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

February 14, 2018

Michael Yox
Regulatory Affairs Director
Southern Nuclear Operating Company
7835 River Road, Bldg. 140, Vogtle 3 & 4
Waynesboro, GA 30830

SUBJECT: VOGTLE ELECTRIC GENERATING PLANT, UNITS 3 AND 4 - NRC INTEGRATED INSPECTION REPORTS 05200025/2017004, 05200026/2017004

Dear Mr. Yox:

On December 31, 2017, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at the Vogtle Electric Generating Plant, (VEGP) Units 3 and 4. The enclosed inspection report documents the inspection results, which the inspectors discussed on January 18, 2018 with Mr. Mark Rauckhorst and other members of your staff. The results of this inspection are documented in the enclosed report.

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 two findings of very low safety significance (Green) in this report. Both findings involved violations of NRC requirements. The NRC is treating these violations as non-cited violations (NCVs) consistent with Section 2.3.2.a of the NRC Enforcement Policy.

If you contest the violations or significance of these NCVs, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region II; the Director, Office of Enforcement; and the NRC resident inspector at the VEGP Units 3 and 4.

If you disagree with a cross-cutting aspect assignment, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region II; and the NRC resident inspector at the VEGP Units 3 and 4.

This letter, its enclosure, and your response (if any) will be made available for public inspection and copying at http://www.nrc.gov/reading-rm/adams.html and at the NRC Public Document Room in accordance with Title 10 of the Code of Federal Regulations (10 CFR) 2.390, "Public Inspections, Exemptions, Requests for Withholding."

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

Sincerely,

**/RA/**

Jamie Heisserer, Branch Chief
Construction Inspection Branch 1
Division of Construction Oversight (DCO)

Docket Nos.: 5200025, 5200026
License Nos: NPF-91, NPF-92

Enclosure: NRC Inspection Report (IR) 05200025/2017004, 05200026/2017004
w/attachment: Supplemental Information

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SUBJECT: VOGTLE ELECTRIC GENERATING PLANT, UNITS 3 AND 4 - NRC INTEGRATED INSPECTION REPORTS 05200025/2017004, 05200026/2017004

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

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|---|---|
| Docket Numbers: | 5200025<br>5200026 |
| License Numbers: | NPF-91<br>NPF-92 |
| Report Numbers: | 05200025/2017004<br>05200026/2017004 |
| Licensee: | Southern Nuclear Operating Company, Inc. |
| Facility: | Vogtle Electric Generating Plant Unit 3<br>Vogtle Electric Generating Plant Unit 4 |
| Location: | Waynesboro, GA<br>Cranberry Township, PA |
| Inspection Dates: | October 1, 2017 through December 31, 2017 |
| Inspectors: | A. Artayet, Senior Construction Inspector, DCO<br>P. Braxton, Resident Inspector, DCO<br>T. Brimfield, Resident Inspector, DCO<br>P. Carman, Construction Project Inspector, DCO<br>L. Castelli, Senior Construction Inspector, DCO<br>T. Chandler, Resident Inspector, DCO<br>C. Cheung, Construction Project Inspector, DCO<br>J. Christensen, Construction Inspector, DCO<br>N. Coovert, Technical Assistant, DCO<br>G. Crespo, Senior Construction Inspector, DCO<br>P. Donnelly, Resident Inspector, DCO<br>J. Eargle, Senior Project Inspector, DCO<br>B. Griman, Construction Inspector, DCO<br>D. Harmon, Construction Inspector, DCO<br>H. Je, Construction Inspector, DCO<br>C. Jones, Senior Construction Inspector, DCO<br>N. Karlovich, Resident Inspector, DCO<br>B. Kemker, Senior Resident Inspector, DCO<br>G. Khouri, Senior Construction Inspector, DCO<br>J. Lizardi-Barreto, Construction Inspector, DCO<br>R. Mathis, Test Inspector, DCO<br>A. Nielsen, Senior Health Physicist, DRS<br>A. Ponko, Senior Construction Inspector, DCO<br>S. Smith, Senior Construction Inspector, DCO<br>C. Smith, Construction Inspector, DCO<br>T. Steadham, Senior Construction Inspector, DCO<br>S. Temple, Resident Inspector, DCO<br>J. Vasquez, Construction Inspector, DCO<br>J. Walker, Emergency Preparedness Inspector, DRS |

Enclosure

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| Accompanying Personnel: | Jorge Cintron-Rivera, Electrical Engineer, NRR<br>Yuken Wong, Senior Mechanical Engineer, NRO<br>Tom Scarbrough, Senior Mechanical Engineer, NRO<br>Ken Mott, I&C Electronics Engineer, NRO |
| Approved by: | Jamie Heisserer, Branch Chief<br>Construction Inspection Branch 1<br>Division of Construction Oversight |

## SUMMARY OF FINDINGS

Inspection Report (IR) 05200025/2017004, 05200026/2017004; 10/01/2017 through 12/31/2017; Vogtle Electric Generating Plant Units 3 and 4, Inspection of the ITAAC-Related Design and Fabrication Requirements and Part 52, Offsite Dose Calculation Manual (ODCM).

This report covers a three month period of inspection by regional and resident inspectors, and announced Inspections, Tests, Analysis, and Inspection Criteria (ITAAC) inspections by regional inspectors. Two green findings, each with an associated NCV in the Design/Engineering cornerstone and Operational Readiness cornerstone were identified. 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". Construction Cross Cutting Aspects are determined using IMC 0613, "Power Reactor Construction Inspection Reports." The NRC's program for overseeing the 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 – The NRC identified an ITAAC finding of very low safety significance (Green) and associated NCV of 10 CFR Part 50.55a(b), for the licensee's failure to demonstrate compliance with American Society of Mechanical Engineers (ASME) Code Section III, 1998 Edition with Addenda 1999 through 2000, Section NB-3222.2, "Primary Plus Secondary Stress Intensity." The inspectors identified that the licensee failed to ensure that the maximum range of stress intensities for the passive residual removal heat exchanger (PRHR HX) tube sheet and the core makeup tank (CMT) inlet nozzle were within ASME Code allowable limits for Service Level A/B conditions which was a performance deficiency. The licensee entered this finding into their corrective action program (CAP) as Condition Report (CR) 10402072, CR 10402069, CR 10454090, Corrective Action Prevention and Learnings (CAPAL) 100489810, and CAPAL 100489811 and took corrective actions to perform additional analyses after removing calculation conservatism to reevaluate the stress cut locations in question in order to show ASME Code compliance.

The finding was determined to be more than minor because the performance deficiency represented an adverse condition that rendered the quality of components indeterminate, and required substantive corrective action. The inspectors determined this finding was associated with the Design/Engineering Cornerstone. Using IMC 2519, Appendix A, "AP1000 Construction Significance Determination Process," the inspectors determined that the finding was associated with a system or structure; it was associated with the Passive Core Cooling System (PXS) system which is assigned to the high risk importance column of the AP1000 Construction Significance Determination Matrix, and the licensee was able to demonstrate with reasonable assurance that the design function of the applicable structure or system would not be impaired by the deficiency. Therefore, this finding was of very low safety significance (Green). The inspectors determined the finding was indicative of present licensee performance and was associated with the cross-cutting aspect of Conservative Bias, H.14, in the area of Human Performance, in accordance with IMC 0613, Appendix F, "Construction Cross-Cutting Areas and Aspects." (1A11, 1A38)

Green - The inspectors identified an NCV of Technical Specification (TS) 5.5.1 of very low safety significance for the licensee's failure to include accurate parameters in the ODCM for the calculation of offsite radiation doses due to routine gaseous effluent releases. Specifically, the

ODCM contained long-term atmospheric dispersion factors that were less conservative than those used in the Updated Final Safety Analysis Report (UFSAR) and Early Site Permit to demonstrate compliance with 10 CFR 20 and 10 CFR 50, Appendix I. The licensee documented this issue in CR 10437502 and has planned corrective actions including re-evaluation of the dispersion values contained in the ODCM by an independent subject matter expert.

The finding was of more than minor significance because it was associated with the Operational Readiness Cornerstone, Program Effectiveness Attribute of Process and Effluent Monitoring, and adversely affected the associated cornerstone objective to ensure licensees adequately develop and implement the operational programs required by a license condition or regulation. The finding has a cross-cutting aspect in the area of Human Performance, Conservative Bias [H.14], because the dispersion parameters incorporated into the ODCM were less conservative than the ones used in the approved licensing basis documents. (3P02)

**B. Licensee-Identified Violations**

None

## REPORT DETAILS

### Summary of Plant Construction Status

During this report period in Unit 3, in containment, steam generator 1 was set into the nuclear island. Pipe installation and welding and value installation of the Reactor Coolant System (RCS) and PXS continued in containment. In the shield building, additional placements of reinforced concrete were complete and rebar installation continued to 117' to 149'. The lower personnel airlock at 107' was installed through the shield building. In the auxiliary building, wall rebar installation and concrete pours continued to elevation 117' and floor installation at 82'6" was complete.

In Unit 4, in containment, concrete was placed up to 87'6" on the east side and rebar installation up to 98' began. In the shield building, steel composite panels at layer 05 were installed and installation of reinforced steel above 100' began. In the auxiliary building, wall rebar installation and concrete pours continued to elevation 100' and floor installation at 82'6" continued.

### 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 3) ITAAC Number 2.1.02.02a (13) / Family 06F

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 2.1.02.02a (13). The inspectors used the following NRC Inspection Procedures (IP)/sections to perform this inspection:

- 65001.B-02.03-Welder Qualification
- 65001.B-02.04-Production Controls
- 65001.B-02.06-Records

The inspectors observed activities related to machine welding of the RCS to verify that the welding was being done in accordance with the ASME Boiler and Pressure Vessel Code (BPVC), Section III, and the applicable procedures. Specifically the inspectors observed machine welding activities for welds SV3-RCS-PL01-FW-BCL05, SV3-RCS-PL01-FW-BCL02, and SV3-RCS-PL01-FW-BCL03, which joined the two cold legs and one hot leg loop pipes to steam generator B, to verify, as required by the ASME Code and the applicable procedures, that:

- the work, including details of materials and personnel, was being documented;
- the weld joint was sufficiently protected from wind or rain;
- the weld area was clean and free of harmful substances such as moisture, grease, or paint;
- cleaning and grinding between weld passes and starts and stops was performed as necessary;

- the correct weld filler metal was being used and had been appropriately issued with an issue slip;
- QC inspectors performed regular inspections of the welding activities;
- the interpass temperature was monitored and kept below the procedure's maximum temperature; and
- the welds were made in accordance with the variables listed in the welding procedure.

The inspectors also reviewed a sample of two of the welding operator's qualification records to verify that the operators were qualified to make the weld in accordance with the ASME Code, Section IX. Additionally the inspectors reviewed the Certified Material Test Report (CMTR) for the weld filler metal being used to verify that it was traceable by heat number and that it had been tested in accordance with the ASME Code Sections II & III and met all the ASME Code's chemical requirements.

The inspectors observed machine Gas Tungsten Arc Welding (GTAW) of the last cover pass for weld-no. SV3-RCS-PL01-FW-BHL02 between the RCS-L001B hot leg elbow and steam generator B inlet nozzle to determine whether welding was performed in accordance with the welding procedure.

The inspectors observed liquid penetrant (PT) examination on the internal back weld surface for weld SV3-RCS-PL01-FW-BCL3 between the RCS-L002C cold leg pipe and outlet reactor coolant pump (RCP) 2A nozzle to determine whether the examination was performed and documented in accordance with the PT examination procedure.

b. Findings

No findings were identified.

1A02 (Unit 3) ITAAC Number 2.1.02.02a (13) / Family 06F

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 2.1.02.02a (13). The inspectors used the following NRC IPs/sections to perform this inspection:

- 65001.B-02.03-Welder Qualification
- 65001.B-02.04-Production Controls
- 65001.B-02.05-Inspection

The inspectors reviewed documents, observed in-process field activities, and performed independent inspections on the RCS piping to the A steam generator. Specifically, the inspectors reviewed the travelers and performed an independent inspection of the fit-up for the hot leg L001A and cold legs L002A and L002B. The inspectors reviewed travelers 910962-012 for hot leg L001A, 910962-013 for cold leg L002B, and 910962-014 for cold leg L002A to determine if they sequenced all operations, referenced procedures and instructions, established hold points, and provided for production welding and inspection sign-offs. The inspectors also performed an independent inspection of the fit-up of all 3 legs to the A steam

generator (field weld numbers SV3-RCS-PL01-FW-AHL02, SV3-RCS-PL01-FW-ACL03, and SV3-RCS-PL01-FW-ACL05) to determine if the weld joint geometry, including root opening and fit-up tolerances, were as specified in weld specification WCP-6.

The inspectors reviewed MISTRAS computed radiographic images for the following five welds of the RCS piping to determine whether the image brightness compared at the body of the wire image quality indicator and area of interest were in accordance with the requirements of the ASME Code, Section III, Subsection NB-5000 and Section V, Article 2:

- SV3-RCS-PL01-FW-BCL03 and -BCL04 joining cold leg RCS-L002C to the RCP-2A outlet nozzle and reactor vessel (RV) inlet nozzle, respectively;
- SV3-RCS-PL01-FW-BCL05 and -BCL06 joining cold leg RCS-L002D to the RCP-2B outlet nozzle and RV inlet nozzle, respectively; and
- SV3-RCS-PL01-FW-BHL02 joining hot leg RCS-L001B to the steam generator B inlet nozzle.

In addition, the inspectors reviewed associated radiographic examination reports to determine whether the techniques and geometric unsharpness were in accordance with the requirements of the MISTRAS radiographic examination procedure 521-RT-302.

The inspectors observed interpass machine GTAW fabrication on field weld number SV3-RCS-PLW-041-2 for an 18” diameter pressurizer surge piping line, RCS-PL-L003, between spools RCS-PLW-041A-1 and -041B-1 (Items 5 and 3 of SV3-PL01-V6-003, respectively) to determine whether ER316L spooled wire with heat number 1182D was used in accordance with PCI Welding Procedure Specification (WPS) 8 MC-GTAW. Specifically, the inspectors observed interpass welding before the informational 50% radiography and near completion of the butt joint to determine whether the weld metal oscillation and dwell time weave patterns, and resulting U-shaped weld profile inside the narrow-groove were maintained to ensure fusion into the sidewalls in accordance with the requirements of the ASME Code, Section III, subsection NB.

In addition, the inspectors reviewed associated PCI surge piping line work package traveler 912941-008 to determine whether QC hold points were sequentially signed-off, and welding operator and weld filler metal traceability were recorded in accordance with the requirements of the ASME Code, Section III subsection NB, and PCI's Quality Assurance (QA) program. The inspectors reviewed Welder Maintenance Logs (WML) and Welder Performance Qualifications (WPQ) for three welding operators to determine whether individual certifications were maintained in accordance with the requirements of the ASME Code, Section IX. Also, the inspectors reviewed one Certificate of Conformance (CoC), 19726, to determine whether temporary solid round bars of heat # 4Y423 used as tack blocks inside the narrow-groove joint during fit-up and tacking activities were traceable with chemical analysis and mechanical properties in accordance with the applicable requirements of the ASME Code, Section III subsection NB, and American Society for Testing and Materials (ASTM) A479 Type 316L.

b. Findings

No findings were identified.

1A03 (Unit 3) ITAAC Number 2.1.02.02a (13) / Family 06F

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 2.1.02.02a (13). The inspectors used the following NRC IPs/sections to perform this inspection:

- 65001.B-02.05-Inspection

The inspectors observed PT examination on the exterior weld surface for weld number SV3-RCS-PL01-FW-BHL01 between the RCS-L001B hot leg pipe and reactor vessel nozzle to determine whether the examination was performed and documented in accordance with procedure GDP 9.7, and the ASME Code, Section V, Article 6.

b. Findings

No findings were identified.

1A04 (Unit 3) ITAAC Number 2.1.02.05a.i (19) / Family 14A
(Unit 4) ITAAC Number 2.1.02.05a.i (19) / Family 14A

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 2.1.02.05a.i (19). The inspectors used the following NRC IPs/sections to perform this inspection:

- 65001.E-02.01-Design Basis Requirements
- 65001.E-02.03-Qualification
- 65001.E-02.04-Documentation
- 65001.E-02.06-Problem Identification and Resolution

The inspectors reviewed documents for Rosemount Pressure Sensors (commodity JE52) and Temperature Sensors (commodity JE53) and interviewed personnel to verify:

- the licensee used the appropriate limiting design basis parameters as input for the seismic qualification of the components and that the necessary design basis documents and calculations, as appropriate, were correctly incorporated into the qualification program for the components;
- seismic qualification was adequately completed and controlled in accordance with Institute of Electrical and Electronics Engineers (IEEE) Standard 344-1987, IEEE Standard 323-1974, NRC Regulatory Guide 1.100, ASME NQA-1-2007, and design specifications;
- licensee records established an adequate basis for acceptance of the ITAAC with qualification criteria attributes and that the qualification report concluded that the

components can withstand the conditions that would exist before, during, and following a design basis seismic event without loss of safety function for the time required to perform the safety function; and
- seismic qualification documentation was maintained in an auditable manner, was complete, and clearly documented completion of the ITAAC acceptance criteria for the samples inspected.

Specifically, the inspectors performed these reviews for the following components associated with the indicated commodity:
- RCS-JE-PT140D, RCS Wide Range Pressure Sensor (JE52)
- RCS-JE-TE121D, RCS Cold Leg 1A Narrow Range Temperature Sensor (JE53)

The inspectors reviewed a sample of test deficiencies identified during the seismic qualification process, as documented in the Equipment Qualification Data Package (EQDP) applicable to each component, to determine if the identified deficiencies were adequately resolved.

The inspectors reviewed the UFSAR, Chapter 3, Attachment E to identify the limiting design basis parameters that were to be used as input for the qualification of the components. The inspectors reviewed the qualification program documents (such as the EQDP, Equipment Qualification Summary Report (EQSR), applicable test procedures, test specifications, and test reports) to verify that the following qualification requirements were incorporated properly:
- design codes;
- analysis and testing methodologies;
- load combinations; and
- required seismic forces and effects.

b. Findings

No findings were identified.

1A05 (Unit 3) ITAAC Number 2.1.02.05a.i (19) / Family 14A
(Unit 4) ITAAC Number 2.1.02.05a.i (19) / Family 14A

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 2.1.02.05a.i (19). The inspectors used the following NRC IPs/sections to perform this inspection:

- 65001.E-02.01-Design Basis Requirements
- 65001.E-02.03-Qualification
- 65001.E-02.04-Documentation
- 65001.E-02.06-Problem Identification and Resolution

The inspectors reviewed documents for Rosemount pressure sensors (commodity JE52) and temperature sensors (commodity JE53) and interviewed personnel to verify:
- the licensee used the appropriate limiting design basis parameters as input for the environmental qualification of the components and that the necessary design basis

documents and calculations, as appropriate, were correctly incorporated into the qualification program for the components;
- environmental qualification of components was adequately completed and controlled in accordance with the requirements in 10 CFR 50.49, applicable methodology in the UFSAR Ch. 3, and IEEE Standard 323-1974 and the results meet the acceptance criteria stated in the applicable design specification and the ITAAC;
- the documented qualified life was consistent with the results of the qualification activities;
- licensee records established an adequate basis for acceptance of the ITAAC with qualification criteria attributes and that the qualification report concluded that the components can withstand the 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; and
- environmental qualification documentation was maintained in an auditable manner, was complete, and clearly documented completion of the ITAAC acceptance criteria for the samples inspected.

The inspectors reviewed a sample of test deficiencies identified during the environmental qualification process, as documented in the EQDP applicable to each component, to determine if the identified deficiencies were adequately resolved and met the requirements of IEEE Standard 323-1974.

Specifically, the inspectors performed these reviews for the following components associated with the indicated commodities:
- RCS-JE-PT140C, RCS Wide Range Pressure Sensor (JE52); and
- RCS-JE-TE131A, RCS Hot Leg 1 Narrow Range Temperature Sensor (JE53).

The inspectors reviewed the UFSAR Chapter 3, Attachment E, to identify the limiting design basis parameters (i.e. environmental temperature, pressure, total radiation dose, radiation dose rate, cycling, electrical parameters and humidity) that were to be used as input for the qualification of the components. The inspectors reviewed the qualification program documents (such as the EQDP, EQSR, applicable test procedures, test specifications, and test reports) to verify that the following qualification requirements were incorporated properly:
- qualification methodology per IEEE Standard 323-1974;
- environmental parameters under normal operating conditions, abnormal conditions, and design basis events;
- simulated accident conditions, including, temperature, pressure, radiation, pH, and chemical additives;
- post-accident conditions, including time and submergence.

The inspectors reviewed the margins applied to test parameters used during qualification of the equipment. Specifically, the inspectors reviewed the following parameters to determine if the margins used met IEEE Standard 323-1974, Section 6.3.1.5:
- temperature;
- pressure; and
- radiation.

In addition, the inspectors reviewed the test procedure, test plan, and test reports to verify that the tested profiles enveloped the limiting design basis parameters. Specifically, the inspectors reviewed the simulated accident conditions including temperature, pressure, radiation, pH, and chemical additives as recorded in the test reports.

b. Findings

No findings were identified.

1A06 (Unit 3) ITAAC Number 2.2.01.02a (91) / Family 06F

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 2.2.01.02a (91). The inspectors used the following NRC IPs/sections to perform this inspection:

- 65001.06-02.01 - General Installation
- 65001.B-02.03-Welder Qualification
- 65001.B-02.04-Production Controls

The inspectors observed manual GTAW and reviewed associated documents for the internal portion of weld-no. U3-S1-E13-PAL/E13, between the lower personnel airlock and containment vessel penetration sleeve, to determine whether the following welding activities were in accordance with the requirements of the ASME Code, Section III, Subsection NE, and Westinghouse Electric Company (WEC) design specification:

- quality control inspection sign-offs were documented on the weld traveler, as required by the QA program;
- preheat was performed, as described by the welding procedure; and
- welders and weld filler metals were traceable, as required by the welding program.

In addition, the inspectors reviewed qualifications for four welders to verify the welders were tested and certified in accordance with the ASME Code, Section IX.

b. Findings

No findings were identified.

1A07 (Unit 3) ITAAC Number 2.2.01.02a (91) / Family 06F

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 2.2.01.02a (91). The inspectors used the following NRC IPs/sections to perform this inspection:

- 65001.03-02.03 - Installation and Welding
- 65001.03-02.08 - Problem Identification and Resolution

- 65001.F- Inspection of the ITAAC-Related Design and Fabrication Requirements
- 65001.F-02.02-Fabrication Records Review
- 65001.F-02.04-General QA Review

The inspectors reviewed the procurement and fabrication documents for the following Unit 3 containment system (CNS) ASME pipe sections, to determine whether the materials met the requirements of the procurement specifications, drawings, and the ASME code Section III, Subsection NE:

- FPS-PL-L107 Fire Protection Supply to Containment,
- SFS-PL-L038 Spent Fuel Pool Cooling Suction from Containment, and
- CAS-PL-L204 Service Air In

The inspectors reviewed the following documents for the sampled pipe sections to determine if they met the requirements of the AP1000 specification for shop fabricated piping:

- certificate of compliance packing list and documentation checklist;
- non-destructive examination (NDE) reports;
- cleaning and final inspection reports;
- QA inspection reports;
- CMTRs; and
- non-conformance report (NCR) Log.

The inspectors observed the storage of the pipe sections to determine whether the storage conditions met ASME NQA-1-1994, Part II, Subpart 2.2, quality and technical requirements and reviewed the associated QA inspection reports. The inspectors reviewed the Westinghouse QA audit of CB&I Laurens (WES-2017-039) for fabrication activities and programmatic aspects and reviewed a sample of the supplier's corrective action requests identified during the audit to determine if they met the CBIL-QAM-001 QA manual.

b. Findings

No findings were identified.

1A08 (Unit 3) ITAAC Number 2.2.01.05.i (98) / Family 11A
(Unit 4) ITAAC Number 2.2.01.05.i (98) / Family 11A

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 2.2.01.05.i (98). The inspectors used the following NRC IPs/sections to perform this inspection:

- 65001.E-02.01-Design Basis Requirements
- 65001.E-02.03-Qualification
- 65001.E-02.04-Documentation
- 65001.E-02.06-Problem Identification and Resolution

The inspectors reviewed documents for electrical penetrations (commodities EY01 and EY02), air operated ball valves (commodity PV10), air operated butterfly valves

(commodity PV11) and Fisher control valves (commodity PV14) and interviewed personnel to verify:

- the licensee used the appropriate limiting design basis parameters as input for the seismic qualification of the structures, systems, or components (SSCs) and that the necessary design basis documents and calculations, as appropriate, were correctly incorporated into the qualification program for the SSCs;
- seismic qualification was adequately completed and controlled in accordance with Regulatory Guide 1.100, IEEE Standard 344-1987, ASME QME-1-2007, and applicable design specifications;
- licensee records established an adequate basis for acceptance of the ITAAC with qualification criteria attributes and the qualification report concluded the SSCs can withstand the conditions that would exist before, during, and following a design basis seismic event without loss of safety function for the time required to perform the safety function; and
- seismic qualification documentation was maintained in an auditable manner, was complete, and clearly documented completion of the ITAAC acceptance criteria for the samples inspected.

Specifically, the inspectors performed these reviews for the following components associated with the indicated commodity:

- IDSC-EY-P28Y, Electrical Penetration P28 (EY01);
- DAS-EY-P03Z, Electrical Penetration P03 (EY02);
- CAS-PL-V014, Instrument Air Supply Outside Containment Isolation Valve (PV10);
- VFS-PL-V009, Containment Purge Discharge Containment Isolation Valve – IRC (PV11); and
- WLS-PL-V067, Reactor Coolant Drain Tank (RCDT) Gas Outlet Containment Isolation Valve – IRC (PV14).

The inspectors reviewed a sample of test deficiencies identified during the seismic qualification process, as documented in the EQDP applicable to each component, to determine if the identified deficiencies were adequately resolved.

The inspectors reviewed the UFSAR Chapter 3, Attachment E to identify the limiting design basis parameters to be used as input for the qualification of the SSC. The inspectors reviewed the qualification program documents (such as the EQDP, EQSR, applicable test procedures, test specifications, and test reports) to verify that the following qualification requirements were incorporated properly:

- design codes;
- analysis and testing methodologies;
- load combinations; and
- required seismic forces and effects.

b. Findings

No findings were identified.

1A09 (Unit 3) ITAAC Number 2.2.01.05.i (98) / Family 11A
(Unit 4) ITAAC Number 2.2.01.05.i (98) / Family 11A

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 2.2.01.05.i (98). The inspectors used the following NRC IPs/sections to perform this inspection:

- 65001.E-02.01-Design Basis Requirements
- 65001.E-02.03-Qualification
- 65001.E-02.04-Documentation
- 65001.E-02.06-Problem Identification and Resolution

The inspectors reviewed documents for air operated butterfly valves (commodity PV11) and Fisher control valves (commodity PV14) and interviewed personnel to verify:

- the licensee used the appropriate limiting design basis parameters as input for the environmental qualification of the components and the necessary design basis documents and calculations, as appropriate, were correctly incorporated into the qualification program for the components;
- environmental qualification of components was adequately completed and controlled in accordance with the requirements in 10 CFR 50.49, applicable methodology in UFSAR Ch. 3, IEEE Standard 323-1974, and IEEE Standard 382-1996 and the results met the acceptance criteria stated in the applicable design specification and the ITAAC;
- the documented qualified life was consistent with the results of the qualification activities;
- licensee records established an adequate basis for acceptance of the ITAAC with qualification criteria attributes and the qualification report concluded the components can withstand the 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; and
- environmental qualification documentation was maintained in an auditable manner, was complete, and clearly documented completion of the ITAAC acceptance criteria for the samples inspected.

The inspectors reviewed a sample of test deficiencies identified during the environmental qualification process, as documented in the EQDP applicable to each component, to determine if the identified deficiencies were adequately resolved and met the requirements of IEEE Standard 323-1974.

Specifically, the inspectors performed these reviews for the following components associated with the indicated commodities:

- VFS-PL-V009, Containment Purge Discharge Containment Isolation Valve – IRC (PV11); and
- WLS-PL-V067, Reactor Coolant Drain Tank Gas Outlet Containment Isolation Valve – IRC (PV14).

