



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

February 13, 2019

Mr. George A. Lippard III  
Vice President, Nuclear Operations  
South Carolina Electric & Gas Company  
Virgil C. Summer Nuclear Station  
Bradham Blvd & Hwy 215  
P.O. Box 88, Mail Code 800  
Jenkinsville, SC 29065

SUBJECT: VIRGIL C. SUMMER NUCLEAR STATION, UNIT 1 – NUCLEAR REGULATORY  
COMMISSION INTEGRATED INSPECTION REPORT 05000395/2018004

Dear Mr. Lippard:

On December 31, 2018, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Virgil C. Summer Nuclear Station, Unit 1. On February 29, 2019, the NRC inspectors discussed the results of this inspection with you and other members of your staff. The results of this inspection are documented in the enclosed report.

NRC inspectors documented one finding of very low safety significance (Green) in this report. The finding involved a violation of NRC requirements. The NRC is treating this violation as a non-cited violation (NCV) consistent with Section 2.3.2.a of the Enforcement Policy.

If you contest the violation or significance of this NCV, 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 the Virgil C. Summer Nuclear Station.

If you disagree with the cross-cutting aspects assigned to the findings 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 the 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 10 CFR 2.390, "Public Inspections, Exemptions, Requests for Withholding."

Sincerely,

**/RA/**

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

Docket No.: 50-395  
License No.: NPF-12

Enclosure:  
IR 05000395/2018004

cc: Distribution via ListServ

SUBJECT: VIRGIL C. SUMMER NUCLEAR STATION, UNIT 1 – NUCLEAR REGULATORY  
COMMISSION INTEGRATED INSPECTION REPORT 05000395/2018004  
February 13, 2019

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**U.S. NUCLEAR REGULATORY COMMISSION**

**REGION II**

Docket No: 50-395

License No: NPF-12

Report No: 05000395/2018004

Enterprise Identifier: I-2018-004-0046

Licensee: South Carolina Electric & Gas (SCE&G) Company

Facility: Virgil C. Summer Nuclear Station, Unit 1

Location: Jenkinsville, SC 29065

Dates: October 1, 2018 through December 31, 2018

Inspectors: J. Reece, Senior Resident Inspector  
E. Hilton, Resident Inspector  
J. Diaz-Velez, Senior Health Physicist (Sections 71124.04 and 71151)  
S. Downey, Senior Reactor Inspector (Sections 7111108)  
C. Dykes, Health Physicist (Section 71124.05)  
D. Lanyi, Senior Operations Engineer (Section 1R11)  
W. Loo, Senior Health Physicist (Sections 71124.02 and 71124.03)  
A. Nielsen, Senior Health Physicist (Sections 71124.01 and 71124.03)  
W. Pursley, Health Physicist (Section 71124.02)  
R. Williams, Senior Reactor Inspector (Section 71111.08)

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 licensee's performance by conducting a baseline inspection and radiation protection inspection at Virgil C. Summer Nuclear Station, Unit 1, 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. NRC and self-revealed findings, violations, and additional items are summarized in the table below. A licensee-identified non-cited violation was documented in report Section 71124.01.

### List of Findings and Violations

Inadequate Procedure Leading to 'A' EDG Fire Event			
Cornerstone	Significance	Cross-cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000395/2018004-02 Opened/Closed	[P.3] – Resolution	71111.13 - Maintenance Risk Assessments and Emergent Work Control & 71111.19 - Post Maintenance Testing
A self-revealing, Green NCV of Technical Specification 6.8, "Procedures and Programs," was identified for the failure to ensure procedures for performing maintenance on the 'A' EDG were adequately established which led to a leak in the 'A' EDG exhaust manifold and a consequent fire event.			

## PLANT STATUS

Unit 1 operated at rated thermal power (RTP) until October 5, 2018, when the unit entered refueling outage 24. The unit return to service on November 28, 2018, and reached RTP on November 29, 2018, and remained at or near RTP for the remainder of the quarter.

## INSPECTION SCOPES

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

## REACTOR SAFETY

### 71111.01 – Adverse Weather Protection

#### Seasonal Extreme Weather (1 Sample)

The inspectors evaluated readiness of the condensate storage tank on December 18, 2018, and the emergency diesel generators (EDG) on December 19, 2018, for seasonal extreme weather conditions prior to the onset of cold temperatures associated with the fall and early winter seasons.

#### Impending Severe Weather (1 Sample)

The inspectors evaluated readiness for impending adverse weather conditions for Hurricane Michael on October 10, 2018.

### 71111.04 - Equipment Alignment

#### Partial Walkdown (1 Sample)

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

- (1) 'A' and 'B' motor driven emergency feedwater (MDEFW) pumps during emergent work on turbine driven emergency feedwater (TDEFW) pump flow control valve; inspection was completed on December 13, 2018

### 71111.04 - Equipment Alignment Detailed Walkdown (1 Sample)

The inspectors evaluated system configurations during a complete walkdown of the 'A' and

'B' trains of the emergency feedwater (EFW) system inside containment; inspection was completed on November 18, 2018.

#### 71111.05AQ - Fire Protection Annual/Quarterly

##### Quarterly Inspection (5 Samples)

The inspectors evaluated fire protection program implementation in the following selected areas. A licensee identified violation is documented in the Inspection Results section below.

- (1) Intermediate building 436 elevation (fire zones IB01.25.05.01, and .02, IB01.25.06.01, and .02, IB01.14); inspection was completed on October 17, 2018
- (2) Turbine building (fire zone TB01.01); inspection was completed on October 17, 2018
- (3) Reactor building containment (fire zone RB01); inspection was completed on November 15, 2018
- (4) Control building 482 elevation (fire zones CB22, CB23); inspection was completed on December 28, 2018
- (5) Fire service (FS) pumps and alternate FS pumps (fire zones AFSPH01, CWPH01, CWPH02); inspection was completed on December 28, 2018

##### Annual Inspection (1 Sample)

The inspectors evaluated fire brigade performance during a fire drill; inspection was completed on December 12, 2018.

#### 71111.07A - Heat Sink Performance (1 Sample)

On October 28, 2018, the inspectors evaluated the readiness and availability of 'B' component cooling water (CCW) heat exchanger (HX) during inspection and cleaning.

