



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**
REGION II
245 PEACHTREE CENTER AVENUE N.E., SUITE 1200
ATLANTA, GEORGIA 30303-1200

November 7, 2019

Mr. Daniel Stoddard
Senior Vice 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 – INTEGRATED INSPECTION REPORT
05000280/2019003 AND 05000281/2019003

Dear Mr. Stoddard:

On September 30, 2019, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at Surry Power Station and discussed the results of this inspection with F. Mladen and other members of your staff. The results of this inspection are documented in the enclosed report.

The NRC inspectors did not identify any finding or violation of more than minor significance.

This letter, its enclosure, and your response (if any) will be made available for public inspection and copying at <http://www.nrc.gov/reading-rm/adams.html> and at the NRC Public Document Room in accordance with 10 CFR 2.390, "Public Inspections, Exemptions, Requests for Withholding."

Sincerely,

/RA/

Bradley J. Davis, Chief
Reactor Projects Branch 4
Division of Reactor Projects

Docket Nos. 05000280 and 05000281
License Nos. DPR-32 and DPR-37

Enclosure:
As stated

cc w/ encl: Distribution via LISTSERV®

SUBJECT: SURRY POWER STATION – INTEGRATED INSPECTION REPORT
05000280/2019003 AND 05000281/2019003 DATED NOVEMBER 7, 2019

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DATE	11/05/2019	11/05/2019	11/07/2019

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**U.S. NUCLEAR REGULATORY COMMISSION
Inspection Report**

Docket Numbers: 05000280 and 05000281

License Numbers: DPR-32 and DPR-37

Report Numbers: 05000280/2019003 and 05000281/2019003

Enterprise Identifier: I-2019-003-0030

Licensee: Virginia Electric and Power Company

Facility: Surry Power Station

Location: Surry, VA

Inspection Dates: July 01, 2019 to September 30, 2019

Inspectors: R. Carrion, Senior Reactor Inspector
J. Diaz-Velez, Senior Health Physicist
S. Downey, Senior Reactor Inspector
C. Fontana, Emergency Preparedness Inspector
A. Johnson, Materials Engineer
W. Loo, Senior Health Physicist
M. Magyar, Reactor Inspector
L. McKown, Senior Resident Inspector
W. Pursley, Health Physicist
C. Read, Resident Inspector
F. Sacko, Electrical Engineer
S. Sanchez, Senior Emergency Preparedness Inspector
J. Walker, Emergency Response Inspector

Approved By: Bradley J. Davis, Chief
Reactor Projects Branch 4
Division of Reactor Projects

SUMMARY

The U.S. Nuclear Regulatory Commission (NRC) continued monitoring the licensee's performance by conducting an integrated inspection at Surry Power Station in accordance with the Reactor Oversight Process. The Reactor Oversight Process is the NRC's program for overseeing the safe operation of commercial nuclear power reactors. Refer to <https://www.nrc.gov/reactors/operating/oversight.html> for more information.

List of Findings and Violations

No findings or violations of more than minor significance were identified.

Additional Tracking Items

Type	Issue Number	Title	Report Section	Status
URI	05000280,05000281/20 14007-04	Qualification Basis for Safety-Related Molded Case Circuit Breakers	71152	Closed

INSPECTION SCOPES

Inspections were conducted using the appropriate portions of the inspection procedures (IPs) in effect at the beginning of the inspection unless otherwise noted. Currently approved IPs with their attached revision histories are located on the public website at <http://www.nrc.gov/reading-rm/doc-collections/insp-manual/inspection-procedure/index.html>. Samples were declared complete when the IP requirements most appropriate to the inspection activity were met consistent with Inspection Manual Chapter (IMC) 2515, "Light-Water Reactor Inspection Program - Operations Phase." The inspectors performed plant status activities described in IMC 2515 Appendix D, "Plant Status" and conducted routine reviews using IP 71152, "Problem Identification and Resolution." The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel to assess licensee performance and compliance with Commission rules and regulations, license conditions, site procedures, and standards.

REACTOR SAFETY

71111.01 - Adverse Weather Protection

Impending Severe Weather Sample (IP Section 03.03) (1 Sample)

- (1) The inspectors evaluated readiness for impending adverse weather conditions for Hurricane Dorian on September 5, 2019.

71111.04Q - Equipment Alignment

Partial Walkdown Sample (IP Section 03.01) (3 Samples)

The inspectors evaluated system configurations during partial walkdowns of the following systems/trains:

- (1) Emergency Diesel Generators' fuel oil supply alignment following underground fuel oil tank sampling on July 11, 2019.
- (2) Main Control Room air handling units' alignment after degradation of the 2-VS-AC-8 air handling unit on July 16, 2019.
- (3) Spent Fuel Pool Cooling Pump and Heat Exchangers in advance of fall refueling outage on September 27, 2019.

71111.05Q - Fire Protection

Quarterly Inspection (IP Section 03.01) (5 Samples)

The inspectors evaluated fire protection program implementation in the following selected areas:

- (1) Fire protection loop isolations and fire pumps following rupture of a segment of buried piping on July 15, 2019
- (2) Unit 1 Emergency Switchgear Room, on August 21, 2019.
- (3) Unit 1 Safeguards Basement, Elevation 11'-6" on September 24, 2019.
- (4) Unit 1 Safeguards Valve Pit, Elevation 28'-6" on September 25, 2019.
- (5) #2 Emergency Diesel Generator Room, Elevation 27'-6" on September 26, 2019.

71111.11Q - Licensed Operator Regualification Program and Licensed Operator Performance

Licensed Operator Performance in the Actual Plant/Main Control Room (IP Section 03.01) (1 Sample)

- (1) The inspectors observed and evaluated licensed operator performance in the Control Room during 1-OPT-RX-005, Control Rod Partial Movement Testing, on July 10, 2019.

Licensed Operator Regualification Training/Examinations (IP Section 03.02) (1 Sample)

- (1) The inspectors observed and evaluated a simulator regualification training session involving a ruptured steam generator and a loss of containment instrument air resulting in an Alert declaration, on July 17, 2019.

