



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

November 24, 2021

Mr. Daniel Stoddard  
Senior Vice President and Chief Nuclear Officer  
Innsbrook Technical Center  
5000 Dominion Boulevard  
Glen Allen, VA 23060-6711

**SUBJECT: SURRY POWER STATION – INTEGRATED INSPECTION REPORT  
05000280/2021003 AND 05000281/2021003**

Dear Mr. Stoddard:

On September 30, 2021, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at Surry Power Station. On October 8, 2021, the NRC inspectors discussed the results of this inspection with Mr. Doug Lawrence, Surry Site Vice President, and other members of your staff. The results of this inspection are documented in the enclosed report.

Two findings of very low safety significance (Green) are documented in this report. Two of these findings involved violations of NRC requirements. We are treating these violations as non-cited violations (NCVs) consistent with Section 2.3.2 of the Enforcement Policy.

If you contest the violations or the significance or severity of the violations documented in this inspection report, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region II; the Director, Office of Enforcement; and the NRC Resident Inspector at 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 U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region II; and the NRC Resident Inspector at Surry Power Station.

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 Title 10 of the *Code of Federal Regulations* 2.390, "Public Inspections, Exemptions, Requests for Withholding."

D. Stoddard

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Sincerely,

*/RA/*

Stewart N. Bailey, 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  
05000280/2021003 AND 05000281/2021003 Dated November 24, 2021

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| NAME   | J. Seat    | B. Towne  | L. McKown  | S. Bailey   |  |
| DATE   | 11/18/2021 | 11/18/2021  | 11/18/2021 | 11/18/2021  |  |

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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: 05000280/2021003 and 05000281/2021003

Enterprise Identifier: I-2021-003-0021

Licensee: Virginia Electric and Power Company

Facility: Surry Power Station

Location: Surry, VA

Inspection Dates: July 1, 2021 to September 30, 2021

Inspectors: L. McKown, Senior Resident Inspector  
B. Towne, Resident Inspector  
J. Diaz-Velez, Senior Health Physicist  
C. Fontana, Emergency Preparedness Inspector  
B. Kellner, Senior Health Physicist  
J. Rivera, Health Physicist  
S. Sanchez, Senior Emergency Preparedness Inspector  
J. Walker, Emergency Response Inspector

Approved By: Stewart N. Bailey, Chief  
Reactor Projects Branch 4  
Division of Reactor Projects

Enclosure

## 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

| Uperder Failure Results in Unplanned Orange Risk Condition for Containment Key Safety Function   |   |                            |                |
|--|---|----------------------------|----------------|
| Cornerstone  | Significance                                    | Cross-Cutting Aspect       | Report Section |
| Barrier Integrity  | Green<br>NCV 05000280/2021003-01<br>Open/Closed | [H.12] - Avoid Complacency | 71111.13       |
| A finding of very low safety significance (Green) was self-revealed following the failure of the Fuel Building upender during an outage. The failure blocked the Unit 1 fuel transfer canal gate valve, 1-FH-1, which prevented the ability to establish containment closure at a time when the calculated time to core boil was 30.4 minutes. As a result of being unable to isolate containment within the calculated time to boil, Surry Unit 1 entered an unplanned Orange risk condition in accordance with their outage risk plan for the Containment Key Safety Function (KSF). |   |                            |                |

| Failure of Siren Testing Program to Comply with the FEMA ANS Design Report  |  |                      |                |
|---|--|----------------------|----------------|
| Cornerstone   | Significance   | Cross-Cutting Aspect | Report Section |
| Emergency Preparedness  | Green<br>NCV 05000280,05000281/2021003-02<br>Open/Closed | [H.1] - Resources    | 71152          |
| The inspectors identified a Green NCV of Title 10 of the Code of Federal Regulations (CFR), Part 50.47(b)(5). Specifically, the licensee failed to ensure the alert and notification system (ANS) (or early warning system (EWS)) siren testing procedures complied with the approved Federal Emergency Management Agency (FEMA) ANS design report. This non-compliance affected an EWS quarterly test conducted on June 9, 2021. |  |                      |                |

### Additional Tracking Items

None.

## PLANT STATUS

Unit 1 operated at or near rated thermal power for the entire inspection period.

Unit 2 began the inspection period at rated thermal power. On September 19, 2021, Unit 2 began coast down from rated thermal power for entry into a scheduled refueling outage. On September 30, 2021, Unit 2 had reached 91 percent rated thermal power in advance of the scheduled refueling outage.

## 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 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. Starting on March 20, 2020, in response to the National Emergency declared by the President of the United States on the public health risks of the coronavirus (COVID-19), resident and regional inspectors were directed to begin telework and to remotely access licensee information using available technology. During this time, the resident inspectors performed periodic site visits each week, increasing the amount of time on site as local COVID-19 conditions permitted. As part of their onsite activities, resident inspectors conducted plant status activities as described in IMC 2515, Appendix D; observed risk significant activities; and completed on site portions of IPs. In addition, resident and regional baseline inspections were evaluated to determine if all or a portion of the objectives and requirements stated in the IP could be performed remotely. If the inspections could be performed remotely, they were conducted per the applicable IP. In some cases, portions of an IP were completed remotely and on site. The inspections documented below met the objectives and requirements for completion of the IP.

## REACTOR SAFETY

### 71111.01 - Adverse Weather Protection

#### Seasonal Extreme Weather Sample (IP Section 03.01) (1 Sample)

- (1) The inspectors evaluated readiness for seasonal extreme weather conditions prior to the onset of seasonal high temperatures for the following systems:

Unit 1 & 2 refueling water storage tanks and station switchyard on July 22, 2021.

#### Impending Severe Weather Sample (IP Section 03.02) (1 Sample)

- (1) The inspectors evaluated the adequacy of the overall preparations to protect risk-significant systems from impending severe weather from Tropical Storm Elsa on July 8, 2021.

### 71111.04 - Equipment Alignment

#### Partial Walkdown Sample (IP Section 03.01) (4 Samples)

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

- (1) Unit 2 'A' motor driven auxiliary feedwater pump train on July 22, 2021.
- (2) Main control room chillers A, B, and C with E out of service for planned maintenance following emergent failure of D chiller compressor on July 29, 2021.
- (3) Unit 1 and 2 emergency switchgear on August 5, 2021.
- (4) Emergency diesel generator and support systems on September 2, 2021.