#### 71111.08 - Inservice Inspection Activities (1 Sample)

The inspectors evaluated pressurized water reactor non-destructive testing by reviewing the following examinations from October 15, 2018 to October 25, 2018:

- (1) Eddy Current Examination
  - a) Steam Generator A - ET for tubes R02C25, R110C91, R110C51, ASME Class 1
  - b) Steam Generator B - ET for tubes R19C40, R02C39, ASME Class 1
  - c) Steam Generator C - ET for tube R115C62, ASME Class 1
- (2) Liquid Penetrant Examination
  - a) Weld MW-13, pipe to valve weld, ASME Class 2. This included a review of associated welding activities
  - b) Weld MW-14, pipe to valve weld, ASME Class 2.
  - c) Weld MW-30, pipe to flange weld, ASME Class 3. This included a review of associated welding activities
  - d) Weld MW-31, pipe to flange weld, ASME Class 3

(3) Magnetic Particle Examination

- a) Weld MW-24, pipe to flange weld, ASME Class 3. This included a review of associated welding activities.
- b) Weld MW-25, pipe to pipe weld, ASME Class 3.
- c) Weld MW-32, pipe to flange weld, ASME Class 3

(4) Ultrasonic Examination

- a) Weld CGR-1-4308-3, pipe to elbow weld, ASME Class 1
- b) Weld CGR-1-4308-4, pipe to elbow weld, ASME Class 1
- c) Weld CGE-1-4104-19, pipe to elbow weld, ASME Class 1

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

71111.11Q - Licensed Operator Requalification Program and Licensed Operator Performance

Operator Requalification (1 Sample)

The inspectors observed and evaluated an operator requalification simulator exam scenario occurring on December 10, 2018.

Operator Performance (3 Samples)

The inspectors observed and evaluated:

- (1) Unit 1 shutdown for refueling outage; observation was completed on October 5, 2018
- (2) Unit reactor coolant system (RCS) cooldown and operator response to letdown alarms; observation was completed on October 6, 2018
- (3) Operators performing transformer lockout testing, maintaining level in steam generators (SG) and secured 'B' EFW pump; observation was completed on October 12, 2018

Annual Review of Licensee Requalification Examination Results (1 Sample)

On August 16, 2018, 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." The inspectors performed an in-office review of the overall pass/fail results of the individual operating examinations and the crew simulator operating 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 71111.11.

71111.12 - Maintenance Effectiveness

Routine Maintenance Effectiveness (2 Samples)

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



- (1) 'B' EDG service water (SW) return piping pinhole leak and subsequent repairs; inspection was completed on November 7, 2018
- (2) Maintenance Rule (a)(1) evaluation for risk significant function, AH08d, EDG ventilation; inspection was completed on December 11, 2018

#### 71111.13 - Maintenance Risk Assessments and Emergent Work Control (4 Samples)

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

- (1) Yellow risk condition for RCS lowered inventory for reactor vessel head removal; inspection was completed on November 17, 2018
- (2) Emergent work for repairs on 'A' EDG exhaust system fire; inspection was completed on November 5, 2018
- (3) Emergent work for repairs on digital control system cabinet for moisture separator re-heaters and feedwater heaters; inspection was completed on November 27, 2018
- (4) Emergent work on TDEFW pump flow control valve; inspection was completed on December 13, 2018

#### 71111.15 - Operability Determinations and Functionality Assessments (3 Samples)

The inspectors evaluated the following operability determinations and functionality assessments in review of Condition Reports:

- (1) CR-18-03296, 'B' EDG SW pinhole leaks; inspection was completed on November 17, 2018
- (2) CR-18-01032, Past operability review for SG PORV failure to open; inspection was completed on October 23, 2018
- (3) CR-18-04866, Past operability review for RBCU flow switch IFS1900B; inspection was completed on December 11, 2018

#### 71111.18 - Plant Modifications (1 Sample)

The inspectors evaluated procedure controlled temporary modification, Work Order (WO) 1711177, install temporary power to 'A' spent fuel pool (SFP) pump motor; inspection was completed on November 13, 2018

#### 71111.19 - Post Maintenance Testing (PMT) (7 Samples)

The inspectors evaluated the following post maintenance tests:

- (1) WO1709582, 'A' component cooling water (CCW) heat exchanger hydrolase or clean tubes, leak test; inspection was completed on October 30, 2018
- (2) WO1816658, Implement ECR50933B to repair cavitation damage at XVB03121A-SW, SW discharge butterfly valve for 'A' EDG ; inspection was completed on October 29, 2018
- (3) WO1815079, Repair 'A' EDG exhaust fire damage; inspection was completed on November 5, 2018
- (4) WO1711625, 'B' and 'C' charging pump flow test after maintenance; inspection was completed on November 8, 2018
- (5) WO1711495, Perform as found testing of breaker APN1FB-15; inspection was

- completed on November 13, 2018
- (6) WO1820647, Repair air leak on IFV03556-PRZ-EF for TDEFW flow control valve; inspection was completed on December 27, 2018
  - (7) WO1711728, Repair relief valve with seat leakage on XVR03146C-SW; inspection completed on December 31, 2018

#### 71111.20 - Refueling and Other Outage Activities (1 Sample)

The inspectors evaluated Unit 1 refueling outage activities from October 5, 2018, until reactor startup was completed on November 24, 2018. The inspection was completed on November 24, 2018.

#### 71111.22 - Surveillance Testing

The inspectors evaluated the following surveillance tests:

##### Routine (2 Samples)

- (1) Surveillance Test Procedure (STP) 206.001, "Integrated Leak Rate Test," Revision 5; inspection was completed on October 11, 2018
- (2) STP-220.001A, "Motor Driven Emergency Feedwater Pump and Valve Test," Revision 12, and STP 220.008, "Motor Driven Emergency Feedwater Pump Full Flow Test," Revision 7C; inspection was completed on October 2, 2018

##### Reactor Coolant System Leakage Detection Testing (1 Sample)

STP-114.002, "Operational Leakage Calculation," Revision 12G; inspection was completed on November 28, 2018

##### Containment Isolation Valve(s) (1 Sample)

STP-215-003A, "Containment Isolation Valve Leakage Test for the CVCS, ND, RC, SF, ST, SP and WL Systems," Revision 7B; inspection was completed on November 15, 2018

##### In-service (1 Sample)

STP 230.006A, "ECCS Charging Pump Operability Testing (Refueling)," Revision 8E; inspection was completed on November 21, 2018

### **RADIATION SAFETY**

#### 71124.01 - Radiological Hazard Assessment and Exposure Controls

##### Radiological Hazard Assessment (1 Sample)

The inspectors evaluated radiological hazards assessments and controls.

