



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION**  
REGION II  
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November 12, 2021

Mr. Michael Yox  
Regulatory Affairs Director  
Southern Nuclear Operating Company  
7825 River Road, BIN 63031  
Waynesboro, GA 30830

**SUBJECT: VOGTLE ELECTRIC GENERATING PLANT, UNITS 3 AND 4 – NRC INITIAL  
TESTPROGRAM AND OPERATIONAL PROGRAMS INTEGRATED  
INSPECTION REPORTS 05200025/2021005, 05200026/2021005**

Dear Mr. Yox:

On September 30, 2021, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at Vogtle Electric Generating Plant, Units 3 and 4. The enclosed inspection report documents the inspection results, which the inspectors discussed on October 18, 2021 with Mr. Glen Chick, Vogtle 3 & 4 Executive Vice President, and other licensee and contractor staff members.

The inspection examined a sample of construction activities conducted under your Combined License (COL) as it relates to safety and compliance with the Commission's rules and regulations and with the conditions of these documents. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel.

NRC inspectors documented five findings of very low safety significance (Green) in this report. All of these findings involved a violation of NRC requirements. The NRC is treating these violations as noncited violations (NCVs) consistent with Section 2.3.2.a of the Enforcement Policy.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any), will be made available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system ADAMS. ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Should you have any questions concerning this letter, please contact us.

Sincerely,

/RA/

Bradley J. Davis, Chief  
Construction Inspection Branch 2  
Division of Construction Oversight

Docket Nos.: 5200025, 5200026

License Nos: NPF-91, NPF-92

Enclosure: NRC Inspection Report (IR) 05200025/2021005, 05200026/2021005

w/attachment: Supplemental Information

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SUBJECT: VOGTLE ELECTRIC GENERATING PLANT, UNITS 3 AND 4 – NRC INITIAL TEST  
PROGRAM AND OPERATIONAL PROGRAMS INTEGRATED INSPECTION  
REPORTS 05200025/2021004, 05200026/2021004  
DATED: November 12, 2021

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**U.S. NUCLEAR REGULATORY COMMISSION**  
**Region II**

Docket Numbers: 5200025  
5200026

License Numbers: NPF-91  
NPF-92

Report Numbers: 05200025/2021005  
05200026/2021005

Licensee: Southern Nuclear Operating Company, Inc.

Facility: Vogtle Unit 3 & 4 Combined License

Location: Waynesboro, GA

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

Inspectors: J. Eargle, Senior Resident Inspector - Testing, Division of Construction Oversight (DCO)  
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Approved by: Bradley J. Davis, Chief  
Construction Inspection Branch 2  
Division of Construction Oversight

## SUMMARY OF FINDINGS

Inspection Report (IR) 05200025/2021005, 05200026/2021005; 07/01/2021 through 09/30/2021; Vogtle Unit 3 & 4 COL, initial test program and operational programs integrated inspection report.

This report covers a three-month period of announced inspection Inspections, Tests, Analysis, and Inspection Criteria (ITAAC), preoperational test program, startup test program, and operational program inspections by resident and regional inspectors. Five findings were determined to be of very low safety significance (Green) by the inspectors. The significance of most findings is indicated by their color (Green, White, Yellow, or Red) using Inspection Manual Chapter (IMC) 2519, "Construction Significance Determination Process". Cross-cutting aspects are determined using IMC 0613, Appendix F, "Construction Cross-Cutting Areas and Aspects." All violations of NRC requirements are dispositioned in accordance with the NRC's Enforcement Policy and the temporary enforcement guidance outlined in enforcement guidance memorandum 11-006. The NRC's program for overseeing the safe construction of commercial nuclear power reactors is described in IMC 2506, "Construction Reactor Oversight Process General Guidance and Basis Document."

### A. NRC-Identified and Self Revealed Findings

**(Green)** A self-revealed construction finding of very low safety significance with an associated noncited violation (NCV) of Title 10 of the Code of Federal Regulations (10 CFR), Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," was identified for the licensee's failure to accomplish activities in procedure 3-IDSC-SOP-002, "Class 1E AC System – Division C," Version 0 in accordance with procedure NMP-AP-003, "Procedure and Work Instruction Use and Adherence," Version 6.1. The licensee entered this issue into its corrective action program (CAP) as condition report (CR) 50103788, CR 50103789, and CR 50103907.

The performance deficiency was determined to be of more than minor significance and thus a finding because it represented a substantive failure to implement an adequate program, process, procedure, or quality oversight function. The inspectors determined the finding was of very low safety significance (Green) because the event impaired only one train of the IDS. The inspectors determined the finding had a cross-cutting aspect of H.2, Field Presence, in the area of Human Performance. Specifically, senior managers did not ensure that operators performing 3-IDS-SOP-002 had adequate supervisory and management oversight of work activities which led to plant equipment being damaged. [H.2] (Section 1P01)

**(Green)** The NRC inspectors identified a performance deficiency and construction finding of very low safety significance and an associated Severity Level (SL) IV non-cited violation (NCV) of 10 CFR 50.59, "Changes, tests, and experiments," for the licensee's failure to perform a written safety evaluation prior to implementing a change to remove ASME QME-1-2007 commitments from the UFSAR in accordance with procedure ND-LI-VNP-002. The licensee entered this issue into its corrective action program as CR 50098695.

The inspectors determined that the failure to follow procedure ND-LI-VNP-002 to perform a 10 CFR 50.59 evaluation for the removal of ASME QME-1-2007 commitments from the design bases was a violation of 10 CFR 50.59(d)(1), and a performance deficiency. Per the guidance in IMC 0613, Appendix E, "Examples of Minor Construction Issues," the performance deficiency

was determined to be more than minor, and thus a finding, because it represented a substantive failure to establish or implement an adequate program, process, procedure, or quality oversight function. Specifically, the removal of QME-1-2007 for dynamic restraints constituted a more than minimal increase in the likelihood of a malfunction of a structure, system, or component important to safety and there was a reasonable likelihood that the change would have required Commission review and approval prior to implementation in accordance with 10 CFR 50.59(c)(2)(ii). The inspectors determined the finding had a cross-cutting aspect of H.3, Change Management in the area of Human Performance. Specifically, the licensee failed to ensure the process for reviewing the change to remove QME-1-2007 for dynamic restraints was systematic in that all aspects of QME-1-2007 were evaluated for their impact on dynamic restraints. [H.3] (Section 3P01)

**(Green)** NRC inspectors identified a performance deficiency and ITAAC finding of very low safety significance and an NCV of 10 CFR 50.49(e)(5), "Environmental qualification of electric equipment important to safety for nuclear power plants," for the licensee's failure to establish the qualified lives of all nonmetallic components necessary for the completion of the safety function of the squib and main steam isolation (MSI) valves in accordance with procedure APP-GW-G1-002, "AP1000 Equipment Qualification Methodology." The licensee entered this issue into its CAP as CR 50096894.

The performance deficiency was determined to be more than minor, and thus a finding, because it is material to the acceptance criteria of the ITAAC, and the performance deficiency prevented the licensee from meeting the ITAAC Design Commitment. The inspectors determined this finding was of very low safety significance because the finding did not impair a design function of the valves. The inspectors determined no cross-cutting aspect applied because the performance deficiency did not reflect current licensee performance. (Section 3P01)

**(Green)** NRC inspectors identified an ITAAC finding and associated NCV of 10 CFR 50.49.e(5) for the failure to establish the qualified life of the Containment High Range Monitor (CHRM) door gasket in accordance with Institute of Electrical and Electronics Engineers Standard (IEEE) 323-1974. The licensee entered this issue into its CAP as CR 50096896 and CAP-IR-2021-6870 and is working on corrective actions to address the issue.

The performance deficiency was determined to be more than minor, and thus a finding, because it represented an adverse condition that rendered the quality of a system, structure, or component (SSC), unacceptable or indeterminate, and required substantive corrective action. The inspectors determined that the finding was of very low safety significance because the finding was not associated with a system or structure in risk importance table. The inspectors determined the finding was associated with the cross-cutting aspect of "Consistent Process" in the area of Human Performance. Specifically, the licensee failed to use a consistent, systematic approach to make decisions whether the AP1000 harsh environment included wetted environments. [H.13] (Section 3P01)

**(Green)** NRC identified an ITAAC finding and associated violation of 10 CFR 50, Appendix B, Criterion III, for the failure to seismically or environmentally qualify the Electrical Penetration Assemblies (EPAs) in accordance with IEEE 317, Section 6.2.10. Specifically, the licensee failed to test or analyze the as installed assembly including cable configurations, terminations, termination box, raceways, and their respective interactions. The licensee entered this issue into its CAP as CR 50104476 and is working on corrective actions to address the issue

The performance deficiency was determined to be more than minor, and thus a finding, because it represented an adverse condition that rendered the quality of an SSC unacceptable or indeterminate and required substantive corrective action. The inspectors determined the finding was of very low safety significance because the licensee was able to show through additional analysis that the finding did not impact a design function of the EPAs. The inspectors determined the finding was associated with the cross-cutting aspect of "Change Management" in the area of Human Performance. Specifically, the licensee leadership failed to use a systematic process for evaluating and implementing changes to as installed SSCs compared to configurations that were environmentally qualified so that nuclear safety remained the overriding priority. [H.3] (Section 3P01)

## **B. Licensee-Identified Violations**

None

## REPORT DETAILS

### Summary of Plant Construction Status

During this report period for Unit 3, the licensee completed various activities to satisfy aspects of the Vogtle Unit 3 operational programs and initial test program. The licensee completed hot functional testing activities which included testing the reactor coolant system, residual heat removal system, passive core cooling system, main steam system, etc. at elevated temperatures and pressures. The licensee performed post hot functional testing inspection of the reactor internals to ensure that there was no observable damage or loose parts. The licensee performed preoperational and component tests of various SSCs and their control systems, e.g. Class 1E DC and UPS system (IDS), protection and monitoring system (PMS), and plant control system. Additionally, the licensee performed testing of air operated valves and motor operated valves; and performed response time testing of permanently installed plant instrumentation.

During this report period for Unit 4, the licensee continued with integrated flush activities by flushing portions of chemical and volume control system spent fuel pool system (SFS), and RNS. The licensee completed the initial pump runs for the component cooling water system and service water system, and the initial compressor run for the compressed and instrument air system. In addition to continuing with the installation of plant SSCs, the licensee is making preps for the upcoming secondary hydrostatic test.

### 1. CONSTRUCTION REACTOR SAFETY

**Cornerstones: Design/Engineering, Procurement/Fabrication,  
Construction/Installation, Inspection/Testing**

#### IMC 2503, Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC) - Related Work Inspections

##### 1A01 (Unit 4) ITAAC Number C.2.6.09.08a (668) / Family 17A

###### a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number C.2.6.09.08a (668). The inspectors used the following NRC inspection procedure (IP)/sections to perform this inspection:

- 65001.17 – Inspection of ITAAC-related Security Structure, Systems, and Components

The inspectors performed an inspection to determine if the openings in Vogtle Unit 4 vital area barriers for heating, ventilation, and cooling system vents were secured to prevent exploitation of the openings to satisfy the ITAAC and 10 CFR 73.55(e)(4).

The inspectors reviewed the design specifications and associated drawings to identify designated heating, ventilation, and cooling system openings through vital area barriers

and the way they will be secured and monitored. The inspectors examined the physical installation of one heating, ventilation, and cooling system opening (SV4-VAS-AS-04) to the vital area during this inspection period. The inspectors performed direct observation inspection of the opening to determine if it was secured in a manner that would delay or prevent exploitation. Specifically, the inspectors directly inspected the barrier, locking mechanisms, welds, and bolts associated with the opening.

b. Findings

No findings were identified.

