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

August 4, 2020

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 05000395/2020002 AND INDEPENDENT SPENT FUEL STORAGE INSTALLATION INSPECTION (ISFSI) REPORT 07201038/2020001

Dear Mr. Stoddard:

On June 30, 2020, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at Virgil C. Summer Nuclear Station. On July 16, 2020, 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.

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 Virgil C. Summer Nuclear 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 Virgil C. Summer Nuclear 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."

Sincerely,

/RA/

Randall A. Musser, Chief
Reactor Projects Branch 3
Division of Reactor Projects

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

Enclosure:
As stated

cc w/ encl: Distribution via LISTSERV®

SUBJECT: VIRGIL C. SUMMER NUCLEAR STATION – INTEGRATED INSPECTION REPORT 05000395/2020002 AND INDEPENDENT SPENT FUEL STORAGE INSTALLATION INSPECTION (ISFSI) REPORT 07201038/2020001 Dated August 4, 2020

DISTRIBUTION:
M. Kowal
S. Price
L. Gibson
Public
RidsNrrPmSummerResource
RidsNrrDro Resource

ADAMS ACCESSION NUMBER: ML20218A140

☐ SUNSI Review		☐ Non-Sensitive ☐ Sensitive		☐ Publicly Available ☐ Non-Publicly Available	
OFFICE	RII: DRP				
NAME	R. Musser				
DATE	8/4/2020				

OFFICIAL RECORD COPY

U.S. NUCLEAR REGULATORY COMMISSION
Inspection Report

Docket Number:	05000395 and 07201038
License Number:	NPF-12
Report Number:	05000395/2020002 and 07201038/2020001
Enterprise Identifier:	I-2020-002-0051 and I-2020-001-0108
Licensee:	Dominion Energy
Facility:	Virgil C. Summer Nuclear Station
Location:	Jenkinsville, SC
Inspection Dates:	April 01, 2020 to June 30, 2020
Inspectors:	E. Coffman, Reactor Inspector J. Dolecki, Acting Senior Resident Inspector S. Downey, Senior Reactor Inspector C. Fontana, Emergency Preparedness Inspector E. Hilton, Resident Inspector B. Kellner, Senior Health Physicist K. McCurry, Acting Resident Inspector A. Nielsen, Senior Health Physicist M. Read, Senior Resident Inspector S. Sanchez, Senior Emergency Preparedness Insp J. Walker, Emergency Response Inspector
Approved By:	Randall A. Musser, 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

Failure to assess and manage the increase in risk that may result from proposed maintenance activities during yellow shutdown risk			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000395/2020002-01 Open/Closed	[H.12] - Avoid Complacency	71111.13
The inspectors identified a Green finding and associated Non-cited Violation (NCV) of 10 CFR 50.65(a)(4) when the licensee failed to assess and manage the increase in risk that may result from proposed maintenance activities, including surveillances. Specifically, from April 13 to 15, 2020, the licensee was in a Yellow risk condition due to lowered inventory for reactor vessel head removal when it was determined that the licensee failed to clearly identify protected equipment in the field and main control room in accordance with Operations Administrative Procedure (OAP)-114.1, "Protected Equipment Program," to prevent inadvertent work from being performed on it. As a result, while in lowered inventory, a High Risk Evolution (HRE), on April 14, 2020, the licensee performed a surveillance test on licensee-identified protected equipment and did not correctly assess the associated risk in accordance with their procedures prior to doing so.			

Failure to implement procedures for refueling preparations resulting in unanticipated elevated risk condition			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Initiating Events	Green NCV 05000395/2020002-02 Open/Closed	[H.12] - Avoid Complacency	71111.20
A self-revealed Green finding and associated Non-cited Violation (NCV) of Technical Specifications 6.8, Procedures and Programs, was identified when the licensee failed to implement procedures for activities involving preparations for refueling and refueling equipment operation, as referenced in Regulatory Guide (RG) 1.33, "Quality Assurance Program Requirements (Operations)," Revision 2, dated February 1978, Appendix A, Item 2.k. Specifically, the licensee failed to implement refueling preparations procedures for correctly installing temporary sandbox covers in the reactor cavity. As a result, a reactor cavity leak on April 15, 2020, required the licensee to reduce reactor coolant system (RCS) inventory and enter an unanticipated elevated (yellow) shutdown risk condition.			

