



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**
REGION II
SAM NUNN ATLANTA FEDERAL CENTER
61 FORSYTH STREET, SW, SUITE 23T85
ATLANTA, GEORGIA 30303-8931

July 28, 2009

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
05000280/2009003 and 05000281/2009003.**

Dear Mr. Heacock:

On June 30, 2009, the United States Nuclear Regulatory Commission (NRC) completed an inspection at your Surry Power Station, Units 1 and 2, and the Surry Independent Spent Fuel Storage Installation. The enclosed inspection report documents the inspection results, which were discussed on July 16, 2009, with Mr. Bischof and other members of your staff.

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

The report documents one self-revealing finding of very low safety significance (Green). The finding was determined to involve a violation of NRC requirements. Additionally, three licensee-identified violations which were determined to be of very low safety significance are listed in this report. However, because of the very low safety significance and because they are entered into your corrective action program, the NRC is treating these findings as non-cited violations (NCVs) consistent with Section VI.A.1 of the NRC Enforcement Policy. If you contest any NCV, 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.

In addition, if you disagree with the characterization of any finding 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. The information you provide will be considered in accordance with Inspection Manual Chapter 0305.

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

Sincerely,

/RA/

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

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

Enclosure: Inspection Report 05000280/2009003 and 05000281/2009003
w/Attachment: Supplemental Information

cc w/encl. (See page 3)

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 Division of Reactor Projects

Docket Nos.: 50-280, 50-281
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cc w/encl. (See page 3)

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cc w/encl:

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Letter to David A. Heacock from Gerald J. McCoy dated July 28, 2009.

SUBJECT: SURRY POWER STATION – NRC INTEGRATED INSPECTION REPORT
05000280/2009003 and 05000281/2009003.

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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: 05000280/2009003 and 05000281/2009003

Licensee: Virginia Electric and Power Company (VEPCO)

Facility: Surry Power Station, Units 1 and 2

Location: 5850 Hog Island Road
Surry, VA 23883

Dates: April 1, 2009 through June 30, 2009

Inspectors: C. Welch, Senior Resident Inspector
J. Nadel, Resident Inspector
D. Arnett, Project Engineer (1R12)
R. Chou, Reactor Inspector (1R08)
M. Coursey, Reactor Inspector (1R08)
C. Fletcher, Reactor Inspector (1R08)

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

Enclosure

SUMMARY OF FINDINGS

IR 05000280/2009-003 and 05000281/2009-003; 04/01/2009 – 06/30/2009; Surry Power Station, Units 1 and 2; Post Maintenance Testing

The report covered a 3 month period of inspection by resident inspectors and an announced inspection by regional inspectors. One Green finding, which was a non-cited violation (NCV), was identified. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process" (SDP). The cross-cutting aspect was determined using IMC 0305, "Operating Reactor Assessment Program." Findings for which the SDP does not apply may be Green or be assigned a severity level after NRC management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process" Revision 4, dated December 2006.

A. NRC Identified and Self-Revealing Findings

Cornerstone: Mitigating Systems

- Green. A self-revealing Green non-cited violation (NCV) of Technical Specification 6.4, "Unit Operating Procedures and Programs;" was identified for the failure to provide adequate work instructions for installation of design change (DC) SU-08-0001, for engine-driven emergency service water pump 1-SW-P-1A. Corrective action to remove the modification from the 'A' pump was completed and reasonable compensatory measures established for all three pumps pending removal / alteration of the exhaust piping modifications. The licensee entered this issue into the CA program as CR 337337.

The finding, associated with the Procedure Quality attribute of the Mitigating Systems Cornerstone, is more than minor because it adversely affected the cornerstone objective to ensure the availability, reliability, and operability of 1-SW-P-1A to perform its safety function during a design basis event. Evaluated using a Phase II SDP risk analysis per Appendix A of MC-0609, the finding was determined to be of very low safety significance (Green) due to availability of the two remaining ESVPs which provided full mitigation capability for the safety functions required. A cross-cutting aspect in the area of human performance work control was assigned to the finding (H.3.a). (Section 1R19)

B. Licensee Identified Violations

Violations of very low safety significance, which were identified by the licensee, have been reviewed by the inspectors. Corrective actions taken or planned by the licensee have been entered into the licensee's corrective action program. These violations and corrective actions are listed in Section 4OA7 of this report.

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REPORT DETAILS

Summary of Plant Status

Unit 1 began the period at full Rated Thermal Power (RTP) and operated at full power until April 19, 2009 when the unit was shutdown for a refueling outage. On May 14, 2009 Unit 1 returned to 100 percent RTP and operated at or near full RTP for the remainder of the inspection period.

Unit 2 operated at or near full RTP throughout the inspection period.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R01 Adverse Weather Protection

.1 Site Specific Weather Event

a. Inspection Scope

The inspectors reviewed licensee implementation of its' severe weather procedures for a tornado watch issued for Surry County on April 6, 2009. The inspectors, on a sampling basis, verified actions contained in OC-21, "Severe Weather Checklist" and 0-AP-37.01, "Abnormal Environmental Conditions" were completed. The inspectors walked down the risk-significant areas identified below to verify compliance with the procedural requirements and to assess whether the specified actions provided adequate protection for the structures, systems, and components.

- Emergency Diesel Generators 1, 2, and 3
- Unit 1 and 2 Turbine Building Basement and Emergency Switchgear Rooms

b. Findings

No findings of significance were identified.

1R04 Equipment Alignment

.1 Partial Walkdown

a. Inspection Scope

The inspectors performed a partial walkdown of the following six risk-significant systems to verify the operability of redundant or diverse trains and components for equipment removed from service and / or that the system was properly aligned to perform its' designated safety function following an extended outage. The inspectors attempted to identify any discrepancies that could impact the function of the system, and, therefore, potentially increase risk. The inspectors reviewed applicable operating procedures,

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station drawings, the Updated Final Safety Analysis Report, and Technical Specifications to determine the correct configuration to support system operation. The inspectors verified the positions of critical valves, breakers, and control switches by in-field observation and/or review of the main control board. The inspectors reviewed the corrective action program to verify equipment alignment issues were being identified and resolved.

- Unit 1 inside recirculation spray system (ISRS)
- Unit 1 outside recirculation spray system (OSRS)
- Unit 1 auxiliary feedwater (AFW) motor and turbine driven systems
- Unit 1 safety injection (SI) system
- Unit 1 containment spray (CS) system
- Unit 2 safety injection (SI) system

b. Findings

No findings of significance were identified.