The inspectors reviewed the UFSAR Chapter 3, Attachment E to identify the limiting design basis parameters (i.e. environmental temperature, pressure, total radiation dose, radiation dose rate, cycling, electrical parameters and humidity) to be used as input for the qualification of the SSC. The inspectors reviewed the qualification

program documents (such as the EQDP, EQSR, applicable test procedures, test specifications, and test reports) to verify that the following qualification requirements were incorporated properly:

- qualification methodology per IEEE Standard 323-1974;
- environmental parameters under normal operating conditions, abnormal conditions, and design basis events;
- simulated accident conditions, including, temperature, pressure, radiation, pH, and chemical additives;
- post-accident conditions, including time and submergence.

The inspectors reviewed the margins applied to test parameters used during qualification of the equipment. Specifically, the inspectors reviewed the following parameters to determine if the margins used met IEEE Standard 323-1974, Section 6.3.1.5:

- temperature;
- pressure; and
- radiation.

In addition, the inspectors reviewed the test procedure, test plan, and test reports to verify the tested profiles enveloped the limiting design basis parameters. Specifically, the inspectors reviewed the simulated accident conditions including temperature, pressure, radiation, pH, and chemical additives as recorded in the test reports.

b. Findings

No findings were identified.

1A10 (Unit 3) ITAAC Number 2.2.02.05a.i (126) / Family 14A
(Unit 4) ITAAC Number 2.2.02.05a.i (126) / Family 14A

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 2.2.02.05a.i (126). The inspectors used the following NRC IPs/sections to perform this inspection:

- 65001.E-02.01-Design Basis Requirements
- 65001.E-02.03-Qualification
- 65001.E-02.04-Documentation
- 65001.E-02.06-Problem Identification and Resolution

The inspectors reviewed documents for Ultra level sensors (commodity JE52), flexible wedge gate valves (commodity PV03) and air operated butterfly valves (commodity PV11) and interviewed personnel to verify:

- the licensee used the appropriate limiting design basis parameters as input for the seismic qualification of the components and the necessary design basis documents and calculations, as appropriate, were correctly incorporated into the qualification program for the components;

- seismic qualification was adequately completed and controlled in accordance with Regulatory Guide 1.100, IEEE Standard 344-1987, IEEE Standard 323-1974, ASME BPVC Section III 1998-2000, and design specifications;
- licensee records established an adequate basis for acceptance of the ITAAC with qualification criteria attributes and the qualification report concluded the components can withstand the conditions that would exist before, during, and following a design basis seismic event without loss of safety function for the time required to perform the safety function; and
- seismic qualification documentation was maintained in an auditable manner, was complete, and clearly documented completion of the ITAAC acceptance criteria for the samples inspected.

Specifically, the inspectors performed these reviews for the following components associated with the indicated commodity:

- PCS-JE-LT010, Passive Containment Cooling Water Storage Tank (PCCWST) Water Level Sensor (JE52);
- PCS-PL-V046, Recirc Header Discharge to PCCWST Isolation Valve (PV03); and
- PCS-PL-V001A, PCCWST Isolation Valve (PV11).

The inspectors reviewed a sample of test deficiencies identified during the seismic qualification process, as documented in the EQDP applicable to each component, to determine if the identified deficiencies were adequately resolved.

The inspectors reviewed the UFSAR Chapter 3, Attachment E to identify the limiting design basis parameters to be used as input for the qualification of the SSC. The inspectors reviewed the qualification program documents (such as the EQDP, EQSR, applicable test procedures, test specifications, and test reports) to verify that the following qualification requirements were incorporated properly:

- design codes;
- analysis and testing methodologies;
- load combinations; and
- required seismic forces and effects.

b. Findings

No findings were identified.

1A11 (Unit 3) ITAAC Number 2.2.03.02a (159) / Family 06F

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 2.2.03.02a (159). The inspectors used the following NRC IPs/sections to perform this inspection:

- 65001.06 - Inspection of ITAAC-Related Installation of Mechanical Components
- 65001.06-02.05 - Problem Identification and Resolution
- 65001.F- Inspection of the ITAAC-Related Design and Fabrication Requirements
- 65001.F-02.01-Design Document Review
- 65001.F-02.04-General QA Review

The inspectors reviewed design documents and applicable construction specifications, drawings, and procedures, and interviewed personnel to verify if the documents adequately defined the final design and arrangement of SSCs in the PXS. Additionally, the inspectors reviewed SSC attributes to verify they were correctly identified, documented, reviewed, and approved by responsible engineering personnel in accordance with WEC procedures, design specifications, and codes and regulations, as discussed in more detail later in this section. Specifically, the inspectors performed these reviews for the following components associated with the indicated commodity:

- PRHR HX (ME02)
- CMT A (MT01)
- CMT B (MT01)
- accumulator tank A (MT02)
- accumulator tank B (MT02)

The inspectors reviewed the following design documents associated with the PRHR HX, CMTs, and accumulator tanks:

- WEC design specification and supporting documents, including sub-component analyses
- ASME generic design report
- design drawings
- plant and system transient analyses
- licensing bases documents

The inspectors selected specific inspection criteria and critical attributes for the SSCs, along with inherent characteristics of engineering programs, to verify if the program controlling design activities had been established and were correctly implemented in accordance with a sampling of sections related to design control for safety-related software applications and training/qualifications in documents QMS, “Quality Management System – A,” Revision (Rev.) 7, and WCAP-12308, “ASME III Quality Assurance Program,” Rev. 40. The criteria selected by the inspectors also considered requirements included by reference to test codes and references to requirements contained in the UFSAR. In addition, the inspectors selected a sample of critical attributes and scenarios to determine if internal and external events or hazards could affect the component’s performance and if that could result in a more than minimal impact to the conclusions made in the WEC transient analysis and in Chapter 15, “Accident Analyses,” of the UFSAR.

For each of the PXS components, the inspectors selected a sample of stress and design analyses for subcomponents to verify if the design inputs were correctly identified and documented and that the subcomponents were designed in accordance with the ASME Section III requirements. Specifically, the review was focused on how the licensee’s contractor related the design requirements to ASME requirements in order to ensure the component would meet its design safety functions during normal operations and event conditions. The inspectors reviewed the calculations, design specifications, and transient analyses to verify if a selected sample of assumptions and results were consistent with Chapter 15 of the UFSAR.

The inspectors reviewed a sample of personnel qualification records and job task training matrix for the engineers who performed design activities, specifically transient analyses. This review was to verify if the design documents were created and verified by qualified engineers and that personnel involved in the development of design documents met WEC procedure and ASME Section III qualification requirements. The inspectors also reviewed Registered Professional Engineer (RPEs) records for the WEC design specifications for the PRHR HX, CMTs, and accumulator tanks to verify qualification records met WEC procedure, ASME, and NQA-1 requirements.

The inspectors reviewed a sample of corrective action documents, including CAPALs, deviation notices, and engineering and design coordination reports (E&DCRs) to verify if the conditions were adequately evaluated by the responsible organizations and that the accepted condition complied with the final design and as-built records. The inspectors also reviewed corrective action documents issued during the inspection to verify if issues were entered into the licensee's or applicable contractor's CAP in accordance with CAP requirements.

For the PRHR HX, the inspectors selected the following criteria for review:

- a sample of design attributes associated with component classification and Service Level conditions in accordance with applicable requirements of ASME Section III, Subsection NB, 1998 ed. with 2000 addenda;
- component parameters including primary temperature and pressure, and secondary temperature and pressure;
- potential for water hammer in susceptible heat exchanger; and
- SSC conditions/operations with respect to design assumptions in heat transfer calculations, and as described in the UFSAR.

Specifically for the PRHR HX, the inspectors reviewed the as-built component design documents for the Unit 3 PRHR HX, PXS-ME-01, to verify if the component was built in accordance with ASME Code Section III requirements. The inspectors reviewed as-built reconciliation documents, corrective actions, and associated analyses for issues identified during and post fabrication to verify that the final documentation and corrections made, still aligned with the original design specifications and the UFSAR. These documents included:

- as-built design report and applicable reconciliation documents;
- quality assurance data packages (QADP); and
- as-built design drawings.

For the CMTs, the inspectors selected the following criteria for review:

- a sample of design attributes associated with component classification and Service Level conditions in accordance with applicable requirements of ASME Section III, Subsection NB, 1998 ed. with 2000 addenda;
- thermal effects of system and associated thermal stresses on component
- SSC conditions/operations with respect to design assumptions for tank volume and boron concentration to verify they met the design requirements and function as described in the UFSAR.

For the accumulator tanks, the inspectors selected the following criteria for review:

- a sample of design attributes associated with component classification and Service Level conditions in accordance with applicable requirements of the ASME code Section III, Subsection ND, 1998 ed. with 2000 addenda;
- tank pressure with respect to nitrogen temperature, over pressurization, and relief valve operability
- SSC conditions/operations with respect to design assumptions for tank volume and boron concentration to verify they met the design requirements and function as described in the UFSAR.

b. Findings

Introduction

The NRC identified an ITAAC finding of very low safety significance (Green) and associated NCV of 10 CFR Part 50.55a(b), for Southern Nuclear Operating Company's (SNC) failure through their contractor WEC to demonstrate compliance with ASME Code Section III, 1998 Edition with Addenda 1999 through 2000, Subsection NB-3222.2, "Primary Plus Secondary Stress Intensity." The inspectors identified that the licensee failed to ensure the maximum range of stress intensities for the PRHR HX tube sheet and the CMT inlet nozzle were within ASME Code allowable limits for Service Level A/B conditions. Specifically, stress cut locations V and VI for the PRHR HX tube sheet and stress cut location III, Alloy 690 Weld Build-Up, for the CMT inlet nozzle exceeded the maximum range of stress intensity allowed by the ASME Code Section III, Subsection NB-3222.2.

Description

During the ASME mechanical component design inspection conducted in August 14 - 25, 2017, the inspectors identified two examples where the licensee failed to ensure the maximum range of stress intensities for the PRHR HX tube sheet and the CMT inlet nozzle were within ASME Code allowable limits. The failure to comply with ASME Code design requirements had the potential to result in inadequate design margins relied upon during Service Level A/B conditions.

Calculation APP-ME02-Z0C-042, "AP1000 PRHR HX Tube Sheet Analysis," Rev. 6, documented the stress analysis of the PRHR HX tube sheet to demonstrate compliance with the ASME Code. The licensee determined at stress cut location V and VI, some stress intensities exceeded the allowable value of less than or equal to (≤) 3Sm, which is the maximum range of this stress intensity allowed by the ASME Code Section III Subsection NB-3222.2. Section 5.2.2.3 of the calculation discussed the application of the simplified elastic-plastic analysis as permitted by ASME section NB-3228.5, "Simplified Elastic-Plastic Analysis." NB-3228.5 requires criterion (a) through (f) be met in order to exclude the thermal bending stresses. The licensee utilized engineering judgement to meet section NB-3228.5 even though the evaluation did not satisfy criterion (a) "The range of primary plus secondary membrane plus bending stress intensity, excluding thermal bending stresses, shall be ≤ 3Sm." The inspectors concluded engineering judgement was not adequate to satisfy ASME Code requirements. The licensee entered this issue into its CAP as CR 10402072 and WEC CAPAL 100489810, and took corrective actions to perform additional analyses after

removing calculation conservatism to reevaluate the stress cut locations in question to show ASME Code compliance.

Calculation APP-MT01-Z0R-011, "AP1000 CMT Inlet and Outlet Nozzle Analysis," Rev. 6, documented the stress analysis of the CMT 8-inch inlet and outlet nozzles to demonstrate compliance with the ASME Code. The licensee determined for the inlet nozzle, stress cut location III, some stress intensities exceeded the allowable value of ≤ 3Sm, which is the maximum range of this stress intensity allowed by Subsection NB-3222.2. Section 5.2.3(a) of the calculation discussed the application of the simplified elastic-plastic analysis as permitted by ASME section NB-3228.5, which requires criterion (a) through (f) be met in order to exclude the thermal bending stresses. The licensee utilized engineering judgement to meet NB-3228.5 even though the evaluation did not satisfy criterion (a) "The range of primary plus secondary membrane plus bending stress intensity, excluding thermal bending stresses, shall be ≤ 3Sm." The inspectors concluded engineering judgement was not adequate to satisfy ASME Code requirements. The licensee entered this issue into its CAP as CR 10402069 and WEC CAPAL 100489811, and took corrective actions to perform additional analyses after removing calculation conservatism to reevaluate the stress cut location in question in order to show ASME Code compliance.

Analysis

The licensee's failure to ensure the maximum range of stress intensities for the tube sheet of the PRHR HXs and the inlet nozzle of the CMTs were within ASME Code allowable limits was a performance deficiency. Specifically, stress cut locations V and VI for the PRHR HX tube sheet and stress cut location III for the CMT inlet nozzle exceeded the maximum range of stress intensity allowed by the ASME Code Section III Subsection NB-3222.2. The finding was determined to be of more than minor safety significance because the performance deficiency represented an adverse condition that rendered the quality of components indeterminate, and required substantive corrective action. The licensee through its contractor WEC, performed additional analyses after removing calculation conservatism to reevaluate the stress cut locations in question to show ASME Code compliance. This is an ITAAC finding because the design commitment for ITAAC 2.2.03.02a states "The components identified in Table 2.2.3-1 as ASME Code Section III are designed and constructed in accordance with ASME Code Section III requirements," and the acceptance criteria states "The ASME Code Section III design reports exists for the as-built components identified in Table 2.2.3-1 as ASME Code Section III." This finding is material to the ITAAC acceptance criteria because the design reports, APP-ME02-Z0R-100, "AP1000 PRHR HX Generic Design Report," Rev. 2, and APP-MT01-Z0R-001, "AP1000 CMT ASME Generic Design Report," Rev. 4, including associated design documents incorporated by reference, failed to demonstrate the PRHR HX and CMTs design met the ASME Code Section III requirements.

The inspectors determined this finding was associated with the Design/Engineering Cornerstone. The finding was not associated with a security finding; it was not associated with an IMC 2504 operational/construction program; and it was not associated with a repetitive, NRC-identified omission of a program critical attribute. Using IMC 2519, Appendix A, "AP1000 Construction Significance Determination Process," the inspectors determined the finding was associated with a system or structure; it was associated with the PXS system which is assigned to the

high risk importance column of the AP1000 Construction Significance Determination Matrix, and the licensee was able to demonstrate with reasonable assurance that the design function of the applicable structure or system would not be impaired by the deficiency (row 1 of the Construction Significance Determination Matrix). Therefore, this finding was of very low safety significance (Green). The inspectors determined the finding was indicative of present licensee performance and was associated with the cross-cutting aspect of Conservative Bias, H.14, in the area of Human Performance, in accordance with IMC 0613, Appendix F, "Construction Cross-Cutting Areas and Aspects." Specifically, the licensee failed to use decision making practices that emphasized prudent choices when using engineering judgement in lieu of ASME Code compliance [DM.2]. The licensee through the contractor performed an apparent cause analysis, CAPAL 10089810, to evaluate the cause of the engineering judgement and inaccurate information in calculation APP-ME02-Z0C-042. The licensee also generated CR 10457090 for additional extent of condition reviews.

Enforcement

10 CFR Part 50.55a(b), "Use and conditions on the use of standards," requires, in part, "Systems and components of boiling and pressurized water-cooled nuclear power reactors must meet the requirements of the ASME BPV Code and the ASME OM Code …." ASME Code Section III, 1998 Edition with Addenda 1999 through 2000, Subsection NB-3222.2, "Primary Plus Secondary Stress Intensity," requires, in part, "the allowable value of the maximum range of this stress intensity is ≤ 3Sm." Contrary to the above, since February 17, 2014, the licensee, through its contractor WEC, failed to ensure certain stress intensities in the tube sheet of the PRHR HX and inlet nozzle of the CMTs were ≤ 3Sm. Specifically, the failure to comply with ASME Code design requirements has the potential to result in inadequate design margins relied upon during service level A/B conditions. The licensee entered this finding into its CAP as CR 10402072, CR 10402069, CR 10454090, CAPAL 100489810, and CAPAL 100489811 and took corrective actions to perform additional analyses after removing calculation conservatism to reevaluate the stress cut locations in question in order to show ASME Code compliance. This violation is being treated as an NCV consistent with Section 2.3.2.a of the NRC Enforcement Policy. This issue is identified as NCV 05200025/2017004-01 and 05200026/2017004-01, PRHR HX Tube Sheet and CMT Inlet Nozzle Stress Intensity Not Within ASME Code Allowable Limits.

1A12 (Unit 3) ITAAC Number 2.2.03.02a (159) / Family 06F

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 2.2.03.02a (159). The inspectors used the following NRC IPs/sections to perform this inspection:

- 65001.03-02.03 - Installation and Welding
- 65001.B-02.03-Welder Qualification
- 65001.B-02.04-Production Controls

The inspectors observed welding of PXS line PXS-PL-L018B, the CMT B direct vessel injection line, to determine if it was being welded in accordance with the ASME Code,

Section III, and QA Plan requirements. Specifically the inspectors observed welding and associated activities related to weld number APP-PXS-PLW-02P-01 to verify that:

- the work, including details of materials and personnel, was being documented on a weld data sheet as part of the traveler;
- the weld joint was sufficiently protected from wind or rain;
- the weld area was clean and free of harmful substances such as moisture, grease, paint, etc.;
- cleaning and grinding between weld passes and starts & stops was performed as necessary;
- the correct weld filler metal was being used and had been appropriately issued with an issue slip;
- the interpass temperature was monitored and kept below the procedure's maximum; and
- the weld was made in accordance with the variables listed in the welding procedure.

The inspectors also reviewed the welder's qualification records to verify that he was qualified to make the weld by successfully taking a documented qualification test administered in accordance with the ASME Code Section IX.

The inspectors observed pipe welding and inspection activities for weld number SV3-PXS-PLW-02Y-8 on PXS line L018B to determine whether piping installation was controlled in accordance with the requirements of the ASME Code, Section III. Specifically, the inspectors observed the sequence of personnel hold point sign-offs for fit-up and tack on the weld record to determine whether sign-offs were completed in the proper order by a welding construction representative, Quality Control (QC) inspector, and Authorized Nuclear Inspector (ANI) in accordance with the requirements of the WECTEC ASME QA program. In addition, the inspectors observed measurements and other actions performed by these individuals for the following attributes to verify the:

- weld groove root opening, surface cleanliness, and tack welds were as described in references of welding procedure WPS1-8.8T01;
- maximum 1/32" mismatch for concentric alignment of the weld joint was as delineated in the ASME Code;
- quadrant surface V-markings on both sides of the weld was performed for periodic in-service inspection;
- argon backing gas was internally monitored using a calibrated oxygen analyzer to prevent weld oxidation as described in WPS1-8.8T01; and
- welder identification and weld rod heat numbers were transferred from the Welding Material Requisition (WMR) to the weld record as required for traceability.

Additionally, the inspectors observed the layout and orientation of the piping to determine whether the piping was installed as drawn on the isometric drawing of the work package. The inspectors also reviewed two CMTRs for ER316L weld rods for the manual GTAW process to determine whether the chemical analysis and mechanical properties were in accordance with the requirements of the ASME Code.

b. Findings

No findings were identified.

1A13 (Unit 3) ITAAC Number 2.2.03.02a (159) / Family 06F

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 2.2.03.02a (159). The inspectors used the following NRC IPs/sections to perform this inspection:

- 65001.03-02.06 - Nondestructive Examination (NDE)
- 65001.03-02.07 - Review of Records
- 65001.B-02.04-Production Controls
- 65001.B-02.06-Records

The inspectors observed installation activities associated with the 8" diameter nozzle check valve (PXS-PL-V017B), which was welded to the pipe spool located on the outlet side of the valve; identified as weld number SX3-PXS-PLW-02P-6. The inspectors observed these welding activities to verify whether the valve installation activities on line number PXS-PL-L018B, which consists of piping for the CMT direct vessel injection line B, were controlled in accordance with the requirements of the 1998 Edition including 2000 Addenda of the ASME Code, Section III, Subsection ND.

Specifically, the inspectors reviewed the applicable sequence of activities for hold point sign-offs by welding construction, QC, and ANI personnel to verify whether they were performed in accordance with site welding procedures. The inspectors also reviewed the weld data sheets to verify if proper traceability for the welder identification and heat numbers for weld filler material were included in the weld data sheets in accordance with site welding procedures. Finally, the inspectors observed welding activities associated with an intermediate pass to ensure the welder was observing interpass temperature requirements and using electrical characteristics, techniques, and argon shielding gas in accordance with the requirements of the approved WPS.

The inspectors also observed welding activities associated with the PXS line PXS-PL-L112B, which consists of piping for the in-containment refueling water storage tank direct vessel injection line B, to determine if welding was performed in accordance with of the 1998 Edition including 2000 Addenda of the ASME Code, Section III.

Specifically, the inspectors observed welding and associated activities related to weld number SV3-PXS-PLW-02E-1-RW1 to verify whether:

- the work, including details of materials and personnel, was being documented on a weld data sheet as part of the traveler;
- the weld joint was sufficiently protected from wind or rain;
- the weld area was clean and free of harmful substances such as moisture, grease, and paint;
- cleaning and grinding between weld passes and starts & stops was performed as necessary;
- the correct weld filler metal was being used and had been appropriately issued with an issue slip;
- the interpass temperature was monitored and kept below the procedure's maximum; and

- the weld was made in accordance with the variables listed in the welding procedure.

In addition, the inspectors reviewed NDE results for PT and radiographic testing (RT) for welds located on both the L018B and L112B lines. As part of the inspection, the inspectors reviewed NDE for the following welds:

- PT results for welds SV3-PXS-PLW-02P-5 and SV3-PXS-PLW-02P-6 located on line L018B;
- RT results for welds SV3-PXS-PLW-029-3 and SV3-PXS-PLW-02E-1-C1 located on line L112B; and
- RT results for SV3-PXS-PLW-02P-1-C1 and SV3-PXS-PLW-02Y-8 located on line L018B.

Specifically, the inspectors reviewed the above PT reports to ensure the weld surface temperature and dwell time for the application of the dye penetrant were within the requirements of the procedure. For radiography, the inspectors reviewed inspection reports to ensure the source type, source size, film type, source to film distance, and type and thickness of material being radiographed along with exposure were in accordance with the requirements of the procedure. Inspectors also reviewed RT reports to ensure any rejectable indications identified on the RT film were appropriately identified and documented on the inspection report and the RT image quality indicators were the correct type, the correct thickness, and visible in accordance with site procedures.

The inspectors also reviewed the associated work packages to ensure records were reviewed and approved by the proper authority, and stored and maintained in such a manner as to demonstrate conformance with the 1998 Edition including 2000 Addenda of the ASME Code, Section III, and site procedures for record handling and storage. In addition, the inspectors reviewed the work packages to verify whether the accepted, rejected, and repaired items were documented in written reports in accordance with site procedures.

b. Findings

No findings were identified.

1A14 (Unit 3) ITAAC Number 2.2.03.02a (159) / Family 06F

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 2.2.03.02a (159). The inspectors used the following NRC IPs/sections to perform this inspection:

- 65001.03-02.03 - Installation and Welding
- 65001.B-02.04-Production Controls

The inspectors performed a direct inspection of work activities associated with the A accumulator discharge line in room 11206 inside Unit 3 containment. Specifically, the work activities were associated with line L029A from Table 2.2.3-2 of Appendix C of

the COL, which makes up the line between the accumulator and the isolation valve PXS-PL-V027A. The inspectors observed the fit-up inspection performed by QC on field weld number SV3-PXS-PLW-014-18 to determine if the requirements of Inspection Plan F-S562-005, "Pipe Welding/Braze; ASME Section III Visual Pipe Weld Inspection" were met. The inspectors also performed an independent inspection of the weld fit-up to determine if the weld joint geometry, including root opening and fit-up tolerances, met the requirements of the welding specification and E&DCR APP-GW-VFY-001. The inspectors also observed the proper purge gas was used and an oxygen analyzer was utilized to determine if the requirements of the WPS were met prior to welding the root. The inspectors independently inspected the weld rods to determine if the welding consumables utilized were traceable and were in compliance with the WPS and the ASME Code. The inspectors observed welding equipment, including power cables and gas lines, were in good condition. Finally, the inspectors reviewed welder performance qualification test records to determine if the welder was qualified for the piping material, electrode/process, and position in the field.

b. Findings

No findings were identified.

1A15 (Unit 3) ITAAC Number 2.2.03.02a (159) / Family 06F

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 2.2.03.02a (159). The inspectors used the following NRC IPs/sections to perform this inspection:

- 65001.06-02.01 - General Installation

The inspectors reviewed a sample of three records to verify that accumulator A had not been damaged during lifting and placement. Specifically, the inspectors reviewed the design and analysis of the accumulator's lifting lugs to verify that the analysis was done in accordance with the ASME Code, Section III, Subsection ND, Table ND-3321-1, and American National Standards Institute (ANSI) N14.6-1993, Special Lifting Devices for Shipping Containers Weighing 10,000 Pounds (4,500 kg) or More". The inspectors also reviewed the results of the analysis to verify whether the accumulator would be able to avoid plastic deformation from its own weight during lifting. Additionally, the inspectors reviewed the lifting plan to verify that the accumulator was lifted by the lifting lugs in accordance with its design.

b. Findings

No findings were identified.

1A16 (Unit 3) ITAAC Number 2.2.03.02a (159) / Family 06F

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 2.2.03.02a (159). The inspectors used the following NRC IPs/sections to perform this inspection:

- 65001.03-02.01 - Purchase and Receipt of Materials
- 65001.03-02.02 - Storage and Handling
- 65001.B-02.02-Welding Procedure Qualification
- 65001.B-02.06-Records
- 65001.F-02.02-Fabrication Records Review

The inspectors reviewed fabrication records for a sample of PXS pipe segments fabricated by CB&I Laurens from Table 2.2.3-2 of Appendix C of the Vogtle Unit 3 COL to determine if they were fabricated in accordance with the requirements of the ASME Code, Section III and the procurement specifications. The inspectors reviewed records for the following lines and spools:

- Line PXS-L027A, spool SV3-PLW-014-3
- Line PXS-L112A, spool SV3-PLW-018-1
- Line PXS-L132A, spool SV3-PLW-01H-1
- Line PXS-L127A, spool SV3-PLW-01Q-2
- Line PXS-L102, spool SV3-PLW-036-1
- Line PXS-L104B, spool SV3-PLW-041-2
- Line PXS-L180A, spool SV3-PLW-110-1
- Line PXS-L142B, spool SV3-PLW-1CR1

For each spool, as applicable, the inspectors reviewed the drawings and work travelers to determine if the work steps adequately covered the work to be performed and all steps had been signed and completed. The inspectors reviewed the CMTR to determine if the pipes and fittings had been fabricated, heat treated, and tested for strength and chemistry in accordance with the ASME code Sections III and II and the fabrication specification. The inspectors reviewed the code data report to determine if it was correctly completed and signed by the ANI. The inspectors reviewed the bending reports to determine if pipe bending was performed in accordance with the fabrication specification. The inspectors reviewed any associated NCRs to determine if identified nonconformances received adequate technical justification. The inspectors reviewed the NDE reports to determine if welds was inspected by the appropriate level of NDE inspector and were found acceptable in accordance with the ASME Code. The inspectors reviewed the weld filler metal CMTRs to determine if the weld metal had been tested for ferrite number and chemical analysis as required by the ASME Code and the fabrication specification. The inspectors also reviewed the fabricator's PT procedure to determine if it met the requirements of the ASME Code Sections III and V and also a sample of frequently used welding procedures and qualification records to determine if they were written and qualified in accordance with the ASME Code Sections III and IX.

The inspectors reviewed two receipt inspection reports to verify that issues identified during the receipt inspection were handled according to receipt inspection and corrective action procedures. The inspectors also reviewed audits of CB&I Laurens to verify CB&I Laurens had been audited and approved to perform the work associated with the fabrication of welded and bent pipe spools. The inspectors reviewed

additional audits to verify that they had followed up on and closed previously identified audit findings.

Lastly the inspectors reviewed the licensee's storage procedure applicable to storing the pipe spools prior to installation. The inspectors performed a walk down of two pipe spools, SV3-PXS-PLW-111-1 and SV3-PXS-PLW-112-2, in a lay down yard to verify whether the PXS piping had the required markings, was traceable, and was being stored in accordance with the procedure and ASME NQA-1, 1994 edition. These two pipe spools are associated with Line PXS-PL-L180A.

b. Findings

No findings were identified.

