UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
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ATLANTA, GEORGIA 30303-1257

August 10, 2017

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 05200025/2017002, 05200026/2017002

Dear Mr. Yox:

On June 30, 2017, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at Vogtle Electric Generating Plant (VEGP) Units 3 and 4. The enclosed inspection report documents the inspection results, which the inspectors discussed on July 20, 2017 with you and other members of your staff.

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

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

If you disagree with the cross-cutting aspects assigned to the finding, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the Regional Administrator, Region II, and the NRC Resident Inspector office at the Vogtle Electric Generating Plant 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 10 Code of Federal Regulations (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) 05200025/2017002, 05200026/2017002
w/ attachment: Supplemental Information

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Region II

Docket Numbers:	5200025 5200026
License Numbers:	NPF-91 NPF-92
Report Numbers:	05200025/2017002 05200026/2017002
Licensee:	Southern Nuclear Operating Company, Inc.
Facility:	Vogtle Electric Generating Plant Unit 3 Vogtle Electric Generating Plant Unit 4
Location:	Waynesboro, GA
Inspection Dates:	April 1, 2017 through June 30, 2017
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Approved by: Jamie Heisserer, Branch Chief
Construction Inspection Branch 1
Division of Construction Oversight

SUMMARY OF FINDINGS

Inspection Report (IR) 05200025/2017002, 05200026/2017002; 04/01/2017 through 06/30/2017; Vogtle Electric Generating Plant Units 3 and 4, Inspection of the ITAAC-Related Design and Fabrication Requirements.

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. One green NCV associated with the Design/Engineering cornerstone was identified consistent with the NRC Enforcement Policy, Section 2.3. 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 Title 10 of the Code of Federal Regulations (10 CFR) Part 50, Appendix B, Criterion III, "Design Control" for the licensee's failure through their contractor Westinghouse Electric Company (WEC) to perform thermal stress analysis in the ASME design report for the shear cap and valve body of the 14-inch fourth-stage automatic depressurization system (ADS) squib valves, RCS-PL-V004A/B/C/D. The licensee entered this finding into their corrective action program as Condition Reports (CR) 10379762 and 10389193 and WEC Corrective Action, Prevention and Learning (CAPAL) 100478099 and 100481984. The licensee performed immediate corrective actions to demonstrate with reasonable assurance through design analysis that the component would have been able to meet its design function. Additional long-term corrective actions include performance of additional analysis and revisions to the ASME design report and supporting documentation.

The inspectors determined this finding was associated with the Design/Engineering Cornerstone. The finding was determined to be more than minor because the performance deficiency represented an adverse condition that rendered the quality of component indeterminate, and required substantive corrective action. The inspectors also determined that the finding was more than minor because it represented an ITAAC finding that was material to the acceptance criteria of VEGP Unit 3 and 4 ITAAC 13 (2.1.02.02a), and if left uncorrected, the licensee may not have been able to demonstrate that the acceptance criteria of this ITAAC was met. The inspectors evaluated the finding in accordance with IMC 2519, Appendix A, "AP1000 Construction Significance Determination Process," and determined the finding was of very low safety significance (Green) because it was associated with the RCS 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.

The inspectors determined the finding was indicative of present licensee performance and was associated with the cross-cutting aspect of Documentation, in the area of Human Performance, in accordance with IMC 0613, Appendix F, “Construction Cross-Cutting Areas and Aspects.” Specifically, the licensee failed to maintain complete, accurate, and up-to-date design documentation for the 14-inch ADS squib valves [H.7]. (Section 1A01)

B. Licensee-Identified Violations

None

REPORT DETAILS

Summary of Plant Construction Status

During this report period in Unit 3, concrete was placed in module CA05, which forms a part of the walls of the Chemical and Volume Control System (CVS) room and the Passive Core Cooling System (PXS) B compartment. Inside containment, the rebar floor for IRWST (In-Containment Refueling Water Storage Tank), up to elevation 103', was complete and installation began on floor modules at 107'2". Modules Q223 and Q233 which form portions of the DVI lines were set in containment. Module Q305, which contains CVS, PXS, and Liquid Radwaste System (WLS) isolation valves arrived onsite. In the auxiliary building, concrete for the spent fuel floor was poured. In the shield building, rebar and concrete were placed up to 109'10"/117'6" and steel concrete composite (SC) panels continued to arrive and were assembled into groups of two.

In Unit 4, the 14" squib valves and one Reactor Coolant Pump (RCP) arrived onsite. In the non-radiologically controlled part of the auxiliary building, concrete floors were placed to 82'6". In containment, rebar was installed up to 96'6" inside containment (west). The shield building SC course 02 concrete was placed and SC course 03 was set in the nuclear island. In the yard, modules CA01 (pressurizer compartment only), CA02 (northeast wall of the IRWST), and CA03 (west wall of the IRWST) were completed.

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
(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 Inspection Procedures (IP)/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-02.02-Fabrication Records Review

- 65001.F-02.04-General QA Review

The inspectors reviewed design and fabrication documents associated with the Unit 3 14-inch fourth-stage ADS squib valves serial numbers (S/N) 0920-164451-3-1, 0920-164451-3-2, 0920-164451-3-3, and 0920-164451-3-4 to determine whether the documents adequately define the final design and arrangement. Specifically, the inspectors reviewed the American Society of Mechanical Engineers (ASME) design reports, WEC design specification, valve datasheets, design drawings, plant and system transient analyses, valve functional requirement analyses, and licensing bases documents for the 14-inch fourth-stage ADS squib valves.

The inspectors selected a sample of stress and design analyses related to the valve wall thickness, body, shear cap, and bolting material to verify that the design inputs were correctly identified and documented, and that the valves were designed in accordance with the ASME Section III requirements, specifically as they relate to the design requirements that ensure the component can meet design safety functions during a design-basis accident. The inspectors reviewed design specifications and transient analyses to verify that they were properly translated into the licensee's documentation, which includes the COL and Updated Final Safety Analysis Report (UFSAR), specifically Chapter 15, "Accident Analysis". The inspectors also verified that the component design and as-built conditions met the design assumptions in the WEC transient analysis. Additionally, the inspectors reviewed a sample of quality release and certificate of conformance (CoC) documents to verify if as-built critical dimensions conform to stress and design parameters analyzed in the ASME design report and design drawings.

The inspectors selected a sample of critical attributes and scenarios to determine if internal and external events or hazards could affect the components performance and if they would result in a more than minimal impact to the conclusions made in the WEC transient analysis, and the licensee's UFSAR Chapter 15, Accident Analysis. The inspectors evaluated the following attributes and scenarios:

- inadvertent mechanical actuation of one of the fourth-stage ADS valves
- adequate flow conditions with loss of one fourth-stage ADS valve
- thermal effects across the fourth-stage ADS valves
- impacts on the valve and surrounding components and structures during the actuation of ADS

The inspectors reviewed a sample of qualification records to verify if design documents were reviewed and approved by the responsible engineering group, and that personnel involved in the development of design documents met WEC and ASME Section III qualification requirements. Specifically, the inspectors reviewed qualification records for the Professional Engineers who developed the squib valve and piping system design specifications.

The inspectors reviewed a sample of deviation notices to verify that the conditions were adequately evaluated by the responsible organizations and that the accepted condition complies with the final design. The inspectors also reviewed corrective action documents issued during the inspection to verify that issues were entered into the licensee or applicable contractor corrective action program in accordance with program requirements.

b. Findings

Introduction

The NRC identified an ITAAC finding of very low safety significance (Green) and associated NCV of 10 CFR Part 50, Appendix B, Criterion III, "Design Control" for Southern Nuclear Operating Company's (SNC) failure through their contractor WEC to perform thermal stress analysis in the ASME design report for the shear cap and valve body of the 14-inch fourth-stage ADS squib valves, RCS-PL-004A/B/C/D. Specifically, the inspectors identified that thermal transients in APP-RCS-M3C-051, "Design Transients for the AP1000 RCS Class A, B and C Valves and the RCS Class A Piping," were not appropriately transcribed to the valve transient document, valve data sheet, and design specification which resulted in the failure to meet ASME Section III requirements in the ASME design report, APP-PV70-VDR-101001, "Compilation of Design Reports for PV70 Datasheet 100."

Description

During the week of June 19, 2017, the inspectors identified that the ASME design report, APP-PV70-VDR-101001, "Compilation of Design Reports for PV70 Datasheet 100," for the 14-inch fourth-stage ADS squib valves, RCS-PL-V004A/B/C/D, did not analyze for thermal transients as required by ASME Boiler and Pressure Vessel Code (BPVC) Section III, Subsection NB. Specifically, the inspectors determined that the following ASME Section III requirements were not met: subparagraphs NB-3222.2, "Primary Plus Secondary Stress Intensity" and NB-3222.4, "Analysis for Cyclic Operation" for the shear cap, and subparagraph NB-3545.3, "Fatigue Requirements" for the valve body because the ASME design report did not account for thermal stresses that occur during normal and accident plant transients.

The inspectors noted that the valve datasheet for the 14-inch squib valves, AP1000 Valve Datasheet -PV70-Z0D-101 from APP-PV70-Z0R-001, "PV70 Squib (Pyrotechnic Actuated) Valves, ASME Section III Class 1, Data Sheet Report", stated that design transients are provided in the WEC design specification. Additionally, the valve datasheet stated that the valve body and valve shear cap shall be designed to withstand transient conditions.

Section 6.1.5.1 of the WEC design specification, APP-PV70-Z0-001, "Squib (Pyrotechnic Actuated) Valves, ASME Boiler and Pressure Vessel Code, Section III Class 1", Rev. 6, dated July 17, 2014, requires transient analysis to be performed in accordance with ASME BPVC Section III, Subsection NB-3550, and that the valves shall withstand thermal, pressure, and load transients. APP-PV70-Z0-001, sections 3.3.2.1 and 6.1.5.1 also stated that the applicable plant and system transients to the squib valves are contained in APP-PV70-Z0Y-001, "Plant and System Transients Applicable to PV70 Valves." Design specification APP-PV70-Z0-001 identified APP-PV70-Z0Y-001 as an attachment to the design specification, and is listed in Appendix D of APP-PV70-Z0-001.

APP-PV70-Z0Y-001 contains the plant and system transients applicable to safety related squib valves. Section 2.1.1 states, in part, that reactor coolant system (RCS) design transients that apply to the valves specified in datasheet APP-PV-70-Z0D-101 are listed per Table 2.1. The transients listed in Table 2.1 are consistent with those

found in APP-RCS-M3C-051, “Design Transients for the AP1000 RCS Class A, B and C Valves and the RCS Class A Piping.”

The inspectors determined that the ASME design report, APP-PV70-VDR-101001, contained insufficient detail to show that the 14-inch ADS squib valves satisfy the thermal stress requirements. The RCS design transients in APP-RCS-M2C-051 evaluated both pressure and temperature variations resulting from design transients; however, the temperature variations were not appropriately transcribed to the plant and system transients for the squib valves contained in APP-PV70-Z0Y-001, valve datasheet -PV70-Z0D-101, and WEC design specification APP-PV70-Z0-001. Additionally, the ASME design report, APP-PV70-VDR-101001, incorrectly stated that there were no thermal transients specified for the 14-inch squib valves, and did not completely analyze for thermal stresses on the shear cap and valve body in accordance with ASME BPVC Section III, Subsection NB requirements.

Analysis

The licensee’s failure to perform thermal stress analysis in the ASME design report for the shear cap and valve body of the 14-inch ADS squib valves was a performance deficiency. The inspectors identified that thermal transients in APP-RCS-M3C-051 were not appropriately transcribed to the valve transient document, valve data sheet, and design specification which resulted in the failure to meet ASME Section III requirements in the ASME design report, APP-PV70-VDR-101001. The finding was determined to be more than minor because the performance deficiency represented an adverse condition that rendered the quality of component indeterminate, and required substantive corrective action. Specifically, WEC and the valve vendor performed additional analysis and calculations to verify that the valve would still meet its’ design function and additional long-term corrective actions include revisions to the ASME design report and WEC documents. The inspectors also determined that the finding was more than minor because it represented an ITAAC finding that was material to the acceptance criteria of VEGP Unit 3 &4 ITAAC 13 (2.1.02.02a), and if left uncorrected, the licensee may not have been able to demonstrate that the acceptance criteria of this ITAAC was met. Specifically, the acceptance criteria of this ITAAC requires that the ASME Code Section III design reports exist for the as-built component, the 14-inch fourth-stage ADS squib valves. ASME BPVC Section III, paragraph NCA-3350 states, in part, the designer shall prepare a design report in sufficient detail to show that the applicable stress limitations are satisfied when the component is subject to the loading conditions specified in the design specification. The inspectors determined that the design specification did not include all loading conditions; therefore, the ASME design report would not have had sufficient detail to show that the stress limitations were satisfied.

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 that the finding was associated with a system or structure; it was associated with the RCS 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 Documentation, in the area of Human Performance, in accordance with IMC 0613, Appendix F, "Construction Cross-Cutting Areas and Aspects." Specifically, the licensee failed to maintain complete, accurate, and up-to-date design documentation for the 14-inch ADS squib valves [H.7].

Enforcement

Title 10 CFR Part 50, Appendix B, Criterion III, "Design Control," requires, in part, that measures are established to assure that the design basis, for those structures, systems, and components to which Appendix B applies, are correctly translated into specifications. ASME BPVC Section III, paragraph NCA-3350 states, in part, the designer shall prepare a design report in sufficient detail to show that the applicable stress limitations are satisfied when the component is subject to the loading conditions specified in the design specification. Section 6.1.8.1 of WEC design specification APP-PV70-Z0-001, "Design Specification for Squib (Pyrotechnic Actuated) Valves, ASME BPVC, Section III Class 1," Rev. 6, states, ASME BPVC Section III design reports for class 1 valves shall be performed in accordance with the ASME BPVC Section III, NB-3500 in sufficient detail to demonstrate that the valve meets the requirements of the ASME BPVC. As an alternative the valve may be designed to ASME BPVC Section III, Subsection NB-3200. WEC document APP-RCS-M3C-051, "Design Transients for the AP1000 RCS Class A, B and C Valves and the RCS Class A Piping," Rev. 0 identifies the design transients applicable to the 14-inch ADS squib valves, which include thermal effects. Contrary to the above, since July 17, 2014, the licensee, through their contractor WEC, failed to translate the design basis into specifications. Document APP-PV70-Z0-001, "Design Specification for Squib (Pyrotechnic Actuated) Valves, ASME BPVC, Section III Class 1," Rev. 6, failed to account for the applicable stress limitations from thermal transients identified in document APP-RCS-M3C-051, "Design Transients for the AP1000 RCS Class A, B and C Valves and the RCS Class A Piping," Rev. 0, and as a result, failed to correctly translate the design requirements into resulting specifications, specifically the ASME design report.

The licensee performed immediate corrective actions to demonstrate with reasonable assurance through design analysis that the component would have been able to meet its design function. Supplemental calculations were developed to show the additional margin to the valve stress limit was sufficient to account for the original exclusion of the thermal stresses. The licensee entered this finding into their corrective action program as CRs 10379762 and 10389193 and WEC CAPALs 100478099 and 100481984. Additional long-term corrective actions include performance of additional analysis and revisions to the ASME design report and supporting documentation. Since the corrective actions have not been fully implemented, this NCV will remain open until the NRC can verify that compliance is restored and the acceptance criteria of Unit 3 & 4 ITAAC 13 is not impacted. This violation is being treated as a non-cited violation consistent with Section 2.3.2.a of the Enforcement Policy. This issue is identified as NCV 05200025/2017002-01 and

05200026/2017002-01, Thermal Stress Analysis Not Performed for 14-inch ADS Squib Valves IAW with ASME Section III.

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:

- 65001.06 - Inspection of ITAAC-Related Installation of Mechanical Components
- 65001.06-02.01 - General Installation
- 65001.06-02.02 - Component Welding
- 65001.B-02.04-Production Controls
- 65001.F-02.03-Observation of Fabrication Activities

The inspectors performed an inspection of numerous construction activities associated with the installation of the Unit 3 ”A” Steam Generator. Prior to installation of the “A” steam generator lower level (SGLL) lateral support brackets, the inspectors observed the development and machining of the associated inlay weldment on the steam generator cubicle walls to determine if:

- design requirements in the approved fabrication procedures were in accordance with NF-4441 ASME code;
- work was conducted in accordance with the approved quality assurance traveler, including work stoppage for established hold points;
- specially trained personnel and special tools were available to perform the work;
- correct drawings and work procedures were available to the workers at the work site;
- weldment area was sufficiently protected from inclement conditions;
- preheating of the weldment area was performed in accordance with the welding procedure specifications (WPS);
- welding surfaces in the weldment area were smooth, uniform, and free from significant surface discontinuities such as cracks or seems;
- welding surfaces in the weldment area were free from paint, oil, rust, scale, slag, grease, moisture, or other harmful materials detrimental to welding;
- welding variables specified in the WPS were routinely verified; and
- machining of the weldment met the applicable quality and technical requirements established in the quality assurance traveler.

The inspectors observed the installation of the SGLL bracket for the “A” steam generator to the weldments on the steam generator cubicle walls to determine if:

- design requirements in the approved fabrication procedures were in accordance with NF-4441 ASME code;
- installation requirements, including proper location, placement, dimensions, alignment, and other mounting requirements were specified in the approved quality assurance traveler;

- specially trained personnel and special tools were available to perform the work;
- correct drawings and work procedures were available to the workers at the work site;
- hold Points were observed and quality control inspections were conducted as required;
- lifting and rigging was performed in accordance with approved procedures;
- welding area was sufficiently protected from inclement conditions;
- preheating of the weldment was performed in accordance with the WPS;
- welding surfaces were smooth, uniform, and free from significant surface discontinuities such as cracks or seems;
- welding surfaces were free from paint, oil, rust, scale, slag, grease, moisture, or other harmful materials detrimental to welding;
- weld joint geometry, including root opening and fit-up tolerances, were as specified in the approved WPS; and
- welding variables specified in the WPS were routinely verified.