.2 Complete Walkdown

a. Inspection Scope

The inspectors conducted a complete walkdown of the Unit 1 auxiliary feedwater system (AFW), including the steam supply to the turbine drive auxiliary feedwater (TDAFW) pump, with specific focus on motor driven pump 3A, to verify the functional capability of the system. To better understand various feedwater related concerns, the inspectors reviewed Operating Experience Smart Sample (OpESS) FY2009-02, "A Negative Trend and Recurring Events Involving Feedwater Systems;" applicable referenced documents and generic NRC communications, and all greater-than-green findings related to feedwater or their backup systems for pressurized water reactors. To determine the correct alignment and aid in assessing the material condition of the system, the inspectors reviewed the plant health report; plant issues documents; condition reports; the UFSAR and Technical Specifications; and the applicable station procedures and drawings. During the walkdown, the inspectors verified that valves and breakers were in their proper position, component labeling was accurate, hangers and supports were functional, and valves were locked as required. Outstanding plant issues/deficiencies were reviewed to assure they were properly classified and did not affect the capability of the system to perform its safety function. Issues associated with the feedwater regulating valves were reviewed to verify that corrective actions taken were appropriate and the valves remained capable of performing their safety function.

b. Findings

No findings of significance were identified.

1R05 Fire Protection

a. Inspection Scope

The inspectors conducted a defense-in-depth (DID) review for the six fire areas listed below by walkdown and review of licensee documents. 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.

- Fire Zone 7 and 21, Fuel Building
- Fire Zone 8, EDG Room No. 3
- Fire Zone 15, Unit 1 Reactor Containment
- Fire Zone 17, Auxiliary Building 13' elevation
- Fire Zone 19, Unit 1 Safeguards and Main Steam Valve House
- Fire Zone 20, Unit 2 Safeguards and Main Steam Valve House

b. Findings

No findings of significance were identified.

1R06 Flood Protection Measures

a. Inspection Scope

The inspectors reviewed selected risk-important plant design features and licensee procedures intended to protect the plant and its safety-related equipment from internal flooding events in the Unit 1 and 2 turbine building basements. The inspectors reviewed the applicable flood analysis and design documents, the UFSAR, engineering calculations, abnormal operating procedures, and the Individual Plant Examination (IPE) of Non-Seismic External Events and Fires. Completed preventive maintenance and surveillance records for the Unit 1 and 2 turbine building flood detection devices; including probes, alarms, and protection circuitry, were also reviewed. Walkdowns were performed to review compliance with procedures for internal and external flooding and to inspect the condition of floor drains, expansion joint shields, and flood and spill control dams/curbing.

b. Findings

No findings of significance were identified.

1R08 In-service Inspection (ISI) Activities

.1 Non-Destructive Examination (NDE) Activities and Welding Activities

a. Inspection Scope

From April 27 - May 01, 2009, the inspectors reviewed the implementation of the licensee's In-service Inspection (ISI) program for monitoring degradation of the reactor coolant system (RCS) boundary and risk significant piping boundaries. The inspectors' activities consisted of an on-site review of NDE and welding activities to evaluate compliance with the applicable edition of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (BPVC), Section XI (Code of record: 1998 Edition with 2000 Addenda), and to verify that indications and defects (if present) were appropriately evaluated and dispositioned in accordance with the requirements of the ASME Code, Section XI acceptance standards.

The inspectors' review of NDE activities specifically covered examination procedures, NDE reports, equipment and consumables certification records, personnel qualification records, and calibration reports (as applicable) for the following examinations:

- UT of 11448-WMKS-0100G1/14-WFPD-17/1-03 Pipe-Tee IAW W/O 38102359212/NDER09-002
- PT of 11448-WKMS-RS-P-2A/1-RS-P-2A/0-08 Integral Attachment IAW W/O 38102359212/NDER09-002

The inspectors' review of welding activities specifically covered the welding activities listed below in order to evaluate compliance with procedures and the ASME Code. The inspectors reviewed the work orders, repair and replacement plans, weld data sheets, welding procedures, procedure qualification records, welder qualification records, and NDE reports.

- Cut out old valve and install flanges for new valve 01-FW-131 IAW W/O 783861-05

b. Findings

No findings of significance were identified.

.2 PWR Vessel Upper Head Penetration (VUHP) Inspection Activities

a. Inspection Scope

Reactor Vessel Upper Head Penetration activities performed by the licensee during this outage did not fall under the scope of section 02.02 of the inspection procedure.

b. Findings

No findings of significance were identified.

.3 Boric Acid Corrosion Control (BACC) Inspection Activities

a. Inspection Scope

The inspectors reviewed the licensee's BACC program activities to ensure implementation with 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 on-site record review of procedures and the results of the licensee's containment walk-down inspections performed during the Unit 1 cycle 22 refueling outage. The inspectors also interviewed the previous BACC program owner and conducted a walk-down of the reactor containment building to evaluate compliance with licensee's BACC program requirements and verify that degraded or non-conforming conditions, such as boric acid leaks identified during the containment walk-down, were properly identified and corrected in accordance with the licensee's BACC and corrective action programs.

The inspectors reviewed a sample of engineering evaluations completed for evidence of boric acid found on systems containing borated water to verify that the minimum design code required section thickness had been maintained for the affected components. The inspector selected the following evaluations for review:

- CR331771 Boric Acid discovered on 1-RH-E-1A (flange)
- CR331451 Boric acid discovered on 1-CH-431 (packing)

b. Findings

No findings of significance were identified.

.4 Steam Generator (SG) Tube Inspection Activities

a. Inspection Scope

The inspectors reviewed activities, plans, condition monitoring and operational assessments, the pre-outage degradation assessment, and procedures for the inspection and evaluation of the steam generator Inconel Alloy 600TT tubing for Unit 1 SGs 'A' and 'C' to determine if the activities were being conducted in accordance with Technical Specifications (TS) and applicable industry standards. Data gathering, analysis, and evaluation activities were reviewed.

The inspectors reviewed data results to verify the adequacy of the licensee's primary, secondary, and resolution analyses.

The inspectors reviewed the tube maximum through-wall depth wear approximately 99 percent on the inside of tube R9C69 in SG 'A' at 0.32 inch above and below the top of the tube-sheet. In-Situ pressure testing was performed and completed successfully without a leak or bursting of tube R9C69.

The inspectors observed the in-Situ test for this tube and tube plugging activities in SG 'C' due to the circumferential cracks identified above the one inch of the tube-end in the hot leg. The inspectors reviewed equipment, data operators, and analyst certifications and qualifications, including medical exams.

The inspectors reviewed data for the following tubes:

SG 'A': R9C69, R12C69, R13C70, R9C80, R2C36, R27C84, R14C55, R13C55, R12C55, R115C93, R151C16, R149C32, R147C30, and R145C40

SG 'C': R1C44, R4C44, R8C40, R10C26

b. Findings

No findings of significance were identified.

.5 Identification and Resolution of Problems

a. Inspection Scope

The inspectors performed a review of ISI-related problems, including welding and BACC, which were identified by the licensee and entered into the corrective action program as Condition Reports (CRs). The inspectors reviewed the CRs to confirm that the licensee had appropriately described the scope of the problems and had initiated corrective actions. The review also included the licensee's consideration and assessment of operating experience events applicable to the plant. The inspectors performed this review to ensure compliance with 10CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," requirements. The corrective action documents reviewed by the inspectors are listed in the report Attachment.