IMC 2504, Construction Inspection Program – Inspection of Construction and Operational Programs

1P01 Construction Quality Assurance (QA) Criterion 16

- 35007-A16.04 - Inspection Requirements and Guidance
- 35007-A16.04.02 - Inspection of QA Program Implementation

a. Inspection Scope

The inspectors conducted daily reviews of issues entered into the licensee's CAP to assess issues that might warrant additional follow-up inspection, to assess repetitive or long-term issues, to assess adverse performance trends, and to ensure the CAP appropriately included regulatory required non-safety related SSCs. The inspectors periodically attended the licensee's CAP review meetings, held discussions with licensee and contractor personnel, and performed reviews of CAP activities during the conduct of other baseline inspection procedures. The inspectors reviewed conditions entered into the licensee's CAP to determine whether the issues were classified in accordance with the licensee's quality assurance (QA) program and CAP implementing procedures. The inspectors reviewed corrective actions associated with conditions entered into the CAP to determine whether appropriate actions to correct the issues were identified and implemented effectively, including immediate or short-term corrective actions, in accordance with the applicable QA program requirements and 10 CFR 50, Appendix B, Criterion XVI. Additionally, the inspectors reviewed the corrective actions taken to determine whether they were commensurate with the significance of the associated conditions in accordance with the licensee's CAP implementing procedures. The inspectors completed reviews of CAP entry logs to verify if issues from all aspects of the project, including equipment, human performance, and program issues, were being identified by the licensee and associated contractors at an appropriate threshold and entered into the CAP as required by licensee's CAP implementing procedures. The inspectors performed a focused review on the following condition reports:

- CR 50103788;
- CR 50103789; and
- CR 50103907.

## b. Findings

### Introduction

A self-revealed construction finding of very low safety significance (Green) with an associated noncited violation (NCV) of Title 10 of the Code of Federal Regulations (10 CFR), Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," was identified for the licensee's failure to accomplish activities in procedure 3-IDSC-SOP-002, "Class 1E AC System – Division C," Version 0 in accordance with procedure NMP-AP-003, "Procedure and Work Instruction Use and Adherence," Version 6.1.

### Description

On August 12, 2021, operators were removing IDSC-DU-1 DIV C, 120 VAC Inverter 1, and 3-IDSC-EA-1 DIV C, 120 VAC Distribution Panel 1, from service per procedure 3-IDSC-SOP-002. This procedure was designated as a continuous use procedure. Southern Nuclear Company (SNC) procedure NMP-AP-003, Section 4.3, specifies, in part, that for a continuous use procedure, operators perform all steps in sequence, complete each step before moving to the next step, and sign off each step after completing it and before moving to the next step.

During the performance of procedure 3-IDSC-SOP-002, operators performed Attachment 4, Section 4.2, Step d, to discharge the inverter's capacitor, before completing Step c, to open the inverter's DC input breaker. As a result of performing these steps out of sequence, the internal resistors for the inverter failed and require replacement. The licensee entered this issue into its CAP as CR 50103788, CR 50103789, and CR 50103907.

### Analysis

The inspectors determined the failure to accomplish activities in procedure 3-IDSC-SOP-002 in accordance with procedure NMP-AP-003 was contrary to 10 CFR 50, Appendix B, Criterion V and was a performance deficiency. The performance deficiency was determined to be of more than minor significance and thus a finding because it represented a substantive failure to implement an adequate program, process, procedure, or quality oversight function. Specifically, the licensee failed to perform all steps in sequence, complete each step before moving to the next step, and sign off each step after completing it and before moving to the next step. This caused damage to the inverter due to the internal resistors failing.

The inspectors concluded the finding was associated with the Construction/Installation Cornerstone and assessed the finding in accordance with IMC 2519, "Construction Significance Determination Process," Appendix A, "AP 1000 Construction Significance Determination Process," Section 4. The inspectors determined the finding was associated with the IDS and was of very low safety significance because the event impaired only one train of the IDS.

The performance deficiency did not impact an ITAAC, thus it was determined to be a construction finding.

In accordance with IMC 0613 Appendix F, Construction Cross-Cutting Areas and Aspects,” the inspectors determined the finding had a cross-cutting aspect of H.2, Field Presence, in the area of Human Performance. Specifically, senior managers did not ensure that operators performing 3-IDS-SOP-002 had adequate supervisory and management oversight of work activities which led to plant equipment being damaged.

### Enforcement

10 CFR 50, Appendix B, Criterion V, states in part, “Activities affecting quality shall be prescribed by documented instructions, procedures, or drawings, of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions, procedures, or drawings.”

Contrary to the above, on August 12, 2021, the licensee failed to accomplish activities in procedure 3-IDSC-SOP-002 in accordance with procedure NMP-AP-003. Specifically, when performing 3-IDSC-SOP-002, the licensee failed to perform all steps in sequence, complete each step before moving to the next step, and sign off each step after completing it and before moving to the next step. This finding did not present an immediate safety concern because the issue only affected one of the four divisions, the plant was not operating, and the reactor vessel did not have fuel in it. The inverter was immediately secured and placed the affected division in a safe condition, and further corrective actions that are being executed and tracked by the licensee include troubleshooting and repairs to the inverter's resistors and personnel training. The licensee entered this issue into its CAP as CR 50103788, CR 50103789, and CR 50103907.

Because this violation was not repetitive or willful, was of very low safety significance (Green), and was entered into the licensee's corrective action program, this violation is being treated as a NCV consistent with Section 2.3.2.a of the NRC Enforcement Policy (NCV 05200025/2021005-01, Failure to Follow Procedure 3-IDSC-SOP-001).

## **3. OPERATIONAL READINESS**

### **Cornerstones: Operational Programs**

#### IMC 2503, Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC) - Related Work Inspections

##### 3T01 (Unit 3) ITAAC Number 2.1.02.08b (30) / Family 06D

###### a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 2.1.02.08b (30). The inspectors used the following NRC IPs/sections to perform this inspection:

- 65001.D-02.03-Test Results Review

The inspectors used appropriate portions of the IP to review the results of the following procedure to determine if the reactor coolant pumps (RCPs) have a rotating inertia to provide reactor coolant system (RCS) flow coastdown on loss of power to the pumps. Specifically, the test results were reviewed to verify if they satisfied the applicable quality and technical requirements of the UFSAR and the ITAAC.

- 3-RSC-ITPP-506, "Reactor Coolant Pump and Reactor Coolant Flow Precore Hot Functional," Version (Ver.) 3

b. Findings

No findings were identified.

3T02 (Unit 3) ITAAC Number 2.1.02.09a (41) / Family 14D

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 2.1.02.09a (41). The inspectors used the following NRC IPs/sections to perform this inspection:

- 65001.D-02.03-Test Results Review

The inspectors used appropriate portions of the IP to review the results of the following procedure to determine if the calculated post-fuel load RCS flow rate was greater than or equal to 301,670 gallons per minute. Specifically, the test results were reviewed to verify if they satisfied the applicable quality and technical requirements of the UFSAR and the ITAAC:

- 3-RCS-ITPP-506, Reactor Coolant Pump and Reactor Coolant Flow Precore Hot Functional, Ver. 3

b. Findings

No findings were identified.

3T03 (Unit 3) ITAAC Number 2.1.02.11a.ii (47) / Family 10C

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 2.1.02.11a.ii (47). The inspectors used the following NRC IPs/sections to perform this inspection:

- 65001.D-02.03-Test Results Review

The inspectors used the appropriate portions of the IP to review the results of the following procedure to determine if the remotely operated valves identified as having PMS control performed their active function after receiving a signal from PMS, and that these valves opened within the required times after receipt of an actuation signal. Specifically, the test results were reviewed to verify if they satisfied the applicable quality and technical requirements of the UFSAR and ITAAC.

- B-GEN-ITPCI-039, PMS CIM Component Test Procedure, Ver. 3

b. Findings

No findings were identified.

3T04 (Unit 3) ITAAC Number 2.1.02.12a.iii (55) / Family 07D

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 2.1.02.12a.iii (55). The inspectors used the following NRC IPs/sections to perform this inspection:

- 65001.D-02.03-Test Results Review

The inspectors used appropriate portions of the IP to review the results of the following procedure to determine if the automatic depressurization system stages 1, 2, and 3 motor operated valves changed position under preoperational test conditions. Specifically, the test results were reviewed to verify if they satisfied the applicable quality and technical requirements of the UFSAR and the ITAAC.

- 3-PXS-ITPP-505, "ADS Stages 1-3 Dynamic Test," Revision (Rev.) 1.1

b. Findings

No findings were identified.

3T05 (Unit 3) ITAAC Number 2.1.03.07.i (78) / Family 05D

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 2.1.03.07.i (78). The inspectors used the following NRC IPs/sections to perform this inspection:

- 65001.D-02.02-Test Witnessing

The inspectors used appropriate portions of the IP to observe the licensee's performance of the following procedure used to test if the reactor internals would withstand the effects of flow induced vibration. Specifically, the tests were observed to

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verify if they satisfied the applicable quality and technical requirements of the UFSAR and the ITAAC.

- SV3-CVAP-T2R-100, Vogtle Unit 3 Pre-Hot Functional Test Inspection of Reactor Vessel Internals, Rev. 3.0

b. Findings

No findings were identified.

3T06 (Unit 3) ITAAC Number 2.2.01.11a.iii (116) / Family 07D

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 2.2.01.11a.iii (116). The inspectors used the following NRC IPs/sections to perform this inspection:

- 65001.D-02.02-Test Witnessing
- 65001.D-02.03-Test Results Review

The inspectors used appropriate portions of the IP to observe the licensee's performance of the following procedure used to test if the motor-operated valve performed its active safety-related function to change position under preoperational conditions. Specifically, the tests were observed to verify if they satisfied the applicable quality and technical requirements of the Updated Final Safety Analysis Report (UFSAR) and the ITAAC.

- 3-CCS-ITPP-501, Component Cooling Water System Preoperational Test Procedure, Rev. 2.0

The inspectors used appropriate portions of the IP to review the results of the following procedures to determine if the motor-operated valves performed their active safety-related function to change position. Specifically, the tests were observed to verify if they satisfied the applicable quality and technical requirements of the UFSAR and the ITAAC.

- G-GEN-ITPCM-001, Limitorque SMB/SB Motor Operated Valve Component Testing, Ver. 3.0
- 3-SFS-ITPP-502, Spent Fuel Pool Cooling System Flow Path Preoperational Test Procedure, Ver. 3.1

b. Findings

No findings were identified.

3T07 (Unit 3) ITAAC Number 2.2.01.11b (118) / Family 07D

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 2.2.01.11b (118). The inspectors used the following NRC IPs/sections to perform this inspection:

- 65001.D-02.03-Test Results Review

The inspectors used appropriate portions of the IP to review the results of the following procedures to determine if after loss of motive power, the remotely operated valves assumed the indicated loss of motive power position. Specifically, the test results were reviewed to verify if they satisfied the applicable quality and technical requirements of the UFSAR and the ITAAC.

- B-GEN-ITPCM-017, Air-Operated Valve Test, Ver. 6.1
- B-GEN-ITPCM-001, Limitorque SMB/SB Motor Operated Valve Component Testing, Ver. 4

b. Findings

No findings were identified.

3T08 (Unit 3) ITAAC Number 2.2.03.08b.01 (175) / Family 06D

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 2.2.03.08b.01 (175). The inspectors used the following NRC IPs/sections to perform this inspection:

- 65001.D-02.02-Test Witnessing
- 65001.D-02.03-Test Results Review

The inspectors used the appropriate portions of the IP to observe the licensee's performance of the following procedure used to verify if the passive residual heat removal heat exchanger (PRHR HX) heat transfer rate exceeded the heat transfer rate predicted for the as-tested initial conditions. Specifically, the test was observed to verify if the test satisfied the applicable quality and technical requirements of the UFSAR and the ITAAC.

- 3-PXS-ITPP-504, Passive Core Cooling System Hot Functional Test, Rev. 2.1

The inspectors also used appropriate portions of the IP to review the test results that verified if the PRHR HX heat transfer rate exceeded the heat transfer rate predicted for the as-tested initial conditions. Specifically, the test results were reviewed to determine whether they contained sufficient information to meet the requirements of the UFSAR and ITAAC acceptance criteria.

- 3-PXS-ITPP-504, Passive Core Cooling System Hot Functional Test, Rev. 2.1

b. Findings

No findings were identified.

3T09 (Unit 3) ITAAC Number 2.6.03.04c (603) / Family 08D

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 2.6.03.04c (603). The inspectors used the following NRC IPs/sections to perform this inspection:

- 65001.D-02.02-Test Witnessing

The inspectors used appropriate portions of the IP to observe the licensee's performance of the following procedures used to test if the battery terminal voltage was greater than or equal to 210 Volts after a period of no less than 24 hours with an equivalent load that equals or exceeds the battery bank design duty cycle capacity. Specifically, the tests were observed to verify if they satisfied the applicable quality and technical requirements of the UFSAR and the ITAAC.