71111.12 - Maintenance Effectiveness

Routine Maintenance Effectiveness Inspection (IP Section 02.01) (1 Sample)

The inspectors evaluated the effectiveness of routine maintenance activities associated with the following equipment and/or safety significant functions:

- (1) Unit 1 and 2 Station Batteries 1A & 1B preventive maintenance strategies following discovery of unexpected sedimentation in Unit 1 battery 1A, cell 26, on August 26, 2019.

71111.13 - Maintenance Risk Assessments and Emergent Work Control

Risk Assessment and Management Sample (IP Section 03.01) (5 Samples)

The inspectors evaluated the risk assessments for the following planned and emergent work activities:

- (1) Unit 1 and Unit 2 elevated risk upon rupture of underground fire main and loss of fire protection system pressure on July 13, 2019.
- (2) Unit 1 elevated risk of introducing foreign material into the reactor coolant system during pump disassembly of the '1C' charging pump casing on July 22, 2019.
- (3) Emergent change in station risk due to engine failure to start during 2-OPT-EG-001, #2 Emergency Diesel Generator Monthly Start Exercise testing (CR1127834), on July 29, 2019.
- (4) Elevated Trip risk associated with restoration of 531 Offsite Line sequenced with 0-PT-8.8, Canal Level Logic Testing, on August 6, 2019.
- (5) Elevated Risk associated with Unit 2 condensate storage tank Internal Inspections and Level Instrument Calibrations, on August 20, 2019.

71111.15 - Operability Determinations and Functionality Assessments

Operability Determination or Functionality Assessment (IP Section 02.02) (6 Samples)

The inspectors evaluated the following operability determinations and functionality assessments:

- (1) CR1125964, cross-tie valve between service water chemical injection pumps left open, on July 8, 2019.
- (2) CR1126835, fire main rupture between 1-FP-86 and 1-FP-92 (yard fire main), on July 15, 2019.
- (3) CR1127217, NRC identified apparent undersized fillet weld on service water piping in MER 4, on July 19, 2019.
- (4) CR1127585, NRC identified cold recirculation pipe in 2-SI-P-1B, Unit 2 Low Head Safety Injection Pump, on July 29, 2019.
- (5) CR1127851 and CR1127846, NRC identified debris in backflow preventers in Mechanical Equipment Rooms 3 and 4, July 29, 2019.
- (6) CR1125899, CR1101522, & CR1128490 (CA7682619), FLEX Spent Fuel Pool Instrumentation uninterruptable power supply battery health alarms in on both channels on August 8, 2019.

71111.18 - Plant Modifications

Temporary Modifications and/or Permanent Modifications (IP Section 03.01 and/or 03.02) (2 Samples)

The inspectors evaluated the following temporary or permanent modifications:

- (1) Permanent shaft keyway modification for 1-CH-P-1C following identification of deformation on July 1, 2019
- (2) Permanent piping modifications for the Unit 2 charging pump service water pump piping and supports in Mechanical Equipment Room 4, on July 16, 2019

71111.19 - Post-Maintenance Testing

Post-Maintenance Test Sample (IP Section 03.01) (7 Samples)

The inspectors evaluated the following post maintenance tests:

- (1) 2-PT-18.8, 'B' charging pump service water pump performance testing following motor and strainer maintenance, on July 9, 2019
- (2) 0-OPT-SW-002, Emergency Service Water Pump 1-SW-P-1B, following repeat ejection of pump packing (38204200818 & 38204200862) on July 26, 2019
- (3) 2-OPT-EG-001, #2 Emergency Diesel Generator Monthly Start Exercise following start failure and start logic relay replacement (38204193912, 38204201123, 38204201124, & 38204201125) on July 30, 2019
- (4) OP-51.1, 'B' component cooling pump post-maintenance testing following motor electrical preventative maintenance and oil change, on July 31, 2019
- (5) 1-OPT-SI-005, Unit 1 Low Head Safety Injection Pump testing following suction and discharge valve preventive maintenance (38204195341) on August 29, 2019
- (6) 0-OSP-AAC-001, Alternate AC Station Blackout Diesel Generator governor replacement and emergency stop valve troubleshooting (38103735090, CR1130048, CR1130050, & CR1130086) on September 4, 2019
- (7) 1-IPT-CC-NI-N-42, Unit 1 Nuclear Instrumentation Power Range N-42 Channel Calibration, following failure and replacement of the N-42 isolation amplifier (38204203495) on September 30, 2019

71111.22 - Surveillance Testing

The inspectors evaluated the following surveillance tests:

Surveillance Tests (other) (IP Section 03.01) (3 Samples)

- (1) 1-OPT-CS-002, Unit 1 '1A' and '1B' Containment Spray System Testing, on July 8, 2019
- (2) 2-OPT-EG-001, #2 Emergency Diesel Generator Monthly Start Exercise Test, on July 29, 2019
- (3) 2-OPT-FW-003, Unit 2 Turbine Driven Auxiliary Feedwater Pump 2-FW-P-2 quarterly testing (38204194609, 38204194608, 38103744570, & 3810374452), on August 5, 2019

71114.01 - Exercise Evaluation

Inspection Review (IP Section 02.01-02.11) (1 Sample)

- (1) The inspectors evaluated the biennial emergency plan exercise during the week of July 22, 2019. The exercise scenario simulated a loss of offsite power on Unit 1, with a failure of the #3 emergency diesel generator (EDG) to power the electrical bus. A subsequent fire in the #3 EDG room led to the declaration of an Alert. Four control rods unexpectedly drop into the reactor core, but the reactor fails to automatically or manually trip, thus creating conditions that met the threshold for declaring a Site Area Emergency. Then a large break loss of coolant accident was simulated, along with the failure of the only containment spray pump, and eventual leak in the containment hatch from pressurization. Once the reactor vessel level indication system reached a certain threshold, along with core exit thermocouples less than 700 degrees Fahrenheit, this then met the simulated conditions for a General Emergency and allowed the Offsite Response Organizations to demonstrate their ability to implement emergency actions.