After installation of the "A" steam generator intermediate level (SGIL) and SGLL lateral support brackets, the inspectors preformed a fabrication records review of the six quality assurance travelers used to install the overlay weldments and the brackets to verify that the travelers were adequate to furnish evidence of activities affecting quality, and that the weld overlays and brackets conformed to applicable codes, standards, regulations, and quality and technical standards.

b. Findings

No findings were identified.

1A03 (Unit 3) ITAAC Number 2.1.02.02b (14) / Family 03F

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 2.1.02.02b (14). The inspectors used the following NRC IPs/sections to perform this inspection:

- 65001.F-02.02-Fabrication Records Review

The inspectors reviewed purchase orders, engineering drawings, and documentation associated with material manufacturing and testing, fabrication, and examination of the austenitic stainless steel RCS piping to determine whether these activities were performed with acceptable results for both hot legs (RCS-L001A and 001B) and four cold legs (L002A and -2B, -2C and -2D) in accordance with the design and fabrication requirements of the UFSAR and ASME Section III, Subsection NB for Class 1 Components, 1998 Edition including 2000 Addenda. Specifically, the inspectors reviewed:

- two WEC vendor purchase orders specifying 10 CFR 50, Appendix B, NQA-1-1994, and 10 CFR Part 21/50.55e applicability for safety-related components and services from IBF S.p.A, Tioga Pipe Supply Company, and Carolina

Energy Solutions (CES) with respective ASME Section III-Division 1, IBF and Tioga Quality System Certificates, and CES Certificates of Authorization;
- temporary shop floor storage with protective blankets and nozzle Foreign Material Exclusion (FME) covers with in-process piping bevel end-preparations prior to transportation for field installation and welding
- engineering drawings, sketches, three visual and dimensional check reports, eight physical marking records, IBF S.p.A. and Tioga Pipe Supply ASME Quality System Certificates, two CES Certificates of Authorization, and six CES ASME data reports and observed code symbol stamps of ASME nameplates for verification of design requirements
- RCL piping and fitting manufacturing records for solution annealing heat treatment, testing of mechanical properties, chemical analysis, and corrosion testing;
- CES fabrication records of three fabshop welds for boss fittings and a pressurizer spray scoop
- three nondestructive examination (NDE) procedures and reports for liquid dye penetrant and ultrasonic testing of austenitic stainless steel materials

Specifically, the inspectors reviewed documentation to determine whether RCL pipe spools and manual Gas Tungsten Arc Welding (GTAW) of small bore fittings were in accordance with the applicable requirements of ASME Section II, Part A for Ferrous Material Specifications, Section V for Nondestructive Examination, specifically Article 5 for Ultrasonic testing (UT) and Article 6 for Liquid Penetrant testing (PT), and Section IX for Welding and Brazing Qualifications. Specifically, the inspectors reviewed:

- twenty-eight Certified Material Test Reports (CMTR) for heat and product form chemical analysis and mechanical properties of traceable piping, fittings, and pressurizer spray scoop;
- seven heat treatment records (including strip charts and thermocouple locations) for heating to a minimum temperature of 1900°F prior to quenching in water;
- seven corrosion tests for detecting susceptibility to intergranular attack associated with chromium carbide precipitation;
- nine NDE-PT reports for piping and fittings with use of proper penetrant and developer time, examination temperature, and lighting with satisfactory result signatures by a SNT-TC-1A Level II examiner;
- twelve NDE-UT reports for piping with use of proper straight and angle beam scanning frequency, transducer size, wedge angle, and sensitivity for full thickness examination of accessible volume with satisfactory result signatures by a SNT-TC-1A Level II operator;
- CES WPS that provide directions to welders using applicable essential and nonessential variables with supporting procedure qualification reports (PQRs);
- CMTRs on two heats for chemical analysis and mechanical properties of traceable GTAW rods;
- welding documents for three welds including weld travelers with Quality Control (QC) sign-off, and recording traceable welder heat numbers for piping, fittings, spray scoops, and weld filler metals, and welders;
- three Weld Material Withdrawal Slips with number tracked on each weld traveler for traceability to welders and weld filler metal heat numbers for each fabshop weld nozzle number; and

- thirteen CES NDE-PT reports for three fabshop welds with use of proper penetrant and developer time, examination temperature, and lighting with satisfactory result signatures by a SNT-TC-1A Level II examiner.

b. Findings

No findings were identified.

1A04 (Unit 3) ITAAC Number 2.1.02.05a.ii (20) / Family 14E
(Unit 4) ITAAC Number 2.1.02.05a.ii (20) / Family 14E

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 2.1.02.05a.ii (20). 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 Reactor Coolant Pump Speed Sensor (commodity JE62), motor operated valves (commodity PV01), and squib valves (commodity PV70) and interviewed personnel to verify that:

- the licensee used the appropriate limiting design basis parameters as input for the seismic qualification of the Structure, System, or Component (SSC) and that the necessary design basis documents and calculations, as appropriate, were correctly incorporated into the qualification program for the SSC;
- seismic qualification was adequately completed and controlled in accordance with Regulatory Guide 1.100, Institute of Electrical and Electronics Engineers (IEEE) Std. 344-1987, 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 that the qualification report concluded that the SSC 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.

The inspectors reviewed all seismic functional qualification test anomalies identified during the qualification process, as documented in the Equipment Qualification Data Package (EQDP) applicable to each component, to determine the effectiveness of the licensee's corrective measures.

The inspectors reviewed the UFSAR to identify the limiting design basis parameters that were used as input for the qualification of the SSC to verify that the necessary requirements for the qualification were incorporated, such as:

- design codes;
- analysis and testing methodologies;
- load combinations;
- seismic acceleration; and
- required input motion and response spectrum.

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

- RCS-JE-ST281, RCP 1A Pump Speed Sensor (JE62)
- RCS-JE-ST282, RCP 1B Pump Speed Sensor (JE62)
- RCS-JE-ST283, RCP 2A Pump Speed Sensor (JE62)
- RCS-JE-ST284, RCP 2B Pump Speed Sensor (JE62)
- RCS-PL-V014A/B/C/D, Fourth-stage ADS Motor operated valve (MOV) (PV01)
- RCS-PL-V001A/B, First-stage ADS MOV (PV01)
- RCS-PL-V004A/B/C/D, Fourth-stage ADS Squib Valve (PV70)

The inspectors performed these reviews to verify that the commodity codes listed in the EQDP were seismically qualified consistent with the requirements specified in the UFSAR. The inspectors also reviewed the design codes, analysis and testing methodologies, load combinations, seismic acceleration, and required input motion to verify consistency with the UFSAR requirements.

b. Findings

No findings were identified.

1A05 (Unit 3) ITAAC Number 2.1.02.07a.i (24) / Family 10E
(Unit 4) ITAAC Number 2.1.02.07a.i (24) / Family 10E

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 2.1.02.07a.i (24). 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 Reactor Coolant Pump Speed Sensor (commodity JE62), motor operated valves (commodity PV01), and squib valves (commodity PV70) and interviewed personnel to verify that:

- the licensee used the appropriate limiting design basis parameters as input for the environmental qualification of the SSC and that the necessary design basis documents and calculations, as appropriate, were correctly incorporated into the qualification program for the SSC;
- environmental qualification of SSCs was adequately completed and controlled in accordance with the requirements in 10 CFR 50.49, applicable methodology in the UFSAR, regulatory guidance, and IEEE standards and the results meet the acceptance criteria stated in the 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 SSC 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 all environmental qualification test anomalies identified during the qualification process, as documented in the EQDP applicable to each component, and to determine if the resolution of each anomaly to determine the effectiveness of the licensee's corrective measures and if met the requirements of IEEE Std. 323-1974.

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

- RCS-JE-ST281, RCP 1A Pump Speed Sensor (JE62)
- RCS-JE-ST282, RCP 1B Pump Speed Sensor (JE62)
- RCS-JE-ST283, RCP 2A Pump Speed Sensor (JE62)
- RCS-JE-ST284, RCP 2B Pump Speed Sensor (JE62)
- RCS-PL-V011A, First-stage ADS Isolation MOV (PV01)
- RCS-PL-V001A, First-stage ADS MOV (PV01)
- RCS-PL-V004A/B/C/D, Fourth-stage ADS Squib Valve (PV70)

The inspectors reviewed the UFSAR to identify the limiting design basis parameters that were used as input for the qualification of the SSC. The inspectors reviewed the qualification program documents (such as procedures, test specifications, and test reports) to verify that all the necessary requirements for the qualification were incorporated, such as:

- qualification methodology (i.e. test or analysis) per IEEE Std. 323-1974;
- environmental parameters under normal operating conditions, abnormal conditions, and design basis events;
- environmental temperature, pressure, total radiation dose, radiation dose rate, cycling, electrical parameters and humidity;
- simulated accident conditions, including, temperature, pressure, radiation, pH, and chemical additives;
- margin, as specified in IEEE Std. 323-1974; and
- post-accident conditions, including time and submergence, where applicable.

The inspectors reviewed the Equipment Qualification Summary Report (EQSR), EQDP, and applicable test procedures and test records related to the qualification for the expected environment to verify that qualification activities were adequately controlled and the methodology conformed to IEEE Std. 323-1974. The inspectors reviewed the environmental profiles documented in APP-VP-GW-030, "Plant Environmental Conditions," to verify that the tested profiles enveloped the actual worst case environmental conditions that would be expected. The inspectors reviewed test procedures and test records to verify that the qualification was in accordance with IEEE Std. 323-1974 and that the valve actuator was qualified in accordance with IEEE Std. 382-1996, "IEEE Standard for Qualification of Actuators for Power-Operated Valve Assemblies With Safety-Related Functions for Nuclear Power Plants."

b. Findings

No findings were identified.

1A06 (Unit 3) ITAAC Number 2.1.02.08a.i (28) / Family 07A

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 2.1.02.08a.i (28). The inspectors used the following NRC IPs/sections to perform this inspection:

- 65001.07-02.01 - General Installation

The inspectors reviewed the pressurizer safety valve data sheet report and performed direct inspection of pressurizer safety valve RCS-PL-V005A for Unit 3. The inspectors reviewed the information provided in the valve data sheets and compared the data provided on the valve name plate to ensure the valves were manufactured as specified. The inspectors reviewed the maximum flow capacity listed on the name plate to determine whether the flow capacity of the pressurizer safety valve exceeded 750,000 lb/hr and that the listed pressure and temperature rating were greater than or equal to the system set-pressure as required by the acceptance criteria of the ITAAC and Section 2.1 the UFSAR.

b. Findings

No findings were identified.

1A07 (Unit 3) ITAAC Number 2.1.02.08d.iii (34) / Family 03A

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 2.1.02.08d.iii (34). The inspectors used the following NRC IPs/sections to perform this inspection:

- 65001.A.02.03 - Independent Assessment/Measurement Inspection

The inspector performed an independent inspection by reviewing documentation to determine whether the critical attributes of the as-built SSC conformed to the final design. Specifically, the inspectors reviewed the valve design specification, valve datasheet, and the fabricated valve records to verify if the measured flow area of the valves (serial numbers 0920-164451-3-1, 0920-164451-3-2, 0920-164451-3-3, and 0920-164451-3-4) were traceable to the valve tag numbers (RCS-PL-V004A, RCS-PL-V004B, RCS-PL-V004C, RCS-PL-V004D) and if the flow area requirement was met.

b. Findings

No findings were identified.

1A08 (Unit 3) ITAAC Number 2.1.02.12a.iv (56) / Family 07E
(Unit 4) ITAAC Number 2.1.02.12a.iv (56) / Family 07E

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 2.1.02.12a.iv (56). 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, specifically EQDP APP-PV70-VBR-005, and EQSR APP-PV70-VBR-004 for the 14-inch ADS squib valves (Commodity PV70) and interviewed personnel to determine if:

- the licensee used the appropriate limiting design basis parameters as input for the mechanical functional qualification of the valves and that the necessary design basis documents and calculations, as appropriate, were correctly incorporated into the qualification program for the SSC;
- mechanical functional qualification was adequately completed and controlled in accordance with the provisions in ASME QME-1-2007, as specified in the UFSAR, and the results met the acceptance criteria stated in the design specification and the ITAAC;
- licensee records established an adequate basis for the functional qualification, and the qualification report demonstrated that the valves could perform their safety functions to operate under design conditions for the time required to perform the safety function; and
- mechanical functional 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:

- RCS-PL-V004A, Fourth-stage ADS Squib Valve (PV70)
- RCS-PL-V004B, Fourth-stage ADS Squib Valve (PV70)

- RCS-PL-V004C, Fourth-stage ADS Squib Valve (PV70)
- RCS-PL-V004D, Fourth-stage ADS Squib Valve (PV70)

The inspectors reviewed the UFSAR to identify the limiting design-basis parameters that were used as input for the qualification of the 14-inch ADS squib valves. The inspectors reviewed the qualification program documents (such as design specifications, test procedures, and test specifications) to verify that all the necessary requirements for the qualification were incorporated, such as:

- analysis and testing methodologies as per QME-1-2007
- fluid temperature, flow, and pressure
- environmental temperature
- required operating time

The inspectors reviewed applicable test procedures and records to verify that the following was performed in accordance with ASME QME-1-2007, UFSAR Section 3.9.3.2.2, "Valve Operability," and Design Specification APP-PV70-Z0-001:

- the functional qualification of the 14-inch ADS squib valves
- extrapolation of the functional qualification to address specific design adjustments
- demonstration of the functional capability of production valve assemblies
- completion of the applicable qualification plans, functional qualification reports, and application reports

The inspectors reviewed all mechanical functional qualification issues and test anomalies identified during the functional qualification process, as documented in EQDP APP-PV70-VBR-005, and evaluated the resolution of those issues based on the review of the applicable documentation and discussions with the licensee and supporting WEC personnel to determine to determine the effectiveness of the licensee's corrective measures.

b. Findings

No findings were identified.

1A09 (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.F-02.02-Fabrication Records Review

The inspectors reviewed Ishikawajima-Harima Heavy Industries Co., Ltd. (IHI) fabrication records associated with the assembly of the upper and lower personnel airlocks (Y03 and Y04) to verify compliance with the requirements of the WEC Containment Vessel (CV) Design Specification, ASME Section III, Subsection NE 2001-2002, and Subsection NC, 1998-2000, and the UFSAR.

The inspectors reviewed purchase orders to verify that they appropriately specified acceptable quality, technical, and 10 CFR Part 21/10 CFR 50.55(e) requirements. The inspectors reviewed a sample of fabrication records to verify that they are adequate to determine if the personnel airlock conforms to ASME, FSAR, and WEC specifications. Specifically, the inspectors reviewed base metal CMTRs to determine if the materials met the following requirements of ASME Section II and ASME Section III:

- chemical properties (heat and product, if applicable)
- yield strength
- ultimate tensile strength
- elongation
- drop weight testing (if applicable)

The inspectors reviewed ASME Form N-2 code data reports, manufactured and certified by IHI, to determine if there was an established and effective method for tracking completion of design and test acceptance criteria at vendor manufacturing facilities. The inspectors reviewed the N-2 data reports and design drawings to determine whether the materials were traceable, fabricated to the correct dimensions and design thicknesses, hydrostatically tested at a pressure of 59 psig, and approved by an Authorized Nuclear Inspector (ANI).

Additionally, the inspectors observed the storage of the item by performing a walkdown of the storage area to determine whether the storage conditions met applicable quality and technical requirements as specified by the airlock vendor.

b. Findings

No findings were identified.

1A10 (Unit 3) ITAAC Number 2.2.01.03a (93) / Family 06B

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 2.2.01.03a (93). The inspectors used the following NRC IPs/sections to perform this inspection:

- 65001.11-02.05 - Nondestructive Examination
- 65001.B-02.06-Records

The inspectors reviewed a weld associated with the steam generator blowdown line on containment penetration number SV3-SGS-PY-C03A (P27). The inspectors reviewed the radiographic testing (RT) film for weld number SV3-SGS-PY-C03A-3, which was classified as an ASME Section III, Class 2 containment pressure boundary weld. The inspectors independently reviewed the film to determine whether the weld met the acceptance criteria of ASME Section III NE 2001 Edition with 2002 Addenda. The inspectors also reviewed the completed nondestructive testing report to determine whether the record of the examination was in accordance with Article 2, Radiographic Examination, of ASME Section V. The inspectors reviewed RT procedure number 521-

RT-301 to determine whether the procedure conformed with ASME Section V, Article 2.

The inspectors reviewed the isotope source strength, film type, source to film distance, and exposure times to verify that they were in accordance with the procedural requirements. The inspectors also reviewed image quality indicators to verify that they were the correct type and thickness and that the required sensitivity and radiograph density met the applicable code requirements.

b. Findings

No findings were identified.

1A11 (Unit 3) ITAAC Number 2.2.01.04a.ii (96) / Family 06F

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 2.2.01.04a.ii (96). The inspectors used the following NRC IPs/sections to perform this inspection:

- 65001.F-02.02-Fabrication Records Review

The inspectors reviewed a sample of upper and lower personnel airlock fabrication (Y03 and Y04) records to verify compliance with the design specification, ASME Code Section II, Parts A and C, and Section III, Subsection NE-2000, 2001-2002, and the UFSAR. Specifically, the inspectors reviewed CMTRs for the fabricated components used to assemble the airlocks to determine if the materials met all applicable impact testing requirements.

b. Findings

No findings were identified.