- B-GEN-ITPCE-008, "Class 1E and Non-Class 1E Battery testing,"(Division B 125 VDC 24hr Battery 1B, and Division C 250 VDC 24hr and 72hr service tests), Ver. 7

b. Findings

No findings were identified.

IMC 2504, Construction Inspection Program – Inspection of Construction and Operational Programs

3P01 Environmental Qualification

- 51080-02.03 - Inspection Tasks
- 51080-App A - Checklist for Review of Licensee Electrical Environmental Qualification (EQ) Documentation Files
- 51080-App C - EQ of Nonmetallic Parts for Pumps, Valves, and Dynamic Restraints

a. Inspection Scope

The inspectors reviewed the EQ program to verify if the program was established, implemented, and documented in accordance 10 CFR 50.49. The inspectors reviewed program procedures to determine if the licensee had implemented a program to generate, maintain, and distribute the list of electrical and mechanical equipment

requiring EQ. The inspectors reviewed procedures for EQ of nonmetallic parts for pumps, valves, and dynamic restraints to verify if those components were captured in the EQ program in accordance with American Society of Mechanical Engineers (ASME) QME-1-2007. The inspectors sampled EQDPs for low voltage cable splices, junction boxes, and EPAs to verify if the components required for EQ were tested or analyzed in accordance with 10 CFR 50.49.

b. Findings

**NCV 05200025/2021005-02, Failure to Complete 10 CFR 50.59 Evaluation Prior to Altering Dynamic Restraint Qualification Requirements**

Introduction

The NRC inspectors identified a performance deficiency and construction finding of very low safety significance (Green) and an associated Severity Level (SL) IV non-cited violation (NCV) of 10 CFR 50.59, "Changes, tests, and experiments," for the licensee's failure to perform a written safety evaluation prior to implementing a change to remove ASME QME-1-2007 commitments from the UFSAR in accordance with procedure ND-LI-VNP-002.

Description

For initial licensing, the NRC staff relied upon the content of the UFSAR that specified that dynamic restraints would be qualified in accordance with ASME QME-1-2007. After the initial licensing review, the licensee initiated LDCR-2016-107 to remove ASME QME-1-2007 from the UFSAR and thus the licensing basis for dynamic restraints under 10 CFR 50.59. The licensee incorrectly determined it would not be an adverse change to the licensing basis. Changing the qualification basis from ASME QME-1-2007 to ASME BPV Section III removed qualified life requirements for the non-metallic parts of the dynamic restraints.

The licensee compared ASME QME-1-2007, Section QDR, "Qualification of Dynamic Restraints," to ASME Boiler and Pressure Vessel Code (BPV), Section III, Subsection NF, (1998 with 2002). The ASME BPV, Section III covered material compatibility, structural integrity, etc. but did not establish qualified life requirements for the non-metallic parts of dynamic restraints. The licensee failed to consider the lack of requirements for non-metallic parts in ASME BPV, Section III that are in ASME QME-1-2007.

In addition, Section QR in ASME-QME-1-2007 described acceptable methods for qualifying non-metallic parts in pumps, valves, and dynamic restraints without conflict with Section QDR. Following the change, neither the licensee's FSAR nor ASME Boiler and Pressure Vessel Code Section III addressed qualification of non-metallic parts for dynamic restraints. The inspectors concluded that the removal of qualification requirements for dynamic restraints was an adverse change to the facility as described in the UFSAR as it decreased the reliability of dynamic restraint design function over their designated lives.

Based on NEI 96-07, Section 4.3.2, the inspectors concluded that the removal of qualification requirements from dynamic restraints was an adverse change and that a 10 CFR 50.59 safety evaluation should have been performed prior to implementing the change. The inspectors also concluded that the change constituted a more than minimal increase in the likelihood of a malfunction of a structure, system, or component important to safety since the change failed to ensure that the licensee still met other acceptance criteria in ASME QME-1-2007, to which they were committed. As this change was a more than minimal increase, there was a reasonable likelihood that the change would have required Commission review and approval prior to implementation in accordance with 10 CFR 50.59(c)(2)(ii).

The inspectors reviewed licensee procedure ND-LI-VNP-002 and determined that the licensee did not follow its procedure. The procedure made the appropriate references to NEI 96-07 and provided sufficient explanation for the licensee to determine that the change was adverse and that a written evaluation should have been performed. The procedure also had sufficient explanation for the licensee to determine that the change resulted in a more than minimal increase in the likelihood of a malfunction of a structure, system, or component, and that there was a reasonable likelihood that the change required a license amendment. The licensee entered this issue into its corrective action program as CR 50098695.

### Analysis

The inspectors determined that the failure to follow procedure ND-LI-VNP-002 to perform a 10 CFR 50.59 evaluation for the removal of ASME QME-1-2007 commitments from the design bases was a violation of 10 CFR 50.59(d)(1), and a performance deficiency. Per the guidance in IMC 0613, Appendix E, "Examples of Minor Construction Issues," the performance deficiency was determined to be more than minor, and thus a finding, because it represented a substantive failure to establish or implement an adequate program, process, procedure, or quality oversight function. Specifically, the removal of QME-1-2007 for dynamic restraints constituted a more than minimal increase in the likelihood of a malfunction of a structure, system, or component important to safety and there was a reasonable likelihood that the change would have required Commission review and approval prior to implementation in accordance with 10 CFR 50.59(c)(2)(ii).

This finding was a construction finding because the performance deficiency was not material to the acceptance criteria of an ITAAC.

The inspectors determined the finding was associated with the Inspection/Testing Cornerstone and assessed the finding in accordance with IMC 2519, "Construction Significance Determination Process," Appendix A, "AP1000 Construction Significance Determination Process," Section 4. The inspectors determined this finding was of very low safety significance because the finding did not impair a design function.

In accordance with IMC 0613 Appendix F, "Construction Cross-Cutting Areas and Aspects," the inspectors determined the finding had a cross-cutting aspect of H.3, Change Management in the area of Human Performance. Specifically, the licensee failed to ensure the process for reviewing the change to remove QME-1-2007 for

dynamic restraints was systematic in that all aspects of QME-1-2007 were evaluated for their impact on dynamic restraints.

In addition, the Construction Reactor Oversight Process' significance determination process does not specifically consider the regulatory process impact in its assessment of licensee performance. Therefore, it is necessary to address this violation which impedes the NRC's ability to regulate using traditional enforcement to adequately deter non-compliance.

The inspectors determined that the failure to perform a 10 CFR 50.59 evaluation for the removal of ASME QME-1-2007 from the design bases was a violation of 10 CFR 50.59(d)(1). In accordance with Section 6.5 of the NRC Enforcement Policy, the inspectors determined this was a Severity Level IV violation because the conditions of the performance deficiency were evaluated as having very low safety significance.

### Enforcement

10 CFR 52.98 (c)(2) states, in part, that "changes that are not within the scope of the referenced design certification rule are subject to the applicable change processes in 10 CFR part 50, unless they also involve changes to or noncompliance with information within the scope of the referenced design certification rule

10 CFR 50.59(d)(1), "Changes, tests, and experiments," requires, in part, that "licensees shall maintain records of changes to the facility...made pursuant to paragraph (c) of this section. These records must include a written evaluation which provides the bases for the determination that the change, test, or experiment does not require a license amendment pursuant to paragraph (c)(2) of this section."

Contrary to the above, since April 2020, the licensee failed to include a written evaluation prior to making a change to the facility as described in the UFSAR. Specifically, the licensee failed to perform a 10 CFR 50.59 evaluation prior to implementing a change to remove ASME QME-1-2007 from the UFSAR.

The licensee entered this issue into its CAP as CR 50098695 and is working on corrective actions. This issue does not represent an immediate safety concern because there was no fuel in the reactor and the dynamic restraints were not required to perform their safety function at the time of the inspection. Because this violation was not repetitive or willful, and was entered into the licensee's CAP, this violation is being treated as a non-cited violation consistent with Section 2.3.2.a of the NRC Enforcement Policy (NCV 05200025/2021005-02, Failure to Obtain a License Amendment Prior to Altering Dynamic Restraint Qualification Requirements).

## **NCV 05200025/2021005-03, Failure to Demonstrate Qualification of Valve Nonmetallic Parts**

### Introduction

The NRC inspectors identified a performance deficiency and ITAAC finding of very low safety significance (Green) and an NCV of 10 CFR 50.49(e)(5), "Environmental qualification of electric equipment important to safety for nuclear power plants," for the

licensee's failure to establish the qualified lives of all nonmetallic components necessary to the completion of the safety function of the squib and main steam isolation (MSI) valves in accordance with procedure APP-GW-G1-002, "AP1000 Equipment Qualification Methodology." Specifically, a qualified life for the Viton nonmetallic components used in the squib and MSI valves was not established.

### Description

During the review of the qualification reports for the squib and MSI valves, the inspectors determined that the non-metallic parts, specifically Viton seals, were tested without establishing that they had been subjected to artificial aging sufficient to envelop the thermal degradation expected over the installed life of the elastomer. Specifically, the MSI valve Viton elastomers were not thermally aged at all, while the Viton gaskets and O-rings in the squib valve assembly were only thermally aged to an equivalent period of approximately 50% of the desired qualified life.

Prior to testing the valves, the licensee made the determination that the Viton materials were insensitive to the deleterious effects of thermal aging based on the material's long expected life. This determination was not in accordance with licensee procedure APP-GW-G1-002, Sections 3.3.2, "Aging," and 5.2.2, "Thermal Aging," which determined that the aging mechanism for the non-metallic parts met the criteria as a significant aging mechanism and a conservative activation energy should have been applied in the selection and use of thermal aging parameters for test and calculations. Without aging or determining the activation energy of the Viton material, a qualified life wasn't determined.

In addition, the failure to artificially age the squib and MSI valves non-metallic parts failed to account for synergistic effects that are possible when multiple stress environments are applied simultaneously, such as aging, radiation, humidity, vibration, etc., in accordance with Section 3.3.2, "Aging," in licensee procedure APP-GW-G1-002.

By failing to demonstrate that aging was not a significant aging mechanism and account for synergistic effects, the licensee was required to define a qualified life for the Viton O-rings or artificially age them sufficiently to their designated end-of-installed life condition. The licensee entered this issue into its corrective action program as CR 50096894.

### Analysis

The inspectors determined that the failure to follow procedure APP-GW-G1-002 to establish the qualified lives of all nonmetallic components necessary to the completion of the safety function of the squib and MSI valves was contrary to 10 CFR 50.49(e)(5) and was a performance deficiency. Per the guidance in IMC 0613, Appendix E, "Examples of Minor Construction Issues," the performance deficiency was determined to be more than minor, and thus a finding, because it is material to the acceptance criteria of the ITAAC, and the performance deficiency prevented the licensee from meeting the ITAAC Design Commitment. Specifically, the licensee failed to demonstrate that the valves would be able to perform their design basis function for the qualified lives.

This finding is an ITAAC finding because the performance deficiency is material to ITAAC 2.2.04.05a.i and 2.1.02.05a.i. Specifically, the acceptance criteria requires that the components listed in Tables 2.2.4-1 and 2.1.2-1 can withstand the environmental conditions that would exist before, during, and after a design basis accident without loss of safety function for the time required to perform the safety function. By not thermally aging the Viton nonmetallic components, the licensee was not able to demonstrate it could meet the ITAAC.

The inspectors determined that the finding was associated with the Inspection/Testing Cornerstone and assessed the finding in accordance with IMC 2519, "Construction Significance Determination Process," Appendix A, "AP1000 Construction Significance Determination Process," Section 4. The inspectors determined this finding was of very low safety significance because the finding did not impair a design function of the valves.

The inspectors determined no cross-cutting aspect applied because the performance deficiency did not reflect current licensee performance.

### Enforcement

10 CFR 50.49(e)(5) requires, in part, that equipment qualified by test must be preconditioned by natural or artificial aging to its end-of-installed life condition.

