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

April 27, 2016

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

SUBJECT: SURRY POWER STATION – NRC INTEGRATED INSPECTION REPORT
05000280/2016001 AND 05000281/2016001

Dear Mr. Heacock:

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

NRC inspectors documented one finding of very low safety significance (Green) and an associated severity level IV violation of NRC requirements under the traditional enforcement process in this report. The NRC is treating this violation as a non-cited violation (NCV) consistent with Section 2.3.2.a of the NRC Enforcement Policy.

If you contest the violation or significance of the 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.

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

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

Sincerely,

/RA/

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

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

Enclosure:
IR 05000280/2016001, 05000281/2016001
w/Attachment: Supplementary Information

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Letter to David A. Heacock from Steven D. Rose dated April 27, 2016

SUBJECT: SURRY POWER STATION – NRC INTEGRATED INSPECTION REPORT 05000280/2016001 AND 05000281/2016001

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REGION II

Docket Nos.:	50-280, 50-281
License Nos.:	DPR-32, DPR-37
Report No:	05000280/2016001, 05000281/2016001
Licensee:	Virginia Electric and Power Company (VEPCO)
Facility:	Surry Power Station, Units 1 and 2
Location:	5850 Hog Island Road Surry, VA 23883
Dates:	January 1, 2016 through March 31, 2016
Inspectors:	P. McKenna, Senior Resident Inspector C. Jones, Resident Inspector G. Eatmon, Resident Inspector (North Anna)
Approved by:	Steven D. Rose, Chief Reactor Projects Branch 5 Division of Reactor Projects

Enclosure

SUMMARY

IR 05000280/2016001, 05000281/2016001; 01/01/2016-03/31/2016; Surry Power Station Units 1 and 2: Adverse Weather Protection.

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

Cornerstone: Mitigating Systems

- Green. An NRC-identified finding of very low safety significance and an associated Severity Level IV NCV of 10 CFR 50.59, "Changes, Tests, and Experiments," was identified when the licensee failed to perform and maintain a written evaluation to demonstrate that a procedure change did not require a license amendment. Specifically, the licensee implemented a change to procedure 0-OP-ZZ-021, "Severe Weather Preparation," Revision 12, to allow installation of tarpaulins over the main steam valve house (MSVH) ventilation louvers thereby changing the Updated Final Safety Analysis Report (UFSAR) facility design without maintaining supporting calculations.

  The licensee's failure to perform a 10 CFR 50.59 evaluation was a performance deficiency (PD). The inspectors determined that the PD was more than minor because it was associated with the design control attribute of the Mitigating Systems Cornerstone and adversely affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the change allowed the ventilation of the MSVH to be blocked and the lack of engineering calculations resulted in a condition where there was a reasonable doubt about the operability of the auxiliary feedwater (AFW) pumps for their required mission time. Using Manual Chapter 0609.04, "Initial Characterization of Findings," Table 2, dated June 19, 2012; the finding was determined to adversely affect the Mitigating Systems Cornerstone. The inspectors screened the finding using Inspection Manual Chapter (IMC) 0609, Appendix A, "Significance Determination Process (SDP) for Findings at-Power," dated June 19, 2012, and determined that it screened as Green because the PD did not affect the design or qualification of the AFW system and it did not represent an actual loss of system safety function. Using IMC 0310, "Aspects within the Cross-Cutting Areas," dated December 4, 2014, the inspectors determined that the finding had a cross-cutting aspect in the procedure adherence component of the human performance area, H.8, because the licensee failed to follow processes, procedures and work instructions for the 50.59 applicability review when changing the severe weather preparation procedure.

Additionally, the failure to perform a 10 CFR 50.59 evaluation was determined to be more-than-minor in accordance with the guidance in the NRC Enforcement Manual for traditional enforcement violations, because the MSVH louvers were actually covered and there was a reasonable likelihood that the lack of MSVH ventilation could affect the operability of the AFW pumps for their required mission time. The failure constitutes a violation of 10 CFR 50.59, which impacts the regulatory process and therefore, was evaluated through the traditional enforcement process. The SDP, which was used to evaluate this performance deficiency, does not specifically consider the impact on the regulatory process. Thus, although related to a common regulatory concern, it is necessary to address both the violation and finding using different processes to correctly reflect both the regulatory importance of the violation and the safety significance of the associated performance deficiency. (Section 1R01)

REPORT DETAILS

Summary of Plant Status

Unit 1 operated at or near rated thermal power (RTP) throughout the inspection period.

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

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R01 Adverse Weather Protection

Readiness for Impending Adverse Weather Conditions

a. Inspection Scope

The inspectors performed a site specific weather related inspection due to anticipated adverse weather conditions, specifically extreme cold temperature, on January 21, 2016. The inspectors reviewed the licensee's preparations for potential severe weather as well as severe weather procedure 0-OP-ZZ-021, "Severe Weather Preparation," Revision 12. The inspectors walked down site areas which included the emergency diesel generators, emergency switchgear rooms, emergency service water pump house, and the turbine, safeguards, and auxiliary buildings.

b. Findings

Introduction: An NRC-identified finding of very low safety significance (Green) and an associated Severity Level IV NCV of 10 CFR 50.59, "Changes, Tests, and Experiments," was identified when the licensee failed to perform and maintain a written evaluation to demonstrate that a procedure change did not require a license amendment. Specifically, the licensee implemented a change to procedure 0-OP-ZZ-021, "Severe Weather Preparation," Revision 12, to allow installation of tarpaulins over the MSVH ventilation louvers thereby changing the UFSAR facility design without maintaining supporting calculations.