71114.04 - Emergency Action Level and Emergency Plan Changes

Inspection Review (IP Section 02.01-02.03) (1 Sample)

- (1) The inspectors evaluated submitted Emergency Action Level, Emergency Plan, and Emergency Plan Implementing Procedure changes during the week of July 22, 2019. This evaluation does not constitute NRC approval.

71114.08 - Exercise Evaluation Scenario Review

Inspection Review (IP Section 02.01 - 02.04) (1 Sample)

- (1) The inspectors reviewed and evaluated in-office, the proposed scenario for the biennial emergency plan exercise at least 30 days prior to the day of the exercise.

RADIATION SAFETY

71124.06 - Radioactive Gaseous and Liquid Effluent Treatment

Inspectors evaluated licensee performance in ensuring that gaseous and liquid effluent processing systems are maintained to properly mitigate, monitor and evaluate radiological discharges to the public. Inspectors reviewed compensatory measures for out-of-service effluent monitors.

Walk Downs and Observations (IP Section 02.01) (1 Sample)

The inspectors walked down the following gaseous and liquid radioactive effluent monitoring and filtered ventilation systems to assess the material condition and verify proper alignment according to plant design:

- (1) Inspectors reviewed the following:
 - SRF Liquid Effluent Monitor (01-RRM-RITS-131), SRF Vent Filter Systems, Vent Stack #1 Monitor, and Process Vent Particulate Monitor (01-GW-RM-130A).

Calibration and Testing Program (Process & Effluent Monitors) (IP Section 02.02) (1 Sample)

The inspectors reviewed gaseous and liquid effluent monitor instrument calibrations or tests by reviewing information not limited to but including alarm set points, periodicity, National Institute of Standards and Traceability for sources used.

- (1) Inspectors reviewed the following:
 - U1 Process Vent Normal Range (1-GW-RM-130) dated 07/30/2019
 - U2 Vent Vent Normal Range (1-VG-RM-131) dated 08/31/2017
 - SRF Liquid Waste Disposal Rad. Monitor (1-RRM-RE-131) dated 06/03/2019
 - CW Discharge Tunnel Rad. Monitor (1/2-SW-120/220) dated 07/16/2019

Sampling and Analysis (IP Section 02.03) (1 Sample)

The inspectors reviewed radioactive effluent sampling and analysis activities.

- (1) The inspectors reviewed the following:

Radioactive Effluent Sampling and Analysis

- Ventilation Vent # 1 - Inspectors observed the weekly sample collection, lab. sample preparation for analysis, reviewed lab. counting results, and observed the release permit generation process.
- 1-PT-50.4 Health Physics Sampling Ventilation Vent 1 dated June 4, 2019
- 1-PT-50.4 Health Physics Sampling Ventilation Vent 1 dated July 16, 2019
- 24-JUL-2017-0018 Liquid Effluent Sample (Laundry drain monitoring Tank B)

Effluent discharges with inoperable monitors

- None occurred during this inspection period.

Instrumentation and Equipment (IP Section 02.04) (1 Sample)

The inspectors reviewed flow rates for effluent stack and related vent flow and surveillances. Inspectors also reviewed maintenance and methodologies for one or two high-range effluent

monitors (or other effluent/process monitor) relied on in emergency operating procedures for decision making.

(1) Inspectors reviewed the following:

Air Cleaning Systems

- 0-PT-24.17 Test of Gaseous Waste Charcoal for 1-GW-FL-1A/B (Work Order # 38203876270)
- 0-PT-24.17 Test of Gaseous Waste Charcoal for 1-GW-TS-100A/101A/100B/101B, 1-GWPDI-100, and 1-GW-PI-108/120 (Work Order # 38204187579)
- 0-MCM-0620-12 Filter and Charcoal Replacement of 1-GW-FL-1A (Work Order # 38103259966)
- 0-MCM-0620-12 Filter and Charcoal Replacement of 1-GW-FL-1B (Work Order # 38103635285)

High-Range Effluent Monitor

- 1-GM-RM-130 Calibration (Work Order #38203876395)
- 1-GM-RM-130 Calibration (Work Order #38103779371)
- 1-GM-RM-120 Calibration (Work Order #38203871092)
- 1-GM-RM-120 Calibration (Work Order #38103745535)

Dose Calculations (IP Section 02.05) (1 Sample)

The inspectors reviewed required annual reports for changes, release permits and the offsite dose calculation manual for changes and results.

(1) The inspectors reviewed the following:

Liquid and Gaseous Discharge Permits

- Liquid Release Permits #L-20190820-B and L20190828-180-B
- Gas Release Permits #G-20180701-C and G-20180701-C

Abnormal Gaseous or Liquid Tank Discharge

- None

Annual Radiological Effluent Release Reports

- Annual Radiological Effluent Report CY2017
- Annual Radiological Effluent Report CY2018

71124.07 - Radiological Environmental Monitoring Program

Site Inspection (IP Section 02.01) (1 Sample)

The inspectors evaluated the radiological environmental monitoring program implementation.

(1) The inspectors performed walkdowns of environmental sampling stations, direct radiation measurement locations and meteorological instrumentation. Inspectors also performed observations of preparation and collections of different environmental sample types. Inspectors reviewed sampling results and maintenance, calibration,

quality control and ground water records.

Walkdowns, Calibrations, and Maintenance Record Review

Inspectors observed material condition of sampling and direct radiation measuring equipment at the following locations:

- Surry Station (SS) 0.3 NNE
- Hog Island Reserve (HIR) 2.0 NNE
- Bacon's Castle (BC) 4.5 SSW
- Alliance (ALL) 5.1 WSW
- Colonial Parkway (CP) 3.8 NNW

Environmental Sample Collections and Preparation Observation

- Air particulate samples from locations listed above
- Air Iodine samples from locations listed above

Licensee Actions in Response to Missed Sample, Inoperable Sampler, Lost TLD or Anomalous Measurement

- Milk not available CR 1085500
- Kings Mill TLD missing CR 1080538
- TLD #02(WNW) missing CR 1084393

Sampling Program for the Potential of Licensed Material Entering Groundwater

- Spent Fuel Pool
- U1&2 Containment
- Yard Storm Drain System
- Fuel Building

Groundwater Protection Initiative (GPI) Implementation (IP Section 02.02) (1 Sample)

- (1) The inspectors reviewed the licensees continuing implementation of the voluntary Nuclear Energy Institute (NEI) Ground Water Protection Initiative.