Contrary to the above, since 2012, the licensee failed to precondition Viton nonmetallic parts to their end-of-installed life condition. Specifically, for the qualification by test of the squib and MSI valves, the licensee failed to age the Viton elastomers, gaskets, and O-rings to their end-of-installed life conditions.

The licensee entered this issue into its corrective action program as CR 50096894 and is working on corrective actions to address the issue. This issue does not represent an immediate safety concern because there was no fuel in the reactor and these components were not required to perform their safety function at the time of the inspection.

Because this violation was not repetitive or willful, and was entered into the licensee's corrective action program, this violation is being treated as a NCV consistent with Section 2.3.2.a of the NRC Enforcement Policy (NCV 05200025/2021005-03, Failure to Demonstrate Qualification of Valve Nonmetallic Parts).

### **NCV 05200025/2021005-04, Failure to Demonstrate Qualification of Containment High Radiation Monitor Door Gasket**

#### Introduction

NRC identified a Green ITAAC finding and associated NCV of 10 CFR 50.49.e(5) for the failure to establish the qualified life of the Containment High Range Monitor (CHRM) door gasket in accordance with IEEE 323-1974.

#### Description

On July, 19, 2021, the inspectors performed an inspection of APP-RMS-VBR-002, "Equipment Qualification Data Package for the Radiation Monitoring System Containment High Range Monitor and Field Cable Connections at the EPA Feedthroughs for the AP1000 Plant," Rev 0. The CHRM was qualified in accordance with the licensing basis in standard IEEE 323-1974, "IEEE Standard for Qualifying Class 1E Equipment for Nuclear Power Generating Stations," as endorsed by Regulatory Guide (RG) 1.89, "Environmental Qualification of Certain Electric Equipment Important to Safety for Nuclear Power Plants" revision 1. IEEE 323-1974, Section 5, "Principles of Qualification," specified, in part, "principles and procedures for demonstrating the qualification of Class 1E equipment include: ... (2) Assurance that any extrapolation or inference be justified by allowances for known potential failure modes and the mechanism leading to them, ... (6) Qualification of any interfaces associated with Class 1E equipment." Examples of interfaces include "connection boxes, splices, terminal boards, electrical connections, grommets, gaskets, cables, conduits, enclosures, etc."

The EQ documents specified that three different configurations of CHRM interfaces were tested for qualification. One configuration was labeled Equipment Under Test (EUT)1 that represented the installed interface configuration. EUT1 protected the CHRM soft components (connectors and cabling) with a metal connection box and rigid conduits and the various seals including the sensor door gasket. For the EUT2 and EUT3 configurations, the soft components were exposed to the LOCA environment, except for a piece of sheet metal to test the indirect effects of spray and steam on the components. The indirect effects of spray and steam significantly degraded the EUT2 and EUT3 interfaces causing failures of the CHRM functionality due to splitting and blistering in the soft components. Where EUT1 soft components were minimally exposed, due to the test setup, the spray and steam caused localized blistering and splitting in short sections of cabling. The inspectors noted that a qualified life of the door gasket interface even though it was present throughout the test preventing excessive moisture from entering the connection box.

The evaluation of the failures and degradation was documented in report APP-RMS-J7C-009, "AP1000 Radiation Monitoring System LOCA Test Engineering Evaluation for the Electrical Penetration Feedthroughs." The report Section 4, stated, in part, that "there were no significant material differences" in the connectors between the three configurations. Section 5.3, specified, that what caused the failures during the tests was "the presence of spray rather than steam. Spray only needs to be postulated in the vicinity of the break" [*loss of coolant accident (LOCA) pipe break*]. The inspectors noted that this statement regarding the "spray only needs to be postulated in the vicinity of the break," inferred that spray is only associated with a LOCA pipe break and leaves out the containment spray systems. The spray simulation in the qualification test is for containment spray system in accordance with RG 1.89 regulatory position C.2.b. The AP1000 design is to condense and recirculate the LOCA atmosphere causing a showering effect similar to a containment spray system. The report, Section 5.3, indicated that it was the wetting of the components from "Excessive Exposure (Spray rather than steam) and Excessive Exposure (Boric Acid and TSP rather than neutral)," that caused the EUT failures. Finally, the report, Section A.2, stated, in part, the EUT1 "gasket is not a herm[e]tic seal. There is a path for communication between the outside environment and the environment inside the box. Mineral cloth wrapped around the cable connections was in good condition. Practically dry with only traces of soaking at the bottom."

The licensee justified not determining a qualified life for the door gasket based on the statements in Section A.2 above. The licensee inference was not justified because it failed to credit the door gasket preventing excessive moisture from entering the connection box during the test, and that spray was not a direct result of the LOCA break but rather containment spray similar to AP1000 condensate rain showering.

Not crediting the seals used during qualification did not meet the principles of qualification in IEEE 323-1974 Section 5. Without a gasket, the CHRM soft components could be exposed to the same degradation as the EUTs that failed the testing. The inspectors determined that the qualification for the CHRM, as tested, was in part based on the performance of the gasket, however, the qualification of the CHRM excluded the known potential failure modes (aging) of the gasket to determine the qualified life of the gasket as required by IEEE 323-1974. The licensee entered this issue into its CAP as CR 50096896 and CAP-IR-2021-6870 and is working on corrective actions to address the issue.

### Analysis

The failure to consider the known potential failure modes (aging) of the CHRM door gasket to determine a qualified life in accordance with IEEE 323-1974 was contrary to 10 CFR 50.49(e)5 and a performance deficiency. Per the guidance in IMC 0613, Appendix E, "Examples of Minor Construction Issues," the performance deficiency was determined to be more than minor, and thus a finding, because it represented an adverse condition that rendered the quality of an SSC, unacceptable or indeterminate, and required substantive corrective action. Specifically, the failure to consider the known potential failure modes (aging) of the CHRM door gasket to determine a qualified life represented an adverse condition that rendered the quality of the CHRM unacceptable or indeterminate.

The inspectors determined the performance deficiency was material to the acceptance criteria of ITAAC index 823 (3.5.00.01.i). The applicable acceptance criterion of ITAAC 3.5.00.01.i requires, in part, that a report exists and concludes that Class 1E equipment identified in Table 3.5-1 as being located in a harsh environment can withstand the environmental conditions that would exist before, during, and following a design basis accident without loss of safety function for the time required to perform the safety function.

The inspectors determined that the CHRMs identified in Table 3.5-1 as PXS-RE (160, 161, 162, and 163) were not qualified to withstand the environmental conditions that would exist during and following a design basis accident without loss of safety function for the time required to perform the safety function.

The inspectors determined the finding was associated with the Construction/Installation cornerstone of the Construction Reactor Safety strategic performance area. The inspectors assessed the finding using IMC 2519, Appendix A, "AP1000 Significance Determination Process," dated October 26, 2020, and determined that the finding was not associated with a security program determined, the finding was not associated with the failure to properly implement an IMC 2504 operational/construction program; and it

was not associated with a repetitive, NRC-identified omission of a program critical attribute.

The inspectors determined the finding was a performance deficiency with a significance very low safety significance, GREEN, because the finding was not associated with a system or structure in risk importance table.

The inspectors determined the finding was indicative of present licensee performance and was associated with the cross-cutting aspect of "Consistent Process" in the area of Human Performance, in accordance with IMC 0613, Appendix F, "Construction Cross-Cutting Areas and Aspects," dated November 4, 2020. Specifically, the licensee failed to use a consistent, systematic approach to make decisions whether the AP1000 harsh environment included wetted environments. [H.13].

### Enforcement

10 CFR Part 50.49.e(5), "Aging," required, in part, that "equipment qualified by test must be preconditioned by natural or artificial (accelerated) aging to its end-of-installed life condition. Consideration must be given to all significant types of degradation which can have an effect on the functional capability of the equipment.

Contrary to the above, since October 2020, the licensee failed to precondition equipment qualified by test by natural or artificial (accelerated) aging to its end-of-installed life condition and consider all significant types of degradation which can have an effect on the functional capability of the equipment. Specifically, the licensee failed to consider the known potential failure modes (aging) of the CHRM door gasket to determine its qualified life which can have an effect on the functional capability of the CHRM.

The licensee entered this issue into its CAP as CR 50096896 and CAP-IR-2021-6870 and is working on corrective actions to address the issue. This issue does not represent an immediate safety concern because there was no fuel in the reactor and these components were not required to perform their safety function at the time of the inspection.

Because this violation was not repetitive or willful, and was entered into the licensee's corrective action program, this violation is being treated as a NCV consistent with Section 2.3.2.a of the NRC Enforcement Policy (NCV 05200025/2021005-04, Failure to Demonstrate Qualification of Containment High Radiation Monitor Door Gasket).

### **NCV 05200025/2021005-05, Failure to Qualify EPAs in Accordance with IEEE 317**

#### Introduction

NRC identified a Green ITAAC finding and associated violation of 10 CFR 50, Appendix B, Criterion III, for the failure to seismically or environmentally qualify the EPAs in accordance with IEEE 317, Section 6. Specifically, the licensee failed to test or analyze the as installed assembly including cable configurations, terminations, termination box, raceways, and their respective interactions.

## Description

On July 9, 2021, the inspectors reviewed EQDP SV3-EY01-VBR-004, "Low Voltage Power, Control, and I&C Electrical Penetration Assemblies," Rev 4, to determine the methods of the seismic and environmental qualification used for the low voltage EPAs. The inspectors determined that the qualification was performed using testing combined with analysis, and the tests were conducted on a partial prototype EPA without the interfaces of the terminal boxes or raceways. In addition, the inspectors determined the tested external cable configuration was different than that of the as-installed condition. The review of the tests determined that the prototype EPA was flexible, and these interfaces could make the complete EPA more flexible with more degrees of freedom. The review of the analyses in the EQDP Section 4, "Qualification by Analysis," determined the analysis used to support the testing also did not model the EPA with these interfaces either or provide justification as to why there would be no impacts. The analysis only considered a linear length of cable and connector, but did not consider the termination box, raceway, or as-installed configuration of the external cables.

The EQDP indicated that the EPAs were qualified in accordance with IEEE 317-1987. By failing to include the interfaces in the qualification, the licensee did not meet the requirements in IEEE 317, Sections 6.1.3 and 6.2.10. These sections describe that the test configuration of the EPA be representative of the design being qualified, and that the tested configuration include consideration of terminal boxes, external cables, and raceways.

Additional analysis was performed to qualify the EPAs, which was conducted in accordance with IEEE 323 and 344-1987. The analysis failed to provide justification as to why the configuration with terminal boxes, external cables, and raceways had no impact. The analysis did not represent the dynamic properties nor evaluated the nonlinear behavior that could potentially exist between the components. This was necessary to determine the responses of the complete EPA and the potential interactions of the equipment and interfaces from those responses.

In addition, the EQDP, Subsection 4.6, "Maximum Unsupported Cable Length Analysis, [APP-EY01-V7R-001, "Archival of MIRION IPS-2545, EPA Analysis," Rev. 0]" extended the maximum unsupported cable length for partial prototype EPAs. Based on their review, the inspectors found that the Mirion prototype model used to extend the cable length for the AP1000 EPAs did not consider or model the interfaces between the termination box, raceways, and external cables. Based on the flexibility identified during the Mirion prototype testing, the components should have been included in the tested configuration or justification provided as to why there would be no additional impacts. In addition, this analysis inappropriately analyzed test data from a similar EPA to extrapolate benchmark acceptance criteria for cable length using the static coefficient method. This was an unsuitable approach to reasonably estimate the nature and magnitude of deformations that may have occurred from the tested EPA, cables, and terminations, while implying that the extrapolated results were conservative.

The inspectors determined that the combination of testing and analysis in the EQDP brought into question the qualification of the EPA with the included interfaces. Without test, mathematical model, or an analysis that provides logical proof that the interfaces

would not impact the design or function of the EPA, the inspectors were unable to verify the seismic or environmental qualification of the EPAs. The licensee entered this issue into its CAP as CR 50104476 and performed additional analysis to show that the finding did not impact a design function of the EPAs.

### Analysis

The failure to seismically or environmentally qualify the EPAs in accordance with IEEE 317, Section 6.2.10 was contrary to 10 CFR 50, Appendix B, Criterion III and a performance deficiency. Per the guidance in IMC 0613, Appendix E, "Examples of Minor Construction Issues," the performance deficiency was determined to be more than minor, and thus a finding, because it represented an adverse condition that rendered the quality of an SSC unacceptable or indeterminate and required substantive corrective action. Specifically, the failure to consider all significant types of degradation that could have an adverse impact on EPA functional capability for environmental and seismic qualification could allow unacceptable degradation during a design basis accident.