Description: On January 20, 2016, the resident inspectors were performing a cold weather walkdown of Surry Unit 1 and Unit 2 plant equipment in accordance with inspection procedure 71111.01, "Adverse Weather Protection," effective date January 1, 2016, and noticed the ventilation louvers to the MSVH were covered with tarpaulins. A recent change to 0-OP-ZZ-021 authorized operations to install tarpaulins on the MSVH louvers that completely blocked airflow. The licensee reported this was done in an effort to keep the MSVH enclosure above 55 degrees Fahrenheit during extreme cold. The inspectors questioned the licensee in order to determine if they had performed heat loading calculations to support AFW pump operation for the change in room ventilation configuration. The licensee reviewed the procedure change and determined that the required 10 CFR 50.59 applicability review had not been performed properly and subsequently removed the tarpaulins. The Engineering department provided two past

calculations (EWR 91-100) and (ME-0800) that supported operability of the AFW pumps in the MSVH with the tarpaulins in place and the tarpaulins were again placed over the louvers after Operations made an immediate operability determination. The licensee documented this issue in condition report (CR) 1024604.

Dominion procedure CM-AA-400, "10 CFR 50.59 and 10 CFR 72.48 – Changes, Tests, and experiments," Revision 6, provides implementation guidance for satisfying the NRC's regulatory change control requirements, as defined in 10 CFR 50.59 and 10 CFR 72.48, for the purpose of determining whether or not a change can be implemented without prior NRC review and approval. The completion of attachment 1 of CM-AA-400 performs an applicability review to determine if a full screening must be performed. The installation of the tarpaulins was pre-screened out of needing a 10 CFR 50.59 screening based on the licensee's classification of the change as not being a temporary modification to the facility.

The inspectors reviewed the marked up copy (pre-change) of the severe weather preparation procedure and noted that the letters "TM" were written in where there were references to installation of the tarpaulins. The inspectors questioned the licensee about the letters "TM" and they stated that it was an abbreviation for "temporary modification." The inspectors reviewed the referenced calculations, EWR 91-100 and ME-0800 that modeled the blocked ventilation for the MSVH and found that the assumptions used were not the same as the actual conditions found with the louvers covered. The calculations assumed that the louvers were open either one quarter or one half of an inch providing natural circulation and heat removal, which did not exist with the tarpaulins in place. In addition to the assumed heat removal, the heat loading calculations were based off of the original Allis Chalmers motors. Unit 2 motor driven AFW pumps have one Homewood motor installed in place of the old Allis Chalmers motors. Section 9.13.3.4 of the UFSAR, "Safeguards Area Ventilation," states that "ventilation is provided by a wall-mounted exhaust fan and by openings in the wall at ground level and in the roof." The installed tarpaulins sealed off the ground level source of ventilation invalidating the assumptions in the design of the facility. The inspectors discussed their findings with the licensee and the licensee again removed the tarpaulins while calculation ME-0800 was revised. The licensee documented this issue CR 1026288.

The licensee conducted an apparent cause evaluation (ACE) to address the MSVH outdoor air intake damper leakage assumptions not being clearly defined in calculation ME-0800 and determined the apparent cause to be the procedure change supporting documents, attachment 1 of CM-AA-400 and calculation ME-0800, were not verified to be complete in providing documentation bounding the installation of the tarpaulins. Corrective action (CA) 3021668 was assigned to address the missed 10 CFR 50.59 screening. In addition, the licensee revised calculation ME-0800 to bind the outside air temperature for the installation of tarpaulins that completely blocked the MSVH louvers and determined that they had not operated outside the bounded temperature while the tarpaulins were installed.

Analysis: The inspectors determined that the licensee's failure to perform a 10 CFR 50.59 evaluation was a PD that was within the licensee's ability to foresee and correct. Specifically, the change to the severe weather preparation procedure authorizing installation of the tarpaulins was not properly categorized as a procedurally controlled temporary modification. This would have required the licensee to conduct an

appropriate in-depth design review and 10 CFR 50.59 evaluation prior to the issuing the procedure revision. The inspectors determined that the PD was more than minor because it was associated with the design control attribute of the Mitigating Systems Cornerstone and adversely affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the change allowed the ventilation of the MSVH to be blocked and the lack of engineering calculations resulted in a condition where there was a reasonable doubt about the operability of the AFW pumps for their required mission time. Using IMC 0609.04, "Initial Characterization of Findings," Table 2, dated June 19, 2012; the finding was determined to adversely affect the Mitigating Systems Cornerstone. The inspectors screened the finding using Manual Chapter 0609, Appendix A, "SDP for Findings at-Power," dated June 19, 2012, and determined that it screened as Green because the PD did not affect the design or qualification of the AFW system and it did not represent an actual loss of system safety function. Using IMC 0310, "Aspects within the Cross-Cutting Areas," dated December 4, 2014, the inspectors determined that the finding had a cross-cutting aspect in the procedure adherence component of the human performance area, H.8, because the licensee failed to follow processes, procedures and work instructions for the 50.59 applicability review when changing the severe weather preparation procedure.