OTHER ACTIVITIES – BASELINE

71151 - Performance Indicator Verification

The inspectors verified licensee performance indicators submittals listed below:

EP01: Drill/Exercise Performance (IP Section 02.12) (1 Sample)

- (1) EP01: Drill & Exercise Performance for the period January 1, 2018, through March 31, 2019.

EP02: ERO Drill Participation (IP Section 02.13) (1 Sample)

- (1) EP02: Emergency Response Organization Drill Participation for the period January 1, 2018, through March 31, 2019.

EP03: Alert & Notification System Reliability (IP Section 02.14) (1 Sample)

- (1) EP03: Alert & Notification System Reliability for the period January 1, 2018, through March 31, 2019.

MS06: Emergency AC Power Systems (IP Section 02.05) (2 Samples)

- (1) Unit 1 (July 1, 2016 – June 30, 2019)
- (2) Unit 2 (July 1, 2016 – June 30, 2019)

MS07: High Pressure Injection Systems (IP Section 02.06) (2 Samples)

- (1) Unit 1 (July 1, 2016 – June 30, 2019)
- (2) Unit 2 (July 1, 2016 – June 30, 2019)

MS08: Heat Removal Systems (IP Section 02.07) (2 Samples)

- (1) Unit 1 (July 1, 2016 – June 30, 2019)
- (2) Unit 2 (July 1, 2016 – June 30, 2019)

MS10: Cooling Water Support Systems (IP Section 02.09) (2 Samples)

- (1) Unit 1 (July 1, 2016 – June 30, 2019)
- (2) Unit 2 (July 1, 2016 – June 30, 2019)

PR01: Radiological Effluent Technical Specifications/Offsite Dose Calculation Manual
Radiological Effluent Occurrences (RETS/ODCM) Radiological Effluent Occurrences Sample.
(IP Section 02.16) (1 Sample)

- (1) · 10/01/2018 to 08/31/2019

71152 - Problem Identification and Resolution

Annual Follow-up of Selected Issues (IP Section 02.03) (1 Partial)

The inspectors reviewed the licensee's implementation of its corrective action program related to the following issues:

- (1) (Partial)
URI 05000280/2014007-04; 05000281/2014007-04, Qualification Basis for Safety-Related Molded Case Circuit Breakers on September 25, 2019.

OTHER ACTIVITIES – TEMPORARY INSTRUCTIONS, INFREQUENT AND ABNORMAL

71003 - Post-Approval Site Inspection for License Renewal

The NRC continued monitoring Dominion's performance at Surry by conducting a Post-Approval Site Inspection for License Renewal - Phase 4 in accordance with the license renewal inspection program (LRIP). Per IMC 2516, the LRIP is the process used by NRC staff to verify the adequacy of aging management programs (AMPs) and other activities associated with an applicant's request to renew an operating license of a commercial nuclear power plant beyond the initial licensing period under 10 CFR Part 54, "Requirements for the Renewal of Operating

Licenses for Nuclear Power Plants.”

The inspectors reviewed the licensee’s implementation of the Aging Management Programs (AMPs) shown below by selecting a sample of structures, systems, components (SSCs) within the scope of the respective AMPs. The inspectors performed the following activities, as applicable to each SSC, to determine that there is a reasonable assurance that the effects of aging are being adequately managed: walked down all accessible SSCs to observe their general condition and identify any signs of aging related degradation; interviewed plant personnel; reviewed completed work orders; reviewed applicable monitoring and trending data; and reviewed the acceptability of inspection and test results. For each AMP shown below, the inspectors also reviewed a sample of aging related issues entered into the licensee’s corrective action program to verify that age-related degradation is being identified at an appropriate threshold and corrected.

Post-Approval Site Inspection for License Renewal (9 Samples)

- (1) Augmented Inspection Program
 - a. Weld 1-08, Pipe to Weldolet Weld on line 12-RC-10, ASME Class 1
 - b. Weld 1-02, Reducer to Nozzle Weld on line 12-WFPD-117, ASME Class 1
 - c. Weld 2-15, Pipe to Pipe Weld on line 4-RC-15, ASME Class 1
 - d. Unit 2 High Energy Piping Outside Containment (Main Steam and Feedwater Piping)

- (2) Buried Piping and Valve Inspection Program
 - 36” Recirculating Spray Heat Exchanger service water pipe and transition to the 8” 2C service water header.
 - Copper-Nickel piping in the Service Water System
 - Emergency Diesel Generator (EDG) Fuel Oil Piping in EDG Room #3
 - Fire water header piping between valves 1-FP-86 and 1-FP-92
 - Fire Protection System piping at fire hydrant 1-FP-512
 - Service water piping upstream of valve 1-SW-MOV-101A.
 - Service water piping at valve 1-SW-MOV-103C

- (3) Chemistry Control Program for Primary Systems
 - Unit 1 & Unit 2 Primary Sample Sinks
 - Boric Acid Storage Tanks
 - Primary Grade Water Tanks
 - Spent Fuel Pool Demineralizer Ion Exchanger
 - Refueling Water Storage Tanks
 - Deborating Demineralizer

- (4) Chemistry Control Program for Secondary Systems
 - Bearing Cooling System
 - Condensate Storage Tank
 - EDG Cooling System
 - Feedwater System
 - Steam Generators