The inspectors determined this performance deficiency was material to the acceptance criteria of an ITAAC. The acceptance criterion of ITAAC 2.2.01.05.i requires, in part, that the as-built equipment including anchorage is seismically bounded by the tested or analyzed conditions, and a report exists and concludes that the as-built Class 1E equipment and the associated wiring, cables, and terminations identified in Table 2.2.1-1 as being qualified for a harsh environment are bounded by type tests, analyses, or a combination of type tests and analyses. The inspectors determined that the as built equipment, identified in Table 2.2.1-1, including anchorage was not seismically bounded by the tested or analyzed conditions, and the Class 1E equipment was not bounded by type tests, analyses, or a combination of type tests and analyses.

The inspectors determined the finding was associated with the Construction/Installation cornerstone of the Construction Reactor Safety strategic performance area. The inspectors assessed the finding using IMC 2519, Appendix A, "AP1000 Significance Determination Process," dated October 26, 2020, and determined that the finding was not associated with a security program determined, the finding was associated with the failure to properly implement an IMC 2504 operational/construction program; and it was not associated with a repetitive, NRC-identified omission of a program critical attribute.

The inspectors determined the finding was a performance deficiency with a very low safety significance because the licensee was able to show through additional analysis that the finding did not impact a design function of the EPAs.

The inspectors determined the finding was indicative of present licensee performance and was associated with the cross-cutting aspect of "Change Management" in the area of Human Performance, in accordance with IMC 0613, Appendix F, "Construction Cross-Cutting Areas and Aspects," dated November 4, 2020. Specifically, the licensee leadership was not using a systematic process for evaluating and implementing changes to as-installed SSCs compared to configurations that were environmentally qualified so that nuclear safety remained the overriding priority [H.3].

### Enforcement

10 CFR 50 Appendix B, Criterion III, "Design Control," required, in part, "design control measures shall provide for verifying or checking the adequacy of design, such as by the performance of design reviews, by the use of alternate or simplified calculational methods, or by the performance of a suitable testing program."

Since October 2020, the licensee qualification program failed to provide design control measures for verifying or checking the adequacy of EPA design, such as by the use of alternate or simplified calculational methods, or by the performance of a suitable testing program. Specifically, the licensee failed to provide design control measures through testing or analysis for verifying or bounding the impacts of the termination box, raceways, terminations, their interfaces, and their interactions on the EPA assembly as whole for seismic and environmental qualification.

The licensee entered this issue into its corrective action program as CR 50104476 and is working on corrective actions to address the issue. This issue does not represent an immediate safety concern because there was no fuel in the reactor and these components were not required to perform their safety function at the time of the inspection.

Because this violation was not repetitive or willful, and was entered into the licensee's CAP, this violation is being treated as a NCV consistent with Section 2.3.2.a of the NRC Enforcement Policy (NCV 05200025/2021005-05, Failure to Qualify EPAs in Accordance with IEEE 317).

### 3P02 Fire Protection Program

- 64705-02.01 - Implemented Operational Feature of the Fire Protection Program
- 64705-02.02 - Adequacy and operational readiness

#### a. Inspection Scope

The inspectors reviewed aspects of the licensee's fire protection program to determine if reasonable assurance existed at the time of the inspection to verify that the reviewed aspects of the program will meet the requirements of 10 CFR 50.48, Fire Protection, once fully implemented after the 10 CFR 52.103(g) finding. The inspectors reviewed the site's fire protection program document, fire hazards analysis, and fleet and site-specific procedures to determine if the requirements of Branch Technical Position CMEB 9.5-1 were incorporated into the fire protection program.

Specifically, the inspectors reviewed various aspects of the fire protection program to determine if:

- the program provided for returning the nonfunctional equipment to service in a reasonable period of time,
- the licensee performed a post-fire SSD analysis, and that the analysis demonstrated that the SSCs important to safety can accomplish their respective post-fire SSD functions,
- the site's fire protection program required all changes to the program to be reviewed and documented to determine that the change does not adversely

affect the ability to achieve and maintain safe shutdown in the event of a fire, and

- the licensee's fire protection program and change process were adequate to ensure that all necessary program documents, calculations, etc. are updated as a result to any change to the program.

b. Findings

No findings were identified.

3P03 Inservice Testing

- 73758-App A - Appendix A, Review of Functional Design, Qualification, and Preservice Testing/Inservice Testing (PST/IST) Programs for Pumps, Valves, and Dynamic Restraints
- 73758-App B - Appendix B, Implementation of Functional Design and Qualification Program for Pumps, Valves, and Dynamic Restraints

a. Inspection Scope

The inspectors reviewed procedure NMP-ES-013-007, IST Program Data Trending and Evaluation, and verified that it was in compliance with the ASME OM Code and supports the implementation of the Vogtle 3&4 IST Program. Specifically, NMP-ES-013-007 is a Southern Nuclear Fleet procedure that was updated to add applicability to Vogtle Units 3&4.

b. Findings

No findings were identified.

3P04 Preservice Inspection

- 73754-02.02 - Personnel Qualification & Certification
- 73754-02.03 - Non-destructive Examination (NDE) Review

a. Inspection Scope

The inspectors observed volumetric ultrasonic NDE on the direct vessel injection A/B line to verify if the NDE was conducted in accordance with approved procedures. The inspectors also reviewed the equipment and personnel qualifications.

b. Findings

No findings were identified.

3P05 Preservice Testing

- 73758-App A - Appendix A. Review of Functional Design, Qualification, and PST/IST Programs for Pumps, Valves, and Dynamic Restraints
- 73758-App B - Appendix B. Implementation of Functional Design and Qualification Program for Pumps, Valves, and Dynamic Restraints

a. Inspection Scope

The inspectors performed the following activities related to the development and implementation of the Functional Design and Qualification Program for pumps, valves, and dynamic restraints that will perform safety-related functions at Vogtle Units 3 & 4:

- The inspectors reviewed motor-operated valve (MOV) design specifications, application report, functional qualification report, and other documents, related to the qualification of a sample of motor-operated butterfly valves at Vogtle Units 3 & 4. The inspectors discussed the MOV qualification activities described in these documents with licensee staff and contractors. On this basis, the inspectors determined that the licensee satisfied the design specification provisions for implementing ASME Standard QME-1-2007, which the NRC accepted in Regulatory Guide 1.100 (Revision 3), for the MOVs listed below:
  - NPS 10 Class 150 TRICENTRIC® Butterfly Valves with Limatorque Motor Actuators
- The inspectors reviewed design specifications, application reports, functional qualification reports, equipment qualification reports and data packages, and other documents, related to the qualification of a sample of pyrotechnic-actuated (squib) valves at Vogtle Units 3 & 4. The inspectors discussed the qualification activities described in these documents with licensee staff and contractors. For example, the inspectors verified that the qualification analysis addressed the capability of the piping system to withstand the combined loads (including end loading) during actuation of the squib valves. Further, the inspectors confirmed that the post-installation performance of the squib valves is addressed by lot testing of active parts of the squib valves, such as actuator cartridges, tension bolts, and shear caps. On this basis, the inspectors determined that the licensee satisfied the design specification provisions for implementing ASME Standard QME-1-2007, which the NRC accepted in Regulatory Guide 1.100 (Rev. 3), for the squib valves listed below:
  - 8-inch Class 150 and Class 2500 Squib Valves
  - 14-inch Class 2500 Squib Valves

b. Findings

No findings were identified.

- 50054-02.02 - Specific Requirements

a. Inspection Scope

The inspectors performed a walkdown of the capsule brackets to verify if they were installed in accordance with the design. The inspectors observed the locations of the capsule brackets to verify if they were installed in accordance with the design drawings. The inspectors also visually reviewed the vessel material samples to verify if the samples were the material specified in the design specification. The inspectors observed the installation of the vessel material samples to verify if they were installed in accordance with the installation procedure.

b. Findings

No findings were identified.

**4. OTHER INSPECTION RESULTS**

4OA5 Other Activities

.01

a. Inspection Scope

The inspectors reviewed the corrective actions associated NCV 0520025/2021002-02, Failure to Use Worst Case Load Profile for IDS Battery Service Test, (CR 50080247) to verify if the violation was corrected. Specifically, the inspectors reviewed 3-IDS-ITPP-501, "Class 1E DC and UPS Preoperational Testing," to verify if the worst-case load profile was used for the battery service tests.

b. Findings

No findings were identified.

.02

a. Inspection Scope

The inspectors reviewed corrective actions developed and implemented by the licensee to verify if the violation identified as 05200025/2020009-01, Failure to Complete Containment Prior to Unit 3 ILRT, was corrected.

b. Findings

No findings were identified.

4OA6 Meetings, Including Exit

.1 Exit Meeting.

On October 18, 2021, the inspectors presented the inspection results to Mr. G. Chick, Vogtle 3&4 Executive Vice President, and other licensee and contractor staff members. Proprietary information was reviewed during the inspection period but was not included in the inspection report.

## **SUPPLEMENTAL INFORMATION**

### **KEY POINTS OF CONTACT**

#### **Licenses and Contractor Personnel**

A. Nix, NI Manager  
K. Roberts, ITAAC Manager  
M. Hickox, Test Support Manager  
C. Alexander, Milestone Manager  
S. Boyle, Milestone Manager  
D. Pagan-Diaz, ITP Turnover. Manager  
J. Olsen, NI Supervisor  
N. Kellenberger, SNC Licensing Supervisor  
C. Castell, SNC Licensing Engineer  
N. Patel, SNC Licensing Engineer  
J. Cole, SNC Licensing Engineer  
J. Weathersby, SNC Licensing Engineer  
C. Main, ITAAC Project Manager  
D. Wade, ITAAC Project Manager  
B. Macioce, Principle Engineer Digital Testing  
R. McKay, ITP Test Engineer  
S. Turner, ITP Test Engineer  
G. Weaver, ITP Test Engineer  
R. Nicoletto, ITP Test Engineer  
W. Pipkins, ITP Test Engineer  
D. Melton, ITP Test Engineer  
R. Espara, ITP Test Engineer  
J. Clark, ITP Test Engineer  
K. Morgan, ITP Test Engineer

### **LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED**

<u>Item Number</u>	<u>Type</u>	<u>Status</u>	<u>Description</u>
05200025/2021005-01	NCV	Open/Closed	Failure to Follow Procedure 3-IDSC-SOP-002
05200025/2021005-02	NCV	Open/Closed	Failure to Obtain a License Amendment Prior to Altering Dynamic Restraint Qualification Requirements
05200025/2021005-03	NCV	Open	Failure to Demonstrate Qualification of Valve Nonmetallic Parts

05200024/2021005-04	NCV	Open	Failure to Demonstrate Qualification of Containment High Radiation Monitor Door Gasket
05200025/2021005-05	NCV	Open	Failure to Qualify EPAs in Accordance with IEEE 317
05200025/2020009-01	NCV	Closed	Failure to Complete Containment Prior to Unit 3 ILRT
05200025/2021002-02	NCV	Closed	Failure to Use Worst Case Load Profile for IDS Battery Service Test

## LIST OF DOCUMENTS REVIEWED

### Section 1

#### Section 1A01

APP-VAS-MD-659, Auxiliary Building Area 5 Elevation 153'0" VAS Duct ISO View, Rev. 9  
 APP-MD03-V2-850003, DFDAF-330 Damper Schedule, Rev. 15  
 APP-MD03-V2-850006, Fire Damper Grating Assembly, Rev. 1  
 APP-AB01-AB-010, Blockouts and Barriers (Penetrations, Seals and Fire Stops) Details Sheet 10, Rev. 4  
 APP-AB01-AB-012, Blockouts and Barriers (Penetrations, Seals and Fire Stops) Details Sheet 12, Rev. 0  
 Engineering & Design Coordination Report No. APP-FSAR-GEF-061, Addition of AS04 Specialty Device Detail to HVAC, Rev. 0  
 Engineering & Design Coordination Report No. APP-SES-GEF-031, Updates to Barrier Matrix, Rev. 0  
 APP-AS21-A1-001, AP1000 Security Barrier Design Requirements, Rev. 1  
 APP-GW-MD-103, HVAC Details Sheet 1, Rev. 1