Additionally, the failure to perform a 10 CFR 50.59 evaluation was determined to be more-than-minor in accordance with the guidance in the NRC Enforcement Manual for traditional enforcement violations because the MSVH louvers were actually covered and there was a reasonable likelihood that the lack of MSVH ventilation could affect the operability of the AFW pumps for their required mission time. The failure constitutes a violation of 10 CFR 50.59, which impacts the regulatory process and therefore, was evaluated through the traditional enforcement process. The SDP, which was used to evaluate this performance deficiency, does not specifically consider the impact on the regulatory process. Thus, although related to a common regulatory concern, it is necessary to address both the violation and finding using different processes to correctly reflect both the regulatory importance of the violation and the safety significance of the associated performance deficiency.

The violation of 10 CFR 50.59, "Changes, Tests, and Experiments," impacted the ability of the NRC to perform its regulatory process and was dispositioned using traditional enforcement. In determining the severity level of the traditional enforcement aspect of the issue, the inspectors identified that Subsection d.2 of Section 6.1, "Reactor Operations," of the NRC Enforcement Policy listed a 10 CFR 50.59 violation that results in conditions evaluated by the SDP as having very low safety significance (Green) as an example of a Severity Level IV violation. Because the associated finding was determined to be of very low safety significance as discussed above, the traditional enforcement aspect of this issue was determined to be a Severity Level IV NCV.

Enforcement: Title 10 CFR 50.59(d)(1) requires, in part, that the licensee maintain records of changes in the facility, of changes in procedures, and of tests and experiments made pursuant to 10 CFR 50.59(c). These records must include a written evaluation which provides the bases for determination that the change, test, or experiment does not require a license amendment pursuant to paragraph (c)(2) of this section. Surry UFSAR Section 9.13.3.4, Safeguards Area Ventilation, states that "ventilation is provided by a wall-mounted exhaust fan and by openings in the wall at ground level and in the roof." Contrary to the above, on October 14, 2015, the licensee

failed to perform and maintain a written evaluation to demonstrate that a procedure change to procedure 0-OP-ZZ-021, “Severe Weather Preparation,” did not require a license amendment. Specifically, the procedure revision changed the configuration of the ventilation of the MSVH and affected the operating temperatures for the MDAFW pumps. Because this violation was determined to be a Severity Level IV violation and of very low safety significance (Green); and because the issue was entered into the licensee’s corrective action program (CAP) as CRs 1024604 and 1026288, this violation is being treated as an NCV, consistent with Section 2.3.2 of the NRC Enforcement Policy: NCV 05000280, 05000281/2016001-01; Failure to Perform a 10 CFR 50.59 Evaluation for Blocking Ventilation to Main Steam Valve Houses.

1R04 Equipment Alignment

Partial Walkdown

a. Inspection Scope

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

- Unit 2 Outside Recirculation Spray (OSRS), train A, after system valve stroking.
- "B" and "C" Emergency Service Water (ESW) pumps while "A" ESW pump was out of service for maintenance.
- Emergency Diesel Generator (EDG) fuel system lineup following #2 EDG monthly performance test.

b. Findings

No findings were identified.

1R05 Fire Protection

Quarterly Fire Protection Reviews

a. Inspection Scope

The inspectors conducted tours of the five areas listed below that are important to reactor safety to verify the licensee’s implementation of fire protection requirements as described in fleet procedures CM-AA-FPA-100, “Fire Protection/Appendix R (Fire Safe Shutdown) Program,” Revision 11, CM-AA-FPA-101, “Control of Combustible and Flammable Materials,” Revision 8, and CM-AA-FPA-102, “Fire Protection and Fire Safe Shutdown Review and Preparation Process and Design Change Process,” Revision 5. The reviews were performed to evaluate the fire protection program operational status and material condition and the adequacy of: (1) control of transient combustibles and ignition sources; (2) fire detection and suppression capability; (3) passive fire protection

features; (4) compensatory measures established for out-of-service, degraded or inoperable fire protection equipment, systems, or features; and (5) procedures, equipment, fire barriers, and systems so that post-fire capability to safely shutdown the plant is ensured. The inspectors reviewed the corrective action program to verify fire protection deficiencies were being identified and properly resolved.

- Unit 1 Cable Vault
- Unit 1 Emergency Switchgear (ESGR) and Relay Room
- Unit 1 Battery Rooms
- Unit 2 Battery Rooms
- Fire Pump Building

b. Findings

No findings were identified.