- (5) Civil Engineering Structural Inspection Program
 - Auxiliary Building

- Containment
 - Fuel Building
 - Intake and Discharge Structures and Tunnels
 - Manholes
 - Masonry Walls
 - Turbine Building
- (6) General Condition Monitoring
- Various structures, systems, components, and items within the scope of the following program areas:
 - Inspections of Radiologically Controlled Areas for Borated Water Leakage
 - Periodic focused inspections such as system walkdowns
 - Area inspections for condition of structural supports and doors
- (7) Non-EQ Cable Monitoring Program
- Intermediate Range Channel N36 Cables (01-NI-NE-36-DETECT, 02-NI-NE-36-DETECT)
 - Type E1 Cables in the Unit 1 & Unit 2 Auxiliary Building, Unit 2 Safeguards Room, and the Unit 2 Cable Spreading Room
 - Type E3 Underground Cables that supply power to the “C” Reservice Station Service Transformer
- (8) Tank Inspection Program
- EDG Coolant Expansion Tank (03-EG-TK-7)
 - EDG Fuel Oil Tank (03-EE-TK-3)
 - EDG Starting Air Receiver Tanks (03-EG-TK-1/2/3/4/5/6)
 - Unit 1 Fire Protection Tanks (01-FP-TK-1A, 01-FP-TK-1B)
 - Unit 2 Chemical Addition Tank (02-CS-TK-2)
 - Unit 2 Refueling Water Storage Tank (02-CS-TK-1)
- (9) Work Control Process
- 96” Circulating Water Lines (1-CW-PP-96.00-WC-PIPE, 2-CW-PP-96.00-WC-PIPE)
 - Containment Instrument Air Compressor Heat Exchangers (1-IA-E-4A/4B, 2-IA-E-4A/4B)
 - Emergency Service Water Pump B (1-SW-P-1B)
 - High Level Intake Structure
 - Unit 1 Main Control Room Chillers (1-VS-E-4A, 1-VS-E-4D)
 - Unit 2 Feedwater Regulating Valve (2-FW-FCV-2488)
 - Unit 2 Main Steam Safety Valves (2-MS-SV-205A, 2-MS-SV-202C)

INSPECTION RESULTS

Unresolved Item (Closed)	Qualification Basis for Safety-Related Molded Case Circuit Breakers URI 05000280,05000281/2014007-04	71152
<p>Description: On November 10, 2014, the NRC issued Inspection Report 05000280/2014007 and 05000281/2014007 documenting Unresolved Item (URI) 05000280/2014007-04; 05000281/2014007-04 associated with approximately 60 safety-related molded case circuit breakers (MCCBs) installed in mild environments for greater than 20 years. At that time, the inspectors observed that the licensee had not performed engineering evaluations to justify continued operation beyond the manufacturer design service life established in Westinghouse Electric Technical Bulletin TB-04-13, "Replacement Solutions for Obsolete Classic MCCBs, UL [Underwriters Laboratory] Testing Issues, Breaker Design Life and Trip Band Adjustment," which was superseded in 2006 by TB-06-02, "Aging Issues and Subsequent Operating Issues for Breakers That are at Their 20-Year Design/Qualified Lives; UL Certification/Testing Issues Update." Since then, the NRC undertook efforts, such as training, to assist inspectors in dispositioning issues related to how long safety-related components remain in service and to clarify the applicability of various regulations and industry standards. As part of this effort, the NRC determined current agency regulations require the establishment of quality assurance programs and supporting procedures that, among other things, set PM schedules for the inspection or replacement of parts having a specific lifetime.</p> <p>During the NRC's previous inspection, the team identified the licensee's failure to implement required preventive maintenance on safety related molded case circuit breakers (NCV 05000280/2014007-01; 05000281/2014007-01, Failure to Perform Required Preventative Maintenance on Class 1E Molded Case Circuit Breakers). The inspectors verified completion of corrective actions associated with this NCV during the Surry Power Station NRC Design Bases Assurance Inspection (Team) Report Number 05000280/2017007 and 05000281/2017007 issued on September 22, 2017 (CR560488 & CR560597). While the NRC undertook the training efforts previously described, the licensee replaced the MCCBs associated with the URI (CR553796 & CR558445). Because these actions reasonably ensured the continued quality of the MCCBs, the inspectors determined further efforts to evaluate the qualification basis in effect at the time the URI was issued were no longer needed to provide reasonable assurance of adequate protection of public health and safety.</p> <p>Based on the above, no performance deficiency or violation of regulatory requirements was identified. This review did not represent an inspection sample.</p> <p>Corrective Action Reference(s): CR553796, CR558445, CR560488, and CR560597</p>		

EXIT MEETINGS AND DEBRIEFS

The inspectors verified no proprietary information was retained or documented in this report.

- On July 26, 2019, the inspectors presented the Emergency Preparedness Exercise inspection results to F. Mladen and other members of the licensee staff.
- On August 16, 2019, the inspectors presented the License Renewal Phase IV Inspection Exit Meeting inspection results to Roy Simmons, Plant Manager and other members of the licensee staff.
- On October 7, 2019, the inspectors presented the Third Quarter 2019 Integrated Baseline Inspection Program Exit inspection results to F. Mladen and other members of the licensee staff.

DOCUMENTS REVIEWED

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
71003	Corrective Action Documents	CA278275, CA3043578, CA3052253, CA3057457, CA7317266, CA7643442, CR1014025, CR1015578, CR1016519, CR1016880, CR1017433, CR1035737, CR1050808, CR1052032, CR1052038, CR1052039, CR1052040, CR1052050, CR1052051, CR1052136, CR1052141, CR1052188, CR1052195, CR1052199, CR1052205, CR1052383, CR1059013, CR1061924, CR1068192, CR1068384, CR1068648,		

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
		CR1069157, CR1075996, CR1079710, CR1087963, CR1088833, CR1093199, CR1096915, CR1097265, CR1098557, CR1101423, CR1104723, CR1105154, CR1107843, CR1109101, CR1109103, CR1109416, CR1113848, CR1120563, CR1121216, CR1123559, CR1126168, CR1125354, CR1126835, CR1128837, CR1128894, CR1128904, CR435932, CR476205, CR496654, CR496866, CR496867, CR514139, CR514142, CR540390		