#### 71111.05 - Fire Protection

##### Fire Area Walkdown and Inspection Sample (IP Section 03.01) (3 Samples)

The inspectors evaluated the implementation of the fire protection program by conducting a walkdown and performing a review to verify program compliance, equipment functionality, material condition, and operational readiness of the following fire areas:

- (1) Unit 2 mechanical equipment room #2 on July 19, 2021.
- (2) Spent fuel building lower level on July 28, 2021.
- (3) Auxiliary building on September 15, 2021.

#### 71111.06 - Flood Protection Measures

##### Inspection Activities - Internal Flooding (IP Section 03.01) (1 Sample)

The inspectors evaluated internal flooding mitigation protections in the:

- (1) Mechanical equipment room #3 and emergency switchgear rooms during maintenance on the service water strainer on September 16, 2021.

#### 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 main control room during performance of 2-OPT-CS-002, Containment Spray System Test, on September 30, 2021.

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

- (1) The inspectors observed and evaluated operations in the simulator during a graded Emergency Preparation drill on July 20, 2021.

#### 71111.12 - Maintenance Effectiveness

##### Maintenance Effectiveness (IP Section 03.01) (3 Samples)

The inspectors evaluated the effectiveness of maintenance to ensure the following structures, systems, and components (SSCs) remain capable of performing their intended function:

- (1) Low level intake structure vacuum priming air compressor chronic and recurring issues, on July 21, 2021.
- (2) 'B' spent fuel pool cooling pump preventative maintenance on September 2, 2021.
- (3) Unit 1 'A' main station battery cell on September 13, 2021.

#### 71111.13 - Maintenance Risk Assessments and Emergent Work Control

##### Risk Assessment and Management Sample (IP Section 03.01) (3 Samples)

The inspectors evaluated the accuracy and completeness of risk assessments for the following planned and emergent work activities to ensure configuration changes and appropriate work controls were addressed:

- (1) Emergent elevated risk [condition report (CR)1169711] from Green to Yellow upon discovery of failure of the low level intake structure (LLIS) Unit 1 vacuum priming air compressor while the Unit 2 compressor was tagged out of service for maintenance, on April 8, 2021.
- (2) Emergent elevated shutdown risk (CR1171627) from Yellow to Orange due to failure of the Unit 1 fuel building upender during lowered reactor vessel level inventory for vessel head lift with inability to establish containment closure within the time to boil on loss of decay heat removal, on April 30, 2021.
- (3) Emergent loss of real-time contingency analysis associated with response to grid instability concurrent with scheduled switchyard activities (CR1177416) on July 23, 2021.

#### 71111.15 - Operability Determinations and Functionality Assessments

##### Operability Determination or Functionality Assessment (IP Section 03.01) (4 Samples)

The inspectors evaluated the licensee's justifications and actions associated with the following operability determinations and functionality assessments:

- (1) CR1177545, Unit 1 leak-by through the turbine driven auxiliary feedwater pump steam exhaust condensing and falling to ground uncaptured through a break in the exhaust piping on July 26, 2021.
- (2) CR1177774, Failure of D main control room chiller compressor while E chiller out of service for planned maintenance on July 29, 2021.
- (3) CR1179958, Electrolyte levels low in alert range in #1 emergency diesel battery cells on September 2, 2021.
- (4) CR1180476, Unit 1 'A' main station battery found multiple cells with sediment buildup touching separating plates on September 13, 2021.

#### 71111.18 - Plant Modifications

##### Temporary Modifications and/or Permanent Modifications (IP Section 03.01 and/or 03.02) (1 Sample)

The inspectors evaluated the following temporary or permanent modifications:

- (1) Unit 1 refueling water storage tanks' temporary chillers modification due to elevated temperatures on July 15, 2021.

#### 71111.19 - Post-Maintenance Testing

##### Post-Maintenance Test Sample (IP Section 03.01) (4 Samples)

The inspectors evaluated the following post-maintenance test activities to verify system operability and functionality:

- (1) Work order (WO)38204211421, Unit 1 emergency diesel generator #1 fuel oil surveillances following replacement of fuel oil relief valve on July 19, 2021.
- (2) CR1177545, Unit 1 leak-by through the turbine driven auxiliary feedwater pump steam exhaust condensing and falling to ground uncaptured through a break in the exhaust piping on July 27, 2021.
- (3) WO38204201334, Restoration of 'E' main control room chiller from planned maintenance window following emergent failure of 'D' chiller compressor on July 29, 2021.
- (4) WO38204201552 & WO38204201619, 'B' spent fuel pool cooling pump following preventative maintenance on September 2, 2021.

#### 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 19, 2021. The simulated scenario began with a dropped control rod and loose parts alarm in the lower reactor vessel, followed by a high radiation alarm from the reactor coolant system letdown radiation monitor. This met the conditions for declaring an Alert. Subsequently, a large break loss of coolant accident was simulated, thus meeting the conditions for declaring a Site Area Emergency. When a recirculation spray pump failed and containment radiation levels continued to increase, conditions for a General Emergency were met, and the Offsite Response Organizations were able 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 19, 2021. This evaluation does not constitute NRC approval.

#### 71114.06 - Drill Evaluation

##### Drill/Training Evolution Observation (IP Section 03.02) (1 Sample)

The inspectors evaluated:

- (1) The inspectors evaluated a licensee emergency planning drill in the simulator and technical support center on July 6, 2021. The drill involved fuel damage, primary to secondary leakage, and secondary to the environment leakage with associated emergency classification declarations and protective action recommendations from Notice of Unusual Event to General Emergency.

#### 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**

#### 71124.02 - Occupational ALARA Planning and Controls

##### Verification of Dose Estimates and Exposure Tracking Systems (IP Section 03.02) (3 Samples)

The inspectors evaluated dose estimates and exposure tracking. The inspectors reviewed the following as low as reasonably achievable planning documents:

- (1) Work in Progress ALARA Reviews (WIPR) for ALARA Plan 21-016, Primary Steam Generator Eddy Current:  
WIPR # 21-009 - 50% review, May 6, 2021  
WIPR # 21-021 - 80% review, May 11, 2021.
- (2) Work in Progress ALARA Reviews (WIPR) for ALARA Plan 21-010, Scaffolding:  
WIPR # 21-006 - 50% review, May 4, 2021  
WIPR # 21-007 - 80% review, May 6, 2021.
- (3) Work in Progress ALARA Reviews (WIPR) for ALARA Plan 21-003, Station Operations:  
WIPR # 21-031 - 50% review, May 16, 2021  
WIPR # 21-031 - 80% review, May 25, 2021.

