



UNITED STATES  
NUCLEAR REGULATORY COMMISSION

REGION II  
SAM NUNN ATLANTA FEDERAL CENTER  
61 FORSYTH STREET, SW, SUITE 23T85  
ATLANTA, GEORGIA 30303-8931

July 21, 2006

Virginia Electric and Power Company  
ATTN: Mr. David A. Christian  
Sr. Vice President and  
Chief Nuclear Officer  
Innsbrook Technical Center - 2SW  
5000 Dominion Boulevard  
Glen Allen, VA 23060-6711

SUBJECT: SURRY POWER STATION - NRC INTEGRATED INSPECTION REPORT  
05000280/2006003 AND 05000281/2006003

Dear Mr. Christian:

On June 30, 2006, 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 report documents the inspection findings which were discussed on July 12, 2006, with Mr. Jernigan and other members of your staff.

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

Based on the results of this inspection, no findings of significance were identified. However, one licensee-identified violation which was determined to be of very low safety significance is listed in this report. The NRC is treating this violation as a non-cited violation (NCV) in accordance with Section VI.A.1 of the NRC's Enforcement Policy because of its low safety significance and because it is entered into your corrective action program. If you contest this non-cited violation, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the United States 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 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 NRC's document 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/*

Kerry D. Landis, Chief  
Reactor Projects Branch 5  
Division of Reactor Projects

Docket Nos.: 50-280, 50-281, 72-002  
License Nos.: DPR-32, DPR-37, SNM-2501

Enclosure: NRC Inspection Report 5000280, 5000281/2006003 w/Attachment:  
Supplemental Information

cc w/encl: (See page 3)

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cc w/encl:

Chris L. Funderburk, Director  
Nuclear Licensing and  
Operations Support  
Virginia Electric & Power Company  
Electronic Mail Distribution

Donald E. Jernigan  
Site Vice President  
Surry Power Station  
Virginia Electric & Power Company  
Electronic Mail Distribution

Virginia State Corporation Commission  
Division of Energy Regulation  
P. O. Box 1197  
Richmond, VA 23209

Lillian M. Cuoco, Esq.  
Senior Counsel  
Dominion Resources Services, Inc.  
Electronic Mail Distribution

Attorney General  
Supreme Court Building  
900 East Main Street  
Richmond, VA 23219

Distribution w/encl: (See page 4)

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Report to D. A. Christian from Kerry D. Landis dated July 21, 2006

SUBJECT: SURRY POWER STATION - NRC INTEGRATED INSPECTION REPORT  
05000280/2006003 AND 05000281/2006003

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U.S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket Nos.: 50-280, 50-281, 72-002  
License Nos.: DPR-32, DPR-37, SNM-2501

Report Nos.: 05000280/2006003, 05000281/2006003

Licensee: Virginia Electric and Power Company (VEPCO)

Facility: Surry Power Station, Units 1 & 2  
Surry Independent Spent Fuel Storage Installation

Location: 5850 Hog Island Road  
Surry, VA 23883

Dates: April 1 - June 30, 2006

Inspectors: N. Garrett, Senior Resident Inspector  
D. Arnett, Resident Inspector  
J. Fuller, Reactor Inspector (Sections 1R08, 4OA7)

Approved by: K. Landis, Chief, Reactor Projects Branch 5  
Division of Reactor Projects

Enclosure

## SUMMARY OF FINDINGS

IR 05000280/2006-003, IR 05000281/2006-003; 04/01/2006 - 06/30/2006; Surry Power Station Units 1 & 2 and Independent Spent Fuel Storage Installation; Event Followup, Routine Integrated Report

The report covered a three-month period of inspection by resident inspectors and a regional reactor inspector. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using IMC 0609, "Significance Determination Process," (SDP). 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 3, dated July 2000.

A. NRC Identified and Self-Revealing Findings

No findings of significance were identified.

B. Licensee-Identified Violations

A violation of very low safety significance, which was identified by the licensee, has been reviewed by the inspectors. Corrective actions taken or planned by the licensee have been entered into the licensee's corrective action program. This violation and the corrective action tracking number is listed in Section 4OA7 of this report.

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## REPORT DETAILS

### Summary of Plant Status

Unit 1 was operated at or near rated power until the unit was shutdown on April 23, 2006, for a refueling outage. The unit was taken critical on May 25 and placed on-line May 27. The unit was taken off-line on May 28 to perform main turbine balancing. The unit was placed on-line May 29 and reached 100% rated power on May 30. The unit was operated at or near 100% rated power except for a downpower to 91% on June 29 to repair the 'A' reheater stop valve.

Unit 2 was operated at 100% rated power the entire reporting period.

### **1. REACTOR SAFETY**

#### **Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity**

#### 1R01 Adverse Weather Protection

##### .1 Hurricane Preparations

##### a. Inspection Scope

On June 12, 2006, early in the hurricane season, inspectors conducted a tour of all the owner-controlled areas. The purpose of the tour was to evaluate the licensee's preparedness for high winds and hurricane conditions well in advance of the approach of any hurricanes. Emphasis was placed on the identification of any loose material which would become airborne hazards to either the plant or the switchyard during high winds. Inspectors toured the low level intake, construction buildings, the sewage treatment plant, the area outside the warehouse, and the vicinity of the gas turbines at Gravel Neck. Inspectors also reviewed Operations Checklist (OC-21) "Severe Weather Checklist," Abnormal Procedure (AP) 37.01 "Abnormal Environmental Conditions," and the Dominion Hurricane Response Plan (Nuclear) (HRP-N).

##### b. Findings

No findings of significance were identified.