Additional Tracking Items

Type	Issue Number	Title	Report Section	Status
LER	05000395/2019-003-01	LER 2019-003-01 for Virgil C. Summer Nuclear Station (VCSNS), Completion of a Technical Specification Required Plant Shutdown	71153	Closed

PLANT STATUS

Unit 1 began the inspection period at rated thermal power. On April 10, 2020, the unit was shut down for a refueling outage. The unit was restarted on May 9, 2020. The unit was returned to rated thermal power on May 15, 2020 and remained at or near rated thermal power for the remainder of the 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 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 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 and during that time 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 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

71111.04 - 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) Safeguards electrical switchgear on April 13, 2020
(2) Residual heat removal (RHR) system on June 5, 2020

71111.05 - Fire Protection

Fire Area Walkdown and Inspection Sample (IP Section 03.01) (2 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) Service Water Pump House on June 24, 2020
(2) Intermediate Building Elevation 412 on June 12 and June 18, 2020

71111.08P - Inservice Inspection Activities (PWR)

PWR Inservice Inspection Activities Sample (IP Section 03.01) (1 Sample)

(1) The inspectors evaluated pressurized water reactor non-destructive testing by reviewing the following examinations from April 20 to April 30, 2020:
    1. Eddy Current Examination
        a. Steam Generator A - ET for tube R2C77, R96C55, R115C72
        b. Steam Generator B - ET for tube R5C90, R92C87
        c. Steam Generator C - ET for tube R35C92, R105C78
    2. Liquid Penetrant Examination
        a. Weld CGE-2-2522B-WS-4, welded attachment, ASME Class 2.
        b. Weld A-31, Main Steam tubing replacement welds, ASME Class 2. This included a review of associated welding activities.
        c. Weld A-32, Main Steam tubing replacement welds, ASME Class 2. This included a review of associated welding activities.
        d. Weld MW-1, check valve body to bonnet seal weld, ASME Class 1. This included a review of associated welding activities.
    3. Ultrasonic Examination
        a. Weld CGE-1-4202A-2, pipe to elbow weld, ASME Class 1
        b. Weld CGE-1-4202A-3, pipe to elbow weld, ASME Class 1
        c. Weld CGE-1-4308-3, pipe to elbow weld, ASME Class 1
        d. Weld CGE-1-4308-4, pipe to elbow weld, ASME Class 1
        e. Weld CGE-1-4502-16, pipe to tee weld, ASME Class 1
        f. Weld CGE-1-4502-20, pipe to tee weld, ASME Class 1
    4. Visual Examination
        a. VT-2 of Weld MW-1, check valve body to bonnet seal weld, ASME Class 1. This included a review of associated welding activities.

    The Inspectors evaluated the licensee's boric acid control program performance.

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 plant shutdown leading into Refueling Outage 25 on April 10-11, 2020; operations personnel during Yellow risk conditions with lowered reactor vessel inventory on April 13, 2020; and operations personnel during plant startup coming out of the refueling outage on May 9, 2020.

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

(1) The inspectors observed a simulator evaluation that included loss of service water, small break loss of coolant accident, loss of the 'DA' emergency bus, and inadequate core cooling on June 16, 2020.

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) Yellow risk due to reduced decay heat removal capability during scheduled 'B' spent fuel pool cooling swap to alternate power supply on April 21, 2020
(2) Yellow risk due to lowered reactor vessel inventory during scheduled reactor vessel head installation from April 29 to May 1, 2020
(3) Yellow risk due to lowered reactor vessel inventory during scheduled reactor vessel head removal from April 13 to 15, 2020, and subsequent cavity leak which required re-draining the cavity on April 16, 2020.

71111.15 - Operability Determinations and Functionality Assessments

Operability Determination or Functionality Assessment (IP Section 03.01) (2 Samples)

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

(1) 'B' chiller due to oil pressure cutout switch failure on April 1, 2020
(2) Turbine-driven emergency feedwater pump due to leakage across recirculation bypass isolation valve, XVA61007-EF, on April 10, 2020

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 Modification - Engineering Change Request 50941 ('B' Core Subcooling Margin Change)
(2) Permanent Modification - Engineering Change Packages 50933G and 50933H (modifications to the 'B' service water train to install a new throttling ball valve and replace the damaged piping from cavitation in the system)

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) Turbine driven emergency feedwater pump following preventative maintenance on April 9, 2020
(2) Maintenance to pressurizer power operated relief valve, PCV00445A-RC, following unsatisfactory stroke time test and air leak on May 8, 2020

(3) 'B' channel core subcooling margin monitor repair and calibration on May 7, 2020
(4) Reactor trip breaker retest following shunt trip device replacement on April 16, 2020
(5) Reactor Building Cooling Unit fan 65A following repairs and replacement of fan blades on May 1, 2020

71111.20 - Refueling and Other Outage Activities

Refueling/Other Outage Sample (IP Section 03.01) (1 Sample)

(1) The inspectors evaluated Unit 1 Refueling and Maintenance Outage activities from April 10 to May 10, 2020

71111.22 - Surveillance Testing

The inspectors evaluated the following surveillance tests:

