VHRA Barrier Doors and Locks Inspection, Rev. 2

#### Records and Data

Air Sample Log, for the period 1/1/2015 through 10/22/15  
 Apex Gamma Spectrum Analysis for Air Sample: 04-MAY-2015-0044, U1 CTMT 18" C-RCP Cube, 5/04/15  
 Argos-5PAB Personnel Contamination Monitor Calibration Certificate, S/N 1112-247, 2/10/15  
 Argos-5PAB Personnel Contamination Monitor Calibration Certificate, S/N 1112-250, 2/9/15  
 Cronos Contamination Monitor Calibration Certificate, S/N 1303-068, 6/29/15  
 Excel Spreadsheet, Non-SNM Items in Surry Pool, 9/1/15  
 HIS-20 Active RWPs Dose Report, 10/21/15  
 Radiation Protection Department Clock Reset Briefing Sheet, CR Number 578666, Event Date 5/4/15  
 Routine Radiological Surveys: Map # 703, Low Level Waste Storage Facility, 8/27/15; Map # 506, D Building, 10/17/15; Map # 325, Auxiliary Building 27' Elevation, 10/15/15; Map # 350, Auxiliary Building 13' Elevation, 10/15/15; Map # 375, Auxiliary Building -2' Elevation, 10/4/15; Map # 300, Auxiliary Building 45' Elevation, 10/5/15  
 RP-AA-300, Attachment 1, TEDE ALARA Review, U2R26 – RCP Flange Machining, 9/24/15  
 RP-AA-275, Attachment 2, Radiological Risk Plan, U2R26 RCP Flange Machining, 9/24/15  
 Site Wide Communication – CRUD Burst Initiated on Tuesday 10/20/15  
 Surry Unit 2 Characterization of Alpha Source Term for S2C26, 10/13/15  
 Surry U2R26 Daily Dose Report, 10/15/15  
 Surveys of Flux Thimble Cutting Tool in SFP: Map # 400 Fuel Building 45' Elevation, Flux Thimble Cutting Tool [underwater] 7/17/15, 10/15/15  
 U2R26 Daily Exposure Status Report, 10/19/15  
 U2R26 Outage Schedule, 8/17/15  
 U2R26 Outage RWP List, 10/19/15  
 Unit 1 Containment Surveys for Flux Thimble Cutting: Map # 100, Unit 1 Containment 47', 5/20/15; Map # 102, Unit 1 Containment Reactor Cavity, 4/29/15, 5/1/15, 5/15/15, 5/16/15, and 7/16/15; Map # 900, Unit 1 Containment Reactor Cavity Flux Thimble Cutting Tool and Tri-Nuke Filter [underwater], 5/6/15 and 5/8/15  
 Unit 2 Containment Surveys [U2R26 Outage]: Initial Entry (all elevations), Pre/Post Shielding Installation, Post Crud Burst, Reactor Cavity Entry, and Incore Sump Entry, Multiple surveys for the period 10/19/15 through 10/21/15

U.S. NRC, National Source Tracking System, Annual Inventory Reconciliation Report, License ID 998, 01/13/15  
 Work Order 38103462549, Inventory of Nationally Tracked Sources by Health Physics, 1/15/15  
 Work Order 38103397302, Beta Activity Conversion Factor, 8/5/15  
 2015 Non-Outage RWP List, 9/21/15

Corrective Action Program (CAP) Documents

CA304245  
 CR558674  
 CR570473  
 CR576443  
 CR576574  
 ACE019935  
 ACE019924  
 RP-AA-111-1009, Attachment 1, Radiological Survey Program Review, Surry Power Station 2015, (DRAFT)

**Section 2RS8: Radioactive Material Processing and Transportation**

Procedures, Manuals, and Guides

0-HSP-HIC-001, HP Surveillance of High Integrity Containers (HICs) Inside SRF HIC Storage Area, Rev. No. 0  
 0-HSP-RESIN-001, Primary Resin Transfer Activities, Rev. No. 4  
 HP-1071.022, Placing High Integrity Containers (HICs) Into Storage at the SRF HIC Storage Area, Rev. No. 0  
 HP-1072.020, Sampling, Analyzing, and Classifying Radioactive Waste, Rev. No. 6  
 C-HP-1071.010, Control of Radioactive Sources, Rev. No. 8  
 C-HP-1071.030, Receiving Radioactive Material, Rev. No. 5  
 C-HP-1071.040, Packaging and Shipment of Radioactive Material, Rev. No. 13  
 C-HP-1072.010, Packaging Radioactive Waste, Rev. No. 2  
 C-HP-1072.050, Radioactive Waste Transfer To Licensed Waste Processors, Rev. No. 12  
 C-HP-1072.070, Radioactive Waste Disposal Using the Energy Solutions Containerized Waste Facility, Rev. No. 7  
 C-HP-1072.071, Radioactive Waste Disposal Using the Energy Solutions Bulk Waste Facility, Rev. No. 7  
 HP-1071.021, Storing Radioactive Material Outside the Protected Area, Rev. 11  
 OP-22.9.25, Processing Polyethylene HICs, Rev. No. 20  
 PI-AA-200, Corrective Action, Rev. No. 28  
 RP-AA-108, Radioactive Material Control Program, Rev. No. 4  
 VPAP-2104, Radioactive Waste Process Control Program, Rev. No. 8