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Regualification Program

.1 Resident Inspector Quarterly Review

a. Inspection Scope

On June 4, 2009, the inspectors observed a licensed operator simulator training session. The training was administered using scenario RQ-09.3-ST-2 and involved both operational transients and design basis events. The inspector verified the simulator conditions were consistent with the scenario and reflected the actual plant configuration (i.e. simulator fidelity). The inspector 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

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emergency operating procedures; demonstrated proper command and control; communicated effectively; and appropriately classified events per the emergency plan. The inspectors confirmed items for improvement were identified and discussed with the operators to further improve performance.

b. Findings

No findings of significance were identified.

1R12 Maintenance Effectiveness

a. Inspection Scope

For the equipment issues described in the three 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. 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), VPAP 0815, "Maintenance Rule Program," and the Surry Maintenance Rule Scoping and Performance Matrix.

- CR 334239 – Unit 1 PORV Tailpipe Temps are elevated
- CR 334541 – 1-SI-P-1B delta P was in the inoperable range
- CR 334236 – U-1 Containment personnel hatch inner door will not operate

b. Findings

No findings of significance were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control

a. Inspection Scope

The inspectors evaluated, as appropriate, for the five work activities listed below: (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.

- April 6, 2009, Unit 1 and 2 elevated on-line risk (Green) due to a National Weather Service issued tornado watch
- April 17, 2009, Unit 1 elevated on-line risk (Yellow) due to concurrent planned maintenance on the 1B charging pump and station blackout diesel generator
- April 22, 2009, Unit 1 elevated shutdown risk (Yellow) due to J bus logic testing concurrent with reactor coolant system loop draindown activities
- June 1 - 4, 2009, Unit 1 and 2 online (Green) risk during emergent work to repair the emergency service water pump 1-SW-P-1A diesel engine and exhaust pipe missile shield
- June 29, 2009, Unit 1 and 2 on-line risks (Green) due to planned surveillance testing of EDG #3 during a hot weather alert

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations

a. Inspection Scope

The inspectors reviewed the two 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 determinations of operability followed procedural requirements of OP-AA-102, Revision 3, "Operability Determination." The inspectors reviewed the corrective action program to verify deficiencies in operability determinations were being identified and corrected.

- CR 0332742, Unit 1 1A battery identified with cracks in the lid near the positive post
- CR 337337; Condition report for Operability Generation for 1-SW-P-1A

b. Findings

No findings of significance were identified.

1R19 Post Maintenance Testing

a. Inspection Scope

For the nine risk-significant maintenance activities listed below, the inspectors reviewed the associated post maintenance testing (PMT) procedures and either witnessed the testing and/or reviewed completed records 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) test 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) test 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 its safety function. The inspectors reviewed the corrective action program to verify PMT deficiencies were being identified and corrected. Documents reviewed are listed in the Attachment to this report.

- 01-SI-MOV-1862B spring pack replacement and preventive maintenance; WOs. 38102112593, 38074000901, and 38074000902
- 01-SI-MOV-1863B preventive maintenance, lube, and diagnostic testing; WOs. 38102112659 and 38102113575
- 01-SW-P-1A troubleshooting and corrective maintenance; WOs 3810250095, 38102579920, 38102579766, 38102579938, 38102579754, and 38102580060
- Unit 1 charging pump '1B' removal, design modification, and rebuild; WO 38102487951
- Post maintenance control rod exercise test, 1-NSP-RX-014; WO 38102351821
- Post maintenance rod drop timing test, 1-NPT-RX-014; WO 38102255985
- Post refueling startup physics testing, 1-NPT-RX-008; WO. 38102255991
- Post maintenance testing of Unit 1 Containment Equipment Hatch and Emergency Personnel Escape Airlock Leakage Testing 1-OPT-CT-302
- Post maintenance testing of Unit 1 Containment Personnel Airlock Test 1-OPT-CT-301

b. Findings

Introduction: A self-revealing Green non-cited violation (NCV) of Technical Specification 6.4, "Unit Operating Procedures and Programs," was identified for the failure to provide adequate work instructions for installation of design change (DC) SU-08-0001, for engine-driven emergency service water pump 1-SW-P-1A.

Description: Design change (DC) SU-08-0001 was installed on 1-SW-P-1A in early May 2009 to address the lack of missile protection for the engine-driven emergency service water pump 1-SW-P-1A. Heavy rains were experienced on several occasions during the installation and resulted in work being temporarily secured. A tent erected over the work site did not offer full protection to the work area and plans to regROUT the area around the exhaust pipe were cancelled due to length of the cure time for the grouting material. Post maintenance testing, which did not verify integrity of the RTV silicone sealant, was completed and the pump returned to an operable status on May 8, continued periods of rain occurred over the next few days.

The licensee attempted to run 1-SW-P-1A on May 30, 2009 but the engine failed to start. Two additional attempts to start the engine were made during trouble shooting before the starter motor was replaced on May 31. On the first attempt to start the engine following replacement of the starter motor, the diesel engine momentarily turned over

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before the machine appeared to lock up. A second attempt was then made using the pre-lube bypass function and the diesel successfully cranked over and ran however, immediately after the start water was seen spraying from the engine and the engine was secured.

During subsequent investigation approximately 1 to 1.5 gallons of water was drained from the engine's exhaust manifold and it was noted significant damage to one piston rod and cylinder liner had occurred. The rain water penetrated the silicone RTV sealant that had been applied beneath the base plate of the modification to prevent water intrusion into the engine exhaust pipe. The RTV sealant did not properly cure and was exposed to water during the installation process. The engine was repaired and restored to an operable condition on June 4, 2009.

Analysis: The inspectors determined the failure to provide adequate work instructions to assure a water tight seal was obtained between the roof deck and missile shield sub-assembly mating surface was a performance deficiency which was within the licensee's ability to foresee and prevent that resulted in 1-SW-P-1A being inoperable. The finding, associated with the Procedure Quality attribute of the Mitigating Systems Cornerstone, is more than minor because it adversely affected the cornerstone objective to ensure the availability, reliability, and operability of 1-SW-P-1A to perform its' safety function during a design bases event. The finding was evaluated using MC 0609, "Significance Determination Process". The Phase I analysis process found that because the finding represented an actual loss of safety function of a single train for greater than the technical specification allowed outage time, a Phase II analysis was required. The Phase II analysis process found that the finding was determined to be of very low safety significance (Green), because the dominant core damage sequence was Loss of service water (LSW), and mitigated by the availability of the two remaining ESFPs.

The finding has a cross-cutting aspect in the area of human performance work control because the licensee failed to plan and coordinate work activities consistent with nuclear safety in that they did not adequately consider job site and environmental conditions when developing work instructions to install DC SU-08-001 for 1-SW-P-1A (H.3.a).