1R06 Flood Protection Measures

Annual Review of Electrical Manholes

a. Inspection Scope

The inspectors conducted an inspection of underground manholes subject to flooding that contain cables whose failure could affect risk-significant equipment. The inspectors performed walkdowns of risk-significant areas, including manholes 1-EP-MH-1 and 1-EP-MH-2, to assess the condition of electrical cables located inside the underground manholes. The inspectors verified by direct observation and review of the associated inspection documents that the cables, splices, support structures, and sump pumps located within the manholes appeared intact, and that the cables were not being impacted by water. In addition, the inspectors reviewed several past periodic licensee inspection results and the licensee's CAP database for each of the above mentioned manholes to ensure that any degraded conditions identified were appropriately resolved.

b. Findings

No findings were identified.

1R11 Licensed Operator Requalification Program

.1 Resident Inspector Quarterly Review

a. Inspection Scope

The inspectors observed and evaluated a licensed operator simulator exercise given on February 9, 2016. The scenario involved a failed turbine driven AFW pump, a steam generator tube rupture resulting in a reactor trip and safety injection, and declaration of an alert. This scenario was intended to exercise the entire operations crew and assess the ability of the operators to react correctly to multiple failures. The inspectors observed the crew's performance to determine whether the crew met the scenario objectives; accomplished the critical tasks; demonstrated the ability to take timely action

in a safe direction and to prioritize, interpret, and verify alarms; demonstrated proper use of alarm response, abnormal, and emergency operating procedures; demonstrated proper command and control; communicated effectively; and appropriately classified events per the emergency plan. The inspectors observed the post training critique to determine that weaknesses or improvement areas revealed by the training were captured by the instructor and reviewed with the operators.

b. Findings

No findings were identified.

.2 Resident Inspector Observation of Control Room Operations

a. Inspection Scope

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

- On January 7, response to “C” reactor coolant pump oil reservoir low level alarm
- On March 9, 2-OPT-RX-005, “Control Rod Assembly Partial Movement”
- On March 14, 2-OPT-EG-001, “#2 Emergency Diesel Generator (EDG) Monthly Start Exercise Test”

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness

a. Inspection Scope

For the one equipment issue described in the condition report listed below, the inspectors evaluated the effectiveness of the corresponding licensee's preventive and corrective maintenance. The inspectors performed a detailed review of the problem history and associated circumstances, evaluated the extent of condition reviews, as required, and reviewed the generic implications of the equipment and/or work practice problem(s). Inspectors performed walkdowns of the accessible portions of the system, performed in-office reviews of procedures and evaluations, and held discussions with system engineers. The inspectors compared the licensee’s actions with the requirements of the Maintenance Rule (10 CFR 50.65), station procedures ER-AA-MRL-10, “Maintenance Rule Program,” Revision 6, and ER-AA-MRL-100, “Implementing Maintenance Rule,” Revision 10.

- CR 1027241, Intake Canal Low Level Alarm

b. Findings

No findings were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control

a. Inspection Scope

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

- On January 4, Unit 1 and Unit 2 risk while troubleshooting the Unit 1 inoperable "A" power range nuclear instrument N41.
- On January 21, Unit 1 and Unit 2 risk while the "A" component cooling heat exchanger and "A" spent fuel pool pump were out of service for maintenance during extreme cold weather.
- On February 24, Unit 1 and Unit 2 risk while the alternate AC (AAC) diesel was out of service during a tornado watch and warning.
- On March 2, Unit 1 and Unit 2 risk during the replacement of the Unit 1 HI consequence limiting safeguards (HI-CLS) relay.

b. Findings

No findings were identified.

1R15 Operability Evaluations

a. Inspection Scope

The inspectors reviewed the four operability evaluations listed below, affecting risk-significant mitigating systems, to assess as appropriate: (1) the technical adequacy of the evaluations; (2) whether continued system operability was warranted; (3) whether other existing degraded conditions were considered; (4) if compensatory measures were involved, whether the compensatory measures were in place, would work as intended, and were appropriately controlled; and (5) where continued operability was considered unjustified, the impact on TS Limiting Conditions for Operation and the risk significance. The inspectors' review included verification that operability determinations were made as specified in OP-AA-102, "Operability Determination," Revision 14. The inspectors reviewed the licensee's corrective action program to verify deficiencies in operability determinations were being identified and corrected.

- CR1024604, 10 CFR 50.59 screen not performed for covering main steam valve house ventilation louvers with tarpaulins during cold weather
- CR1028277, Magnetic speed pickup on overspeed trip device broken on AAC diesel
- CR1026038, HI CLS relay slow to energize
- CR1030931, Unit 1 “B” low head safety injection (LHSI) pump seal leak

b. Findings:

No findings were identified.