1A17 (Unit 3) ITAAC Number 2.2.03.02a (159) / Family 06F

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 2.2.03.02a (159). The inspectors used the following NRC IPs/sections to perform this inspection:

- 65001.03-02.03 - Installation and Welding
- 65001.03-02.06 - Nondestructive Examination (NDE)
- 65001.07-02.01 - General Installation
- 65001.07-02.02 - Component Welding
- 65001.B-02.03-Welder Qualification
- 65001.B-02.04-Production Controls

The inspectors observed in-process field activities and performed independent inspections on the installation of accumulator A discharge check valve V029A contained in line number L025A from Appendix C of the COL table 2.2.3-2. Specifically, the inspectors observed the valve being welded to the pipe spool, performed an independent visual inspection of the final weld and observed the licensee's quality control inspector perform a PT examination on the final weld. The inspectors observed in-process welding to determine if the requirements of the weld procedure specification were met. Specifically, the inspectors observed work to determine if it was conducted in accordance with a weld data record that sequenced all operations, referenced procedures and instructions, established hold points, and provided for production welding and inspection signoffs. The inspectors reviewed shielding gas composition and flow, welding parameters utilized, and weld rod material size and type used in the field to determine if the requirements of WPS 1-8.8T01 were met. Finally, the inspectors reviewed records to determine if the welder was qualified to perform the weld.

Upon completion of the weld, inspectors performed an independent visual inspection of the weld to determine if the requirements of Quality Inspection Plan F-S562-005, "Pipe Welding/Braze; ASME Section III Visual Pipe Weld Inspection" and the ASME Code Section III were met. In addition, the inspectors observed Mistras perform a PT exam to determine if the requirements of procedure 100-PT-301, "Liquid Penetrant

Examination in Accordance with ASME Section V, Article 6", were met. The inspectors also performed an independent assessment of the exam results to determine if the weld met the acceptance criteria in the ASME Code Section III, Subsection NB-2546.

In addition, the inspectors reviewed drawings and specifications associated with check valve V029A to determine if it was installed properly. Specifically, the inspectors reviewed SV0-PV03-VMM-003, "Maintenance Manuals for AP1000 PV03 Gate, Swing Check and Stop-Check Valves" and drawing SV3-PXS-PLW-014, "Passive Core Cooling System Containment BLDG Room 11206 Accumulator Discharge to DVIA" to determine if the valve was installed in the proper location, orientation, and flow direction in accordance with the design and the manufacturers recommendations. The inspectors made field observations and reviewed documentation to determine if the valve was fabricated with the proper material and the pressure capacity of the valve exceeded the intended system pressure plus a safety factor.

b. Findings

No findings were identified.

1A18 (Unit 3) ITAAC Number 2.2.03.02a (159) / Family 06F

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 2.2.03.02a (159). The inspectors used the following NRC IPs/sections to perform this inspection:

- 65001.B-02.04-Production Controls

The inspectors observed manual GTAW for weld SV3-PXS-PLW-012-6, which joins the 8" diameter tee fitting with PXS line L021A and CMT A line for the common injection header to the DVI A nozzle, to verify if welding was conducted in accordance with the ASME Code, Section III, Subsection NB. Specifically, the inspectors observed the fit-up and tack, partial root pass, and intermediate weld passes to verify whether they were performed in accordance with welding procedure WPS1-8.8T01. The inspectors also compared the piping configuration to the construction isometric drawings to determine whether the system was being constructed in accordance with the design.

b. Findings

No findings were identified.

1A19 (Unit 3) ITAAC Number 2.2.03.02a (159) / Family 06F

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 2.2.03.02a (159). The inspectors used the following NRC IPs/sections to perform this inspection:

- 65001.03-02.02 - Storage and Handling
- 65001.03-02.03 - Installation and Welding
- 65001.B-02.04-Production Controls

The inspectors performed a direct inspection of work activities associated with the installation of the Unit 3 Passive Residual Heat Removal (PRHR) outlet line (cold leg piping). The inspectors observed field welding activities performed on line RCS-L113, which makes up a portion of the return line between the PRHR outlet nozzle and the A steam generator channel head. Specifically, the inspectors observed work activities to verify whether the weld joint was protected from inclement weather and piping and welding consumables were properly stored and handled in accordance with approved procedures.

The inspectors observed welding activities associated with weld number SV3-RCS-PLW-04A-8 to verify if piping was being installed at the proper location in the plant with proper clearances from other piping and obstructions in accordance with approved drawings. The inspectors observed welding to verify whether the weld was made in accordance with the ASME Code, Section III, Subsection NB. Also, the inspectors reviewed the traveler to verify if the traveler coordinated and sequenced all operations, referenced procedures and instructions, established hold points, and provided for production welding and inspection signoffs in accordance with approved procedures.

b. Findings

No findings were identified.

1A20 (Unit 3) ITAAC Number 2.2.03.05a.i (165) / Family 14A
(Unit 4) ITAAC Number 2.2.03.05a.i (165) / Family 14A

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 2.2.03.05a.i (165). The inspectors used the following NRC IPs/sections to perform this inspection:

- 65001.E-02.01-Design Basis Requirements
- 65001.E-02.03-Qualification
- 65001.E-02.04-Documentation
- 65001.E-02.06-Problem Identification and Resolution

The inspectors reviewed documents for Ultra level sensors (commodity JE52), air operated ball valves (commodity PV10), and control valve (commodity PV20) and interviewed personnel to verify:

- the licensee used the appropriate limiting design basis parameters as input for the seismic qualification of the components and the necessary design basis documents and calculations, as appropriate, were correctly incorporated into the qualification program for the components;
- seismic qualification was adequately completed and controlled in accordance with Regulatory Guide 1.100, IEEE Standard 344-1987, IEEE Standard 323-1974, ASME QME-1-2007, and applicable design specifications;
- licensee records established an adequate basis for acceptance of the ITAAC with qualification criteria attributes and the qualification report concluded the components can withstand the conditions that would exist before, during, and following a design basis seismic event without loss of safety function for the time required to perform the safety function; and
- seismic qualification documentation was maintained in an auditable manner, was complete, and clearly documented completion of the ITAAC acceptance criteria for the samples inspected.

Specifically, the inspectors performed these reviews for the following components associated with the indicated commodities:

- PXS-JE-LT045, In-Containment Refueling Water Storage Tank (IRWST) Level Sensor (JE52);
- PXS-PL-V130A, IRWST Gutter Isolation Valve (PV10); and
- PXS-PL-V108A, PRHR HX Control Valve (PV20).

The inspectors reviewed a sample of test deficiencies identified during the seismic qualification process, as documented in the EQDP applicable to each component, to determine if the identified deficiencies were adequately resolved.

The inspectors reviewed the UFSAR to identify the limiting design basis parameters to be used as input for the qualification of the components. The inspectors reviewed the qualification program documents (such as the EQDP, EQSR, applicable test procedures, test specifications, and test reports) to verify that the following qualification requirements were incorporated properly:

- design codes;
- analysis and testing methodologies;
- load combinations; and
- required seismic forces and effects.

b. Findings

No findings were identified.

1A21 (Unit 3) ITAAC Number 2.2.03.05a.i (165) / Family 14A
(Unit 4) ITAAC Number 2.2.03.05a.i (165) / Family 14A

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 2.2.03.05a.i (165). The inspectors used the following NRC IPs/sections to perform this inspection:

- 65001.E-02.01-Design Basis Requirements

- 65001.E-02.03-Qualification
- 65001.E-02.04-Documentation
- 65001.E-02.06-Problem Identification and Resolution

The inspectors reviewed documents for Ultra level sensors (commodity JE52), air operated ball valves (commodity PV10), Fisher control valves (commodity PV14), and control valves (commodity PV20) and interviewed personnel to verify:

- the licensee used the appropriate limiting design basis parameters as input for the environmental qualification of the components and the necessary design basis documents and calculations, as appropriate, were correctly incorporated into the qualification program for the components;
- environmental qualification of components was adequately completed and controlled in accordance with the requirements in 10 CFR 50.49, applicable methodology in the UFSAR Ch. 3, and IEEE Standard 323-1974 and the results met the acceptance criteria stated in the applicable design specification and the ITAAC;
- the documented qualified life was consistent with the results of the qualification activities;
- licensee records established an adequate basis for acceptance of the ITAAC with qualification criteria attributes and the qualification report concluded the components can withstand the 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; and
- environmental qualification documentation was maintained in an auditable manner, was complete, and clearly documented completion of the ITAAC acceptance criteria for the samples inspected.

The inspectors reviewed a sample of test deficiencies identified during the environmental qualification process, as documented in the EQDP applicable to each component, to determine if the identified deficiencies were adequately resolved and met the requirements of IEEE Standard 323-1974.

Specifically, the inspectors performed these reviews for the following components associated with the indicated commodities:

- PXS-JE-LT046, IRWST Level Sensor (JE52);
- PXS-PL-V130A, IRWST Gutter Isolation Valve (PV10);
- PXS-PL-V014A, CMT A Discharge Isolation Valve (PV14); and
- PXS-PL-V108B, PRHR HX Control Valve (PV20).

The inspectors reviewed the UFSAR Chapter 3, Attachment E to identify the limiting design basis parameters (i.e. environmental temperature, pressure, total radiation dose, radiation dose rate, cycling, electrical parameters and humidity) to be used as input for the qualification of the components. The inspectors reviewed the qualification program documents (such as the EQDP, EQSR, applicable test procedures, test specifications, and test reports) to verify that the following qualification requirements were incorporated properly:

- qualification methodology per IEEE Standard 323-1974;
- environmental parameters under normal operating conditions, abnormal conditions, and design basis events;
- simulated accident conditions, including, temperature, pressure, radiation, pH, and chemical additives;

- post-accident conditions, including time and submergence.

The inspectors reviewed the margins applied to test parameters used during qualification of the equipment. Specifically, the inspectors reviewed the following parameters to determine if the margins used met IEEE Standard 323-1974, Section 6.3.1.5:

- temperature;
- pressure; and
- radiation.

In addition, the inspectors reviewed the test procedure, test plan, and test reports to verify that the tested profiles enveloped the limiting design basis parameters. Specifically, the inspectors reviewed the simulated accident conditions including temperature, pressure, radiation, pH, and chemical additives as recorded in the test reports.

b. Findings

No findings were identified.

1A22 (Unit 3) ITAAC Number 2.2.05.05a.i (259) / Family 12A
(Unit 4) ITAAC Number 2.2.05.05a.i (259) / Family 12A

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 2.2.05.05a.i (259). The inspectors used the following NRC IPs/sections to perform this inspection:

- 65001.E-02.01-Design Basis Requirements
- 65001.E-02.03-Qualification
- 65001.E-02.04-Documentation
- 65001.E-02.06-Problem Identification and Resolution

The inspectors reviewed documents for air operated butterfly valves (commodity PV11) and interviewed personnel to verify:

- the licensee used the appropriate limiting design basis parameters as input for the seismic qualification of the components and the necessary design basis documents and calculations, as appropriate, were correctly incorporated into the qualification program for the components;
- seismic qualification was adequately completed and controlled in accordance with Regulatory Guide 1.100, IEEE Standard 344-1987, ASME QME-1-2007, and design specifications;
- licensee records established an adequate basis for acceptance of the ITAAC with qualification criteria attributes and the qualification report concluded the components can withstand the conditions that would exist before, during, and following a design basis seismic event without loss of safety function for the time required to perform the safety function; and

- seismic qualification documentation was maintained in an auditable manner, was complete, and clearly documented completion of the ITAAC acceptance criteria for the samples inspected.

Specifically, the inspectors performed these reviews for VES-PL-V022B, Main Control Room Pressure Relief Isolation Valve B associated with commodity PV11.

The inspectors reviewed a sample of test deficiencies identified during the seismic qualification process, as documented in the EQDP applicable to each component, to determine if the identified deficiencies were adequately resolved.

The inspectors reviewed the UFSAR Chapter 3, Attachment E to identify the limiting design basis parameters to be used as input for the qualification of the components. The inspectors reviewed the qualification program documents (such as the EQDP, EQSR, applicable test procedures, test specifications, and test reports) to verify that the following qualification requirements were incorporated properly:

- design codes;
- analysis and testing methodologies;
- load combinations; and
- required seismic forces and effects.

b. Findings

No findings were identified.

1A23 (Unit 3) ITAAC Number 2.3.06.05a.i (361) / Family 06A
(Unit 4) ITAAC Number 2.3.06.05a.i (361) / Family 06A

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 2.3.06.05a.i (361). The inspectors used the following NRC IPs/sections to perform this inspection:

- 65001.E-02.01-Design Basis Requirements
- 65001.E-02.03-Qualification
- 65001.E-02.04-Documentation
- 65001.E-02.06-Problem Identification and Resolution

The inspectors reviewed documents for normal residual heat removal (RNS) heat exchanger (commodity ME1C), swing check valve (commodity PV03), and Fisher control valve (commodity PV14) and interviewed personnel to verify:

- the licensee used the appropriate limiting design basis parameters as input for the seismic qualification of the components and the necessary design basis documents and calculations, as appropriate, were correctly incorporated into the qualification program for the components;
- seismic qualification was adequately completed and controlled in accordance with Regulatory Guide 1.100, IEEE Standard 344-1987, ASME QME-1-2007, and design specifications;

- licensee records established an adequate basis for acceptance of the ITAAC with qualification criteria attributes and the qualification report concluded the components can withstand the conditions that would exist before, during, and following a design basis seismic event without loss of safety function for the time required to perform the safety function; and
- seismic qualification documentation was maintained in an auditable manner, was complete, and clearly documented completion of the ITAAC acceptance criteria for the samples inspected.

Specifically, the inspectors performed these reviews for the following components associated with the indicated commodity:

- RNS-ME-01A, RNS Heat Exchanger A (Tube Side) (ME1C);
- RNS-PL-V017A, RNS Discharge RCS Pressure Boundary Check Valve (PV03);
- RNS-PL-V015A, RNS Discharge RCS Pressure Boundary Check Valve (PV03); and
- RNS-PL-V061, RNS Return from Chemical and Volume Control System Containment Isolation Valve (PV14).

The inspectors reviewed a sample of test deficiencies identified during the seismic qualification process, as documented in the EQDP applicable to each component, to determine if the identified deficiencies were adequately resolved.

The inspectors reviewed the UFSAR to identify the limiting design basis parameters to be used as input for the qualification of the components. The inspectors reviewed the qualification program documents (such as the EQDP, EQSR, applicable test procedures, test specifications, and test reports) to verify that the following qualification requirements were incorporated properly:

- design codes;
- analysis and testing methodologies;
- load combinations; and
- required seismic forces and effects.
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b. Findings

No findings were identified.

1A24 (Unit 3) ITAAC Number 2.5.01.04 (519) / Family 10F
(Unit 4) ITAAC Number 2.5.01.04 (519) / Family 10F

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 2.5.01.04 (519). The inspectors used the following NRC IPs/sections to perform this inspection:

- 65001.22-A1.03.01-Inspection of Software Management Plan (SMP)
- 65001.22-A1.03.03-Inspection of Software Configuration Management Plan (SCMP)
- 65001.22-A3.03.04-Design Phase Documentation

- 65001.22-A4.03.02-Integration Phase Documentation
- 65001.22-A5.03.04 - Documentation

The inspectors reviewed APP-GW-GLR-623, and associated references to verify that the diverse actuation system (DAS) hardware and software development design process provided specific documentation and reviews for the DAS development phase for hardware and any software and the DAS system test phase.

The inspectors reviewed APP-GW-GLR-623 to verify if it provided a roadmap to the documentation that fulfills the inspections, tests, analyses and acceptance criteria for the DAS ITAAC 2.5.01.04, parts a) and b) in accordance with 10 CFR 52.99.

**Development Phase**

The inspectors reviewed DAS organizational planning documents to determine if a process was developed in accordance with ITAAC 2.5.01.04. The inspectors reviewed WNA-PD-00239-WAPP, "AP1000 I&C Diverse Actuation System Project Plan," Revision 1 and WNA-PD-00080-SV0, "Project Plan Title: Vogtle 3&4 I&C Program," Revision 1 to determine if they met the guidance of BTP 7-14, "Guidance on Software Reviews for Digital Computer-Based Instrumentation and Control Systems." Specifically, the inspectors reviewed the DAS Development phase organizational responsibilities were defined and implemented as described in the BTP.

The inspectors reviewed APP-DAS-GEH-001, "DAS System Design Process," Revision 1 to verify that IEEE 1074-1995 requirements were included in the design process. Specifically, the inspectors reviewed the mapping of the DAS development hardware and software phases listed in APP-DAS-GEH-001 to the IEEE-1074-1995 lifecycle phases to verify the DAS design process was formally structured in accordance with the IEEE 1074-1995 requirements.

The inspectors reviewed APP-DAS-GEH-001 to verify that the required IEEE-1074-1995 Section 5, "Development Processes" activities, for both hardware and software, were defined and the required development phase outputs for each life cycle activity were listed in accordance with IEEE 1074-1995. The inspectors reviewed the DAS life cycle activities and resultant activity output documents listed in APP-GW-GLR-623 to verify that the output documents were identified covering implementation of the development phase activity.

The inspectors reviewed APP-DAS-GEH-001 to verify it met the requirements of IEEE-1074-1995, section 7.2, "Software Configuration Management Process." The inspectors reviewed APP-DAS-GEH-001 to verify that the DAS configuration management process defined the following items to be managed:

- hardware,
- software,
- drawings,
- specifications,
- software requirements,
- purchased software code, and
- software tools.

In addition, the inspectors reviewed APP-DAS-GEH-001 to verify the process for documenting changes to these configuration items was defined
The inspectors reviewed configuration management implementation documents SV0-ISIP-J0R-008 and WNA-RL-03934-SV3. The inspectors reviewed the configuration items were documented for the release and the DAS development configuration management identification process was in accordance with IEEE 1074-1995, Section 7.2.4, “Develop Configuration Identification”.

**System Test Phase**
The inspectors reviewed the Configuration Management Release Report (CMRR) release 8.4.0 for baseline SVO-ISIP-J0R-008, Revision 4 to verify if a baseline was established and documented the status and history of the controlled items in accordance with IEEE 1074-1995 and APP-DAS-GEH-001. The inspectors reviewed baseline 8.4.0 Readiness Review to determine whether it was conducted and documented in accordance with WNA-WI-00223-WAPP. The inspectors sampled the record of changes in the CMRR from Revision 3 to Revision 4. Specifically, the inspectors reviewed closed open items to verify the change process was clearly documented and completed through formal procedures.

The inspector’s reviewed the AP1000 I&C V&V Summary Report Work Instruction (WNA-WI-00477-WAPP) and the Vogtle Unit 3 AP1000 DAS System V&V Summary Report (SV3-DAS-H6U-001) to verify that the process developed and report documentation for the test phase was adequate and in compliance with the IEEE 1074-1995 and APP-GW-T5-013.

The inspectors reviewed SV3-DAS-H6U-001, to verify that requirements not validated at the test phase were identified as required by APP-GW-T5-013. The inspectors reviewed the system design requirements listed as “unfulfilled prior to shipment”. The inspectors reviewed the DAS Requirement Traceability Matrix to verify these test phase requirements were traceable to being tested during future site testing.
The inspectors reviewed AP1000 DAS System Test Plan (APP-DAS-T5-001) to verify that the DAS Test Plan defined the activities to be performed for factory testing, documentation of test results, and configuration controls for the equipment under test in accordance with IEEE 1074-1995 and APP-GW-T5-013. The inspectors reviewed the following DAS test phase reports to verify the documentation was in compliance with the DAS System Test Plan:

- Heat/rise Power Draw Test
- System Cabinet Hardware Test
- Factory acceptance Test

The inspectors reviewed APP-GW-GLR-623, to verify the report was maintained in an auditable form and clearly documented an assessment of the implementation of the life cycle process in accordance with Staff Position on AP1000 Digital Instrumentation and Control. Additionally, the inspectors reviewed documentation to verify the licensee reviewed APP-GW-GLR-623 to determine whether the ITAAC requirements were met in accordance with ND-RA-001-008.

b. Findings

No findings were identified.

1A25 (Unit 3) ITAAC Number 2.5.02.07c (536) / Family 10E
(Unit 4) ITAAC Number 2.5.02.07c (536) / Family 10E

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 2.5.02.07c (536). The inspectors used the following NRC IPs/sections to perform this inspection:

- 65001.E-02.01-Design Basis Requirements
- 65001.E-02.03-Qualification
- 65001.E-02.04-Documentation

The inspectors reviewed the analysis included in APP-GW-GLR-803 and associated references to verify that data communication between safety and non-safety systems does not inhibit the performance of the safety function during a design basis accident. The protection and safety monitoring system (PMS) is a safety digital instrumentation and control system that uses Advant Ovation Interface (AOI) gateways to transmit data from the PMS to the non-safety systems. The inspectors reviewed specifications and drawings to verify the communication of PMS to non-safety systems through the AOI gateway was in accordance with WCAP-16674-P and WCAP-16675-P. The inspectors sampled the following PMS AOI gateways to ensure requirements were appropriately translated into the design:

- PMS division A AOI gateway
- PMS division B AOI gateway
- PMS division C AOI gateway
- PMS division D AOI gateway

The inspectors reviewed requirement specifications to verify that IEEE 7-4.3.2-2003 requirements were appropriately included in the design requirements. Specifically, the inspectors reviewed requirement specification APP-PMS-J4-003 to ensure system requirements for data communication through the AOI gateways included both electrical and communication isolation between PMS and non-safety systems in accordance with IEEE requirements. The inspectors reviewed the PMS architecture drawings to ensure whether the PMS only sent data out to the non-safety system via the AOI gateway for communication isolation in accordance with the requirement specification. The inspectors also reviewed the requirements to verify that the AOI gateways were required to meet Class 1E to non-Class1E isolation and separation requirements.

The inspectors reviewed design specifications to ensure the requirements of APP-PMS-J4-003 were appropriately translated into the design. Specifically, the inspectors reviewed design specification APP-PMS-J4-020 to verify that the design of the AOI gateway had no data flow from the non-safety system to the safety system via the AOI gateway. The inspectors reviewed the communication cable configuration drawings ensure each PMS division had only one fiber-optic link to the AOI gateway for one-way communication in accordance with the design specification. The inspectors also reviewed the PMS architecture and communication cable configuration drawings to verify whether the isolated one-way interface to the non-safety system was established in the maintenance and test panel.

The inspectors reviewed PMS design drawings to ensure design specifications in APP-PMS-J4-020 were appropriately translated into detailed system architecture and communication configuration drawings. Specifically, the inspectors reviewed design drawings to verify that each AOI gateway used a single fiber-optic cable connected from the transmitter port of the PMS side to the receiver port of the non-safety side of the AOI gateway were in accordance with electrical isolation and one-way communication requirements.

The inspectors reviewed APP-GW-GLR-803 to verify that the analysis was maintained in an auditable form and clearly documented completion of the ITAAC. The inspectors also reviewed APP-PMS-J4-020 to verify that a complete record existed for the AOI gateway. The inspectors reviewed ITAAC closure documentation to verify that the licensee referenced the principal closure document which stated the ITAAC requirements have been met.

b. Findings

No findings were identified.

1A26 (Unit 3) ITAAC Number 2.6.03.02.i (597) / Family 08A
(Unit 4) ITAAC Number 2.6.03.02.i (597) / Family 08A

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 2.6.03.02.i (597). The inspectors used the following NRC IPs/sections to perform this inspection:

- 65001.E-02.01-Design Basis Requirements
- 65001.E-02.03-Qualification
- 65001.E-02.04-Documentation
- 65001.E-02.06-Problem Identification and Resolution

The inspectors reviewed documents for 250 volt direct current battery banks (commodity DB01) and 250 volt direct current motor control centers (commodity DK01) and interviewed personnel to verify:

- the licensee used the appropriate limiting design basis parameters as input for the seismic qualification of the components and the necessary design basis documents and calculations, as appropriate, were correctly incorporated into the qualification program for the components;
- seismic qualification was adequately completed and controlled in accordance with Regulatory Guide 1.100, IEEE Standard 344-1987, ASME QME-1-2007, and applicable design specifications;
- licensee records established an adequate basis for acceptance of the ITAAC with qualification criteria attributes and the qualification report concluded the components can withstand the conditions that would exist before, during, and following a design basis seismic event without loss of safety function for the time required to perform the safety function; and

- seismic qualification documentation was maintained in an auditable manner, was complete, and clearly documented completion of the ITAAC acceptance criteria for the samples inspected.

Specifically, the inspectors performed these reviews for the following components associated with the indicated commodity:
- IDSB-DB-2A, Division B 250 VDC 72-Hour Battery Bank 2 (DB01); and
- IDSB-DK-1, Division B 250 VDC MCC (DK01).

The inspectors reviewed a sample of test deficiencies identified during the seismic qualification process, as documented in the EQDP applicable to each component, to determine if the identified deficiencies were adequately resolved.

The inspectors reviewed the UFSAR Chapter 3, Attachment E to identify the limiting design basis parameters to be used as input for the qualification of the components. The inspectors reviewed the qualification program documents (such as the EQDP, EQSR, applicable test procedures, test specifications, and test reports) to verify that the following qualification requirements were incorporated properly:
- design codes;
- analysis and testing methodologies;
- load combinations; and
- required seismic forces and effects.

Additionally, the inspectors reviewed seismic reconciliation evaluations to verify the test response spectra still enveloped the subsequently revised required response spectra with the margins required by the Westinghouse design specifications.

b. Findings

No findings were identified.

1A27 (Unit 3) ITAAC Number 3.1.00.01 (733) / Family 18A

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 3.1.00.01 (733). The inspectors used the following NRC IPs/sections to perform this inspection:

- 65001.01-02.06 - Records
- 65001.A.02.02 - Installation Records Review

The inspectors performed direct inspection of the licensee's data for the Technical Support Center (TSC) minimum floor space. The licensee collected actual field measurements for pre and post drywall installation to determine whether the total floor space was greater than the minimum required floor space in the ITAAC. The licensee measured the actual floor space for the following rooms in the TSC using a 100' tape measure: B119, B120, B121, B122, B123, B124, B125, B126, B127, B128, B129 and B130. The inspectors reviewed the licensee's as-built TSC floor space survey data and conducted a walkdown of the TSC to verify whether the total floor space in the TSC satisfied the ITAAC acceptance criteria of greater than 1875 $ft^2$.

b. Findings

No findings were identified.

1A28 (Unit 3) ITAAC Number 3.1.00.05 (737) / Family 18A
(Unit 4) ITAAC Number 3.1.00.05 (737) / Family 18A

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 3.1.00.05 (737). The inspectors used the following NRC IPs/sections to perform this inspection:

- 65001.A.02.02 - Installation Records Review

The inspectors reviewed the Standard Emergency Plan Annex and performed a walk down to verify the Vogtle TSC and Operations Support Center (OSC) were located in different locations as required by the ITAAC. The inspectors reviewed approved building drawings to verify whether the TSC was located in the lower level of the Communication Support Center (Building 305) and the OSC was located in the Maintenance Support Building (Building 303).

b. Findings

No findings were identified.

1A29 (Unit 3) ITAAC Number 3.3.00.02a.i.b (761) / Family 01F

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 3.3.00.02a.i.b (761). The inspectors used the following NRC IPs/sections to perform this inspection:

- 65001.01-02.05 - Steel Structures
- 65001.01-02.06 - Records
- 65001.A.02.01 - Observation of in-Process Installation Activities
- 65001.A.02.02 - Installation Records Review
- 65001.B-02.01-Program and Procedures Review
- 65001.B-02.02-Welding Procedure Qualification
- 65001.B-02.03-Welder Qualification
- 65001.B-02.04-Production Controls
- 65001.F-02.01-Design Document Review
- 65001.F-02.02-Fabrication Records Review

The inspectors reviewed records and ongoing work associated with the Vogtle Unit 3 shield building. This inspection focused on the shield building steel composite (SC) panels and the shield building air inlet modules (AI). For the SC panels, the inspectors sampled the design, fabrication/assembly, and in-process welding of the SC panels.

For the AI modules, the inspectors sampled the design, procurement, fabrication, receipt inspection, and storage. For both the SC panels and AI modules the inspectors reviewed a sample of E&DCRs.