Enforcement: Technical Specification 6.4.A requires in part that detailed written procedures with appropriate instructions be provided for corrective maintenance operations which could have an effect on the safety of the reactor. Contrary to this, work instructions for installation of DC SU-08-0001, for engine-driven emergency service water pump 1-SW-P-1A, were not complete in that they did not provide adequate instructions to ensure a water tight seal was obtained between the mating surfaces of the roof top and modification sub-assembly. Because this finding is of very low safety significance and was entered into the licensee's corrective action program as CR 337337, this violation is being treated as a NCV, consistent with Section VI.A.1 of the NRC Enforcement Policy and is identified as NCV 05000280, 05000281/2009003-01, Inadequate Work Instructions for Installation of a Design Change. Corrective action was completed to restore engine-driven emergency service water pump 1-SW-P-1A to the original configuration, and interim compensatory measures have been established.

1R20 Refueling and Other Outage Activities

a. Inspection Scope

The inspectors performed the activities described below for the Unit 1 Refueling Outage (RFO) that began on April 19, 2009, and ended May 14, 2009.

Review of Outage Plan:

On a routine basis, the inspectors reviewed the refueling outage work plan and daily shutdown risk assessments. Periodic updates to the Surry Unit 1 2009 RFO Shutdown Risk Review Report, accounting for schedule changes and unplanned activities, were also reviewed. Reviews focused on verifying that adequate defense-in-depth was provided for each safety function and/or the Licensee implemented planned contingencies to minimize the overall risk where redundancy was limited or not available. Detailed risk reviews for specific high risk periods/activities are documented in section 1R13 of this report.

Monitoring of Shutdown Activities:

The inspectors observed performance of portions of the reactor shutdown and plant cooldown to assess operator performance with respect to communications, command and control, procedure adherence, and compliance with Technical Specification cooldown limits. Upon shutdown, the inspectors conducted a thorough containment walkdown to identify structures, piping, and supports in containment with stains or deposited material that could indicate previously unidentified leakage from components containing reactor coolant and/or signs of physical damage.

Licensee control of Outage Activities:

Clearance Activities - The inspectors reviewed a sample of risk significant clearance activities and verified tags were properly hung and/or removed, equipment was appropriately configured per the clearance requirement, and that the clearance did not impact equipment credited to meet the shutdown critical safety functions.

Reactor Coolant System Instrumentation - The inspectors periodically observed and verified by diverse means that associated instruments were functioning properly for the reactor/refueling cavity and spent fuel pool (SFP) water level, the reactor coolant and spent fuel pool temperature, and the operating residual heat removal system

Electrical Power - The inspectors verified that the status of electrical systems met TS requirements and the licensee's outage risk control plan. The inspectors verified that compensatory measures were implemented when electrical power supplies were impacted by outage work activities. The inspectors verified that credited backup power supplies were available.

Residual Heat Removal and SFP System Monitoring - The inspectors observed the SFP cooling and reactor RHR system status and operating parameters to verify that the

Enclosure

cooling systems operated properly. Verification included periodic review of the SFP and reactor cavity level, temperature, and RHR system flow.

Inventory Control - The inspectors reviewed actions to establish, monitor, and maintain the proper water inventory in the reactor vessel/cavity and spent fuel pool. The inspectors reviewed the plant system flow paths and configurations established for reactor makeup and verified the configurations were consistent with the outage plan.

Reactivity Control - The inspectors reviewed the outage risk plan to verify that activities, systems, and/or components which could cause unexpected reactivity changes were identified and controlled accordingly.

Foreign Material Exclusion (FME) - The inspectors reviewed implementation of licensee procedures for FME control for the open reactor vessel, reactor cavity, and SFP.

Containment Closure - The inspectors reviewed activities during the outage to control containment penetrations and to maintain the capability to achieve containment closure in accordance with the refueling operations technical specifications. Periodic tours of containment were performed to review the control of work activities and containment conditions.

Problem Identification and Resolution - The inspectors verified the licensee was identifying outage related issues and had entered them into the corrective action program.

Control of Heavy Loads:

The inspectors reviewed and verified station procedures for heavy load lifts were consistent with station analysis and Appendix 9B of the UFSAR to ensure that heavy load lifts were conducted safely. The inspectors reviewed actions to manage the increased risk during these activities and observed the heavy load lifts for the Unit 1 reactor vessel head removal and upper internals reinstallation. The inspectors reviewed the procedures for the heavy load lifts involving the reactor pump motors.

Refueling Activities:

The inspectors, on a sampling basis, verified the requirements of TS 3.10, Refueling, were met, and that refueling activities were conducted in accordance with station procedures. Activities were monitored from the control room and refueling bridge at various times while fuel handling activities were in progress to observe the communications and coordination between personnel and to verify core reactivity was controlled and fuel movement was accomplished and tracked in accordance with the fuel movement schedule. The inspectors observed portions of the core mapping evolution and watched the video recording of the core verification to independently verify the as-loaded core configuration matched the designed core reload configuration for Unit 1 cycle 23.

Monitoring of Heat-up and Startup Activities:

Prior to startup, the inspectors examined the spaces inside the containment building to verify that debris had not been left which could affect performance of the containment sumps. On a sampling basis the inspectors verified that technical specification, license conditions, and other requirements, commitments, and administrative procedure prerequisites were met for changes in plant configurations/modes. To monitor restart activities, the inspectors performed control room observations, plant walkdowns, and reviewed main control board indicators, operator logs, plant computer information, and station procedures. Control room observations included the approach to criticality, critical operations, low power physics testing, and the synchronization of the main turbine generator to the electrical grid.

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing

a. Inspection Scope

The inspectors witnessed and/or reviewed test records for the seven risk-significant surveillance tests listed below, to determine whether the SSCs selected meet the Technical Specifications (TS), Updated Final Safety Analysis Report (UFSAR), and licensee procedure requirements and demonstrate that the SSCs are capable of performing their intended safety functions (under conditions as close as practical to accident conditions or as required by TS) and their operational readiness.

In-Service Testing:

- 1-OPT-RS-001; Containment Outside Recirculation Spray Pumps Flow and Leak Test
- 1-OPT-RH-003; RHR System Operability Test
- 1-OPT-RS-003; Flow of Inside Recirculation Spray Pumps 1-RS-P-1A and 1-RS-P-1B
- 1-OPT-SI-002, Rev 20; Refueling test of the Low Head Safety Injection Check Valves to the Cold Legs

Surveillance Testing:

- 1-OPT-ZZ-001; ESF Actuation with Undervoltage and Degraded Voltage – 1H Bus
- OPT-SI-024; Charging pump '1B' head curve verification and comprehensive test

Containment Isolation Valve:

- 1-OPT-CT-201, Rev 19; Containment Isolation Valve Local Leak Rate Testing (Type C Containment Testing) for containment penetrations 58 and 94

b. Findings

No findings of significance were identified.