#### 71124.06 - Radioactive Gaseous and Liquid Effluent Treatment

##### Walkdowns and Observations (IP Section 03.01) (5 Samples)

The inspectors evaluated the following radioactive effluent systems during walkdowns:

- (1) Surry radwaste facility (SRF) vent stack monitor.
- (2) SRF liquid radwaste monitor.
- (3) Unit 1 radiological control area (RCA) exhaust ventilation filtration system.
- (4) Unit 1 safeguards area exhaust ventilation filtration system.
- (5) Plant Vent 2 stack monitor.

##### Sampling and Analysis (IP Section 03.02) (3 Samples)

Inspectors evaluated the following effluent samples, sampling processes and compensatory samples:

- (1) Inspectors observed and evaluated Plant Vent 1 stack monitor particulate and iodine filter change-out and analysis on June 29, 2021.
- (2) Inspectors evaluated gaseous compensatory sampling for Plant Vent 2 stack monitor out of service on February 23, 2021.
- (3) Inspectors evaluated liquid compensatory sampling for service water system effluent line monitor out of service on February 7, 2020.

#### Dose Calculations (IP Section 03.03) (2 Samples)

The inspectors evaluated the following dose calculations:

- (1) Plant Vent 2 stack continuous gaseous release May 13-20, 2021.
- (2) Liquid waste monitoring tank B batch liquid release May 17, 2021.

#### Abnormal Discharges (IP Section 03.04) (1 Sample)

The inspectors evaluated the following abnormal discharges:

- (1) Unit 2 reactor water storage tank (RWST) pipe leakage December 15, 2020.

#### 71124.07 - Radiological Environmental Monitoring Program

##### Environmental Monitoring Equipment and Sampling (IP Section 03.01) (1 Sample)

- (1) The inspectors evaluated environmental monitoring equipment and observed collection of environmental samples. The inspectors observed equipment material condition, calibration, and the presence of collocated environmental dosimeters during observation of the changeout of eight weekly particulate and charcoal air samples by the licensee.

##### Radiological Environmental Monitoring Program (IP Section 03.02) (1 Sample)

- (1) The inspectors evaluated the implementation of the licensee's radiological environmental monitoring program.

##### GPI Implementation (IP Section 03.03) (1 Sample)

- (1) The inspectors evaluated the licensee's implementation of the Groundwater Protection Initiative program to identify incomplete or discontinued program elements.

#### 71124.08 - Radioactive Solid Waste Processing & Radioactive Material Handling, Storage, & Transportation

##### Radioactive Material Storage (IP Section 03.01) (1 Sample)

The inspectors evaluated the licensee's performance in controlling, labeling, and securing the following radioactive materials:

- (1) Inspectors evaluated the licensee's performance in controlling, labelling, and securing radioactive materials.

Radioactive Waste System Walkdown (IP Section 03.02) (1 Sample)

The inspectors walked down the following accessible portions of the solid radioactive waste systems and evaluated system configuration and functionality:

- (1) Inspectors walked down accessible portions of the solid radioactive waste systems (SRF facility) and evaluated system configuration and functionality.

Waste Characterization and Classification (IP Section 03.03) (3 Samples)

The inspectors evaluated the licensee's characterization and classification of radioactive waste for the following waste streams:

- (1) Sample L87372-1 - (1-CH-FL-2).
- (2) Sample L87372-3 - (2-CH-FL-3).
- (3) Sample L87372-4 - (DAW 2019).

Shipping Records (IP Section 03.05) (4 Samples)

The inspectors evaluated the following non-excepted radioactive material shipments through a record review:

- (1) Shipment D2021-2, Type A Package, Waste Class A and B.
- (2) Shipment SV2019-2, Type B Cask Resin, Waste Class C.
- (3) Shipment SV2020-1, Type B Cask Resin, Waste Class A (Unstable).
- (4) Shipment SV2020-3, LSA II, Waste Class A (Unstable).

**OTHER ACTIVITIES – BASELINE**

71151 - Performance Indicator Verification

The inspectors verified licensee performance indicators submittals listed below:

OR01: Occupational Exposure Control Effectiveness Sample (IP Section 02.15) (1 Sample)

- (1) Unit 1 (April 1, 2020 through May 31, 2021)  
Unit 2 (April 1, 2020 through May 31, 2021)

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) Unit 1 (April 1, 2020 through May 31, 2021)  
Unit 2 (April 1, 2020 through May 31, 2021)

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

- (1) Unit 1 (April 1, 2020, through March 31, 2021)  
Unit 2 (April 1, 2020, through March 31, 2021)

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

- (1) Unit 1 (April 1, 2020, through March 31, 2021)  
Unit 2 (April 1, 2020, through March 31, 2021)

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

- (1) Unit 1 (April 1, 2020, through March 31, 2021)  
Unit 2 (April 1, 2020, through March 31, 2021).

71152 - Problem Identification and Resolution

Annual Follow-up of Selected Issues (IP Section 02.03) (2 Samples)

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

- (1) Post event assessment (CA8498672) of process, program, procedure, or human performance considerations concerning the risk state assessment associated with the loss of the Containment Key Safety Function at Unit 1 on April 30, 2021.
- (2) Challenges associated with emergency preparedness siren testing failure on June 9, 2021.

71153 - Follow Up of Events and Notices of Enforcement Discretion

Reporting (IP Section 03.05) (1 Sample)

- (1) The inspectors evaluated retraction of Event Notification (EN) 55299, 8-hour report concerning a loss of the capability to activate the sirens from both Surry local activation sites, retracted on June 18, 2021.