The inspectors reviewed the design of the Shield Building with a focus on the SC cylindrical wall panels and AI modules. The inspectors reviewed design calculations, construction specifications, and drawings to verify if they were completed in accordance with the technical and QA requirements. The inspectors reviewed calculations and a sample of E&DCRs to determine if they were prepared in accordance with the requirements of Criterion III, "Design Control", of Appendix B to 10 CFR Part 50 and conformed to American Concrete Institute (ACI) 349, American Institute of Steel Construction (AISC) N690, and the UFSAR. The inspectors reviewed design documents to verify if the SC cylindrical wall panels and AI modules were designed as reinforced concrete structures in accordance with ACI 349-01, and the tension ring was designed as a steel structure in accordance with AISC N690-1994. The inspectors reviewed design changes as documented in E&DCRs to verify if they were subject to design control measures commensurate with those applied to the original design in accordance with the requirements of Criterion III, of Appendix B to 10 CFR Part 50. The inspectors also reviewed a sample of construction specifications and design drawings associated with the SC wall panels and AI modules to determine if the applicable technical and QA requirements were correctly translated into design output documents in accordance with 10 CFR 50 Appendix B, ACI 349-01, and AISC N690.

The inspectors reviewed a sample of procurement, fabrication, receipt inspection, and storage documentation for the AI module, AI-02. Inspectors reviewed the requirements of those design and fabrication specifications to verify if they were in accordance with ACI-349 and AISC N-690. The inspectors reviewed purchase orders (POs) to determine if the material specifications for components fabricated from A572 steel met the requirements of ASTM A572-07. Additionally, the inspectors reviewed the fabrication specifications for NDE referenced in the PO to verify if they met the requirements of AISC N690-94 and American Welding Society (AWS) D1.1:2000.

The inspectors reviewed CMTRs, for the plate material of the AI walls to determine if they were consistent with the requirements of the material specifications specifically, for chemical and mechanical properties. The inspectors reviewed NDE reports to determine if the components were tested in accordance with the SB fabrication specification. Specifically, the inspectors reviewed the NDE reports to verify if the NDE met the following requirements from the fabrication specifications:

- sampling frequency and NDE method used were applicable to the type of weld joint;
- records were present and complete; and
- records were signed by qualified personnel.

The inspectors conducted an independent walkdown of AI-02 to determine if the as-built configuration was in conformance with the design drawings. During this independent walkdown, the inspectors also reviewed the storage of the components to determine if they were stored in accordance with their quality level, as detailed in NPP-10-01, and QS 13.11.

The inspectors reviewed the WPSs associated with the in-process welding to verify if the WPSs were qualified in accordance with AISC N690-94 and AWS D1.1:2000. The inspectors observed in-process welding on vertical seam welds (10M to 10L) and horizontal seam welds (09D to 10DE) to verify if the welding was conducted in accordance with the following WPS parameters:

- Wire type
- Welding position
- Voltage
- Travel Speed

The inspectors reviewed the CMTRs for the filler material, or welding rods, to verify if they were in compliance with the requirements for chemical and material properties of A-5.20 filler materials. The inspectors reviewed welder qualification records to determine the welders were qualified for the work they were performing, in accordance with AWS D1.1:2000.

The inspectors also reviewed a sample of five E&DCRs for the AI modules. The inspectors selected this sample for review to determine if there was adequate recognition, screening, disposition, and general compliance with APP-GW-GAP-420 & APP-GW-GAP-428, respectively. During the review of fabrication records, the inspectors reviewed examples of E&DCRs that represented design changes originating at the vendor, and not yet complete when delivered on site. In these circumstances, the inspectors reviewed these E&DCRs to verify if the licensee had established an effective method for tracking the completion of these items after they have been receipt inspected.

b. Findings

No findings were identified.

1A30 (Unit 3) ITAAC Number 3.3.00.02a.i.c (762) / Family 01F

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 3.3.00.02a.i.c (762). The inspectors used the following NRC IPs/sections to perform this inspection:

- 65001.01-02.05 - Steel Structures
- 65001.02-02.01 - Inspection of Concrete Placement
- 65001.A.02.01 - Observation of in-Process Installation Activities
- 65001.A.02.03 - Independent Assessment/Measurement Inspection

The inspectors performed an inspection associated with walls along column lines 11 and L in the non-radiologically controlled area of the Unit 3 Auxiliary Building between EL. 100’-0” and 117’-6”. The inspectors reviewed licensee records including design drawings, quality control procedures, E&DCRs, corrective action documents, and non-conformance reports and observed ongoing reinforcement installation activities.

The inspectors performed a field walkdown of the walls in the non-rad area to verify if they were constructed in accordance with ACI 349-01. Specifically, the inspectors conducted in field observations of installed reinforcing steel to verify if it was the right size, met spacing requirements and minimum concrete clear cover, and lapped splices met the minimum length as described in design drawings. Also, the inspectors conducted a walkdown to verify if mechanical and electrical penetrations had the proper clearance and additional reinforcement was installed to compensate for large openings. The inspectors independently measured rebar spacing in congested areas to determine if reduced spacing between steel reinforcement bars would make concrete-mix flow and vibration difficult to control during concrete placement. Also the inspectors conducted a walkdown of the embedments to verify if they were located properly in the structure, secured, and free of concrete or excessive rust and had the proper clearances in accordance with licensee's design specifications and drawings.

The inspectors observed reinforcement installation activities to verify if they were performed using the latest-approved design changes, design drawings and quality control procedures in accordance with NQA-1 1994, Basic Requirement 3. In addition, the inspectors performed a walkdown of the as-installed reinforcement to determine if it was installed in accordance with design drawings. Also, the inspectors reviewed several non-conforming condition reports to evaluate if non-conforming items were properly dispositioned in accordance with the licensee's Nonconformance and Disposition Report (N&D) procedure.

The inspectors reviewed the applicable design calculations to determine whether critical design attributes were flowed down to the design drawings and represented in the as-built condition.

b. Findings

No findings were identified.

1A31 (Unit 3) ITAAC Number 3.3.00.02a.i.d (763) / Family 01F

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 3.3.00.02a.i.d (763). The inspectors used the following NRC IPs/sections to perform this inspection:

- 65001.01-02.05 - Steel Structures
- 65001.02-02.01 - Inspection of Concrete Placement
- 65001.A.02.01 - Observation of in-Process Installation Activities
- 65001.A.02.03 - Independent Assessment/Measurement Inspection

The inspectors performed an inspection associated with walls along column line 1 located in the radiologically controlled area of unit 3 auxiliary building between EL. 100-0" and 117'-6". The inspectors reviewed licensee records including design drawings, quality control procedures, E&DCRs, corrective action documents, and NCRs and observed ongoing reinforcement installation activities.

The inspectors observed construction activities of the walls in the area to verify if they were constructed in accordance with ACI 349-01. The inspectors performed a field walkdown of the wall to verify if installed reinforcing steel bars were the right size, met spacing requirements, were free of concrete and excessive rust, met minimum concrete clear cover, and that lapped splices met the minimum length.

The inspectors observed installation activities to determine if they were performed using the latest-approved design changes and design drawings as required in accordance with NQA-1 1994, Basic Requirement 3 (Design Control).

The inspectors observed on-going concrete placement activities for the wall on column line 1 between column lines I and J-2 to verify if activities were completed in accordance with the requirements of NQA-1-1994, subpart 2.5. Specifically, the inspectors reviewed quality control records to determine if pre-placement inspection activities were performed in accordance with inspection plans and the latest revision of design drawings. In addition, the inspectors reviewed the concrete pour card and batch ticket to verify if the following parameters were documented in accordance with licensee's concrete specifications:

- proper mix type,
- concrete strength,
- transport time,
- air content,
- concrete temperature, and
- slump flow.

The inspectors observed concrete placement activities to verify if the activities were conducted in accordance with licensee's concrete specifications and instructions discussed during pre-placement planning meetings. The inspectors observed placement activities to verify if the concrete mix was properly vibrated and placement drop distances did not exceeded concrete placement specification requirements.

The inspectors reviewed the applicable design calculations to determine whether critical design attributes flowed down to the design drawings and were represented in the as-built condition.

b. Findings

No findings were identified.

1A32 (Unit 3) ITAAC Number C.2.6.09.01 (658) / Family 17E
(Unit 4) ITAAC Number C.2.6.09.01 (658) / Family 17E

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number C.2.6.09.01 (658).

This is a security-related input. See non-public report 05200025/2017404 and 05200026/2017404 for details

b. Findings

No findings were identified.

1A33 (Unit 3) ITAAC Number C.2.6.12.05 (675) / Family 08F

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number C.2.6.12.05 (675). The inspectors used the following NRC IPs/sections to perform this inspection:

- 65001.16-02.04 - Design Analysis
- 65001.16-02.05 - Design Verification
- 65001.F-02.02-Fabrication Records Review

The inspectors reviewed the Principal Closure Documents (PCDs) to verify if the onsite equipment was rated to withstand and interrupt offsite fault currents. The inspectors reviewed the ratings of the onsite interface equipment and compared these to the offsite fault current analyses.

The inspectors reviewed the PCD for onsite interface components and reviewed the following:

- isolated phase bus duct and its associated equipment
- main generator circuit breaker
- main step-up transformer
- unit auxiliary transformers
- reserve auxiliary transformers
- turbine generator

Specifically, the inspectors reviewed qualification test reports to verify if interface components were tested in accordance with the design specifications. In addition, the inspectors reviewed drawings to verify if the interface component ratings were in accordance with the design specifications.

The inspectors reviewed the PCD of the short circuit analysis to verify if the licensee's analyses followed industry accepted standards for calculating and documenting the anticipated grid available fault currents. The inspectors independently calculated the fault current contribution from the main generator to determine whether the analysis performed by CAPE (Computer Aided Protection Engineering, version 14, dated 8/25/2017) software was adequate. In addition, the inspectors reviewed the acceptance of this analysis by the ITAAC group to determine if the methodology and objective evidence met the licensee’s procedure for ITAAC principal closure document review.

The inspectors compared the offsite fault currents to the onsite interface component withstand and interrupting ratings to verify whether they were compatible at the interface points.

The inspectors reviewed documents associated with the PCDs to verify whether the documents identified the author, verifier, and approver with associated signatures and

dates, in accordance with the licensee's ITAAC principal closure document procedure. The inspectors interviewed engineering staff and reviewed one resume to evaluate whether the staff's technical qualifications were appropriate for performing the analyses.

b. Findings

No findings were identified.

1A34 (Unit 3) ITAAC Number E.3.9.05.01.01 (849) / Family 18A

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number E.3.9.05.01.01 (849). The inspectors used the following NRC IPs/sections to perform this inspection:

- 65001.A.02.02 - Installation Records Review

The inspectors performed direct inspection of the licensee's data for the TSC minimum floor space. The licensee collected actual field measurements for pre and post drywall installation to determine whether the total floor space was greater than the minimum required floor space in the ITAAC. The licensee measured the actual floor space for the following rooms in the TSC using a 100' tape measure: B119, B120, B121, B122, B123, B124, B125, B126, B127, B128, B129 and B130. The inspectors reviewed the licensee's as-built TSC floor space survey data and performed a walkdown of the TSC to verify whether the total floor space in the TSC met the ITAAC acceptance criteria of greater than 2175 $ft^2$.

b. Findings

No findings were identified.

1A35 (Unit 4) ITAAC Number 2.1.02.02a (13) / Family 06F

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 2.1.02.02a (13). The inspectors used the following NRC IPs/sections to perform this inspection:

- 65001.F- Inspection of the ITAAC-Related Design and Fabrication Requirements
- 65001.F-02.02-Fabrication Records Review
- 65001.F-02.04-General QA Review

The inspectors reviewed fabrication records for Vogtle Unit 4 14" automatic depressurization system (ADS) squib valve assembly number 0920-164452-3-1 to verify if design and fabrication activities were completed in accordance with applicable specifications, drawings, and approved procedures. The inspectors reviewed the

CMTR to verify if the materials used met chemical analysis and mechanical testing requirements as specified in the ASME Code Section II, Part A.

The inspectors reviewed the hydrostatic test procedures and records for the valve to verify if testing was performed according to the production/acceptance testing requirements in the design specification and the ASME Code Section III, Subsection NB-3531.1. The inspectors also reviewed the radiographic examination report and film of surface repairs of the valve body casting. Specifically, the inspectors reviewed the film and report to verify if the sources, activity levels, film type, source to film distance, thickness of material being radiographed and exposure times were in accordance with the requirements of the ASME Code Section V, Article 2.

The inspectors reviewed the licensee's audit of the supplier's QA Program (WES-2017-054) to determine if the implementation of QA requirements applicable to the supplier's valve fabrication activities were performed in accordance with the supplier's (SPX) QA Manual sixth edition. In addition, the inspectors performed a direct inspection of the storage conditions for the squib valves to determine if the valves were stored in compliance with the ASME NQA-1-1994 level C and AP1000 document APP-GW-VHP-002.

b. Findings

No findings were identified.

1A36 (Unit 4) ITAAC Number 2.2.01.02a (91) / Family 06F

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 2.2.01.02a (91). The inspectors used the following NRC IPs/sections to perform this inspection:

- 65001.03-02.02 - Storage and Handling
- 65001.03-02.08 - Problem Identification and Resolution
- 65001.F-02.02-Fabrication Records Review
- 65001.F-02.04-General QA Review

The inspectors reviewed the procurement and fabrication documents for the following Unit 4 CNS ASME pipe sections, to determine whether the materials met the requirements of the procurement specifications, drawings, and the ASME Code, Section III, Subsection NC:

- CAS-PL-L015 Instrument Air In,
- SFS-PL-L038 Spent Fuel Pool Cooling Suction from Containment, and
- WLS-PL-L022 RCDT Gas Out.

The inspectors reviewed the following information in the purchase orders for the sampled pipe sections to determine if they met the requirements of the AP1000 specification for shop fabricated piping:

- certificate of compliance packing list and documentation checklist;
- NDE reports;

- cleaning and final inspection reports;
- CMTRs; and
- NCR log.

The inspectors observed the storage of the pipe sections to determine whether the storage conditions met ASME NQA-1 quality requirements and reviewed the associated QA inspection reports. The inspectors reviewed the Westinghouse QA audit of CB&I Laurens (WES-2017-039) for fabrication activities and programmatic aspects and reviewed a sample of the supplier's corrective action requests identified during the audit to determine if they met quality requirements in the CBIL-QAM-001 QA Manual.

b. Findings

No findings were identified.

1A37 (Unit 4) ITAAC Number 2.2.01.02a (91) / Family 06F

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 2.2.01.02a (91). The inspectors used the following NRC IPs/sections to perform this inspection:

- 65001.F- Inspection of the ITAAC-Related Design and Fabrication Requirements
- 65001.F-02.02-Fabrication Records Review

The inspectors reviewed documents associated with fabrication of containment vessel (CV) flued head penetrations P-20 (normal residual heat removal) and P-22 (spent fuel pool cooling) to verify material and mechanical properties met the SA-182/SA-182M requirements of the ASME Code Section III, subsection NC. Specifically, the inspectors reviewed the CMTRs, CV flued head piping penetration material specifications, and CV flued head supplier fabrication drawings to verify if materials met the design specification.

b. Findings

No findings were identified.

1A38 (Unit 4) ITAAC Number 2.2.03.02a (159) / Family 06F

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 2.2.03.02a (159). The inspectors used the following NRC IPs/sections to perform this inspection:

- 65001.06 - Inspection of ITAAC-Related Installation of Mechanical Components
- 65001.06-02.05 - Problem Identification and Resolution
- 65001.F- Inspection of the ITAAC-Related Design and Fabrication Requirements

- 65001.F-02.01-Design Document Review
- 65001.F-02.04-General QA Review

The inspectors reviewed design documents and applicable construction specifications, drawings, and procedures, and interviewed personnel to verify if the documents adequately defined the final design and arrangement of SSCs in the PXS. Additionally, the inspectors reviewed SSC attributes to verify they were correctly identified, documented, reviewed, and approved by responsible engineering personnel in accordance with WEC procedures, design specifications, and codes and regulations, as discussed in more detail later in this section. Specifically, the inspectors performed these reviews for the following components associated with the indicated commodity:

- PRHR HX (ME02)
- CMT A (MT01)
- CMT B (MT01)
- accumulator tank A (MT02)
- accumulator tank B (MT02)

The inspectors reviewed the following design documents associated with the PRHR HX, CMTs, and accumulator tanks:

- WEC design specification and supporting documents, including sub-component analyses
- ASME generic design report
- design drawings
- plant and system transient analyses
- licensing bases documents

The inspectors selected specific inspection criteria and critical attributes for the SSCs, along with inherent characteristics of engineering programs, to verify if the program controlling design activities had been established and were correctly implemented in accordance with a sampling of sections related to design control for safety-related software applications and training/qualifications in documents QMS, “Quality Management System – A,” Revision (Rev.) 7, and WCAP-12308, “ASME III Quality Assurance Program,” Rev. 40. The criteria selected by the inspectors also considered requirements included by reference to test codes and references to requirements contained in the UFSAR. In addition, the inspectors selected a sample of critical attributes and scenarios to determine if internal and external events or hazards could affect the component’s performance and if that could result in a more than minimal impact to the conclusions made in the WEC transient analysis and in Chapter 15, “Accident Analyses,” of the UFSAR.

For each of the PXS components, the inspectors selected a sample of stress and design analyses for subcomponents to verify if the design inputs were correctly identified and documented and that the subcomponents were designed in accordance with the ASME Code Section III requirements. Specifically, the review was focused on how the licensee’s contractor related the design requirements to the ASME Code requirements in order to ensure the component would meet its design safety functions during normal operations and event conditions. The inspectors reviewed the

calculations, design specifications, and transient analyses to verify if a selected sample of assumptions and results were consistent with Chapter 15 of the UFSAR.

The inspectors reviewed a sample of personnel qualification records and job task training matrix for the engineers who performed design activities, specifically transient analyses. This review was to verify if the design documents were created and verified by qualified engineers and personnel involved in the development of design documents met WEC procedure and the ASME Code Section III qualification requirements. The inspectors also reviewed RPE records for the WEC design specifications for the PRHR HX, CMTs, and accumulator tanks to verify qualification records met WEC procedure, ASME Code, and NQA-1 requirements.

The inspectors reviewed a sample of corrective action documents, including CAPALs, deviation notices, and E&DCRs to verify if the conditions were adequately evaluated by the responsible organizations and that the accepted condition complied with the final design and as-built records. The inspectors also reviewed corrective action documents issued during the inspection to verify if issues were entered into the licensee or applicable contractor CAP in accordance with CAP requirements.

For the PRHR HX, the inspectors selected the following criteria for review:

- a sample of design attributes associated with component classification and service level conditions in accordance with applicable requirements of ASME Section III, Subsection NB, 1998 ed. with 2000 addenda;
- component parameters including primary temperature and pressure, and secondary temperature and pressure;
- potential for water hammer in susceptible heat exchanger; and
- SSC conditions/operations with respect to design assumptions in heat transfer calculations, and as described in the UFSAR.

For the CMTs, the inspectors selected the following criteria for review:

- a sample of design attributes associated with component classification and Service Level conditions in accordance with applicable requirements of ASME Section III, Subsection NB, 1998 ed. with 2000 addenda;
- thermal effects of system and associated thermal stresses on component
- SSC conditions/operations with respect to design assumptions for tank volume and boron concentration to verify they met the design requirements and would function as described in the UFSAR.

Specifically, for the CMTs, the inspectors reviewed the as-built component design documents for the Unit 4A CMT, PXS-MT-02A, to verify if the component was built in accordance with the ASME Code Section III requirements. The inspectors reviewed as-built reconciliation documents, corrective actions, and associated analyses for issues identified during and post fabrication to verify the final documentation and corrections made, still aligned with the original design specifications and the UFSAR. These documents included:

- as-built design report and applicable reconciliation documents;
- QADP; and
- as-built design drawings.

For the accumulator tanks, the inspectors selected the following criteria for review:

- a sample of design attributes associated with component classification and Service Level conditions in accordance with applicable requirements of ASME Section III, Subsection ND, 1998 ed. with 2000 addenda;
- tank pressure with respect to nitrogen temperature, over pressurization, and relief valve operability
- SSC conditions/operations with respect to design assumptions for tank volume and boron concentration to verify they met the design requirements and would function as described in the UFSAR.

Specifically, for the accumulator tanks, the inspectors reviewed the as-built component design documents for the Unit 4A accumulator, PXS-MT-01A, to verify if the component was built in accordance with ASME Code Section III requirements. The inspectors reviewed as-built reconciliation documents, corrective actions, and associated analyses for issues identified during and post fabrication to verify that the final documentation and corrections made, still aligned with the original design specifications and the UFSAR. These documents included:

- as-built design report and applicable reconciliation documents;
- QADP; and
- as-built design drawings.

b. Findings

See section 1A11

Description

See section 1A11

Analysis

See section 1A11

Enforcement

See section 1A11

1A39 (Unit 4) ITAAC Number 2.2.03.02a (159) / Family 06F

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 2.2.03.02a (159). The inspectors used the following NRC IPs/sections to perform this inspection:

- 65001.03-02.01 - Purchase and Receipt of Materials
- 65001.03-02.02 - Storage and Handling
- 65001.B-02.02-Welding Procedure Qualification
- 65001.B-02.06-Records
- 65001.F-02.02-Fabrication Records Review

The inspectors reviewed fabrication records for a sample of PXS pipe segments fabricated by CB&I Laurens from table 2.2.3-2 of Appendix C of the COL to determine if they had been fabricated in accordance with the requirements of the ASME Code Section III and the procurement specifications. The inspectors reviewed records for the following lines and spools:

- Line PXS-L015A, spool SV4-PLW-011-1
- Line PXS-L029A, spool SV4-PLW-013-1
- Line PXS-L113A, spool SV4-PLW-01A-1
- Line PXS-L017A, spool SV4-PLW-01K-2
- Line PXS-L113A, spool SV4-PLW-01Z-1
- Line PXS-L027B, spool SV4-PLW-024-1
- Line PXS-L127B, spool SV4-PLW-02L-1C
- Line PXS-L025B, spool SV4-PLW-02L-3
- Line PXS-L131B, spool SV4-PLW-090-2
- Line PXS-L180B, spool SV4-PLW-101-1
- Line PXS-L142A, spool SV4-PLW-221-1
- Line PXS-L113A, spool SV4-PLW-470-1

For each spool, as applicable the inspectors reviewed the drawings and work travelers to determine if the work steps to be performed had been controlled and all steps had been signed and completed. The inspectors reviewed the CMTR to determine if the pipes and fittings had been fabricated, heat treated, and tested for strength and chemistry in accordance with the ASME Code Sections III and II and the fabrication specification. The inspectors reviewed the code data report to determine if it had been completed and signed by the ANI. The inspectors reviewed bending reports to determine if pipe bending had been performed in accordance with the fabrication specification. The inspectors reviewed all NCRs associated with the pipe spool to determine if identified nonconformances been dispositioned in accordance with the QA Program. The inspectors reviewed NDE reports to determine if welds had been inspected by the appropriate level of NDE inspector and were found acceptable in accordance with the ASME Code. The inspectors reviewed the weld filler metal CMTRs to determine if the weld metal had been tested for ferrite number and chemical analysis as required by the ASME Code and the fabrication specification. The inspectors also reviewed the fabricator's PT procedure to determine if it met the requirements of the ASME Code Sections III and V, welding procedures, and qualification records to determine if they had been written and qualified in accordance with the ASME Code Sections III and IX.

The inspectors reviewed a receipt inspection report to verify that issues identified during the receipt inspection were handled according to the receipt inspection procedure. The inspectors also reviewed audits of CB&I Laurens to verify that CB&I Laurens had been audited and approved to perform the work associated with the fabrication of welded and bent pipe spools. The inspectors also reviewed additional audits to verify that the licensee had followed up on and closed previously identified audit findings.

Lastly the inspectors reviewed the licensee's storage procedure for pipe spools and performed a walk down of four pipe spools in a warehouse and in a lay down yard to verify whether the PXS piping had the required markings, was traceable, and was being stored in accordance with the procedure and ASME NQA-1, 1994 edition. The

inspectors walked down the following pipes associated with lines PXS-PL-L113A, PXS-PL-L180B, and PXS-PL-L142A:

- SV4-PXS-PLW-01A-2
- SV4-PXS-PLW-470-1
- SV4-PXS-PLW-101-1
- SV4-PXS-PLW-221-1

b. Findings

No findings were identified.

1A40 (Unit 4) ITAAC Number 3.3.00.02a.i.a (760) / Family 01F

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 3.3.00.02a.i.a (760). The inspectors used the following NRC IPs/sections to perform this inspection:

- 65001.B-02.03-Welder Qualification
- 65001.B-02.04-Production Controls
- 65001.B-02.05-Inspection

The inspectors observed manual GTAW welding for welds joining structural submodules CA01-22 and CA03-01, which make up the connection between the west wall of the refueling cavity and the west wall of the IRWST. Specifically, the inspectors observed welds 870442-FW011 and 870442-FW013 to determine whether welding activities were performed in accordance with the requirements of the AWS D1.6 Code. The inspectors reviewed records to determine whether the weld data sheet (WDS) and welder qualifications were in accordance with the code. The inspectors reviewed the WDS to determine whether QC inspection hold point sign-offs were completed for fit-up and tack, root visual testing (VT), and backgouge PT as required by the WECTEC QA plan.

In addition, the inspectors reviewed performance qualification records to determine whether welders JEG4833 and WRS5383 were tested and certified in accordance with the requirements of AWS D1.6, Section 4 - Part B for welding duplex stainless steel in the vertical position. The inspectors reviewed a CMTR for ER2209 classification to determine whether the chemical analysis and mechanical properties for heat # 1203C were in accordance with the requirements of the AWS A5.9 welding rod material specification.

The inspectors independently evaluated the as-built weld that joins structural modules CA02 to CA03, which make up the east wall and the west wall of the IRWST. The inspectors inspected the final weld surfaces of FW-01 shown on drawing SV4-CA02-CAK-870664 and a spacer plate on drawing SV4-CA02-S8-111-R0 for both vertical seam groove welds. Specifically, the inspectors performed a walkdown and visually inspected the welds to determine whether the weld surface profiles (i.e. undercut, coldlap and surface porosity) were completed in accordance with the requirements of

AWS D1.6, paragraphs 5.11 "Weld Profiles", and 6.28 "Quality of Welds - Statically Loaded".

b. Findings

No findings were identified.

1A41 (Unit 4) ITAAC Number 3.3.00.02a.i.a (760) / Family 01F

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 3.3.00.02a.i.a (760). The inspectors used the following NRC IPs/sections to perform this inspection:

- 65001.01-02.05 - Steel Structures
- 65001.01-02.07 - Identification and Resolution of Problem
- 65001.A.02.02 - Installation Records Review
- 65001.F-02.02-Fabrication Records Review

The inspectors reviewed records and ongoing work associated with the Vogtle Unit 4 containment internal structures (CIS). This inspection focused on CIS floor modules of the maintenance floor (el. 107'-0") and operating deck floor (el. 135'-3"). Specifically, the inspectors looked at CIS modules CA32 and CA33 (el. 107'-0") and CA56 (el. 135'-3"). For these modules, the inspection sampled the procurement, fabrication, receipt inspection, and storage. The inspectors reviewed a sample of E&DCRs and N&Ds.

The inspectors reviewed the procurement, fabrication, receipt inspection, and storage for the CIS modules. The inspectors reviewed the requirements of those design and fabrication specifications to verify they were in accordance ACI-349 and AISC N-690. The inspectors reviewed POs to determine if the material specifications for components fabricated from A572 steel met the requirements of ASTM A572-07. Additionally, the inspectors reviewed the fabrication specifications for NDE referenced in the PO to verify if they met the requirements of AISC N690-94 and AWS D1.1:2000.

The inspectors reviewed NDE reports to determine if the components were tested in accordance with the Shield Building fabrication specification. Specifically, the inspectors reviewed the NDE reports to verify if the NDE met the following requirements from the fabrication specifications:

- sampling frequency and NDE method used were applicable to the type of weld joint;
- records were present and complete; and
- records were signed by qualified personnel.