1A12 (Unit 3) ITAAC Number 2.2.01.05.ii (99) / Family 11E
(Unit 4) ITAAC Number 2.2.01.05.ii (99) / Family 11E

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 2.2.01.05.ii (99). 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, specifically EQDP APP-PV11-VBR-006 and EQSR APP-PV11-VBR-005 for motor operated valves (commodity PV11) and interviewed personnel to verify that:

- the licensee used the appropriate limiting design basis parameters as input for the seismic qualification of the SSC and that the necessary design basis documents and calculations, as appropriate, were correctly incorporated into the qualification program for the SSC;
- seismic qualification was adequately completed and controlled in accordance with Regulatory Guide 1.100, IEEE Std. 344-1987, ASME BPVC Section III, 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 SSC 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.

The inspectors reviewed all seismic functional qualification test anomalies identified during the qualification process, as documented in EQDP APP-PV11-VBR-006 to determine the effectiveness of the licensee's corrective measures.

The inspectors reviewed the UFSAR to identify the limiting design basis parameters that were used as input for the qualification of the SSC to verify that all the necessary requirements for the qualification were incorporated, such as:

- design codes
- analysis and testing methodologies
- load combinations
- seismic acceleration
- required input motion and response spectrum

Specifically, the inspectors performed these reviews for CCS-PL-V207, CCS Containment Isolation MOV – Outlet Line IRC (PV11).

The inspectors performed these reviews to verify that the commodity codes listed in the EQDP were seismically qualified consistent with the requirements specified in the UFSAR. The inspectors also reviewed the design codes, analysis and testing methodologies, load combinations, seismic acceleration, and required input motion to verify consistency with the UFSAR requirements.

b. Findings

No findings were identified.

1A13 (Unit 3) ITAAC Number 2.2.01.06a.i (101) / Family 08E
(Unit 4) ITAAC Number 2.2.01.06a.i (101) / Family 08E

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 2.2.01.06a.i (101). 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, specifically EQDP APP-PV11-VBR-006 and EQSR APP-PV11-VBR-005 for motor operated valves (commodity PV11) and interviewed personnel and interviewed personnel to verify that:

- the licensee used the appropriate limiting design basis parameters as input for the environmental qualification of the SSC and that the necessary design basis documents and calculations, as appropriate, were correctly incorporated into the qualification program for the SSC;
- environmental qualification was adequately completed and controlled in accordance with the requirements in 10 CFR 50.49, applicable methodology in the UFSAR, regulatory guidance, and IEEE standards and the results meet the acceptance criteria stated in the 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 SSC 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 all environmental qualification test anomalies identified during the qualification process, as documented in EQDP APP-PV11-VBR-006, and to determine if the resolution of each anomaly met the requirements of IEEE Std. 323-1974.

Specifically, the inspectors performed these reviews for SFS-PL-V034, SFS Suction Line Containment Isolation MOV – IRC (PV11).

The inspectors reviewed the UFSAR to identify the limiting design basis parameters that were used as input for the qualification of the SSC. The inspectors reviewed the qualification program documents (such as procedures, test specifications, and test reports) to verify that all the necessary requirements for the qualification were incorporated, such as:

- qualification methodology (i.e. test or analysis) as per IEEE Std. 323-1974
- environmental parameters under normal operating conditions, abnormal conditions, and design basis events

- environmental temperature, pressure, total radiation dose, radiation dose rate, cycling, electrical parameters and humidity
- simulated accident conditions, including, temperature, pressure, radiation, pH, and chemical additives
- margin, as specified in IEEE Std. 323-1974
- post-accident conditions, including time and submergence, where applicable

The inspectors reviewed the EQSR, EQDP, and applicable test procedures and test records related to the qualification for the expected environment to verify that qualification activities were adequately controlled and that the methodology conformed to IEEE Std. 323-1974. The inspectors reviewed the environmental profiles documented in APP-VP-GW-030, "Plant Environmental Conditions," to verify that the tested profiles enveloped the actual worst case environmental conditions that would be expected. The inspectors reviewed test procedures and test records to verify that the qualification was in conformance with IEEE Std. 323-1974 and that the valve actuator was qualified in conformance with IEEE Std. 382-1996, "IEEE Standard for Qualification of Actuators for Power-Operated Valve Assemblies With Safety-Related Functions for Nuclear Power Plants."

b. Findings

No findings were identified.

1A14 (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

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 2.2.01.11a.i (114). 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, specifically EQDP APP-PV11-VBR-006, and EQSR APP-PV11-VBR-005 for MOVs (Commodity PV11) and interviewed personnel to determine if:

- the licensee used the appropriate limiting design basis parameters as input for the mechanical functional qualification of the SSC and that the necessary design basis documents and calculations, as appropriate, were correctly incorporated into the qualification program for the SSC;
- mechanical functional qualification was adequately completed and controlled in accordance with the applicable methodology in the UFSAR, regulatory guidance, and standards and the results meet the acceptance criteria stated in the design specification and the ITAAC;

- licensee records established an adequate basis for acceptance of the ITAAC with qualification criteria attributes and that the qualification report concluded that the SSC 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
- mechanical functional 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 the UFSAR to identify the limiting design-basis parameters that were used as input for the qualification of the 14-inch ADS squib valves. The inspectors reviewed the qualification program documents (such as design specifications, test procedures, and test specifications) to verify that all the necessary requirements for the qualification were incorporated, such as:

- analysis and testing methodologies as per QME-1-2007
- fluid temperature, flow, and pressure
- environmental temperature
- required operating time

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

- SFS-PL-V038, SFS Discharge Line Containment Isolation MOV – ORC (PV11)
- SFS-PL-V035, SFS Suction Line Containment Isolation MOV – ORC (PV11)
- CCS-PL-V200, CCS Containment Isolation MOV – Inlet Line ORC (PV11)
- CCS-PL-V208, CCS Containment Isolation MOV – Outlet Line ORC (PV11)
- SFS-PL-V034, SFS Suction Line Containment Isolation MOV – IRC (PV11)
- CCS-PL-V207, CCS Containment Isolation MOV – Outlet Line IRC (PV11)
- VFS-PL-V800A, Vacuum Relief Containment Isolation A – ORC (PV11)
- VFS-PL-V800B, Vacuum Relief Containment Isolation B – ORC (PV11)

The inspectors reviewed applicable test procedures and records to verify if the following were performed in accordance with ASME QME-1-2007, UFSAR Section 3.9.3.2.2, “Valve Operability,”:

- functional qualification
- extrapolation of the functional qualification to other valves
- demonstration of the functional capability of production valve assemblies
- completion of the applicable qualification plans, functional qualification reports, and application reports

The inspectors reviewed all mechanical functional qualification issues test anomalies identified during the functional qualification process, as documented in EQDP APP-PV11-VBR-006, and the resolution of those issues to determine the effectiveness of the licensee’s corrective measures.

b. Findings

Introduction

The inspectors identified an unresolved item (URI) related to the functional qualification of the PV11 MOVs. The inspectors found that the licensee did not have available documentation to demonstrate that the functional qualification activities were adequately controlled and that the methodology conformed to ASME QME-1-2007.

Description

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. The valve vendor tested an 8-inch butterfly valve and a 16-inch butterfly valve to support the functional qualification of the entire range of PV11 MOVs. In the sampled Application Reports for 4-inch and 6-inch butterfly valves, the inspectors found that the description of the functional qualification was not consistent with the provisions of ASME QME-1-2007 for the extrapolation of the functional qualification of valves.

For example, each sampled Application Report indicated that a valve vendor methodology had been applied in demonstrating the acceptability of its specific valve. Each report compared the flow test results for the 8-inch butterfly valve to the torque predicted by the methodology to operate that 8-inch valve. With the methodology predicting a greater required torque than the actual test results for the 8-inch butterfly valve, the Application Reports asserted that the methodology could be applied to other butterfly valves. The inspectors found that the available documentation did not demonstrate that the valve vendor methodology could be reliably applied over the full range of sizes for the PV11 butterfly valves. Further, the available documentation failed to demonstrate that the implementation of the methodology would be controlled for the assumed parameters to determine the torque requirements for specific butterfly valves with a reliable margin to account for valve parameter uncertainties. The licensee stated that documentation to demonstrate the adequacy of the methodology and its control for the assumed parameters would need to be obtained from the valve vendor.

The licensee and WEC initiated corrective actions (SNC CR 10379926 and WEC CAPAL 100478419) to obtain documentation to demonstrate the adequacy of the valve vendor methodology to predict the torque requirements to operate the PV11 MOVs under design-basis conditions with appropriate controls for the assumed valve parameters in order to achieve acceptable margin to account for valve parameter uncertainties. Planned corrective actions also including addressing the extent of condition to other valve commodities. This item is unresolved pending the inspectors' review of the licensee's corrective actions to determine if a more than minor performance deficiency exists.

This unresolved item is identified as URI 05200025/2017002-02 and 05200026/2017002-02, "Extrapolation of Functional Qualification for PV11 MOVs".

1A15 (Unit 3) ITAAC Number 2.2.02.05a.ii (127) / Family 14E
(Unit 4) ITAAC Number 2.2.02.05a.ii (127) / Family 14E

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 2.2.02.05a.ii (127). 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, specifically EQDP APP-PV01-VBR-012 and EQSR APP-PV01-VBR-011 for MOVs (commodity PV01) and interviewed personnel to verify that:

- the licensee used the appropriate limiting design basis parameters as input for the seismic qualification of the SSC and that the necessary design basis documents and calculations, as appropriate, were correctly incorporated into the qualification program for the SSC;
- seismic qualification was adequately completed and controlled in accordance with Regulatory Guide 1.100, IEEE Std. 344-1987, ASME Boiler and Pressure Vessel (B&PV) Code Section III, 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 SSC 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.

The inspectors reviewed all seismic functional qualification test anomalies identified during the qualification process, as documented in the EQDP APP-PV01-VBR-012, to determine the effectiveness of the licensee's corrective measures.

The inspectors reviewed the UFSAR to identify the limiting design basis parameters that were used as input for the qualification of the SSC to verify if all the necessary requirements for the qualification were incorporated, such as:

- design codes
- analysis and testing methodologies
- load combinations
- seismic acceleration
- required input motion and response spectrum

Specifically, the inspectors performed these reviews for PCS-PL-V002A, PCCWST Isolation Block MOV (PV01).

The inspectors performed these reviews to verify that the commodity codes listed in the EQDP were seismically qualified consistent with the requirements specified in the

UFSAR. The inspectors also reviewed the design codes, analysis and testing methodologies, load combinations, seismic acceleration, and required input motion to verify consistency with the UFSAR requirements.

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:

- 65001.06-02.02 - Component Welding
- 65001.F-02.02-Fabrication Records Review

The inspectors reviewed a sample of fabrication records for Vogtle Unit 3 Accumulator A contained in the Quality Assurance Data Package (QADP) submitted by the manufacturer to the licensee. The inspectors reviewed purchase orders for the component to verify that they specified the appropriate quality and technical information and contained requirements for 10CFR Part 21 and 10 CFR Part 50.55(e) requirements. The inspectors also reviewed CoCs and CMTRs to verify that the material used for fabrication of the Accumulator was in accordance with the applicable ASME BPVC Section II material codes for chemistry and material testing requirements. Additionally, the inspectors reviewed the nameplate and stampplate to verify that the markings and identifications were in accordance with ASME BPVC Section III code and the design specifications.

The inspectors reviewed a sample of Non-Conformance Reports (NCRs) of fabrication discrepancies, specifically those with 'repair' or 'use-as-is' dispositions, to verify that an adequate analysis was performed and that the corrective actions were in accordance with the design documents and ASME BPVC Section III code. Additionally, the inspectors reviewed NDE reports for Magnetic Particle testing (MT), Visual examination (VT), PT, UT, and RT to verify that the examinations were performed in accordance with the applicable ASME BPVC Sections III and V code. The inspectors also reviewed the results reports to verify that the interpretations were performed by qualified NDE personnel and were accurate in accordance with the requirements listed in ASME Sections III and V codes. The inspectors reviewed qualification records of the NDE personnel performing the examinations, located in the QADP, to verify that they were qualified in accordance with ASME SNT-TC-1A. These records included written and practical testing as well as training hour requirements.

b. Findings

No findings were identified.

1A17 (Unit 3) ITAAC Number 2.2.03.02a (159) / Family 06F
(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 associated with the Unit 3 & 4 8-inch PXS squib valves, which included APP-PXS-PL-V118A/B, APP-PXS-PL-V120A/B, APP-PXS-PL-V123A/B, and APP-PXS-PL-V125A/B, to determine whether the documents adequately define the design and arrangement. Specifically, the inspectors reviewed the ASME design reports, WEC design specification, valve datasheets, design drawings, plant and system transient analyses, valve functional requirement analyses, and licensing bases documents for the 8-inch PXS squib valves.

The inspectors selected a sample of stress and design analyses related to the valve wall thickness, body, and shear caps to verify that the design inputs were correctly identified and documented, and that the valves were designed in accordance with the ASME Section III requirements, specifically as they relate to the design requirements that ensure the component can meet design safety functions during a design-basis accident. The inspectors reviewed design specifications and transient analyses to verify that they were properly translated into the licensee's documentation, which includes the COL and UFSAR, specifically Chapter 15, Accident Analysis. The inspector also verified that the component design met the design assumptions in the WEC transient analysis.

The inspectors selected a sample of critical attributes and scenarios to determine if internal and external events or hazards could affect the components performance and if they would result in a more than minimal impact to the conclusions made in the WEC transient analysis, and the licensee's UFSAR Chapter 15, Accident Analysis. The inspectors evaluated the following scenarios:

- inadvertent mechanical actuation of one of the PXS valves
- adequate flow conditions with loss of one train of 8-inch PXS squib valves - V123A/B and 125A/B
- thermal and pressure effects across the 8-inch PXS squib valves
- impacts on the squib valve, associated check valves -V121A/B and -V124A/B, and surrounding components if the potential exists for a waterhammer event to occur during squib valve actuation

The inspectors reviewed a sample of qualification records to verify design documents were reviewed and approved by the responsible engineering group, and that personnel involved in the development of design documents met WEC and ASME Section III qualification requirements. Specifically, the inspectors reviewed

qualification records for the Professional Engineers who developed the squib valve and piping system design specifications.

The inspectors also reviewed corrective action documents issues during the inspection to verify that issues were entered into the licensee or applicable contractor corrective action program in accordance with program requirements.

b. Findings

No findings were identified.

1A18 (Unit 3) ITAAC Number 2.2.03.03a (161) / Family 06B

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 2.2.03.03a (161). The inspectors used the following NRC IPs/sections to perform this inspection:

- 65001.06-02.02 - Component Welding
- 65001.B-02.02-Welding Procedure Qualification
- 65001.B-02.03-Welder Qualification
- 65001.B-02.04-Production Controls
- 65001.F-02.02-Fabrication Records Review

The inspectors reviewed a sample of welding records for Vogtle Unit 3 Accumulator A contained in the QADP submitted by the manufacturer to the licensee. The inspectors reviewed purchase orders for the weld material to verify that they specified the appropriate quality and technical information and contained requirements for 10CFR Part 21 and 10 CFR Part 50.55(e) requirements. The inspectors also reviewed CoCs and CMTRs to verify that the welding material used for fabrication of the Accumulator was in accordance with the applicable ASME Section II code for chemistry and material testing requirements. The inspectors reviewed weld procedure specifications (WPSs) and their associated PQRs to verify that the qualification of the welds for the accumulator met the requirements of ASME Section IX code. Specifically, the inspectors reviewed the WPSs and PQRs to verify that they were up to date and had been qualified in the proper positions. The inspectors verified that the type and number of qualifications for the WPSs were adequately performed in accordance with ASME BPVC Section IX code. Finally, the inspectors reviewed the essential and nonessential supplementary variables to ensure that they were correct in accordance with the ASME BPVC Section IX code. The inspectors also reviewed the welder performance qualifications of the welders performing welding on the accumulator to verify that they were qualified to be performing the associated welds. Specifically, the inspectors reviewed these documents to verify the welders had performed the qualified welds within 6 months of this work and that the welders had demonstrated the ability to perform the qualified WPSs successfully.

The inspectors reviewed a sample of weld records for welds performed on the Accumulator to verify that the proper welding material and WPSs were being used and

the welds were being performed by qualified personnel. Additionally, the inspectors reviewed NDE reports for MT, VT, PT, UT, and RT to verify that the examinations were performed in accordance with the applicable ASME BPVC Sections III and V code. The inspectors also reviewed the results reports to verify that the interpretations were performed by qualified NDE personnel. The inspectors reviewed qualification records of the NDE personnel performing the examinations (located in the QADP) to verify that they were qualified in accordance with ASME SNT-TC-1A. These records included written and practical testing as well as training hour requirements.

b. Findings

No findings were identified.

1A19 (Unit 3) ITAAC Number 2.2.03.05a.ii (166) / Family 14E
(Unit 4) ITAAC Number 2.2.03.05a.ii (166) / Family 14E

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 2.2.03.05a.ii (166). 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 MOVs (commodity PV01), Level Sensors (commodity JE61), and squib valves (commodity PV70) and interviewed personnel to verify that:

- the licensee used the appropriate limiting design basis parameters as input for the seismic qualification of the SSC and that the necessary design basis documents and calculations, as appropriate, were correctly incorporated into the qualification program for the SSC;
- seismic qualification was adequately completed and controlled in accordance with Regulatory Guide 1.100, IEEE Std. 344-1987, ASME BPVC Section III, 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 SSC 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.

The inspectors reviewed all seismic functional qualification test anomalies identified during the qualification process, as documented in the EQDP applicable to each component, to determine the effectiveness of the licensee's corrective measures.