#### Section 1P01

NMP-AP-003, Procedure and Work Instruction Use and Adherence, Version 6.1  
 3-IDSC-SOP-002, Class 1E AC System - Division C, Version 0

## 3. OPERATIONAL READINESS

#### Section 3T01

ND-21-0627, ITAAC Closure Notification on Completion of Item 2.1.02.08b [Index Number 30], 08/2021  
 SV3-RCS-ITR-800040, Unit 3 Recorded Results of RCS Flow Coastdown Flow Measurement Test: ITAAC 2.1.02.08b, NRC Index Number: 30, 08/2021  
 SV3-RCS-T2C-5063, Vogtle Unit 3 RCS Flow Coastdown Preoperational Testing Results Validation, Rev. 0

SV3-RCS-T2R-5063, Vogtle Unit 3 RCS Flow Coastdown Preoperational Testing Summary Report, Rev. 0  
Work Order 1071744  
2.1.02.08b-U3-CP, ITAAC Completion Package, Rev. 0

### **Section 3T02**

3-RCS-ITPP-506, Reactor Coolant Pump and Reactor Coolant Flow Precore Hot Functional, Ver. 3.0  
SV3-RCS-T2C-5061, Component, Hot Leg, Elbow, and Cold Leg Bend Differential Pressure Flow Calculation from Vogtle Unit 3 Hot Functional Testing, Rev. 0  
SV3-RCS-T2R-5061, Vogtle Unit 3 Hot Functional Testing – Reactor Coolant System Flow Summary Report, Rev. 0  
ND-21-0632, ITAAC Closure Notification on Completion of 2.1.02.09a [Index Number 41], 08/2021  
SVP-SV0-006408, Completion Package for ITAAC 2.1.02.09a , 07/2021

### **Section 3T03**

ND-20-0749, ITAAC Closure Notification on Completion of ITAAC 2.1.02.11a [Index Number 47], 08/2021  
ITAAC Technical Reports:  
SV3-RCS-ITR-800047, Unit 3 Recorded Results of Remotely Operated RCS Valves Controlled by PMS and the Main Control Room: ITAAC 2.1.02.11a.ii Item 11.a and 11.b, NRC Index Number: 47, Rev. 0  
SV3-RCS-ITR-801047, Unit 3 Recorded Results of Remotely Operated RCS Valves Response to Loss of Motive Power: ITAAC 2.1.02.11a.ii Item 12b, NRC Index Number: 47, Rev. 0  
Work Package SV3-RCS-T0W-SNC921644, Perform ITAAC 2.1.02.11a.ii Item 10  
2.1.02.11a.ii-U3-CP, ITAAC Completion Package, Rev. 0  
B-GEN-ITPCI-001, PMS Cabinets, Ver. 1.2

### **Section 3T04**

3-PXS-ITPP-505, “ADS Stages 1-3 Dynamic Test,” Rev. 1.1  
WO 1071720  
ND-21-0625 ITAAC Closure Notification on Completion of 2.1.02.12a.iii [Index Number 55], 07/2021  
2.1.02.12a.iii-U3-CP, ITAAC Completion Package, Rev. 0

### **Section 3T05**

SV3-CVAP-T2R-100, Vogtle Unit 3 Pre-Hot Functional Test Inspection of Reactor Vessel Internals, Rev. 3.0  
3-RXS-ITPP-501, Pre- and Post-Hot Functional Test Inspection of Reactor Vessel Internals, Rev. 3.0  
WO 1061754  
CR 50104315  
CR 50103428  
TE 60029420  
ESR 50104314

## **Section 3T06**

3-CCS-ITPP-501, Component Cooling Water System Preoperational Test Procedure, Rev. 2.0  
3-CNS-ITPP-503, LLRT Containment Leak Rate Test Type C, Rev. 3.0  
WO 1048157SV3-CNS-ITR-800116, Unit 3 Recorded Results of CCS Motor-Operated Valves Change Position as Indicated in Table 2.21-1: ITAAC 2.2.01.11a.iii, Rev. 0  
G-GEN-ITPCM-001, Limitorque SMB/SB Motor Operated Valve Component Testing, Ver. 3.0  
SV3-CNS-ITR-801116, Unit 3 Recorded Results of SFS Motor-Operated Valves Change Position as Indicated in Table 2.21-1: ITAAC 2.2.01.11a.iii, Rev. 0  
3-SFS-ITPP-502, Spent Fuel Pool Cooling System Flow Path Preoperational Test Procedure, Ver. 3.1

## **Section 3T07**

ND-21-0745, ITAAC Closure Notification on Completion of ITAAC 2.2.01 .11 b [Index Number 118], 08/2021  
ITAAC Technical Reports (ITRs):  
SV3-CNS-ITR-800118, Unit 3 Test Results for CAS Containment Isolation Valves Loss of Motive Power Testing: ITAAC 2.2.01.11 b, NRC Index Number: 118, Rev. 1  
SV3-CNS-ITR-801118, Unit 3 Test Results for CCS Containment Isolation Valves Loss of Motive Power Testing: ITAAC 2.2.01.11 b, NRC Index Number: 118, Rev. 0  
SV3-CNS-ITR-802118, Unit 3 Test Results for SFS Containment Isolation Valves Loss of Motive Power Testing: ITAAC 2.2.01.11 b, NRC Index Number: 118, Rev. 0  
SV3-CNS-ITR-803118, Unit 3 Test Results for VFS Containment Isolation Valves Loss of Motive Power Testing: ITAAC 2.2.01.11 b, NRC Index Number: 118, Rev. 1  
SV3-CNS-ITR-804118, Unit 3 Test Results for VWS Containment Isolation Valves Loss of Motive Power Testing: ITAAC 2.2.01.11 b, NRC Index Number: 118, Rev. 1  
SV3-CNS-ITR-805118, Unit 3 Test Results for WLS Containment Isolation Valves Loss of Motive Power Testing: ITAAC 2.2.01.11 b, NRC Index Number: 118, Rev. 1  
2.2.01 .11 b-U3-CP, ITAAC Completion Package, Rev. 0

## **Section 3T08**

3-PXS-ITPP-504, Passive Core Cooling System Hot Functional Test, Rev. 2.1  
3-GEN-ITPP-517, Precore Hot Functional Test Procedure, Rev. 5.0  
WO 1071719  
2.2.03.08b.01-U3-CP, ITAAC Completion Package, Rev. 0  
ND-21-0868, ITAAC Closure Notification on Completion of ITAAC 2.2.03.08b.01 [NRC Index Number 175], 09/2021  
SV3-PXS-T2C-011, Vogtle Unit 3 PXS Hot Functional Test Results Validation for PRHR Performance, Rev. 0  
SV3-PXS-ITR-800175, Unit 3 Recorded Results of PRHR Heat Exchanger Heat Transfer Rate Test: ITAAC 2.2.03.08b.01, Rev. 0

## **Section 3T09**

B-GEN-ITPCE-008, "Class 1E and Non-Class 1E Battery testing,"(Divisions A and B 125 VDC 24hr Battery 1B only), Ver. 7  
APP-DB01-Z0-001, "Design Specification for Class 1E 250 VDC Batteries and Racks," Rev. 10  
3-IDS-ITPP-501, "Class 1E DC and UPS Preoperational Testing," Ver. 5.1  
CR 50080247

## Section 3P01

APP-GW-G0X-003, AP1000 Commodity Locator Codes, Rev. 11  
APP-GW-G1X-001, Governing AP1000 Design Codes and Standards, Rev. 10  
APP-GW-VP-010, Equipment Qualification Methodology and Documentation Requirements for AP1000 Safety-Related Valves and Valve Appurtenances, Rev. 3  
CR 50098695  
LDCR-2016-107, Snubber Qualification Changes, Rev. 2  
LDCR-2016-107, Snubber Qualification Changes, Rev. 1  
APP-GW-VPD-002, AP1000 Safety Related Component List, Rev. 11  
APP-GW-G1-002, AP1000 Plant Equipment Qualification Methodology, Rev. 3  
APP-GW-N2C-009, Beta Reduction Factors and Gamma Equivalency for Various Shielding Materials, Rev. 0  
APP-PV70-T5-001, Qualification Plan for Safety-Related Squib Valve Actuators, Electrical Connector Assemblies, and Bracket Assemblies for Westinghouse Electric Company for use in Westinghouse AP1000 Nuclear Power Plants, Rev. 5  
LTR-EQ-18-23, Activation Energy for TE Connectivity Splice Materials, 05/22/2018  
ND-AD-002, Nuclear Development Corrective Action Program, Rev. 29.1  
ND-EN-VNP-006, Equipment Qualification Data Package (EQDP) Review and Acceptance, Rev. 4.0  
ND-LI-VNP-002, Applicability Determination and 50.59 / Departure Screening for VEGP 3&4, Rev. 18  
ND-LI-VNP-002-F06, 50.59 / Departure Screening for Vogtle 3&4, Rev. 6  
ND-LI-VNP-003, 50.59 / Departure Evaluations for Vogtle 3&4, Rev. 8.0  
ND-LI-VNP-007, Licensing Document Change Requests for VEGP 3&4, Rev. 10  
NMP-AD-008, Applicability Determinations, Rev. 21.1  
SV0-EY20-VPC-001, Vogtle Units 3 and 4 EY20 Cale Splice Thermal Aging and Post-DBA Aging Calculation, Rev. 0  
APP-PV64-Z0-001, Design Specification Main Steam Isolation, ASME BPVC, Section III, Class 2, Rev. 7  
APP-PV70-Z0-001, Squib (Pyrotechnic Actuated) Valves, ASME Boiler and Pressure Vessel Code Section III, Class 1, Rev. 7  
App-SS30-Z0-002, Design and Fabrication Requirements for Hydraulic Shock Absorbers (Snubbers), Rev. 4  
APP-EY20-VBR-002, Equipment Qualification Data Package for Class 1E Low Voltage Cable Splices for Use in the AP1000 Plant, Rev. 0  
APP-PV64-VBR-012, Equipment Qualification Data Package for Main Steam Isolation Valves for Use in the AP1000 Plant, Rev. 0  
APP-PV70-VBR-005, Equipment Qualification Data Package for 14" Squib Valves for Use in the AP1000 Plant, Rev. 1  
SV3-1050-P2-0014, Nuclear Island Containment and Shield BLDG General Arrangement Operating Deck EL 135'-3, Rev. 5  
SV3-PMS-VPR-009, Mild Environment Abnormal Temperature and Relative Humidity Extremes Report for NIS and RMS Cable Connection Assemblies for Use in the AP1000 Plant, Rev. 0  
SV3-EJ01-VBR-002, Equipment Qualification Data Package for EJ01 Class 1E Junction Boxes for Use in the AP1000 Plant, Rev. 0  
SV3-EY20-VBR-002, Low Voltage Cable Splices, Rev. 0  
SV3-1050-P2-0014 Nuclear Island Containment and Shield BLDG General Arrangement Operating Deck EL 135'-3, Rev. 5

SV3-PMS-VPR-009 Mild Environment Abnormal Temperature and Relative Humidity Extremes Report for NIS and RMS Cable Connection Assemblies for Use in the AP1000 Plant, Rev. 0  
SV3-RMS-V0-001 AP1000 Radiation Monitoring System Vendor Outline Drawing Package, Rev. 1  
SV3-RMS-VBR-002 Equipment Qualification Data Package for the Radiation Monitoring System (RMS) Containment High Range Monitor (CHRM) and Field Cable Connections at the EPA Feedthroughs, Rev. 0  
SV3-RMS-VBR-007 Containment High Range Monitor Design Basis Accident Test Report, Rev. 0