The inspectors reviewed CoCs to verify if acceptance of these components was completed in accordance with licensee procedure F-Q445-004. The inspectors conducted an independent walkdown of CIS modules to verify if the as-built configuration matched what was detailed in the design drawings, documented in weld travelers, and received on site for use. During this independent walkdown, the inspectors also reviewed the storage of the modules to determine they were being

stored in accordance with their Quality Level, as detailed in procedures NPP-10-01 and QS 13.11.

The inspectors also reviewed a sample of 10 N&Ds and EDCRs for the CIS modules. The inspectors selected a sample of these documents to review to determine if there was adequate recognition, screening, disposition, and general compliance with APP-GW-GAP-420 & APP-GW-GAP-428, respectively. During the review of fabrication records, the inspectors looked for examples of E&DCRs that represented design changes originating at the vendor, and not yet complete when delivered on site. In these circumstances, the inspectors reviewed these E&DCRS to verify if the licensee had established an effective method for tracking the completion of these items after they have been receipt inspected.

b. Findings

No findings were identified.

1A42 (Unit 4) ITAAC Number 3.3.00.02a.i.a (760) / Family 01F

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 3.3.00.02a.i.a (760). The inspectors used the following NRC IPs/sections to perform this inspection:

- 65001.01-02.05 - Steel Structures
- 65001.B-02.02-Welding Procedure Qualification
- 65001.B-02.03-Welder Qualification
- 65001.B-02.04-Production Controls
- 65001.B-02.05-Inspection
- 65001.F-02.02-Fabrication Records Review
- 65001.F-02.03-Observation of Fabrication Activities

The inspectors performed an inspection of the Unit 4 CA01 Module, which makes up refueling canal, pressurizer compartment, and steam generator compartments. The inspectors observed fit-up and in-process GTAW welding of embed plate B-147 to the Unit 4 CA01 Module, subassembly 2, at elevation 103'-0" to verify if welding activities were completed in accordance with AWS D1.6:1999 and the WPS.

The inspectors reviewed the WPS used for welding plate B-147 to verify if the WPS was qualified in conformance with AWS D1.6:1999. The inspectors reviewed the WPS to verify if it specified welding positions, all of the applicable essential and nonessential supplementary variables referenced in the code, and shielding gas flow and composition. The inspectors reviewed the applicable procedure qualification record (PQR) associated with the WPS to verify if the PQR confirmed successful WPS qualification in accordance with AWS D1.6:1999.

The inspectors reviewed the in-process work package to verify if weld documentation was traceable throughout the work package. The inspectors reviewed a sample of weld records to determine if each weld was traceable to a welder. The inspectors

reviewed the work steps and signature logs to determine if work step sequences were maintained and QC had signed and dated the inspections (in-process and completed) as required by the work package. In addition, the inspectors reviewed a sample of completed weld logs to determine if QC had completed the final NDE for the welds. The inspectors reviewed the work steps in the work package to verify any nonconformances identified were documented to allow for tracking, evaluation, and dispositioning, including required QC signatures.

The inspectors observed the weld fit-up configuration for embed plate B-147 to verify if the weld joint geometry, including root opening, elevation, and fit-up tolerances were as specified in the work package and the embed plate was marked to maintain traceability from storage through installation in the work package. The inspectors independently assessed the weld joint preparation to verify if the surfaces to be welded were smooth, uniform, and free from significant surface discontinuities, contaminants, and corrosion. The inspectors observed the welder preparing to perform welding to verify if the temperature of the base material at the joint prior to welding met the preheat requirements of the WPS and the weld joint was sufficiently protected from inclement conditions, including temperature, moisture, dust, and wind. The inspectors observed the following in-process welding attributes and parameters to verify if the work was conducted in accordance with the weld data sheet and within the ranges specified on the WPS:

- filler metal classification,
- filler metal diameter,
- preheat temperature,
- travel speed,
- amps,
- volts,
- heat input, and
- weld technique.

Additionally, the inspectors observed welders and field engineers to determine if they routinely checked welding variables during in-process welding and if the variables were in accordance with the WPS. The inspectors reviewed the in-process weld data sheet, including the welder filling out required fields, to verify if the weld was traceable to the welder and the weld data sheet documented sequencing of operations, established adequate hold points, and provided production welding and inspection signoffs.

The inspectors reviewed the welder qualifications records for the welder performing the welding on plate B-147 to verify if the welder was qualified. Specifically, the inspector reviewed the qualifications to determine if the welder was qualified for this type of weld, including weld process, position, and materials, and the qualification was identifiable to the welder.

b. Findings

No findings were identified.

1A43 (Unit 4) ITAAC Number 3.3.00.02a.i.b (761) / Family 01F

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 3.3.00.02a.i.b (761). The inspectors used the following NRC IPs/sections to perform this inspection:

- 65001.01-02.05 - Steel Structures
- 65001.01-02.07 - Identification and Resolution of Problem
- 65001.A.02.02 - Installation Records Review
- 65001.F-02.01-Design Document Review
- 65001.F-02.02-Fabrication Records Review

The inspectors reviewed records and ongoing work associated with the Vogtle Unit 4 Shield Building. This inspection focused on the Shield Building SC panels. For SC panels 07J and 09B, the inspection sampled the design, procurement, fabrication/assembly, and storage. Additionally, the inspectors reviewed a sample of E&DCRs.

The inspectors reviewed the design of the Shield Building with a focus on the SC cylindrical wall panels. The inspectors reviewed design calculations, construction specifications, and drawings to verify if they were completed in accordance with the technical and QA requirements. The inspectors reviewed calculations and a sample of E&DCRs to determine if they were prepared in accordance with the requirements of Criterion III, “Design Control”, of Appendix B to 10 CFR Part 50 and conformed to the ACI 349, AISC N690, and the UFSAR. The inspectors reviewed design documents to verify if the SC cylindrical wall panels were designed as reinforced concrete structures in accordance with ACI 349-01, and the tension ring was designed as a steel structure in accordance with AISC N690-1994. The inspectors reviewed design changes as documented in E&DCRs to verify if they were subject to design control measures commensurate with those applied to the original design in accordance with the requirements of Criterion III, of Appendix B to 10 CFR Part 50. The inspectors also reviewed a sample of construction specifications and design drawings associated with the SC wall panels and AI modules to determine if the applicable technical and QA requirements were correctly translated into design output documents in accordance with 10 CFR Appendix B, ACI 349, and AISC N690.

The inspectors reviewed a sample of procurement, fabrication/assembly, and storage for the SC Panels 07J and 09B. The inspectors reviewed the requirements of those design and fabrication specifications to verify they were in accordance with ACI 349-01 and AISC N-690. The inspectors reviewed POs to determine if the material specifications for components fabricated from A572 steel met the requirements of ASTM A572-07. Additionally, the inspectors reviewed the fabrication specifications for NDE referenced in the PO to verify if they met the requirements of AISC N690-94 and AWS D1.1:2000.

The inspectors reviewed CMTRs, for the plate material of the SC walls to determine if they were consistent with the requirements of the material specifications specifically, for chemical and mechanical properties. The inspectors reviewed NDE reports to determine if the components were tested in accordance with the Shield Building

fabrication specification. Specifically, the inspectors reviewed the NDE reports to verify if the NDE met the following requirements from the fabrication specifications:

- sampling frequency and NDE method used were applicable to the type of weld joint;
- records were present and complete; and
- records were signed by qualified personnel.

The inspectors conducted an independent walkdown of SC Panels 07J and 09B to determine that the as-built configuration matched what was detailed in the design drawings. During this independent walkdown, the inspectors also reviewed the storage of the components to determine they were being stored in accordance with their Quality Level, as detailed in NPP-10-01 and QS 13.11.

The inspectors also reviewed a sample of 5 E&DCRs for these SC panels. The inspectors selected a sample of these documents to review for adequate recognition, screening, disposition, and general compliance with procedure APP-GW-GAP-420. During the review of fabrication records, the inspectors looked for examples of E&DCRs that represent design changes originating at the vendor, and not yet complete when delivered on site. In these circumstances, the inspectors reviewed these E&DCRs to verify if the licensee had established an effective method for tracking the completion of these items after they were receipt inspected.

b. Findings

No findings were identified.

1A44 (Unit 4) ITAAC Number 3.3.00.02a.i.c (762) / Family 01F

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 3.3.00.02a.i.c (762). The inspectors used the following NRC IPs/sections to perform this inspection:

- 65001.01-02.01 - Procedures
- 65001.02-02.01 - Inspection of Concrete Placement
- 65001.A-02.01 - Observation of in-Process Installation Activities
- 65001.A-02.03 - Independent Assessment/Measurement Inspection

The inspectors reviewed implementing procedures and quality records, performed independent measurements, and observed field installation activities for the following wall sections between elevations 82’-6” and 100’-0” associated with the non-radiologically controlled area of the Auxiliary Building for Vogtle Unit 4:

- column line 7.3 wall from column line I to the Shield Building;
- column line 9.1 wall from column line I to column line L;
- column line J wall from column line 7.3 to column line 9.2;
- column line K wall from the Shield Building to column line 9.2; and
- column line L wall from the Shield Building to column line 9.2.

The inspectors reviewed a sample of approved implementing procedures and specifications to determine whether they correctly translated the requirements specified in the applicable QA programs; 10 CFR 50 Appendix B; Section 3.3 of Appendix C of the COL; and code commitments in ACI 349-01, AWS D1.1:2000, and AWS D1.4:1998. The inspectors reviewed the described work controls in each document sampled, including approved work processes and inspection requirements, to determine whether they clearly prescribed acceptable methods of quality control inspection. Specifically, the inspectors reviewed the processes to determine if the quality control inspection would ensure the as-built condition met specified design requirements, drawings, and material specifications. Additionally, the inspectors reviewed the quality control inspection requirements to determine whether they included appropriate quantitative and/or qualitative acceptance criteria for determining the prescribed activities were accomplished as required by the QA programs and 10 CFR 50 Appendix B. The inspectors reviewed testing and measuring work controls included in the sampled procedures and specifications to verify if they included requirements for measuring and test equipment to be calibrated and maintained in accordance with approved calibration procedures and vendor requirements. The inspectors also reviewed the procedures and specifications to determine whether they provided qualification requirements for craft and quality control inspection personnel performing installation and testing activities in accordance with the applicable QA programs and 10 CFR 50 Appendix B.

For the wall section along column line 7.3, the inspectors observed installation activities to determine whether approved procedures and work packages were available in the work area and followed in accordance with the applicable QA programs and 10 CFR 50 Appendix B. The inspectors observed nonconforming items in the work area to determine whether they were clearly identified and segregated, if possible, in accordance with the applicable QA programs and 10 CFR 50 Appendix B. For the wall section along column line 7.3, the inspectors performed independent inspection and measurements to determine whether these aspects of the wall section were constructed in accordance with the quality and technical requirements in the design drawings, procedures, specifications, ACI 349-01, and AWS D1.4:1998. Prior to concrete placement, the inspectors independently assessed reinforcing steel and embedments to determine whether they were secured and free of contaminants and excessive rust as required by the applicable QA programs, procedures, and specifications. The inspectors performed the above activities for the following aspects of the wall section:

- formwork,
- embedments,
- horizontal and vertical reinforcing steel bars,
- shear reinforcement,
- wall dowel bars extending above elevation 100’-0”, and
- bar splices.

For the wall section along column line 7.3, the inspectors also observed Lenton rebar coupler mechanical splice installation activities to determine whether required vendor instructions were implemented in the field and required inspections were performed during and after splicing in accordance with procedure and specification requirements. The inspectors reviewed the work steps associated with the installation of the Lenton rebar couplers included in the work package to determine whether acceptance criteria

for installation activities were defined and satisfied, each splice was documented, and the documentation included materials used, location, and type of splice in accordance with the procedures and specifications.

For all of the wall sections listed above, the inspectors independently assessed the formwork prior to concrete placement to determine whether it was secure, leak tight, and free from debris or excess water as required by ACI 349-01, the applicable QA programs, procedures, and specifications.

For all of the wall sections described above, the inspectors reviewed a sample of in-process work packages in the work area for reinforcing steel, embedments, formwork, and concrete placement to determine whether the latest approved procedures, drawings, and work instructions were available at the installation area and were followed throughout installation as required by applicable QA programs and 10 CFR 50 Appendix B. The inspectors reviewed a sample of in-process work steps with signature logs included in the in-process work packages in the work area to determine whether the licensee verified the items installed met specified requirements and the installation, inspection, and testing sequences were maintained in accordance with the applicable QA programs, procedures, and specifications. The inspectors reviewed the design changes, field modifications, and nonconformances included in the work packages to determine whether they were controlled and processed in accordance with the QA program.

The inspectors observed concrete placement activities for all of the wall sections described above to determine whether approved work instructions, procedures, and specifications were available in the work area and were followed throughout the concrete placement. The inspectors observed the equipment being used during the concrete placement to verify it was suitable and sized for the work in accordance with the applicable QA programs, procedures, specifications, and ACI 349-01. The inspectors observed field engineering and quality control inspections throughout the concrete placement to verify if inspection during placement was performed as required by the applicable QA programs, procedures, specifications, and ACI 349-01. During the concrete placement, the inspectors independently evaluated placement drop distances to determine whether any segregation occurred and they were in accordance with the applicable QA programs, procedures, specifications, and ACI 349-01.

During the concrete placement, the inspectors evaluated a sample of batch tickets as they were being filled out and signed by the concrete truck drivers, filed engineers, and quality control inspectors to determine whether each batch ticket was reviewed for the following in accordance with the applicable QA programs, procedures, specifications, and ACI 349-01:

- verification of proper mix,
- transport time and truck rotations,
- placement location, and
- amount of temper water being added at the truck delivery point.

The inspectors reviewed a sample of batch tickets throughout the concrete placement to verify if records were produced and indicated the following in accordance with the applicable QA programs, procedures, specifications, and ACI 349-01:

- mix,

- location,
- time placed,
- water additions,
- temperature of the concrete mix, and
- ambient conditions.

The inspectors evaluated a sample of batch tickets after the concrete placement to verify if quality records were retrievable, verified by quality control, and were identical to the ones generated during the concrete placement in accordance with the applicable QA programs, procedures, specifications.

During the concrete placement for all of the wall sections described above, the inspectors observed in-process concrete testing, including concrete temperature, slump, air content, and unit weight. The inspectors performed this observation to determine whether testing performed at the proper location and frequency and sample collection and testing techniques conformed to the standards required by procedures, specifications, and ASTM standards. In addition, the inspectors observed the testing to determine if test results were evaluated against applicable quantitative and qualitative acceptance criteria in accordance with the applicable QA programs, 10 CFR 50 Appendix B, procedures, specifications, and ASTM standards. During in-process concrete testing, the inspectors observed the making and initial curing of concrete strength test sample cylinders to determine whether they were made at the required location and frequency and were cured in accordance with specified requirements of with the applicable QA programs, procedures, specifications, and ASTM standards. The inspectors interviewed the personnel performing the in-process concrete testing to determine whether they were knowledgeable, experienced, and trained as required by the applicable QA programs, 10 CFR 50 Appendix B, procedures, specifications, and ASTM standards.

b. Findings

No findings were identified.

1A45 (Unit 4) ITAAC Number 3.3.00.02a.i.d (763) / Family 01F

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 3.3.00.02a.i.d (763). The inspectors used the following NRC IPs/sections to perform this inspection:

- 65001.01-02.01 - Procedures
- 65001.01-02.05 - Steel Structures
- 65001.A.02.03 - Independent Assessment/Measurement Inspection

The inspectors performed an inspection associated with the floor concrete slab located between column lines 1 and 2 and column lines I and N located in the radiologically controlled area of the Unit 4 auxiliary building at EL. 82’-6”. The inspectors reviewed records including design drawings, engineering specifications, and engineering design change requests.

The inspectors performed a field walkdown of the concrete slab to verify if they were constructed in accordance with ACI 349-01. Specifically, the inspectors conducted in field observations of slab construction to verify if:

- rebar were the right size;
- rebar met critical spacing requirements;
- rebar was free of concrete and excessive rust;
- rebar met minimum concrete clear cover;
- lapped splices met the minimum lengths; and
- mechanical and electrical penetrations had the proper clearances and additional rebar was installed where required.

The inspectors observed reinforcement installation activities to verify if they were performed using the latest-approved design changes, design drawings and quality control procedures in accordance with NQA-1 1994, Basic Requirement 3.

The inspectors reviewed the applicable design calculations to determine whether critical design attributes flowed down to the design drawings and represented in the as-built condition.

b. Findings

No findings were identified.

1A46 (Unit 4) ITAAC Number 3.3.00.02a.i.d (763) / Family 01F

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 3.3.00.02a.i.d (763). The inspectors used the following NRC IPs/sections to perform this inspection:

- 65001.01-02.01 - Procedures
- 65001.02-02.01 - Inspection of Concrete Placement
- 65001.02-02.02 - Laboratory Testing
- 65001.02-02.06 - Record Review
- 65001.A.02.01 - Observation of in-Process Installation Activities

The inspectors reviewed implementing procedures and quality records, performed independent inspection, and observed field installation activities for the floor sections at elevation 82’-6” from column lines 1 to 2 and I to N associated with the radiologically controlled area of the Auxiliary Building for Vogtle Unit 4.

The inspectors reviewed a sample of approved implementing procedures and specifications to determine whether they correctly translated the requirements specified in the applicable QA programs; 10 CFR 50 Appendix B; Section 3.3 of Appendix C of the COL; and code commitments in ACI 349-01, AWS D1.1:2000, and AWS D1.4:1998. The inspectors reviewed the described work controls in each document sampled, including approved work processes and inspection requirements, to determine whether they clearly prescribed acceptable methods of quality control inspection. Specifically, the inspectors reviewed the processes to determine if the

quality control inspection would ensure the as-built condition met specified design requirements, drawings, and material specifications. Additionally, the inspectors reviewed the quality control inspection requirements to determine whether they included appropriate quantitative and/or qualitative acceptance criteria for determining that the prescribed activities were accomplished as required by the QA programs and 10 CFR 50 Appendix B. The inspectors reviewed testing and measuring work controls included in the sampled procedures and specifications to verify if they included requirements for measuring and test equipment to be calibrated and maintained in accordance with approved calibration procedures and vendor requirements. The inspectors also reviewed the procedures and specifications to determine whether they provided qualification requirements for craft and quality control inspection personnel performing installation and testing activities in accordance with the applicable QA programs and 10 CFR 50 Appendix B.

The inspectors independently assessed the formwork prior to concrete placement to determine whether it was secure, leak tight, and free from debris or excess water as required by ACI 349-01, the applicable QA programs, procedures, and specifications.

The inspectors observed concrete placement activities for all of the wall sections described above to determine whether approved work instructions, procedures, and specifications were available in the work area and were followed throughout the concrete placement. The inspectors observed the equipment being used during the concrete placement to verify it was suitable and sized for the work in accordance with the applicable QA programs, procedures, specifications, and ACI 349-01. The inspectors observed field engineering and quality control inspections throughout the concrete placement to verify if inspection during placement was performed as required by the applicable QA programs, procedures, specifications, and ACI 349-01. During the concrete placement, the inspectors independently evaluated placement drop distances to determine whether any segregation occurred and they were in accordance with the applicable QA programs, procedures, specifications, and ACI 349-01.

During the concrete placement, the inspectors evaluated a sample of batch tickets as they were being filled out and signed by the concrete truck drivers, field engineers, and quality control inspectors to determine whether each batch ticket was reviewed for the following in accordance with the applicable QA programs, procedures, specifications, and ACI 349-01:

- verification of proper mix,
- transport time and truck rotations,
- placement location, and
- amount of temper water being added at the truck delivery point.

The inspectors reviewed a sample of batch tickets throughout the concrete placement to verify if records were produced and indicated the following in accordance with the applicable QA programs, procedures, specifications, and ACI 349-01:

- mix,
- location,
- time placed,
- water additions,
- temperature of the concrete mix, and

- ambient conditions.

The inspectors evaluated a sample of batch tickets after the concrete placement to verify if quality records were retrievable, verified by quality control, and were identical to the ones generated during the concrete placement in accordance with the applicable QA programs, procedures, specifications.

During the concrete placement, the inspectors observed in-process concrete testing, including concrete temperature, slump, air content, and unit weight. The inspectors performed this observation to determine whether testing performed at the proper location and frequency and sample collection and testing techniques conformed to the standards required by procedures, specifications, and ASTM standards. In addition, the inspectors observed the testing to determine if test results were evaluated against applicable quantitative and qualitative acceptance criteria in accordance with the applicable QA programs, 10 CFR 50 Appendix B, procedures, specifications, and ASTM standards. During in-process concrete testing, the inspectors observed the making and initial curing of concrete strength test sample cylinders to determine whether they were made at the required location and frequency and were cured in accordance with specified requirements of with the applicable QA programs, procedures, specifications, and ASTM standards. The inspectors interviewed the personnel performing the in-process concrete testing to determine whether they were knowledgeable, experienced, and trained as required by the applicable QA programs, 10 CFR 50 Appendix B, procedures, specifications, and ASTM standards. After the concrete placement, the inspectors reviewed field and lab concrete test results to determine whether the records were retrievable, complete, accurate, and were evaluated against the appropriate acceptance criteria, and approved as required by the applicable QA programs, procedures, and specifications. The inspectors observed concrete curing activities to determine whether curing was in accordance with specifications and procedures with regard to the method, materials, duration, and temperature.

b. Findings

No findings were identified.

1A47 (Unit 4) ITAAC Number 3.3.00.02a.ii.a (764) / Family 01A

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 3.3.00.02a.ii.a (764). The inspectors used the following NRC IPs/sections to perform this inspection:

- 65001.01-02.04 - Key Dimensions and Volumes
- 65001.01-02.06 - Records
- 65001.A.02.02 - Installation Records Review

The inspectors performed concrete thickness inspection associated with the containment internal structures for Vogtle Unit 4. Specifically, the inspectors sampled the shield wall between the reactor vessel cavity (module CA04) and reactor coolant drain tank room (module CB65) between elevations 71’-6” and 83’-0”.

The inspectors performed a review of the survey program to determine if key dimensions of containment internal structures were verified through a quality controlled process and whether there had been any substantial changes to the survey program. The inspectors interviewed personnel in charge of surveying activities and reviewed training records for the surveyors to verify the survey measurements were performed by qualified individuals. The inspectors reviewed surveying records associated with the wall section to determine whether wall dimensions complied with the dimensions specified, including allowed tolerances, in Table 3.3-1 of Appendix C of the Vogtle Unit 4 COL for the sample. The inspectors reviewed specific procedures and surveying inspection reports to determine if:

- surveying activities were performed by qualified individuals other than those who performed the work being inspected;
- measuring and test equipment (M&TE) used for the surveys were calibrated at the required frequency for each work operation, as described in the implementing documents;
- survey results indicated acceptability and compliance with commitments contained in the UFSAR; and
- surveys were performed in accordance with inspection plans and procedures.

b. Findings

No findings were identified.

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

1P01 Construction QA Criterion 10

- 35007-A10.04 - Inspection Requirements and Guidance
- 35007-A10.04.01 - Inspection of QA Implementing Documents
- 35007-A10.04.02 - Inspection of QA Program Implementation

a. Inspection Scope

The inspectors reviewed the licensee's implementation of QA Program requirements for conducting inspections of materials, equipment, and components to verify activities were accomplished in accordance with the NRC-approved QA Program description.

The inspectors also reviewed implementing procedures for conduct of quality inspections to confirm the requirements of the Nuclear Development Quality Assurance Manual, Version 17.0, including the committed version of ASME NQA-1 continued to be addressed since the previous inspection.

In addition, the inspectors conducted interviews with personnel responsible for control of quality inspections, performed record reviews, and conducted direct observations of a diverse sample of quality inspection activities. The scope of review included observations of inspections performed by the licensee of raceway supports in the Unit 4 battery rooms, and welding activities in Unit 3. The inspectors also reviewed the

inspection report and associated documentation for a concrete rebar inspection for Unit 4.

Overall, the inspectors reviewed inspection procedures, work packages, drawings, inspection plans, and licensee inspection reports associated with the aforementioned inspection activities to verify the documents addressed the following attributes as applicable:

- the person(s) conducting the inspection were qualified and/or authorized to conduct the inspection, and to update markings or documentation subsequent to the inspection;
- the inspector had the current implementing document and appropriate tools to conduct the inspection (not applicable to inspection of Unit 4 concrete rebar);
- the items were installed as described by the drawings and construction specifications;
- items were marked accurately in the documents to reflect their inspection status; and
- results of the inspection(s) were documented and complete.

b. Findings

No findings were identified.

1P02 Construction QA Criterion 12

- 35007-A12.04 - Inspection Requirements and Guidance
- 35007-A12.04.01 - Inspection of QA Implementing Documents
- 35007-A12.04.02 - Inspection of QA Program Implementation

a. Inspection Scope

The inspectors reviewed the licensee's implementation of QA Program requirements for control of M&TE to verify activities were accomplished in accordance with the NRC-approved QA Program description.

The inspectors also reviewed implementing procedures for control of M&TE to confirm the requirements of the Nuclear Development Quality Assurance Manual, Revision 17, continued to be addressed since the previous inspection. The inspectors reviewed program procedures to confirm program procedures covered devices used to demonstrate that SSCs will perform satisfactorily in service, and requirements and acceptance limits for M&TE were properly flowed down from applicable design documents.

In addition, the inspectors conducted interviews with personnel responsible for control of M&TE, performed record reviews, and conducted direct observations of use and handling of a diverse sample of items. The inspectors performed these inspection activities to verify if the following program attributes were addressed:

- M&TE in work areas, including devices recorded in work control packages as having been used in the performance of work activities;
- M&TE maintained in storage or ready room which were available for use

- system for tracking status and use of M&TE;
- records to show calibration of M&TE to recognized standard;
- M&TE found to be out of calibration or damaged, and records to show evaluation of previous use; and
- M&TE packaged for shipment to offsite facility, such as calibration service.

The inspectors reviewed the tracking system for control and calibration of the onsite M&TE used by the licensee. The inspectors also interviewed personnel controlling the tracking system, as well as users of the equipment, to verify that they understood the program aspects. The inspectors sampled equipment in the storage facilities and in the field to ensure the equipment and instrumentation used was properly calibrated and used within the specifications to the equipment. Samples selected included M&TE that had been taken out of service because of non-conforming conditions to evaluate adequacy of controls to prevent inadvertent use.

Devices selected for inspection samples included the following:

- V-2Z-0033, Voltmeter, Awaiting Calibration
- V-AD-0086, Pressure Gauge
- V-AP-0130, Digital Thermometer; used during welding inspection
- V-2Z-0047, Voltmeter

b. Findings

No findings were identified.

1P03 Construction QA Criterion 14

- 35007-A14.04 - Inspection Requirements and Guidance
- 35007-A14.04.01 - Inspection of QA Implementing Documents
- 35007-A14.04.02 - Inspection of QA Program Implementation

a. Inspection Scope

The inspectors reviewed the licensee's implementation of QA Program requirements for indicating status of items designated to undergo inspection and test, and which were to be made available for operation. The inspectors reviewed activities to verify whether the activities were accomplished in accordance with the NRC-approved Nuclear Development Quality Assurance Manual.

The inspectors reviewed the implementing procedures that had been updated since the previous inspection and which specifically addressed the inspection, test, and operating status of items that were safety-related or risk-significant. The inspectors performed this review to confirm the requirements of the Nuclear Development Quality Assurance Manual continued to be addressed.

In addition to the procedure review, the inspectors conducted interviews with responsible individuals in operations and system engineering, and conducted direct observations of status indications for items that were subject to inspection or test, or had been made available for operation. The inspectors performed these activities to

verify that only the items have which have undergone required inspection and testing, and have passed or been determined to be acceptable are used. The scope of review included the following:

- supply breaker for malfunctioned Firewater System Tank B refill Motor operated valve 0-YFS-V003B (CR 10433494),
- temporary Modification status tag on Auxiliary Pump House PLC Cabinet,
- jurisdictional Control Tag on Auxiliary Pump House PLC Cabinet,
- jurisdictional Control Tags on Auxiliary Pump House HVAC Panel 0-VPS-MS-01, and
- quality Control Hold Tag on Access Hatch to Firewater System Tank B.

b. Findings

No findings were identified.