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
	Corrective Action Documents Resulting from Inspection	CR1128845	Requirement to provide certain information prior to start of an NRC inspection not met	08/13/2019
		CR1129011	ER-SU-AUG-101 Documentation of LR Compliance	08/15/2019
	Drawings	11448-FE-32B	Duct Line Plan & Detail, Surry Power Station – Unit 1	Revision 10
	Engineering Evaluations	CE-0087	Guideline for Monitoring of Structures, SPS	Revision 7
		CE-2014	Evaluation Concrete Beam at SPS High-Level Intake Structure	Revision 0
		ETE-CEP-2012-1007	Non-EQ Cable Monitoring, License Renewal Aging Management Program (LR-1772/LR-2772)	Revision 1
		ETE-CEP-2017-1002	Work Control Process, License Renewal Aging Management Activities	Revision 0
		ETE-CEP-2017-1003	General Condition Monitoring Activities, License Renewal Aging Management Activities (LR-1766/LR-2766)	Revision 0
		ETE-CEP-2017-1005	Civil Engineering Structural Inspection, License Renewal Aging Management Activities (LR-1714/LR-2714)	Revision 0
		ETE-CEP-2017-1009	Augmented Inspection Activities, License Renewal Aging Management Activities (LR-1731/LR-2731)	Revision 1
		ETE-CEP-2017-1015	Tank Inspection Activities, License Renewal Aging Management Activities (LR-1756/LR-2756)	Revision 0
		ETE-NAF-2018-0002	Surry Units 1 and 2 Extended Steam Generator Feedwater Nozzle Weld Examination Frequency	Revision 0
		ETE-SLR-2018-1326	Surry Subsequent License Renewal Project – Aging Management Program Evaluation Report – External Surfaces Monitoring of Mechanical Components	Revision 4
		ETE-SLR-2018-1338	Surry Subsequent License Renewal Project – Aging Management Program Evaluation Report – Masonry Walls	Revision 1
		ETE-SLR-2018-1339	Surry Subsequent License Renewal Project – Aging Management Program Evaluation Report – Structures Monitoring	Revision 2
		ETE-SLR-2018-1340	Surry Subsequent License Renewal Project – Aging Management Program Evaluation Report – Inspection of Water-Control Structures Associated with Nuclear Power	Revision 1

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
			Plants	
		ETE-SU-2011-0024	License Renewal Inspections for RWST and CAT	Revision 0
		ETE-SU-2011-0070	Summary of Tank Inspections for Surry License Renewal Commitment Number 10	Revision 0
		ETE-SU-2011-0075	Component Cooling Pipe in Containment NDE Results 2009-2013	Revision 2
		ETE-SU-2011-0103	License Renewal Tank Inspection Plans for the Period of Extended Operations	Revision 3
		ETE-SU-2012-0046	Condition Assessment of Plant Structures (Third Five-Year Inspection Interval)	Revision 0
		ETE-SU-2014-0020	Evaluation of 2014 Inspection of 1-FP-TK-IA	Revision 0
		ETE-SU-2014-0080	Assessment of Additional Cathodic Protection and Site Soil Analysis at Surry Power Station	Revision 1
		ETE-SU-2014-0081	Evaluation of 2014 Inspection of 1-FP-TK-IB	Revision 0
		ETE-SU-2015-0076	Evaluation and Repair of Degraded Concrete in the High-Level Intake Bays	Revision 4
		ETE-SU-2016-1011	2016 Aging Management Review of NON-EQ Cable Inspections	Revision 0
		ETE-SU-2019-0002	Condition Assessment of Plant Structures (Fourth Five-Year Inspection Interval)	Revision 0
		ETE-SU-2019-0015	UPTI Condition Assessment and Asses Management Plan (Surry Life Cycle Management Plan, Rev. 13)	Revision 0
	Miscellaneous	B. Muirhead	Curtiss-Wright Personnel Certification Statement: UT II	02/04/2017
	Miscellaneous	B. Muirhead	Curtiss-Wright Certification of Visual Acuity and Color Vision	01/10/2017
	Miscellaneous	ER-AA-CBL-10	Cable Management Program	Revision 2
	Miscellaneous	ER-SU-5909	SPS Program to Inspect Non-EQ Electrical Cables	Revision 4
	Miscellaneous	ET-CEP-04-0021	Walkdown Visual Inspection of Non-EQ Cables at Surry Power Station	Revision 1
	Miscellaneous	M. Smith	Curtiss-Wright Personnel Certification Statement: UT II	09/26/2016
	Miscellaneous	M. Smith	Curtiss-Wright Certification of Visual Acuity and Color Vision	07/26/2019
	Miscellaneous	W. Steppe	Curtiss-Wright Personnel Certification Statement: PT II	01/21/2017

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
		W. Steppe	Curtiss-Wright Certification of Visual Acuity and Color Vision	09/01/2016
	NDE Reports	PT-17-002	Liquid Penetrant Examination	05/14/2017
		UT-16-021	UT Calibration/Examination	10/26/2016
		UT-17-009	UT Calibration/Examination	05/11/2017
	Procedures	0-CSP-PL-001	Subsurface Drain Chemistry	Revision 6
		0-MCM-0203-02	Containment Instrument Air Compressor Maintenance	Revision 24
		0-MPM-1900-01	Periodic Inspection of Flood and Spill Protection Dikes, Dams, and Expansion Joint Shields	Revision 15
		0-MPM-1901-01	High Level Intake Structure Screenwells and Associated Piping Inspection	Revision 33
		0-MPM-1901-02	Low Level Intake Structure Screenwells 1D, 2A, 2B Service Water Inspection	Revision 9
		0-NSP-BS-001	Erosion Control Inspection	Revision 2
		0-NSP-BS-005	Monitoring of Structures	Revision 11
		0-OSP-FP-010	0-OSP-FP-010, Daily Fire Door Inspection	Revision 8
		0-STP-70.7	Annual Intake Canal Liner Visual Inspection/Acceptance Test	Revision 4
		1-NPT-LR-001	License Renewal General Condition Monitoring Review - Unit 1 Containment	Revision 1
		1-NPT-LR-002	License Renewal General Condition Monitoring Review - Unit 1 Areas Outside of Containment	Revision 1
		1-NPT-MS-001	Inservice Inspection System Pressure Test for Main Steam System Components Outside Containment	Revision 3
		1-OPT-MS-001	Operations Periodic Test	Revision 3
		2-NPT-LR-001	License Renewal General Condition Monitoring Review - Unit 2 Containment	Revision 1
		2-NPT-LR-002	License Renewal General Condition Monitoring Review - Unit 2 Areas Outside of Containment	Revision 1
		2-NPT-MS-001	Inservice Inspection System Pressure Test for Main Steam System Components Outside Containment	Revision 3
		2-OPT-MS-001	Operations Periodic Test	Revision 3
38-01-ISI-INT5	Surry Power Station Unit 1, Inservice Inspection Plan Components and Component Supports, 5th Interval	Revision 3		
38-02-ISI-INT5	Surry Power Station Unit 2, Inservice Inspection Plan	Revision 3		