## **Section 3P02**

### Drawings

APP-1000-AF-901, Fire Area Drawing Nuclear Island Section AA, Rev. 5  
APP-AB01-AB-001, Blockouts and Barriers (Penetrations, Seals and Fire Stops) Details-Sheet 1, Rev. 9  
SV3-1210-JFH 800500, Fiber Optic Linear Heat Detection Layout and Wiring, Rev. 1  
57811-BMT-11306-AW-138, Containment Building Room 11306, Elevation 107'-2", MSW WO3/WO5 L500 Board Layout, Rev. 1  
SV3-1200-CRK-CV0893, Unit 3 Auxiliary Building Walls El. 66' 6" Concrete Placement Layout, Rev. 11  
SV3-1230-CCK-CV4261, Unit 3 Auxiliary Building Wall Placements from El. 100'-0" to El. 117'-6", Rev. 1  
SV3-1220-CRK-CV2157, Unit 3 Auxiliary Building Walls El. 82'-6" to 100'-0" Concrete Placement Layout, Rev. 3  
APP-1010-AF-001, Fire Area Drawing Nuclear Island Plan at El. 66'-6", Rev. 5  
APP-1020-AF-001, Fire Area Drawing Nuclear Island Plan at El. 82'-6", Rev. 6  
APP-1020-AF-002, Fire Area Drawing Nuclear Island Plan at El. 96'-6", Rev. 6  
APP-1030-AF-001, Fire Area Drawing Nuclear Island Plan El. 100'-0" and 107'-2", Rev. 6  
APP-1040-AF-001, Fire Area Drawing Nuclear Island Plan at El. 117'-6", Rev. 5  
APP-IDSA-E3-DK-101, "One line Diagram Class 1E 250V DC MCC IDSA-DK-1 Auxiliary Bldg," Sheet 1, Rev. 5  
APP-IDSA-E3-DK-102, "One line Diagram Class 1E 250V DC MCC IDSA-DK-1 Auxiliary Bldg," Sheet 2, Rev. 4  
APP-IDSA-E3-DK-103, "One line Diagram Class 1E 250V DC MCC IDSA-DK-1 Auxiliary Bldg," Sheet 3, Rev. 1  
APP-IDS-E3-001, "Class 1E DC System Station One Line Diagram Divisions A & C," Sheet 1, Rev. 3  
APP-IDS-E3-002, "Class 1E DC System Station One Line Diagram Divisions B, D & Spare," Sheet 1, Rev. 3

### Licensing & Design Basis Docs

APP-GW-N4R-003, "Fire Protection Analysis Report," Rev. 2  
NMP-ES-035, Fire Protection Program, Ver. 7.0  
NMP-ES-035, Fire Protection Program Implementation, Ver. 14.0  
NMP-ES-035-003, Fleet Hot Work Instructions, Ver. 10.0  
NMP-ES-035-014, Fleet Transient Combustible Controls, Ver. 5.0  
NMP-ES-035-019, Pre-Fire Plans, Ver. 2.0  
APP-GW-N4R-003, Fire Protection Analysis Report, Rev. 2  
APP-FPS-M3-001, AP1000 Fire Protection System (FPS) System Specification Document, Rev. 0

COL VEGP Combined License Vogtle Electric Generating Plant Unit 3, Through  
Amendment 186  
VEGP 3 & 4, UFSAR, Rev. 10  
Vogtle Units 3 & 4 Technical Requirements Manual (TRM), Rev. 18  
SVO-SES-EF-900009, Distributed Antenna System Design, Rev. 2  
ND-18-1408, Request for License Amendment Regarding Routing of Class 1E  
Divisional Cables Supporting Passive Containment Cooling (LAR-18-028), 11/16/2018  
ND-19-0041, Supplement to Request for License Amendment Regarding Routing of Class 1E  
Divisional Cables Supporting Passive Containment Cooling (LAR-18-028S1), 1/24/2019

#### Procedures

3-AOP-115, "Loss of Normal Residual Heat Removal," Rev. H.7  
3-EOP-SDP-2, "Response to Loss of RNS During Shutdown," Rev. F.5  
3-AOP-601, "Evacuation of Control Room," Rev. J.9  
3-AOP-902, "Fire Response Emergency," Rev. H.7  
B-GEN-OPS-005, "Fire Response Procedure," Rev. 5  
B-GEN-OPS-004, Fire Brigade Equipment Quarterly Inspection, Ver. 2.0  
B-PFP-ENG-001, Control of Pre-Plans, Ver. 3.0  
B-PFP-ENG-001-F3110, Aux. Bldg. non-RCA, EI 66'-6"  
B-PFP-ENG-001-F3114, Aux. Bldg. non-RCA, EI 117'-6"  
B-PFP-ENG-001-F3128, Aux. Bldg. & PCS Valve Room  
B-GEN-ENG-008, Fire Equipment Functionality and Fire Protection Impairments (FPI)  
Requirements, Version 1.0  
B-GEN-ENG-008-GL02, Fire Equipment Functionality and Fire Protection Impairments (FPI)  
Basis, Version 1.0  
ND-LI-NP-007, Licensing Document Change Requests for VEGP Units 3 & 4, Version 9.0  
NMP-ES-035-005, Fire Protection Alternative Compensatory Measures, Version 6.0  
NMP-ES-035-006, Fire Protection Program Impact Screen and Detailed Reviews, Version 11.0  
NMP-ES-035-006-F05, Fire Protection Program Impact Screen, Version 5.0  
NMP-ES-035-006-F06, Detailed Fire Protection Program Change Evaluation, Version 4.0  
NMP-ES-095-001, Documentation Change Processes, Version 1.0

#### Work Orders

SNC921209, FSP Individual Fire Detector Test Package  
SV3-1230-CCW-CV2443, Aux Building Battery Rack Walls (32, 33, 34, 36, & 37) up to  
EI. 100'-0", closed 10/29/2020  
SV3-1230-CCW-800001, 108'4" to 115'-6", CL Wall, Concrete Placement & Post-Placement  
(Wall 89), closed 2/7/2019

#### Miscellaneous

3-AOP-902-B, "Background Information for 3-AOP-902, Fire Response Emergency," Rev. G.6  
APP-IDS-E8-001, "Class 1E DC and UPS System Specification Document," Rev. 5  
B-017-CCR 100318946, Fire Brigade Training Roster, May 12, 2021  
B-017-CCR 100319184, Fire Brigade Training Roster, May 19, 2021  
Vogtle 3 & 4 Fire Protection Regulation Structure (Applicable NFPA Codes of Record), Revised  
6/25/2021  
FPRA Calculation List, Revised 6/25/2021  
Maximo FPS PM List, Revised 6/25/2021  
Fire Pre-Plan Index and Status List, Revised 6/25/2021  
SV3-1200-ITR-800797, Fire Barrier Inspection Report, Unit 3: ITAAC 3.3.00.07c.ii.a,  
3.3.00.07c.ii.b, Rev. 0

VS3-ITAAC-ST-2.3.04.10, FPS Individual Fire Detectors – ITAAC: SV3-2.3.04.10, Rev. 0  
WCAP-15871, AP1000 Assessment Against NFPA 804, Rev. 1

#### Corrective Action Documents Reviewed

CR 50092969, Equivalent Composite Firewall material not part of a listed assembly, 5/18/2021  
CR 50004139, Cable Route Design Discrepancy with COL Appendix C, 8/31/2018  
CAR 50007691, Cable Route Design Discrepancy with COL Appendix C, 8/31/2018  
TE 60003574, Cable Route Design Discrepancy with COL Appendix C, 8/31/2018

#### Condition Reports Generated During Inspection

CR 50103154, WCAP-15871 incorrect statement on listing of fire walls and penetrations,  
8/10/2021

### **Section 3P03**

#### Procedure

NMP-ES-013-007, IST Program Data Trending and Evaluation, Revision 3.0

### **Section 3P05**

#### Design Specifications

APP-PV11-Z0-001, “Design Specification for Butterfly Valves, ASME Boiler and Pressure  
Vessel Code Section III Class 2 and 3”, Rev. 13  
APP-PV70-Z0-001, “Squib (Pyrotechnic Actuated) Valves, ASME Boiler and Pressure Vessel  
Code Section III, Class 1”, Rev. 7

#### Datasheets

APP-PV11-Z0D-122, “PV Datasheet 122”, Rev. 7

#### Calculations

APP-GW-PVR-002, “Piping and Valve Interface Requirements Document”, Rev. 3  
APP-GW-VP-010, “Equipment Qualification Methodology and Documentation Requirements for  
AP1000 Safety-Related Valves and Valve Appurtenances”, Rev. 3  
APP-PV11-VPR-003, “Functional Qualification Report for a NPS 8 TRICENTRIC Butterfly  
Valve”, Rev. 0  
APP-PV70-T5-001, “Qualification Plan for Safety-Related Squib Valve Actuators, Electrical  
Connector Assemblies, and Bracket Assemblies for Westinghouse Electric Company for use  
in Westinghouse AP1000 Nuclear Power Plants”, Rev. 5  
APP-PV70-VBR-002, “Equipment Qualification Summary Report for 8” Squib Valves for Use in  
the AP1000 Plant”, Rev. 1  
APP-PV70-VBR-003, “Equipment Qualification Data Package for 8” Squib Valves for Use in the  
AP1000 Plant”, Rev. 1  
APP-PV70-VBR-004, “Equipment Qualification Summary Report for 14” Squib Valves for Use in  
the AP1000 Plant”, Rev. 1  
APP-PV70-VBR-005, “Equipment Qualification Data Package for 14” Squib Valves for Use in  
the AP1000 Plant”, Rev. 1  
APP-PV70-VBR-005, “Equipment Qualification Data Package for 14” Squib Valves for Use in  
the AP1000 Plant”, Rev. 1  
APP-PV70-VPR-013, “ASME QME-1-Functional Qualification Report for 14” Squib Valves  
Installed in AP1000 Plants”, Rev. 0

APP-PV70-VPR-014, "ASME QME-1 Functional Qualification Report for 8" Squib Valves Installed in AP1000 Plants", Rev. 0  
APP-PV70-VPR-016, "QME-1 Testing of a 14"-2500# Squib Valve for Westinghouse Electric Company, LLC Job Number T57622 (PR028955)", Rev. 0  
APP-PV70-VPR-021, "Test Report of QME Testing Performed on 8 inch HP Squib Valve", Re. 0  
APP-PV70-VQQ-002, "14" ADS Squib Valve Assembly Data Package", 08/2018  
APP-PV70-VQQ-053, "Lot Acceptance Testing", Rev. 0  
APP-PXS-PLR-010, "AP1000 Direct Vessel Injection Line A (APP-PXS-PLR-010) Piping Stress Analysis Report", Rev. 6  
APP-PXS-PLR-020, "AP1000 Direct Vessel Injection Line B (APP-PXS-PLR-020) Piping Stress Analysis Report", Rev. 6  
APP-PXS-PLR-030, "Piping Analysis Report for Loop 1 – Automatic Depressurization System 4<sup>th</sup> Stage West Compartment and Passive Residual Heat Removal Supply", Rev. 4  
APP-RCS-PLR-030, "Piping Analysis Report for Reactor Coolant System (RCS) Loop 2 – Automatic Depressurization System (ADS) 4<sup>th</sup> Stage East Compartment, Containment Building Room 11302", Rev. 4  
SV0-PV11-VPR-122 (Revision 0, 7-24-2020), "Vogtle 3&4 Application Report for Tricentric NPS 10 Motor-Operated Butterfly Valves"

#### Procedure

NMP-ES-013-007, IST Program Data Trending and Evaluation, Revision 3.0

#### **Section 3P06**

#### Drawing

APP-MI01-V2-133, Reactor internals core barrel assembly, Rev. 3

#### Specifications

APP-MI01-Z0-001, AP1000 Reactor internals functional specification, Rev. 5  
APP-MI01-Z0-101, AP1000 Reactor vessel internals design specification, Rev. 10  
APP-MI01-Z0-600, AP1000 Reactor vessel internals fabrication requirements, Rev. 3

#### QA document

QR-14-3343, Quality release and certificate of conformance, Rev. 0

### **4. OTHER INSPECTION RESULTS**

#### **Section 4OA5**

.01

B-GEN-ITPCE-008, "Class 1E and Non-Class 1E Battery Capacity Testing," Rev. 7  
APP-DB01-Z0-001, "Design Specification for Class 1E 250 VDC Batteries and Racks," Rev. 10  
3-IDS-ITPP-501, "Class 1E DC and UPS Preoperational Testing," Ver. 5.1  
CR 50080247

## LIST OF ACRONYMS

10 CFR	Title 10 of the Code of Federal Regulations
ASME	American Society of Mechanical Engineers
CAP	Corrective Action Program
CHRM	containment high range monitor
COL	Combined License
CR	condition report
EPA	electrical penetration assembly
EQ	environmental qualification
EQDP	equipment qualification data package
EUT	equipment under test
IDS	Class 1E DC and UPS system
IEEE	Institute of Electrical and Electronics Engineers
IMC	inspection manual chapter
IP	inspection procedure
IR	inspection report
IST	inservice testing
ITAAC	inspection, tests, analysis, and acceptance criteria
LOCA	loss of coolant accident
MSI	main steam isolation
MOV	motor operated valve
NCV	noncited violation
NDE	nondestructive examination
NRC	Nuclear Regulatory Commission
PST	preservice testing
QA	quality assurance
Rev.	revision
SNC	Southern Nuclear Company
SSC	systems, structures, and components
UFSAR	Updated Final Safety Analysis Report
Ver	version

## ITAAC INSPECTED

No.	ITAAC No.	Design Commitment	Inspections, Tests, Analysis	Acceptance Criteria
30	2.1.02.08b	8.b) The RCPs have a rotating inertia to provide RCS flow coastdown on loss of power to the pumps.	A test will be performed to determine the pump flow coastdown curve.	The pump flow coastdown will provide RCS flows greater than or equal to the flow shown in Figure 2.1.2-2, "Flow Transient for Four Cold Legs in Operation, Four Pumps Coasting Down."
41	2.1.02.09a	9.a) The RCS provides circulation of coolant to remove heat from the core.	Testing and analysis to measure RCS flow with four reactor coolant pumps operating at no-load RCS pressure and temperature conditions will be performed. Analyses will be performed to convert the measured pre-fuel load flow to post-fuel load flow with 10-percent steam generator tube plugging.	The calculated post-fuel load RCS flow rate is > 301,670 gpm.