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

(1) STP-220.008, "Motor Driven Emergency Feedwater Pump Full Flow Test," on April 6, 2020
(2) STP-401.002, "Main Steam Line Code Safety Valves ASME OM Code Test," on April 8, 2020
(3) STP-125.013A, "Diesel Generator 'A' Semiannual Operability Test," on June 16 and 17, 2020

Inservice Testing (IP Section 03.01) (1 Sample)

(1) STP-220.008A, "Turbine Driven Emergency Feedwater Pump Full Flow Test," on May 08, 2020

RCS Leakage Detection Testing (IP Section 03.01) (1 Sample)

(1) STP-114.002, "Operational Leakage Calculation," on April 3, 2020

71114.02 - Alert and Notification System Testing

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

(1) The inspectors evaluated the maintenance and testing of the alert and notification system during the week of June 8, 2020.

71114.03 - Emergency Response Organization Staffing and Augmentation System

Inspection Review (IP Section 02.01-02.02) (1 Sample)

(1) The inspectors evaluated the readiness of the Emergency Preparedness Organization during the week of June 8, 2020.

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 and Emergency Plan Implementing Procedure changes during the week of June 8, 2020. This evaluation does not constitute NRC approval.

71114.05 - Maintenance of Emergency Preparedness

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

(1) The inspectors evaluated the maintenance of the emergency preparedness program during the week of June 8, 2020.

RADIATION SAFETY

71124.05 - Radiation Monitoring Instrumentation

Calibration and Testing Program (IP Section 03.02) (15 Samples)

The inspectors evaluated the calibration and testing of the following radiation detection instruments:

(1) Thermo Scientific AMS-4, ID # 1754
(2) Canberra GEM-5, ID # 1809-259
(3) Canberra ARGOS, ID # 1610-221
(4) Canberra CHRONOS, ID # 1610-238
(5) RMG-7, Containment High-range Area Radiation Monitor
(6) RMG-18, Containment High-range Area Radiation Monitor
(7) Ludlum L-177 Frisker, ID # 265890
(8) Thermo Scientific RO-20 Ion Chamber, ID # 1106
(9) Ludlum 9-3 Ion Chamber, ID # 343170
(10) Ludlum Model 3 Neutron Survey Meter, ID #245897
(11) Mirion Telepole, ID # 6609-030
(12) Hidex Liquid Scintillation Counter
(13) High Purity Germanium Detector, ID # 21
(14) Standup Whole Body Counter
(15) Mirion DMC-3000 Electronic Dosimeter, ID # 913096

Effluent Monitoring Calibration and Testing Program Sample (IP Sample 03.03) (2 Samples)

The inspectors evaluated the calibration and maintenance of the following radioactive effluent monitoring and measurement instrumentation:

(1) RMA-3, Plant Vent Stack
(2) RML-9, Liquid Radwaste

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 July 1, 2019, through March 31, 2020.

IE01: Unplanned Scrams per 7000 Critical Hours Sample (IP Section 02.01) (1 Sample)

(1) IE01 Unplanned Scrams validated from January 1, 2019 to March 31, 2020

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

(1) EP02: Emergency Response Organization Drill Participation for the period July 1, 2019, through March 31, 2020.

IE03: Unplanned Power Changes per 7000 Critical Hours Sample (IP Section 02.02) (1 Sample)

(1) IE03 Unplanned Power Changes validated from January 1, 2019 to March 31, 2020

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

(1) EP03: Alert & Notification Reliability for the period July 1, 2019, through March 31, 2020.

IE04: Unplanned Scrams with Complications (USwC) Sample (IP Section 02.03) (1 Sample)

(1) IE04 Unplanned Scrams w/ Complications validated from January 1, 2019 to March 31, 2020

BI01: Reactor Coolant System (RCS) Specific Activity Sample (IP Section 02.10) (1 Sample)

(1) BI01 Specific Activity validated from April 1, 2019 to March 31, 2020

BI02: RCS Leak Rate Sample (IP Section 02.11) (1 Sample)

(1) BI02 RCS Leak Rate validated from April 1, 2019 to March 31, 2020

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

(1) July 2019 to February 2020

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) July 2019 to February 2020

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) CR-19-01939, CR-19-03116, CR-20-01294, CR-20-01314 and CR-20-01489 - Failure of reactor building cooling unit drain line switches IFS01900B and IFS01900A, and review of corrective actions during Refueling Outage 25.
(2) CR-19-01330 - Corrective actions to address cavitation in the service water system including continuous monitoring between the time the issue was identified and Refueling Outage 25, modifications to replace the piping tee with pinhole leaks located downstream of the throttled component cooling water heat exchanger return valve, and installation of a new 20-inch throttling ball valve with a noise attenuator to prevent further cavitation. The inspectors reviewed documents related to these activities, including new issues identified and entered into the corrective action program, and subsequently performed an independent visual inspection of the piping and valve modifications.