The inspectors reviewed the UFSAR to identify the limiting design basis parameters that were used as input for the qualification of the SSC to verify that all the necessary requirements for the qualification were incorporated, such as:

- design codes
- analysis and testing methodologies
- load combinations
- seismic acceleration
- required input motion and response spectrum

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

- PXS-JE-LT011A/B/C/D, PXS-JE-LT013A/B/C/D, Core Makeup Tank (CMT) A Level Sensor (JE61)
- PXS-JE-LT012A/B/C/D, PXS-JE-LT014A/B/C/D, CMT B Level Sensor (JE61)
- PXS-PL-V118A/120A, Containment Recirculation A Squib Valve (PV70)
- PXS-PL-V118B/120B, Containment Recirculation B Squib Valve (PV70)
- PXS-PL-V123A/125A, IRWST Injection A Squib Valve (PV70)
- PXS-PL-V123B/125B, IRWST Injection B Squib Valve (PV70)
- PXS-PL-V002A, CMT A Inlet Isolation Motor-operated Valve (PV01)

The inspectors performed these reviews to verify that the commodity codes listed in the EQDP were seismically qualified consistent with the requirements specified in the UFSAR. The inspectors also reviewed the design codes, analysis and testing methodologies, load combinations, seismic acceleration, and required input motion to verify consistency with the UFSAR requirements.

b. Findings

No findings were identified.

1A20 (Unit 3) ITAAC Number 2.2.03.07a.i (170) / Family 10E
(Unit 4) ITAAC Number 2.2.03.07a.i (170) / Family 10E

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 2.2.03.07a.i (170). 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 Level Sensors (commodity JE61), motor operated valves (commodity PV01), and squib valves (commodity PV70) and interviewed personnel to verify that:

- the licensee used the appropriate limiting design basis parameters as input for the environmental qualification of the SSC and that the necessary design basis documents and calculations, as appropriate, were correctly incorporated into the qualification program for the SSC;
- environmental qualification was adequately completed and controlled in accordance with the requirements in 10 CFR 50.49, applicable methodology in the UFSAR, regulatory guidance, and IEEE standards and the results meet the acceptance criteria stated in the 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 SSC 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 all environmental qualification test anomalies identified during the qualification process, as documented in the EQDP applicable to each component, to determine the effectiveness of the licensee's corrective measures and if requirements of IEEE Std. 323-1974 were met.

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

- PXS-JE-LE050/51/52, Containment Flood-up Level Sensor (JE61)
- PXS-JE-LT011A/B/C/D, PXS-JE-LT013A/B/C/D, CMT A Level Sensor (JE61)
- PXS-JE-LT012A/B/C/D, PXS-JE-LT014A/B/C/D, CMT B Level Sensor (JE61)
- PXS-PL-V002A, CMT A Inlet Isolation MOV (PV01)
- PXS-PL-V118A/120A, Containment Recirculation A Squib Valve (PV70)
- PXS-PL-V118B/120B, Containment Recirculation B Squib Valve (PV70)
- PXS-PL-V123A/125A, IRWST Injection A Squib Valve (PV70)
- PXS-PL-V123B/125B, IRWST Injection B Squib Valve (PV70)

The inspectors reviewed the UFSAR to identify the limiting design basis parameters that were used as input for the qualification of the SSC. The inspectors reviewed the qualification program documents (such as procedures, test specifications, and test reports) to verify that all the necessary requirements for the qualification were incorporated, such as:

- qualification methodology (i.e. test or analysis) as per IEEE Std. 323-1974
- environmental parameters under normal operating conditions, abnormal conditions, and design basis events
- environmental temperature, pressure, total radiation dose, radiation dose rate, cycling, electrical parameters and humidity
- simulated accident conditions, including, temperature, pressure, radiation, pH, and chemical additives
- margin, as specified in IEEE Std. 323-1974
- post-accident conditions, including time and submergence, where applicable

The inspectors reviewed the EQSR, EQDP, and applicable test procedures and test records related to the qualification for the expected environment to determine if qualification activities were adequately controlled and that the methodology conformed to IEEE Std. 323-1974. The inspectors reviewed the environmental profiles documented in APP-VP-GW-030, "Plant Environmental Conditions," to verify that the tested profiles enveloped the worst case environmental conditions that would be expected. The inspectors reviewed test procedures and test records to verify that the qualification was in conformance with IEEE Std. 323-1974, and that the valve actuators were qualified in accordance with IEEE Std. 382-1996, "IEEE Standard for Qualification of Actuators for Power-Operated Valve Assemblies With Safety-Related Functions for Nuclear Power Plants," and that the connectors were qualified in accordance with IEEE Std. 572-1985.

b. Findings

No findings were identified.

1A21 (Unit 3) ITAAC Number 2.2.03.12a.i (214) / Family 07E
(Unit 4) ITAAC Number 2.2.03.12a.i (214) / Family 07E

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 2.2.03.12a.i (214). 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, specifically EQDP APP-PV70-VBR-003 and EQSR APP-PV70-VBR-002 for 8-inch PXS squib valves (Commodity PV70) and interviewed personnel to determine if:

- the licensee used the appropriate limiting design basis parameters as input for the mechanical functional qualification of the valves and that the necessary design basis documents and calculations, as appropriate, were correctly incorporated into the qualification program for the SSC;
- mechanical functional qualification was adequately completed and controlled in accordance with the provisions in ASME QME-1-2007, as specified in the UFSAR, and the results met the acceptance criteria stated in the design specification and the ITAAC;
- licensee records established an adequate basis for the functional qualification of the valves, and the qualification report demonstrated that the valves could perform their safety function to operate under design conditions for the time required to perform the safety function; and

- mechanical functional 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:

- PXS-PL-V118A/120A, Containment Recirculation A Squib Valve (PV70)
- PXS-PL-V118B/120B, Containment Recirculation B Squib Valve (PV70)
- PXS-PL-V123A/125A, IRWST Injection A Squib Valve (PV70)
- PXS-PL-V123B/125B, IRWST Injection B Squib Valve (PV70)

The inspectors reviewed the UFSAR to identify the limiting design-basis parameters that were used as input for the qualification of the 8-inch ADS squib valves. The inspectors reviewed the qualification program documents (such as design specifications, test procedures, and test specifications) to verify that all the necessary requirements for the qualification were incorporated, such as:

- analysis and testing methodologies as per QME-1-2007
- fluid temperature, flow, and pressure
- environmental temperature
- required operating time

The inspectors reviewed applicable test procedures and records to verify if the following was performed in accordance with ASME QME-1-2007, UFSAR Section 3.9.3.2.2, and Design Specification APP-PV70-Z0-001:

- the functional qualification of the 8-inch PXS squib valves
- extrapolation of the functional qualification to address specific design adjustments
- demonstration of the functional capability of production valve assemblies
- completion of the applicable Qualification Plans, Functional Qualification Reports, and Application Reports

The inspectors reviewed all mechanical functional qualification issues and test anomalies identified during the functional qualification process, as documented in EQDP APP-PV70-VBR-003, and the resolution of those issues to determine the effectiveness of the licensee's corrective measures.

b. Findings

No findings were identified.

1A22 (Unit 3) ITAAC Number 2.3.06.05a.ii (362) / Family 06E
(Unit 4) ITAAC Number 2.3.06.05a.ii (362) / Family 06E

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 2.3.06.05a.ii (362). 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, specifically EQDP APP-PV01-VBR-012 and EQSR APP-PV01-VBR-011 for MOVs (commodity PV01) and interviewed personnel to verify that:

- the licensee used the appropriate limiting design basis parameters as input for the seismic qualification of the SSC and that the necessary design basis documents and calculations, as appropriate, were correctly incorporated into the qualification program for the SSC;
- seismic qualification was adequately completed and controlled in accordance with Regulatory Guide 1.100, IEEE Std. 344-1987, ASME BPVC Section III, 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 SSC 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.

The inspectors reviewed all seismic functional qualification test anomalies identified during the qualification process, as documented in EQDP APP-PV01-VBR-012, to determine the effectiveness of the licensee's corrective measures.

The inspectors reviewed the UFSAR to identify the limiting design basis parameters that were used as input for the qualification of the SSC to verify that all the necessary requirements for the qualification were incorporated, such as:

- design codes
- analysis and testing methodologies
- load combinations
- seismic acceleration
- required input motion and response spectrum

Specifically, the inspectors performed these reviews for RNS-PL-V001A, RCS Inner Hot Leg Suction Motor-operated Isolation Valve (PV01).

The inspectors performed these reviews to verify that the commodity codes listed in the EQDP were seismically qualified consistent with the requirements specified in the UFSAR. The inspectors also reviewed the design codes, analysis and testing methodologies, load combinations, seismic acceleration, and required input motion to verify consistency with the UFSAR requirements.

b. Findings

No findings were identified.

1A23 (Unit 3) ITAAC Number 2.5.02.07a (534) / Family 10E
(Unit 4) ITAAC Number 2.5.02.07a (534) / Family 10E

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 2.5.02.07a (534). 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 conducted interviews and reviewed the design basis of the PMS isolation devices to determine if the isolation devices prevent the maximum credible faults from propagating into the PMS when PMS provides process signals to the PLS. The inspectors reviewed the design specification documents to verify that the licensee was using the appropriate design basis parameters for fault testing and to verify that the design basis was appropriately translated and documented in the qualification testing summary reports, APP-PMS-VBR-015, "Protection and Safety Monitoring System Isolation Summary Report for Use in the AP1000 Plant," Rev. 2 and APP-JY50-T2R-001, "Reactor Trip Switchgear IEEE 384 Fault Test Report," Rev. 0.

Additionally, the inspectors reviewed test reports to verify that the isolation devices were qualified in accordance with WCAP-15776 and IEEE Std. 384-1981 and that the results met the acceptance criteria stated in the design specification and the ITAAC. The inspectors also reviewed procedures, plans, design changes, assembly drawings, and design specifications to verify details within the test reports.

The inspectors reviewed documentation of the licensee's review and acceptance of the qualification testing summary reports to verify that a licensee review of the ITAAC record was performed per "ND-RA-001-008, ITAAC Principal Closure Document Review," V. 5. The inspectors also reviewed the documentation to verify that the licensee's review concludes that the ITAAC requirements had been met.

b. Findings

No findings were identified.

1A24 (Unit 3) ITAAC Number 2.5.02.07d (537) / Family 10E
(Unit 4) ITAAC Number 2.5.02.07d (537) / Family 10E

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 2.5.02.07d (537). 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 conducted interviews and reviewed documents associated with the Component Interface Module (CIM) Priority type testing, including APP-PMS-T1P-080, "AP1000 Protection and Safety Monitoring System System Integration Test CIM Priority Test Procedure" and APP-PMS-T2R-080, "AP1000 Protection and Safety Monitoring System System Integration Test CIM Priority Test Report" to verify if:

- the licensee was using the appropriate design basis parameters for testing and that the design basis was appropriately translated into CIM Priority qualification type test;
- all the necessary requirements for the testing were incorporated, including ITAAC requirements and acceptance criteria;
- the testing was conducted in accordance with the specification, the results met the acceptance criteria stated in the design specification and the ITAAC;
- required testing of the CIM Priority Logic was adequately completed and controlled in accordance with regulatory requirements, applicable industry standards, design specifications, and approved procedures;
- licensee records established an adequate basis for acceptance of the ITAAC with testing criteria attributes; and
- the documentation included a licensee review of the ITAAC records and documentation that the ITAAC requirements have been met.

Specifically, the inspectors sampled test cases for a component with onerous consequences, a MOV, and an air-operated valve (AOV) to verify that the automatic safety function and the Class 1E manual controls both have priority over the non-Class 1E soft controls. The inspectors reviewed the Automated Record Gatherer and Operator Simulator (ARGOS) and Standard Input/Output Simulator (SOIS) input files in comparison with the CIM priority test results to ensure that the test cases development for testing the CIM priority logic was adequate to demonstrate the prioritization of automatic safety functions and Class 1E manual controls over non-Class 1E soft controls.

The inspectors reviewed test report APP-PMS-T2R-080 to verify that any anomalies associated with CIM priority testing were documented and dispositioned in accordance with APP-PMS-T5-001, "AP1000 Protection and Safety Monitoring System Test Plan," and NA 4.19.9, "Issue Reporting and Resolution."

b. Findings

No findings were identified.

1A25 (Unit 3) ITAAC Number 2.5.02.14 (553) / Family 10F
(Unit 4) ITAAC Number 2.5.02.14 (553) / Family 10F

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 2.5.02.14 (553). The inspectors used the following NRC IPs/sections to perform this inspection:

- 65001.22-A1.03-Inspection Requirements and Guidance
- 65001.22-A2.03.03-Requirements Phase Documentation
- 65001.22-A3.03.04-Design Phase Documentation
- 65001.22-A4.03.02-Integration Phase Documentation
- 65001.22-A5.03.01 - Verification and Validation (V&V)
- 65001.22-A5.03.02 - System/Software Testing
- 65001.22-A5.03.03 - Validation & Test Phase Safety Analysis
- 65001.22-A5.03.04 - Documentation
- 65001.22-A6.03.04 - Installation Testing

The inspectors conducted interviews and reviewed Westinghouse's documentation, associated with the Protection and Monitoring System (PMS) CIM Safety Remote Node Controller (SRNC) subsystem lifecycle to assess conformance with the licensing basis, the design commitment, ITA, and acceptance criteria of ITAAC 2.5.02.14.

The CIM-SRNC subsystem provides the interface to control an engineered safety feature (ESF) component from the PMS, the Plant Control System (PLS) and the local control on the CIM. The CIM employs a priority arbitration logic to determine which input to use.

The inspectors reviewed prior NRC IR 99900404/2014-201 (ML14058A995) and IR 99900404/2016-201 (ML15363A360), to verify if each lifecycle phase was adequately evaluated. The inspectors reviewed the lifecycle phase activities associated with the CIM-SRNC subsystem, in accordance with the description provided in section 2 through 7 and Appendix B, of APP-GW-GLR-611, "ITAAC 2.5.02.14: Component Interface Module Design Process Technical Report," Revision 3.

CIM-SRNC Subsystem Design Requirements Phase

The design requirements phase consists of the project concept and planning activities and during this phase of the CIM lifecycle, the project requirements and planning documents are developed. The inspectors reviewed 6105-00015, "CIM-SRNC Software Program Manual", Revision 7 and the planning documents identified in the ITAAC Technical Report to determine if a planned design process was developed in accordance with the licensing basis. In addition, the inspectors reviewed 6105-00017, "CIM-SRNC Regulatory Guide and Industry Standards Compliance Exceptions", Revision 01, to determine if the exceptions noted were in compliance with regulatory requirements and the licensing basis. Specifically, two exceptions were reviewed, CIM-1028-002 and CIM-1028-003 that discussed the exceptions taken during the CIM's development process and the changes that will be made to CIMs developed in the future.

CIM-SRNC Subsystem System Definition Phase

During this phase of the CIM lifecycle, the hardware and software requirements are developed. This phase is referred to as the Requirements Phase in the CIM-SRNC Management Plan. In addition the failure modes and software hazards are evaluated in a Failure Modes and Effects Analysis (FMEA) and a Software Hazards Analysis (SHA). Following completion of the requirements and analysis the Independent Verification & Validation (IV&V) team performs a review in accordance with the CIM-SRNC IV&V Plan and documents the review in a Phase Summary Report.
The inspectors reviewed the IV&V Phase Summary Report, 6105-00092, "CIM SRNC IV&V Summary Report," Revision 11, Section 2.6, "Requirements IV&V (Development Process)" in which Westinghouse recorded a series of activities (tasks) performed in accordance with individual work instructions. The inspectors reviewed a sample of the system definition phase task reports and associated work instructions to assess whether the instructions provided adequate review guidance consistent with IEEE Standard 1012-1998 and Appendix B to 10 CFR Part 50. These tasks included:

- traceability analysis
- software requirements evaluation
- interface analysis
- criticality analysis
- IV&V test plan generation
- configuration management assessment
- hazard analysis
- risk analysis
- security assessment
- test evaluation
- user documentation assessment
- audit performance
- baseline change assessment
- regression analysis

The inspectors reviewed the task reports to verify if documentation of corrective actions during the system definition/requirements phase was in accordance with the licensing basis. Specifically the inspectors reviewed details associated with OnTime Ticket number 6027 regarding anomalies associated with the requirements evaluation and OnTime Ticket number 6043 associated with the hazards analysis task for the requirements phase. The inspectors performed the review to verify if the issues and resolutions were adequately documented in the OnTime reporting system. In addition, the inspectors reviewed, 6105-60019, "CIM-SRNC Software Hazard Analysis Report", Revision 3 to verify if the resolution was adequately captured.

The inspectors reviewed the FMEA to determine if the CIM-SRNC subsystem was evaluated and plausible failures included in the FMEA analysis. The inspectors reviewed Westinghouse documents 6105-10008 and 6105-20008, "SRNC Reliability Analysis", Revision 5, and "CIM Reliability Analysis", Revision 7 to verify if the component level FMEA met the requirements of WNA-DS-01271-GEN, "CIM Hardware Requirements Specification'" and WNA-DS-01272-GEN, "SRNC Requirements Specification".

CIM-SRNC Hardware and Software Development Phase

The Hardware and Software development phase corresponds to the design and implementation phase in the CIM-SRNC Management Plan. Both hardware and software are developed and during the implementation portion the Hardware Description Language (HDL) is authored. Additionally, compiling, simulating, synthesizing, place and route, and generation of the binary image for the SRNC-CIM Field Programmable Gate Array (FPGA) is completed.

The inspectors reviewed the IV&V phase summary report, Section 2.7, "Design IV&V (Development Process)" to verify if documentation of the design phase was performed in accordance with the licensing basis. Specifically the inspectors reviewed eight anomalies associated with the Requirements Traceability Analysis (RTA) performed by the IV&V team. These eight anomalies generated three OnTime tickets. The inspectors reviewed the details associated with OnTime Ticket numbers 6089, 6094 and 6096 regarding these anomalies associated with the RTA. The inspectors performed the review to verify if the issues and resolutions were adequately documented in the OnTime reporting system. In addition, the inspectors reviewed Hardware Requirements Specification, WNA-DS-01271-GEN requirement R008.12 which describes the "hot swap" capabilities of the CIM. The inspectors interviewed Westinghouse's design team to verify if the correctness and completeness of this requirement to ensure the CIM-SRNC subsystem remained functional after the removal and insertion of the CIM module.