**INSPECTION RESULTS**

| Uppender Failure Results in Unplanned Orange Risk Condition for Containment Key Safety Function  |   |                            |                |
|--|---|----------------------------|----------------|
| Cornerstone  | Significance                                    | Cross-Cutting Aspect       | Report Section |
| Barrier Integrity  | Green<br>NCV 05000280/2021003-01<br>Open/Closed | [H.12] - Avoid Complacency | 71111.13       |
| A finding of very low safety significance (Green) was self-revealed following the failure of the Fuel Building upender during an outage. The failure blocked the Unit 1 fuel transfer canal gate valve, 1-FH-1, which prevented the ability to establish containment closure at a time when the calculated time to core boil was 30.4 minutes. As a result of being unable to isolate containment within the calculated time to boil, Surry Unit 1 entered an unplanned Orange risk condition in accordance with their outage risk plan for the Containment Key Safety Function (KSF). |   |                            |                |
| <u>Description:</u> On April 30, 2021 at 1701, Surry Unit 1 entered an unplanned Orange risk condition for the Containment KSF due to the fuel handling upender becoming stuck in a  |   |                            |                |

partially raised position while it was on the Fuel Building side. With the upender stuck in the raised position in the Fuel Building, it could not be transferred to containment. This prevented isolation of the transfer canal gate valve, 1-FH-1, which is a containment isolation valve. The licensee determined that reasonable assurance of containment closure could not be demonstrated due to the calculated time to core boil of 30.4 minutes. This resulted in an unplanned shutdown risk increase from Green to Orange for the Containment KSF in accordance with the defense-in-depth shutdown risk plan. The shutdown risk plan, as outlined in Dominion procedure OU-AA-200, Shutdown Risk Management, is how the licensee meets 10CFR50.65(a)(4) maintenance risk requirements of the Maintenance Rule during refueling outages. At the time of the upender failure the reactor was operating with several heightened risk factors, including being in the Refueling Shutdown mode with the vessel head de-tensioned, in lowered reactor inventory with steam generators unavailable for decay heat removal; and the reactor had been shut down for only five days and therefore had a relatively high decay heat load. The inspectors observed that Surry had not incorporated insights from prior upender failures (CR1095580) into the Unit 1 outage risk plan.

After the failure, Operations personnel verified that the 'B' Trains of low-head safety-injection (LHSI) and high-head safety-injection (HHSI) were protected and available as required by Dominion procedure 1-OSP-ZZ-004, Unit 1 Safety Systems Status List for Cold Shutdown/Refueling Conditions. Contingency plans were developed and implemented to restore the KSF to a Green condition. Operators were briefed and staged in containment and the Fuel Building as part of a containment closure contingency team with tools to perform an emergency recovery of the upender if needed. Subsequently, guidance was created, reviewed, and approved to recover the fuel transfer cart by cutting the wire cable mechanism that normally allows for movement of the cart and rigging it down to the horizontal position so it could be manually pulled through the 1-FH-1 valve and back into Unit 1 containment. These actions were completed, and the 1-FH-1 valve was closed, re-establishing containment closure at 0546 on May 1, 2021.

Corrective Actions: The licensee developed a contingency procedure to lower the upender by cutting the wire cable, allowing the transfer carriage to be returned to containment and unblocking the fuel chute. The contingency plan was established and implemented IAW OU-AA-200, to re-establish containment closure capability for the fuel transfer canal containment penetration.

Corrective Action References: CRs 1171627, 1171628, 1171684, 1095580

Performance Assessment:

Performance Deficiency: The licensee's failure to assess the risk and develop appropriate risk mitigating actions prior to the maintenance, as required by OU-AA-200, Shutdown Risk Management, and 10CFR50.65(a)(4), was a performance deficiency. Specifically, the approved outage risk plan failed to consider or create risk management actions (RMAs) for a failure of the upender during dry checks, that could challenge containment closure capability when the calculated time to core boil is short. The issue of concern was reasonably within the licensee's ability to foresee and correct due to operational experience with the fuel handling equipment revealing previous failures of the upender hoist.

Screening: The inspectors determined the performance deficiency was more than minor because it was associated with the SSC and Barrier Performance attribute of the Barrier Integrity cornerstone and adversely affected the cornerstone objective to provide reasonable assurance that physical design barriers protect the public from radionuclide releases caused

by accidents or events. Specifically, the licensee was unable to close 1-FH-1 and isolate the containment boundary for over 12 hours due to the upender failure. This occurred at a time after shutdown where the calculated time to core boiling was 30.4 minutes.

Significance: The inspectors assessed the significance of the finding using Appendix K, "Maintenance Risk Assessment and Risk Management SDP." Using Flowchart 1, "Assessment of Risk Deficit," inspectors determined the finding was related to the use of RMAs only and therefore should be assessed with Flowchart 2, "Assessment of RMAs." Flowchart 2 requires the determination of the incremental core damage probability (ICDP) and the incremental large early release probability (ILERP), which the inspectors did with assistance from a regional Senior Reactor Analyst (SRA). For ICDP, the SRA used IMC 0609 Appendix G, Phase 2, "Significance Determination Process Template for PWR During Shutdown," Worksheet 6, "SDP for a PWR Plant - Loss of Inventory in POS 2 (RCS Vented)." Because the failed containment isolation valve, 1-FH-1, was not in direct communication with the RCS and the leak path could be considered self-limiting, the top event function of LEAK STOP and all other top functions are still met and there is no change in core damage probability (CDP) due to the condition. For ILERF, the SRA used IMC 0609 Appendix H, "Containment Integrity Significance Determination Process." Since the finding only affects LERF, and not CDF, it is considered a Type B shutdown finding and is evaluated per Section 07.02, "Approach for Assessing Type B Findings at Shutdown." Per Step 2.1, the finding occurred within eight days of the outage in POS 2, so the inspectors continued to Step 2.2. Containment status was determined to be intact based on Note 1 of Table 7.3, Phase 1 Screening-Type B Findings at Shutdown. (An intact containment is one in which, the licensee intends to: (1) close all containment penetrations with a single barrier or can be closed in time to control the release of radioactive material, and (2) maintain the containment differential pressure capability necessary to stay intact following a severe accident at shutdown. When the RCS is open, an intact containment means that containment can be reclosed prior to RCS boiling. A Type B performance deficiency results when a licensee intends to have an intact containment but cannot maintain that capability due to a performance deficiency.) Thus Step 2.2.B directs the inspectors to use Table 7.3. Table 7.3 directs a Phase 2 evaluation to be performed. Table 7.4, "Phase 2 Risk Significance -Type B Findings at Shutdown (For POS 1/TW-E and POS 2/TW-E in which the finding occurs during the first eight days of the outage)," qualitatively screens the performance deficiency to White since this is a PWR with in-depth shutdown capability. Using Table 7.8, "PWRs With In-depth Shutdown Mitigation Capability," risk can be conservatively quantified as  $8e-7$  for LERF. Using these values and Appendix K Flowchart 2, ILERP was greater than  $1e-7$  but less than  $1e-6$ . Since three or more risk management actions could be credited, an order of magnitude reduction in risk is credited against actual maintenance risk. Therefore, the finding screens to Green.