#### 1R04 Equipment Alignment

##### .1 Partial System Walkdowns

##### a. Inspection Scope

The inspectors performed partial walkdowns of the following four systems to verify correct system alignment. The inspectors checked for correct valve and electrical power alignments by comparing positions of valves, switches, and breakers to the procedures and drawings listed in the Attachment. Additionally, the inspectors reviewed the

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corrective action system to verify that equipment alignment problems were being identified and properly resolved.

- Emergency service water (ESW) pumps 1-SW-P-1B and 1-SW-P-1C while 1-SW-P-1A was tagged out for maintenance
- ESW pumps 1-SW-P-1A and 1-SW-P-1B while 1-SW-P-1C was tagged out for oil change
- Component cooling heat exchangers 1-CC-E-1A, 1-CC-E-1B, and 1-CC-E-1D while 1-CC-E-1C was tagged out for tube scraping
- Containment spray pump 1-CS-P-1B while 1-CS-P-1A was tagged out for bearing work

b. Findings

No findings of significance were identified.

.2 Complete System Walkdown

a. Inspection Scope

The inspectors performed a detailed walkdown of the accessible portions of the Unit 1 residual heat removal (RHR) system to review the system alignment and condition. The walkdown emphasized pump and piping overall condition, status of boric acid leaks and associated targets, plant issues associated with system deficiencies, valve and breaker position verifications, and component labeling. The inspectors reviewed the corrective action database to verify that equipment alignment issues were being identified and resolved. The documents reviewed are listed in the Attachment.

b. Findings

No findings of significance were identified.

1R05 Fire Protection

.1 Fire Area Walkdowns

a. Inspection Scope

The inspectors conducted tours of the following nine areas to assess the adequacy of the fire protection program implementation. The inspectors checked for the control of transient combustibles and the condition of the fire detection and fire suppression systems (using "SPS Appendix R Report") in the following areas:

- Emergency diesel generator #2
- Battery room 1A
- Battery room 1B
- Battery room 2A

- Fuel oil pump house north
- Fuel oil pump house south
- Mechanical equipment room #3
- Alternate AC diesel building
- Unit 1 main steam valve house

b. Findings

No findings of significance were identified.

.2 Annual Fire Brigade Drill

a. Inspection Scope

The inspectors observed a fire brigade drill to evaluate the readiness of the licensee's personnel to fight fires. Specific aspects evaluated were the use of protective clothing and self contained breathing apparatus, fire hose deployment and reach, approach into the fire area, effectiveness of communications among the fire brigade members and the control room, sufficiency of fire fighting equipment brought to the fire scene, and the drill objectives and acceptance criteria.

b. Findings

No findings of significance were identified.

1R08 Inservice Inspection (ISI) Activities

.1 Piping Systems and Containment ISI

a. Inspection Scope

During the period from May 1, 2006, to May 12, 2006, the inspectors observed and reviewed the licensee's implementation of their ISI program for monitoring degradation of the reactor coolant system boundary and the risk significant piping system boundaries for Surry Unit 1. The inspectors observed and reviewed a sample of American Society of Mechanical Engineers (ASME), Section XI and Risk Informed ISI required examinations in order of risk priority as identified in Section 71111.08-03 of inspection procedure 71111.08, "Inservice Inspection Activities."

The inspectors conducted an on-site review of nondestructive examination (NDE) activities to evaluate compliance with Technical Specifications and the applicable editions of ASME Section V and XI to verify that indications and defects (if present) were appropriately evaluated and dispositioned in accordance with the requirements of ASME Section XI acceptance standards.

Specifically, the inspectors observed the following examinations:

Manual Ultrasonic Testing (UT):

- Weld Number 1-10, 6"-RC-21-1502, Safety Injection Pipe to Check Valve, RI ISI, ASME Class 1

Liquid Penetrant Examination:

- Weld Number 1-10, 4"-RC-14-1502, Pressurizer Spray Line, ASME Class 2
- Weld Number 2-07, 4"-RC-15-1502, Pressurizer Spray Line, ASME Class 2

Specifically, the inspectors reviewed the following examination records:

Manual UT:

- Weld Number 1-10, 4"-RC-14-1502, Pressurizer Spray Line, ASME Class 2
- Weld Number 2-07, 4"-RC-15-1502, Pressurizer Spray Line, ASME Class 2

Visual Examination (VT):

- VT-2: 1-PT-11.0, Unit 1 Reactor Coolant Pressure Test, 12/2004
- VT-2: 1-PT-11.0, Unit 1 Reactor Coolant Pressure Test, 6/2003

Specifically, the inspectors reviewed the following examination records that contained recordable indications:

- VT-3: Mark # 1-SI-HSS-020, 12"-SI-45-1502, "A" Accumulator Hydraulic Snubber
- VT-3: Mark # 1-WFPD-H003A, 14"-WFPD-17-601, Spring Can
- UT: Weld Number 1-10, 6"-RC-21-1502, Safety Injection Pipe to Check Valve, RI ISI, ASME Class 1

The inspectors reviewed a sample of welding activities performed since the beginning of the last Unit 1 refueling outage for ASME pressure boundary piping. The inspectors reviewed welding procedures, procedure qualification records, and final NDE reports for the following welds:

- Weld 38-01-SS-HCV-101A-VALVE, SG 1A Hot Leg HCV, ASME Class 1
- Weld 38-01-RC-FT-1414, Loop A Flow Transmitter, ASME Class 1

The inspectors performed a review of ISI related problems that included welding, boric acid corrosion control, and steam generator inservice examinations that were identified by the licensee and entered into their corrective action program. The inspectors reviewed a sample of these corrective action documents to confirm that the licensee had appropriately described the scope of the problem and had initiated corrective actions. The inspectors performed this review to ensure compliance with 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," requirements. The corrective action documents reviewed by the inspectors are listed in the Attachment.

b. Findings

No findings of significance were identified.