Shipping Records and Radwaste Data

10 CFR Part 37 Training Records for Radiological Protection Department Personnel  
 10 CFR 61 Waste Stream Sample Results: 1-CH-FL-2 (04/08/15); 1-FC-FL-1B (05/06/15); B Loop Drain Valve (05/04/15); B Pressurizer Spray Valve (04/30/15); Blend Tank 2014-1 Resins (06/17/14); Catch Tank Resins (05/12/15); EBT 2015 Bottle 1 Sludge (05/21/15); R O Filter (03/23/15); Tri-Nuke 2014 (05/12/14); and WMG Sludge (01/21/15)  
 Lecture Attendance Record for Energy Solutions DOT/NRC Radioactive Waste Packaging, Transportation and Disposal, Air Transport of Radioactive Materials (IATA) and Load Securing for Radioactive Materials Training Workshop, 06/06/14

Radioactive Material Control Assignments, Dominion, Radiological Protection Department,  
 Surry Power Station, Memorandum to File, 09/09/15  
 Shipment No. SH-2014-019  
 Shipment No. SH-2015-013  
 Shipment No. SH-2015-027  
 Shipment No. SH-2015-032  
 Shipment No. SV2015-1  
 Shipment Receipt ID No. RT-2013-024  
 Surry Radwaste Facility Radioactive Materials Inventory Records, Filters in Storage in 2015  
 (Bunkers E, H and I)

CAP Documents

CR547384

CR566547

Program Evaluation CRS # 02204, Solid Radioactive Waste Control Program Content and  
 Implementation, January 2013 – June 2015, 08/14/15

**Section 40A1: Performance Indicator Verification**

Procedures

ER-AA-SPI-1001, Implementation of the Consolidated Data Entry (CDE) Reporting for Mitigating  
 System Performance Index (MSPI), Rev. 3

ER-AA-SPI-1002, Maintaining the MSPI Basis Document, Rev. 2

Other Documents

Monthly PI Reports with Associated Data, September 2014 to September 2015

Technical Report SE-0006, NRC MSPI Basis Document Surry Power Station, Rev. 1

NEI 99-02, Regulatory Assessment Performance Indicator Guideline, Rev. 7

SU-2014-0082, MSPI Basis Document, Rev. 0

**Section 40A2: Identification and Resolution of Problems**

Procedures

1-AP-9.00, RCP Abnormal Conditions, Rev. 36

ER-AA-102, Preventative Maintenance Program, Rev. 8

ER-AA-PRS-1010, Preventative Maintenance Task Basis & Maintenance Strategy, Rev. 7

Condition Reports

|         |         |         |         |         |         |
|---------|---------|---------|---------|---------|---------|
| 581101  | 581116  | 581331  | 582021  | 582047  | 582696  |
| 1002289 | 1003878 | 1014657 | 1014721 | 1014795 | 1015310 |
| 1015578 | 1005610 | 1015517 | 1015518 | 1015750 | 1016347 |
| 1016351 | 1016947 | 1009753 | 1019829 | 1019845 | 1019848 |
| 1020378 |         |         |         |         |         |

Work Orders

38102566261

Other Documents

0-AP-12.00, Service Water System Abnormal Conditions, Rev. 14

ACE 000680, Clogged Suction Strainer on 1-VS-E-4C, Rev. 0

CCA 000317, Common Cause Analysis CH Pump Service Water System Events, Rev. 0

DRN 0114-0093-LTR-01, MPR Associates Peer Technical Review of RCE 3002046 – Surry 1-RC-P-1B Seal Degradation, Rev. 0  
Engineering Start-up Assessment for CW/SW, 11/25/15  
ETE-SU-2015-0029, 1C SW Header Debris Evaluation, 5/22/15  
ETE-SU-2015-1004, MER 3 Ciller Revised SW Operating Parameters, Rev. 0  
ETE-SU-2015-1023, VS Rotating Strainer Media Size Evaluation, Rev. 0  
ODM 581101, Degrading Trend on 1-RC-P-1B N9000 Seal, 6/30/15  
ODM 1004996, Degrading Trend on 1-RC-P-1B 3<sup>rd</sup> Stage Seal, 8/17/15  
RCE 3002046, 1-RC-P-1B Seal Degradation, Rev. 1  
RCE 3003883, Degraded Service Water Conditions Resulted in 0-AP-12 Entry, Rev. 0  
S-PMTE-2009-0084, PM Task Evaluation, Maintenance (SW pipe of MER 3&4) Inspection and Cleaning, 6/10/09