Cross-Cutting Aspect: H.12 - Avoid Complacency: Individuals recognize and plan for the possibility of mistakes, latent issues, and inherent risk, even while expecting successful outcomes. Individuals implement appropriate error reduction tools. In this case, the organization became complacent with the sequencing of upender dry checks during outages and did not anticipate the possibility of an upender failure that would not allow for at least manual movement of the equipment. The resulting outage risk plans failed to consider the risk impact from a failure, despite past examples of failures with the fuel transfer equipment.

Enforcement:

Violation: 10 CFR 50.65(a)(4) requires, in part, that before performing maintenance activities (including but not limited to surveillance, post-maintenance testing, and corrective and preventative maintenance), the licensee shall assess and manage the increase in risk that

may result from the proposed maintenance activities. Contrary to this, prior to April 30, 2021, the licensee failed to assess and develop appropriate risk mitigating actions that considered a potential failure of fuel handling equipment that would challenge their ability to isolate the containment barrier.

Enforcement Action: This violation is being treated as a non-cited violation, consistent with Section 2.3.2 of the Enforcement Policy.

**Failure of Siren Testing Program to Comply with the FEMA ANS Design Report**

| Cornerstone            | Significance   | Cross-Cutting Aspect | Report Section |
|------------------------|--|----------------------|----------------|
| Emergency Preparedness | Green<br>NCV 05000280,05000281/2021003-02<br>Open/Closed | [H.1] - Resources    | 71152          |

The inspectors identified a Green NCV of Title 10 of the Code of Federal Regulations (CFR), Part 50.47(b)(5). Specifically, the licensee failed to ensure the alert and notification system (ANS) (or early warning system (EWS)) siren testing procedures complied with the approved Federal Emergency Management Agency (FEMA) ANS design report. This non-compliance affected an EWS quarterly test conducted on June 9, 2021.

Description: The licensee’s testing procedure specifies that a primary and backup siren testing station are to be determined prior to each test. The primary and backup testing stations are rotated for each quarterly test. In addition, the State employs a process for siren activation, whereby a primary and backup activation location is determined. However, the procedure does not specify which button should be depressed for either location. During the quarterly siren test conducted on June 9, 2021, Virginia Department of Emergency Management (VDEM) was designated as the primary activation location, and James City County (JCC) was designated as the backup. The morning of the test, the *primary* activation button was pressed at the VDEM station, without siren activation. Because VDEM did not receive confirmation of siren activation, JCC was notified to perform siren activation, whereby the *backup* activation button was depressed. After 20 minutes, confirmation of the sirens activating was not received and the test was suspended because all avenues for activating the sirens had been procedurally exhausted.

The FEMA ANS design report describes the Surry EWS siren system and explains how siren testing shall be conducted. The EWS activation points are comprised of three offsite identical activation panels located at VDEM, JCC, and Surry County. Each of the identical activation panels include a primary and a backup activation push button. The process for activating the sirens during the quarterly test begins with designating which of the locations will be the primary, backup, and tertiary. Next, roll call of the counties within the emergency planning zone is given 10 minutes prior to activating the sirens. The sirens are activated using the “VEOC Situational Awareness Unit Surry Nuclear Power Station” procedure, where the operator arms the activation panel, selects the appropriate action pushbutton (primary or backup), and then actuates the sirens. The last step is to verify the sirens were activated in the field. In the event that confirmation of siren alert does not occur, the procedure directs the operator(s) to use the VEOC procedure to use the same steps to activate the sirens at the backup station activation panel. If the sirens do not alert via the backup activation station, the final tertiary station is activated.

The licensee submitted four-hour and eight-hour event notifications per 10 CFR 50.72(b)(2) & (3) respectively. The eight-hour event notification was later retracted after troubleshooting

revealed that there was no loss of siren capability. The *primary* server from JCC was functional and would have actuated all the sirens during the test on June 9 had it been utilized.

The inspectors reviewed licensee documentation and determined that the process to activate the sirens from the designated points was insufficient. During the test, only the *primary* activation button was depressed at the primary activation station, and only the *backup* activation button at the backup station was depressed. Had the *primary* button been depressed at the *backup* activation station during the test, the sirens would have sounded. In addition, the licensee and the State's quarterly siren testing procedure did not designate a tertiary activation location, which is not in compliance with the FEMA ANS design report.

Corrective Actions: The licensee entered the issue into the corrective action program on June 9, 2021, and subsequently conducted a causal evaluation.

Corrective Action References: CRs 1174831, 1179951

Performance Assessment:

Performance Deficiency: The inspectors determined that the EWS siren testing procedures were not in compliance with the requirements in the FEMA ANS design report and this was a performance deficiency that was reasonably within the ability of the licensee to foresee and correct.

Screening: The inspectors determined the performance deficiency was more than minor because it was associated with the Facilities and Equipment attribute of the Emergency Preparedness cornerstone and adversely affected the cornerstone objective to ensure that the licensee is capable of implementing adequate measures to protect the health and safety of the public in the event of a radiological emergency. Specifically, the licensee processes and procedures did not ensure adequate testing of the alert and notification system.

Significance: The inspectors assessed the significance of the finding using Appendix B, "Emergency Preparedness SDP." The inspectors assessed the significance of the finding using Inspection Manual Chapter 0609, "Significance Determination Process," Attachment 4, Table 2 worksheet (issue date December 13, 2019), and the corresponding Appendix B, "Emergency Preparedness Significance Determination Process," the performance deficiency was determined to have very low safety significance (Green) because there was a procedural non-compliance, and despite a surveillance test failure, after further licensee investigation, all 71 sirens in the emergency planning zone (EPZ) system would have functioned if called upon.

Cross-Cutting Aspect: H.1 - Resources: Leaders ensure that personnel, equipment, procedures, and other resources are available and adequate to support nuclear safety. The finding had a cross-cutting aspect of resources associated with human performance because the licensee did not ensure the procedures necessary for the quarterly siren test were consistent with the FEMA ANS design report. This led to a failed test, putting the availability of the siren system in question.