The inspectors reviewed the tasks documented in the IV&V Phase Summary Report, Section 2.8, "Implementation IV&V". These tasks included:

- traceability analysis
- source code generation documentation review
- interface analysis
- criticality analysis
- test case generation and evaluation
- test procedure generation and verification
- component verification and validation (V&V) test execution and verification
- IV&V acceptance test and verification
- hazard analysis
- risk analysis
- security assessment
- test evaluation
- baseline change assessment

The inspectors reviewed a sample of the work instructions for these tasks, to assess whether the instructions provided adequate review guidance, consistent with IEEE Standard 1012-1998 and Appendix B to 10 CFR Part 50. The inspectors also reviewed a sample of the IV&V task reports to verify if individual task activities were adequately documented and consistent with the work instructions. Specifically, the inspectors reviewed reports 6105-60128 and "6105-50132 associated with source code evaluation and test evaluation. The inspectors performed the review to determine if the task reports detailed the activities identified in each work instruction, and any anomalies identified from the IV&V review were documented in accordance with Defect Management work instruction.

The inspectors reviewed the details associated with OnTime Ticket number 6119 regarding anomalies associated with mapping of requirements to component-level ISE tests and sub-system level SIOS tests identified during review of the requirements traceability matrix. The inspectors performed the review to verify if the issues and resolutions were adequately documented in the OnTime reporting system. In addition, the inspectors reviewed Section 2.9.2, "Test Procedure Generation and Verification," of the IV&V phase summary report to verify that the results were also reviewed and documented by the IV&V team.

The inspectors reviewed the IV&V Test Plan, 6105-00005, "CIM-SRNC Test Plan," Revision 11, to verify if it provided an adequate description for the evaluation of implementation activities, and that those activities were performed and documented in Section 2.8, "Implementation IV&V," of 6105-00092, "CIM-SRNC IV&V Phase Summary Report," Revision 11.

CIM-SRNC System Integration and Test Phase Review

During this phase of the CIM lifecycle, software and hardware are integrated and type tested. Register Transfer Level modules are combined into the top-level design for use in simulation testing, creating the image to be flashed onto the FPGAs, and testing the integrated CIM-SRNC. These activities are referred to as the Test Phase in the CIM-SRNC Management Plan.

The inspectors reviewed the IV&V Test Plan, 6105-00005, "CIM-SRNC Test Plan," Revision 11, to determine if it provided adequate description for the evaluation of integration and testing activities in accordance with IEEE 1012-1998, 6105-00015, "CIM-SRNC Software Program Manual," and 6105-00013, "CIM-SRNC IV&V Plan. In addition, the inspectors reviewed the test activities to verify they were performed and documented in Section 2.9,"Test IV&V," of 6105-00092, "CIM-SRNC IV&V Phase Summary Report," Revision 11.

The inspectors reviewed the tasks documented in the IV&V Phase Summary Report Section 2.9. These tasks included:

- traceability analysis
- test procedure generation and verification
- IV&V acceptance test and verification
- hazard analysis
- risk analysis
- security assessment
- test evaluation
- baseline change and regression analysis

The inspectors reviewed a sample of the work instructions for these tasks, to verify if the instructions provided adequate review guidance, consistent with IEEE Standard 1012-1998 and Appendix B to 10 CFR Part 50.

The inspectors also reviewed a sample of the IV&V test phase task reports to verify that individual task activities were adequately documented and were consistent with the work instructions. Specifically, the inspectors reviewed reports 6105-60140 and 6105-60144 associated with baseline change and regression analysis and test

procedure generation and verification. The inspectors reviewed the task reports to verify if the activities identified in each work instruction, and any anomalies identified from the IV&V review were documented in accordance with Defect Management work instruction.

The inspectors reviewed the details associated with OnTime Ticket number 2160 regarding anomalies identified during test procedure generation and verification to verify if the issues and resolutions were adequately documented in the OnTime reporting system. In addition, the inspectors reviewed Section 2.9.2,"Test Procedure Generation and Verification," of the IV&V phase summary report to verify that the results were adequately captured.

The inspectors reviewed CAPAL 100078270 that documented issues associated with a gap in CIM IV&V simulation environment (ISE) testing. The issue was identified from an internal evaluation of prior peer review activities associated with the testing. In response, Westinghouse developed testbench code and documentation updates, performed additional ISE testing, and performed additional peer review activities after the additional ISE testing was completed. The inspectors reviewed both the ISE Test Task Report, 61005-60136, and the ISE Peer Review Task Report, to verify if the additional testing addressed the issues identified in CAPAL 1000078270. The inspectors reviewed the test objectives to assess whether they were documented and that the results reflected completion of those objectives. In addition the inspectors reviewed the criteria in the peer review to verify it evaluated test cases, models, monitor checkers, and compiler directives, and the task results documented rationale for acceptance of the test results.

CIM-SRNC Sub-system Installation Phase Review

During this phase of the CIM lifecycle, FPGA images are loaded onto the CIM/SRNC and verified and validated through IV&V testing. The subassemblies are combined and tested further in the production environment during manufacturing to ensure hardware/software are functioning properly.

The inspectors reviewed Westinghouse's IV&V test plan, 6105-00005, "CIM-SRNC Test Plan," Revision 11, to verify if it provided adequate description for the evaluation of installation activities, and that those activities were performed and documented in Section 2.10, "Installation and Checkout IV&V," of 6105-00092, "CIM-SRNC IV&V Phase Summary Report," Revision 11.

Per the IV&V phase summary report, Section 2.10,"Installation and Checkout," Westinghouse's performed a series of activities(tasks) in accordance with individual work instructions . These tasks included:

- installation review
- hazard analysis update
- risk analysis
- security assessment
- test evaluation
- configuration management review

The inspectors reviewed a sample of the work instructions for these tasks, to verify if the instructions provided adequate review guidance, consistent with IEEE Standard 1012-1998 and Appendix B to 10 CFR Part 50. The inspectors also reviewed a sample of the IV&V Installation Phase task reports to verify that individual task activities were adequately documented and were consistent with the work instructions. Specifically, the inspectors reviewed reports 6105-60149, 6105-60146, 6105-60145, 6105-60148 and 6105-60150 associated with installation, hazard analysis, risk analysis, security assessment, and test evaluation. The inspectors reviewed the task reports to verify if the activities identified in each work instruction, and any anomalies identified from the IV&V review were documented in accordance with Defect Management work instruction.

CIM-SRNC IV&V Final Summary Report

Additionally, the inspectors reviewed 6105-00092, "CIM SRNC IV&V Summary Report", Revision 11. The inspection team reviewed the ten "deferred items", which describe anomalies that have been identified and evaluated by design and verification and validation (V&V) team members and determined that the issues are benign and will be considered for correction if the design is updated at a future date. From the ten items, three were selected for further review. OnTIME Tickets 6338, 6950 and 6971 were reviewed to verify if they were documented in accordance with Defect Management work instruction.

b. Findings

No findings were identified.

1A26 (Unit 3) ITAAC Number 2.6.09.01 (641) / Family 17X
(Unit 3) ITAAC Number 3.3.00.14 (820) / Family 17E
(Unit 4) ITAAC Number 2.6.09.01 (641) / Family 17X
(Unit 4) ITAAC Number 3.3.00.14 (820) / Family 17E

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Numbers 2.6.09.01 (641) and 3.3.00.14 (820). This is a security-related input. See non-public report 05200025/2017402 & 05200026/2017402 for inspection details and results.

b. Findings

See non-public report 05200025/2017402 & 05200026/2017402 for inspection details and results.

1A27 (Unit 3) 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:

- 65001.02-02.01 - Inspection of Concrete Placement
- 65001.02-02.02 - Laboratory Testing
- 65001.02-02.03 - Special Considerations
- 65001.02-02.06 - Record Review
- 65001.02-02.08 - Construction Interface Concerns
- 65001.A.02.01 - Observation of in-Process Installation Activities
- 65001.F-02.01-Design Document Review

The inspectors reviewed quality records and performed direct inspection of construction activities associated with the containment internal structures for Vogtle Unit 3. Specifically, the inspectors observed construction activities associated with the containment vessel bottom head concrete along the north side between elevations 94'-0" and 98'-6".

The inspectors reviewed a sample of design changes and specifications to determine whether:

- design changes were completed in accordance with applicable specifications, drawings, and approved procedures, including timeliness of design changes and drawing revisions;
- design change documentation demonstrated adequacy of design by reference to analyses, calculations, bounding condition checks, functional assessments, and/or engineering evaluations;
- design changes and field modifications were properly controlled, documented, processed in accordance with quality and technical requirements commensurate with the original design;
- the interchange of design information between designers, constructors, inspectors, and managers regarding structural work, constructability issues, and field changes was adequate to ensure all necessary information was included in the work packages and translated into design changes and drawings;
- structural concrete activities, including design changes, were coordinated of with other disciplines as necessary;
- critical attributes associated with the ITAAC were correctly identified in the work packages and documented for review and approval by responsible engineering personnel; and
- the documents were consistent with the design commitments and requirements of the technical specifications, the UFSAR, and code commitments.

The inspectors reviewed the concrete placement plan included in the work package to determine whether it included appropriate considerations for unexpected events or accidents, preparations for potential weather-related emergencies, and pumping concrete, including configuration considerations for plac eability and adequate consolidation. The inspectors observed concrete placement activities to determine whether:

- accepted procedures and specifications were followed throughout the concrete placement;
- the equipment used was suitable and sized for the work;

- each batch ticket was reviewed for verification of proper mix, transport time, placement location, and amount of temper water being added at the truck delivery point;
- mixing time and rotations were adequate, including after any additions were made;
- placement drop distances did not exceed specification requirements and did not result in segregation;
- concrete was placed in lifts in accordance with the concrete placement plan;
- inspection during placement was performed as required; and
- records were produced, reviewed, and indicated mix, location, time placed, water additions, temperature of the concrete mix, and ambient conditions.

The inspectors reviewed concrete test results to determine whether:

- records were complete, accurate, and approved as required;
- test results were reviewed and evaluated against appropriate acceptance criteria; and
- the records were retrievable.

The inspectors interviewed licensee and contractor personnel to determine whether:

- contractors performing safety-related work followed approved implementing procedures that describe administrative and procedural controls, approved work processes, and inspection requirements;
- personnel conducting work and quality assurance roles were qualified and knowledgeable; and
- effective oversight in accordance with specifications and program requirements was implemented for the installation activities observed.

b. Findings

No findings were identified.

1A28 (Unit 3) 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 - Inspection of ITAAC-Related Foundations & Buildings
- 65001.01-02.05 - Steel Structures
- 65001.01-02.06 - Records
- 65001.01-02.07 - Identification and Resolution of Problem
- 65001.B-02.06-Records
- 65001.F- Inspection of the ITAAC-Related Design and Fabrication Requirements
- 65001.F-02.02-Fabrication Records Review
- 65001.F-02.03-Observation of Fabrication Activities

The inspectors reviewed the design, procurement, and fabrication of the following containment internal structures (CIS) modules: CA35, CA36, CA56, SPL18, and SPL51. Modules CA35 and CA36 were floor modules that were fabricated using structural steel shapes and plates and were components of the composite floor at elevation 107'-2". Module CA36 was a floor module that was fabricated using structural steel shapes and plates and was a component of the composite floor at elevation 135'-3". Modules SPL18 and SPL51 were steel frame modules that were fabricated using structural steel shapes and form the structural steel frame supporting the maintenance and operating floors at elevations 118'-6" and 135'-3", respectively.

The inspectors performed a review of those CIS modules to verify if the SSCs were designed and fabricated in conformance with the facility license, applicable codes and standards, licensing commitments, regulatory requirements, and the UFSAR. Specifically, the inspectors:

- reviewed a sample of procurement documents for structural steel to verify that the shape, size, dimensions, type, and grade of material conformed to the approved specifications and design drawings; that certified mill test reports or a certified report of tests made by the fabricator or qualified testing laboratory were available; and by direct inspection, that the items on-site were what was ordered by procurement;
- observed stored material to verify that an adequate marking system was used to maintain the identity of material from storage to installation; structural steel was protected from corrosion caused by exposure to weather; and nonconforming material was adequately identified and segregated;
- observed fabricated components to verify that minimum concrete edge distance and spacing for studs was as specified;
- reviewed quality records to verify that those records related to inspected activities and audits were accurate, and that the recorded information met project requirements and licensing basis specifications; and
- reviewed corrective action documents and nonconformance & disposition reports to verify that the licensee and fabricator were identifying problems at an appropriate threshold and entering them into their corrective action program.

The inspectors performed a review of those CIS modules to demonstrate that the SSCs were welded in accordance with the applicable welding code. Specifically, the inspectors reviewed weld data records to determine if: 1) they were reviewed and approved by the proper authority and stored and maintained in such a manner as to demonstrate conformance with applicable Codes, standards, and procedure requirements; 2) provided traceability to the welding activities and included weld filler material traceability, weld data or process records (travelers), weld maps, weld inspection records, weld repair records, NDT records, and if applicable, heat treatment records; and a 3) reviewed accepted, rejected, and repaired items were documented in written reports.

Inspectors performed a review of those CIS modules to verify that the SSCs were designed and fabricated in conformance with the facility license, applicable codes and standards, regulatory requirements, and the UFSAR. Specifically, the inspectors:

- reviewed the applicable SSC design and construction documents associated with ITAAC to determine whether: 1) the documents adequately defined the final design and arrangement of these SSCs; and 2) SSC attributes associated with ITAAC were correctly identified and documented for review and approval by responsible engineering personnel;
- reviewed a sample of purchase orders to verify that they appropriately specify acceptable quality, technical, and 10 CFR Part 21/10 CFR 50.55(e) requirements;
- reviewed a sample of fabrication records, including CMTRs, to verify that they were adequate to furnish evidence of activities affecting quality and SSCs conformed to applicable codes, standards, regulations, and quality and technical requirements;
- reviewed a sample of nonconformance reports and other design deviation documents associated with SSCs to ensure that “repair” and “use-as-is” reports and associated documents were performed in accordance with applicable codes, standards, regulations, and quality and technical requirements;
- observed the storage conditions and markings on the items to determine if they were in accordance with the applicable quality and technical requirements;
- reviewed Westinghouse fabrication and procurement specifications to verify that they were consistent with the design commitments and requirements documented in the licensing basis;
- reviewed corrective actions for identified fabrication deficiencies to ensure that they were implemented in a timeframe commensurate with their significance, and that the nonconformances were resolved in accordance with applicable procedures; and
- reviewed NDE records for welds completed at the fabricator and observed completed welds to verify that the records adequately reflected the conditions found in the field and met applicable code requirements.

b. Findings

No findings were identified.

1A29 (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:

- 65001.02-02.01 - Inspection of Concrete Placement
- 65001.A.02.03 - Independent Assessment/Measurement Inspection

The inspectors performed an independent inspection of the floor in the CVS room in the Unit 3 Nuclear Island Auxiliary Building at elevation 82'-6". The inspectors observed the installation of reinforcing steel, performed direct measurements, observed pre-placement inspections, and observed in-process concrete placement activities to verify the as-built condition of the floor conformed to the applicable design specified in Section 3.8, Design of Category 1 Structures, of the UFSAR.

The inspectors observed the installation of the reinforcing steel to determine whether the activities met applicable quality and technical requirements and were conducted in accordance with approved procedures, specifications, drawings, and industry codes. Independent measurements were performed by the inspectors to verify the reinforcing steel was properly located within the structure, was of the proper size, and had the proper clearances.

Additionally, the inspectors observed concrete pre-placement and in-process concrete activities for the floor to verify if:

- pre-placement inspections were completed and documented by quality control before concrete was placed;
- the concrete temperature, slump, air content, and unit weight were determined at the proper location and frequency as required in the design specifications;
- the specified concrete mix was batched and the constituents used were in accordance with the design requirements;
- each truck was measured and each trip received proper ticketing and documentation;
- the placement equipment used was suitable for the work and performed as required;
- the time limit between mixing and placement was not exceeded;
- temperature limits were not exceeded;
- placement drop distances did not exceed specification requirements and did not result in segregation;
- concrete was properly vibrated to ensure adequate consolidation of the placement; and
- test specimen samples, for concrete strength determination, were sampled at the required location and frequency, and cured in accordance with specified requirements.

b. Findings

No findings were identified.

1A30 (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:

- 65001.01-02.01 - Procedures
- 65001.02-02.01 - Inspection of Concrete Placement
- 65001.A.02.02 - Installation Records Review

The inspectors reviewed quality records for the concrete placement associated with the spent fuel pool floor (Room 12563) located at elevation 92’-8 ½” between column lines 2 to 4 and K-2 to L-2. The inspectors reviewed the concrete placement records to determine whether the records reflected the as-built condition of the spent pool floor

and to determine whether the records provided documentary evidence that the applicable quality and technical requirements were met.

The inspectors reviewed the procedures for concrete placement and testing activities to verify the procedures adequately prescribed the work processes, inspection requirements, and acceptable methods of quality control. The inspectors also reviewed quality records for the concrete placement to verify:

- pre-placement inspections were completed by QC before concrete was placed;
- batch records indicated placement location, mix, volume, date, transport time, amount of temper water being added at the truck delivery point, and special instructions;
- the time limit between mixing and placement was not exceeded;
- temperature limits were not exceeded; and
- concrete strength test sample cylinders were made at the required location and frequency, and were cured in accordance with specified requirements.