1R19 Post Maintenance Testing

a. Inspection Scope

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

- 1-OSP-SW-004, “Measurement of Macrofouling Blockage of CCHX 1-CC-E-1C,” Revision 31 and ER-AA-HTX-1002, “Heat Exchanger Program Visual and Leak Testing,” Revision 2, after "C" component cooling (CC) HX maintenance package.
- 0-OPT-ZZ-008, “ASME System Pressure Tests,” Revision 11, after Unit 1 charging pump service water system strainer replacement.
- 0-OP-ZZ-009, “ASME Code Class Leakage,” Revision 7, and 0-OP-SW-002, “Emergency Service Water Pump Operation,” Revision 46, after “B” emergency service water pump battery, diesel engine throttle linkage, and bearing oil cooler replacements.
- 0-OSP-AAC-003, “Automatic Start Test of AAC Generator,” Revision 10, after AAC diesel 18 month maintenance package.
- 1-PT-8.4, “Consequence Limiting Safeguards (Hi-Train),” Revision 17 {OTO1}, after 1-LM-RLY-100-D5 relay replacement on Unit 1 train “A”.
- 2-IPT-CC-RC-L-460, “Pressurizer Level Protection Loop L-2-460 Channel Calibration,” Revision 14, after the replacement of detector low side drain valve and tightening of test connection cap on Unit 2 channel 2 pressurizer (PZR) level instrument.
- 2-PT-2.33B, “Emergency Bus Undervoltage and Degraded Protection Test "J" Train,” Revision 7, after 1-EP-27-1JDUS-1J1A relay replacement.

b. Findings

No findings were identified.

1R22 Surveillance Testing

a. Inspection Scope

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

In-Service Testing:

- 1-OPT-CS-002, "Containment Spray System Test," Revision 17
- 1-OPT-FW-003, "Turbine Driven Auxiliary Feedwater Pump 1-FW-P-2 Performance Test," Revision 50, and 1-OPT-FW-007, "Turbine Driven AFW Pump Steam Supply Line Check Valve Test," Revision 7

Surveillance Testing:

- 0-OPT-EG-001, "#3 EDG Quarterly Performance Test," Revision 73
- 0-EPT-0104-01, "Semi-Annual Station Battery Test," Revision 17
- 2-PT-8.5, "Consequence Limiting Safeguards Logic (Hi-Hi Train) Test," Revision 31

b. Findings

No findings were identified.

1EP6 Drill Evaluation

EP Training Evolution (Simulator)

a. Inspection Scope

On February 9, 2016, the inspectors reviewed and observed a licensee simulator-based EP training evolution. The inspectors assessed the licensee emergency procedure usage, emergency plan classifications, and notifications. The inspectors evaluated the adequacy of the licensee's conduct of the training evolution and post-training evolution critique performance. The inspectors verified that the training evolution critique identified performance weaknesses and entered these items into the licensee's CAP.

b. Findings

No findings were identified.

4. OTHER ACTIVITIES

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

4OA1 Performance Indicator (PI) Verification

a. Inspection Scope

The inspectors performed a periodic review of the six following Unit 1 and 2 PIs to assess the accuracy and completeness of the submitted data and whether the performance indicators were calculated in accordance with the guidance contained in NEI 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 7. The inspection was conducted in accordance with NRC Inspection Procedure 71151, "Performance Indicator Verification." Specifically, the inspectors reviewed the Unit 1 and Unit 2 data reported to the NRC for the period January 1, 2015 through December 31, 2015. Documents reviewed included applicable NRC inspection reports, licensee event reports, operator logs, station performance indicators, and related CRs.

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

b. Findings

No findings were identified.

4OA2 Identification and Resolution of Problems

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

a. Inspection Scope

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

b. Findings

No findings were identified.

.2 Annual Sample: Review of CR 541474 Corrective Action for Instrument Air Line Break Downstream of 2-IA-202

a. Inspection Scope

The inspectors performed a review regarding the licensee's assessments and corrective actions associated with CR 541474, "Instrument Air Line Break." Specifically, on March 6, 2014, the airline downstream of 2-IA-202 separated. The inspectors assessed the licensee's problem identification threshold, cause analyses, extent of condition reviews, compensatory actions, and the prioritization and timeliness of the licensee's corrective actions to determine whether the licensee was appropriately identifying, characterizing, and correcting problems associated with this issue and whether the planned or completed corrective actions were appropriate. The inspectors compared the actions

taken to the requirements of the licensee's CAP as specified in procedure, PI-AA-200, "Corrective Action Program," Revision 29 and 10 CFR 50, Appendix B. In addition, the inspectors reviewed the corrective action program for similar issues, and interviewed engineering personnel to assess the effectiveness of the implemented corrective actions.

b. Findings

No findings were identified.

The licensee determined that the apparent cause was improper assembly at the time of construction approximately 40 years ago. Instrument air system walkdowns were performed as needed to address assembly and design issues with vibration. The inspectors verified that the licensee had identified problems with this issue at an appropriate threshold and entered them into the CAP; and had proposed or implemented appropriate corrective actions. The inspectors noted that other aging related failures such as leaking check valves have occurred causing air system low pressure alarms. The inspectors determined that the corrective actions developed as a result of the apparent cause analysis were reasonable commensurate with the safety significance of the instrument air system.

.3 Semi-Annual Trend Review

a. Inspection Scope

The inspectors performed a review of the licensee's CAP documents to identify trends that could indicate the existence of a more significant safety issue. The inspectors' review was focused on repetitive equipment and corrective maintenance issues, but also considered the results of daily inspector CAP item screening discussed in Section 4OA2.1. The review included issues documented outside the normal correction action program in system health reports, corrective maintenance work orders, component status reports, site monthly meeting reports, and maintenance rule assessments. The inspectors' review nominally considered the six month period of July through December, 2015, although some examples expanded beyond those dates when the scope of the trend warranted.