##### Instructions to Workers (1 Sample)

The inspectors evaluated worker instructions.

#### Contamination and Radioactive Material Control (1 Sample)

The inspectors evaluated contamination and radioactive material controls.

#### Radiological Hazards Control and Work Coverage (1 Sample)

The inspectors evaluated radiological hazards control and work coverage.

#### High Radiation Area and Very High Radiation Area Controls (1 Sample)

The inspectors evaluated risk-significant high radiation area and very high radiation area controls.

#### Radiation Worker Performance and Radiation Protection Technician Proficiency (1 Sample)

The inspectors evaluated radiation worker performance and radiation protection technician proficiency.

### 71124.02 - Occupational As Low As Reasonably Achievable (ALARA) Planning and Controls

#### Radiological Work Planning (2 Samples)

The inspectors evaluated the licensee's radiological work planning by reviewing the following activities:

- (1) Primary Side Steam Generator Work, RWP: 18-04900, RF-24 Primary Steam Generator Work
- (2) Secondary Steam Generator Work, RWP: 18-04902, RF-24 Secondary Side Steam Generator Work

#### Verification of Dose Estimates and Exposure Tracking Systems (1 Sample)

The inspectors evaluated dose estimates and exposure tracking.

#### Implementation of ALARA and Radiological Work Controls (4 Samples)

The inspectors reviewed ALARA practices and radiological work controls by reviewing the following activities:

- (1) Fuel Movement, RWP-18-4200, RF24 Refuel Activities
- (2) Primary Steam Generator Prep Activities, RWP-4900, RF-24 Primary Manways/Diaphragms/Weld Exam
- (3) Scaffold Installation, RWP-18-4003, Outage Scaffold Installation
- (4) HP Activities, RWP-18-4006, Health Physics Activities for RF24

#### Radiation Worker Performance (1 Sample)

The inspectors evaluated radiation worker and radiation protection technician performance.

#### 71124.03 - In-Plant Airborne Radioactivity Control and Mitigation

##### Engineering Controls (1 Sample)

The inspectors evaluated airborne controls and monitoring.

##### Use of Respiratory Protection Devices (1 Sample)

The inspectors evaluated respiratory protection.

##### Self-Contained Breathing Apparatus for Emergency Use (1 Sample)

The inspectors evaluated the licensee's self-contained breathing apparatus program.

#### 71124.04 - Occupational Dose Assessment

##### Source Term Characterization (1 Sample)

The inspectors evaluated the licensee's source term characterization.

##### External Dosimetry (1 Sample)

The inspectors evaluated the licensee's external dosimetry program.

##### Internal Dosimetry (1 Sample)

The inspectors evaluated the licensee's internal dosimetry program.

##### Special Dosimetric Situations (1 Sample)

The inspectors evaluated the licensee's performance for special dosimetric situations.

#### 71124.05 - Radiation Monitoring Instrumentation

##### Walk Downs and Observations (1 Sample)

The inspectors evaluated radiation monitoring instrumentation during plant walkdowns.

##### Calibration and Testing Program (1 Sample)

The inspectors evaluated the licensee's calibration and testing program.

### **OTHER ACTIVITIES – BASELINE**

#### 71151 - Performance Indicator Verification (3 Samples)

The inspectors verified licensee performance indicators submittals listed below for the period from October 1, 2017 through September 30, 2018. Inspection was completed on November 15, 2018.

- (1) Mitigating System Performance Index (MSPI) - Heat Removal System
- (2) MSPI - Cooling Water Systems
- (3) Safety System Functional Failures

71151 - Performance Indicator Verification from Radiation Protection Inspection (2 Samples)

The inspectors verified licensee performance indicators submittals listed below for the period from April 1, 2017 through September 30, 2018.

- (1) OR01: Occupational Exposure Control Effectiveness
- (2) PR01: Radiological Effluent Technical Specifications/Offsite Dose Calculation  
Manual Radiological Effluent Occurrences (RETS/ODCM) Radiological Effluent Occurrences

71152 - Problem Identification and Resolution

Semiannual Trend Review (1 Sample)

The inspectors reviewed the licensee's corrective action program for trends that might be indicative of a more significant safety issue. Specifically, the inspectors reviewed CR-18-02820, Service water pinhole leaks. Inspections were completed on December 12, 2018.

## INSPECTION RESULTS

Inadequate Procedure Leading to 'A' EDG Fire Event			
Cornerstone	Significance	Cross-cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000395/2018004-02 Opened/Closed	[P.3] – Resolution	71111.13 - Maintenance Risk Assessments and Emergent Work Control & 71111.19 - Post Maintenance Testing
A self-revealing, Green NCV of Technical Specification 6.8, "Procedures and Programs," was identified for the failure to ensure procedures for performing maintenance on the 'A' EDG were adequately established which led to a leak in the 'A' EDG exhaust manifold and a consequent fire event.			
<p><u>Description:</u></p> <p>On November 4, 2018, during a surveillance test of the 'A' EDG, exhaust fumes were reported by the operator. Following review by maintenance personnel, the licensee made the determination that this was a normal condition and the decision to load the EDG was made. Approximately 16 minutes into the full load run, the operators identified visible flames near the exhaust manifold in the vicinity of the turbochargers. The 'A' EDG was immediately unloaded, shutdown, and declared inoperable; operators extinguished the fire using an extinguisher. The licensee initiated CR-18-05016 to document the event, perform an investigation of the cause, and implement repairs.</p> <p>The inspectors reviewed the licensee's corrective action program (CAP) database and noted that on August 23, 2018, the licensee initiated CR-18-03451 to document an exhaust leak on the 'A' EDG near the turbochargers during a post-maintenance run. The CR was updated on the following day to state that exhaust fumes were no longer visible when the EDG was loaded to greater than 3000 kilo-watts due to suspected gasket leakage prior to exhaust manifold warming up. The inspectors reviewed maintenance history and noted that the exhaust manifold assembly on 'A' EDG was replaced during the Fall refueling outage in 2015, due to cracks in circumferential welds. Additionally, the 'B' EDG exhaust manifold was replaced during the Spring refueling outage in 2017, for similar reasons.</p> <p>The inspectors reviewed the results of the investigation documented in CR-18-05016 and noted the following comments: "it was determined the exhaust manifold bellows flange serving the #8, #9, and #12 cylinders nearest the right bank turbo was almost completely disassembled and was the source of the significant exhaust leakage. Five of the six bellows flange bolts had worked loose and had fallen off into the exhaust manifold shroud and/or cover which provided approximately a 1/4" wide circumferential gap allowing exhaust gas leakage." The inspectors noted the hot gas leakage along with residual oil led to the fire.</p> <p>While the licensee did not perform an apparent cause evaluation, the inspectors noted that related vendor drawing P12620219, Sheet 1 of 3, specified a torque value of 35 – 50 foot pounds for the bolts which had loosened and fallen out of the exhaust bellows flanges. The inspectors reviewed safety-related mechanical maintenance procedure, MMP-180.050, "Diesel Generator Exhaust Manifold Maintenance, XEG0001A/B-E," Revision 1, and noted that step 7.2.4 stated, "Tighten exhaust joints and bellows bolts wrench tight verifying bolts do not protrude through the nut plate and contact the bellows." The inspectors noted there was</p>			