.2 Boric Acid Corrosion Control Program (BACCP)

a. Inspection Scope

The inspectors reviewed the licensee's Boric Acid Corrosion Control Program to ensure compliance with commitments made in response to NRC Generic Letter 88-05, "Boric Acid Corrosion of Carbon Steel Reactor Pressure Boundary," and Bulletin 2002-01, "Reactor Pressure Vessel Head Degradation and Reactor Coolant Pressure Boundary Integrity."

The inspectors conducted an on-site record review and an independent walk-down of the containment building, which is not normally accessible during at-power operations, to evaluate licensee compliance with their program procedures and applicable industry guidance. In particular, the inspectors verified that the licensee's visual examinations focused on locations where boric acid leaks could cause degradation of safety significant components and that degraded or non-conforming conditions were properly identified in the licensee's corrective action program. The inspectors reviewed documentation for the visual examination of reactor pressure vessel bottom mounted instrumentation, inspection of insulated bolted connections and principal leak locations, and reactor coolant system pressure tests.

The inspectors reviewed a sample of engineering evaluations completed for boric acid on reactor coolant system piping and other ASME code class components to verify that the minimum design code required section thickness had been maintained for affected components. The inspectors also reviewed licensee corrective action documents initiated for evidence of boric acid leakage to confirm that they were consistent with requirements of Section XI of the ASME Code; 10 CFR 50, Appendix B, Criterion XVI; and licensee BACCP procedures. Specifically, the inspectors reviewed boric acid engineering evaluations for the following components:

- 1-RC-PCV-1455 A and 1-RC-PCV-1455 B Valves
- 1-CH-HCV-1200C-VALVE, Letdown Orifice Isolation Valve

b. Findings

No findings of significance were identified.

.3 Steam Generator (SG) Tube Inservice Inspection

a. Inspection Scope

The inspectors reviewed the Unit 1 SG tube eddy current test (ECT) examination activities to ensure compliance with Technical Specifications, applicable industry

operating experience and technical guidance documents, ASME Code Section XI requirements, and the Surry Power Station Steam Generator Monitoring and Inspection Plan. The inspectors observed ECT acquisition, secondary side visual examinations, primary and secondary eddy current data analysis, resolution analysis, tube plugging, and In-Situ Pressure Testing activities.

The inspectors reviewed the SG examination scope, Examination Technique Specification Sheets, ECT analysis guidelines, and the current SG specific assessment of potential degradation mechanisms. The inspectors reviewed documentation to ensure that the ECT probes and equipment configurations were qualified to detect the expected types of SG tube degradation in accordance with Appendix H, "Performance Demonstration for Eddy Current Examination" of EPRI "Pressurized Water Reactor Steam Generator Examination Guidelines: Revision 6." Inspectors verified that changes to the qualified eddy current techniques were properly evaluated and that any in-process changes were properly reviewed by all the analysis personnel. Additionally, the inspectors reviewed the qualification and certification records for the primary analysis personnel, resolution analysis personnel, and the automated analysis equipment.

The inspectors reviewed In-Situ Pressure Testing activities for two SG tubes that met the licensee's in-situ screening criteria. The inspectors reviewed the in-situ test records to confirm that pressure testing activities were conducted in accordance with industry guidelines and the plant specific test plan.

Licensee activities related to the detection and removal of loose parts located on the secondary side of SG tubes were reviewed by the inspectors. The inspectors observed portions of the licensee's secondary side visual examination activity and reviewed the loose part inventory listing for all Unit 1 steam generators.

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification Program

a. Inspection Scope

The inspectors observed licensed operator performance during simulator training session RQ-06.3-ST-1-H-1.1 to determine whether the operators:

- were familiar with and could successfully implement the procedures associated with recognizing and recovering from a fire in the main control room that required evacuation of the control room;
- recognized the high-risk actions in those procedures; and,
- were familiar with related industry operating experiences.

b. Findings

No findings of significance were identified.

1R12 Maintenance Effectivenessa. Inspection Scope

For the two equipment issues described below, the inspectors evaluated the effectiveness of the licensee's corresponding preventive and corrective maintenance. For each selected item below, the inspectors performed a detailed review of the problem history and surrounding 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. 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 Criteria Matrix.

- High vibrations on the Unit 1 'B' charging pump, 1-CH-P-1B, during comprehensive testing
- Increased fouling of the component cooling heat exchangers

b. Findings

No findings of significance were identified.

1R13 Maintenance Risk Assessments and Emergent Work Controla. Inspection Scope

The inspectors evaluated the adequacy, accuracy, and completeness of the following seven plant risk assessments performed prior to changes in plant configuration for maintenance activities or in response to emergent conditions. When applicable, inspectors assessed if the licensee entered the appropriate risk category in accordance with plant procedures. Specifically, the inspectors reviewed:

- Plan of the Day (POD) for week April 22 - 28, including failure of the Unit 1 'B' auxiliary building exhaust fan, 1-VS-F-58B, during 'J' bus logic testing and rescheduling of risk significant surveillance testing
- POD for week May 1 - 6, including moving Unit 1 'A' component cooling heat exchanger, 1-CC-E-1A, maintenance and addition of Unit 1's three high head safety injection pumps since they would not be available for core reload along with appropriate contingency plan
- POD for week May 13 - 19, including high vibrations on the Unit 1 'B' charging pump, failure of the alternate AC diesel generator lube oil heaters, and rescheduling of risk significant surveillance testing

- POD for week May 21 - 27, including an emergent repair for the number 3 emergency diesel generator automatic bus transfer device and rescheduling of risk significant surveillance testing
- POD for week June 5 - 9, including a shift in the outage time for the Unit 1 'A' core spray pump, 1-CS-P-1A, and extension of outage time for the 4 'C' main control room air conditioner, 1-VS-E-4C, and rescheduling of risk significant surveillance testing
- POD for week June 11 - 16, including emergent maintenance for the Unit 1 'A' bearing cooling water pump, 1-BC-P-1A, and addition of and rescheduling of risk significant surveillance testing
- POD for week June 19 - 23, including changes in maintenance outage time for the Unit 1 station air compressor, 1-SA-C-1, and rescheduling of risk significant surveillance testing

b. Findings

No findings of significance were identified.