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

b. Assessment and Observations

No findings of significance were identified. In general, the licensee has identified trends and has addressed the trends with their CAP. No new adverse trends were identified this period that had not already been identified by the licensee.

4OA3 Follow-up of Events and Notices of Enforcement Discretion

(Closed) Licensee Event Report (LER), 05000280/2015-003-00, Unit 1 Trip Due to Loss of Main Generator Field

a. Inspection Scope

On October 13, 2015, at 2120 hours, with Unit 1 operating at 100 percent and Unit 2 operating at 94 percent power, Unit 1 generator experienced a loss of field to the rotor and tripped causing a subsequent reactor trip. No work or power changes were being performed to Unit 1 when the trip occurred. The direct cause of the event was the failure of the exciter to rotor coupling. The coupling was replaced with the coupling from Unit 2 and the installation procedures were revised to ensure all vendor assembly techniques were incorporated. The inspectors reviewed the LER, the associated root cause evaluation and corrective actions, interviewed the license staff, and walked down associated components. This LER is closed.

b. Findings

No findings were identified.

4OA5 Other Activities

Contingency Plans for Licensee Strikes or Lockouts

a. Inspection Scope

The inspectors evaluated, in accordance with IP 92709, the adequacy of the licensee's strike contingency plan prior to the expiration of the International Brotherhood of Electrical Workers (IBEW) contract on March 31, 2016 to determine if:

- The required minimum number of qualified personnel would be available for the proper operation, security, and safety of the facility.
- Reactor operation and facility security would be maintained as required.
- The contingency plan complies with the requirements in TS and CFR.

The inspectors reviewed the process used by the licensee to train non-licensed personnel who could be performing functions they are not normally assigned. This included a review of the completed training records and observations of watchstation final qualification walkthroughs and job performance measurements (JPMs). The inspectors also reviewed the licensee's nuclear business continuity plan and discussed this plan with licensee management to ensure there would be provisions to maintain site coverage for licensed operators, other workers to operate the site, and to implement the site emergency plan.

b. Findings

No findings were identified.

4OA6 Meetings, Including Exit

Exit Meeting Summary

On April 13, 2016, the inspection results were presented to Mr. L. Lane and other members of his staff, who acknowledged the findings. The inspectors asked the licensee whether any of the material examined during the inspection should be considered proprietary. No proprietary information was identified.

ATTACHMENT: SUPPLEMENTARY INFORMATION

SUPPLEMENTARY INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel
L. Baker, Training Manager
D. Cobb, Manager, Nuclear Oversight
J. Eggart, Manager, Radiation Protection & Chemistry
B. Garber, Supervisor, Station Licensing
M. Haduck, Manager, Outage and Planning
R. Hanson, Manager, Protection Services
R. Johnson, Manager, Operations
L. Lane, Site Vice President
D. Lawrence, Director, Station Safety and Licensing
J. Rosenberger, Director, Station Engineering
R. Scanlan, Manager, Maintenance
R. Simmons, Plant Manager
M. Smith, Manager, Nuclear Organizational Effectiveness
N. Turner, Manager, Nuclear Emergency Preparedness

LIST OF ITEMS OPENED, CLOSED AND DISCUSSED

Opened and Closed		
05000280, 281/2016001-01	NCV	Failure to Perform a 10 CFR 50.59 Evaluation for Blocking Ventilation to Main Steam Valve Houses (Section 1R01)
Closed		
05000280/2015-003-00	LER	Unit 1 Trip Due to Loss of Main Generator Field (Section 4OA3)

Attachment

LIST OF DOCUMENTS REVIEWED

Section 1R01: Adverse Weather Protection

Procedures

0-AP-37.01, Abnormal Environmental Conditions, Rev. 68
0-LOG-SBNY-001, Service Building North Yard Logs, Rev. 103
0-OP-ZZ-021, Severe Weather Preparation, Rev. 10
0-OP-ZZ-021, Severe Weather Preparation, Rev. 11
0-OP-ZZ-021, Severe Weather Preparation, Rev. 12

Condition Reports (*NRC Identified)

*1024604 *1026288 *1029816 1029854

Other Documents

ACE 3023219, MSVH Outdoor Air Intake Damper Leakage Assumptions Not Clearly Defined in Calculation ME-0800
CM-AA-400, 10 CFR 50.59 and 10 CFR 72.48 – Changes, Tests, and Experiments, Rev. 5
EWR 91-100, VS Dampers Actuator Modification, 8/02/91
ME-0800, GOTHIC MSVH Loss of Ventilation, Rev. 0

Section 1R04: Equipment Alignment

Procedures

0-OP-SW-002A, Emergency Service Water System Alignment, Rev. 9
0-OP-EG-001A, EDG 3 System Alignment, Rev. 15
1-OP-EG-001A, EDG 1 System Alignment, Rev. 13
2-OP-EG-001A, EDG 2 System Alignment, Rev. 13
2-OP-RS-001A, Outside Recirc Spray System Alignment, Rev. 7