Enforcement:

Violation: Title 10 CFR Part 50.54(q)(2) requires that a holder of a nuclear power reactor operating license under this part, shall follow and maintain the effectiveness of an emergency

plan that meets the requirements in Appendix E to this part and the planning standards of 10 CFR 50.47(b). Title 10 CFR Part 50.47(b)(5) requires, in part, the means to provide early notification and clear instruction to the populace within the plume exposure pathway Emergency Planning Zone have been established. Section IV.D.3 of Appendix E to 10 CFR Part 50 requires, in part, the licensee demonstrate the appropriate governmental authorities have the capability to make a public alerting and notification decision promptly, each nuclear power reactor licensee shall demonstrate that administrative and physical means have been established for alerting and providing prompt instructions to the public within the plume exposure pathway EPZ, and that the design objective of the prompt public alert and notification system shall be to have the capability to essentially complete the initial alerting and initiate notification of the public within the plume exposure pathway EPZ within about 15 minutes.

The licensed design objective “ANS Updated Design Report Surry Power Station, Revision 2, Section 3.8” provided the sequence for primary, backup, and tertiary siren system activation. The Design Report specifies that the sirens are activated using the “VEOC Situational Awareness Unit Surry Nuclear Power Station” procedure. This procedure stated that the operator arms the siren activation panel, selects the appropriate action pushbutton (primary or backup), and then actuates the sirens. The last step verified the sirens were activated in the field. However, if confirmation of a siren alert did not occur, the procedure directed the operator(s) to use the VEOC procedure to use the same steps to activate the sirens at the backup station activation panel. If the sirens do not alert via the backup activation station, a final tertiary station is activated.

Following an NRC discussion with FEMA related to the applicability of the approved ANS design report, Revision 2, Section 3.8, correspondence from FEMA stated that FEMA “can confirm the siren system activation procedures used at all activation points during the test were not consistent with the procedures in the FEMA-approved ‘ANS Updated Design Report Surry Power Station,’ Revision 2. Further, the backup server switch was not attempted at any of the activation points.”

Contrary to the above, on June 9, 2021, the licensee failed to demonstrate that within the EPZ, administrative and physical means were established for alerting and providing prompt instructions to the public, and the design objective of the prompt public alert and notification system had the capability to complete the initial alerting of the public. The licensee failed to ensure EWS siren testing design objectives complied with the approved ANS design report, Revision 2, Section 3.8, when they failed to ensure both *primary* push buttons were depressed at the primary and backup offsite siren activation locations, and also failed to include the tertiary activation point in the “VEOC Situational Awareness Unit Surry Nuclear Power Station” test procedure.

Enforcement Action: This violation is being treated as a non-cited violation, consistent with Section 2.3.2 of the Enforcement Policy.

|   |       |
|---|-------|
| Observation: Licensee Evaluation of Shutdown Safety Containment Closure Reasonable Assurance  | 71152 |
| On April 30, 2021, Surry Power Station Unit 1 entered an unplanned Orange shutdown risk state due to the loss of the Containment Key Safety Function. The inspectors have captured an associated finding pursuant to 10 CFR 50.65(a)(4) as detailed in finding 2021003-01. Following these events, Surry Power Station performed a Level of Effort Evaluation (CA8498672) to determine if any process, program, procedure, or human performance |       |

considerations applied. Within this evaluation the station determined that the entry into the Orange risk state and declaration of loss of the Containment KSF was conservative based upon “reasonable assurance” defined in OU-AA-200, and developed in ET-NAF-06-0077, which establishes a relationship between containment closure capability and the “time to suppress core boiling.”

OU-AA-200 defines “reasonable assurance” as “Capability exists such that the time to achieve Containment Closure is less than the available time to suppress core boiling. Reasonable Assurance credits capability to suppress boiling using alternate decay heat removal methods compared to an assessment of time to achieve Containment Closure during Shutdown conditions other than Reduced Inventory.” This is distinct from the OU-AA-200 definition of “time to boil” which states, “Given the plant configuration, decay heat load, and location of the fuel from the previous operating cycle, the time it would take to reach bulk coolant saturation temperature with no decay heat removal systems in operation.” The use of “time to suppress boiling” was identified in a peer assessment in 2012 as an apparent departure from industry standard. In response, Dominion Energy observed that risk is not substantially different at lowered inventory conditions versus reduced inventory conditions. This response identified a need to incorporate actions into procedures similar to those taken for operation at reduced inventory, at lowered inventory. However, Dominion Energy chose to maintain the “reasonable assurance” conditions within OU-AA-200 as described above.

While CA8498672 describes an apparent departure from industry standard, the inspectors have not observed a performance deficiency with respect to the April 30, 2021 event and regulatory requirements associated with shutdown risk and “time to suppress boiling.” Finding 2021003-01 captures the assessment associated with “time to boil.” However, the inspectors have observed that had the station acted consistent with CA8498672 during the events of April 30, 2021, establishing OU-AA-200 “reasonable assurance” and maintaining Green shutdown risk without additional credible risk mitigating actions, the significance determination would have likely ended in escalated enforcement. In this case, the determination of ILERF would have been equivalent to finding 2021003-01 resulting in 8e-7. This would then direct significance determination under of IMC 0609 Appendix K Flowchart 2.

Appendix K, Section 04.03, describes the methodology of crediting licensee risk management actions against four categories: increasing risk awareness and control, reducing duration of maintenance activity, minimizing magnitude of risk increase, and, establishing action thresholds such that risk significant configurations are not normally entered voluntarily. The screening rule used in this SDP is to assign a credit of one-half order of magnitude reduction in risk to the correctly calculated risk if the licensee effectively implemented one or two categories of the RMAs to manage risk. The RMAs credited for risk reduction are only those for which credit was not already taken in the risk calculation. If the licensee effectively implemented three or more categories of the RMAs that have not already been evaluated in the risk calculation, an order of magnitude reduction in risk is credited against the actual maintenance risk.

If the “reasonable assurance” doctrine described in CA8498672 had been applied to the April 30, 2021 event, the inspectors could not give credit for the “minimizing magnitude of risk increase” or “establishing action thresholds such that risk significant configurations are not normally entered voluntarily” RMA categories. Therefore, this event would screen to White, escalated enforcement.

