



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**
REGION II
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ATLANTA, GEORGIA 30303-1200

February 9, 2021

Mr. Daniel G. Stoddard
Senior Vice President and Chief Nuclear Officer
Dominion Energy
Innsbrook Technical Center
5000 Dominion Blvd., Floor: IN-2SW
Glen Allen, VA 23060

SUBJECT: VIRGIL C. SUMMER NUCLEAR STATION – INTEGRATED INSPECTION
REPORT 05000395/2020004 AND INDEPENDENT SPENT FUEL STORAGE
INSTALLATION (ISFSI) INSPECTION 07201038/2020002

Dear Mr. Stoddard:

On December 31, 2020, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at Virgil C. Summer Nuclear Station. On January 26, 2021, the NRC inspectors discussed the results of this inspection with Mr. George Lippard, Site Vice President, and other members of your staff. The results of this inspection are documented in the enclosed report.

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

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."

Sincerely,

/RA/

Booma Venkataraman, Acting Chief
Reactor Projects Branch 3
Division of Reactor Projects

Docket Nos. 05000395 and 07201038
License No. NPF-12

Enclosure:
As stated

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REPORT 05000395/2020004 AND INDEPENDENT SPENT FUEL STORAGE
INSTALLATION (ISFSI) INSPECTION 07201038/2020002 dated February 9,
2021

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NAME	A. Wilson	B. Venkataraman			
DATE	02/09/2021	02/09/2021			

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U.S. NUCLEAR REGULATORY COMMISSION
Inspection Report

Docket Numbers: 05000395 and 07201038

License Number: NPF-12

Report Numbers: 05000395/2020004 and 07201038/2020002

Enterprise Identifier: I-2020-004-0040 and I-2020-002-0076

Licensee: Dominion Energy

Facility: Virgil C. Summer Nuclear Station

Location: Jenkinsville, SC 29065

Inspection Dates: September 01, 2020 to December 31, 2020

Inspectors: D. Dumbacher, Senior Operations Engineer
E. Hilton, Resident Inspector
M. Read, Sr. Resident Inspector
A. Rosebrook, Senior Reactor Analyst

Approved By: Booma Venkataraman, Acting Chief
Reactor Projects Branch 3
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 Virgil C. Summer Nuclear 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

None.

PLANT STATUS

The unit operated at or near rated thermal power for the entire inspection period.

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.

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 Disease 2019 (COVID-19), resident 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; conducted plant status activities as described in IMC 2515, Appendix D, "Plant Status"; 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 portions 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 cold temperatures on December 22, 2020

External Flooding Sample (IP Section 03.03) (1 Sample)

- (1) The inspectors evaluated that flood protection barriers, mitigation plans, procedures, and equipment are consistent with the licensee's design requirements and risk analysis assumptions for coping with external flooding during heavy rainfall events on December 9, 2020.

71111.04 - Equipment Alignment

Partial Walkdown Sample (IP Section 03.01) (2 Samples)

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

- (1) Charging/safety injection pump cooling units on October 19, 2020
- (2) 'A' and 'B' emergency diesel generators on December 7, 2020

Complete Walkdown Sample (IP Section 03.02) (1 Sample)

- (1) The inspectors evaluated system configurations during a complete walkdown of the emergency feedwater system on November 4, 2020.

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) Cable chase room in Fire Area CB21 on elevation 463 feet on October 14, 2020
- (2) Turbine driven emergency feedwater pump room inside the intermediate building on elevation 412 feet on November 4, 2020
- (3) Emergency diesel generator building on November 19, 2020

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) The inspectors evaluated internal flooding mitigation protections in the auxiliary building elevations 374 feet and 388 feet on October 7, 2020

71111.11A - Licensed Operator Requalification Program and Licensed Operator Performance

Requalification Examination Results (IP Section 03.03) (1 Sample)

The licensee completed the annual requalification operating examinations required to be administered to all licensed operators in accordance with Title 10 of the *Code of Federal Regulations* 55.59(a)(2), "Requalification Requirements," of the NRC's "Operator's Licenses." During the week of November 9, 2020, the inspector performed an in-office review of the overall pass/fail results of the individual operating examinations, the crew simulator operating examinations, and the biennial written examinations in accordance with Inspection Procedure (IP) 71111.11, "Licensed Operator Requalification Program." These results were compared to the thresholds established in Section 3.02, "Requalification Examination Results," of IP 71111

- (1) The inspectors reviewed and evaluated the licensed operator examination failure rates for the requalification annual operating exam administered on October 20, 2020.

71111.11Q - Licensed Operator Requalification 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 operations personnel during alarm response, source checks, and starting reactor building cooling unit fans on October 1, 2020, main control room emergency ventilation testing on November 2, 2020, and 'B' solid state protection testing on November 20, 2020.

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

- (1) The inspectors observed a simulator evaluation that included a faulted steam generator and declaring a Notice of Unusual Event due to a tornado strike in the Protected Area on November 16, 2020.