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:

- 65001.01-02.07 - Identification and Resolution of Problem
- 65001.02-02.01 - Inspection of Concrete Placement
- 65001.A.02.02 - Installation Records Review
- 65001.A.02.03 - Independent Assessment/Measurement Inspection

The inspectors reviewed quality records of the concrete placement and performed a direct inspection of the reinforcing steel installation activities associated with the J1-Line Wall in the Unit 3 Auxiliary Building located at elevation 82’-6” to 105’ 10” and between column lines 4 to 5. The inspectors performed a field inspection of the reinforcing steel and reviewed various documents to determine if:

- the installation activities met applicable quality and technical requirements established by approved procedures, design specifications, drawings, and industry codes;
- problems identified during the inspection were entered into the licensee/contractor corrective action program in accordance with the program requirements;
- key building critical dimensions and materials satisfied design specifications, requirements, and relevant ITAAC; and

- reinforcing steel was properly located in the structure, was sized as specified in the drawings, had proper clearances, and was secured and free of excessive rust.

b. Findings

No findings were identified.

1A32 (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:

- 65001.01-02.01 - Procedures
- 65001.A.02.01 - Observation of in-Process Installation Activities

The inspectors observed reinforcing steel installation activities associated with the spent fuel pool floor located in the rad-controlled area of the auxiliary building between column lines 2 to 4 and K-2 to L-2 at elevation 92'-8 1/2". Specifically, the inspectors performed independent measurements and observed installed reinforcing steel and embedments to determine if as-built characteristics of the spent fuel pool on Unit 3 were in accordance with Section 3 of the UFSAR.

The inspectors performed a document review in order to verify that:

- the applicable revisions of approved procedures, drawings, and instructions were being followed;
- nonconforming items were clearly identified and dispositioned; and
- any design changes or field modifications relevant to the work observed were properly controlled and processed in accordance with quality and technical requirements.

The inspectors also performed a field walkdown in order to determine if:

- reinforcing steel, embedment, and formwork installations were controlled and performed in accordance with the applicable specifications, codes, drawings, and procedures;
- reinforcing steel and embedments were located properly in the structure, were secured and free of concrete or excessive rust, and had proper clearances; and
- reinforcing steel and embedments were located, installed, assembled, and connected in accordance with the latest approved-for-construction drawings and specifications.

b. Findings

No findings were identified.

1A33 (Unit 3) ITAAC Number 3.3.00.02a.ii.c (766) / Family 01A

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 3.3.00.02a.ii.c (766). The inspectors used the following NRC IPs/sections to perform this inspection:

- 65001.01-02.01 - Procedures
- 65001.01-02.04 - Key Dimensions and Volumes
- 65001.A.02.03 - Independent Assessment/Measurement Inspection

The inspectors performed an inspection of the walls of the non-radiologically controlled auxiliary building. The inspectors reviewed the survey procedures to verify if the procedures contained methods of quality control inspection to ensure that the as-built condition meets the design requirements and appropriate quantitative acceptance criteria exists.

The inspectors reviewed the associated records produced from the survey to verify if the records document that the completed work met the design specifications and the key site parameters that are specified for the design of safety-related aspects of SSCs. Specifically the inspectors reviewed the as-built survey records of the following non-radiological controlled auxiliary building walls to verify they conformed to the as-built thickness requirements as specified in Table 3.3-1 of Appendix C of the COL:

- Wall K from column line 11 to 9.3 and elevation 82'6" to 100'0"
- Wall M from column line 11 to 9.3 and elevation 82'6" to 100'0"
- Wall L from column line 11 to 9.3 and elevation 82'6" to 100'0"
- Wall 11 from column line L to Q and elevation 82'6" to 100'0"

b. Findings

No findings were identified.

1A34 (Unit 3) ITAAC Number 3.3.00.02a.ii.d (767) / Family 01A

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 3.3.00.02a.ii.d (767). The inspectors used the following NRC IPs/sections to perform this inspection:

- 65001.01-02.01 - Procedures
- 65001.01-02.04 - Key Dimensions and Volumes
- 65001.A.02.03 - Independent Assessment/Measurement Inspection

The inspectors performed an inspection of the walls of the radiologically controlled auxiliary building. The inspectors reviewed the survey procedures to verify if the procedures contained methods of quality control inspection to ensure that the as-built

condition meets the design requirements and appropriate quantitative acceptance criteria exists.

The inspectors reviewed the associated records produced from the survey to verify if the records document that the completed work met the design specifications and the key site parameters that are specified for the design of safety-related aspects of SSCs. Specifically the inspectors reviewed the as-built survey records of the following non-radiological controlled auxiliary building walls to verify they conformed to the as-built thickness requirements as specified in Table 3.3-1 of Appendix C of the COL:

- Wall 1 from column line J-2 to N and elevation 82'6" to 100'0"
- Wall I from column line 1 to 4 and elevation 82'6" to 100'0"
- Wall I from column line 4 to 7.3 and elevation 82'6" to 100'0"

b. Findings

No findings were identified.

1A35 (Unit 3) ITAAC Number 3.3.00.03c (779) / Family 01A

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 3.3.00.03c (779). The inspectors used the following NRC IPs/sections to perform this inspection:

- 65001.01-02.04 - Key Dimensions and Volumes
- 65001.A.02.03 - Independent Assessment/Measurement Inspection

The inspectors performed an inspection of the non-radiologically controlled auxiliary building. Specifically, the inspectors reviewed wall surveys and concrete density and compressive strength tests to verify if the key site parameters of the walls met the shielding requirements specified in table 3.3-1 of Appendix C of the COL and the UFSAR section 3.8.4 and 12.3.2. The inspectors reviewed documents related to the following walls to determine whether the critical attributes of as-built SSC conformed to the final design:

- Wall K from column line 11 to 9.3 and elevation 82'6" to 100'0"
- Wall M from column line 11 to 9.3 and elevation 82'6" to 100'0"
- Wall L from column line 11 to 9.3 and elevation 82'6" to 100'0"

b. Findings

No findings were identified.

1A36 (Unit 3) ITAAC Number 3.3.00.03d (780) / Family 01A

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 3.3.00.03d (780). The inspectors used the following NRC IPs/sections to perform this inspection:

- 65001.01-02.04 - Key Dimensions and Volumes
- 65001.A.02.03 - Independent Assessment/Measurement Inspection

The inspectors performed an inspection of the radiologically controlled auxiliary building. Specifically, the inspectors reviewed concrete density and compressive strength tests to verify if the key site parameters of the walls met the shielding requirements specified in table 3.3-1 of Appendix C of the COL and the UFSAR section 3.8.4 and 12.3.2. The inspectors reviewed documents related to the following walls to determine whether the critical attributes of as-built SSC conformed to the final design:

- Wall 4 from column line I to J-1 and elevation 82'6" to 100'0"
- Wall J-1 from column line 4 to the shield building and elevation 82'6" to 100'0"
- Wall 5 from column line I to the shield building and elevation 82'6" to 100'0"

b. Findings

No findings were identified.

1A37 (Unit 4) ITAAC Number 2.1.02.02b (14) / Family 03F

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 2.1.02.02b (14). The inspectors used the following NRC IPs/sections to perform this inspection:

- 65001.F-02.01-Design Document Review
- 65001.F-02.02-Fabrication Records Review

The inspectors reviewed purchase orders, engineering drawings, and documentation associated with material manufacturing and testing, fabrication, and examination of the austenitic stainless steel RCS piping to determine whether these activities were performed with acceptable results for both hot legs (RCS-L001A and 001B) and four cold legs (L002A and -2B, -2C and -2D) in accordance with the design and fabrication requirements of the UFSAR and 1998 Edition including 2000 Addenda of ASME Section III, Subsection NB for Class 1 Components. Specifically, the inspectors reviewed:

- two WEC vendor purchase orders specifying 10 CFR 50, Appendix B, NQA-1-1994, and 10 CFR Part 21/50.55e applicability for safety-related components and services from IBF S.p.A, Tioga Pipe Supply Company, and CES with

respective ASME Section III-Division 1, IBF and Tioga Quality System Certificates, and CES Certificates of Authorization
- Engineering drawings, sketches, four visual and dimensional check reports, six physical marking records, IBF S.p.A. and Tioga Pipe Supply ASME Quality System Certificates, two CES Certificates of Authorization, and six CES ASME data reports for verification of design requirements
- RCL piping and fitting manufacturing records for solution annealing heat treatment, testing of mechanical properties, chemical analysis, and corrosion testing
- CES fabrication records of three fabshop welds for boss fittings and a pressurizer spray scoop
- three NDE procedures and reports for liquid dye penetrant and ultrasonic testing of austenitic stainless steel materials

Specifically, the inspectors reviewed documentation to determine whether RCL pipe spools and manual GTAW of small bore fittings were in accordance with the applicable requirements of ASME Section II, Part A for Ferrous Material Specifications, Section V for NDE, Article 5 for NDE-UT and Article 6 for NDE-PT, and Section IX for Welding and Brazing Qualifications. Specifically, the inspectors reviewed:

- thirty CMTRs for heat and product form chemical analysis and mechanical properties of traceable piping, fittings, and pressurizer spray scoop
- six heat treatment records (including strip charts and thermocouple locations) for heating to a minimum temperature of 1900°F prior to quenching in water
- six corrosion tests for detecting susceptibility to intergranular attack associated with chromium carbide precipitation
- six NDE-PT reports for piping and fittings with use of proper penetrant and developer time, examination temperature, and lighting with satisfactory result signatures by a SNT-TC-1A Level II examiner
- twelve NDE-UT reports for piping with use of proper straight and angle beam scanning frequency, transducer size, wedge angle, and sensitivity for full thickness examination of accessible volume with satisfactory result signatures by a SNT-TC-1A Level II operator
- CES WPS that provide directions to welders using applicable essential and nonessential variables with supporting PQRs
- CMTRs on two heats for chemical analysis and mechanical properties of traceable GTAW rods
- welding documents for three welds including weld travelers with QC sign-off, and recording traceable welder heat numbers for piping, fittings, spray scoops, and weld filler metals, and welders
- three Weld Material Withdrawal Slips with number tracked on each weld traveler for traceability to welders and weld filler metal heat numbers for each fabshop weld nozzle number
- thirteen CES NDE-PT reports for three fabshop welds with use of proper penetrant and developer time, examination temperature, and lighting with satisfactory result signatures by a SNT-TC-1A Level II examiner

The inspectors reviewed WEC Deviation Notice SV4-PL01-GNR-009 for internal surface indications on the RCL piping cold leg 01 (RCS-L002A) visually discovered during initial receipt inspection that appeared to have been mechanically gouged approximately 32" from the end of the straight run portion of the pipe spool at zero

degree orientation, 3/64" maximum depth, and 1.5" maximum length. Specifically, the inspectors reviewed the deviation notice to verify that the surface repair was adequately identified, documented, and dispositioned by only grinding/buffing with a 3:1 taper transition into surrounding base metal without welding and encroaching on the minimum wall thickness with subsequent acceptable ultrasonic thickness measurements and final NDE-PT in accordance with the applicable requirements of ASME Section III, Subarticle NB-2500, Examination and Repair of Pressure-Retaining Material.

b. Findings

No findings were identified.

1A38 (Unit 4) ITAAC Number 2.1.02.08a.i (28) / Family 07A

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 2.1.02.08a.i (28). The inspectors used the following NRC IPs/sections to perform this inspection:

- 65001.07-02.01 - General Installation

The inspectors reviewed the pressurizer safety valve data sheet report and performed direct inspection of pressurizer safety valve RCS-PL-V005B for Unit 4. The inspectors reviewed the information provided in the valve data sheets and compared the data provided on the valve name plate to ensure the valves were manufactured as specified. The inspectors reviewed the maximum flow capacity listed on the name plate to determine whether the flow capacity of the pressurizer safety valve exceeded 750,000 lb/hr and that the listed pressure and temperature rating were greater than or equal to the system set-pressure as required by the acceptance criteria of the ITAAC and Section 2.1 the UFSAR.

b. Findings

No findings were identified.

1A39 (Unit 4) ITAAC Number 2.1.02.08d.iii (34) / Family 03A

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 2.1.02.08d.iii (34). The inspectors used the following NRC IPs/sections to perform this inspection:

- 65001.A.02.03 - Independent Assessment/Measurement Inspection

The inspector performed an independent inspection by reviewing documentation to determine whether the critical attributes of the as-built SSC conformed to the final design. Specifically, the inspectors reviewed the valve design specification, valve datasheet, and the fabricated valve records to verify if the measured flow area of the

valves (serial numbers 0920-164452-3-1, 0920-164452-3-2, 0920-164452-3-3, and 0920-164452-3-4) were traceable to the valve tag numbers (RCS-PL-V004A, RCS-PL-V004B, RCS-PL-V004C, RCS-PL-V004D) and if the flow area requirement was met.

b. Findings

No findings were identified.

1A40 (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-02.02-Fabrication Records Review

The inspectors reviewed IHI fabrication records associated with the assembly of the upper and lower personnel airlocks (Y03 and Y04) to verify compliance with the requirements of the WEC CV Design Specification, ASME Section III, Subsection NE, 2001-2002, and Subsection NC, 1998-2000, and the UFSAR.

The inspectors reviewed purchase orders to verify if they appropriately specified acceptable quality, technical, and 10 CFR Part 21/10 CFR 50.55(e) requirements. The inspectors reviewed a sample of fabrication records to verify that they are adequate to determine if the personnel airlock conforms to ASME, FSAR, and WEC specifications. Specifically, the inspectors reviewed base metal CMTRs to determine if the materials met the following requirements of ASME Section II and ASME Section III:

- chemical properties (heat and product, if applicable)
- yield strength
- ultimate tensile strength
- elongation
- drop weight testing (if applicable)

The inspectors reviewed ASME Form N-2 code data reports, manufactured and certified by IHI, to determine if there was an established and effective method for tracking completion of design and test acceptance criteria at vendor manufacturing facilities. The inspectors reviewed the N-2 data reports and design drawings to determine whether the materials were traceable, fabricated to the correct dimensions and design thicknesses, hydrostatically tested at a pressure of 59 psig, and approved by an ANI.

Additionally, the inspectors observed the storage of the item by performing a walkdown of the storage area to determine whether the storage conditions met applicable quality and technical requirements as specified by the airlock vendor.

b. Findings

No findings were identified.

1A41 (Unit 4) ITAAC Number 2.2.01.04a.ii (96) / Family 06F

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 2.2.01.04a.ii (96). The inspectors used the following NRC IPs/sections to perform this inspection:

- 65001.F-02.02-Fabrication Records Review

The inspectors reviewed a sample of upper and lower personnel airlock fabrication (Y03 and Y04) records to verify compliance with the design specification, ASME Code Section II, Parts A and C, and Section III, Subsection NE-2000, 2001-2002, and the UFSAR. Specifically, the inspectors reviewed CMTRs for the fabricated components used to assemble the airlocks to determine if the materials met all applicable impact testing requirements.

b. Findings

No findings were identified.

1A42 (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.A.02.04 - Review As-built Deviations/Nonconformance
- 65001.B-02.03-Welder Qualification
- 65001.B-02.04-Production Controls
- 65001.B-02.05-Inspection
- 65001.B-02.06-Records

The inspectors reviewed the completed and in-process weld records, nondestructive testing reports, and in-process work package (SV4-1208-SCW-CV6995, "Course 2 Unit 4 Shield Building") for the following welds associated with course 2 of the Vogtle Unit 4 shield building from 103'-6" to 113'-6":

- Horizontal Weld CV12242-01L2HJ-O (Plate 01L to Plate 02H and 02J)
- Horizontal Weld CV12242-01K2GH-O (Plate 01K to Plate 02G and 02H)
- Horizontal Weld CV12242-01J2G-O (Plate 01J to Plate 02G)
- Horizontal Weld CV12242-01M2JK-O (Plate 01M to Plate 02J and 02K)
- Horizontal Weld CV12242-01N2KL-O (Plate 01N to Plate 02K and 02L)

The inspectors reviewed the completed and in-process weld records, nondestructive testing reports, and in-process work package (SV4-1208-SCW-CV6996, "Course 3

Unit 4 Shield Building") for the following welds associated with course 3 of the Vogtle Unit 4 shield building from 113'-6" to 123'-6":

- Vertical Weld CV12243-3FG-O (Plate 03F to Plate 03G)
- Horizontal Weld CV12243-2H3GH-O (Plate 2H to Plates 3G and 3H)
- Horizontal Weld CV12243-2J3HJ-O (Plate 2J to Plates 3H and 3J)
- Horizontal Weld CV12243-2K3JK-O (Plate 2K to Plates 3J and 3K)
- Horizontal Weld CV12243-2L3K-O (Plate 2L to Plate 3K)
- Horizontal Weld CV12243-2G3FG-O (Plate 2G to Plates 3F and 3G)

The inspectors reviewed these weld records to determine whether:

- the welding activity was properly documented in the work traveler;
- records provided adequate traceability to all aspects of the welding activity, including traceability to the welder who performed the work;
- the records adequately documented the following attributes: reference to procedure and welder qualifications, inspector qualifications, weld material certifications and receipt inspection reports, weld data or process records (travelers), weld maps, weld inspection records, and NDE records;
- the records were appropriately retained and stored in accordance with quality assurance (QA) program requirements;
- required inspections were identified in the traveler with hold points, as appropriate; and
- accepted, rejected, and repaired items were documented in written reports.

The inspectors reviewed a sample of the UT records for the above welds to determine whether the required examinations were performed in accordance with the MISTRAS UT procedure (100-UT-310, "Ultrasonic examination of welds in accordance with American Welding Society (AWS) Structural Welding Code D1.1," Revision 7) and the AWS D1.1:2000, Structural Welding Code - Steel. The inspectors also reviewed the UT procedure for conformance to the AWS D1.1:2000 Code. Specifically, the inspectors reviewed the following UT examination reports:

- NDE Report Number V-17-UT-310-0264
- NDE Report Number V-17-UT-310-0248
- NDE Report Number V-17-UT-310-0282
- NDE Report Number V-17-UT-310-0286
- NDE Report Number V-17-UT-310-0270

The inspectors observed the UT inspection of weld number CV12243-2G-3FG-O to determine whether the inspection was performed in accordance with procedure 100-UT-310. The inspectors reviewed the qualification records for the NDE inspector, and verified that the UT instrument was calibrated. The inspectors reviewed the quality control inspector's UT certifications to verify that he was qualified in accordance with the MISTRAS written practice.