no torque specification for the bolting.

The inspectors concluded the licensee failed to adequately establish MMP-180.050 to stipulate required torque specifications contrary to the requirements of TS 6.8.1a, which states in part that written procedures shall be established covering the activities referenced in Appendix 'A' of Regulatory Guide 1.33, Revision 2, Section 9, "Procedures for Performing Maintenance." Although the failure occurred during a refueling outage with the unit in a defueled mode in which the 'A' EDG was not required by TS or for risk mitigation, the inspectors also concluded that had the 'A' EDG been depended upon during its mission time of 24 hours during the previous operating cycle, the resulting vibration, loss of bolting material, and resultant exhaust leakage most likely would have led to a fire event. Additionally, the inspectors concluded that the licensee had opportunities for more timely corrective action prior to the fire event when identified previously in CR-18-03451.

Corrective Action(s): The licensee implemented CR-18-05016 to identify causes and appropriate corrective actions.

Corrective Action Reference(s): The licensee entered this issue into their CAP as CR-18-05016. CR-18-03451 was also previously initiated for an exhaust leak on 'A' EDG. WO 1818803 was initiated to correct the similar condition adverse to quality (CAQ) on 'B' EDG.

#### Performance Assessment:

Performance Deficiency: The licensee's failure to adequately establish MMP-180.050 with required torque values which led to exhaust leakage and consequent fire event was a performance deficiency (PD).

Screening: The inspectors determined the PD was more than minor because it adversely affected the mitigating systems cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences and the respective attribute of equipment performance relative to maintenance. Specifically, the licensee failed to adequately establish MMP-180.050 with required torque values for exhaust manifold bolting material.

Significance: The inspectors used IMC 0609, "Significant Determination Process," Attachment 4, dated October 7, 2016, and Appendix A – Exhibit 2, dated July 1, 2012, and determined the finding was of very low safety significance or Green because the finding was not a design deficiency or loss of function.

Cross-cutting Aspect: The inspectors reviewed IMC 0310, "Aspects Within Cross Cutting Areas," dated December 4, 2014, and determined the cause of this finding involved the cross-cutting area of problem identification and resolution and the aspect of resolution, P.3, because the licensee failed to take effective corrective actions commensurate with an issue's safety significance in that they failed to correct a CAQ involving the 'A' EDG exhaust leak documented in CR-18-03451.

#### Enforcement:

Violation: TS 6.8.1a states in part that written procedures shall be established covering the activities referenced in Appendix 'A' of Regulatory Guide 1.33, Revision 2, February 1978. Section 9 of RG 1.33 requires procedures for performing maintenance on safety related

equipment. MMP-180.050, "Diesel Generator Exhaust Manifold Maintenance, XEG0001A/B-E," Revision 1, was established to perform maintenance on the EDG exhaust manifolds.

Contrary to the above, on November 4, 2018, the licensee failed to adequately establish MMP-180.050 to stipulate required torque specifications for bolting materials which led to exhaust leakage and consequent fire event

Disposition: This violation is being treated as an NCV consistent with Section 2.3.2.a of the Enforcement Policy.

Observation and Minor Violation for SW Pinhole Leaks	71152 Trend Review
<p>Minor Violation: 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," for failure to promptly identify and correct a condition adverse to quality (CAQ). Specifically, the licensee did not initiate corrective actions related to cavitation damage on the downstream pipe tees for the component cooling water heat exchanger discharge butterfly valves, XVB03123A&amp;B-SW, which are normally throttled for flow control. As a result, the piping tees were damaged to the extent that multiple pinhole leaks developed requiring the licensee to seek NRC approval for multiple relief requests and non-code repairs.</p> <p>Screening: Because the licensee implemented prompt corrective actions during the subsequent refueling outage and the components remained in an operable but degraded condition, the inspectors identified this as a minor violation of Criterion XVI.</p> <p>Enforcement: This failure to comply with 10 CFR 50, Appendix B, Criterion XVI constitutes a minor violation that is not subject to enforcement action in accordance with the NRC's Enforcement Policy. The licensee entered the multiple problems into their CAP as trend CR-18-02820.</p> <p>The inspectors performed a corrective action program (CAP) trend review for problems related to service water (SW) pinhole leaks after facilitating multiple licensee requests for temporary non-code repairs for SW pinhole leaks for emergency diesel generators (EDGs) and component cooling water (CCW) heat exchangers (Hx) over the previous inspection quarters. Additionally, the inspectors noted the licensee initiated CR-18-02820 for a similar trend and to also perform a common cause evaluation. Specifically, the inspectors identified 14 CR's for SW pinhole leaks and are listed in the documents attachment.</p> <p>The inspectors had previously documented CAP observations and a minor violation regarding cavitation damage downstream of throttled butterfly valves in NRC Integrated Inspection Report 05000395/2018001. The observations discuss historical aspects of cavitation damage relating to the downstream SW piping for the EDG's. The inspectors identified additional historical information relating to the licensee's awareness of the cavitation issues associated with throttle butterfly valves, XVB03123A&amp;B-SW.</p> <ul style="list-style-type: none"> <li>An engineering Technical Work Record, TWR-LS11312, dated May 18, 2005, evaluated wall thinning downstream of a butterfly valve, XVB03125A-SW, throttled for back-flushing of CCW Hx's. The TWR stated, "The CC Hx valves are manufactured by Henry Pratt and the Henry Pratt Company recommends that their butterfly valve not</li> </ul>	