71153 - Followup of Events and Notices of Enforcement Discretion

Event Followup (IP Section 03.01) (1 Sample)

(1) The inspectors evaluated the licensee's response during a declared Notice of Unusual Event (NOUE) due to a fire on non-safety-related switchgear in the turbine building on May 1, 2020. The inspectors confirmed that the licensee properly classified the event in accordance with emergency action level procedures and made timely notifications to the NRC and state/county governments. Although the event occurred during the refueling outage, there was no impact to safety-related equipment from the fire or fire fighting response. Inspectors reviewed the interim extent of condition for the faulty transformer and breaker which determined that no installed safety-related equipment was affected.

Event Report (IP Section 03.02) (1 Sample)

The inspectors evaluated the following licensee event reports (LERs):

(1) LER 05000395/2019-003-01, Completion of a Technical Specification Required Plant Shutdown (ADAMS Accession No. ML20093G463). The inspectors determined that it was not reasonable to foresee or correct the cause discussed in the LER; therefore, no performance deficiency was identified. The inspectors did not identify a violation of NRC requirements because the plant shutdown was completed prior to the expiration of the Technical Specification Limiting Condition for Operation. This LER is closed.

OTHER ACTIVITIES – TEMPORARY INSTRUCTIONS, INFREQUENT AND ABNORMAL

60855.1 - 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 on June 16, 2020.

INSPECTION RESULTS

Failure to assess and manage the increase in risk that may result from proposed maintenance activities during yellow shutdown risk			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000395/2020002-01 Open/Closed	[H.12] - Avoid Complacency	71111.13

The inspectors identified a Green finding and associated Non-cited Violation (NCV) of 10 CFR 50.65(a)(4) when the licensee failed to assess and manage the increase in risk that may result from proposed maintenance activities, including surveillances. Specifically, from April 13 to 15, 2020, the licensee was in a Yellow risk condition due to lowered inventory for reactor vessel head removal when it was determined that the licensee failed to clearly identify protected equipment in the field and main control room in accordance with Operations Administrative Procedure (OAP)-114.1, “Protected Equipment Program," to prevent inadvertent work from being performed on it. As a result, while in lowered inventory, a High Risk Evolution (HRE), on April 14, 2020, the licensee performed a surveillance test on licensee-identified protected equipment and did not correctly assess the associated risk in accordance with their procedures prior to doing so.

Description: Operations Administrative Procedure (OAP)-114.1, “Protected Equipment Program,” is written, in part, to meet the requirements of 10 CFR 50.65(a)(4) to provide reasonable assurance that work activities minimize plant risk. This procedure applies to both online and shutdown conditions with the goal of maintaining plant and shutdown risk within acceptable levels by maintaining defense in depth of key safety functions. Key safety functions include decay heat removal, inventory control, power availability, reactivity control, and containment. OAP-114.1, Section 4.3 defines “protected equipment” as any structure, system, or component (SSC) which has been identified as being essential to ensure that defense-in-depth of key safety functions or overall risk levels can be maintained.

On April 13, 2020, while in a scheduled refueling outage, the licensee entered a Yellow shutdown risk condition due to lowering reactor coolant system (RCS) inventory to remove the reactor vessel head. At the time of this activity, the licensee determined the time to boil of the RCS was approximately 25 minutes. The licensee had declared this activity a HRE, as stated in their shutdown safety plan, and also identified the “’A’ and ‘B’ Train ESF Equipment” as protected during this HRE in their plant status Plant Information Meeting (PIM) documentation. The 'A' and 'B' trains of the Engineered Safety Feature (ESF) equipment consists of an assortment of SSCs, including the high head safety injection function which is provided by the charging pumps, and associated suction and discharge valves and breakers, in the chemical and volume control system (CVCS).

The licensee remained in a Yellow shutdown risk condition from April 13 to April 15, during which time the inspectors conducted system walkdowns of the protected equipment. The inspectors determined that in the field, as well as the main control room, the licensee had not placed any postings or barriers on or surrounding the 'A' and 'B' train ESF equipment to clearly indicate it was protected to prevent inadvertent maintenance from being performed in the areas, as required by Section 6.4 of OAP-114.1. Specifically, the inspectors observed that all three charging pumps and the associated breakers were not protected in the field or on the

main control room boards.