## **EXIT MEETINGS AND DEBRIEFS**

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

- On October 8, 2021, the inspectors presented the Integrated Inspection results to Mr. Doug Lawrence, Surry Site Vice President and other members of the licensee staff.
- On July 1, 2021, the inspectors presented the Radiation Protection Inspection results to Mr. D. Lawrence and other members of the licensee staff.
- On July 22, 2021, the inspectors presented the Emergency Preparedness Exercise Inspection results to Mr. D. Lawrence and other members of the licensee staff.
- On August 11, 2021, the inspectors presented the Radiation Protection Inspection results to J. Henderson and other members of the licensee staff.

**DOCUMENTS REVIEWED**

| Inspection Procedure | Type                        | Designation                                    | Description or Title   | Revision or Date       |
|----------------------|-----------------------------|--|--|------------------------|
| 71111.01             | Drawings                    | 11448-FM-084A, SH 1                            | Containment Spray System   | 47                     |
|                      | Engineering Changes         | SU-21-00152                                    | Refueling Water Storage Tank Temporary Modification                                | 0                      |
|                      | Miscellaneous               |  | Electric Transmission Recommendations for Nuclear Power Stations                   | 10/06/2020             |
|                      | Procedures                  | 0-OP-ZZ-021                                    | Severe Weather Readiness   | rev 23                 |
| 71111.04             | Drawings                    | 11448-FB-041A Sh 2                             | Chilled Water System   | 73                     |
|                      |                             | 11448-FE-1D SH-001                             | 4160V One Line Diagram   | Rev 31                 |
|                      | Miscellaneous               | SDBD-SPS-AFW                                   | System Design Basis Document for Auxiliary Feedwater System                        | 30                     |
|                      | Procedures                  | 0-OP-EG-001A                                   | EDG 3 System Alignment   | Rev 16                 |
|                      |                             | 1-OP-EG-001A                                   | EDG 1 System Alignment   | Rev 14                 |
|                      |                             | 2-OP-EG-001A                                   | EDG 2 System Alignment   | Rev 14                 |
| 71111.05             | Fire Plans                  | 0-FS-FP-163                                    | Fuel Building Elevation 6 feet - 10 inches and 15 feet - 10 inches                 | 1                      |
|                      |                             | 2-FS-FP-126                                    | Mechanical Equipment Room #2   | 2                      |
| 71111.06             | Miscellaneous               | NSA Memo 91191                                 | Accident Management Strategy for Internal Flood                                    | 11/18/1991             |
| 71111.11Q            | Procedures                  | OP-AA-100                                      | Conduct of operations  | Rev 43                 |
| 71111.12             | Corrective Action Documents | CR1169711, CR1169718, CR1169724, CR1169726     | Low Level Instrument Structure Vacuum Priming Pump Condition Reports               |                        |
|                      | Miscellaneous               |  | Low Level Intake Structure Vacuum Priming Pump Maintenance Rule (a)(1) Action Plan | presented on 8/11/2021 |
|                      | Procedures                  | 1-EPT-0102-01                                  | Station Battery 1A Voltage Check   | Rev 7                  |
| 1-EPT-0103-01        |                             | Main Station Battery 1A Specific Gravity Check | Rev 18   |                        |
| 71111.18             | Engineering Changes         | SU-21-00152                                    | Unit 1 RWST Chiller Temporary Modification   | 0                      |

| Inspection Procedure | Type  | Designation        | Description or Title   | Revision or Date |
|----------------------|---|--------------------|--|------------------|
| 71114.06             | Miscellaneous   |                    | Surry Power Station Emergency Preparedness Drill Plan executed on July 6, 2021   |                  |
| 71124.02             | ALARA Plans   |                    | SURRY POWER STATION U1R30 U1 REFUELING OUTAGE REPORT April 25, 2021 - June 1, 2021   | 6/16/2021        |
| 71124.06             | Corrective Action Documents                           | CR1034018          | Confirmatory measure cross check gas sample disagreement.  | 04/13/2016       |
|                      | Corrective Action Documents Resulting from Inspection | CR1176203          | 2021 NRC RP Public Rad Safety and Transportation inspection observations.  | 07/01/2021       |
|                      | Procedures  | CY-AA-LQC-400      | Laboratory Quality Control   | Rev. 9           |
|                      |   | CY-AA-LQC-400-1000 | Confirmatory Measurements Using Blind Samples  | Rev. 3           |
| 71124.07             | Calibration Records                                   |                    | REMP Air Sampler Calibration Records:<br>SN 21058 - 9/13/2019 & 9/8/2020<br>SN 21059 - 9/5/2019 & 9/8/2020<br>SN 22124 - 9/8/2020 & 10/4/2020<br>SN 22126 - 11/14/2020 & 1/13/2021<br>SN 23354 - 9/8/2020 & 4/20/2021<br>SN 23356 - 10/22/2019 & 12/3/2020<br>SN 27315 - 10/23/2018 & 12/3/2020<br>SN 28184 - 1/14/2020 & 1/13/2021<br>SN 28185 - 1/14/2020 & 1/13/2021<br>SN 28186 - 10/22/2019 & 8/18/2020<br>SN 28187 - 1/14/2020 & 1/11/2021 | Various          |
|                      |   | WO 38204215128     | Backup Met Tower Calibration   | 06/25/2020       |
|                      |   | WO 38204215129     | Primary Met Tower Calibration  | 10/01/2020       |
|                      |   | WO 38204215458     | Backup Met Tower Calibration   | 01/14/2021       |
|                      |   | WO 38204215590     | Primary Met Tower Calibration  | 03/03/2021       |
|                      | Corrective Action                                     | CA8263622          | Level of Effort Evaluation for U-2 RWST valve leak of  | 01/28/2021       |