1R14 Operator Performance During Non-Routine Evolutions and Events

a. Inspection scope

For the non-routine event described below, the inspectors reviewed operator logs, plant computer data, and strip charts to determine what occurred and how the operators responded and to verify if the response was in accordance with plant procedures.

- Loss of Unit 1 Annunciators on May 1, 2006

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations

a. Inspection Scope

The inspectors evaluated the technical adequacy of six operability evaluations to ensure that operability was properly justified and the subject component or system remained available such that no unrecognized increase in risk occurred. The operability evaluations were described in the engineering transmittal (ET) and Plant Issues listed below:

- S-2005-5470-R3, "D" Main Control Room (MCR) chiller, 1-VS-E-4D inoperable due to pitting, corrosion and erosion in at least 40% of the 1<sup>st</sup> and 3<sup>rd</sup> pass inlet tubes
- S-2005-2937, "B" Emergency Service Water Pump, 1-SW-P-1B Discharge Piping Wall thickness

- S-2005-5639, Nuclear Instrument N-31 inoperable due to spiking while unit is at power
- ET-NAF-06-0045, Evaluation of Proposed Change to Surry FW-MOV-151/251 Operation and Alignment
- S-2006-2702, "E" MCR chiller, 1-VS-E-4E inoperable due to thru wall leak at weld
- S-2006-2295, Degraded Unit 1 reactor protection system relay 1-RP-RLY-27-3XB

b. Findings

No findings of significance were identified.

1R17 Permanent Plant Modifications

a. Inspections Scope

The inspectors evaluated Design Change Package 05-024, "Outside Recirculation Spray Pump Full Test Flow Piping Modification." This modification installed a full flow test pipe as required by ASME pump test requirements. The inspectors verified the following attributes:

- Materials
- Flowpaths
- Pressure boundary
- Structural requirements
- Licensing basis
- Post modification testing

b. Findings

No findings of significance were identified.

1R19 Post Maintenance Testing

a. Inspection Scope

The inspectors reviewed the six post maintenance test procedures and activities associated with the repair or replacement of the following components to determine whether the procedures and test activities were adequate to verify operability and functional capability following maintenance on the equipment:

- Maintenance Work Order (MWO) 729033-05/6/9, "C" Emergency service water pump, 1-SW-P-1C annubar replacement
- MWO 745897-04, Remove, repair, and reinstall the 1'B' charging pump, 1-CH-P-1B



- MWO 733923-01, Unit 2 'C' charging pump minimum flow recirculation valve, 2-CH-MOV-2275C
- MWO 749187-01, Number 2 emergency diesel generator 18 month preventative maintenance
- MWO 747035-01, Replace relay 38-01-RP-RLY-AJT3XB
- MWO 530253-01, Unit 1 'A' containment spray pump, 1-CS-P-1A, lube and inspection

b. Findings

No findings of significance were identified.

1R20 Refueling and Other Outage Activities (Unit 1)

a. Inspection Scope

The inspectors performed the inspection activities described below for the Unit 1 refueling outage that began on April 23, 2006, and ended May 27, 2006.

The inspectors reviewed the licensee's outage risk control plan ("Unit 1 2006 Refueling Outage Safety Assessment" and VPAP-2805, "Shutdown Risk Program") to verify that the licensee had appropriately considered risk, industry experience, and previous site specific problems, and to confirm that the licensee had mitigation/response strategies for losses of key safety functions.

During the cooldown which preceded the outage, the inspectors reviewed portions of the cooldown process to verify that Technical Specification cooldown restrictions were followed.

The inspectors confirmed that, when the licensee removed equipment from service, the licensee maintained defense-in-depth commensurate with the outage risk control plan for key safety functions and applicable Technical Specifications and that configuration changes due to emergent work and unexpected conditions were controlled in accordance with the outage risk control plan.

During the outage, the inspectors:

- Reviewed reactor coolant system (RCS) pressure, level, and temperature instruments to verify that those instruments were installed and configured to provide accurate indication and that instrumentation error was accounted for;
- Reviewed the status and configuration of electrical systems to verify that those systems met Technical Specification requirements and the licensee's outage risk control plan;
- Observed decay heat removal parameters to verify that the system was properly functioning;

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- Observed spent fuel pool operations to verify that outage work was not impacting the ability of the operations staff to operate the spent fuel pool cooling system during and after core offload;
- Reviewed system alignments to verify that the flow paths, configurations, and alternative means for inventory addition were consistent with the outage risk plan;
- Reviewed selected control room operations to verify that the licensee was controlling reactivity in accordance with the Technical Specifications;
- Observed licensee control of containment penetrations to verify that the licensee controlled those penetrations in accordance with the refueling operations Technical Specifications and could achieve containment closure for required conditions; and,
- Reviewed fuel handling operations to verify that those operations and related activities were being performed in accordance with Technical Specifications and approved procedures.