1P04 Construction QA Criterion 16

- 35007-A16 - Appendix 16. Inspection of Criterion XVI – Corrective Action
- 35007-A16.04 - Inspection Requirements and Guidance
- 35007-A16.04.01 - Inspection of QA Implementing Documents
- 35007-A16.04.02 - Inspection of QA Program Implementation

a. Inspection Scope

Resident Inspector Corrective Action Program Routine Review

The inspectors reviewed issues entered into the licensee's and its contractors' CAPs daily 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 various CAPs appropriately included regulatory required non-safety related SSCs. The inspectors completed reviews of CAP entry logs, attended CAP review meetings, held discussions with licensee and contractor personnel, and inspection activities. The inspectors reviewed corrective actions associated with conditions entered into the CAPs to determine whether:

- appropriate actions to correct the issues were identified and implemented effectively, including immediate or short-term corrective actions;
- actions taken were commensurate with the significance of the associated condition;
- issues from all aspects of the project, including equipment, human performance, and program issues were being identified by the licensee and its contractors at an appropriate threshold and entered into the CAPs; and
- issues were appropriately classified in accordance with the Quality Assurance Program Document (QAPD) and CAP implementing procedures.

b. Findings

No findings were identified.

1P05 Construction QA Criterion 18

- 35007-A18 - Appendix 18. Inspection of Criterion XVIII – Audits
- 35007-A18.04 - Inspection Requirements and Guidance
- 35007-A18.04.02 - Inspection of QA Program Implementation
- 65001.F-02.02-Fabrication Records Review

a. Inspection Scope

The inspectors reviewed a sample of the licensee's QA audits and audit procedures to verify the audit program had been effectively implemented as required by the QAPD. The inspectors reviewed procedures for planning and implementing QA oversight of activities affecting quality as conducted by external suppliers.

The inspectors reviewed a sample of audit reports and associated documentation, including audit plans, checklists, and audit findings to verify:

- audit plans and checklists were prepared and issued;
- audit reports included a determination of effectiveness of implementation and compliance with the QA program;
- audit reports were reviewed by management responsible for audited areas;
- each audit report included a summary of identified deficiencies and nonconformances, with response due dates;
- findings corrected during audits were documented and verified during a follow-up process; and
- follow-up activities associated with findings from previous audits were tracked and evaluated to determine whether the identified concerns were appropriately resolved.

The inspectors reviewed a sample of purchase orders and associated audit reports and follow-up actions to determine whether:

- purchase orders specified the applicable quality, technical, material, and regulatory requirements;
- the scope of the audits sufficiently encompassed the scope of the procurement or contract documents;
- audits were conducted prior to placing the supplier on the quality approved supplier list and implementation reviews were conducted after initial purchases as necessary;
- the status of suppliers on the quality approved supplier list reflected the audit status and any open audit findings; and
- deficiencies and nonconformances identified during the audits were tracked and resolved; and
- critical attributes associated with the ITAAC were correctly identified, and the documents were consistent with applicable code requirements and the UFSAR.

b. Findings

No findings were identified.

1P06 Construction QA Criterion 4
Construction QA Criterion 7

- 35007-A4 - Appendix 4. Inspection of Criterion IV – Procurement Document Control
- 35007-A4.04.02 - Inspection of QA Program Implementation
- 35007-A7 - Appendix 7. Inspection of Criterion VII – Control of Purchased Material, Equipment, and Services
- 35007-A7.04.02 - Inspection of QA Program Implementation

a. Inspection Scope

The NRC conducted an onsite inspection of the implementation of the licensee's programs for Procurement Document Control and Control of Purchased Material, Equipment and Services.

Specifically, the inspectors reviewed a sample of safety related purchase documents that pertained to safety related items such as structural steel, anchor plates, ASME Code Section III components, and ASME Code Section III piping subassemblies, to verify that procurement documents and control of purchased material, equipment and services were in accordance with licensee's procedures and processes.

The inspectors reviewed thirteen POs from seven contractors. Six POs were reviewed against their respective requisitions to verify that the requirements for quality, technical, documentation, and certificates were properly transcribed from the requisitions to the POs.

For each PO the inspectors verified that items and/or services were purchased from qualified contractors (i.e. vendors and/or suppliers on the nuclear quality approved suppliers list (ASL)) and each PO contained requirements for the contractor to provide appropriate documentation of quality, including component traceability.

The NRC inspectors reviewed the management and control of the technical documents associated with the POs. This included a review of:

- the development and maintenance of the applicable technical documents list;
- the schedule of required vendor data;
- the receipt of technical documents from the supplier; and
- the subsequent processing and integration of POs into the site's document control system.

The inspectors verified that controls were in place to ensure that the revision level of documents associated with the POs is monitored and updated on a continuous basis in accordance with the licensee's procedures and processes.

The inspectors reviewed the most current ASL to verify that the contractors associated with the referenced POs are listed as "qualified" on the current ASL. Specifically, the inspectors reviewed a sample of audit reports to verify the following:

- audits, surveillances, and evaluations documented the placement or retention of the contractor on the ASL;
- audits, surveillances, and evaluations were conducted on schedule, and by qualified auditors; and

- audits properly identified and dispositioned contractors' corrective action reports.

The NRC inspectors reviewed a sample of inspection attribute lists, inspection plans, and inspection reports, associated with the POs, to verify that items, received on site, were examined for conformance with the requirements specified in the procurement documents (including approved changes). Source inspection records along with the applicable on-site receipt inspection reports provided adequate objective evidence to ensure the acceptance criteria have been met.

The inspectors verified that if an item was accepted for conditional use, then the status was indicated, on a tag and/or documentation. In addition, justification for conditional use was provided, and the authority for conditional release of an item was specified. Nonconforming items and adverse conditions were identified and properly dispositioned and corrected prior to releasing the item for construction. Furthermore, the NRC inspectors conducted a walk down to the warehouse where nonconforming items were segregated to verify that nonconforming items that were determined to be unacceptable and not reconciled, were properly tagged as unavailable for use, and a NCR or corrective action report were initiated.

The NRC inspectors also verified that the receipt inspections were conducted by qualified licensee personnel. The list of qualified receipt inspection personnel was reviewed to ensure receipt inspectors were qualified per the site's quality control procedures.

b. Findings

No findings were identified.

## 3. OPERATIONAL READINESS

**Cornerstones: Operational Programs**

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

3P01 Environmental Qualification

- 51080-02.02 - Pre-Inspection Tasks
- 51080-02.03 - Inspection Tasks

a. Inspection Scope

The inspectors reviewed environmental qualification documents for commodity codes JE52, JE53, PV10, PV11, PV14, and PV20 to verify that the documents contained:

- the qualification specification for the equipment;
- adequate documentation of the qualification of the equipment; and
- a positive statement that the documentation has been reviewed, approved, and the equipment determined to be qualified for its application.

Specifically, the inspectors performed these reviews for the following components associated with the indicated commodities:

- RCS-JE-PT140C, RCS Wide Range Pressure Sensor (JE52);
- PXS-JE-LT046, IRWST Level Sensor (JE52);
- RCS-JE-TE131A, RCS Hot Leg 1 Narrow Range Temperature Sensor (JE53);
- PXS-PL-V130A, IRWST Gutter Isolation Valve (PV10);
- VFS-PL-V009, Containment Purge Discharge Containment Isolation Valve – IRC (PV11);
- WLS-PL-V067, Reactor Coolant Drain Tank Gas Outlet Containment Isolation Valve – IRC (PV14);
- PXS-PL-V014A, CMT A Discharge Isolation Valve (PV14); and
- PXS-PL-V108B, PRHR HX Control Valve (PV20).

The inspectors reviewed the UFSAR Chapter 3, Attachment E, to identify the limiting design basis parameters (i.e. environmental temperature, pressure, total radiation dose, radiation dose rate, cycling, electrical parameters and humidity) to be used as input for the qualification of the SSC. The inspectors reviewed the qualification program documents (such as the EQDP, EQSR, applicable test procedures, test specifications, and test reports) to verify that the following qualification requirements were incorporated properly:

- qualification methodology per IEEE Standard 323-1974;
- environmental parameters under normal operating conditions, abnormal conditions, and design basis events;
- simulated accident conditions, including, temperature, pressure, radiation, pH, and chemical additives;
- post-accident conditions, including time and submergence.

The inspectors reviewed the margins applied to test parameters used during qualification of the equipment. Specifically, the inspectors reviewed the temperatures, pressures, and radiation levels to determine if the margins used met IEEE Standard 323-1974, Section 6.3.1.5:

- temperature;
- pressure; and
- radiation.

In addition, the inspectors reviewed the test procedure, test plan, and test reports to verify that the tested profiles enveloped the limiting design basis parameters. Specifically, the inspectors reviewed the simulated accident conditions including temperature, pressure, radiation, pH, and chemical additives as recorded in the test reports.

b. Findings

No findings were identified.

3P02 Process and Effluent Monitoring - Inspection Procedure 83746 – Part 52, Offsite Dose Calculation Manual (ODCM)

- 83746-02.02 - Radioactive Effluents

- 83746-02.03 - Program Management

a. Inspection Scope

Inspection Procedure 83746 – Part 52, Offsite Dose Calculation Manual (ODCM)

Radioactive Effluents (Section 02.02)
The inspectors reviewed controls for gaseous effluent releases contained in the ODCM, Revision 0, and compared them against the requirements of NUREG-1301 and NEI 07-09A. Specifically, the inspectors reviewed release rate controls, compensatory actions, surveillance requirements, representative sampling controls, provisions for submitting special reports, and dose and dose rate limits for gaseous effluent releases.

The inspectors reviewed the ODCM methodology for calculating gaseous effluent release concentrations and compared it against the requirements of NUREG-1301. Specifically, the inspectors reviewed release equations and parameters including volumes, flow rates, dilution factors, and activity conversions.

The inspectors reviewed the ODCM methodology for calculating offsite doses from gaseous effluent releases and compared it against the requirements of NUREG-1301 and UFSAR Ch. 2, "Site Characteristics". Specifically, for this particular inspection activity (IP item 02.02(c)2), the inspectors reviewed the licensee's long-term atmospheric dispersion factors and atmospheric depletion factors needed to calculate offsite doses.

Program Management (Section 02.03)
The inspectors reviewed the ODCM requirements for the Annual Land Use Census and compared them against NUREG-1301 and NEI 07-09A. Specifically, the inspectors reviewed the Census frequency and methods used to update effluent dose parameters.

The inspectors reviewed the ODCM description of the Annual Radiological Environmental Operating Report, the Annual Radioactive Effluent Release Report, and special reports to determine whether they met the requirements of NUREG-1301 and NEI 07-09A.

The inspectors reviewed two self-assessments in the areas of environmental monitoring and effluent controls for Units 3 and 4 to determine if identified ODCM deficiencies are being captured in the licensee's CAP.

b. Findings

Introduction

The inspectors identified an NCV of TS 5.5.1 of very low safety significance (Green) for the licensee's failure to include accurate parameters in the ODCM for the calculation of offsite radiation doses due to routine gaseous effluent releases. Specifically, the ODCM contained long-term atmospheric dispersion factors

that were less conservative than those used in the UFSAR and ESP to demonstrate compliance with 10 CFR 20 and 10 CFR 50, Appendix I.

Description

During a review of ODCM, Revision 0, Attachment 13, "Meteorological, Liquid, and Gaseous Pathway Analysis," the inspectors noted the licensee used meteorological data averaged over 3 years from January 1, 1985 – December 31, 1987 to calculate long-term atmospheric dispersion (X/Q) and deposition (D/Q) factors. Attachment 13 stated that these X/Q and D/Q values were different than those used in the UFSAR and ESP and that an evaluation had been performed to justify their use. The inspectors reviewed this evaluation and determined it contained three sets of meteorological data from the Vogtle Meteorological Tower: 1985 – 1987 (ODCM values), 1998 – 2002 (UFSAR and ESP values), and 2011 – 2015 (new data set from a meteorology contractor). For different locations at and beyond the site boundary, a comparison was made of the X/Q and D/Q values from the different time periods. The inspectors noted the 1985 - 1987 values were the least conservative at every point evaluated and would result in lower estimates of public dose when compared to the other data sets. In particular, an independent NRC evaluation of X/Q values for ground level releases at the controlling receptor location showed that using the 1998 – 2002 data from the UFSAR and ESP would result in dose estimates 115% greater than using the 1985 – 1987 data in the ODCM. Guidance on how to interpret meteorological data for evaluating effluent releases is provided in RG 1.21, "Measuring, Evaluating, and Reporting Radioactive Material in Liquid and Gaseous Effluents and Solid Waste", Revision 2. This RG states that long-term meteorological data should be periodically reviewed and if the review shows the old X/Q and D/Q values are no longer conservative by a factor of 10% or more, then the licensee should revise the values or provide documentation why they were not. However, the licensee's evaluation used an acceptance criteria of <100% difference between values, which was based on informal discussions between licensee staff and industry peers at a technical conference. Based on these observations, the inspectors determined the licensee's evaluation was inadequate to justify the use of dispersion factors in the ODCM that are less conservative than those used in the UFSAR and ESP to demonstrate compliance with 10 CFR 20 and 10 CFR 50, Appendix I. The inspectors noted there have been no actual releases of radioactive effluents from Vogtle Units 3 and 4. The licensee documented this issue in CR 10437502.

Analysis

The failure to include accurate long-term atmospheric dispersion factors in the ODCM was a performance deficiency. The finding was of more than minor significance because it was associated with the Operational Readiness Cornerstone, Program Effectiveness Attribute of Process and Effluent Monitoring, and adversely affected the associated cornerstone objective to ensure licensees adequately develop and implement the operational programs required by a license condition or regulation. Using less conservative X/Q and D/Q values to calculate doses to the public from routine gaseous effluent releases could lead to an overestimate of the margin available to demonstrate compliance with regulatory limits. The significance of the finding was evaluated using the Public Radiation Safety Significance Determination Process. The finding did not involve a substantial failure to implement the effluent monitoring program and doses to the public are still expected to be a small

fraction of the 10 CFR 50 Appendix I limits. Therefore, the inspectors determined the finding was of very low safety significance (Green). The finding has a cross-cutting aspect in the area of Human Performance, Conservative Bias [H.14], because the dispersion parameters incorporated into the ODCM were less conservative than the ones used in the approved licensing basis documents.

Enforcement

Technical Specification 5.5.1 states, in part, the ODCM shall contain the methodology and parameters used in the calculation of offsite doses resulting from radioactive gaseous and liquid effluents. Contrary to this, on April 17, 2017, when Revision 0 was issued, the ODCM did not contain accurate parameters used in the calculation of offsite doses resulting from radioactive gaseous effluents. The licensee entered this violation into the CAP (CR10437502). Planned corrective actions include re-evaluation of the X/Q and D/Q values contained in the ODCM by an independent subject matter expert. This violation is being treated as an NCV, in accordance with Section 2.3.2 of the NRC Enforcement Policy. NCV 0520025/2017004-02, 05200026/2017004-02; Failure to Include Accurate Atmospheric Dispersion Factors in the Offsite Dose Calculation Manual.

3P03 Process and Effluent Monitoring - Inspection Procedure 80522 – Part 52, Radiological Environmental Monitoring Program (REMP)

- 80522 - Part 52, Radiological Environmental Monitoring Program (REMP)
- 80522-02.01 - Readiness of the Radiological Environmental Monitoring Program (REMP)
- 80522-02.02 - Implementation of the Meteorological Monitoring Program
- 80522-02.03 - Program Management

a. Inspection Scope

Readiness of the REMP (Section 02.01)

From a review of the UFSAR and discussions with licensee staff, the inspectors noted that Vogtle Units 3 and 4 are co-located with Units 1 and 2 and share the same site boundary. In addition, Units 3 and 4 are designed to release low levels of radioactive effluents to the immediate environs around the site in a similar manner to Units 1 and 2 and will have similar pathways for exposure to a member of the public (i.e. gaseous releases to the atmosphere and liquid discharges to the Savannah River). Because of these factors, the licensee incorporated Units 3 and 4 into the existing environmental sampling and analysis program (REMP) currently in use for Units 1 and 2. This Technical Specification (TS)-required program was created based on the guidance in NUREG-1301, “Offsite Dose Calculation Manual: Standard Radiological Effluent Controls for Pressurized Water Reactors”, and has been in operation since 1987. Since that time, the NRC has conducted REMP inspections at Vogtle Units 1 and 2 on a biennial basis to verify these activities are being performed in accordance with the requirements of the ODCM. The results of the most recent REMP inspection can be found in Unit 1 and Unit 2 inspection reports 0500424/2017004 and 0500425/2017004. On the basis of the incorporation of Units 3 & 4 into the existing REMP for Units 1 & 2, the inspectors did not perform operational readiness inspection activities for IP sections 02.01b-g.

The inspectors reviewed the current location of environmental air sampling stations and direct radiation monitoring stations to determine if they were appropriately located given that the Unit 3 and Unit 4 centerline is approximately 0.3 miles away from the current REMP origination point (Unit 1 and Unit 2 centerline). This involved a comparison of current REMP sectors with hypothetical sectors originating from a Unit 3 and Unit 4 centerline to verify that, under all arrangements, the ODCM requirements for the siting of sampling stations would be met. In addition, the inspectors reviewed the requirements for location and number of sample stations contained in the ODCM (for all sample types) against the requirements of NUREG-1301 and Nuclear Energy Institute (NEI) 07-09A, "Generic FSAR Template Guidance for Offsite Dose Calculation Manual (ODCM) Program Description".

Implementation of the Meteorological Monitoring Program (Section 02.02)
The meteorological monitoring program currently in use by Units 1 and 2 was previously evaluated by the NRC as part of the Early Site Permit review process (NUREG-1923) and determined to be adequate for Units 3 and Unit 4. On the basis of this prior NRC approval, the inspectors did not perform operational readiness inspection activities for IP section 02.02.

Program Management (Section 02.03)
On the basis of the incorporation of Units 3 and 4 into the existing REMP management program for Units 1 & 2, the inspectors did not perform operational readiness inspection activities for IP section 02.03.

b. Findings

No findings were identified.

## 4. OTHER INSPECTION RESULTS

### 4OA5 Other Activities

(Unit 3) ITAAC Number 2.2.01.11a.i (114) / Family 07E
(Unit 4) ITAAC Number 2.2.01.11a.i (114) / Family 07E

a. Inspection Scope

(Closed) Unresolved Item (URI) URI 05200025/2017002-02 and 05200026.2017002-02, Extrapolation of Functional Qualification for PV11 MOVs

As discussed in inspection reports 05200025/2017002 and 05200026/2017002 (ML17226A034), the inspectors identified an Unresolved Item (URI) related to the extrapolation for functional qualification of commodity code PV11 Motor Operated Valves (MOVs), URI 05200025/2017002-02 and 05200026/2017002-02, "Extrapolation of Functional Qualification for PV11 MOVs." During that review, the inspectors found that the sampled MOV Application Reports did not justify the functional qualification of the PV11 MOVs in accordance with ASME QME-1-2007 as specified in UFSAR Section 3.9.3.2.2, "Valve Operability," and Design Specification APP-PV11-Z0-001. Specifically, the methodology and controls used to qualify valves by extrapolation was neither adequately described nor documented.

The inspectors reviewed the corrective actions in response to this URI for the PV11 butterfly valves and evaluated the revised documents and modifications to the design calculations for the PV11 butterfly valves. The inspectors found that the revised documents provided an acceptable description of the extrapolation of the qualification of the PV11 MOVs consistent with ASME QME-1-2007. The inspectors determined that the qualification methodology was adequate based on:

- conservative assumptions for valve performance parameters (such as bearing coefficient of friction);
- evaluation of the similarities and differences between the qualified and production valves;
- conservatism in the prediction of the torque requirements to operate the valves by the sizing methodology; and
- significant margin in the actuator torque capability.

The inspectors also determined that the methodology used for qualification of the valves was adequately controlled. In particular, the vendor used EPRI NP-7501 (January 1983), “Application Guide for Motor-Operated Butterfly Valves in Nuclear Power Plants,” in developing the original butterfly valve sizing methodology with conservative assumptions for bearing and packing coefficients of friction. The EQDPs were revised to document the process used to control these assumptions for commodity code PV11.

The inspectors determined that the original valve qualification was technically adequate and that no technical revisions were required as a result of this URI. Consequently, the inspectors determined that the inconsistency of the functional qualification with ASME QME-1 did not represent a substantive failure to establish or implement an adequate program, process, procedure, or quality oversight function. Although this issue was corrected, it constitutes a violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control." Additionally, for reasons as stated above, this violation is of minor significance that is not subject to enforcement action in accordance with Section 2 of the Enforcement Policy. The inspectors determined that the methodology has been adequately documented as required and that the functional qualification for PV11 MOVs was properly accomplished in accordance with ASME QME-1-2007. No additional deficiencies were identified during review of this URI. Unresolved item 05200025/2017002-02 and 05200026/2017002-02 is closed.

b. Findings

No findings were identified.

4OA6 Meetings, Including Exit

Exit Meeting.

On January 18, 2018, the inspectors presented the inspection results to Mark Rauckhorst, Executive Vice President Vogtle 3&4 Construction, along with other licensee and contractor staff members. The inspectors stated that no proprietary information would be included in the inspection report.

## SUPPLEMENTAL INFORMATION

## KEY POINTS OF CONTACT

Licensees and Contractor Personnel
B. Hirmanpour, SNC Licensing
M. Washington, SNC Licensing
A. Miller, WEC Licensing Engineer
R. Wessel, WEC Principal Engineer
S. DiTomasso, WEC Licensing Manager
E. Drake, WEC Principal Engineer
G. Scott, SNC Licensing Engineer
N. Bailey, WEC Principal Engineer
M. Yox, SNC Licensing Director
B. Schlegger, WEC EQ Engineer
P. Ricciuti, WEC Principal Engineer
J. O'Dell, SNC Licensing
B. Burke, WECTEC/Bechtel Procurement
D. Johnson, Bechtel/Warehousing
B. Waters, SNC Procurement Manager
E. Terres, WEC Procurement (ASME)
L. Wood WECTEC Document Control Manager
M. Stefanchik, WEC Supplier Quality Assessment Manager
V. Pierce, Bechtel QC Manager
A. Polate, WECTEC Lead Design RIM
T. Parton, SNC QA Director
A. Dailey, WECTEC Procurement Engineering Manager
M. Patel, PhD., PE – SNC - Principal Engineer – Special Studies
K. Hessler, WECTEC – Electrical Engineer
D. Gray, SNC/ITAAC Project Manager
A. Buckley, SNC Licensing
M. Brazell, SNC Operations
M. Janus, WECTEC
J. Klecha, SNC Project Director
R. Linebarger, SNC System Engineer (Fire Protection)
A. Parton, SNC QA Director
G. Scott, SNC Licensing
B. Vanderburg, WECTEC Quality Inspection
M. Klinvex, WEC Licensing Supervisor
R. Lowes, WEC Engineering
M. Malone, WEC Engineering
C. Stirzel, WEC Engineering

## LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

| Item Number | Type | Status | Description |
|---|---|---|---|
| 05200025/2017004-01, 05200026/2017004-01 | Non Cited Violation | Open | PRHR Tube sheet and CMT Inlet Nozzle Stress Intensity Not Within ASME Code Allowable Limits |
| 05200025/2017004-02, 05200026/2017004-02 | Non Cited Violation | Open and closed | Failure to Include Accurate Atmospheric Dispersion Factors in the Offsite Dose Calculation Manual |
| 05200025/2017002-02, 05200026/2017002-02 | Unresolved Item | Closed | Extrapolation of Functional Qualification for PV11 MOVs |

## LIST OF DOCUMENTS REVIEWED

**Section** 1A01
Qualification records for PCI Energy Services' welders M-1219 and M-1233
Lincoln Electric Company CMTR for welding filler metal lot 1182D
PCI Energy Services welding procedure 8 MC-GTAW Rev. 16
PCI Energy Services GQP-9.7, Solvent Removable Liquid Penetrant Examination and Acceptance Standards for Welds, Base Materials, and Cladding (40° - 125°), Rev. 17
PCI Energy Service Report of Nondestructive Examination for Visible, Solvent Removable Liquid Penetrant Examination Report-No. NDE-910962-064, 11-15-2017
WEC P&ID APP-RCS-M6-001, Piping and Instrumentation Diagram Reactor Coolant System, 10/29/12

**Section** 1A02
910962-012,"Install RCL Piping Weld No. SV3-RCS-PL01-FW-AHL02 for Vogtle Unit 3 SG Inlet Nozzle", Revision 0
910962-013,"Install RCL Piping Weld No.: SV3-RCS-PL01-FW-ACL03 for Vogtle Unit 3 Steam Generator Alpha RCP 1B Outlet Nozzle", Revision 0
910962-014,"Install RCL Piping Weld No.: SV3-RCS-PL01-FW-ACL05 for Vogtle Unit 3 Steam Generator Alpha RCP1A Outlet Nozzle", Revision 0
WCP-6, "Joint Design", Revision 0
MISTRAS 521-RT-302, Radiographic Examination Using Computed Radiography In Accordance with ASME Section V, Article 2, Rev. 0
PCI Energy Services, Dwg. No. AP1-0711, AP1000 Vogtle Unit 3 RCL Install Project # 910962, RCL Piping Weld Map, Rev. 0
MISTRAS Computed Radiography Examination Report P-17-RT-302-0045 (FW-BCL03), 11/30/2017
MISTRAS Computed Radiography Examination Report P-17-RT-302-0046 (FW-BCL05), 11/30/2017
MISTRAS Computed Radiography Examination Report P-17-RT-302-0047 (FW-BHL02), 12/05/2017
MISTRAS Computed Radiography Examination Report P-17-RT-302-0060 (FW-BCL04), 12/11/2017
MISTRAS Computed Radiography Examination Report P-17-RT-302-0061 (FW-BCL06), 12/11/2017

WEC P&ID APP-RCS-M6-001, Piping and Instrumentation Diagram Reactor Coolant System, 10/29/12
PCI Quality Assurance Traveler 912941-005, Surge Spool Item 5, page 154 of 175, Rev. 0
PCI Quality Assurance Traveler 912941-005, Attachment 05, Surge Spool Item 5, page 154 of 175, Rev. 0
PCI Quality Assurance Traveler 912941-005, Attachment 06, Surge Spool Item 3, page 155 of 175, Rev. 0
PCI Energy Services, Dwg. AP1-2310, RCS Piping Installation Surge Piping, Rev. 1
PCI Energy Services, Dwg. AP1-2311, Surge Line Installation In-Service Inspection (ISI) Weld Preparation, Rev. 0
PCI WML for welding operators M1842, M1970, and M2331
PCI WPQs 13801 (3/9/15) and 14604 (1/5/2017) for welding operator M1842
PCI WPQs 12618 (7/13/12), 12626 (7/16/12), 14859 (9/5/17), and 14932 (10/16/17) for welding operator M1970
PCI WPQs 14359 (11/7/16) and 14871 (9/26/17) for welding operator M2331
Specialty Steel Services, Inc. C of C 19726 for ASTM A479 T316L, heat-no. 4Y423, 1" dia. X 12' long, 11-3-17
Walsin Liera Corp. Inspection Certificate A1605170160, stainless steel cold drawn rod bar, heat-no. 4Y423, 2016/05/17

**Section** 1A03
ASME Section V, Article 6, “Liquid Penetrant Examination,” 1999 Edition with 2000 Addenda
GDP 9.7, “Solvent Removable Liquid Penetrant Examination and Acceptance Standards for Welds, Base Metal, and Cladding,” Revision 17

**Section** 1A04
APP-JE53-VBR-002, “Equipment Qualification Data Package for Weed Instrument N9002 and N9004 Resistance Temperature Detectors for Use in the AP1000 Plant,” Revision 1
APP-GW-G1-002, “AP1000 Equipment Qualification Methodology,” Revision 5
APP-GW-VP-040, “AP1000 Safety-Related Field Sensors Equipment Qualification Specification,” Revision 2
APP-JE52-Z0-001, “AP1000 General Design Equipment Specification for Class 1E Pressure and Differential Pressure Transmitters,” Revision 4
APP-JE52-Z0R-001, “AP1000 Class 1E Pressure and Differential Pressure Transmitters Data Sheet Report,” Revision 3
APP-JE52-VBR-003, Equipment Qualification Summary Report for 3155N Pressure Transmitter for Use in the AP1000 Plant, Revision 2
APP-JE52-VBR-004, Equipment Qualification Data Package for 3155N Pressure Transmitter for Use in the AP1000 Plant, Revision 2
WNA-TR-04062-WAPP, “AP 1000 JE52 IEEE Qualification Report of Rosemount 3155N Pressure Transmitters: (D2015008) – Rosemount,” Revision 0
WNA-TR-04080-WAPP, AP 1000 JE52 Test Report Vibration and Seismic Tests - 3155N - (EGS-TR-HW53-3155N-01) – QualTech WNA-TR-04080-WAPP, Revision 0
SV0-JE52-J0M-003, Vogtle AP1000 Class 1E Pressure and Differential Pressure Transmitters Supplier C – Technical Manual, Revision 0
APP-JE53-Z0-001, AP1000 General Design Equipment Specification for Class 1E Resistance Temperature Detectors, Revision 2
APP-JE53-Z0R-001, AP1000 Class 1E Resistance Temperature Detectors Data Sheet Report, Revision 2
APP-JE53-VBR-001, Equipment Qualification Summary Report for Weed Instrument N9002 and N9004 Resistance Temperature Detectors for Use in the AP1000 Plant, Revision 1