No.	ITAAC No.	Design Commitment	Inspections, Tests, Analysis	Acceptance Criteria
47	2.1.02.11a.ii	<p>10. Safety-related displays identified in Table 2.1.2-1 can be retrieved in the MCR.</p> <p>11.a) Controls exist in the MCR to cause the remotely operated valves identified in Table 2.1.2-1 to perform active functions.</p> <p>11.b) The valves identified in Table 2.1.2-1 as having PMS control perform an active safety function after receiving a signal from the PMS.</p> <p>12.b) After loss of motive power, the remotely operated valves identified in Table 2.1.2-1 assume the indicated loss of motive power position.</p>	<p>Inspection will be performed for retrievability of the safety-related displays in the MCR.</p> <p>ii) Stroke testing will be performed on the other remotely operated valves listed in Table 2.1.2-1 using controls in the MCR.</p> <p>ii) Testing will be performed on the other remotely operated valves identified in Table 2.1.2-1 using real or simulated signals into the PMS.</p> <p>iii) Testing will be performed to demonstrate that remotely operated RCS valves RCS-V001A/B, V002A/B, V003A/B, V011A/B, V012A/B, V013A/B open within the required response times. Testing of the remotely operated valves will be performed under the conditions of loss of motive power.</p>	<p>Safety-related displays identified in Table 2.1.2-1 can be retrieved in the MCR.</p> <p>ii) Controls in the MCR operate to cause the remotely operated valves (other than squib valves) to perform active functions.</p> <p>ii) The other remotely operated valves identified in Table 2.1.2-1 as having PMS control perform the active function identified in the table after receiving a signal from PMS.</p> <p>iii) These valves open within the following times after receipt of an actuation signal:  V001A/B &lt; 40 sec  V002A/B, V003A/B &lt; 100 sec  V011A/B &lt; 30 sec  V012A/B, V013A/B &lt; 60 sec  Upon loss of motive power, each remotely operated valve identified in Table 2.1.2-1 assumes the indicated loss of motive power position.</p>
55	2.1.02.12a.iii	<p>12.a) The automatic depressurization valves identified in Table 2.1.2-1 perform an active safety-related function to change position as indicated in the table.</p>	<p>iii) Tests of the motor-operated valves will be performed under pre-operational flow, differential pressure and temperature conditions.</p>	<p>iii) Each motor-operated valve changes position as indicated in Table 2.1.2-1 under pre-operational test conditions.</p>

No.	ITAAC No.	Design Commitment	Inspections, Tests, Analysis	Acceptance Criteria
78	2.1.03.07.i	7. The reactor internals will withstand the effects of flow induced vibration. 10. The reactor lower internals assembly is equipped with holders for at least eight capsules for storing material surveillance specimens.	i) Not used per Amendment No. 151. ii) A pre-test inspection, a flow test and a post-test inspection will be conducted on the as-built reactor internals. Inspection of the reactor lower internals assembly for the presence of capsules will be performed.	i) Not used per Amendment No. 151. ii) The as-built reactor internals have no observable damage or loose parts. At least eight capsules are in the reactor lower internals assembly.
107	2.2.01.07.i	7. The CNS provides the safety-related function of containment isolation for containment boundary integrity and provides a barrier against the release of fission products to the atmosphere.	i) A containment integrated leak rate test will be performed.	i) The leakage rate from containment for the integrated leak rate test is less than La.
116	2.2.01.11a.iii	11.a) The motor-operated and check valves identified in Table 2.2.1-1 perform an active safety-related function to change position as indicated in the table.	iii) Tests of the motor-operated valves will be performed under preoperational flow, differential pressure, and temperature conditions.	iii) Each motor-operated valve changes position as indicated in Table 2.2.1-1 under pre-operational test conditions.
118	2.2.01.11b	11.b) After loss of motive power, the remotely operated valves identified in Table 2.2.1-1 assume the indicated loss of motive power position.	Testing of the remotely operated valves will be performed under the conditions of loss of motive power.	After loss of motive power, each remotely operated valve identified in Table 2.2.1-1 assumes the indicated loss of motive power position.

No.	ITAAC No.	Design Commitment	Inspections, Tests, Analysis	Acceptance Criteria
175	2.2.03.08b.01	8.b) The PXS provides core decay heat removal during design basis events.	1. A heat removal performance test and analysis of the PRHR HX will be performed to determine the heat transfer from the HX. For the test, the reactor coolant hot leg temperature will be initially at $\geq 350^{\circ}\text{F}$ with the reactor coolant pumps running. The IRWST water level for the test will be above the top of the HX. The test will continue until the hot leg temperature is $\leq 250^{\circ}\text{F}$ .	1. A report exists and concludes that the PRHR HX heat transfer rate with the design basis number of PRHR HX tubes plugged is: $\geq 8.46 \times 10^7$ Btu/hr with $250^{\circ}\text{F}$ HL Temp and an initial IRWST temperature of $80^{\circ}\text{F}$ . The heat transfer rate measured in the test should be adjusted to account for differences in the HL and IRWST temperatures and the number of tubes plugged.

603	2.6.03.04c	<p>4.c) Each IDS 24-hour battery bank supplies a dc switchboard bus load for a period of 24 hours without recharging. 4.d) Each IDS 72-hour battery bank supplies a dc switchboard bus load for a period of 72 hours without recharging. 4.e) The IDS spare battery bank supplies a dc load equal to or greater than the most severe switchboard bus load for the required period without recharging. 4.f) Each IDS 24-hour inverter supplies its ac load. 4.g) Each IDS 72-hour inverter supplies its ac load. 4.h) Each IDS 24-hour battery charger provides the PMS with two loss-of-ac input voltage signals. 5.a) Each IDS 24-hour battery charger supplies a dc switchboard bus load while maintaining the corresponding battery charged. 5.b) Each IDS 72-hour battery charger supplies a dc switchboard bus load while maintaining the corresponding battery charged. 5.c) Each IDS regulating transformer supplies an ac load when powered from the 480 V MCC. 6. Safety-related displays identified in Table 2.6.3-1 can be retrieved in the MCR. 11. Displays of the parameters identified in</p>	<p>Testing of each 24-hour as-built battery bank will be performed by applying a simulated or real load, or a combination of simulated or real loads which envelope the battery bank design duty cycle. The test will be conducted on a battery bank that has been fully charged and has been connected to a battery charger maintained at <math>270 \pm 2</math> V for a period of no less than 24 hours prior to the test. Testing of each 72-hour as-built battery bank will be performed by applying a simulated or real load, or a combination of simulated or real loads which envelope the battery bank design duty cycle. The test will be conducted on a battery bank that has been fully charged and has been connected to a battery charger maintained at <math>270 \pm 2</math> V for a period of no less than 24 hours prior to the test. Testing of the as-built spare battery bank will be performed by applying a simulated or real load, or a combination of simulated or real loads which envelope the most severe of the division batteries design duty cycle. The test will be conducted</p>	<p>The battery terminal voltage is greater than or equal to 210 V after a period of no less than 24 hours with an equivalent load that equals or exceeds the battery bank design duty cycle capacity. The battery terminal voltage is greater than or equal to 210 V after a period of no less than 72 hours with an equivalent load that equals or exceeds the battery bank design duty cycle capacity. The battery terminal voltage is greater than or equal to 210 V after a period with a load and duration that equals or exceeds the most severe battery bank design duty cycle capacity. Each 24-hour inverter supplies a line-to-line output voltage of <math>208 \pm 2\%</math> V at a frequency of <math>60 \pm 0.5\%</math> Hz. Each 72-hour inverter supplies a line-to-line output voltage of <math>208 \pm 2\%</math> V at a frequency of <math>60 \pm 0.5\%</math> Hz. Two PMS input signals exist from each 24-hour battery charger indicating loss of ac input voltage when the loss-of-input voltage condition is</p>
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		<p>Table 2.6.3-2 can be retrieved in the MCR.</p>	<p>on a battery bank that has been fully charged and has been connected to a battery charger maintained at <math>270 \pm 2</math> V for a period of no less than 24 hours prior to the test. Testing of each 24-hour as-built inverter will be performed by applying a simulated or real load, or a combination of simulated or real loads, equivalent to a resistive load greater than 12 kW. The inverter input voltage will be no more than 210 Vdc during the test. Testing of each 72-hour as-built inverter will be performed by applying a simulated or real load, or a combination of simulated or real loads, equivalent to a resistive load greater than 7 kW. The inverter input voltage will be no more than 210 Vdc during the test. Testing will be performed by simulating a loss of input voltage to each 24-hour battery charger. Testing of each as-built 24-hour battery charger will be performed by applying a simulated or real load, or a combination of simulated or real loads. Testing of each 72-hour as-built battery charger will be performed by applying a simulated or real</p>	<p>simulated. Each 24-hour battery charger provides an output current of at least 150 A with an output voltage in the range 210 to 280 V. Each 72-hour battery charger provides an output current of at least 125 A with an output voltage in the range 210 to 280 V. Each regulating transformer supplies a line-to-line output voltage of <math>208 \pm 2\%</math> V. Safety-related displays identified in Table 2.6.3-1 can be retrieved in the MCR. Displays identified in Table 2.6.3-2 can be retrieved in the MCR.</p>
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No.	ITAAC No.	Design Commitment	Inspections, Tests, Analysis	Acceptance Criteria
			<p>load, or a combination of simulated or real loads. Testing of each as-built regulating transformer will be performed by applying a simulated or real load, or a combination of simulated or real loads, equivalent to a resistive load greater than 30 kW when powered from the 480 V MCC. Inspection will be performed for retrievability of the safety-related displays in the MCR. Inspection will be performed for retrievability of the displays identified in Table 2.6.3-2 in the MCR.</p>	
668	C.2.6.09.08a	<p>8.a) Penetrations through the protected area barrier are secured and monitored. 8.b) Unattended openings (such as underground pathways) that intersect the protected area boundary or vital area boundary will be protected by a physical barrier and monitored by intrusion detection equipment or provided surveillance at a frequency sufficient to detect exploitation.</p>	<p>Inspections will be performed of penetrations through the protected area barrier. Inspections will be performed of unattended openings that intersect the protected area boundary or vital area boundary.</p>	<p>Penetrations and openings through the protected area barrier are secured and monitored. Unattended openings (such as underground pathways) that intersect the protected area boundary or vital area boundary are protected by a physical barrier and monitored by intrusion detection equipment or provided surveillance at a frequency sufficient to detect exploitation.</p>