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
			Components and Component Supports, 5th Interval	
		CH-93.400	Closed Cooling Water Chemistry Program	Revision 24
		CH-99.500	Primary Chemistry Specifications and Action Levels	Revision 15
		CH-99.600	Secondary Chemistry Specifications and Action Levels	Revision 16
		CY-AP-SEC-200	Secondary System Chemistry	Revision 7
		ER-AA-101	System Engineering Walkdowns	Revision 2
		ER-AA-103	System Engineering Handbook	Revision 3
		ER-AA-CBL-101	Evaluation and Testing of Low Voltage Cables	Revision 3
		ER-AA-CBL-103	Evaluation and Testing of Medium Voltage Cables	Revision 3
		ER-AA-CII-10	ASME Section XI Containment Inservice Inspection Program	Revision 2
		ER-AA-CII-101	ASME Section XI Containment Inservice Inspection (Concrete/IWL) Program Fleet Implementation Requirements	Revision 3
		ER-AA-CII-102	ASME Section XI Containment Inservice Inspection (Metal/IWE) Program Fleet Implementation Requirements	Revision 3
		ER-AA-MRL-10	Maintenance Rule Program	Revision 6
		ER-AA-MRL-100	Implementing Maintenance Rule	Revision 12
		ER-AA-NDE-PT-300	ASME Section XI Liquid Penetrant Examination Procedure	Revision 7
		ER-AA-NDE-UT-801	Ultrasonic Examination of Ferritic Piping Welds in Accordance with ASME Section XI, Appendix VIII	Revision 7
		ER-AA-NDE-UT-802	Ultrasonic Examination of Austenitic Piping Welds in Accordance with ASME Section XI, Appendix VIII	Revision 5
		ER-AP-BAC-10	Boric Acid Corrosion Control Program	Revision 12
		ER-AP-BAC-101	Boric Acid Corrosion Control Program (BACCP) Inspections	Revision 12
		ER-AP-BAC-102	Boric Acid Corrosion Control Program (BACCP) Evaluations	Revision 13
		ER-SU-AUG-101	Surry Augmented Inspection Program	Revision 17
		MA-AA-1002	Leakage Management	Revision 6
		OP-AA-100	Conduct of Operations	Revision 38
		RP-AA-220	Radiological Survey Scheduling	Revision 2
		RP-AA-221	Radiological Survey Records	Revision 7
		RP-AA-222	Radiation Surveys	Revision 3
		RP-AA-223	Contamination Surveys	Revision 4

Inspection Procedure	Type	Designation	Description or Title	Revision or Date	
		RP-SU-101-1000	Health Physics Operations: Department Standards	Revision 2	
		SU-PROC-0000-CH-72.B70	Boron: Operation and Calibration of the Mettler T Series Auto Titrator	Revision 6	
		WM-AA-100	Work Management	Revision 32	
	Self-Assessments	Audit 18-13	Surry License Renewal	11-15-2018	
		Self-Assessment Report (SAR) 3163	Informal License Renewal / Aging Management SA	12-10-2015	
	Work Orders	00470550-01, 38079565601, 38102528278, 38102566261, 38102921108, 38103187487, 38103249126, 38103275045, 38103320488, 38103601914, 38103710818, 38103710868, 38103717453, 38103738416, 38103788846, 38103765534, 38204182589, 38204186356, 38204192142, 38204192148, 38204199602			
	71111.01	Procedures		Dominion Energy Hurricane Response Plan (Nuclear)	14
			0-AP-37.01	ABNORMAL ENVIRONMENTAL CONDITIONS	72
			0-OP-ZZ-021	SEVERE WEATHER PREPARATION	23

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
71111.04Q	Procedures	0-OP-EG-001A	EDG 3 System Alignment	16
		0-OP-FC-001A	Spent Fuel Pit Cooling System Alignment	7
		0-OP-FC-002	Spent Fuel Pit Cooler Operations	5
		0-OP-VS-006	Control Room and Relay Room Ventilation System	74
		1-OP-EG-001A	EDG 1 System Alignment	14
		1-OP-SI-001A	Safety Injection System Alignment	19
		2-OP-EG-001A	EDG 2 System Alignment	14
		2-OP-SI-001A	Safety Injection System Alignment	16
71111.05Q	Procedures	0-FS-FP-122	Diesel Generator Room Number 2 Elevation 27 Feet - 6 Inches	2
		1-FS-FP-139	Safeguards Valve Pit - Unit 1 Elevation 28 Feet - 6 Inches, Elevation 19 Feet - 6 Inches, and Elevation 12 Feet	2
		1-FS-FP-140	Safeguards Basement - Unit 1 Elevation 11 Feet - 6 Inches	2
71111.11Q	Procedures	1-E-3	Steam Generator Tube Rupture	51
		1-ECA-3.3	SGTR Without Pressurizer Pressure Control	45
		1-OPT-RX-005	Control Rod Assembly Partial Movement	38
71111.12	Corrective Action Documents Resulting from Inspection	CR1131000		
	Procedures	1-EPT-0102-01	Monthly Station Battery 1A Cell Voltage Check	5
		CM-SU-STI-101	Technical Specification Surveillance Test Interval List	13
71111.13	Miscellaneous		PHOENIX Scheduler's Evaluation for Surry Power Station, Units 1 and 2	07/22/2019
			PHOENIX Scheduler's Evaluation for Surry Power Station, Units 1 and 2	07/29/2019
			PHOENIX Scheduler's Evaluation for Surry Power Station, Units 1 and 2	08/06/2019
			PHOENIX Scheduler's Evaluation for Surry Power Station, Units 1 and 2	08/20/2019
			PHOENIX Scheduler's Evaluation for Surry Power Station, Units 1 and 2	07/13/2019
71111.15	Corrective Action Documents	CR1125964		