APP-JE53-VBR-002, Equipment Qualification Data Package for Weed Instrument N9002 and N9004 Resistance Temperature Detectors for Use in the AP1000 Plant, Revision 1
WNA-TR-03955-WAPP, JE53 Overall Qualification Report - N9004 (3077-RD5079-001) – Ultra, Revision 1
WNA-TR-03905-WAPP, JE53 Seismic Test Report - N9004 (EGS-TR-HC2217-02) – QualTech, Revision 1
APP-JE53-J0M-002, AP1000 Class 1E Resistance Temperature Detectors N9004 Technical Manual, Revision 2
CR 10420187, NRC identified a typographical error in a soil-structure analysis during an NRC inspection, dated 10/17/2017
CR 10420778, NRC identified a typo in EQ Qualification Summary Report, dated 10/18/2017
CR 10421155, NRC identified a discrepancy between datasheets and configuration drawing, dated 10/19/2017

**Section** 1A05
APP-JE52-VBR-003; Rev. 2; Equipment Qualification Summary Report for 3155N Pressure Transmitter for Use in the AP1000 Plant
APP-JE52-VBR-004; Rev 2; Equipment Qualification Data Package for 3155N Pressure Transmitter for Use in the AP1000 Plant
APP-JE52-VPC-003; Rev. 0, Abnormal Events Evaluation for JE52 Rosemount.
WNA-TR-03999-WAPP; Rev 0; JE52 IEEE Qualification Test Report: Thermal Aging - 3155N (TR-RNII-3155N-03) - Rosemount
WNA-TR-04060-WAPP; Rev. 0; JE52 Test Report Abnormal Events and LOCA/HELB Steam Temperature Testing - 3155N - (EGS-TR-HW53-3155N-02) - QualTech
APP-JE53-VBR-001; Rev. 1; Equipment Qualification Summary Report for Weed Instrument N9002 and N9004 Resistance Temperature Detectors for Use in the AP1000 Plant
APP-JE53-VBR-002; Rev. 1; Equipment Qualification Data Package for Weed Instrument N9002 and N9004 Resistance Temperature Detectors for Use in the AP1000 Plant
APP-JE53-VPR-001; Rev. 2; DBA Pressure and Temperature Evaluation for the JE53 Ultra Electronics Model N9002 Surface Mounted RTD
APP-JE53-VPR-003; Rev 0; Reconciliation of Test Methodology and Input Parameters for Resistance Temperature Detectors Testing
WNA-AR-00514-WAPP; Rev. 1; JE53 Justification of Low Insulation Resistance After Submergence - N9004E (3077-RD5079-011) – Ultra
CAPAL: Issue ID; 100498113; JE53 Typographical Error Based on ITAAC Review

**Section** 1A06
WEC APP-MV50-Z0-003, Design Specification for AP1000 Personnel Airlock, Rev. 5
CB&I Weld Traveler U3-S1-E13-PAL/E13, Rev.1, 11-1-17
CB&I Welder Performance Qualification, WPQ-No. 2+"Dia Pipe 6G for welders 465756 (11-1-17), 63013016 (11-6-17), and 63070462 (11-2-17)
CB&I Welder Performance Qualification, WPQ-No. FC 2G3GU4G 1/2 for welder 63013016 (12-15-11)
CB&I Welder Performance Qualification, WPQ-No. FC 2G3GU4G 3/4 for welders 63070462 (3-15-14) and 63021159 (12-17-12)
CB&I Welder Performance Qualification, WPQ-No. F4 2G3GU4G - 3/4 for welder 63021159 (4-16-13)

**Section** 1A07
APP-GW-P0-008, AP1000 Specification for Field Fabricated Piping and Installation, ASME III, Code Classes 1, 2, 3 and ASME B31.1, Rev. 6

Stone & Webster Inc. Vogtle Unit 3, PO Number J132175-C601.02, Rev. 0
WECTEC Global Project Services Inc. Vogtle Unit 3, J132175-C601.02, Rev. 1
APP-GW-P0-007, AP1000 Specification for Shop Fabricated Piping, Rev. 7
Westinghouse Audit No. WES-2017-039/NIAC #22131, March 21-23, 2017
Shaw Radiographic Examination Procedure SP-RT-1, Rev. 12, 9/24/10
APP-SFS-PLW-511, Spent Fuel Pool Cooling System Auxiliary Bldg. Room 12245 Return from Containment Area, Rev. 4
APP-CAS-PLW-700, Compressed and Instrument Air System Containment Bldg. Room 11400 Cont. Penetration to Check Valve
APP-FPS-PLW-61D, Fire Protection System Auxiliary Bldg. Room 12306 To Containment Penetration From FPS Containment Isolation Valves, Rev. 0

**Section** 1A08
APP-GW-G1-002, “AP1000 Equipment Qualification Methodology”, Rev 2
APP-GW-G1-002, “AP1000 Equipment Qualification Methodology”, Rev 3
APP-GW-G1-002, “AP1000 Equipment Qualification Methodology”, Rev 4
APP-GW-G1-002, “AP1000 Equipment Qualification Methodology”, Rev 5
APP-GW-VP-010, “Equipment Qualification Methodology and Documentation Requirements for AP1000 Safety-Related Valves and Valve Appurtenances”, Rev 2
APP-GW-VP-010, “Equipment Qualification Methodology and Documentation Requirements for AP1000 Safety-Related Valves and Valve Appurtenances”, Rev 3
APP-GW-VP-100, “Equipment Qualification Specifications and Documentation Requirements for AP1000 Safety-Related Electrical and Electro-Mechanical Equipment”, Rev 4
APP-PV10-VBR-004, “Equipment Qualification Data Package for Air-Operated Ball Valves for Use in the AP1000 Plant”, Rev 2
APP-PV10-VPR-003, Environmental and Seismic Qualification Evaluation Report Number ER-ST-8400-D01 Rev 0,” Rev 0
APP-PV10-Z0D-142, “PV10 Datasheet 142”, Rev 1
DR-156-FREQ, “Crane Nuclear Frequency Analysis Report”, Rev 4
DR-159-FREQ, “Crane Nuclear Frequency Analysis Report”, Rev 2
DR-162-FREQ, “Crane Nuclear Frequency Analysis Report”, Rev 4
WLTR56801-03, “Wyle Lab ASME QME-1 Test Report on a 2 Inch Class 150 Ball Valve”, Rev B
ER-ST-8400, “Rotork Fluid Systems Environmental and Seismic Qualification Evaluation Report”, Rev 6
APP-PV11-Z0-001, “Design Specification for Butterfly Valves, ASME Boiler and Pressure Vessel Code Section III, Class 2 and 3”, Rev 10
APP-PV11-VBR-004, “Equipment Qualification Data Package for Air-Operated TRICENTRIC Butterfly Valves for use in the AP1000 Plant”, Rev 2
APP-PV11-Z0D-233, “PV11 Datasheet 233”, Rev 3
APP-PV11-Z0D-131, “PV11 Datasheet 131”, Rev 3
APP-PV11-Z0D-130, “PV11 Datasheet 130”, Rev 3
APP-EY01-VBR-004, “Equipment Qualification Data Package for Low-Voltage Power, Control, and I&C Electrical Penetration Assemblies for Use in the AP1000 Plant”, Revision 3
APP-EY01-VBR-003, “Equipment Qualification Summary Report for Low Voltage Power, Control, and I&C Electrical Penetration Assemblies for Use in the AP1000 Plant”, Revision 3
APP-EY01-Z0D-010, “Specification Datasheet for Class 1E Power and Control Electrical Penetration Assemblies,” Revision 1
APP-EY02-Z0D-010, “Specification Datasheet for Non-1E Power and Control Electrical Penetration Assemblies,” Revision 1
APP-EY01-Z0D-020, “Specification Datasheet for Class 1E I&C Electrical Penetration Assemblies,” Revision 2

APP-EY02-Z0D-020, “Specification Datasheet for Non-1E I&C Electrical Penetration Assemblies,” Revision 1
APP-PV14-VBR-002, “Equipment Qualification Data Package for Fisher HPNS Control Valves for Use in the AP1000 Plant,” Revision 1
APP-PV14-Z0D-105, “PV14 Datasheet 105,” Revision 3
APP-EY01-Z0-001, “Electrical Penetration Assemblies," Revision 6

**Section** 1A09
APP-PV11-VBR-004, “Equipment Qualification Data Package for Air-Operated TRICENTRIC Butterfly Valves for Use in the AP1000 Plant”, Revision 2
APP-PV11-VBR-003, “Equipment Qualification Summary Report for Air-Operated TRICENTRIC Butterfly Valves for Use in the AP1000 Plant”, Revision 2
APP-PV11-GNR-004, “PV11 Deviation Notice for Actuator Movement During LOCA Testing,” Revision 0
APP-PV14-VBR-002, “Equipment Qualification Data Package for Fisher HPNS Control Valves for Use in the AP1000 Plant,” Revision 1
APP-PV14-VBR-001, “Equipment Qualification Summary Report for Fisher HPNS Control Valves for Use in the AP1000 Plant,” Revision 1
08QN51-QR-02, “Fisher Qualification Report 87 - QME-1 Functional Qualification Report for Active, Spring-Return, Air-to-Diaphragm NS2 Actuators per ASME QME-1-2007,” Revision E
11QN10-QR-04, “Fisher Qualification Report 89 - QME-1 Functional Qualification Report for Air Operated Globe Style HPNS Valves per ASME QME-1-2007 – Fluid Evaluation,” Revision A
11QN09-QR-04, “Fisher Qualification Report 89 - QME-1 Functional Qualification Report for Air Operated Globe Style HPNS Valves per ASME QME-1-2007 – Fluid Evaluation,” Revision A
CAPAL 100497751, “Incorrect Statement of Applicability in APP-PV14-VBR-002,” Oct 16, 2017
CR 10419911, “NRC Identified inconsistency in EQ package during NRC Inspection,” Oct 16, 2017

**Section** 1A10
APP-GW-G1-002, “AP1000 Equipment Qualification Methodology”, Revision 2
APP-GW-G1-002, “AP1000 Equipment Qualification Methodology”, Revision 3
APP-GW-G1-002, “AP1000 Equipment Qualification Methodology”, Revision 4
APP-GW-G1-002, “AP1000 Equipment Qualification Methodology”, Revision 5
APP-GW-VP-010, “Equipment Qualification Methodology and Documentation Requirements for AP1000 Safety-Related Valves and Valve Appurtenances”, Revision 2
APP-GW-VP-010, “Equipment Qualification Methodology and Documentation Requirements for AP1000 Safety-Related Valves and Valve Appurtenances”, Revision 3
APP-GW-VP-100, “Equipment Qualification Specifications and Documentation Requirements for AP1000 Safety-Related Electrical and Electro-Mechanical Equipment”, Revision 4
APP-PV11-Z0-001, “Design Specification for Butterfly Valves, ASME Boiler and Pressure Vessel Code Section III, Class 2 and 3”, Revision 10
APP-PV11-VBR-004, “Equipment Qualification Data Package for Air-Operated TRICENTRIC Butterfly Valves for use in the AP1000 Plant”, Revision 2
APP-PV11-Z0D-233, “PV11 Datasheet 233”, Revision 3
APP-PV11-Z0D-131, “PV11 Datasheet 131”, Revision 3
APP-PV11-Z0D-130, “PV11 Datasheet 130”, Revision 3
APP-JE52-VBR-002, “Equipment Qualification Data Package for Model DTN2070, Pressure and Differential Pressure Transmitter for Use in the AP1000 Plant,” Revision 3
APP-PV03-VBR-010, “Equipment Qualification Data Package for Active Flex-Wedge Gate Valves for Use in the AP1000 Plant,” Revision 2

APP-GW-VP-040, “AP1000 Safety-Related Field Sensors Equipment Qualification Specification,” Revision 2
APP-JE52-VBR-001, Equipment Qualification Summary Report for DTN2070 Pressure and Differential Pressure Transmitter for Use in the AP1000 Plant, Revision 3
APP-JE52-VBR-002, Equipment Qualification Data Package for Model DTN2070, Pressure and Differential Pressure Transmitter for Use in the AP1000 Plant, Revision 3
SV0-JE52-J0M-002, Vogtle AP1000 Class 1E Pressure and Differential Pressure Transmitters Supplier B – Technical Manual, Revision 1
WNA-TR-03922-WAPP, AP 1000 JE52 IRWST Supplemental Qualification Report - DTN2070 (3077-RD5075-025-PRC) – Ultra, Revision 0 AP1000
WNA-TR-04276-WAPP, AP1000 JE52 U.S. PCS Valve Room Seismic DTN2070 Qualification Report (3077-RD5075-031-PRC) – Ultra, Revision 0
WNA-TR-03655-WAPP, AP 1000 JE52 Equipment Qualification Final Report – Ultra Revision 1
APP-PV03-Z0D-113, “PV03 Datasheet 113,” Revision 2
APP-PV03-Z0R-001, “3 Inch or Larger Manually Operated Gate, Stop, Check and Check Valves, ASME BPV Code, Section III, Class 1, 2, and 3 Valve Datasheet Report,” Revision 7
APP-PV03-VBR-009, “Equipment Qualification Summary Report for Active Flex-Wedge Gate Valves for Use in the AP1000 Plant,” Revision 2
SV0-PV03-V2-113001, “AP1000 Manually Operated Valve 4-Inch, Class 150, Assembly Drawing APP-PV03-ZOD-113,” Revision 1
SV0-PV03-V2-113002, “AP1000 Manually Operated Valve 4-Inch, Class 150, Assembly Drawing APP-PV03-ZOD-113,” Revision 1
SV0-PV03-V2-113003, “AP1000 Manually Operated Valve 4-Inch, Class 150, Assembly Drawing APP-PV03-ZOD-113,” Revision 1
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E&DCR APP-PV03-GEF-048, “APP-PV03-Z0D-113 Material,” Revision 0

**Section** 1A11
ASME Code
ASME Code Section III, 1998 Edition with Addenda 1999 through 2000
ASME Section III, Article XXIII-1000, “Qualifications and Duties of Specialized Professional Engineers”, 1998 Edition w/ 2000 Addenda

ASME Design Report and Supporting Documents
APP-MT01-Z0-100, Design Specification for AP1000 CMT for System PXS, Rev. 8
APP-MT01-Z0R-001, AP1000 CMT ASME Generic Design Report, Rev. 4
APP-MT01-Z0R-010, AP1000 CMT Vessel Shell Analysis, Rev. 5
APP-MT01-Z0R-011, AP1000 CMT Inlet and Outlet Nozzle Analysis, Rev. 6
APP-MT01-Z0R-013, AP1000 CMT Manway Analysis, Rev. 5
APP-MT01-Z0R-014, AP1000 CMT Small Nozzle Analysis, Rev. 6
APP-ME02-Z0R-100, AP1000 PRHR HX Generic Design Report, Rev. 2
APP-ME02-Z0-101, Design Specification for AP1000 PRHR HX for System PXS, Rev. 7, 8, 12, and 13
APP-ME02-Z0R-100, AP1000 PRHR HX Generic Design Report, Rev. 2 and 3
SV3-ME02-Z0R-001, AP1000 PRHR HX – Vogtle Unit 3 (SV3) ASME Code Design Report, Rev. 1 and 2
APP-MT02-Z0R-010, AP1000 Accumulator Tank Tentative Sizing Calculation, Rev. 1 and 4
APP-MT02-Z0-001, Design Specification for AP1000 Accumulator Tank for PXS, Rev. 6
APP-MT02-Z0R-101, AP1000 Accumulator Tank Generic Design Report, Rev. 4 and 7
APP-MT02-Z0R-001, Detailed Analysis of AP1000 Accumulator Tank, Rev. 4 and 5

Transient Analyses and Component Calculations
APP-PXS-M8-001, AP1000 CMT Interface Control Document (ICD), Rev. 2
APP-PXS-M8-003, AP1000 PRHR HX, Rev. 1
APP-PXS-PLR-010, AP1000 Direct Vessel Injection Line A (APP-PXS-PLR-010) Piping Stress Analysis Report, Rev. 6
APP-PXS-PLR-050, AP1000 CMT 02A Supply Line Piping Stress Analysis Report, Rev. 6
APP-PXS-GSC-002, AP1000 CMT Inlet Line – Thermal Stratification Analysis, Rev. 0
APP-PXS-M3C-004, CMT Sizing/Performance for AP1000, Rev. 3
APP-PXS-M3C-005, PXS Accumulators Sizing / Performance, Rev. 2
APP-PXS-M3C-010, PRHR HX Line resistances, Rev. 3
APP-PXS-M3C-019, IRWST/Containment Sump Injection Lines and ADS Line Resistances, Rev. 5
APP-PXS-M3C-068, Post Accident Boron Concentration, Rev. 1
APP-PXS-M3C-205, Passive Core Cooling System (PXS) Design Transients, Rev. 5 and 6
APP-PXS-M3C-020, PRHR HX Sizing/Performance, Rev. 3
APP-PXS-M3C-400, Piping Hydrodynamic Loads Screening for the PXS, Rev. 1
APP-PXS-M3C-172, Safety/Relief Valve Functional Requirements for PXS Accumulator Safety Relief Valves V022A/B, Rev. 1
APP-PGS-M3-001, AP1000 Plant Gas System (PGS) System Specification Document, Rev. 1
APP-PXS-M3-001, AP1000 PXS System Specification Document, Rev. 8
APP-RCS-M3C-046, AP1000 PRHR Inlet and ADS 4th Stage B – Thermal Stratification Analysis, Rev. 5
APP-RCS-M1-001, Reactor Coolant System Design Transients, Rev. 4
APP-ME02-GEF-121, AP1000 PRHR HX – Tube Sheet Calculation Note Update using ANSYS Thermal Lag Heat Transfer Analysis, Rev. 0
APP-ME02-GEF-119, AP1000 PRHR HX – Tube sheet Calculation Note, Rev. 0
APP-ME02-GRA-001, AP1000 PRHR HX Failure Modes And Effects Analysis (FMEA), Rev. 1
APP-MT01-GEF-081, AP1000 CMT Inlet/Outlet Nozzle Stress Range Rev. to Address CAPAL 100489811, Rev.0
APP-MT01-M2C-001, AP1000 CMT Sizing Calculation, Rev. 7
APP-SSAR-F5-001, AP1000 Safety Analysis Checklist (SAC), Rev. 1
APP-SSAR-GSC-135, Advanced First Core LOFTRAN Base Deck, Rev. 2
APP-SSAR-GSC-141, Advanced First Core Loss of Normal Feedwater/Loss OF AC Power, Rev. 3
APP-SSAR-GSC-536, AP1000 Safe Shutdown Temperature Evaluation, Rev. 3
CN-AP1000-221, “AP-1000 Post Accident Boron Requirement Calculations,” Rev. 0
NRFE-11-120, “AP1000 Pre and Post Accident Boron Concentration,” 9/27/2011
APP-GW-P0C-001, Piping Wall Thickness Calculation, Rev. 6
APP-PL02-ZO-102, AP1000 class 2, 3 Piping And B31.1 Extension Design Specification Shop Order/WBS: PL02, Rev. 2
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QRL Change Approval, Vendor No.: 15-31, signed 3/17//2017

Specifications:
APP-SS01-Z0-001-SUM-04, Summary Specification for Safety Related Miscellaneous Structural Steel, Rev. 1

Misc.:
Updated Final Safety Analysis Report, Chapter 17 Quality Assurance, Rev 3
SNC Nuclear Development Quality Assurance Manual, rev 17
WECTEC Quality Assurance Manual, QAM-01, Rev. 00.01
WECTEC Project Quality Assurance Plan (PQAP), Rev. 7
CR 10232753, Deficiencies noted during review of Unit 4 Reactor Coolant Loop (RCL) Piping documentation, dated 6/7/2016
CR 10242540, Deficiencies noted during review of Unit 4 Reactor Coolant Loop (RCL) piping documentation, dated 6/30/2016
DI 100438443, Deficiencies Identified after Receipt Inspection of AMSE III Reactor Vessel Closure Head, dated January 7, 2017
DI 100475504, Various discrepancies with PV65 Valves, dated June 1, 2017
CAR 268001, Track & evaluate WECTEC CAPAL 100434979 for QADP CRs, dated 11/22/2016
CAR 268469, Issues identified during a sampled Structural Document Re-review of

AECON's U3 Sub-Module Q240 R1, dated 1/10/2017

## 3. OPERATIONAL READINESS

**Section** 3P01
08QN51-QR-02, "Fisher Qualification Report 87 - QME-1 Functional Qualification Report for Active, Spring-Return, Air-to-Diaphragm NS2 Actuators per ASME QME-1-2007," Revision E
11QN09-QR-04, "Fisher Qualification Report 89 - QME-1 Functional Qualification Report for Air Operated Globe Style HPNS Valves per ASME QME-1-2007 – Fluid Evaluation," Revision A
11QN10-QR-04, "Fisher Qualification Report 89 - QME-1 Functional Qualification Report for Air Operated Globe Style HPNS Valves per ASME QME-1-2007 – Fluid Evaluation," Revision A
APP-FSAR-GLR-090; Rev. 0; Generic Licensing Impact Determination for Equipment Qualification
APP-GW-G1-002, Rev. 5, "AP1000 Equipment Qualification Methodology"
APP-GW-VP-100, Revision 4, "Equipment Qualification Specifications and Documentation Requirements for AP1000 Safety-Related Electrical and Electro-Mechanical Equipment"
APP-IDS-VPC-001, Rev. 0, "Seismic Qualification of the 250 VDC Distribution Panel (DD01) and the 250 VDC Motor Control Center (DK01) for Use in the AP1000 Plant"
APP-JE52-VBR-001; Rev. 3; Equipment Qualification Summary Report for DTN2070 Pressure and Differential Pressure Transmitter for Use in the AP1000 Plant;
APP-JE52-VBR-002; Rev. 3; Equipment Qualification Data Package for Model DTN2070, Pressure and Differential Pressure Transmitter for Use in the AP1000 Plant
APP-JE52-VBR-003; Rev. 2; Equipment Qualification Summary Report for 3155N Pressure Transmitter for Use in the AP1000 Plant
APP-JE52-VBR-004; Rev 2; Equipment Qualification Data Package for 3155N Pressure Transmitter for Use in the AP1000 Plant
APP-JE52-VPC-003; Rev. 0, Abnormal Events Evaluation for JE52 Rosemount.
APP-JE52-VPR-001; Rev. 0; DBA Pressure and Temperature Evaluation for the JE52 Ultra Electronics Pressure and Differential Pressure Transmitters
APP-JE53-VBR-001; Rev. 1; Equipment Qualification Summary Report for Weed Instrument N9002 and N9004 Resistance Temperature Detectors for Use in the AP1000 Plant
APP-JE53-VBR-002; Rev. 1; Equipment Qualification Data Package for Weed Instrument N9002 and N9004 Resistance Temperature Detectors for Use in the AP1000 Plant
APP-JE53-VPR-001; Rev. 2; DBA Pressure and Temperature Evaluation for the JE53 Ultra Electronics Model N9002 Surface Mounted RTD
APP-JE53-VPR-003; Rev 0; Reconciliation of Test Methodology and Input Parameters for Resistance Temperature Detectors Testing
APP-PV00-VPR-001; Rev. 0; DBA Pressure and Temperature Evaluation for the ASCO Valve, Inc. NT-8316 Series Nuclear Solenoid Valves
APP-PV00-VPR-003; Rev 0; DBA Pressure and Temperature Envelope Evaluation for Bettis Actuators
APP-PV00-VPR-005; Rev 0; Qualified Life (Years) under Abnormal Conditions SOV Estimated Life Calculations Update
APP-PV10-VBR-003, "Equipment Qualification Summary Report for Air-Operated Ball Valves for Use in the AP1000 Plant," Revision 2
APP-PV10-VBR-004, "Equipment Qualification Data Package for Air-Operated Ball Valves for Use in the AP1000 Plant," Revision 2
APP-PV10-VPR-003, "Environmental and Seismic Qualification Evaluation Report Number ER-ST-8400-D01 Rev 0," Revision 0
APP-PV11-GNR-004, "PV11 Deviation Notice for Actuator Movement During LOCA Testing," Revision 0

APP-PV11-VBR-003, “Equipment Qualification Summary Report for Air-Operated TRICENTRIC Butterfly Valves for Use in the AP1000 Plant”, Revision 2
APP-PV11-VBR-004, “Equipment Qualification Data Package for Air-Operated TRICENTRIC Butterfly Valves for Use in the AP1000 Plant,” Revision 2
APP-PV14-VBR-001, “Equipment Qualification Summary Report for Fisher HPNS Control Valves for Use in the AP1000 Plant,” Revision 1
APP-PV14-VBR-002, “Equipment Qualification Data Package for Fisher HPNS Control Valves for Use in the AP1000 Plant,” Revision 1
APP-PV20-VBR-001; Rev. 2; Equipment Qualification Summary Report for Air Operated Fisher Controls SS-264 Valve Assemblies for Use in the AP1000 Plant
APP-PV20-VBR-002; Rev. 2; Equipment Qualification Data Package for Air Operated Fisher Controls SS-264 Valve Assemblies for Use in the AP1000 Plant
CAPAL 100497751, Incorrect Statement of Applicability in APP-PV14-VBR-002
CAPAL 100498113, JE53 Typographical Error Based on ITAAC Review
CR 10419911, “NRC Identified inconsistency in EQ package during NRC Inspection,” Oct 16, 2017
CR100497751, “Incorrect Statement of Applicability in APP-PV14-VBR-002,” Oct 16, 2017
WNA-AR-00514-WAPP; Rev. 1; JE53 Justification of Low Insulation Resistance After Submergence - N9004E (3077-RD5079-011) – Ultra
WNA-TR-03999-WAPP; Rev 0; JE52 IEEE Qualification Test Report: Thermal Aging - 3155N (TR-RNII-3155N-03) - Rosemount
WNA-TR-04060-WAPP; Rev. 0; JE52 Test Report Abnormal Events and LOCA/HELB Steam Temperature Testing - 3155N - (EGS-TR-HW53-3155N-02) - QualTech

**Section** 3P02
Inspection Procedure 83536 – Part 52, Offsite Dose Calculation Manual (ODCM)
Offsite Dose Calculation Manual for Southern Nuclear Operating Company Vogtle Electric Generating Plant Units 3 & 4, Rev. 0, 4/17/17
NMP-GM-003-F19 Focused Area Self-Assessment (FASA), Pre-NRC Inspection of the Vogtle 3&4 Offsite Dose Calculation Manual (ODCM), 8/24/17
Site Approval Form for NMP-EN-001, Management of the Radioactive Effluent Release Reports and the Offsite Dose Calculation Manuals, Rev. 8
Vogtle Electric Generating Plant White Paper, Evaluation of the Vogtle Combined Site X/Q and D/Q, 8/15/16

**Section** 3P03
IP 80522 – Part 52, Radiological Environmental Monitoring Program (REMP)
Offsite Dose Calculation Manual for Southern Nuclear Operating Company Vogtle Electric Generating Plant Units 3 & 4, Rev. 0, 4/17/17
NMP-GM-003-F19 Focused Area Self-Assessment (FASA), Pre-NRC Inspection of the Vogtle 3&4 Radiological Environmental Monitoring Program (REMP), 6/1/17
SV0-0000-X2-800000, "Vogtle Electric Generating Plant Permanent Buildings and Facilities Site Plan," 6/22/12
1NUREG-1301, “Offsite Dose Calculation Manual: Standard Radiological Effluent Controls for Pressurized Water Reactors”
Nuclear Energy Institute (NEI) 07-09A, Revision 0, “Generic FSAR [Final Safety Analysis Report] Template Guidance for Offsite Dose Calculation Manual (ODCM) Program Description”
Technical Specification (TS) 5.5, Programs and Manuals