The inspectors reviewed the activities performed during the HRE and determined that on April 14, 2020, licensed operators performed surveillance test procedure (STP)-130.005O, "Charging, Letdown, and RCP Seal Return Valve Operability Testing (Mode 5)" from 1:14 AM to 2:30 AM. The procedure was originally scheduled to be performed April 11, 2020, before the site entered a Yellow risk condition. This procedure includes, in part, the stroke-time testing of valves in the 'A' or 'B' ESF trains of CVCS, specifically, the charging pump discharge header isolation valves XVG08107-CS and XVG08108-CS. These valves are in series downstream of all three pumps and were part of the primary RCS boration flow path (one of two credited flow paths) identified by the licensee in the reactivity control shutdown risk assessment and the April 13th night-shift PIM. This testing rendered the flow path inoperable for a short period of time. As required in OAP-114.1, Step 6.6, work on protected equipment will not be allowed unless the work activities have been approved by appropriate personnel using the Protected Train Work Approval Form (Attachment VI of the procedure). Similarly, as required in safety-related Station Administrative Procedure (SAP)-1403, "Outage Management and Execution," Step 6.4, schedule changes affecting high risk activities or key safety functions shall have an individual Refuel Outage Scope Change Request (ROSCR) as well as a Key Safety Function/Shutdown Safety Review (Attachment III of the procedure) performed to assess the impact. Work Order 1904099-002, generated for performing STP-130.005O, stated this task impacts Reactivity Management and may affect boration flow paths; however; the surveillance was rescheduled and performed while in a Yellow shutdown HRE without correctly assessing and managing the risk by completing the required documentation in accordance with OAP-114.1 and SAP-1403. The inspectors determined the licensee failed to correctly assess and manage the risk prior to performing maintenance activities to ensure key SSCs were capable of performing their intended safety function.

Corrective Actions: The licensee generated CR-20-01284 to capture the inspectors' initial observation and the associated performance deficiency of 10 CFR 50.65(a)(4). The licensee completed action 001 of CR-20-01284 to update the Outage Activity Challenge Book to require both residual heat removal (RHR) trains to be placarded and to allow no work that could impact Decay Heat Removal or Inventory Control Key Safety Safety Functions while at lowered inventory.

Furthermore, the licensee generated CR-20-01658 to capture the inspectors' concerns with the performance of STP-130.005O during the Yellow shutdown risk condition on April 14, 2020.

The licensee has implemented interim guidance to operations for placarding equipment and continues to evaluate changes to the site procedures for placarding and shutdown risk evaluations.

Corrective Action References: CR-20-01190, CR-20-01284, CR-20-01658

Performance Assessment:

Performance Deficiency: The inspectors determined that the licensee's failure to assess and manage the increase in risk that could result from performing maintenance activities in accordance with 10 CFR 50.65(a)(4) by not protecting licensee-identified risk-significant equipment in the field and main control room, and subsequently not properly assessing risk prior to performing a surveillance on the protected equipment, was reasonably within their

ability to foresee and correct and should have been prevented, which is a performance deficiency.

Screening: The inspectors determined the performance deficiency was more than minor because it was associated with the Equipment Performance attribute of the Mitigating Systems cornerstone and adversely affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. This performance deficiency resulted in the inoperability of a credited RCS boration flowpath while in a lowered inventory condition. The inspectors also utilized IMC 0612, Appendix E, "Examples of Minor Issues," effective January 1, 2020, to inform and support the determination of whether the performance deficiency was more than minor. The inspectors determined example 8.d in IMC 0612, Appendix E to be similar because the licensee's risk assessment failed to correctly account for (at least qualitatively) the potential loss of one of the two credited RCS boration flow paths coincident with the performance of STP-130.005O. The licensee failed to document a risk assessment or generate compensatory actions in accordance with their procedures. The inspectors also used example 8.f in IMC 0612, Appendix E. The inspectors determined this example to be similar because protected equipment had maintenance activities performed on it. Specifically, the 'A' and 'B' train ESF equipment was stated to be protected by the licensee, however the equipment in the field and in the control room, including the 'A', 'B', and 'C' charging pumps and associated breakers, was not visibly protected and STP-130.005O was performed. The inspectors determined a work order (WO1904099) to perform STP-130.005O was initially scheduled for April 11, but was not completed until April 14, when the site was in a Yellow risk condition.

Significance: The regional Senior Reactor Analyst (SRA) determined that it was appropriate to perform a bounding analysis in accordance with IMC 0609 Appendix M, "Significance Determination Process Using Qualitative Criteria," to assess the risk of the performance deficiency. The approach is to use IMC 0609 Appendix G, "Shutdown Operations Significance Determination Process," for the affected period to estimate the quantitative plant risk at the time of the maintenance activity and apply that estimated risk value to assess the change due to the performance deficiency using the flowcharts in IMC 0609 Appendix K, "Maintenance Risk Assessment and Risk Management Significance Determination Process," taking credit for actions that likely would have been credited as risk management activities (RMAs).