Cornerstone: Emergency Preparedness

1EP6 Drill Evaluation

a. Inspection Scope

The inspectors observed the licensee's emergency response training drill conducted on June 09, 2009, to assess performance in emergency plan classification, protective action recommendation, and off-site notification. This drill required emergency plan response actions be taken by personnel in the simulator control room, the technical support center (TSC), and local emergency operating facility (LEOF). This inspection evaluated the adequacy of the licensee's conduct of the drill and critique performance. This drill is included in the Emergency Response Performance Indicator Statistics.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator (PI) Verification

a. Inspection Scope

The inspectors performed a periodic review of the following Unit 1 and 2 performance indicators (PI) 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." Specifically, the inspectors reviewed the PI indicator data for the third quarter 2008 through the first quarter 2009. Documents reviewed included applicable monthly operating reports, licensee event reports, operator and chemistry department logs, LERs, and NRC inspection reports.

Mitigating Systems Cornerstone

- Safety System Functional Failures (SSFF)

Barrier Integrity Cornerstone

- Reactor Coolant System Specific Activity
- Reactor Coolant System Leak Rate

b. Findings

No findings of significance were identified.

4OA2 Identification and Resolution of Problems

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

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.

.2 Semi-Annual Trend Review

a. Inspection Scope

A semi-annual review of plant issues was performed for the period January –June 2009, to identify trends that might indicate the existence of a more significant safety issue. Included within the scope of this review are repetitive or closely related issues which may have been captured outside the normal corrective action program, such as in trend reports, plant performance indicators, major equipment problem lists or equipment reliability reports, repetitive rework maintenance lists, challenge lists, system health reports, workarounds lists, maintenance rule assessments and self-assessments..

b. Assessment and Observations

No findings of significance were identified. Negative trends observed were captured in the licensee's corrective action program with the most prominent being associated predominantly with emergency lighting and to lesser extent fire doors. Emergency lighting is currently in a(1) status in the Maintenance Rule and is being addressed via corrective action plan.

.3 Annual Sample: Reactor Vessel Head Lift

a. Inspection Scope

The inspectors reviewed the corrective actions implemented by the licensee in regard to lifting requirements for heavy loads, in particular those associated with reactor vessel head lifts. Enforcement discretion was exercised in NRC inspection report 05000280, 281/2007005 as a part of an industry initiative to resolve uncertainty in the licensing bases for heavy load handling. The inspectors reviewed the licensee's load drop analysis, the UFSAR Appendix 9B update, and verified that the limitations specified in the analysis and UFSAR were correctly incorporated into the licensee's procedures for reactor disassembly and reassembly. The inspectors observed the Unit 1 reactor head lift on April 24, 2009 to verify the lift height and weight limitations were observed.

b. Findings and Observations

No findings of significance were identified.

4OA5 Other Activities

.1 Quarterly Resident Inspector Observations of Security Personnel and Activities

a. Inspection Scope

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

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

b. Findings

No findings of significance were identified.

.2 Independent Spent Fuel Storage Installation (ISFSI) Inspections (IP 60855.1)

a. Inspection Scope

The purpose of this inspection was to verify by direct observation and independent evaluation that the licensee performed ISFSI operations in a safe manner and in compliance with approved procedures and to verify by direct observation and review of records that the licensee identified each fuel assembly placed in the ISFSI, recorded the parameters and characteristics of each fuel assembly, and maintained a record of each fuel assembly as a controlled document. The inspection was accomplished by direct observation of selected activities, review of completed records, and interviews with licensee personnel associated with loading and storage of spent fuel casks DOM-32PTH-014-C, DOM-32PTH-015-C, and DOM-32PTH-016-C. Activities observed include transport and storage of cask DOM-32PTH-015-C on June 12, and loading of spent fuel in cask DOM-32PTH-016-C on June 15. The inspectors by direct observation of completed records verified that each fuel assembly placed in the ISFSI was identified, the parameters and characteristics of each fuel assembly were recorded, and that a controlled record of each fuel assembly was maintained. The inspectors reviewed the design limitations for each Dry Shielded Cask (DSC) and compared the specified cask loading to the cask's loading limitations and Technical Specification. The inspectors verified limitations for heavy load lifts in and around the spent fuel pool were incorporated into the licensee's procedures.

b. Findings

No findings of significance were identified.

4OA6 Meetings, Including Exit

Exit Meeting Summary

On July, 16, 2009, the inspection results were presented to Mr. Bischof 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.

An exit meeting for the ISI and SGISI portion was conducted on May 01, 2009, with licensee management. In addition, a follow up electronic mail (ML# 091800113) was sent to Mr. B. Garber on June 8, 2009 which reported no issues identified for the SG ISI inspection.

4OA7 Licensee-Identified Violations

The following violations of very low safety significance (Green) were identified by the licensee and are violations of NRC requirements which meet the criteria of Section VI of the NRC Enforcement Policy, NUREG-1600 for characterization as NCVs:

- Technical Specification 6.4.B.1 requires, in part, that the entrance to each high radiation area be barricaded and conspicuously posted as a high radiation area. Contrary to this, on May 3, 2009, the entrance to a high radiation area was found not barricaded and conspicuously posted. Approximately two hours after the swing gate and posting was replaced it was discovered that two of the wire ties used to secure the sign to the gate had failed resulting in the posting facing the wrong direction and again failing to meet the requirements of TS 6.4.B.1. This was identified in the licensee's CAP as CR 333359 and apparent cause evaluation ACE017570. This finding is of very low safety significance because it did not lead to an overexposure, there was not a substantial potential to result in an overexposure, and the ability to assess dose was not compromised.
- Technical Specification 6.4.A requires in part that detailed written procedures with appropriate instructions are provided for corrective maintenance operations which could have an effect on the safety of the reactor. Contrary to this, inappropriate work instructions were provided to repair ESWP 1-SW-P-1A which caused the ESWP to be found inoperable on June 6, 2009. This was identified in the licensee's CAP as CR 337320. This finding is of very low safety significance because the ESWP was not out-of-service for more than the allowed TS outage time and the two remaining ESWPs were available.