Condition Reports (*NRC Identified)

1023123 1023163 *1025241 *1025288 *1025307 *1025995
*1027413 *1027567 *1030503 *1032301

Drawings

11448-FB-038A SH1, Flow/Valve Operating Numbers Diagram Fuel Oil Lines Unit 1, Rev. 27
11448-FB-038A SH2, Flow/Valve Operating Numbers Diagram Fuel Oil Lines Unit 1, Rev. 49
11448-FM-071A SH 1, Flow/Valve Operating Numbers Diagram Circulating and Service Water System Unit 1, Rev. 80
11448-FM-071E, Flow/Valve Operating Numbers Diagram Service Water Fuel Oil System Unit 1, Rev. 12

Other Documents

CA 295788, Determine/Revise procedures for Relief Valves with Ty Wraps, 6/17/15
VTM 38-C515-00013, Operating and Safety Instructions Direct Spring Operated Safety Valves

Section 1R05: Fire Protection

Procedures

0-FS-FP-198, Diesel Fire Pump Room Elevation 27 Feet – 6 Inches, Rev. 2
0-FS-FP-199, Electric Fire Pump Room Elevation 27 Feet – 6 Inches, Rev. 2
0-LSP-FP-045, Fire Extinguisher Annual Maintenance, Rev. 2
1-FS-FP-101, Unit 1 Cable Vault Penetration Area Elevation 15 Feet – 0 Inches, Rev. 3

1-FS-FP-107, Unit 1 Emergency Switchgear Room Elevation 9 Feet – 6 Inches, Rev. 3
1-FS-FP-108, Unit 1 Relay Room Elevation 9 Feet – 6 Inches, Rev. 3
1-FS-FP-109, Battery Room 1A Elevation 9 Feet – 6 Inches, Rev. 3
1-FS-FP-110, Battery Room 1B Elevation 9 Feet – 6 Inches, Rev. 1
2-FS-FP-109, Battery Room 2A Elevation 9 Feet – 6 Inches, Rev. 3
2-FS-FP-110, Battery Room 2B Elevation 9 Feet – 6 Inches, Rev. 3

Condition Reports (*NRC Identified)
*1023490 *1024168

Drawings
11448-FAR-206 SH 7, Equipment Location – Appendix 'R' Service Building Plan – EL 9' – 6" Unit 1, Rev. 18
11448-FAR-205 SH 2, Equipment Location – Appendix 'R' Auxiliary Building Plan – EL 13' – 0" Unit 1 & 2, Rev. 18
11448-FAR-205 SH 4, Equipment Location – Appendix 'R' Auxiliary Building Plan – EL 45' – 10" Unit 1, Rev. 16

Section 1R06: Flood Protection
Procedures
0-MCM-1207-01, Pumping of Security and Electrical Cable Vaults, Rev. 12
0-MCM-1207-03, Inspection of Electrical Cable Vaults with Safety Related Cables, Rev. 2

Condition Reports
1025432 1031654

Work Orders
38103518130

Section 1R11: Licensed Operator Requalification Program
Procedures
2-OPT-RX-005, Control Rod Assembly Partial Movement, Rev. 34
2-OPT-EG-001, Number 2 Emergency Diesel Generator Monthly Start Exercise Test, Rev. 75

Section 1R12: Maintenance Effectiveness
Procedures
1-IPT-CC-CW-L-102, Intake Canal Level Probe 1-CW-LS-102 Time Response Test and Channel Calibration, Rev. 16

Condition Reports
1027241 1027568 1030984

Work Orders
38103708236

Drawings
11448-FE-3FH, Wiring Diagram Control Cabinet 1-CW-PNL-1A & 1-CW-PNL-1B Unit 1, Rev. 4

Other Documents
VTM 38-F330-00004, Installation and Operation Manual for Liquid Level Switch Model 8-66, FCI Assembly Number 88-162931, Rev. 3

Section 1R13: Maintenance Risk Assessments and Emergent Work Control
Procedures
0-ECM-1801-03, Westinghouse Type BF Relay Replacement, Rev. 3
1-SWI-LM-RLY-100D5, SWI For Replacement Of 01-LM-RLY-100D5-RELAY, Rev. 1
2-IPM-NI-N-41, Nuclear Instrumentation Power Range N-41 Cable Testing, Rev. 1
2-PT-1.2, NIS Power Range Trip Channel Test, Rev. 25

Drawings
11448-ESK-7J, Elementary Diagram Consequence Limiting Safeguards Train 1B (HI) Unit 1, Rev. 22
11448-ESK-7J1, Elementary Diagram Consequence Limiting Safeguards Train 1B Outputs (HI) Unit 1, Rev. 5

Condition Reports
1022823 1022854 1023116 1025334 1025606 1028246

Work Orders
38103696875 38103705501

Other Documents
EOOS Schedulers Risk Evaluation for Surry Power Station, 1/04/16
EOOS Schedulers Risk Evaluation for Surry Power Station, 1/21/16
EOOS Schedulers Risk Evaluation for Surry Power Station, 2/24/16
EOOS Schedulers Risk Evaluation for Surry Power Station, 3/02/16