71111.12 - Maintenance Effectiveness

Maintenance Effectiveness (IP Section 03.01) (1 Sample)

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

- (1) Replacement of a reactor coolant filter on October 28, 2020, following high differential pressure

Quality Control (IP Section 03.02) (1 Sample)

The inspectors evaluated the effectiveness of maintenance and quality control activities to ensure the following SSC remains capable of performing its intended function:

- (1) Repairs to 'B' service water pump discharge piping on October 21, 2020

71111.13 - Maintenance Risk Assessments and Emergent Work Control

Risk Assessment and Management Sample (IP Section 03.01) (4 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) Elevated risk during isolation of 2096 and 2097 main steam dump flow control valves for maintenance activities on November 2, 2020
- (2) Elevated risk during battery replacement for digital rod position indication system logic controller on November 23, 2020
- (3) Yellow risk during 'B' solid state protection system testing on November 20, 2020
- (4) Yellow risk during preventative maintenance activities on the turbine driven emergency feedwater pump on December 9, 2020

71111.15 - Operability Determinations and Functionality Assessments

Operability Determination or Functionality Assessment (IP Section 03.01) (3 Samples)

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

- (1) Chemical volume and control system due to high filter alarms on the reactor coolant filter and the 'B' seal water injection filter on October 24-25, 2020
- (2) Charging pump refueling water storage tank suction isolation valve, LCV00115B, failed to stroke due to degraded contacts on April 15, 2020
- (3) 'B' service water pump motor upper/lower bearing cooling coils degraded due to corrosion on November 2, 2020

71111.19 - Post-Maintenance Testing

Post-Maintenance Test Sample (IP Section 03.01) (5 Samples)

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

- (1) 'C' chiller following annual preventative maintenance, solenoid replacement, and valve inspections on October 8, 2020
- (2) 'B' service water booster pump testing following preventative maintenance on inlet and outlet valves and an oil change of the inboard and outboard pump bearings on September 30, 2020
- (3) 'B' reactor building spray pump following preventative maintenance on inlet and outlet valves and an oil change of the inboard and outboard pump bearings on October 28, 2020
- (4) Diesel driven fire pump following preventative maintenance including annual maintenance, oil change, and replacement of the cooling water drain petcock on November 12, 2020
- (5) 'A' charging pump on following oil changes on the pump and motor on December 8, 2020

71111.22 - Surveillance Testing

The inspectors evaluated the following surveillance tests:

Surveillance Tests (other) (IP Section 03.01) (1 Sample)

- (1) STP-125.002B, Diesel Generator 'B' Operability Test, on December 15, 2020

Containment Isolation Valve Testing (IP Section 03.01) (1 Sample)

- (1) Containment isolation valve testing of penetration XRP0402 on May 5, 2020 via document review on October 16, 2020

FLEX Testing (IP Section 03.02) (1 Sample)

- (1) 80kW backup diesel generator testing on September 15, 2020 and combustion turbine generator testing on September 24, 2020

71114.06 - Drill Evaluation

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

The inspectors evaluated:

- (1) The inspectors evaluated the conduct of a routine Emergency Response Organization drill on November 10, 2020

OTHER ACTIVITIES – BASELINE

71151 - Performance Indicator Verification

The inspectors verified licensee performance indicators submittals listed below:

MS05: Safety System Functional Failures (SSFFs) Sample (IP Section 02.04) (1 Sample)

- (1) MS05 Safety System Functional Failures from October 1, 2019 to September 30, 2020

MS08: Heat Removal Systems (IP Section 02.07) (1 Sample)

- (1) MS08 MSPI Heat Removal Systems from October 1, 2019 to September 30, 2020

MS10: Cooling Water Support Systems (IP Section 02.09) (1 Sample)

- (1) MS10 MSPI Cooling Water Systems from October 1, 2019 to September 30, 2020

71152 - Problem Identification and Resolution

Semiannual Trend Review (IP Section 02.02) (1 Sample)

- (1) The inspectors reviewed a trend of failures of emergency light batteries during discharge testing. One minor violation was identified and is documented in the Inspection Results section.

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

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

- (1) CR-12-02287 and CR-19-01898 involving incomplete Maintenance Rule scoping of systems used in emergency operating procedures

OTHER ACTIVITIES – TEMPORARY INSTRUCTIONS, INFREQUENT AND ABNORMAL

2515/194 - Inspection of the Licensee's Implementation of Industry Initiative Associated With the Open Phase Condition Design Vulnerabilities In Electric Power Systems (NRC Bulletin 2012-01)

The inspectors reviewed the licensee's implementation of the "Nuclear Energy Institute Voluntary Industry Initiative," (ADAMS Accession No. ML15075A454) dated March 16,

2015. This included reviewing how the licensee updated their licensing basis to reflect the need to protect against open phase conditions.