- Technical Specification 3.14 requires, in part, that all three ESW pumps be operable when both units are operating with the exception that one pump may be inoperable up to seven days for maintenance and testing. Contrary to this, on May 31, 2009, the 'A' ESWP was determined to be inoperable for approximately 22 days and on May 12, 2009, two ESW pumps were inoperable for approximately 40 minutes, however, one of the pumps was available. This was identified in the licensee's CAP as CR 337337. This finding is of very low safety significance because the dominant core damage sequence was loss of service water, and mitigated by the availability of two ESWPs.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel

M. Adams, Director, Station Engineering
G. Bischof, Site Vice President
B. Garber, Supervisor, Licensing
K. Grover, Manager, Operations
A. Harrow, Supervisor Electrical Systems
R. Johnson, Manager, Outage and Planning
L. Jones, Manager, Radiation Protection and Chemistry
R. Manrique, Supervisor, Primary Systems
C. Olsen, Manager, Site Engineering
L. Ragland, Supervisor, Health Physics Operations
R. Simmons, Manager, Maintenance
K. Sloane, Plant Manager (Nuclear)
B. Stanley, Director, Station Safety and Licensing
M. Wilda, Supervisor, Auxiliary Systems

LIST OF ITEMS OPENED, CLOSED AND DISCUSSED

Opened and Closed

05000280, 05000281/2009003-01 NCV Inadequate Work Instructions for Installation of a Design Change (Section 1R19)

LIST OF DOCUMENTS REVIEWED

Section 1R01: Adverse Weather Protection

0-AP-37.01, Rev. 37; Abnormal Environmental Conditions
Operations Checklist OC-21 (03/25/09); Severe Weather Checklist

Section 1R04: Equipment Alignment

DWG 11448-FM-068A, Rev 29; Feedwater Emergency Make-up System
DWG 11448-FM-084B, Rev 23; Recirculation Spray System
DWG 11448-FM-089B, Rev 14; Safety Injection System
DWG 11448-FM-089A, Rev 57; Safety Injection System
DWG 11448-FM-084A, Rev 41; Containment Spray System
1-OP-RS-001A, Rev 6, Outside Recirc Spray System Alignment
1-OP-RS-002A, Rev 4, Inside Recirc Spray System Alignment
1-OP-SI-001A, Rev 13, Safety Injection System Alignment
1-OP-CS-001A, Rev 5, Containment Spray System Alignment
1-OP-FW-001A, Rev 6, Auxiliary Feedwater System Alignment

Section 1R05: Fire Protection

0-FS-FP-123, Diesel Generator Room Number 3 Elevation 27 ft 6 in
0-FS-FP-163, Fuel Building Elevation 15 ft 10 in
0-FS-FP-164, Fuel Building Elevation 27 ft 6 in and 45 ft 10 in
0-FS-FP-229, Fuel Building Crane Enclosure Elevation 27 ft 6 in
1-FS-FP-157, Charging Pumps – Unit 1 Auxiliary Building Elevation 13 ft 0 in and 2 ft 0 in
2-FS-FP-157, Charging Pumps – Unit 2 Auxiliary Building Elevation 13 ft 0 in and 2 ft 0 in
1-FS-FP-142, Main Steam Valve House and AFW – Unit 1 Elevation 27 ft 6 in
2-FS-FP-142, Main Steam Valve House and AFW – Unit 2 Elevation 27 ft 6 in

Section 1R06: Flood Protection Measures

1-EPM-0805-01, Rev. 6; Turbine Building Flood Control Testing
0-EPM-0805-01, Rev. 7; Station Flood Detection Testing
0-NAT-FC-001, Rev. 1; Functional Loop Checkout
1-DRP-005R, Rev. 29, Instrumentation Setpoints
Surry Design Change No. 74-55 dated April 24, 1974
Calculation No. 02071.1910, Turbine Building Flood Volume and Operator Response Time
Commitment Tracking System Item No. 1790
CR 331797
CR 331112
WOs: 38102148608, 38079793501, 38102402020, 38102402263, 38102405829,
38102405854

Section 1R08: Inservice Inspection Activities

ER-AP-BAC-10 Boric Acid Corrosion Control Program Rev. 4
ER-AP-BAC-101 Boric Acid Corrosion Control Program (BACCP) Inspections Rev. 3
ER-AP-BAC-102 Boric Acid Corrosion Control Program (BACCP) Evaluations Rev. 3
VPAP-0902 Control of Welding Materials Rev. 6
VPAP-0903 Control of Welding Rev. 9
EPRI, SGMP Information Letter on Example Methodology for Screening of Alloy 600TT Tubing
for Seabrook Elevated Residual Stress Issue, September 14, 2004

Dominion SRY-SGPMS-002, Surry Site Specific Eddy Current Analysis Guidelines
 Areva 51-1264374-06, RSG In-Situ Pressure Test Process Qualification Report, Rev. 6
 Dominion 03-6016219-008, Field Procedure for In-Situ Pressure Testing RSG Tubes Using the
 Triplex Pump, Rev. 0
 ER-AP-SGP-10, Steam Generator Program Description, Rev. 1
 ER-AP-SGP-101, Steam Generator Program, Rev. 2
 ER-AA-NDE-125, Steam Generator Tube Examination Independent Qualified Data Analyst
 Requirements and Responsibilities, Rev. 0
 Examination Technique Specification Sheets (ETSSs) - ETSS_BOB001_MIZ80_R0; ETSS-
 RPC001_MIZ80_R0; ETSS_RPC002_MIZ80_R0; and ETSS_RES001_MIZ80_R0
 ET-S-07-0093, Steam Generator Condition Monitoring and Operational Assessment Surry 1,
 November 2007 Refueling Outage EOC21/REOC16, Rev. 0

Calculations

CEM-0026 Structural Integrity Calculation of RHR Heat Exchanger 1-RH-E-1A
 CEM-0004 Evaluation of Excavation on Main Tube Side Flange of RHR Heat Exchangers 1-RH-
 E-1A and 1-RH-E-1B

Corrective Action Documents (CR)

CR331448 Boric Acid Leakage on 1-SI-101 dated 4/20/2009
 CR331451 Boric Acid Discovered on 1-CH-431 (Packing) dated 4/20/2009
 CR331410 1-CH-HCV-1310A Has Minor Body to Bonnet Boric Acid Deposit dated 4/20/2009.
 CR332725 Rejectable VT-3 Bolt Inspection for 1-RH-E-1A dated 4/28/2009
 CR331771 Boric Acid Discovered on 1-RH-E-1A dated 4/21/2009
 CR102884 Boric Acid on 1-RH-E-1A Flange
 CA078411 CA to Engineering to Evaluate (Boric Acid Leakage) IAW BACC Program
 CR093352 Critical Observation of 2-SD-626-VALVE Replacement dated 3/19/2008
 CR095681 AFW Pump Documentation Issues dated 4/15/2008
 CR325331 Quality Inspection Program Self-Assessment dated 3/3/2009
 CR026301 Third Quarter 2007 Identified Trend dated 12/6/2007
 CR093403 Wrong Part on Material Pick List dated 3/19/2008
 CR097544 12" Pipe 45 Degree Elbow Has the Wrong Wall Thickness dated 5/2/2008
 CR098978 Incorrect Gasket Thickness for 02-RC-PCV-2455A dated 05/14/2008
 CR104220 Critical Observation dated 7/22/2008
 CR024771 1-RH-E-1B Preliminary Lab Metallurgical Failure Analysis dated 12/20/2007
 CR028330 MCR Chiller 1-VS-E-4A Condenser Tubes Have Started to Erode dated 1/7/2008
 CR097780 NDE Rejection of Weld 1-A06 for 2-RH-E-1A dated 5/4/2008
 CR098591 2-SW-506-Valve Replacement Planned for 3/4" Valve, Valve in Field is 1" dated
 5/10/2008
 CR102326 Potential Configuration Management Issue with Regards to Weld Repairs dated
 6/26/2008
 CR115867 Unit 1 "C" Main Steam Riser Hydraulic Snubber Reservoir Level is Low dated
 10/25/2008
 CR332418, Create Work Order to Perform In-Situ Pressure Testing on 1-RC-E-1A
 CR332172, Eddy Current Data Has Recorded a Discontinuity Indicative of Cracking in Hot Leg
 Expansion Transition in Tube R9C69 of SG-A