The inspectors reviewed the licensee's plans for changing plant configurations to verify on a sampling basis that Technical Specifications, license conditions, and other requirements, commitments, and administrative procedure prerequisites were met prior to changing plant configurations. The inspectors reviewed RCS boundary leakage and the establishing of containment integrity. The inspectors examined the spaces inside the containment building prior to reactor startup to verify that debris had not been left which could affect performance of the containment sumps.

The inspectors reviewed various problems that arose during the outage to verify that the licensee was identifying problems related to refueling outage activities at an appropriate threshold and entering them in the corrective action program.

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing

a. Inspection Scope

For the six surveillance tests listed below, the inspectors examined the test procedure and either witnessed the testing and/or reviewed test records to determine whether the scope of testing adequately demonstrated that the affected equipment was functional and operable:

Surveillance

- 2-OPT-RX-005, Control Rod Assembly Partial Movement

Inservice Testing

- 2-OPT-FW-003, Turbine Driven Auxiliary Feedwater Pump, 2-FW-P-2
- 0-OPT-EG-001, Number 3 Emergency Diesel Generator Monthly Start Exercise
- 1-OSP-SW-008, SW Flow Test of RSHX's 1-RS-E-1B and 1-RS-E-1C
- 2-OPT-CH-003, Charging Pump Operability and Performance Test for 2-CH-P-1C

Containment Isolation Valve

- 1-OPT-CT-201, Containment Isolation Valve Local Leak Rate Testing (Type C Containment Testing), Penetrations 24 and 38

b. Findings

No findings of significance were identified.

1R23 Temporary Plant Modificationsa. Inspection Scope

The inspectors reviewed Temporary Modification S1-2006-091, Replacement of Relay AST3-XB, to determine whether system operability/availability was affected, that configuration control was maintained, and that the associated safety evaluation adequately justified implementation.

b. Findings

No findings of significance were identified.

**Cornerstone: Emergency Preparedness**1EP6 Drill Evaluationa. Inspection Scope

The inspectors observed the announced emergency response training drill conducted on June 14, 2006, to assess the licensee's performance in emergency classification, offsite notification, and protective action recommendations. The drill included emergency response actions taken by the management team in the Technical Support Center. This drill evaluation is included in the Emergency Response Performance Indicator statistics.

b. Findings

No findings of significance were identified.

**4 OTHER ACTIVITIES**

4OA1 Performance Indicator Verification

a. Inspection Scope

Cornerstone: Initiating Events

The inspectors performed a periodic review of the "Unplanned Power Changes per 7000 Critical Hours" performance indicator for Units 1 and 2. Specifically, the inspectors reviewed this performance indicator from the third quarter of 2004 through the first quarter of 2006. Inspectors evaluated whether the performance indicator was calculated in accordance with the guidance contained in NEI 99-02, "Regulatory Assessment Performance Indicator Guideline." Documents reviewed included applicable monthly operating reports, licensee event reports, and operator logs.

b. Findings

No findings of significance were identified.

4OA2 Identification and Resolution of Problems

.1 Daily Review of Plant Issues

a. Inspection Scope

As required by 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 corrective action program (CAP). This review was accomplished by reviewing hard copies of each plant issue, attending the daily plant issue review team meetings, and accessing the licensee's computerized database.

b. Findings

No findings of significance were identified.

.2 Semi-Annual Review of Plant Issues

a. Inspection Scope

As required by Inspection Procedure 71152, "Identification and Resolution of Problems," the inspectors performed a review of the licensee's CAP and associated documents to

identify trends that could indicate the existence of a more significant safety issue. The inspector's review was focused on repetitive equipment issues, but also considered the results of daily inspector CAP item screening discussed in Section 4OA2.1 above, licensee trending efforts, and licensee human performance results. The inspector's review nominally considered the six month period of January 2006 through June 2006, although some examples expanded beyond those dates when the scope of the trend warranted. The review also included issues documented outside the normal CAP in major equipment problem lists, repetitive and/or rework maintenance lists, system health reports, and maintenance rule assessments. The inspectors compared and contrasted their results with the results contained in the licensee's latest quarterly trend reports. Corrective actions associated with a sample of the issues identified in the licensee's trend report were reviewed for adequacy.

The inspectors also evaluated the trend report against the requirements of the licensee's corrective action program as specified in VPAP-1601, "Corrective Action," and 10 CFR 50, Appendix B. The documents reviewed are listed in the Attachment.

b. Findings and Observations

No findings of significance were identified. The inspectors evaluated the licensee's trending methodology and observed that the licensee had performed detailed reviews under various systems. The licensee routinely reviewed cause codes, involved organizations, key words, and system links to identify potential trends in their corrective action program data. The licensee performed statistical evaluations of plant issue data to determine areas of focus for the various plant departments. The licensee used the statistical data to focus on potential trends and wrote Plant Issues to monitor the trends identified. The licensee also included the status of all Plant Issues associated with trends written during the quarter in the quarterly trend report.

.3 Annual Sample Review

a. Inspection Scope

The inspectors performed an in-depth review of the root cause evaluation and corrective actions for the trip of the Unit 1 'B' core spray pump breaker, 1-EP-BKR-14J5, during the performance of a quarterly surveillance test on October 5, 2005. This issue was documented in the corrective action program as Plant Issue S-2005-4541. The review was performed to ensure the full extent of the issue was identified, an appropriate evaluation was performed, and appropriate corrective actions were specified and prioritized. The inspectors evaluated the Plant Issue against the requirements of the licensee's corrective action program as delineated in Station Administrative Procedure VPAP-1601, "Corrective Action," and 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action."

b. Findings and Observations

The licensee performed a root cause analysis for the October 5, 2005, failure of the Unit 1 'B' core spray pump breaker. The 1'B' core spray pump breaker tripped open when the pump was taken to start. The licensee electrically tested the pump motor and performed a rotation check of the pump to verify free movement. The licensee then tested the breaker to determine the failure mode. The instantaneous overcurrent setting on the 'C' phase of the breaker was found low out of tolerance and the setting value was not stable during testing.