| Inspection Procedure | Type                    | Designation       | Description or Title   | Revision or Date          |         |
|----------------------|-------------------------|-------------------|--|---------------------------|---------|
|                      | Documents               |                   | tritiated water to ground  |                           |         |
|                      |                         | CR 1162330        | Performance Gap Analysis   | 01/21/2021                |         |
|                      | Engineering Evaluations | ETE-SU-2018-0054  | Engineering Technical Evaluation - Results of Underground Piping and Tank Integrity Program Inspections for 2017                               | 11/18/2018                |         |
|                      | Miscellaneous           |                   | Surry Power Station Environmental TLD Results - 2019 Annual Radiological Environmental Operating Report (AREOR), Table 3-2                     | 04/27/2020                |         |
|                      |                         |                   | Annual Radiological Environmental Operating Report (AREOR) for Surry Power Station - 2019  | 04/27/2020                |         |
|                      |                         |                   | Annual Radiological Environmental Operating Report (AREOR) for Surry Power Station - 2020  | 4/28/2021                 |         |
|                      |                         |                   | Surry Power Station Environmental TLD Results - 2020 Annual Radiological Environmental Operating Report (AREOR), Table 3-2                     | 04/28/2021                |         |
|                      |                         |                   | Surry Groundwater Protection Program Risk Assessment 2019  | Undated                   |         |
|                      |                         | 0-HSP-REMP-001    | Land Use Census - 2019   | 03/12/2020                |         |
|                      |                         | 0-HSP-REMP-001    | Land Use Census - 2020   | 03/11/2021                |         |
|                      |                         | EN# 55035         | Reactor Plant Event Notification   | 12/14/2020                |         |
|                      | Procedures              | HP-3051.020       | Groundwater Protection Program   | Revision 12               |         |
|                      |                         | HSP-GPP-001       | Groundwater Protection Program Reviews and Assessments   | Revision 5                |         |
|                      |                         | RP-AA-502         | Groundwater Protection Program   | Revision 9                |         |
|                      |                         | RP-AA-503         | Radiological Decommissioning Records - 10 CFR 50.75(g) Program   | Revision 2                |         |
|                      |                         | RP-AA-504         | Remediation Process for the Groundwater Protection Program   | Revision 5                |         |
|                      | Self-Assessments        | Audit 19-10       | Audit 19-10: Offsite Dose Calculation Manual, Radiological Environmental Monitoring Program, and Environmental Protection Plan (ODCM/REMP/EPP) | 01/13/2020                |         |
|                      |                         | PA7821755         | Radiological Environmental Monitoring Program Review - August 2018 to October 2020   | 12/01/2020                |         |
|                      | 71124.08                | Corrective Action | CR# 1172242  | Corrective Action Reports | Various |

| Inspection Procedure | Type                | Designation                                 | Description or Title   | Revision or Date |            |
|----------------------|---------------------|---|--|------------------|------------|
|                      | Documents           | and 1134756                                 |  |                  |            |
|                      | Engineering Changes | SU-16-01083                                 | LIQUID MONITOR REPLACEMENT FOR SRF   | 02/07/2020       |            |
|                      | Miscellaneous       | Audit 20-06                                 | Radiation Protection, Process Control Program, and Chemistry                 |                  | 09/16/2020 |
|                      |                     | NSTS Annual Inventory Reconciliation Report | NSTS Annual Inventory Reconciliation Report                                  |                  | 01/07/2020 |
|                      |                     | NSTS Annual Inventory Reconciliation Report | NSTS Annual Inventory Reconciliation Report                                  |                  | 01/06/2021 |
|                      | Procedures          | 0-OP-RW-006                                 | PROCESSING POLYETHYLENE HICS   |                  | Rev. 1     |
|                      |                     | C-HP-1071.010                               | CONTROL OF RADIOACTIVE SOURCES   |                  | Rev. 8     |
|                      |                     | C-HP-1071.030                               | RECEIVING RADIOACTIVE MATERIAL   |                  | Rev. 6     |
|                      |                     | C-HP-1071.040                               | PACKAGING AND SHIPMENT OF RADIOACTIVE MATERIAL                               |                  | Rev. 19    |
|                      |                     | C-HP-1072.010                               | PACKAGING RADIOACTIVE WASTE  |                  | Rev. 3     |
|                      |                     | C-HP-1072.050                               | RADIOACTIVE WASTE TRANSFER TO LICENSED WASTE PROCESSORS                      |                  | Rev. 17    |
|                      |                     | HP-1071.021                                 | STORING RADIOACTIVE MATERIAL OUTSIDE THE PROTECTED AREA                      |                  | Rev. 12    |
|                      |                     | HP-1072.020                                 | SAMPLING, ANALYZING, AND CLASSIFYING RADIOACTIVE WASTE                       |                  | Rev. 6     |
|                      |                     | RMSIP-1                                     | Physical Protection of Category 1 and Category 2 Radioactive Material        |                  | Rev. 3     |
|                      |                     | RP-AA-232                                   | Radioactive Material Control   |                  | Rev. 9     |
| Self-Assessments     | Audit 21-01         | Security                                    |  | 03/10/2021       |            |
| 71151                | Miscellaneous       |   | Electronic Dosimeter dose and dose rate alarm logs - 1/1/2020 thru 6/30/2021 | Various          |            |
|                      |                     | G-20210513-157-C                            | Gaseous Radioactive Release Permit - Vent Vent 2                             | 05/20/2021       |            |
|                      |                     | L-21210627-161B                             | Liquid Radioactive Release Permit - Liquid Waste Monitoring                  | 06/27/2021       |            |

| Inspection Procedure | Type                    | Designation                     | Description or Title  | Revision or Date |
|----------------------|-------------------------|---------------------------------|---|------------------|
|                      |                         |                                 | Tank B  |                  |
|                      |                         | Worksheet ID Number 20-20201213 | Unplanned Liquid Radioactive Release - U-2 RWST leak to ground (CR 1162330 )    | 12/13/2020       |
|                      | Procedures              | LI-AA-500                       | NRC/INPO/WANO Performance Indicator and MOR Reporting                           | Revision 3       |
|                      |                         | PI-AA-100-1000                  | Performance Indicators  | Revision 5       |
|                      |                         | RP-AA-112                       | Radiation Safety Performance Indicator Reporting                                | Revision 4       |
| 71152                | Engineering Evaluations | ET-NAF-06-0077                  | Shutdown Risk Program, Proposed Change to VPAP-2805, Containment Closure Policy | 0                |
|                      | Miscellaneous           |                                 | Surry 2012 OPRV Response  |                  |
|                      |                         | 300-170420 SPS 001              | ANS Updated Design Report Surry Power Station, Rev 2                            | 03/12/2018       |
|                      |                         | CR1174831                       | Level of Effort Evaluation  | 07/01/2021       |
|                      |                         | INPO 06-008                     | Guidelines for the Conduct of Outages at Nuclear Power Plants                   |                  |
|                      | Procedures              |                                 | Surry Power Station Emergency Plan  | 71               |
|                      |                         | OU-AA-200                       | Shutdown Risk Management  | 12               |