CR332168, Eddy Current Data has Recorded a Discontinuity Indicative of Cracking in Hot Leg Tube End in Tube R2C63 of SG-A

Other

W/O 00783861-05 Cut out old Aux Feedwater Valve and Install Flanges.
 NDE Personnel Qualification and Certification Record Rev. 01 (Strickland)
 NDE Personnel Qualification and Certification Record Rev. 01 (Baker)
 Weld Material Field Control Slip S/N 115407
 Weld Material Field Control Slip S/N 138851
 Weld Material Field Control Slip S/N 138750
 Weld Material Field Control Slip S/N 138945
 Weld Material Field Control Slip S/N 139454
 Welding Technique Sheet for Technique 103
 Virginia Power Welder Performance Qualification Record (Batchelor)
 Dominion Welder Performance Qualification Record (Tan)
 Dominion Resources, Inc. Procedure Qualification Record 105 Rev. 4
 Virginia Electric and Power Company Procedure Qualification Record 103
 Virginia Electric and Power Company Procedure Qualification Record 102 Rev. A
 Dominion Resources, Inc. Procedure Qualification Record 101 Rev. 5
 Dominion Resources, Inc. Procedure Qualification Record 135
 Liquid Penetrant Exam PT-09-001
 DWG 11448-WMKS-RS-P-2A Rev. 5
 Certificate of Calibration 20797 for Digital Light Meter S/N H078823
 Certificate of Calibration #090911065BGCY for Digital Thermometer S/N 1065BGCY
 Certificate of Calibration #091034030680037 for Digital Thermometer S/N 403-068-0037
 DWG 11448-WMKS-0100G1 Rev. 9
 Dominion Ultrasonic Test Report UT-09-001
 Dominion Ultrasonic Instrument Linearity Report Rev. 1 L-09-003
 ER-AA-NDE-UT-801 Ultrasonic Examination of Ferritic Piping Welds in Accordance with ASME Section XI, Appendix VIII
 Dominion Contract NDE Personnel Certification Review Checklist (Zollner)
 Dominion Contract NDE Personnel Certification Review Checklist (Harmon)
 Dominion Contract NDE Personnel Certification Review Checklist (T. W. Thomas)
 Dominion Contract NDE Personnel Certification Review Checklist (W. L. Thomas)
 Dominion NDE Personnel Certification Record (Davies)
 Virginia Power VT-2 Examination Report O-NAT-M-004
 Dominion Liquid Penetrant Examination PT-07-046
 Dominion Liquid Penetrant Examination PT-07-047
 Dominion UT Calibration/Examination UT-07-114
 Dominion UT Calibration/Examination UT-07-113
 Dominion UT Calibration/Examination UT-07-121
 Dominion UT Calibration/Examination UT-07-122
 Surry Unit 1 – Spring 2009 Steam Generator Degradation Assessment, Dated 3/30/2009
 Test Plan for In-Situ Pressure Testing for UI SG A Tube R9C69, Dated 4/29/2009
 Work Order 38102544461, Perform SG 1A In-Situ Pressure Test on Tube Requiring the Test Area 51-9108097-000, Engineering Information Record
 Personnel and Equipment Certification and Qualification Records

Section 1R12: Maintenance Effectiveness

CR 334239 Unit 1 PORV Tailpipe temps are elevated
 CR 334236 U-1 Containment personnel hatch inner door will not operate
 CR 334541 During performance of 1-OPT-SI-005, 1-SI-P-1B delta P was in the inoperable range
 CR 334620 Degrading trend noted on 1-SW-P-1B during 0-OPT-SW-002
 CR 026352 1-RC-TI-1463 indicated 220F for PORV Tailpipe temperature
 CR 025781 1-RC-SV-1551A tailpipe temperature shows a disproportionate increase in temp
 CR 006704 2-RC-PCV-2456,Pzr PORV, identified as leaking by its seat
 CR 006609 U2 PZR PORV tailpipe temperature peaked at 201.2F
 CR 006456 2-RC-TI-2463 indication is erratic
 CR 005980 2-RC-TE-2463 PZR PORV line temperature trended up ~27F
 ACE000271 2-RC-PCV-2456,Pzr PORV, identified as leaking by its seat
 ODM 000036 – 1-RC-PCV-146 exhibits minor leakby
 S-2006-2488 1-RC-TI-1463 increased from 170F to 190F
 S-2006-2299 Pressurizer SV and PORV temps are elevated
 S-2005-5511 Noted increasing trend on the PORV tailpipe temp
 S-2005-5143 Trending PI for PZR PORV tailpipe temperature increasing
 S-2004-4739 Pressurizer PORV line downstream temperature has increased
 S-2003-3291 Pzr PORV Relief Line Temperature tripped
 S-2003-3065 Pzr PORV tailpipe temperature reading 173 F
 S-2003-2787 Unit 1 PORV valve line temperature elevated
 S-2003-1476 Pressurizer safety valve temperatures noted to have increased
 VPAP 2802
 ER-AA-MRL-10 Rev 2 – Maintenance Rule Program
 IA005 – Maintenance Rule system description of the Instrument air system
 RC002 - Maintenance Rule system description of the RC system
 RC006 – Maintenance Rule system description for the over-pressure protection system
 RC017 – Maintenance Rule system description of the PORV system

Section 1R13: Maintenance Risk Assessments and Emergent Work Control

Operations Check List OC-97, Protected Equipment Program (effective date 8/21/07)

Section 1R18: Plant Modifications

DWG SU-080001-0-M-401, Rev 1; ESW Pump Diesel Engine Exhaust Piping Modifications,
 DWG 11448-MKS-143A2, Rev.1; Muffler Exhaust Piping (Diesel “A”)
 DC SU-08-0001, ESW Pump Diesel Engine Exhaust Piping Modifications SPS /1&2
 ET-S-08-0031, Rev 0. Resolution of Concern for Lack of Missile Protection for the Diesel Exhaust for 01-SW-P-1A/B/C Emergency Service Water Pumps (not performed).
 ET-S-08-0031, Rev 1; Resolution of Concern for Lack of Missile Protection for the Diesel Exhaust for 01-SW-P-1A/B/C Emergency Service Water Pumps (Superseded)
 ET-S-08-0031, Rev 2; Resolution of Concern for Lack of Missile Protection for the Diesel Exhaust for 01-SW-P-1A/B/C Emergency Service Water Pumps (Superseded - performed on B only)
 ET-S-08-0031, Rev 4. Resolution of Concern for Lack of Missile Protection for the Diesel Exhaust for 01-SW-P-1A/B/C Emergency Service Water Pumps (Superseded - performed on B only)