<p>be used for throttling with less than a 15 degree opening or when cavitation can occur.”</p> <ul style="list-style-type: none"> <li>• An engineering services procedure, ES-505, “Service Water System Corrosion Control and Monitoring Program,” inspection of XVB03123B-SW on May 6, 2008, had pictures of the gate valve which exhibited cavitation damage.</li> <li>• An ES-505 inspection of XVB03123A-SW on October 27, 2009, had pictures of the gate valve and downstream piping. The inspectors noted both components exhibited indications of cavitation damage when compared to other components with known cavitation damage. The inspectors noted the licensee documented the inspection was performed for suspected cavitation but there were no indications of cavitation.</li> <li>• An ES-505 inspection conducted on the same valve on October 27, 2012, stated, “The valve body and disc had areas of moderate cavitation damage from years of throttling. The inspectors identified pictures with similar cavitation damage as shown in the 2009 pictures of the same component. The inspectors also noted the licensee failed to provide any documentation of the downstream piping tee.</li> <li>• The inspectors identified historical operating experience (OE) documents within the licensee’s OE files discussing the cavitation phenomenon with one of the primary causes as the throttling of butterfly valves for flow control.</li> </ul>
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Licensee Identified Non-Cited Violation	71124.01 Inspection Results
<p>This violation of very low safety significant was identified by the licensee and has been entered into the licensee corrective action program and is being treated as a Non-Cited Violation, consistent with Section 2.3.2 of the Enforcement Policy.</p>	
<p>Violation: TS 6.8.1, “Procedures and Programs,” requires, in part, that written procedures be implemented covering the activities recommended in Appendix A of Regulatory Guide 1.33, Rev. 2, Section 7(e), “Radiation Protection Procedures.” Specifically, VCS-HPP-0160.001, Radiological Posting and Labeling, Revision 1, Attachment II, “HRA, LHRA, and VHRA Down-Posting Checklist”, states in part, that prior to actual down posting, HP survey the area to confirm radiation levels do not exceed criteria for down-posted conditions prior to worker access.</p> <p>Contrary to the above, on November 3, 2018, prior to an actual down posting, the licensee did not conduct a survey of the area to confirm that radiation levels did not exceed criteria for down-posted conditions prior to worker access. Specifically, after the HRA boundary around the reactor head was moved on November 3, 2018, a survey was not performed until the next shift by an HP who identified dose rates up to 110 mr/hr at 30 cm outside the posted HRA boundary.</p> <p>Significance/Severity Level: The inspectors reviewed Inspection Manual Chapter 0609, Appendix C, “Occupational Radiation Safety Significance Determination Process,” dated August 19, 2008, and determined the finding was of very low safety significance, Green, because the finding was not related to the As Low As Reasonably Achievable (ALARA) planning, did not involve an overexposure or substantial potential for overexposure, and the ability to assess dose was not compromised.</p> <p>Corrective Action Reference: The licensee has documented this problem in their CAP as CR-18-05037.</p>	

## **EXIT MEETINGS AND DEBRIEFS**

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

The inspectors confirmed that proprietary information was controlled to protect from public disclosure.

On October 25, 2018, the inspector presented the in-service inspection results to George Lippard, Site Vice President, and other members of the licensee staff.

On November 9, 2018, the inspectors presented the baseline radiation protection inspection results to Mr. George Lippard and other members of the licensee staff.

On January 29, 2019, the inspectors presented the quarterly resident inspector inspection results to Mr. George Lippard and other members of the licensee staff.

## **DOCUMENTS REVIEWED**

### **71111.01 – Adverse Weather Protection**

OAP 109.1, Guidelines for Severe Weather

### **71111.04 - Equipment Alignment**

SOP-211, EMERGENCY FEEDWATER SYSTEM, Rev 14I

Drawing number C-314-081 sheet 25, Rev 8

Drawing number C-314-081 sheet 23, Rev 9

Drawing number C-314-081 sheet 27, Rev 7

Drawing number E-001-031, Rev 53

Drawing number E-001-021, Rev 62

Drawing number D-302-083, Rev 54

CR-18-04827, NRC Identified paint flaking on EFW piping in containment

CR-18-04828, NRC Identified rotated pipe support on EFW piping in containment

### **71111.05A/Q - Fire Protection Annual/Quarterly**

29-CFR-1910.1200, Hazard Communications

29-CFR-1910.120, Hazardous Waste Operations and Emergency Response

AOP-900.01, Fire Response Initial Actions, Rev 3

AOP-900.011, Yard Fire Zone Response Actions, Rev 0

MSDS Exxon Univolt 60

MSDS DIALA® Oil AX

Specification, SP-0326, Main Power Transformer, Rev 1

VCS-ERP-0020, ERU Preplan Development and Control, Rev 0

VCS-ERP-0080, ERU Emergency Response Drill Management, Rev 1

CR-18-05943, Station Fire Preplan for Transformer Yard Not Adequate

STP-728.030, Reactor Building Fire Barrier Inspection, Rev 5B

STP-728.033, Turbine Building Fire Barrier Inspection, Rev 5J

STP-728.048, Intermediate Building Elevation 436' Fire Barrier Inspection, Rev 4G

STP-728.041 Control Building Elevation 505 & 482 Fire Barrier Inspection, Rev 5D

STP-728.032, Fire Service Pump House Building Fire Barrier Inspection, Rev 5B

### **71111.08 – Inservice Inspection Activities**

#### **Procedures**

54-ISI-400-022, Multi-Frequency Eddy Current Examination of Tubing, Rev 22

Examination Technique Specification Sheet: ETSS1, ETSS2, ETSS3

PSEG-19, Boric Acid Corrosion Evaluation, Rev 2

QSP-504, Magnetic Particle Testing, Rev 9

SAP-1100, Boric Acid Corrosion Control Program, Rev 3

SGMP-100.006, Steam Generator Tube Inspection Eddy Current Data Analyst Guidelines, Rev 4