The inspectors performed an independent visual inspection of the welds listed above, to determine whether the final weld satisfied the requirements of Table 6.1, "Visual Inspection Acceptance Criteria," of AWS D1.1:2000. The inspectors also verified that the final weld profile met the requirements of section 5.24.4, "Groove or Butt Welds," of AWS D1.1:2000.

The inspectors observed the in process welding of the following welds:

- Vertical Weld CV12243-3FG-O (Plate 03F to Plate 03G)
- Horizontal Weld CV12243-2H3GH-O (Plate 2H to Plates 3G and 3H)
- Horizontal Weld CV12243-2J3HJ-O (Plate 2J to Plates 3H and 3J)
- Horizontal Weld CV12243-2K3JK-O (Plate 2K to Plates 3J and 3K)
- Horizontal Weld CV12243-2L3K-O (Plate 2L to Plate 3K)

During the welding of the above welds, the inspectors observed the amperage and voltage to verify they were within the limits established by the approved welding procedure specification. Additionally, during the in-process welding, the inspectors observed the following to verify activities were being performed in accordance with regulations:

- work was conducted in accordance with a "traveler," weld data record or similar document which coordinated and sequenced the welding and inspection operations
- the weld joint was sufficiently protected from inclement conditions
- surfaces to be welded were smooth, uniform, and free from surface discontinuities such as cracks or seams, and free from paint, oil, rust, scale, slag, grease, moisture or other harmful foreign materials that could be detrimental to welding for at least 2 inches from the weld joint
- weld joint geometry, including root opening and fit-up tolerances were as specified by the WPS
- shielding gas flow and composition was as specified in the WPS
- the temperature of the base material at the joint, prior to welding, met the preheat requirements of the WPS
- the interpass temperatures did not exceed the maximum value specified in the WPS
- the weld joint was traceable to the welders

The inspectors reviewed the work packages and technical document lists for the welds listed above to determine if the licensee had identified any deviations from the approved design. The inspectors reviewed rework activities associated with weld number CV12243-2G3FG-0 to verify that the weld discontinuity identified during the planned UT inspection was properly identified and corrected. The inspectors observed the sizing of the indication, excavation, and rework weld records to verify that all repair activities were performed in accordance AWS D1.1:2000.

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 - Inspection of ITAAC-Related Foundations & Buildings
- 65001.01-02.01 - Procedures
- 65001.01-02.06 - Records
- 65001.01-02.07 - Identification and Resolution of Problem
- 65001.02-02.01 - Inspection of Concrete Placement
- 65001.02-02.02 - Laboratory Testing
- 65001.02-02.03 - Special Considerations
- 65001.02-02.06 - Record Review
- 65001.02-02.08 - Construction Interface Concerns
- 65001.02-02.09 - Concrete Quality Process Problems
- 65001.A.02.01 - Observation of in-Process Installation Activities
- 65001.A.02.04 - Review As-built Deviations/Nonconformance
- 65001.F- Inspection of the ITAAC-Related Design and Fabrication Requirements
- 65001.F-02.01-Design Document Review
- 65001.F-02.02-Fabrication Records Review

The inspectors reviewed quality records and performed direct inspection of construction activities associated with the Shield Building for Vogtle Unit 4. Specifically, the inspectors observed construction activities associated with the steel concrete composite portion of the shield building between azimuths 182 and 342 degrees and elevations 103'-6" and 113'-6", including the vertical reinforced concrete/steel concrete composite transition located approximately at azimuths 182 and 342 degrees.

The inspectors reviewed a sample of approved implementing procedures and specifications to determine whether the documents:

- met the requirements specified in the quality assurance program and the UFSAR, including the reconciliation of construction deviations in critical dimensions and tolerances;
- correctly translated requirements from applicable codes and standards;
- described work controls, approved work processes, and inspection requirements;
- included appropriate quantitative and/or qualitative acceptance criteria for determining that the prescribed activities were accomplished satisfactorily;
- clearly prescribed acceptable methods of quality control inspection to ensure that the as-built condition met specified design requirements, drawings and material specifications;
- required measuring and test equipment to be calibrated and maintained in accordance with approved calibration procedures and vendor requirements; and
- provided qualification requirements for craft and quality control inspection personnel performing installation and testing activities.

The inspectors observed concrete pre-placement activities to determine whether pre-placement planning and training had been completed and the pre-placement inspection was performed by quality control before any concrete was placed. The inspectors reviewed the concrete placement plan included in the work package to determine whether it included appropriate considerations for concrete pumping, including configuration considerations for placeability and adequate consolidation, and

mass concrete, including contingencies preparations for stopping the concrete placement earlier than designed due to unexpected events or potential weather-related emergencies. Prior to concrete placement, the inspectors independently evaluated whether the deviations were adequately captured and addressed and formwork preparation and cleanliness had been completed. The inspectors observed concrete batching and placement activities to determine whether:

- accepted procedures and specifications were followed throughout the concrete placement;
- the batch plant was certified by National Ready Mixed Concrete Association;
- batch plant scales were calibrated;
- the equipment used was suitable, and sized for the work;
- each truck was measured and each trip received proper ticketing and documentation;
- each batch ticket was reviewed for verification of proper mix, transport time, placement location, and amount of temper water being added at the truck delivery point;
- transporting equipment was suitable, reliable, and in an acceptable condition;
- the time limit between mixing and placement was not exceeded;
- temperature limits were not exceeded;
- mixing time and rotations were adequate, including after any additions were made;
- placement drop distances did not exceed specification requirements and did not result in segregation;
- vibrators were approved and calibrated;
- vibrators were handled and operated to ensure adequate consolidation to avoid voiding or honeycombing, including vertical operation and penetration through the new concrete into the previously placed layer;
- concrete was placed in lifts in accordance with the concrete placement plan;
- inspection during placement was performed as required; and
- records were produced, reviewed, and indicated mix, location, time placed, water additions, temperature of the concrete mix, and ambient conditions.

The inspectors interviewed licensee and contractor personnel to determine whether:

- contractors performing safety-related work followed approved implementing procedures that describe administrative and procedural controls, approved work processes, and inspection requirements;
- design processes were performed in compliance with applicable instructions and procedures;
- personnel conducting work and quality assurance roles were qualified and knowledgeable; and
- effective oversight, in accordance with specifications and program requirements, was implemented for the installation activities observed.

During the concrete placement, the inspectors observed in-process concrete testing to determine whether:

- concrete temperature, slump, air content, and unit weight were determined at the proper location and frequency as required by procedures, specifications, and ASTM standards;

- sample collection and testing techniques conformed to the procedures, specifications, and ASTM standards;
- test results were evaluated against applicable quantitative and qualitative acceptance criteria and were satisfactory;
- concrete strength test sample cylinders were made at the required location and frequency and were cured in accordance with specified requirements; and
- personnel performing sampling and testing were trained and qualified.

The inspectors reviewed concrete test results to determine whether:

- records were complete, accurate, and approved as required;
- test results were reviewed and evaluated against appropriate acceptance criteria;
- the records were retrievable; and
- deviations and adverse trends were identified at an appropriate threshold and documented in the corrective action program in accordance with approved procedures.

The inspectors reviewed aspects of the concrete placement processes to determine whether process controls were in place, to verify that issues identified were adequately documented and corrected, and to verify that any process related issues did not adversely affect the concrete quality. Additionally, the inspectors observed curing activities to determine whether curing was in accordance with specifications and procedures with regard to the method, materials, duration, temperature, and inspections. The inspectors reviewed the quality inspection records to determine whether they were complete, accurate, and provided evidence that the quality, code, and ITAAC requirements were satisfied. The inspectors reviewed a sample of inspection and installation records to determine whether:

- the records were adequate to furnish evidence of activities affecting quality;
- the records were reviewed and approved by the responsible organization;
- the recorded information was complete, accurate, and met the licensing basis and ITAAC requirements, and conformed to applicable specifications;
- concrete records were sufficient to confirm that adequate production, placement, inspection, protection, and curing activities were performed and that installation of embedded components was properly controlled; and
- the as-built SSCs conformed to applicable codes, standards, quality requirements, and technical requirements.

The inspectors reviewed training and qualification records for a sample of twelve craft personnel performing concrete consolidation activities, including operating vibrators, during the concrete placement to determine whether the work was performed by trained individuals. The inspectors reviewed training and qualification records for a sample of seven field engineers responsible for maintaining the work packages and conducting the concrete placement to verify they were qualified and authorized to conduct the work.

The inspectors reviewed a sample of nonconformances and design changes to verify:

- the licensee was identifying deviations at an appropriate threshold and entering them into the corrective action program;

- design changes and field modifications were properly controlled, documented, processed in accordance with quality and technical requirements commensurate with the original design;
- structural concrete activities, including design changes, were coordinated of with other disciplines as necessary;
- the interchange of design information between designers, constructors, inspectors, and managers regarding structural work, constructability issues, and field changes was adequate to ensure all necessary information was included in the work packages and translated into design changes and drawings
- the documents adequately defined the final design and arrangement of these SSCs;
- critical attributes associated with the ITAAC were correctly identified and documented for review and approval by responsible engineering personnel;
- any differences between the as-built and as-designed SSCs were documented and dispositioned in accordance with approved modification or change procedures; and
- the nonconformances were resolved and their dispositions had adequate technical bases.

b. Findings

No findings were identified.

1A44 (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 - Inspection of ITAAC-Related Foundations & Buildings
- 65001.01-02.01 - Procedures
- 65001.01-02.06 - Records
- 65001.01-02.07 - Identification and Resolution of Problem
- 65001.02-02.01 - Inspection of Concrete Placement
- 65001.02-02.02 - Laboratory Testing
- 65001.02-02.03 - Special Considerations
- 65001.02-02.06 - Record Review
- 65001.02-02.07 - Problem Identification and Resolution
- 65001.02-02.08 - Construction Interface Concerns
- 65001.02-02.09 - Concrete Quality Process Problems
- 65001.A.02.04 - Review As-built Deviations/Nonconformance
- 65001.F- Inspection of the ITAAC-Related Design and Fabrication Requirements
- 65001.F-02.01-Design Document Review

The inspectors reviewed quality records and performed direct inspection of construction activities associated with the radiologically controlled area of the Auxiliary

Building for Vogtle Unit 4. Specifically, the inspectors observed construction activities associated with the following wall sections of the CA20 structural module:

- wall sections along column line 2 between column lines J-1 and N between elevation 66'-6" and 85'-0"
- wall section along column line 3 between column lines J-1 and K-2 between elevation 66'-6" and 85'-0"
- wall section along column line 3 between column lines K-2 and L-2 between elevation 66'-6" and 89'-6"
- wall section along column line 4 between column lines J-1 and K-2 between elevation 66'-6" and 85'-0"
- wall sections along column line J-1 between column lines 2 and 4 between elevation 66'-6" and 85'-0"
- wall sections along column line J-2 between column lines 2 and 4 between elevation 66'-6" and 85'-0"
- wall section along column line K-2 between column lines 2 and 4 between elevation 66'-6" and 85'-0"
- wall section along column line L-2 between column lines 2 and 4 between elevation 66'-6" and 85'-0"

The inspectors reviewed a sample of design changes, work packages, and drawings included in the work packages to determine whether:

- design changes were completed in accordance with applicable specifications, drawings, and approved procedures, including timeliness of design changes and drawing revisions;
- design change documentation demonstrated adequacy of design by reference to analyses, calculations, bounding condition checks, functional assessments, and/or engineering evaluations;
- design changes and field modifications were properly controlled, documented, processed in accordance with quality and technical requirements commensurate with the original design;
- the interchange of design information between designers, constructors, inspectors, and managers regarding structural work, constructability issues, and field changes was adequate to ensure all necessary information was included in the work packages and translated into design changes and drawings;
- the drawings and work instructions adequately defined the final design and arrangement of these SSCs;
- structural concrete activities, including design changes, were coordinated of with other disciplines as necessary;
- the work packages contained adequate inspection documentation of installation activities for areas that would become inaccessible after concrete placement;
- critical attributes associated with the ITAAC were correctly identified in the work packages and documented for review and approval by responsible engineering personnel; and
- the documents were consistent with the design commitments and requirements of the technical specifications, the UFSAR, and code commitments.

The inspectors reviewed a sample of approved implementing procedures and specifications to determine whether the documents:

- met the requirements specified in the quality assurance program and the UFSAR, including the reconciliation of construction deviations in critical dimensions and tolerances;
- described work controls, approved work processes, and inspection requirements;
- correctly translated requirements from applicable codes and standards, including testing requirements;
- included appropriate quantitative and/or qualitative acceptance criteria for determining that the prescribed activities were accomplished satisfactorily;
- clearly prescribed acceptable methods of quality control inspection to ensure that the as-built condition met specified design requirements, drawings, and material specifications;
- required measuring and test equipment to be calibrated and maintained in accordance with approved calibration procedures and vendor requirements; and
- provided qualification requirements for craft and quality control inspection personnel performing installation and testing activities.

The inspectors observed concrete pre-placement activities to determine whether pre-placement planning and training had been completed and the pre-placement inspection was performed by quality control before any concrete was placed. The inspectors reviewed the concrete placement plan included in work package SV4-CA20-CCW-850000, “Unit 4, CA20 Concrete Wall up to 85’-0”, to determine whether it included appropriate considerations for concrete pumping, including configuration considerations for placeability and adequate consolidation, and mass concrete, including contingencies and preparations for stopping the concrete placement earlier than designed due to unexpected events or potential weather-related emergencies. Prior to concrete placement, the inspectors independently evaluated whether the deviations were adequately captured and addressed and formwork preparation and cleanliness had been completed. The inspectors observed concrete placement activities and reviewed batch plant records to determine whether:

- applicable placement equipment was certified by National Ready Mixed Concrete Association;
- concrete was batched in accordance the specified mix design;
- specifications, procedures, codes, and design requirements were followed throughout the concrete placement;
- the equipment used was suitable, in an acceptable condition, and sized for the work;
- records were produced, reviewed as required, and indicated proper mix, placement location, date, transport time, time placed, volume batched and placed, amount of temper water being added to the truck at the delivery point, and special instructions and ambient conditions;
- mixing time and rotations were adequate, including after any additions were made;
- test results were being utilized to adjust mix proportions, as allowed by the procedures and specifications, to optimize concrete mix characteristics for the placement;

- the time limit between mixing and placement was not been exceeded;
- temperature limits were not exceeded;
- concrete was placed in lifts in accordance with the concrete placement plan;
- placement drop distances did not exceed specification requirements and did not result in segregation; and
- inspection during placement was performed as required.

Additionally, the inspectors reviewed aspects of the concrete placement processes to determine whether process controls were in place, to verify that issues identified were adequately documented and corrected, and to verify that any process related issues did not adversely affect the concrete quality. The inspectors interviewed licensee and contractor personnel to determine whether:

- contractors performing safety-related work followed approved implementing procedures that describe administrative and procedural controls, approved work processes, and inspection requirements;
- design processes were performed in compliance with applicable instructions and procedures;
- personnel conducting work and quality assurance roles were qualified and knowledgeable; and
- effective oversight in accordance with specifications and program requirements was implemented for the installation activities observed.

During the concrete placement, the inspectors observed in-process concrete testing to determine whether:

- concrete temperature, slump, air content, and unit weight were determined at the proper location and frequency as required by procedures, specifications, and ASTM standards;
- test results were evaluated against applicable quantitative and qualitative acceptance criteria and were satisfactory;
- sample collection and testing techniques conformed to the procedures, specifications, and ASTM standards;
- concrete strength test sample cylinders were made at the required location and frequency and were cured in accordance with specified requirements; and
- personnel performing sampling and testing were trained and qualified.

The inspectors observed curing activities to determine whether curing was in accordance with specifications and procedures with regard to the method, materials, duration, temperature, and inspections. The inspectors reviewed inspection results and other information related to the placement to determine whether the placement was subjected to an integrated review before acceptance, that the as-built documentation was complete, and that these activities were controlled and accomplished in accordance with the quality assurance program. The inspectors reviewed concrete test results to determine whether:

- records were complete, accurate, and approved as required;
- test results were reviewed and evaluated against appropriate acceptance criteria;
- the records were retrievable; and

- deviations and adverse trends were identified at an appropriate threshold and documented in the corrective action program in accordance with approved procedures.

The inspectors reviewed training and qualification records for a sample of six craft personnel performing concrete materials testing during the concrete placement to determine whether the work was performed by certified individuals. The inspectors reviewed training and qualification records for a sample of seven field engineers responsible for maintaining the work packages and conducting the concrete placement to verify they were qualified and authorized to conduct the work.

The inspectors reviewed a sample of nonconformances included in the work packages associated with the concrete placement to verify:

- the licensee was identifying deviations at an appropriate threshold and entering them into the corrective action program;
- any differences between the as-built and as-designed SSCs were documented and dispositioned in accordance with approved modification or change procedures; and
- the nonconformances were resolved and their dispositions had adequate technical bases.

b. Findings

No findings were identified.

1A45 (Unit 4) ITAAC Number 3.3.00.03c (779) / Family 01A

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 3.3.00.03c (779). The inspectors used the following NRC IPs/sections to perform this inspection:

- 65001.01-02.04 - Key Dimensions and Volumes
- 65001.A.02.03 - Independent Assessment/Measurement Inspection

The inspectors performed an inspection of the non-radiologically controlled auxiliary building. Specifically, the inspectors reviewed concrete density and compressive strength tests to verify if the key site parameters of the walls met the shielding requirements specified in table 3.3-1 of Appendix C of the COL and the UFSAR section 3.8.4 and 12.3.2. The inspectors reviewed documents related to the following walls to determine whether the critical attributes of as-built SSC conformed to the final design:

- Wall P from column line 11 to 9.3 and elevation 82'6" to 100'0"
- Wall M from column line 11 to 9.3 and elevation 82'6" to 100'0"

b. Findings

No findings were identified.