Section 1R15: Operability Determinations and Functionality Assessments
Procedures
0-OP-AAC-001, AAC Diesel Generator Operation, Rev 28 {OTO1}
0-OP-ZZ-021, Severe Weather Preparation, Rev. 12
1-OPT-SI-005, LHSI Pump Test, Rev. 32
1-PT-8.4, Consequence Limiting Safeguards (Hi-Train), Rev. 17 {OTO1}

Condition Reports (*NRC Identified)
1016527 1026038 *1027408 *1027411 1028277 1030931

Other Documents
DEO-0088, LHSI and ORS Pumps Seal Cooler Sizing Pump Seal Cooler, Cooling Coil, LHSI Pump Seal Cooler, ORS Pump Seal Cooler, 10/19/92

Section 1R19: Post Maintenance Testing
Procedures
0-OP-SW-002, Emergency Service Water Pump Operation, Rev. 46
0-OP-ZZ-009, ASME Code Class Leakage, Rev. 7
0-OPT-ZZ-008, ASME System Pressure Tests, Rev. 11
0-OSP-AAC-003, Automatic Start Test of AAC Diesel Generator, Rev. 10

1-OSP-SW-004, Measurement of Macrofouling Blockage of Component Cooling Heat Exchanger 1-CC-E-1C, Rev. 31
1-PT-2.33B, Emergency Bus Undervoltage and Degraded Protection Test "J" Train, Rev. 7
1-PT-8.4, Consequence Limiting Safeguards (Hi-Train), Rev. 17 {OTO1}
2-IPT-CC-RC-L-460, Pressurizer Level Protection Loop L-2-460 Channel Calibration, Rev. 14
ER-AA-NTX-1002, Heat Exchanger Program Visual and Leak Testing, Rev. 2
GMP-009, Swagelock Fitting Removal and Installation, Rev. 12

Condition Reports
1026038 1029109 1029129 1029765 1030874

Work Orders
38103529658 38103686898 38103700933 38103713943
38103715406

Section 1R22: Surveillance Testing
Procedures
0-EPT-0104-01, Semi-Annual Station Battery Test, Rev. 17
0-OPT-EG-001, Number 3 Emergency Diesel Generator Monthly Start Exercise Test, Rev. 73
1-OPT-CS-002, Containment Spray System Test, Rev. 17
1-OPT-FW-003, Turbine Driven Auxiliary Feedwater Pump 1-FW-P-2, Rev. 50
1-OPT-FW-007, Turbine Driven AFW Pump Steam Supply Line Check Valve Test, Rev. 7
2-PT-8.5, Consequence Limiting Safeguards Logic (Hi-Hi Train), Rev. 31

Condition Reports (*NRC Identified)
*1026280

Work Orders
38102256378 38103505844 38103569705 38103644986
38103645037 38103645098 38103645744 38103657184

Section 4OA1: Performance Indicator Verification
Other Documents
4Q/2015 Performance Indicators – Surry 1 and 2 - Unplanned Scrams per 7000 Critical Hours, dated 03/01/16
4Q/2015 Performance Indicators - Surry 1 and 2 - Unplanned Power Changes per 7000 Critical Hours, dated 03/01/16
4Q/2015 Performance Indicators – Surry 1 and 2 - Unplanned Scrams with Complications, dated 03/01/16
Unit 1 Control Room Narrative Log, 01/01/2015 – 12/31/2015
Unit 2 Control Room Narrative Log, 01/01/2015 – 12/31/2015

Section 4OA2: Identification and Resolution of Problems
Procedures
PI-AA-100-1003, Self-Evaluation, Rev. 15
PI-AA-100-1004, Self-Assessments, Rev. 12
PI-AA-200, Corrective Action, Rev. 29
PI-AA-200-2001, Trending, Rev. 6

Condition Reports

580380	580561	1003197	1006227	1011624	1012251
1014633	1016235	1016236	1019372	1019376	1019816
1020091	1020102	1020110	1022547	1023780	1025169
1025655	1029974	1030351	1030834		

Other Documents

ACE 019690, IA line break-loss of Unit 2 HP drain system
CA 3017367, CA to Engineering to determine and initiate required actions for instrument air low pressure alarm
Surry Power Station Integrated Trend Report Third Quarter 2015, 11/03/15
Surry Power Station Integrated Trend Report Fourth Quarter 2015, 2/03/16

Section 4OA3: Follow-up of Events and Notices of Enforcement Discretion

Condition Reports

1013360	1013644	1013743	1013854	1013906	1013907
1013908	1014005	1014077	1014545	1015829	1016388
1016391	1016533	1016553	1016861	1016867	1017228
1017420	1018277	1018476			

Other Documents

Event Review Team Report, Automatic Unit 1 Reactor Trip on October 13, 2015, Rev. 0
RCE 3015336, Unit 1 Exciter Coupling Failure, Rev. 0
Siemens Surry Unit 1 Generator and Exciter Inspection Customer Final Report, Service Event 04/22/15 to 05/09/15