During the root cause evaluation, the licensee determined it had become an accepted practice for both plant and vendor technicians to use the entire  $\pm 20$  percent manufacturer's tolerance for breaker instantaneous overcurrent settings. This was done to meet an inferred acceptable limit for another breaker setting. The manufacturer recommended that the breaker settings be adjusted as close as possible to the recommended setpoints to allow for setpoint degradation and "drift" over time.

The licensee performed a thorough root cause evaluation and determined the root cause was inadequate procedural guidance, combined with knowledge deficiencies and inadequate maintenance oversight. In addition, the licensee identified deficiencies in the breaker test equipment and a poor testing environment as contributing causes. The licensee determined and implemented corrective actions to prevent recurrence.

The failure to provide detailed written procedures with appropriate checklists and instructions for the calibration and testing of components involving nuclear safety is a violation of Technical Specification 6.4.A.2. The regulatory aspects of this licensee-identified violation were addressed in Section 4OA7 of NRC Inspection Report 05000280,281/2005005.

4OA3 Event Follow-up 71153

.1 (Closed) Licensee Event Report (LER) 05000281/2005001-00, Low Head Safety Injection Pump Breaker Failed to Close Due to Binding

On April 26, 2005, the Unit 2 1'B' low head safety injection pump breaker failed to close while in the test position during emergency bus logic testing. A spare breaker was installed in the breaker cubical and satisfactorily tested. During breaker inspection, the licensee found the closing coil open-circuited and that the closing coil control device which housed the coil had a burnt smell. The licensee also found the breaker closing spring fully charged when it should have been discharged. The licensee performed a root cause investigation of the failed breaker. The licensee determined the most likely root cause for the breaker to fail to close was a binding of the close latch roller in conjunction with a burr or plating problem in the primary closure latch. The binding appeared to be due to inadequate or inconsistent machining of some parts. The binding in the close latch roller was observed during testing at both the Surry Power Station and at the vendor test facility. In addition, the identified roller binding was found on some of the new upgrade kits provided by the vendor. The corrective actions completed and

Enclosure

planned include an inspection of affected parts in all similar 480 volt breakers, modifying the settings for the closing latch assembly, and inspecting all upgrade kits for affected components. The LER was reviewed by the inspectors and no findings of significance were identified and no violation of NRC requirements occurred. The licensee documented the failure of the breaker in Plant Issue S-2005-1919. This LER is closed.

.2 (Closed) LER 05000280/2005003-00, Fuel Leak into Engine Oil causes Emergency Service Water Pump Inoperability

On August 11, 2005, the licensee determined that the 1-SW-P-1B emergency service water pump was inoperable due to fuel oil dilution in the lubricating oil sump of the pump's diesel engine. The licensee determined fuel oil entered the engine's lubricating oil system from a leak between a fuel inlet jumper and a fuel injector. The licensee repaired the leaking fuel oil connection, changed the engine lubricating oil, and returned the pump to service. The inspectors reviewed the licensee root cause, Plant Issue S-2005-3911, and the corrective actions taken. The root cause evaluation properly identified the root and contributing causes and the corrective actions should prevent recurrence. The licensee identified but did not promptly correct the degrading trend in the lubricating oil. The inspectors identified this as a performance deficiency which is a violation of 10 CFR 50, Appendix B, Criterion XVI, "Corrective Actions." The enforcement aspects of the violation were addressed in Section 4OA2 of NRC Inspection Report 05000280,281/2005006. This LER is closed.

4OA5 Other Activities

.1 (Closed) Temporary Instruction (TI) 2515/165: Operational Readiness of Offsite Power (OSP) and Impact on Plant Risk

a. Inspection Scope

The inspectors reviewed licensee procedures and controls, and interviewed operations and maintenance personnel, to verify these documents contained specific attributes delineated in the TI to ensure the operational readiness of offsite power systems in accordance with plant Technical Specifications; the design requirements provided in 10 CFR 50, Appendix A, General Design Criterion 17, "Electric Power Systems," and the impact of maintenance on plant risk in accordance with 10 CFR 50.65(a)(4), "Requirements for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants." Documents reviewed are listed in the Attachment. Appropriate documentation of the results of this inspection was provided to NRC headquarters staff for further analysis, as required by the TI. This completes the Region II inspection TI requirements for the Surry Power Station.

b. Findings

No findings of significance were identified.



.2 Operation of an Independent Spent Fuel Storage Installation (ISFSI) at Operating Plants (60855.1)

a. Inspection Scope

The inspectors observed placing the dry storage cask TN-32-50 into the spent fuel pool, loading spent fuel into the cask, setting the lid on top of the loaded cask, positioning and verifying positive engagement of cask lifting device, lifting the loaded cask above the water surface, draining the water from the cask, moving the loaded cask to the cask setting area by following the heavy load lifting path, drying the cask, backfilling with helium, and the final transportation of the cask to the ISFSI facility. Observations were compared to the licensee's procedures to ensure compliance.

The inspectors reviewed the completed "TN-32 Cask Number 50 ISFSI Fuel Assembly and Insert Component Certification and Cask Loading Map" to verify that the licensee identified each fuel assembly placed in the cask and recorded all fuel assembly parameters and characteristics. The inspectors verified through review of selected records and personnel interviews that records had been established for all the spent fuel stored at the ISFSI pad, that duplicate records of spent fuel was stored at both Surry Power Station and at the corporate offices, and that a physical inventory had been completed on all spent fuel stored in the ISFSI within the last 12 months.

b. Findings

No findings of significance were identified.