Calculation CE-0577, Rev. 3, Pipe Stress Analysis of Emergency Service Water Pump Diesel Engine Exhaust Piping With Modification per DC SU-08-0001, SPS)

Section 1R19: Post-Maintenance Testing

OPT-SI-024; Charging pump "1B" head curve verification and comprehensive test.
 0-EPM-1503-01, Rev. 1; Motor Operated Valve (MOV) Operator Inspection
 0-ECM-1509-05, Rev 23; Rising Stem Motor Operated Valve Quicklook Testing
 0-ECM-1509-06, Rev 20; Quicklook Testing for Quarter Turn Motor Operated Valves
 0-MCM-0304-02, Rev. 12; Limitorque Size SMB-OO Overhaul
 0-MCM-0320-01, Rev. 1; Limitorque Spring Pack Tests Using Framatome Spring Pack Tester
 0-ECM-1504-01, Rev 20; Limitorque Motor Operated Valve (MOV) Motor and Operator Maintenance
 1-OPT-SI-003, Rev 15; Quarterly Test of SI MOVs and RWST Crosstie TVs
 1-PT-18.10J, Rev 7; Verification of Local and Remote Valve Position Indications of Safety Related Valves in the Safeguards Valve Pit Area
 0-MPM-0300-01, Rev 19; Limitorque Operator Type SB, SBD, SMB, and HBC Lubrication and Inspection
 NE-GL-0014, Rev 6; Nuclear Engineering Guideline MOV Diagnostic Test Analysis
 0-MCM-0703-02, Rev 8; Emergency Service Water Diesel Maintenance
 0-MCM-0703-01, Rev 21 OTO-1; Emergency Service Water Pump Diesel Engine Service and Inspection
 0-MCM-1026-01, Rev 1; Spring Hanger Pipe Support Blocking and Unblocking
 0-OPT-SW-001, Rev
 0-OPT-SW-002, Rev OTO-1,
 1-NSP-RX-014, Rev. 13; Rod Exercise Test
 1-NPT-RX-014; Rev. 14; Hot Rod Drops by Bank
 1-NPT-RX-008; Rev 20; Startup Physics Testing
 1-OPT-CT-302, Rev. 07; Unit 1 Containment Equipment Hatch and Emergency Personnel Escape Airlock Leakage Testing
 1-OPT-CT-301, Rev. 05; .Containment Personnel Airlock Test

Section 1R20: Refueling and Other Outage Activities

1-OP-RX-002, Rev 26; Shutdown Margin (Calculated at Zero Power)
 0-OSP-RC-001, Rev 6; RCS and PRZR Heatup/Cooldown Verification
 1-GOP-2.4, Rev 40; Unit Shutdown, RCS Cooldown from HSD to 351F
 1-GOP-2.6, Rev 29; Unit Cooldown, 201F To Ambient
 1-OP-RC-004, Rev. 20; Draining the RCS TO Reactor Flange Level
 1-OPT-CT-002, Rev 3;
 1-PT-70, (Rev 7); Reactor Coolant Level Transmitter (LT-RC-100A)
 1-OP-RX-008, Rev 3; The Calculation of Estimated Critical Conditions Following Refueling
 1-OP-RX-003, Rev 6; Shutdown Margin for Refueling and Special Conditions
 1-OP-RX-009, Rev 12; Dilution to Critical Conditions Following Refueling
 1-OPT-CT-202, Rev 5; Fuel Transfer Tube Flange Local Leakage (as found)
 1-OPT-CT-207, Rev 7; Electrical Penetration Type B Local Leak Rate Test (Amphenol and Older style Conax Penetrations)
 1-OPT-CT-208, Rev 7, Electrical Penetration Type B Local Leak Rate Test (Conax Penetrations)
 1-OPT-CT-209, Rev 7, Westinghouse Electrical Penetration Type B Local Leak Rate Test
 ET-S-09-0060, Rev. 0, Evaluation of Local Leakage Rate Test Results as Per 01-opt-CT-201.

Section 1R22: Surveillance Testing

ET-S-07-0097, (Rev 0) New Acceptance Criteria for 1-RH-P-1B Following Motor Replacement
 ET-S-07-0079, (Rev 2) Establishing IST Comprehensive Values for RHR, HHSI, and IRS
 Pumps

ET-S-09-0060, Rev 0; Evaluation of Local Leakage Rate Test Results as per 01-OPT- CT-201
 ET CME-08-0014, Rev 0; Transmittal of Acceptance Criteria for Periodic Testing of IRS and
 ORS Pumps

ME-0638, Rev. 1; Minimum Delivered ORS Flow for LB LOCA Analysis and Acceptance Criteria
 for ORS Pump Operability Verification Testing

NRC Safety Evaluation Pertaining to Relief Request No. P-4, dated July 31, 1991.

1-NPT-RX-008, Rev 20; Startup Physics Testing

Section 1EP6: Drill Evaluation

Emergency Preparedness Functional Exercise SJUN09FE

Section 4OA1: Performance Indicator Verification

NEI 99-02, Regulatory Assessment Performance Indicator Guideline.

Section 4OA2: Identification and Resolution of Problems

UFSAR Change Number FS 2008-021

1-MCM-1150-01, (Rev 11), Unit 1 Reactor Disassembly and Reassembly

Calculation No. 2008-13001, (Rev 0); Analysis of Postulated Reactor Vessel Head Drop for
 NAPS & SPS

ISFSI Operations

Letter NSF-09-012, dated May 20, 2009; NUHOMS Canister DOM-32PTH-014-C ISFSI Fuel
 Assembly and Insert Component Certification and Canister Loading Map.

Letter NSF-09-013, dated May 20, 2009; NUHOMS Canister DOM-32PTH-015-C ISFSI Fuel
 Assembly and Insert Component Certification and Canister Loading Map.

Letter NSF-09-014, dated May 20, 2009; NUHOMS Canister DOM-32PTH-016-C ISFSI Fuel
 Assembly and Insert Component Certification and Canister Loading Map.

0-OP-FH-072, Rev. 14; NUHOMS 32PTH Dry Shielded Canister Loading and Handling

0-OP-FH-073, Rev. 7; TC/DSC Transfer to ISFSI and DSC Transfer from TC to HSM

0-OP-FH-016, Rev. 2; Pre-cask Loading Verification

PI-CNSTR-T-OP-240.0, Rev. 0; Closure Welding of Dry Shielded Canisters at the Surry and
 North Anna Generating Stations.

Surry ISFSI Safety Analysis Report

NUHOMS HD System Generic Technical Specifications

LIST OF ACRONYMS

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