## 4. OTHER INSPECTION RESULTS

4OA5

WEC CAPAL 100478419, “ASME QME-1 Extrapolation Methodology”
WEC Procurement Advisory Release (PAR) No. 4500309727-417-D, dated October 11, 2017
WEC PAR No. 4500309727-454-A, dated October 11, 2017
WEC PAR No. 4500309727-455-O, dated October 11, 2017
WEC Engineering & Design Coordination Report APP-PV11-GEF-080, “PV11 Equipment Qualification Documentation Updates for ITAAC Inspection Comments,” Revision 0, dated October 12, 2017
APP-PV11-VBR-001, “Equipment Qualification Summary Report for Manual TRICENTRIC Butterfly Valves for Use in the AP1000 Plant,” Revision 1, dated September 30, 2016
APP-PV11-VBR-002, “Equipment Qualification Data Package for Manual TRICENTRIC Butterfly Valves for Use in the AP1000 Plant,” Revision 1, dated October 12, 2016
APP-PV11-VBR-003, “Equipment Qualification Summary Report for Air-Operated TRICENTRIC Butterfly Valves for Use in the AP1000 Plant,” Revision 2, dated April 3, 2017
APP-PV11-VBR-004, “Equipment Qualification Data Package for Air-Operated TRICENTRIC Butterfly Valves for Use in the AP1000 Plant,” Revision 2, dated April 3, 2017
APP-PV11-VBR-005, “Equipment Qualification Summary Report for Motor-Operated TRICENTRIC Butterfly Valves for Use in the AP1000 Plant,” Revision 2, dated May 12, 2017
APP-PV11-VBR-006, “Equipment Qualification Data Package for Motor-Operated TRICENTRIC Butterfly Valves for Use in the AP1000 Plant,” Revision 3, dated May 12, 2017
WVC Document No. 305-55022-V, “Application Report for a TRICENTRIC NPS 6 Butterfly Valve for Use in Westinghouse AP1000 Nuclear Power Plants,” Revision 2, dated November 7, 2016
EPRI TR-107322, “Air-Operated Valve Evaluation Guide,” dated May 1999

## LIST OF ACRONYMS

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| ACI | American Concrete Institute |
| ADS | Automatic Depressurization System |
| AI | Air Inlet |
| AISC | American Institute of Steel Construction |
| ANI | Authorized Nuclear Inspector |
| ANSI | American National Standards Institute |
| AOI | Advant Ovation Interface |
| ASL | Approved Suppliers List |
| ASME | American Society of Mechanical Engineers |
| ASTM | American Society for Testing and Materials |
| AWS | American Welding Society |
| BPVC | Boiler and Pressure Vessel Code |
| CAP | Corrective Action Program |
| CAPAL | Corrective Action Prevention and Learnings |
| CFR | Code of Federal Regulations |
| CIS | Containment Internal Structures |
| CMT | Core Makeup Tank |
| CMTR | Certified Material Test Report |
| CNS | Containment System |
| CoC | Certificate of Conformance |
| COL | Combined License |
| CR | Condition Report |
| CV | Containment Vessel |
| DAS | Diverse Actuation System |
| DCO | Division of Construction Oversight |
| E&DCR | Engineering and Design Coordination Reports |
| EQDP | Equipment Qualification Data Package |
| EQSR | Equipment Qualification Summary Report |
| GTAW | Gas Tungsten Arc Welding |
| IEEE | Institute of Electrical and Electronics Engineers |
| IMC | Inspection Manual Chapter |
| IP | Inspection Procedure |
| IR | Inspection Report |
| IRWST | In-Containment Refueling Water Storage Tank |
| ITAAC | Inspections, Tests, Analysis, and Inspection Criteria |
| M&TE | Measuring & Test Equipment |
| MOV | Motor Operated Valves |
| N&D | Nonconformance and Disposition Report |
| NCR | Non-conformance Report |
| NCV | Non-Cited Violation |
| NDE | Non-Destructive Examination |
| NRC | Nuclear Regulatory Commission |
| ODCM | Offsite Dose Calculation Manual |
| OSC | Operations Support Center |
| PCCWST | Passive Containment Cooling Water Storage Tank |
| PCD | Principal Closure Document |
| PMS | Protection and Safety Monitoring System |
| PO | Purchase Order |
| PQR | Procedure Qualification Record |

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| PRHR | Passive Residual Heat Removal |
| PRHR HX | Passive Residual Heat Removal Heat Exchanger |
| PT | Liquid Penetrant Testing |
| PXS | Passive Core Cooling System |
| QA | Quality Assurance |
| QADP | Quality Assurance Data Package |
| QAPD | Quality Assurance Program Document |
| QC | Quality Control |
| RCP | Reactor Coolant Pump |
| RCS | Reactor Coolant System |
| REMP | Radiological Environmental Monitoring Program |
| RNS | Normal Residual Heat Removal |
| RPE | Registered Professional Engineer |
| RT | Radiographic Testing |
| RV | Reactor Vessel |
| SC | Steel Composite |
| SNC | Southern Nuclear Operating Company |
| SSC | Structure, System, and Component |
| TS | Technical Specification |
| TSC | Technical Support Center |
| UFSAR | Updated Final Safety Analysis Report |
| URI | Unresolved Item |
| VEGP | Vogtle Electric Generating Plant |
| VT | Visual Testing |
| WDS | Weld Data Sheet |
| WEC | Westinghouse Electric Company |
| WML | Welder Maintenance Logs |
| WMR | Welding Material Requisition |
| WPQ | Welder Performance Qualification |
| WPS | Welding Procedure Specification |

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| 13 | 2.1.02.02a | 2.a) The components identified in Table 2.1.2-1 as ASME Code Section III are designed and constructed in accordance with ASME Code Section III requirements. 2.b) The piping identified in Table 2.1.2-2 as ASME Code Section III is designed and constructed in accordance with ASME Code Section III requirements. 3.a) Pressure boundary welds in components identified in Table 2.1.2□1 as ASME Code Section III meet ASME Code Section III requirements. 3.b) Pressure boundary welds in piping identified in Table 2.1.2-2 as ASME Code Section III meet ASME Code Section III requirements. 4.a) The components identified in Table 2.1.2-1 as ASME Code Section III retain their pressure boundary integrity at their design pressure. 4.b) The piping identified in Table 2.1.2-2 as ASME Code Section III retains its pressure boundary integrity at its design pressure. 5.b) Each of the lines identified in Table 2.1.2-2 for which functional capability is required is designed to withstand | Inspection will be conducted of the as-built components and piping as documented in the ASME design reports. Inspection of the as-built pressure boundary welds will be performed in accordance with the ASME Code Section III. A hydrostatic test will be performed on the components and piping required by the ASME Code Section III to be hydrostatically tested. Inspection will be performed for the existence of a report verifying that the as-built piping meets the requirements for functional capability. Inspection will be performed for the existence of an LBB evaluation report or an evaluation report on the protection from dynamic effects of a pipe break. Section 3.3, Nuclear Island Buildings, contains the design descriptions and inspections, tests, analyses, and acceptance criteria for protection from the dynamic effects of pipe rupture. | The ASME Code Section III design reports exist for the as-built components and piping identified in Tables 2.1.2□1 and 2.1.2□2 as ASME Code Section III. A report exists and concludes that the ASME Code Section III requirements are met for non-destructive examination of pressure boundary welds. A report exists and concludes that the results of the hydrostatic test of the components and piping identified in Table 2.1.2□1 and Table 2.1.2□2 as ASME Code Section III conform with the requirements of the ASME Code Section III. A report exists and concludes that each of the as-built lines identified in Table 2.1.2-2 for which functional capability is required meets the requirements for functional capability. An LBB evaluation report exists and concludes that the LBB acceptance criteria are met by the as-built RCS piping and piping materials, or a pipe break evaluation report exists and concludes that protection from the dynamic effects of a line break is provided. |

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| | | combined normal and seismic design basis loads without a loss of its functional capability. 6. Each of the as-built lines identified in Table 2.1.2-2 as designed for LBB meets the LBB criteria, or an evaluation is performed of the protection from the dynamic effects of a rupture of the line. | | |

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| 19 | 2.1.02.05a.i | 5.a) The seismic Category I equipment identified in Table 2.1.2□1 can withstand seismic design basis loads without loss of safety function. 7.a) The Class 1E equipment identified in Table 2.1.2-1 as being qualified for 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. | i) Inspection will be performed to verify that the seismic Category I equipment and valves identified in Table 2.1.2-1 are located on the Nuclear Island. ii) Type tests, analyses, or a combination of type tests and analyses of seismic Category I equipment will be performed. iii) Inspection will be performed for the existence of a report verifying that the as-built equipment including anchorage is seismically bounded by the tested or analyzed conditions. i) Type tests, analyses, or a combination of type tests and analyses will be performed on Class 1E equipment located in a harsh environment. ii) Inspection will be performed of the as-built Class 1E equipment and the associated wiring, cables, and terminations located in a harsh environment. | i) The seismic Category I equipment identified in Table 2.1.2□1 is located on the Nuclear Island. ii) A report exists and concludes that the seismic Category I equipment can withstand seismic design basis loads without loss of safety function. iii) A report exists and concludes that the as-built equipment including anchorage is seismically bounded by the tested or analyzed conditions. i) A report exists and concludes that the Class 1E equipment identified in Table 2.1.2-1 as being qualified for 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. ii) A report exists and concludes that the as-built Class 1E equipment and the associated wiring, cables, and terminations identified in Table 2.1.2□1 as being qualified for a harsh environment are bounded by type tests, analyses, or a combination of type tests and analyses. |

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| 91 | 2.2.01.02a | 2.a) The components identified in Table 2.2.1-1 as ASME Code Section III are designed and constructed in accordance with ASME Code Section III requirements. 2.b) The piping identified in Table 2.2.1-2 as ASME Code Section III is designed and constructed in accordance with ASME Code Section III requirements. 3.a) Pressure boundary welds in components identified in Table 2.2.1-1 as ASME Code Section III meet ASME Code Section III requirements. 3.b) Pressure boundary welds in piping identified in Table 2.2.1-2 as ASME Code Section III meet ASME Code Section III requirements. 4.a) The components identified in Table 2.2.1-1 as ASME Code Section III retain their pressure boundary integrity at their design pressure. 4.b) The piping identified in Table 2.2.1-2 as ASME Code Section III retains its pressure boundary integrity at its design pressure. | Inspection will be conducted of the as-built components and piping as documented in the ASME design reports. Inspection of the as-built pressure boundary welds will be performed in accordance with the ASME Code Section III. i) A hydrostatic or pressure test will be performed on the components required by the ASME Code Section III to be tested. A hydrostatic or pressure test will be performed on the piping required by the ASME Code Section III to be pressure tested. | The ASME Code Section III design reports exist for the as-built components and piping identified in Table 2.2.1-1 and 2.2.1-2 as ASME Code Section III. A report exists and concludes that the ASME Code Section III requirements are met for non□destructive examination of pressure boundary welds. i) A report exists and concludes that the results of the pressure test of the components identified in Table 2.2.1-1 as ASME Code Section III conform with the requirements of the ASME Code Section III. A report exists and concludes that the results of the pressure test of the piping identified in Table 2.2.1-2 as ASME Code Section III conform with the requirements of the ASME Code Section III. |

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| 98 | 2.2.01.05.i | 5. The seismic Category I equipment identified in Table 2.2.1□1 can withstand seismic design basis loads without loss of structural integrity and safety function. 6.a) The Class 1E equipment identified in Table 2.2.1-1 as being qualified for 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. 6.d) The non-Class 1E electrical penetrations identified in Table 2.2.1-1 as being qualified for a harsh environment can withstand the environmental conditions that would exist before, during, and following a design basis accident without loss of containment pressure boundary integrity. | i) Inspection will be performed to verify that the seismic Category I equipment and valves identified in Table 2.2.1-1 are located on the Nuclear Island. ii) Type tests, analyses, or a combination of type tests and analyses of seismic Category I equipment will be performed. iii) Inspection will be performed for the existence of a report verifying that the as-built equipment including anchorage is seismically bounded by the tested or analyzed conditions. i) Type tests, analyses, or a combination of type tests and analyses will be performed on Class 1E equipment located in a harsh environment. ii) Inspection will be performed of the as-built Class 1E equipment and the associated wiring, cables, and terminations located in a harsh environment. i) Type tests, analyses, or a combination of type tests and analyses will be performed on non□Class 1E electrical penetrations located in a harsh | i) The seismic Category I equipment identified in Table 2.2.1□1 is located on the Nuclear Island. ii) A report exists and concludes that the seismic Category I equipment can withstand seismic design basis dynamic loads without loss of structural integrity and safety function. iii) The as-built equipment including anchorage is seismically bounded by the tested or analyzed conditions. i) A report exists and concludes that the Class 1E equipment identified in Table 2.2.1-1 as being qualified for 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. ii) 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. i) A report exists and concludes that the |

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| | | | environment. ii) Inspection will be performed of the as-built non-Class 1E electrical penetrations located in a harsh environment. | non-Class 1E electrical penetrations identified in Table 2.2.1□1 as being qualified for a harsh environment can withstand the environmental conditions that would exist before, during, and following a design basis accident without loss of containment pressure boundary integrity. ii) A report exists and concludes that the as-built non-Class 1E electrical penetrations 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. |
| 114 | 2.2.01.11a.i | 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. | i) Tests or type tests of motor-operated valves will be performed to demonstrate the capability of each valve to operate under design conditions. ii) Inspection will be performed for the existence of a report verifying that the asbuilt motor-operated valves are bounded by the tests or type tests. | i) A test report exists and concludes that each motor-operated valve changes position as indicated in Table 2.2.1-1 under design conditions. ii) A report exists and concludes that the as-built motor-operated valves are bounded by the tests or type tests. |

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| 126 | 2.2.02.05a.i | 5.a) The seismic Category I components identified in Table 2.2.2□1 can withstand seismic design basis loads without loss of safety function. 6.a) The Class 1E components identified in Table 2.2.2-1 as being qualified for 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. | i) Inspection will be performed to verify that the seismic Category I components and valves identified in Table 2.2.2-1 are located on the Nuclear Island. ii) Type tests, analyses, or a combination of type tests and analyses of seismic Category I components will be performed. iii) Inspection will be performed for the existence of a report verifying that the as-built components including anchorage are seismically bounded by the tested or analyzed conditions. i) Type tests or a combination of type tests and analyses will be performed on Class 1E components located in a harsh environment. ii) Inspection will be performed of the as-built Class 1E components and the associated wiring, cables, and terminations located in a harsh environment. | i) The seismic Category I components identified in Table 2.2.2□1 are located on the Nuclear Island. ii) A report exists and concludes that the seismic Category I components can withstand seismic design basis loads without loss of safety function. iii) The report exists and concludes that the as-built components including anchorage are seismically bounded by the tested or analyzed conditions. i) A report exists and concludes that the Class 1E components identified in Table 2.2.2-1 as being qualified for 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. ii) A report exists and concludes that the as-built Class 1E components and the associated wiring, cables, and terminations identified in Table 2.2.2-1 as being qualified for a harsh environment are bounded by type tests, analyses, or a combination of type tests and analyses. |

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| 159 | 2.2.03.02a | 2.a) The components identified in Table 2.2.3-1 as ASME Code Section III are designed and constructed in accordance with ASME Code Section III requirements. 2.b) The piping identified in Table 2.2.3-2 as ASME Code Section III is designed and constructed in accordance with ASME Code Section III requirements. 3.a) Pressure boundary welds in components identified in Table 2.2.3-1 as ASME Code Section III meet ASME Code Section III requirements. 3.b) Pressure boundary welds in piping identified in Table 2.2.3-2 as ASME Code Section III meet ASME Code Section III requirements. 4.a) The components identified in Table 2.2.3-1 as ASME Code Section III retain their pressure boundary integrity at their design pressure. 4.b) The piping identified in Table 2.2.3-2 as ASME Code Section III retains its pressure boundary integrity at its design pressure. 5.b) Each of the lines identified in Table 2.2.3-2 for which functional capability is required is designed to withstand | Inspection will be conducted of the as-built components and piping as documented in the ASME design reports. Inspection of the as-built pressure boundary welds will be performed in accordance with the ASME Code Section III. A hydrostatic test will be performed on the components and piping required by the ASME Code Section III to be hydrostatically tested. Inspection will be performed for the existence of a report verifying that the as-built piping meets the requirements for functional capability. Inspection will be performed for the existence of an LBB evaluation report or an evaluation report on the protection from dynamic effects of a pipe break. Section 3.3, Nuclear Island Buildings, contains the design descriptions and inspections, tests, analyses, and acceptance criteria for protection from the dynamic effects of pipe rupture. | The ASME Code Section III design reports exist for the as□built components and piping identified in Table 2.2.3□1 and 2.2.3-2 as ASME Code Section III. A report exists and concludes that the ASME Code Section III requirements are met for non-destructive examination of pressure boundary welds. A report exists and concludes that the results of the hydrostatic test of the components and piping identified in Table 2.2.3□1 and 2.2.3-2 as ASME Code Section III conform with the requirements of the ASME Code Section III. A report exists and concludes that each of the as-built lines identified in Table 2.2.3-2 for which functional capability is required meets the requirements for functional capability. An LBB evaluation report exists and concludes that the LBB acceptance criteria are met by the as-built RCS piping and piping materials, or a pipe break evaluation report exists and concludes that protection from the dynamic effects of a line break is provided. |

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| | | combined normal and seismic design basis loads without a loss of its functional capability. 6. Each of the as-built lines identified in Table 2.2.3-2 as designed for LBB meets the LBB criteria, or an evaluation is performed of the protection from the dynamic effects of a rupture of the line. | | |

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| 165 | 2.2.03.05a.i | 5.a) The seismic Category I equipment identified in Table 2.2.3□1 can withstand seismic design basis loads without loss of safety function. 7.a) The Class 1E equipment identified in Table 2.2.3-1 as being qualified for 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. | i) Inspection will be performed to verify that the seismic Category I equipment and valves identified in Table 2.2.3-1 are located on the Nuclear Island. ii) Type tests, analyses, or a combination of type tests and analyses of seismic Category I equipment will be performed. iii) Inspection will be performed for the existence of a report verifying that the as-built equipment including anchorage is seismically bounded by the tested or analyzed conditions. i) Type tests, analyses, or a combination of type tests and analyses will be performed on Class 1E equipment located in a harsh environment. ii) Inspection will be performed of the as-built Class 1E equipment and the associated wiring, cables, and terminations located in a harsh environment. | i) The seismic Category I equipment identified in Table 2.2.3-1 is located on the Nuclear Island. ii) A report exists and concludes that the seismic Category I equipment can withstand seismic design basis dynamic loads without loss of safety function. For the PXS containment recirculation and IRWST screens, a report exists and concludes that the screens can withstand seismic dynamic loads and also post-accident operating loads, including head loss and debris weights. iii) A report exists and concludes that the as-built equipment including anchorage is seismically bounded by the tested or analyzed conditions. For the PXS containment recirculation and IRWST screens, a report exists and concludes that the as-built screens including their anchorage are bounded by the seismic loads and also post-accident operating loads, including head loss and debris weights. i) A report exists and concludes that the Class 1E equipment identified in Table 2.2.3-1 as being qualified for a harsh |

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| | | | | 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. ii) A report exists and concludes that the as-built Class 1E equipment and the associated wiring, cables, and terminations identified in Table 2.2.3□1 as being qualified for a harsh environment are bounded by type tests, analyses, or a combination of type tests and analyses. |
| 259 | 2.2.05.05a.i | 5.a) The seismic Category I equipment identified in Table 2.2.5□1 can withstand seismic design basis loads without loss of safety function. | i) Inspection will be performed to verify that the seismic Category I equipment and valves identified in Table 2.2.5-1 are located on the Nuclear Island. ii) Type tests, analyses, or a combination of type tests and analyses of seismic Category I equipment will be performed. iii) Inspection will be performed for the existence of a report verifying that the as-built equipment including anchorage is seismically bounded by the tested or analyzed conditions. | i) The seismic Category I equipment identified in Table 2.2.5-1 is located on the Nuclear Island. ii) A report exists and concludes that the seismic Category I equipment can withstand seismic design basis loads without loss of safety function. iii) A report exists and concludes that the as-built equipment including anchorage is seismically bounded by the tested or analyzed conditions. |

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| 361 | 2.3.06.05a.i | 5.a) The seismic Category I equipment identified in Table 2.3.6□1 can withstand seismic design basis loads without loss of safety function. 7.a) The Class 1E equipment identified in Tables 2.3.6-1 as being qualified for 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. | i) Inspection will be performed to verify that the seismic Category I equipment identified in Table 2.3.6-1 is located on the Nuclear Island. ii) Type tests, analyses, or a combination of type tests and analyses of seismic Category I equipment will be performed. iii) Inspection will be performed for the existence of a report verifying that the as-built equipment including anchorage is seismically bounded by the tested or analyzed conditions. i) Type tests, analyses, or a combination of type tests and analyses will be performed on Class 1E equipment located in a harsh environment. ii) Inspection will be performed of the as-built Class 1E equipment and the associated wiring, cables, and terminations located in a harsh environment. | i) The seismic Category I equipment identified in Table 2.3.6□1 is located on the Nuclear Island. ii) A report exists and concludes that the seismic Category I equipment can withstand seismic design basis loads without loss of safety function. iii) A report exists and concludes that the as-built equipment including anchorage is seismically bounded by the tested or analyzed conditions. i) A report exists and concludes that the Class 1E equipment identified in Table 2.3.6-1 as being qualified for 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. ii) A report exists and concludes that the as-built Class 1E equipment and the associated wiring, cables, and terminations identified in Table 2.3.6□1 as being qualified for a harsh environment are bounded by type tests, analyses, or a combination of type tests and analyses. |

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| 519 | 2.5.01.04 | 4. The DAS hardware and any software are developed using a planned design process which provides for specific design documentation and reviews during the following life cycle stages: a) Development phase for hardware and any software b) System test phase c) Installation phase The planned design process also provides for the use of commercial off-the-shelf hardware and software. | Inspection will be performed of the process used to design the hardware and any software. | A report exists and concludes that the process defines the organizational responsibilities, activities, and configuration management controls for the following: a) Documentation and review of hardware and any software. b) Performance of tests and the documentation of test results during the system test phase. c) Performance of tests and inspections during the installation phase. The process also defines requirements for the use of commercial off-the-shelf hardware and software. |
| 536 | 2.5.02.07c | 7.c) Data communication between safety and nonsafety systems does not inhibit the performance of the safety function. | Type tests, analyses, or a combination of type tests and analyses of the PMS gateways will be performed. | A report exists and concludes that data communication between safety and nonsafety systems does not inhibit the performance of the safety function. |

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| 597 | 2.6.03.02.i | 2. The seismic Category I equipment identified in Table 2.6.3□1 can withstand seismic design basis loads without loss of safety function. | i) Inspection will be performed to verify that the seismic Category I equipment identified in Table 2.6.3□1 is located on the Nuclear Island. ii) Type tests, analyses, or a combination of type tests and analyses of seismic Category I equipment will be performed. iii) Inspection will be performed for the existence of a report verifying that the as-built equipment including anchorage is seismically bounded by the tested or analyzed conditions. | i) The seismic Category I equipment identified in Table 2.6.3□1 is located on the Nuclear Island. ii) A report exists and concludes that the seismic Category I equipment can withstand seismic design basis loads without loss of safety function. iii) A report exists and concludes that the as-built equipment including anchorage is seismically bounded by the tested or analyzed conditions. |
| 658 | C.2.6.09.01 | 1. The external walls, doors, ceiling, and floors in the location within which the last access control function for access to the protected area is performed are bullet□resistant to at least Underwriters Laboratory Ballistic Standard 752, level 4. | Type test, analysis, or a combination of type test and analysis will be performed for the external walls, doors, ceilings, and floors in the location within which the last access control function for access to the protected area is performed. | The external walls, doors, ceilings, and floors in the location within which the last access control function for access to the protected area is performed are bullet□resistant to at least Underwriters Laboratory Ballistic Standard 752, level 4. |
| 675 | C.2.6.12.05 | 5. The fault current contribution of each offsite circuit is compatible with the interrupting capability of the onsite short circuit interrupting devices. | Analyses of the as□built offsite circuit will be performed to evaluate the fault current contribution of each offsite circuit at the interface with the onsite ac power system. | A report exists and concludes the short circuit contribution of each as□built offsite circuit at the interface with the onsite ac power system is compatible with the interrupting capability of the onsite fault current interrupting devices. |

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| 733 | 3.1.00.01 | 1. The TSC has floor space of at least 75 ft2 per person for a minimum of 25 persons. | An inspection will be performed of the TSC floor space. | The TSC has at least 1875 ft2 of floor space. |
| 737 | 3.1.00.05 | 5. The TSC and OSC are in different locations. | An inspection will be performed of the location of the TSC and OSC. | The TSC and OSC are in different locations. |
| 760 | 3.3.00.02a.i.a | 2.a) The nuclear island structures, including the critical sections listed in Table 3.3-7, are seismic Category I and are designed and constructed to withstand design basis loads as specified in the Design Description, without loss of structural integrity and the safety-related functions. | i) An inspection of the nuclear island structures will be performed. Deviations from the design due to as-built conditions will be analyzed for the design basis loads. | i.a) A report exists which reconciles deviations during construction and concludes that the as-built containment internal structures, including the critical sections, conform to the approved design and will withstand the design basis loads specified in the Design Description without loss of structural integrity or the safety-related functions. |
| 761 | 3.3.00.02a.i.b | 2.a) The nuclear island structures, including the critical sections listed in Table 3.3-7, are seismic Category I and are designed and constructed to withstand design basis loads as specified in the Design Description, without loss of structural integrity and the safety-related functions. | i) An inspection of the nuclear island structures will be performed. Deviations from the design due to as-built conditions will be analyzed for the design basis loads. | i.b) A report exists which reconciles deviations during construction and concludes that the as-built shield building structures, including the critical sections, conform to the approved design and will withstand the design basis loads specified in the Design Description without loss of structural integrity or the safety-related functions. |

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| 762 | 3.3.00.02a.i.c | 2.a) The nuclear island structures, including the critical sections listed in Table 3.3-7, are seismic Category I and are designed and constructed to withstand design basis loads as specified in the Design Description, without loss of structural integrity and the safety-related functions. | i) An inspection of the nuclear island structures will be performed. Deviations from the design due to as-built conditions will be analyzed for the design basis loads. | i.c) A report exists which reconciles deviations during construction and concludes that the as-built structures in the non-radiologically controlled area of the auxiliary building, including the critical sections, conform to the approved design and will withstand the design basis loads specified in the Design Description without loss of structural integrity or the safety-related functions. |
| 763 | 3.3.00.02a.i.d | 2.a) The nuclear island structures, including the critical sections listed in Table 3.3-7, are seismic Category I and are designed and constructed to withstand design basis loads as specified in the Design Description, without loss of structural integrity and the safety-related functions. | i) An inspection of the nuclear island structures will be performed. Deviations from the design due to as-built conditions will be analyzed for the design basis loads. | i.d) A report exists which reconciles deviations during construction and concludes that the as-built structures in the radiologically controlled area of the auxiliary building, including the critical sections, conform to the approved design and will withstand the design basis loads specified in the Design Description without loss of structural integrity or the safety-related functions. |

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| 764 | 3.3.00.02a.ii.a | 2.a) The nuclear island structures, including the critical sections listed in Table 3.3-7, are seismic Category I and are designed and constructed to withstand design basis loads as specified in the Design Description, without loss of structural integrity and the safety-related functions. | ii) An inspection of the as□built concrete thickness will be performed. | ii.a) A report exists that concludes that the containment internal structures as-built concrete thicknesses conform to the building sections defined in Table 3.3-1. |
| 849 | E.3.9.05.01.01 | 5.1 The licensee has established a technical support center (TSC) and an onsite operations support center (OSC). [H.1] | 5.1 An inspection of the as□built TSC and OSC will be performed, including a test of the capabilities. | 5.1.1 The TSC has at least 2,175 square feet of floor space. |