The inadequate risk assessment occurred while the plant was in cold shutdown with the reactor vessel internals installed, the refueling cavity drained, and time to boil estimated at 25 minutes. Procedure STP-130.005O, "Charging, Letdown, and RCP Seal Return Valve Operability Testing (Mode 5), contained two distinct steps to verify an alternate boron injection flow path was available at all times in order to meet technical specification requirements. The procedure also called for an HRE brief to ensure operator awareness. The inspectors observed that an operator aid was present in the main control room which identified the secondary boron injection path. These three actions would be appropriate RMAs had an evaluation been conducted and therefore are credited in this bounding analysis.

The surveillance test did not remove the shutdown safety function and the normal path was functional except for the a few minutes when the two valves were stroked closed. Since the exposure time was extremely short, the high pressure injection and boron injection functions were always maintained on the opposite train, and the licensee's qualitative shutdown risk

assessment was YELLOW, the estimated Incremental Conditional Core Damage Probability (ICDP) can reasonable be bounded as less than 1 E-5. When no risk assessment is preformed, ICDP is equal to ICDP deficit. Thus using IMC 0609 Appendix K Flowcharts 1 and 2; a bounding value for ICDP of 1E-5; and 3 credited RMAs, both flowcharts categorized the risk as Green.

Therefore, in accordance with step 4.4.2 of Appendix M, the results of the evaluation show that the finding was of very low safety significance (i.e., 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. Specifically, the licensee had a long-standing station practice of not clearly identifying all protected equipment in the field and relied on proper planning to prohibit work on protected equipment. This does not plan for the possibility of mistakes or account for inherent risk. The use of physical barriers to provide a visual indication of protected equipment would aid as an error reduction tool to prevent accidents.

Enforcement:

Violation: 10 CFR 50.65(a)(4) states, in part, before performing maintenance activities, the licensee shall assess and manage the increase in risk that may result from the proposed maintenance activities. Operations Administrative Procedure (OAP)-114.1, “Protected Equipment Program," establishes requirements for assessing and managing risk. Station Administrative Procedure (SAP)-1403, "Outage Management and Execution," establishes requirements for executing schedule changes affecting high risk activities or key safety functions.

OAP-114.1, Section 6.4.b, states, in part, “protected equipment is to be clearly identified in the field to prevent inadvertent work on or near the protected equipment." Sections 6.4.c and 6.4.d provide further direction for posting of protected equipment signs and robust barriers.

OAP-114.1, Section 6.6.b, states, in part, work on or within two feet of protected equipment will not be allowed, except when activities are approved by the appropriate personnel per Attachment VI, "Protected Train Work Approval Form."

SAP-1403, Section 6.4.3.D, states, in part, scope or schedule changes affecting high risk activities or key safety functions shall have individual ROSCRs. Further, Section 6.4.4.D states, in part, if the scope or schedule change affects a key safety function, then initiate Attachment III to document the evaluation of the change.

Contrary to the above, from April 13 to April 15, 2020, the licensee did not manage the increase in risk that could result from performing maintenance activities on ‘A’ and 'B' train ESF equipment. Specifically, the licensee was in a Yellow risk condition due to Lowered Inventory for RV head removal with equipment in the ‘A’ and ‘B’ ESF trains stated to be protected; however, in accordance with OAP-114.1, this protected equipment was not clearly identified in the field with postings or robust barriers to prevent inadvertent work on or near the protected equipment. As a result, on April 14, 2020, maintenance activities were performed on licensee-identified protected equipment, specifically charging pump discharge header isolation valves XVG08107-CS and XVG08108-CS, which were located in the primary identified RCS boration flowpath without having a completed and approved Protect Train

Work Approval Form or ROSCR. An assessment of risk was not documented or approved in accordance with OAP-114.1 or SAP-1403 prior to performing the surveillance.

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

Failure to implement procedures for refueling preparations resulting in unanticipated elevated risk condition

Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Initiating Events	Green NCV 05000395/2020002-02 Open/Closed	[H.12] - Avoid Complacency	71111.20

A self-revealed Green finding and associated Non-cited Violation (NCV) of Technical Specifications 6.8, Procedures and Programs, was identified when the licensee failed to implement procedures for activities involving preparations for refueling and refueling equipment operation, as referenced in Regulatory Guide (RG) 1.33, "Quality Assurance Program Requirements (Operations)," Revision 2, dated February 1978, Appendix A, Item 2.k. Specifically, the licensee failed to implement refueling preparations procedures for correctly installing temporary sandbox covers in the reactor cavity. As a result, a reactor cavity leak on April 15, 2020, required the licensee to reduce reactor coolant system (RCS) inventory and enter an unanticipated elevated (yellow) shutdown risk condition.