### **Section 40A3: Follow-up of Events and Notices of Enforcement Discretion**

#### Procedures

2-GOP-1.5, Unit Startup, 2% Reactor Power to Max Allowable Power, Rev. 70  
2-OP-TM-001, Turbine – Generator Startup to 20% - 25 % Turbine Power, Rev. 56  
2-OP-TM-003, Turbine – Overspeed Test, Rev. 11

#### Other Documents

RCE 3003232, Unit 2 Reactor Trip During 2-OP-TM-001, 9/15/15

## LIST OF ACRONYMS

|       |  |
|-------|--|
| ACE   | Apparent Cause Evaluation                        |
| ADAMS | Agencywide Document Access and Management System |
| AFW   | Auxiliary Feedwater                              |
| ASME  | American Society of Mechanical Engineers         |
| BACC  | Boric Acid Corrosion Control                     |
| BPVC  | Boiler and Pressure Vessel Code                  |
| CA    | Corrective Action                                |
| CAP   | Corrective Action Program                        |
| CC    | Component Cooling                                |
| CFR   | Code of Federal Regulations                      |
| CH    | Charging   |
| CHSW  | Charging Service Water                           |
| CR    | Condition Report                                 |
| CVCS  | Chemical and Volume Control System               |
| DC    | Direct Current                                   |
| DCP   | Design Change Package                            |
| DOT   | Department of Transportation                     |
| DP    | Delta Pressure                                   |
| EC    | Eddy Current                                     |
| ED    | Electronic Dosimeter                             |
| EDG   | Emergency Diesel Generator                       |
| EPRI  | Electric Power Research Institute                |
| ESGR  | Emergency Switchgear Room                        |
| ETE   | Engineering Technical Evaluation                 |
| ETSS  | Examination Technique Specification Sheet        |
| FAC   | Flow Accelerated Corrosion                       |
| GPM   | Gallons Per Minute                               |
| HRA   | High radiation areas                             |
| HVAC  | Heating, Ventilation and Cooling                 |
| HX    | Heat Exchanger                                   |
| IMC   | Inspection Manual Chapter                        |
| IP    | Inspection Procedure                             |
| ISI   | In-Service Inspection                            |
| LCO   | Limiting Condition for Operation                 |
| LHRA  | Locked High Radiation Area                       |
| LHSI  | Low Head Safety Injection                        |
| LER   | Licensee Event Report                            |
| MCR   | Main Control Room                                |
| MDAFW | Motor Driven Auxiliary Feedwater                 |
| MER   | Mechanical Equipment Room                        |
| MS    | Mitigating Systems                               |
| MOV   | Motor Operated Valve                             |
| MT    | Main Turbine                                     |
| NCV   | Non-cited Violation                              |
| NDE   | Non-destructive Examination                      |
| NEI   | Nuclear Energy Institute                         |
| NEIL  | Nuclear Electric Insurance Limited               |
| NRC   | Nuclear Regulatory Commission                    |

|       |                                      |
|-------|--------------------------------------|
| OE    | Operating Experience                 |
| OPC   | Overspeed Protection Controller      |
| OTO   | One Time Only                        |
| OWA   | Operator Work Around                 |
| PARS  | Publicly Available Records           |
| PD    | Performance Deficiency               |
| PI    | Performance Indicator                |
| PMT   | Post Maintenance Test                |
| PT    | Penetrant Test                       |
| PZR   | Pressurizer                          |
| QCE   | Quick Cause Evaluation               |
| RCA   | Radiologically Controlled Area       |
| RCP   | Reactor Coolant Pump                 |
| RCE   | Root Cause Evaluation                |
| RCS   | Reactor Coolant System               |
| RFO   | Refueling Outage                     |
| RMC   | Radioactive Material Control         |
| RP    | Radiation Protection                 |
| RPS   | Reactor Protection System            |
| RS    | Recirculation Spray                  |
| RSHX  | Recirculation Spray Heat Exchanger   |
| RTE   | Recurring Task Evaluations           |
| RTP   | Rated Thermal Power                  |
| RWP   | Radiation Work Permit                |
| SDP   | Significance Determination Process   |
| SG    | Steam Generator                      |
| SI    | Safety Injection                     |
| SW    | Service Water                        |
| TS    | Technical Specifications             |
| U2R26 | Unit 2 Refueling Outage Number 26    |
| UFSAR | Updated Final Safety Analysis Report |
| UT    | Ultrasonic Testing                   |
| UV    | Under Voltage                        |
| VEPCO | Virginia Electric and Power Company  |
| VT    | Visual Testing                       |
| WO    | Work Order                           |