VCS-PTP-151.001A, Inspection for Boric Acid Corrosion, Rev 0

VCS-QSP-501, Solvent Removable Liquid Penetrant, Rev 1

WD-STD-1036, Generic Procedure for the Ultrasonic Examination of Austenitic Pipe Welds in Accordance with PDI-UT-2, Rev 4

WM-1.0, Welding Manual Procedure, Rev 16

#### NDE Examiner Qualifications:

Certificate of Personnel Qualification for Examiners: C3340, D4825, M6664, F1726, R3716  
Curtiss-Wright Personnel Certification Statement (Pearson), dated 03/18/2017  
Curtiss-Wright Personnel Certification Statement (Weidner), dated 11/7/2016  
Sonic Systems International Certificate of Qualification (Michael), dated 08/16/2018  
Sonic Systems International Certificate of Qualification (Shaugabay), dated 08/22/2018  
System One Certificate of Method Qualification (Stone), Level II - Magnetic Particle, dated 01/04/2017

#### Condition Reports

CR-17-02169	CR-18-02857	CR-18-04458
CR-17-02244	CR-18-03144	CR-18-04459
CR-17-04662	CR-18-03647	CR-18-04644
CR-18-00305	CR-18-04456	
CR-18-02808	CR-18-04457	

#### Miscellaneous Documents

51-9289098, VC Summer 1RF24 Steam Generator Degradation Assessment (Fall 2018), Rev 1  
51-9289100, Site Validation of Eddy Current Techniques for V C Summer 1RF24, Rev 0  
51-9289124, VC Summer Unit 1 – RF24 ECT Inspection Plan, Rev 0  
Certificate of Performance for Eddy Current Probe SNs: 754362, 754385  
ECR 50933B, SW Cooler Return Piping Replacement  
SAP-0158 Steam Generator Management Program, Rev 3  
SG-SGMP-14-15, V.C. Summer Unit 1 Steam Generator Cycle 21 Condition Monitoring and Cycles 22, 23 and 24 Operational Assessment, Rev 0  
UT Report No. RF24-UT-001, dated 10/16/2018  
Work Orders: 1703793-002, 1704591-002, 1814841-001

#### **71111.12 - Maintenance Effectiveness**

WO 1814841, Implement ECR 50933B to repair SW piping pinhole leaks  
ECR 50933B, Modification to change SW piping configuration to reduce cavitation  
FSAR Sections: 1.2.3.8.1, 3.7, 3.9.2, 9.2.1, 9.4.7, 18.2.33  
Drawing, 302-222, sheets 1 & 3  
CR-18-03942, XFN0045B failed to start on 9/26/18

#### **71111.20 – Refueling and Other Outage Activities**

GOP-2, Plant Startup and Heat-up (Mode 5 To Mode 3), Rev 18  
GOP-3, Reactor Startup From Hot Standby To Startup (Mode 3 To Mode 2), Rev 13G  
GOP-4B, Power Operation (Mode 1 - DESCENDING), Rev 1F  
GOP-5, Reactor Shutdown From Startup To Hot Standby (Mode 2 To Mode 3), Rev 12C  
GOP-6 Plant Shutdown From Hot Standby To Cold Shutdown (Mode 3 To Mode 5), Rev 14C  
GOP-7 Core Refueling (Mode 5 To Mode 6 Defuel and Refuel To Mode 6), Rev 11G  
SOP-101, Reactor Coolant System, Rev 30K  
SOP-115, Residual Heat Removal, Rev 22E  
SOP-117, Service Water System, Rev 24E  
SOP-118, Component Cooling Water, Rev 19A  
SOP-123, Spent Fuel Cooling System, Rev 16I  
SOP-211, Emergency Feedwater System, Rev 14I  
SOP-304, 115KV 7.2KV OPERATIONS, Rev 14B

SOP-305, 480 Volt Engineered Safety Features Distribution, Rev 9F  
SOP-306, Emergency Diesel Generator, Rev 19E  
SOP-307, Diesel Generator Fuel Oil System, Rev 13D  
SOP-310, Engineered Safety Features 120 VAC Instrumentation and Control Power System, Rev 12A  
SOP-311, 125 VDC System, Rev 13  
SSP-002, Planning and Scheduling of Outage Activities, Rev 6H  
SSP-004, Outage Safety Review Guidelines, Rev 5D  
SSP-010, Control of Critical Work Activities, Rev 1B  
Core Reload Verification  
MTF 18-13, Core Offload  
MTF 18-15, Core Reload  
SAP-0152, Fatigue Management and Work Hour Limits, Rev 10A  
OAP-108.4, Operations Outage Control of Containment Penetrations, Rev 2D  
DC00020-252, V.C. SUMMER Time To Boil Following Loss of Decay Heat Cooling in Mode 5  
DC00020-198, Heat-Up Model for Water in the SFP, Reactor Cavity, and Reactor Vessel

#### **7111.18 – Plant Modifications**

EMP-100.004, "Installation of Temporary Alternate Feed Cable for Spent Fuel Pumps," Rev 6b  
SAP-364, "Control of Temporary Cables," Rev  
SS-200-927, Sheet 3, 480 Volt Load Center Relay and Breaker Settings (Breaker 1A3)  
SS-200-927, Sheet 15, 480 Volt Load Center Relay and Breaker Settings (Breaker 1DA2)  
SS-200-927, Sheet 17, 480 Volt Load Center Relay and Breaker Settings (Breaker DB2)  
Request for Engineering Evaluation, REE22572, Emergency Power for SF Cooling Pumps

#### **71151 - Performance Indicator Verification**

Control Room Logs for October 1, 2017 through September 30, 2018  
Licensee raw MSPI data for Months of October, 2017 through September, 2018

#### **Procedures**

VCS-EPAP-0106 Emergency Preparedness Performance Indicator Procedure. Rev. 2

#### **Records and Data**

DEP opportunities documentation for 4<sup>th</sup> quarter 2017, and 1<sup>st</sup> and 2<sup>nd</sup> quarters 2018  
Siren test data for 4<sup>th</sup> quarter 2017, and 1<sup>st</sup> and 2<sup>nd</sup> quarters 2018  
Drill & exercise participation records of ERO personnel for 4<sup>th</sup> quarter 2017, and 1<sup>st</sup> and 2<sup>nd</sup> quarters 2018