Description: During refueling outage activities, the licensee used General Maintenance Procedure (GMP)-100.007, “Maintenance Support for Refueling,” to provide steps to remove and reinstall interference items in support of refueling the reactor vessel. Specifically, the licensee used GMP-100.007, in part, to install temporary reactor cavity sandbox covers, which provide a temporary seal to the reactor cavity during fuel movement.

On April 15, 2020, the licensee identified an approximately 25 gallons-per-minute cavity leak at the temporary sandbox cover CP-3. The cavity leak increased, resulting in the licensee’s actions to reduce RCS inventory to 6-9 inches (Lowered Inventory) below the reactor vessel flange and enter an unanticipated licensee-established yellow shutdown risk condition. After the licensee drained the cavity, personnel entered the reactor cavity and found approximately 5-6 inches of the sandbox cover gasket material was out of the grooves.

As a result of a previous leak from the sandbox covers in 2008, the licensee had determined that lubricating the gaskets could cause leakage, and the step for lubricating the gaskets was removed from the procedure. The revision used on April 15, 2020, GMP-100.007, revision 21, stated “Clean and lubricate Temporary sandbox covers and bolts.” Maintenance personnel failed to properly implement the procedure by also lubricating the gaskets.

The inspectors determined GMP-100.007 was not implemented properly by responsible maintenance personnel to ensure the installation of the temporary sandbox cover did not result in leak, which would have prevented the station from entering an unplanned elevated licensee-identified risk condition during the refueling outage.

Corrective Actions: In 2008, the licensee documented a sandbox cover leak in CR-08-01773. The corrective actions, in part, revised the installation procedure GMP-100.007 to eliminate

the lubrication of the seal and to add inspections points during cover setting and post tightening.

In 2020, the licensee documented a sandbox cover leak in CR-20-01253. The licensee replaced the gasket and installed the sandbox covers in accordance with procedure GMP-100.007. Additionally, the licensee initiated actions in CR-20-01253 to enhance procedure GMP-100.007 with a warning about lubricating the gaskets and to determine a method for inspecting final installation of the sandbox covers.

Corrective Action References: CR-20-01253, CR-08-01773

Performance Assessment:

Performance Deficiency: The inspectors determined the licensee's failure to implement maintenance procedures for preparations for refueling and refueling equipment operation, for installing temporary sandbox covers during refueling, as required by TS 6.8, Regulatory Guide 1.33, Revision 2, Item 2.k, was reasonably within the licensee's ability to foresee and correct and is a performance deficiency.

Screening: The inspectors determined the performance deficiency was more than minor because it was associated with the Human Performance attribute of the Initiating Events cornerstone and adversely affected the cornerstone objective to limit the likelihood of events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. Specifically, the licensee failed to implement refueling preparations procedures for correctly installing temporary sandbox covers in the reactor cavity. As a result, a reactor cavity leak on April 15, 2020, required the licensee to reduce reactor coolant system (RCS) inventory and enter an unanticipated yellow shutdown risk condition. Lowered Inventory conditions are contributors to loss of cooling and loss of inventory events and reduce the time for operator response.

Significance: The inspectors assessed the significance of the finding using Appendix G, “Shutdown Safety SDP.” Because the performance deficiency can be considered a precursor for a Loss of inventory (LOI) Event and a Loss of Level Control Event, the inspectors screened the finding using the appropriate questions in NRC IMC 0609, Appendix G, Attachment 1, Exhibit 2,"Initiating Events Screen Questions." The inspectors determined the finding was of very low safety significance (Green) because while the leakage resulted in lowering inventory due to the leak location, the LOI would have been self arresting and would not have resulted in the loss of decay heat removal. The Loss of Level Control Event is not applicable per Appendix G because the performance deficiency did not occur with the plant in reduced inventory, which is an "RCS inventory condition that results in a reactor vessel water level lower than three feet below the reactor vessel flange."

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. The licensee’s evaluation determined the probable cause was the maintenance personnel failed to use human performance tools of procedure use and adherence, self-checking, questioning attitude, and peer checking to ensure the gaskets were prepared and installed per GMP-100.007. The use of human performance tools reduces the possibility of mistakes and mitigates inherent risk. As a result, the inspectors determined a CCA of H.12 is appropriate.

Enforcement:

Violation: Technical Specifications Section 6.8 requires, in part, that written procedures shall be established, implemented, and maintained covering the activities referenced in RG 1.33, Revision 2, Appendix A, Item 2.k, "Preparation for Refueling and Refueling Equipment Operation". General Maintenance Procedure (GMP)-100.007, “Maintenance Support for Refueling was established by the licensee to implement the requirements for preparing equipment to support refueling.

Contrary to the above, the licensee failed to implement procedures for preparations for refueling and refueling equipment operation for installing temporary sandbox covers during refueling, as required by Technical Specification 6.8, Regulatory Guide 1.33, Revision 2, Item 2.k. The licensee's maintenance personnel failed to properly implement GMP-100.007, resulting in a significant leak which required draining of the RCS inventory below the reactor vessel flange for repairs.