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
	Corrective Action Documents Resulting from Inspection	CR1128490		
	Drawings	11448-FM-071D, Sheet 3	Flow/Valve Operating Numbers Diagram Circulating and Service Water System	8
		11548-FM-089A	Flow/Valve Operating Numbers Diagram Safety Injection System Sheets 1 and 2	54 and 55
	Miscellaneous	Weld Record for 02-SW-PP-2.00-WS-PIPE-171-9107		7/16/2019
	Operability Evaluations	Welding Technique Sheet 109		11
71111.18	Corrective Action Documents Resulting from Inspection	CR1127217		
	Drawings	11448-MKS-1021A36	2"-WS-171-21X	2
	Engineering Changes	SU-18-00109	MER-3&4 Charging Service Water Improvements	3
	Miscellaneous	Weld Data Record for 02-SW-PP-2.00-WS-PIPE-171-9107		July 16, 2019
		Welding Technique Sheet 3404		0
	Procedures	0-MCM-1801-01	Welding Safety-Related, Seismic-Related and Fire Protection Equipment	17
		Welding Technique Sheet		11

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
		109		
		Welding Technique Sheet 3404		0
	Work Orders	38204192939		
		38204192942		7/15/2019
71111.19	Procedures	0-ECM-1401-06	Component Cooling Water Motor Maintenance	14
		1-IPT-CC-NI-N-42	Nuclear Instrumentation Power Range N-42 Channel Calibration	5
		2-PT-18.8	Charging Pump Service Water Performance	36
		OP-51.1	Component Cooling Subsystem	11
	Work Orders	38103841715 38103841756 38204203495		7/31/2019
71111.22	Procedures	1-OPT-CS-002	Containment Spray System Test	19
71124.06	Calibration Records	HP-3010.040 (Attachment 2) for RM-RRM-131 Monitor	Effluent Radiation Monitor Setpoint Record	12/02/2015
		HP-3010.040 (Attachment 5) for RM-RRM-131 Monitor	Liquid Effluent Monitor Setpoint Worksheet	12/01/2015
	Corrective Action Documents	CRs 1124974, 1124995, 1117307, 1110189, 1110241, 1110305, 1110714, 1111542, 1118609, 1127391, 1127558,	Corrective Action Documents	

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
		1130517, 1130514, 1115287, and 1124749.		
	Miscellaneous	17-SEP-2019-0008 Gaseous Effluent Sample (Vent. Vent. #1 1250 Marinelli Gas Chamber)	Gamma Spectrum Analysis	09/17/2019
		17-SEP-2019-0009 Gaseous Effluent Sample (Vent. Vent. #1 Charcoal Filter)	Gamma Spectrum Analysis	09/17/2019
		17-SEP-2019-0010 Gaseous Effluent Sample (Vent. Vent. #1 Particulate Filter)	Gamma Spectrum Analysis	09/17/2019
		G-20190910-233-C	Gas Permit Post-Release Data Ventilation Vent # 1 (VG-104)	09/17/2019
	Work Orders	38204196211	7 Day Freq. PT:HP Sampling - Vent. Vent. #1	
71124.07	Calibration Records	C-HP-1033.620, Attachment 2, Calibration Certificate - Portable Air Sampler #22124, 08/27/2018	Portable Air Sampler Calibration	08/27/2018
		C-HP-1033.620, Attachment 2, Calibration Certificate -	Portable Air Sampler Calibration	01/15/2019

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
		Portable Air Sampler #22126		
		C-HP-1033.620, Attachment 2, Calibration Certificate - Portable Air Sampler #27314	Portable Air Sampler Calibration	10/23/2018
		C-HP-1033.620, Attachment 2, Calibration Certificate - Portable Air Sampler #27316	Portable Air Sampler Calibration	10/23/2018
		C-HP-1033.620, Attachment 2, Calibration Certificate - Portable Air Sampler #28187	Portable Air Sampler Calibration	01/15/2019
		W/O 38203875765	PM/CAL PRIMARY MET TOWER INSTRUMENTATION	10/10/2018
	Miscellaneous	AREOR Report	Dominion Energy, Surry Power Station, 2017 & 2018 Radiological Environmental Monitoring Program Report	
	Procedures	0-HSP-GPP-001	GROUNDWATER PROTECTION PROGRAM REVIEWS AND ASSESSMENTS	Revision 3
		0-HSP-REMP-001	LAND USE CENSUS	REVISION NO:12
		0-HSP-SS-002	Well Sampling Instructions	Revision 8
		HP-3051.020	GROUNDWATER PROTECTION PROGRAM	REVISION NO: 12
		RP-AA-504	Remediation Process for the Groundwater Protection Program	Revision 4

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
		VPAP-2103S	Offsite Dose Calculation Manual (Surry)	Revision 21
	Self-Assessments	GWPI Risk Assessment 2019	Surry Groundwater Protection Program Risk Assessment 2019	
71151	Miscellaneous		2Q2017, 2Q2018, & 2Q2019 Derivation and Margin Reports for Surry Power Station Unit 1 Mitigating System Performance Index Performance Indicator Emergency AC, High Pressure Injection, Heat Removal, Residual Heat Removal, and Cooling Water System inputs	
			2Q2017, 2Q2018, & 2Q2019 Derivation and Margin Reports for Surry Power Station Unit 2 Mitigating System Performance Index Performance Indicator Emergency AC, High Pressure Injection, Heat Removal, Residual Heat Removal, and Cooling Water System inputs	