Inspection of the Licensee's Implementation of Industry Initiative Associated With the Open Phase Condition Design Vulnerabilities In Electric Power Systems (NRC Bulletin 2012-01) (1 Sample)

- (1) 2515/194 - Inspection of the Licensee's Implementation of Industry Initiative Associated With the Open Phase Condition Design Vulnerabilities In Electric Power Systems (NRC Bulletin 2012-01)
Revision 0 of this Temporary Instruction (TI) was previously inspected, and closed, in Inspection Report 2019013 (ML19338C072). However, a subsequent revision to the Nuclear Energy Institute (NEI) Voluntary Initiative (Revision 3) provided licensees the option to leave the open phase protection (OPP) system in monitoring mode only in lieu of activating the automatic trip circuitry, provided it was supported by a risk evaluation. Revision 1 (and later Revision 2) of this TI was issued to provide inspection guidance for the new option.

The inspectors remotely reviewed licensee analyses and procedures that demonstrated operator manual actions would successfully mitigate the impact of an Open Phase Condition (OPC). The inspectors completed Section 03.01c of TI 2515/194, Revision 2.

The inspectors verified that modeling used for the OPC reflected the as-designed and as-built plant, assumptions made by the licensee were reasonable, and licensee procedures were adequate to respond to an OPC. The inspectors also verified that human reliability analysis and recovery evaluations were done in accordance with NEI and voluntary initiative guidance.

60855.1 - Operation of an Independent Spent Fuel Storage Installation at Operating Plants

Operation of an Independent Spent Fuel Storage Installation at Operating Plants (1 Sample)

- (1) The inspectors evaluated the licensee's activities related to long-term operation and monitoring of their independent spent fuel storage installation. The inspectors conducted a walkdown during the week of October 5, 2020.

INSPECTION RESULTS

Minor Violation	71152
Minor Violation: The inspectors reviewed a trend of emergency lighting unit battery failures in the past five years. Recognizing failures exceeded the licensee-established Maintenance Rule condition monitoring threshold of no more than 3 failures in a 12-month period, the licensee moved the system into a Maintenance Rule (a)(1) status in 2017. A cause evaluation showed that the charging boards were faulty and were causing the batteries to fail periodic testing. Industry operating experience also showed faulty charging boards commonly challenges the reliability of emergency lighting units. The 2017 (a)(1) action plan included revising the preventative maintenance frequency on lights in higher temperature locations	

from 3 refueling cycles to 1 refueling cycle and replacing all the charging boards. The expected completion period was the second quarter of 2019. Due to supplier quality issues, the (a)(1) action plan completion date was extended to January 2021. Less than one half of charging boards had been replaced as of December 1, 2020. In 2019, four of eleven battery discharge tests failed. In 2020, four of seven battery discharge tests failed. 10 CFR 50.65(a)(3) requires, in part, "adjustments shall be made where necessary to ensure that the objective of preventing failures of structures, systems, and components through maintenance is appropriately balanced against the objective of minimizing unavailability of structures, systems, and components due to monitoring or preventive maintenance." Contrary to the above, the Cycle 25 Maintenance Rule (a)(3) self-assessment, completed on August 6, 2020, failed to review the (a)(1) action plan and therefore failed to recognize that the (a)(1) action plan for the emergency lights was not effective in restoring reliability.

Screening: The inspectors determined the performance deficiency was minor. This performance deficiency was screened in accordance with Inspection Manual Chapter (IMC) 0612 Appendix B, "Additional Screening Guidance," dated January 1, 2020, and was determined to be of minor significance because the failure to perform a Maintenance Rule self-assessment on emergency lights could not be reasonably viewed as a precursor to a significant event, would not have the potential to lead to a more significant safety concern if left uncorrected, and did not adversely affect a cornerstone objective. Specifically, this violation was on a low risk system per NFPA-805 and any failures during a station blackout condition would be mitigated by the requirement that operators always carry flashlights and lighted helmets are available for response.

Enforcement: The licensee entered the violation into their corrective action program as CR-20-03935, revised the Cycle 25 Maintenance Rule (a)(3) self-assessment and performed an extent of condition on other systems that may have been omitted from the self-assessment. This failure to comply with 10 CFR 50.65(a)(3) constitutes a minor violation that is not subject to enforcement action in accordance with the NRC's Enforcement Policy.

EXIT MEETINGS AND DEBRIEFS

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

- On January 26, 2021, the inspectors presented the integrated inspection results to Mr. George Lippard and other members of the licensee staff.
- On December 4, 2020, the inspectors presented the TI-194 Revision 2 inspection results to Mr. George Lippard and other members of the licensee staff.

DOCUMENTS REVIEWED

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
2515/194	Calculations	DC00300-157 Revision 0	Open Phase Mitigation Risk Evaluation	09/19/2019
	Corrective Action Documents	CR 18-04795	Received XCP-638 Point 1-5 during 'A' EDG Maintenance Run	
	Corrective Action Documents Resulting from Inspection	CR 20-03872	TI-194 Revision 2 NRC Observations	