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

EXIT MEETINGS AND DEBRIEFS

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

- On April 24, 2020, the inspectors presented the radiation protection inspection results to Todd Ellison, Manager of Health Physics and Safety, and other members of the licensee staff.
- On April 30, 2020, the inspectors presented the inservice inspection activities inspection results to Mr. George Lippard, Site Vice President, and other members of the licensee staff.
- On June 12, 2020, the inspectors presented the emergency preparedness program inspection results to Mr. George Lippard, Site Vice President, and other members of the licensee staff.
- On July 16, 2020, the inspectors presented the integrated inspection results to Mr. George Lippard, Site Vice President, and other members of the licensee staff.

DOCUMENTS REVIEWED

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
71111.08P	Corrective Action Documents	19-03265, 19-03990, 20-01086, 20-01094, 20.01106, 20-01110, 20-01157, 20-01159, 20-01178, 20-01370, 20-01375, 20-01405, 20-01407, 20-01408, 20-01416		
	Miscellaneous	51-9293025-000	VC Summer SG Condition Monitoring for Cycles 22, 23, 24 and Final Operational Assessment for Cycles 25, 26, 27	Revision 000
		51-9307746-000	V.C. Summer 1RF25 Steam Generator Degradation Assessment	Revision 000
		51-9309356-000	Site Validation of Eddy Current Techniques for V.C. Summer 1RF25	Revision 000
	NDE Reports	RF25-UT-012	Ultrasonic Examination Report for Weld CGE-1-4308-3	04/23/2020
		RF25-UT-013	Ultrasonic Examination Report for Weld CGE-1-4308-4	04/23/2020
		RF25-UT-014	Ultrasonic Examination Report for Weld CGE-1-4202A-2	04/28/2020
		RF25-UT-015	Ultrasonic Examination Report for Weld CGE-1-4202A-3	04/28/2020
		RF25-UT-048	Ultrasonic Examination Report for Weld CGE-1-4502-20	04/28/2020
		RF25-UT-049	Ultrasonic Examination Report for Weld CGE-1-4502-16	04/28/2020
	Procedures	ER-AA-NDE-UT-802	Ultrasonic Examination of Austenitic Piping Welds in Accordance with ASME Section XI, Appendix VIII	Revision 7
		ETSS 1	Bobbin Examination for VC Summer 1R25	Revision 0
		PSEG-19	Boric Acid Corrosion Evaluation	Revision 2
		SAP-0158	Steam Generator Management Program	Revision 4
		SAP-0643	ASME Code, Section XI Repair/Replacement Program	Revision 8
	Work Orders	1916908-006, 1917912-006		
71111.13	Procedures	OAP-108.3	Operations Outage Contingency Plans	Revision 2

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
		SSP-004	Outage Safety Review Guidelines	Revision 7
71124.05	Corrective Action Documents	CR 20-00414		02/08/2020
	Miscellaneous		Victoreen Source Certificate for Containment High-range Area Radiation Monitors RMG-7 and RMG-18	07/24/1984
	Procedures	VCS-HPP-0657	Calibration of the Canberra GEM-5 Portal Monitor	Rev. 1
71151	Calculations	Permit # VSGC2020-012	VC Summer Gaseous Effluent Release Report, Main Plant Vent	03/13/2020
		Permit # VSLB2020-057	VC Summer Liquid Effluent Release Report, Waste Monitor Tank B	03/17/2020
		Sample ID: CL20-0427	Gamma Spectrum Analysis Results, Waste Monitor Tank B	03/16/20
		Sample ID: CP20-0415	Gamma Spectrum Analysis Results, Main Vent Stack (RMA3) Weekly Sample	03/13/2020
	Corrective Action Documents	CR Numbers: 19-02996, 19-03007, 19-03183, 19-03670, 19-03748, 19-03878, 19-03943, 19-04272, 19-04275, 19-04356, 19-04378, 20-00012, 20-00044, 20-00414, 20-00597, 20-00600, and 20-00784		Various
	Miscellaneous		V. C. Summer Nuclear Station 2019 Annual Radioactive Effluent Release Report (ARERR)	04/16/2020
			Electronic Dosimeter (ED) Dose and Dose Rate Alarm Logs	July 2019 to January 2020
		Sample # 20-0427	Tritium Analysis for Liquid Effluents Results, Waste Monitor Tank B	03/16/2020

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
	Procedures	RP-AA-112	Radiation Safety Performance Indicator Reporting	Revision 4
		SAP-1360	NRC and INPO/WANO Performance Indicators	Revision 3
		VCS-HPP-0242	Reporting NRC Performance Indicators	Revision 0