4OA6 Meetings, Including Exit

.1 Exit Meeting Summary

On July 12, 2006, the resident inspectors presented the inspection results to Mr. Jernigan and other members of his staff who acknowledge the findings. The inspectors confirmed that proprietary information was not provided or examined during the inspection.

4OA7 Licensee-Identified Violations

The following finding of very low significance was identified by the licensee and is a violation of NRC requirements which meets the criteria of Section VI of the NRC Enforcement Policy, NUREG-1600, for being dispositioned as a non-cited violation (NCV).

- 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Actions," requires, in part, that measures shall be established to assure that conditions adverse to quality, such as failures, malfunctions, deficiencies, deviations, defective material and equipment, and nonconformances are promptly identified and corrected.



Contrary to the above, during the 2001 Unit 1 refueling outage, the licensee failed to identify a condition adverse to quality, in that a loose part was not identified during eddy current inspection or secondary side visual inspections of the Unit 1 'A' steam generator. The failure to identify the loose part during the 2001 inspection resulted in degradation of two steam generator tubes which was identified during this 2006 refueling outage. These two SG tubes failed to meet their associated condition monitoring limit curves. This finding was identified in the licensee's corrective action program as Plant Issue S-2006-1950. This finding is of very low safety significance because neither tube leaked during the last operating cycle nor burst during the in-situ pressure test.

ATTACHMENT: SUPPLEMENTAL INFORMATION

## SUPPLEMENTAL INFORMATION

### KEY POINTS OF CONTACT

#### Licensee

M. Adams, Director, Nuclear Station Safety and Licensing  
M. Crist, Manager, Operations  
B. Garber, Supervisor, Licensing  
J. Grau, Manager, Nuclear Oversight  
T. Huber, Manager, Engineering  
D. Jernigan, Site Vice President  
L. Jones, Manager, Radiation Protection and Chemistry  
C. Luffman, Manager, Protection Services  
R. Simmons, Manager, Outage and Planning  
K. Sloane, Director, Nuclear Station Operations and Maintenance  
B. Stanley, Manager, Maintenance  
M. Wilson, Manager, Training

#### NRC

K. Landis, Chief, Branch 5, Division of Reactor Projects, Region II

### LIST OF ITEMS OPENED AND CLOSED

#### Opened

None

#### Closed

05000281/2005001-00	LER	Low Head Safety Injection Pump Breaker Failed to Close Due to Binding (Section 4OA3.1)
05000280/2005003-00	LER	Fuel Leak into Engine Oil causes Emergency Service Water Pump Inoperability (Section 4OA3.2)
TI 2515/165	TI	Operational Readiness of Offsite Power and Impact on Plant Risk (Section 4OA5.1)

## LIST OF DOCUMENTS REVIEWED

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

#### Plant Procedures

1-OP-RH-001, RHR Operations  
1-OP-RH-001A, RHR System Alignment  
1-OSP-ZZ-004, U1 Safety Systems Status List for Cold shutdown/Refueling Conditions

#### Plant Drawings

11448-FM-071A Rev. 67  
11448-FMC-072D Rev. 24  
11448-FMC-084A Rev. 24  
11448-FMC-087A Rev. 15  
11448-ESK-5G  
11448-ESK-6BW  
11448-ESK-6BL

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

#### Plant Procedures

1-FS-FP-109, Battery room 1A Elevation 9 feet 6 inches  
1-FS-FP-110, Battery room 1B Elevation 9 feet 6 inches  
1-FS-FP-142, Main Steam Valve House and AFW - Unit 1 Elevation 27 feet - 6 inches  
2-FS-FP-109, Battery room 2A Elevation 9 feet 6 inches  
0-FS-FP-186, Fuel Oil Pump House A Elevation 16 feet  
0-FS-FP-187, Fuel Oil Pump House B Elevation 16 feet  
0-FS-FP-115, Mechanical Equipment Room #3 Elevation 9 feet 6 inches  
0-FS-FP-225, Alternate AC Diesel Room - Construction site Elevation 35 ft  
0-FS-FP-122, Diesel Generator Room number 2, Elevation 27 feet - 6 inches

### **Section 1R08: Inservice Inspection (ISI) Activities**

#### Procedures, Calculations, Examination Reports

0-NSP-RX-018, Reactor Vessel Head Effective Degradation Years Calculation, Rev. 0  
1-4-1-1, S1R19, OAR-1, Fourth Interval - First Period - First Report  
1-OPT-RC-10.1, RCS Leakage Walkdown at Cold Shutdown, 11/20/2004  
0-NSP-RC-003, Visual Examination of Reactor Pressure Vessel Bottom Mounted Instrumentation, Rev. 1, 4/25/2006  
1-NPT-RC-002, Inspection of Insulated Bolted Connections and Principal Leak Locations, 5/2006  
0-NSP-RC-002, Visual Examination of Reactor Pressure Vessel Head Penetration Nozzles, Rev. 4  
1-PT-11.0, RCS Pressure Test, 4/2003  
1-OPT-RC-10.1, Reactor Coolant Leakage Walkdown at Cold Shutdown, 4/2006  
1-OPT-RC-10.1, Reactor Coolant Leakage Walkdown at Cold Shutdown, 11/2004