#### **Corrective Action Program Documents**

CR-18-02305, EP to evaluate the process for selecting DEP opportunities

#### **71152 - Problem Identification and Resolution**

NAMCO Cavitation Analysis

Engineering Information Request 80756: Provide operational criteria for S-321- 001 (Pipe Support Erection Standards) that provides an angular tolerance of +/- 3 degrees for liner supports

## **71124.01 - Radiological Hazard Assessment and Exposure Controls**

### Procedures, Guidance Documents and Manuals

CMP-400.001, Excavation Backfill and Earthwork, Rev. 10  
VCS-HPP-0160.002, Access Control of High Radiation, Locked High Radiation, and Very High Radiation Areas, Rev. 1  
VCS-HPP-0302, Radiation and Contamination Survey Techniques, Rev. 2  
VCS-HPP-0303, Airborne Activity Sampling Techniques, Rev. 1  
VCS-HPP-0158, Radioactive Material Control, Rev. 0

### Records and Data

Air Sample Results, A S/G Platform, 10/21/18  
Gamma Spec Analysis 21\_2018-03-22\_005, SB Pit Dirt  
Gamma Spec Analysis 24\_2018-03-06\_001, Soil Sample #1 SE Corner  
Gamma Spec Analysis 25\_2018-03-06\_001, Soil Sample #2 NE Corner  
Gamma Spec Analysis 24\_2018-10-24\_004, Rock Sample From Under EQ Hatch  
HPSS Administrative Instruction No. 17-002, Fuel Cycle 24 Alpha Characterization, 08/10/17  
Lapel Air Sample Results, Reactor Building Sump, Serial No. 25739, 10/12/18  
National Source Tracking System Annual Inventory Reconciliation, 01/25/18  
Radiological Survey VCS1-M-20181006-28, Auxiliary Building 463-02, 10/6/18  
Radiological Survey VCS1-M-20180830-2, Auxiliary Building 463-02, 08/30/18  
Radiological Survey VCS1-M-20180927-2, ISFSI, 09/27/18  
Radiological Survey VCS1-M-20180730-3, ISFSI, 07/30/18  
Radiological Survey VCS1-M-20181023-42, S/G Primary Platform and Bullpens, 10/23/18  
Radiological Survey VCS1-M-20181022-5, RCDT-A Tagout, 10/21/18  
RWP 18-04900, RF-24 S/G Eddy Current Activities, Rev. 1  
RWP 18-04081, Aggressive Work in Posted Alpha Level 2 Areas – All Alpha Level 3 Work Activities, Rev. 1  
Source Inventory Sheet, Unit 1, 05/31/18  
VC Summer Nuclear Station Work Order (W/O) 1802399-055

### CAP Documents

CR-18-04734  
CR-18-05037

## **71124.02 - ALARA**

### Procedures, Guidance Documents, and Manuals

SAP-0121, ALARA Committee, Revision 10, Change B

### Records and Data

ALARA Committee Minutes, RVHR ALARA Plan Review\_  
ALARA Plan, RF-24 Primary Steam Generator Work, RWP: 18-04900  
ALARA Plan, RF-24 Secondary Steam Generator Work, RWP: 18-04902  
ALARA Plan, RF-24 Primary Manways/Diaphragms/Weld Exam, RWP 18-4901  
ALARA Post Job Review, RWP 17-04950, Reactor Vessel Head Replacement, 04/03/17  
VCS ALARA Group Excellence Plan  
V.C. Summer, RF-23 Post Outage Critique, ORVCH Disposal, June 28, 2017

### **71124.03 - In-Plant Airborne Radioactivity Control and Mitigation**

#### **Procedures, Guidance Documents, and Manuals**

SAP-0999, Corrective Action Program, Rev. 18, Change A  
VCS-HPP-0154, Issuance and Control of Respiratory Protection Equipment, Rev. 0, Change A  
VCS-HPP-0303, Airborne Activity Sampling Techniques, Rev. 1  
VCS-HPP-0403, Radiological Controls for Nuclear Work Activities, Rev. 0  
VCS-HPP-0416, Use and Control of HEPA Filtration Units, Vacuum Equipment, Fans, and Portable A/C Units, Rev. 0  
VCS-HPP-0163, Qualification Process for the Use of Respiratory Protection Equipment, Rev. 0, Change C  
VCS-HPP-0602, Fit Testing, Rev. 0, Change B  
VCS-HPP-0633, Inspection, Maintenance, and Storage of Respiratory Protective Devices, Rev. 0  
VCS-HPP-0924, Operation and Maintenance of High Pressure SCBA Compressor, Rev. 0

#### **Records and Data**

EPT-11, C-Q-EP-SCBA, SCBA Qualification Records for selected personnel in Health Physics, Instrumentation and Controls, and Mechanical Maintenance for 2018  
HEPA Filter Integrity Test Results, HEPA Unit 17, 5/15/18  
HEPA Filter Integrity Test Results, HEPA Unit 43, 10/10/18  
Hydrostatic Retest Data Sheets and Visual Inspection Data Sheets for Bottles OP333747, OP333748, and OP342361  
Scott Air Supplied Products, Specialist Level Course certificates for personnel, 11/02/17  
Scott Air Supplied Products Technician, Maintenance and Overhaul certificates for personnel, 01/12/18  
SCOTT PosiChek3, Visual / Functional Test Results, for the following SCBA Nos.: 6, 01/22/16; 33, 07/27/15 and 06/21/17; and 64, 04/28/15 and 06/26/17  
TRI Air Testing, Laboratory Reports, Compressed Air/Gas Quality Testing, Grade "D" Air, Bauer Compressor # 30542, 07/27/17 and 08/02/18  
VCS-HPP-0633, Attachment VI, Rev. 0, SCBA Inspection Log, 3rd Quarter 2018  
VCS-HPP-0633, Attachment VII, Rev. 0, Monthly Breathing Air Cylinder Inspection Logs, June - October 2018

#### **CAP Documents**

CR-17-03981  
CR-18-01276  
CR-18-01974

### **71124.04 - Occupational Dose Assessment**

#### **Procedures, Guidance Documents, and Manuals**

TWR 2.1.3-17-017, Calibration Bias for Electronic Dosimetry (SRDs), 12/07/17  
VCS-HPP-0157, Personnel Monitoring, Decontamination, and Skin Dose Determination, Rev. 1  
VCS-HPP-0411, Monitoring Exposure with Multibadging, Rev. 0  
VCS-HPP-0505, Issuance and Termination of Personnel Dosimetry, Rev. 0, Change B  
VCS-HPP-0509, Leak Test and Calibration of Self-Reading Dosimetry, Rev. 0