DNAP-1004, Boric Acid Corrosion Control Program (BACCP), Rev. 4  
SSES-6.13, Controlling Procedure for Boric Acid Corrosion Control Program (BACCP), Rev. 7  
VPAP-1103, ASME Section XI Visual Examination Program (VT-1, 2, 3, and General) Rev. 10  
NDE-UT-812, UT Examination of Austenitic Piping Welds in accordance with ASME Section XI, Appendix VIII, Rev. 1  
NDE-PT-701, Visible Solvent Removable Liquid Penetrant Examination Procedure, Rev. 6  
Welding Technique Sheet 801, Rev. 7, and Rev. F 51-9014998-000, Surry Unit 1 1R20 - EPRI Appendix H Eddy Current Technique Review  
51-9020666-000, In-Situ Pressure Test Summary Report for Surry Unit 1, 5/2006  
AREVA, Test Plan for In-Situ Pressure Test Guidelines, Rev. 0  
SRY-SGPMS-002, Surry Site Specific Eddy Current Analysis Guidelines, Rev. 10  
32-9020613-000, Structural Evaluation of Surry Unit 1 Volumetric Tube Damage  
AREVA NP, INC. #6016219A-006, Field Procedure for In-Situ Pressure Testing RSG Tubes Using the Triplex Pump

Plant Issues

PI-S-2006-1989, Boric acid leaks that were identified during NRC containment walkdown  
PI-S-2006-2014, UT couplant bottle in containment without a proper label  
PI-S-2006-2013, 1-PT-11 with no ANII signature  
PI-S-2006-1804, Revise procedure for calculation of reactor pressure vessel head EDY  
PI-S-2006-1823, Boric acid leak identified on drain line downstream of 1-RC-ICV-3001  
PI-S-2006-1462, Results of 1-NPT-RC-002 Inspection  
PI-S-2006-2129, Torque of bolting on the Recirculation Spray Heat Exchanger without a procedure  
PI-S-2006-2039, Component Support Identified with Improper Gap Requirements  
PI-S-2005-3862, ASME Section XI Pressure Test  
PI-S-2006-1950, Steam Generator 1A

**Section 1R12: Maintenance Effectiveness**

Plant Drawings

11448-ESK-11AE  
11548-ESK-6KK  
11448-FMC-71A Rev. 157

Maintenance Work Orders

492773-01, 503447-01, 512388-01, 597863-01, 745897-01, 745897-03, 745897-04, 745897-11

Plant Issues

S-2000-0449, S-2001-0143, S-2002-1717, S-2003-1256, S-2003-1392, S-2003-1521, S-2003-2141, S-2003-2443, S-2003-2704, S-2003-3524, S-2003-3913, S-2003-4960, S-2003-5451, S-2004-1344, S-2004-1462, S-2005-1035, S-2005-1236, S-2005-3066, S-2005-4269, S-2005-4517, S-2005-4553, S-2006-0670, S-2006-0866, S-2006-1054, S-2006-1122, S-2006-1367, S-2006-1368, S-2006-1372, S-2006-1946, S-2006-2252, S-2006-2266

Other Documents

DEO-0488, Evaluation of 01-CH-P-1B with One Loose Pump Mounting Bolt

ET-S-06-0069, Acceptability of 1-CH-P-1B Mounting Bolt  
ET-S-03-0141, Acceptance of Elevated Oil Pressure on 1-CH-P-1B  
1-OSP-SW-002/3/4, Measurement of Macrofouling Blockage of component Cooling heat Exchanger 1-CC-E-1A/B/C/D  
Calculation ME-0222

**Section 1R17: Permanent Modification**

MDAP-0004, Processing Design Change packages  
VPAP-0301, Design Change Process

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

Plant Drawings

11448-FE-1L  
11448-FM-064A  
11448-FM-068A  
11448-FM-071A  
11448-FM-071B  
11448-FM-077B

Plant Procedures

1-GOP-2.7, Unit Shutdown, Power Decrease from Allowable Power to Unit Offline for Refueling Outage  
1-GOP-2.8, Unit Cooldown, HSD to CSD for Refueling  
1-OSP-ZZ-004, Unit 1 Safety Systems Status List for Cold Shutdown/Refueling Conditions  
1-OP-FH-001, Controlling Procedure for Refueling  
1-GOP-1.1, Unit Startup, RCS Heatup from Ambient to 195EF  
1-GOP-1.2, Unit Startup, RCS Heatup from 195EF to 345EF  
1-GOP-1.3, Unit Startup, RCS Heatup from 345EF to HSD  
1-GOP-1.4, Unit Startup, RCS Heatup from HSD to 2% Reactor Power  
1-GOP-1.5, Unit Startup, 2% Reactor Power to Max Allowable Power

Tagouts

1-06-FW-0006, 1-FW-P-3A, Motor drive auxiliary feedwater pump  
1-06-SW-0009, 1B and 1C recirculation spray heat exchanger  
1-05-FW-0002C, 1-FW-P-2, Turbine drive auxiliary feedwater pump  
1-06-CH-0058A, 1-CH-P-1B, 1'B' charging water pump  
1-06-CS-001, 1-CS-P-1A/B, Unit 1 Containment Spray Pumps

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

Dominion Trend Analysis Manual

Dominion Nuclear Trend Report Surry Power Station 4<sup>th</sup> Quarter 2005

Dominion Nuclear Trend Report Surry Power Station 1<sup>st</sup> Quarter 2006

**Section 40A5: Other Activities**

0-OP-FH-062, TN-32 Cask Loading and Handling

TN-32 Cask Number 50, ISFSI Fuel Assembly and Insert Component certification and Cask Loading Map

Nuclear-Electric Transmission Interface Agreement Addendum 1

Nuclear-Electric Transmission Interface Agreement Addendum 2

0-AP-10.18, Response to Grid Instability Rev. 2

OC-6, guidance for allowing I&C maintenance items and surveillance PT's

OC-7, Emergent Issue Response Checklist

0-AP-23.00, Rapid Load Reduction Rev. 18

0-AP-50.00, Opposite Unit Emergency Rev. 21

1-AP-10.07, Los of Unit 1 Power Rev. 39