VCS-HPP-0515, Interpretation of Bioassay Analysis, Rev 0, Change B  
VCS-HPP-0517, Multiple Whole Body and Extremity Badging Exposure Calculations, Rev. 0  
VCS-HPP-0518, Exposure Documentation Control, Rev. 0, Change B  
VCS-HPP-0523, Quality Control and Whole Body Counting with the Chair Whole Body Counter,  
Rev. 0  
VCS-HPP-0717, Sample Collection, Preparation, and Analysis Techniques for Assuring  
Compliance with 10 CFR 61

#### Records and Data

10 CFR 61 Analysis of 2017 DAW, December 17, 2017  
2017 PCOs and PCEs report (undated)  
2018 PCEs report (undated)  
Dosimetry Self-Assessment, dated 10/23/2017  
NVLAP, Certificate of Accreditation to ISO/IEC 17025:2005, Valid from January 7, 2018 to June  
30, 2019

#### CAP Documents

CR-17-02677	CR-18-00244	CR-18-04305
CR-17-02994	CR-18-00484	CR-18-04306
CR-17-03725	CR-18-01957	CR-18-05090
CR-17-04838	CR-18-03344	
CR-17-05410	CR-18-04227	

### **71124.05 - Radiation Monitoring Instrumentation**

#### Procedures, Guidance Documents, and Manuals

VCS-HPP-0522, Set-Up, Calibration, Quality Control and Operation of Gamma Spectroscopy  
Systems with ORTEC Software, Rev. 0, Change C  
VCS-HPP-0801, Counting Statistics and QC Testing for Health Physics Counting Systems,  
Rev. 0, Change A

#### Data and Records

10CFR61 Analysis of 2017 DAW  
ARGOS Personnel Contamination Monitor #1803-094, 05/25/18 Calibration Review and Approval:  
Gamma Det #25, 1LML0 07/09/18, #23 1LML 09/18/16, and  
#23 CHAR-01 08/13/18  
HPP-0818 Attachment III HIDE X 02/18 - 03/18, 04/18 - 06/18  
Quality Control: BC-4 #1029, 01/01 - 03/31/18, and 04/01 - 06/30/18  
Thermo Fisher Scientific Calibration Certificates: Telepole II #428016-053 02/16/17; and  
Telepole II #428016-015, 02/16/17  
VCS-HPP-0522, Set-Up, Calibration, and Generation of Quality Control Bands for the Chair  
Whole Body Counter ENCLOSURE A: Upper Energy Calibration 08/25/17 and 09/19/17,  
and Stand-up Calibration Count 09/19/17  
VCS-HPP-0611 Calibration Certificate: Ludlum 9-3 #333134, 09/13/18; Ludlum L-177 #266938  
07/10/17, 07/02/18; and Thermo Fisher RO-20AA 02/08/17, 02/08/18  
VCS-HPP-0648, Operation and Calibration of the Eberline PM-7: #585 11/09/17; #264 08/9/16,  
07/17/17, and 11/30/17



VCS-HPP-0648, PM7 Calibration Data Sheet: #264, 08/09/16 and 08/09/17  
VCS-HPP-0649, Calibration and Operation of the SAM Tool; #334 08/10/18,  
VCS-HPP-0649, Small Articles Monitor Calibration Report: #334, 03/03/17, 08/08/17, and  
08/08/18  
VCS-HPP-0653, Calibration Certificates: Hand and Foot Monitor #490, 11/03/18 and 11/02/16  
VCS-SAP-0501, Defective Instrument Report, ASP-1 #2194, 02/13/18; and ASP2E #1376,  
06/15/18

#### CAP Documents

17-03725	18-02770	18-00377
17-04099	18-03590	
18-02292	18-03068	

#### **71151 - Performance Indicator Verification**

##### Procedures, Guidance Documents, and Manuals

SPIG-01, Station Performance Indicator Guidelines, Rev. 1  
VCS-HPP-0242, Reporting NRC Performance Indicators, Rev. 0

##### Records and Data Reviewed

Annual Radioactive Effluent Release Report, Virgil C. Summer Nuclear Station, Unit 1, January 1 -  
December 31, 2017  
ED Dose and Dose Rate Alarm Summary Report (CY2017)  
ED Dose and Dose Rate Alarm Summary Report (YTD2018)  
ED DOSE RATE ALARM EVALUATION LOG (VCS\_HPP-04 Enclosure B), March 2017 - October  
2018  
Gaseous and liquid effluent release report summaries for January 2018 - September 2018  
Performance Indicator Data Radiation Safety, July 2017 - July 2018

#### **71152 - Problem Identification and Resolution Trend Review**

CR-17-00198, Operator identified a pinhole leak in the flange downstream of XVB03121A-SW ('A' train EDG)  
CR-18-02364, Operator identified a pinhole leak in field weld below XVB03123B-SW ('B' train CCW Hx)  
CR-18-02706, Operator identified a pinhole leak in pipe tee downstream of XVB03123B-SW  
CR-18-02797, NRC identified a pinhole leak in the pipe tee downstream of XVB03123A-SW ('A' train CCW Hx)  
CR-18-02857, An additional pinhole leak was identified in the pipe tee downstream of XVB03123A-SW  
CR-18-03296, Operator identified a pinhole leak in the flange downstream of XVB03121B-SW ('B' train EDG)  
CR-18-03561, Operator identified 3 additional pinhole leaks (Total of 4) near XVB03121B-SW  
CR-18-03577, Operator identified 1 additional pinhole leak (Total of 5) near XVB03121B-SW  
CR-18-03579, Operator identified 1 additional pinhole leak (Total of 6) near XVB03121B-SW  
CR-18-03735, Operator identified 1 additional leak (Total of 7) near XVB03121B-SW  
CR-18-03736, Operator identified 1 additional leak (Total of 8) near XVB03121B-SW

CR-18-03887, Flange downstream of XVB03121A-SW is not expected to survive another operating cycle without pinhole leaks and requires replacement  
CR-18-04083, Multiple SW pinhole leaks downstream of throttle butterfly valves created operable but degraded conditions; corrective actions and bridging strategies required.  
CR-18-04354, Additional pinhole leak identified on pipe tee below XVB03123A-SW