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

1P01 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 following QA program implementing documents to ensure that they address the QAPD and FSAR commitments for the calibration, maintenance, and use of measuring and test equipment (M&TE) during the construction of Vogtle Units 3&4:

- Nuclear Quality Site Instruction QSI 12.01-V, Control of Measuring and Testing Equipment, Rev. 05.00
- Nuclear Construction and Startup Procedure NCSP-03-10, Measuring and Test Equipment (M&TE) Control, Rev. 04.03
- Nuclear Metrology Standard MS-01.02, Calibration Identification Labels, M&TE Identification Numbers, and Inventory, Rev. 01.01
- Nuclear Metrology Standard MS-01.05, Preparation of Calibration Checklist, Calibrated M&TE History Card/Usage Log, and Checklist for Procurement of M&TE Calibration Services, Rev. 02.01

The inspectors reviewed these implementing documents to verify:

- when M&TE is required by an approved procedure or work package, only calibrated M&TE is to be issued from the calibration facility;
- calibrations are performed at prescribed intervals, or prior to use;
- M&TE is calibrated, adjusted, and maintained against reference calibration standards having traceability to nationally recognized standards;
- calibrated M&TE is labeled, tagged, or suitably marked with a unique identification number, calibration date, calibration due date, and any limitations on use;
- out-of-calibration M&TE is tagged and segregated to prevent its use;
- calibrated M&TE, including standards used for calibrating M&TE, is handled and stored to maintain accuracy; and
- calibration data for each piece of M&TE is properly documented.

The inspectors reviewed the applicable procedures to verify that both the paper copy and the electronic data base used to track M&TE were being maintained in accordance with these requirements. The inspectors also reviewed the log-out/log-in systems to verify that both systems were being properly used by authorized personnel in the calibration facility.

As part of the inspection, the inspectors also observed the calibration of a piece of M&TE, V-N-0059, Wright Tools model 9S391 torque multiplier. The inspectors reviewed the associated calibration procedures, and verified that the appropriate

calibration procedure was available at the work location. The inspectors observed this activity to verify that the M&TE was calibrated in accordance with the appropriate section of the calibration procedure, the calibration records were accurate and complete, and that the M&TE was properly tagged to indicate the current calibration status and any applicable limitations on its use.

b. Findings

No findings were identified.

1P02 Construction QA Criterion 13

- 35007-A13.04 - Inspection Requirements and Guidance
- 35007-A13.04.01 - Inspection of QA Implementing Documents
- 35007-A13.04.02 - Inspection of QA Program Implementation

a. Inspection Scope

The inspectors reviewed the on-site storage of the unit 3 Passive Residual Heat Removal heat exchanger to determine whether the item was being stored in accordance with project requirements. The inspectors reviewed the storage requirements specified in associated vendor manuals and Nuclear Quality Standard QS 13.11 to verify that the storage location and conditions were appropriate. The inspectors performed a walk-down of the storage space to verify that reasonable cleanliness and good housekeeping practices were being maintained, the area was free of excessive moisture and contaminants, and that the associated cribbing, pallets, and skids were not damaged. The inspectors reviewed the requirements for cleanliness and environmental controls to verify that access control, temperature, humidity, and nitrogen blanket requirements were being met or discrepancies had been documented and dispositioned in accordance with APP-GW-GAP-428, Nonconformance and Disposition Report.

b. Findings

No findings were identified.

1P03 Construction QA Criterion 15

- 35007-A15 - Appendix 15. Inspection of Criterion XV – Nonconforming Materials, Parts, or Components
- 35007-A15.04 - Inspection Requirements and Guidance
- 35007-A15.04.01 - Inspection of QA Implementing Documents
- 35007-A15.04.02 - Inspection of QA Program Implementation

a. Inspection Scope

The inspectors reviewed quality records and performed direct inspection of construction activities associated with the program for controlling at-risk installation and work on nonconforming materials, parts, and components. Specifically, the inspectors reviewed the following aspects of the program:

- implementing documents for the QA program, including procedures and specifications
- segregation and identification of items released for at-risk installation and/or limited work activities;
- control and traceability of the nonconforming items to associated documentation, including limiting work restrictions
- completed nonconformance dispositions associated with at-risk work activities
- logs that control and track ongoing at-risk work in the field

The inspectors reviewed recent revisions for a sample of QA implementing documents for the control of nonconforming materials, parts, and components to verify they met the requirements in the Quality Assurance Program Document (QAPD) and commitments in the UFSAR. This review included documents and procedures related to movement of segregated items and working at risk on items with known nonconformances. The inspectors reviewed procedures and specifications to determine whether they established adequate provisions for:

- appropriate screening criteria based safety classification and risk significance;
- review and disposition of the nonconforming items in accordance with the approved QAPD and UFSAR;
- re-inspection of repaired and reworked items in accordance with applicable implementing documents;
- ensuring adequate justification and documentation of approved dispositions, including any design changes;
- control of the nonconforming items to prevent inadvertent use of installation, including marking and segregation;
- notification to affected organizations of the status of nonconforming items;
- evaluations of at-risk work authorization for impact on quality and control of the nonconformances, including limiting work restrictions; and
- ensuring evaluations and work at-risk authorizations are approved by those with appropriated authority and responsibility as required by the QAPD and UFSAR.

The inspectors reviewed a sample of onsite segregation and identification of nonconforming items released for at-risk installation and/or limited work activities to determine whether the licensee has effectively implemented their procedures and specifications for the control of these nonconforming items. Specifically, the inspectors determined whether implementation of the following was in accordance with procedures, specifications, the QAPD, and UFSAR:

- establishment of areas for segregating and controlling nonconforming items during at-risk work activities
- clear and traceable identification of items approved for at-risk work to the applicable limiting work restrictions
- identification of nonconforming items and prevention of inadvertent further processing, installation, testing, or use

For a sample of the onsite items released for at-risk installation and limited work, the inspectors reviewed the associated documentation and item traceability to verify that it contained a technically adequate description of the item, the nonconformance, and the limiting work restrictions. Additionally, the inspectors reviewed the work at-risk

authorizations associated with these nonconforming items to determine if the work being performed and the nonconforming item were both adequately controlled and traceable to the work authorizations. The inspectors also selected a sample of work at-risk authorizations and associated nonconformance evaluations for items that had been previously dispositioned to determine whether the documentation contained technically adequate explanations for the resulting dispositions and evidence that the at-risk work did not negatively affect the quality of the dispositions. The inspectors reviewed the logs that control and track at-risk work to determine whether they included all of the items inspected in the field and were adequate to manage and monitor the status of the ongoing at-risk work activities.

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

Corrective Action Program Routine Review

The resident inspectors conducted daily review of issues entered into the licensee's and contractors' Corrective Action Programs (CAP) to assess issues that might warrant additional follow-up inspection, remain alert of conditions ongoing at the site, to be able to recognize repetitive or long term issues, to be alert of adverse performance trends, and to ensure the CAP appropriately included regulatory required non-safety related SSCs. The inspectors completed this through reviews of CAP entry logs, attending CAP review meetings, 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 the actions were 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 contractors at an appropriate threshold and entered into the CAP; and
- the issues were appropriately classified in accordance with the QAPD and CAP implementing procedures.

Follow-Up of Selected Issues

Based on items reviewed during routine CAP review, the resident inspectors selected a sample of issues identified in the CAP for a more in-depth review and follow-up. The selected issues included conditions adverse to quality, conditions associated with NRC identified findings or violations of regulatory requirements, issues identified through NRC construction experience, issues identified through industry construction experience, and issues identified through licensee audits or assessments. These issues were reviewed to determine whether:

- the licensee and contractors planned and implemented corrective actions were commensurate with the significance of the identified issue;
- classification, prioritization, and evaluation for reportability were conducted in accordance with the QAPD and CAP implementing procedures;
- the problem was completely and accurately identified in a timely manner commensurate with the significance and ease of discovery;
- the issues were screened as required to determine the proper level of evaluation and actions;
- issues associated with design deficiencies were completely identified and corrected, including determining the cause and instituting fixes to the design process and QA program to prevent recurrence of similar deficiencies when required;
- extents of condition, generic implications, common causes, and previous occurrences were evaluated when required;
- the resolution of problems was prioritized based on safety significance;
- corrective actions were appropriately focused and were sufficient to correct the problem identified;
- corrective actions were completed in a timely manner commensurate with the safety significance of the issue, including the implementation of interim corrective actions and compensatory actions to minimize the problem and mitigate its effects until the permanent action could be implemented;
- provisions were in place for escalating to higher management any corrective actions that were not adequate or were not timely;
- the licensee and contractors periodically conducted trend analyses and assessments of aggregated information from their associated CAP to identify programmatic and common cause problems; and
- trend results were communicated to appropriated personnel and management.

The inspectors performed a focused review of CR 10209432. This CR was generated as a result of NRC identified unverified design assumptions in WEC calculations. This CR documented the condition and specifically captured all NRC concerns. WEC CAPAL 100375727 was written to further address the condition and perform an extent of condition. Corrective actions identified in this CR and CAPAL, as well as associated documents, included verification of the design assumptions, confirmation that the design assumptions met code and licensing requirements, and verification of other design inputs and resulting outputs. This evaluation concluded that the issues involved, although not isolated to the NRC identified concerns, did not alter the design outputs. All of the identified conditions adverse to quality were corrected and the design assumptions and inputs were updated when necessary. The inspectors reviewed this CR and associated documents and determined that the licensee's and contractor's actions in response to the issue were adequate. The inspectors reviewed the updated calculations and other documents to verify corrective actions were completed.

The inspectors performed a focused review of CAPAL 100432457. This CAPAL was generated as a result of contractor findings regarding steel reinforcement stirrup spacing within a reinforced concrete precast panel to be used a portion of the floor at elevation 82'-6" in the Unit 4 radiologically controlled area of the Auxiliary Building. This CAPAL documented the condition and specifically identified the code nonconformance and the human performance error. Corrective actions identified in this CAPAL included evaluation of the nonconformance, training of the quality inspectors, and trending. All of the identified conditions adverse to quality were either evaluated against the design or addressed to prevent recurrence. The inspectors reviewed this CR and associated documents and determined that the contractor's actions in response to the issue were adequate. The inspectors reviewed training records, reviewed analyses of the nonconformance, and performed independent inspection of the as-built condition to verify corrective actions were completed.

b. Findings

No findings were identified.

1P05 Construction QA Criterion 16

- 35007-A16.04.02 - Inspection of QA Program Implementation

a. Inspection Scope

During the week of May 15, 2017, the NRC conducted an aspect of the annual CAP team inspection. This inspection was a focused review of WECTEC's Site Operations division safety culture. The inspection consisted of interviews with approximately 40 personnel and records reviews.

Specifically, the inspectors interviewed personnel to determine if:

- a safety conscious work environment (SCWE) was being maintained;
- SNC and WECTEC Employee Concern Programs (ECP) were effective;
- management oversight of the corrective actions to address the nuclear safety culture enhancement within this division were adequate; and
- licensee and WECTEC personnel were reluctant to report safety issues via the different avenues available (CAP, ECP, management, etc.).

During the interviews, the inspectors asked individuals to respond to questions about safety conscious work environment policy, the ability to raise safety concerns, and employee concerns program and corrective action program effectiveness to verify that the licensee and contractor have been adequately addressing issues in this area.

The inspectors reviewed several documents, procedures, and files to determine if:

- procedures were adequate;
- files contained adequate documentation;
- issues were entered and reviewed in a timely manner;

- concerns were adequately addressed;
- corrective actions were tracked; and
- whether individuals were provided feedback.

b. Assessment

Most individuals interviewed communicated a clear understanding of avenues including first-line management to report concerns while others indicated that they would use other avenues available to them, including senior leadership, to address nuclear safety concerns if needed.

The inspectors observed that areas requiring attention and enhancements were already identified by WECTEC and the licensee. These were based on recently completed SNC and WECTEC assessments and the ongoing corrective actions taken, such as organizational/ management changes, training, and periodic assessments to ensure actions were consistent with the site's SCWE policy.

Based on the NRC inspection and the recently completed site assessments, the inspectors noted that the licensee identified actions were ongoing to increase the health of the SCWE. Based on interviews, weaknesses that were previously identified through the CAP, ECP, self-assessments, and other means were being addressed by the licensee and their contractor. Increased leadership emphasis, from both the licensee and their contractor, were in place to enhance the nuclear safety culture within this division.

c. 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

- 51080-02.01 - Team Members and Responsibilities
- 51080-02.03 - Inspection Tasks

a. Inspection Scope

The inspectors reviewed the environmental qualification program for electrical and instrumentation and control equipment to verify that items classified as important to safety met the requirements of 10 CFR 50.49, the commitments of the UFSAR and applicable regulatory requirements.

The inspectors reviewed procedures and conducted interviews with knowledgeable plant personnel to verify if the licensee has measures to generate, maintain, and

distribute a listing of equipment. Specifically, the inspectors reviewed a listing of electrical and mechanical equipment to assure information would reside in an auditable form, remain current for the entire period during which the items are installed in the nuclear power plant, and remain current for equipment that is stored for future use.

The inspectors reviewed procedures and conducted interviews with knowledgeable plant personnel to verify if the licensee had measures for maintenance and control of EQ records. Specifically, the inspectors reviewed procedures for the following attributes qualification specifications, qualification activities, documented evidence of reviews, and documented approvals that show acceptable accomplishment of qualifications.

The inspectors reviewed procedures and conducted interviews with knowledgeable plant personnel to verify if the licensee had measures for conduct of maintenance and/or surveillance. Specifically, the inspectors reviewed procedures to assess whether new and replacement installations, qualified configurations, post-maintenance testing and/or inspection, and specified performance requirements following maintenance were addressed.

The inspectors reviewed procedures and conducted interviews with knowledgeable plant personnel to verify if the licensee had measures for procurement of EQ equipment. Specifically, the inspectors reviewed procurement documents to verify if the documents addressed qualification for replacement and spare EQ equipment, qualification controls, and qualification of EQ equipment before it was used in the plant.

The inspectors reviewed procedures and conducted interviews with knowledgeable plant personnel to verify if the licensee had measures for control of plant modifications. Specifically, the inspectors reviewed the procedures for instruction to determine whether they contained design evaluations, equipment similarity, effects on qualified equipment, and new or reconstituted qualifications.

The inspectors reviewed procedures and conducted interviews with knowledgeable plant personnel to verify if the licensee had measures for orientation and training of the EQ program. Specifically, inspectors reviewed the training material to assess if the licensee identified training requirements for qualified equipment and appropriate training and/or experience for personnel reviewing and approving EQ documentation.

The inspectors reviewed procedures and conducted interviews with knowledgeable plant personnel to verify if the licensee had measures for evaluating and responding to NRC generic communications that defined a mechanism for addressing communications related to equipment requiring qualification.

The inspectors reviewed procedures and conducted interviews with knowledgeable plant personnel to verify if the licensee had measures describing guidance for conducting ongoing quality assurance audits and oversight of EQ program activities

b. Findings

No findings were identified.

3P02 Environmental Qualification

- 51080 - PART 52, Environmental Qualification Program for Electrical and Mechanical Equipment
- 51080-02.01 - Team Members and Responsibilities
- 51080-02.02 - Pre-Inspection Tasks
- 51080-02.03 - Inspection Tasks

a. Inspection Scope

The inspectors reviewed environmental qualification documents for commodity codes JE61, JE62, PV01, PV11, and PV70 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 and 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:

- PXS-JE-LE050/51/52, Containment Flood-up Level Sensor (JE61)
- PXS-JE-LT011A/B/C/D, CMT A Level Sensor (JE61)
- PXS-JE-LT012A/B/C/D, CMT B Level Sensor (JE61)
- PXS-JE-LT013A/B/C/D, CMT A Level Sensor (JE61)
- PXS-JE-LT014A/B/C/D, CMT B Level Sensor (JE61)
- RCS-JE-ST281, RCP 1A Pump Speed Sensor (JE62)
- RCS-JE-ST282, RCP 1B Pump Speed Sensor (JE62)
- RCS-JE-ST283, RCP 2A Pump Speed Sensor (JE62)
- RCS-JE-ST284, RCP 2B Pump Speed Sensor (JE62)
- RCS-PL-V011A, First-stage ADS Isolation MOV (PV01)
- RCS-PL-V001A, First-stage ADS MOV (PV01)
- PXS-PL-V002A, CMT A Inlet Isolation MOV (PV01)
- SFS-PL-V034, SFS Suction Line Containment Isolation MOV (PV11)
- RCS-PL-V004A/B/C/D, Fourth-stage ADS Squib Valve (PV70)
- PXS-PL-V118B/120B, Containment Recirculation B Squib Valve (PV70)
- PXS-PL-V123A/125A, IRWST Injection A Squib Valve (PV70)
- PXS-PL-V118A/120A, Containment Recirculation A Squib Valve (PV70)
- PXS-PL-V123B/125B, IRWST Injection B Squib Valve (PV70)

To perform these reviews, the inspectors reviewed the UFSAR to identify the limiting design basis parameters that were used as input for the qualification of the SSCs. The inspectors reviewed the qualification program documents (such as procedures, test specifications, and test reports) to verify that all the necessary requirements for the qualification were incorporated, such as:

- qualification methodology (i.e. test or analysis) per IEEE Std. 323-1974
- environmental parameters under normal operating conditions, abnormal conditions, and design basis events

- environmental temperature, pressure, total radiation dose, radiation dose rate, cycling, electrical parameters and humidity
- simulated accident conditions, including, temperature, pressure, radiation, pH, and chemical additives
- margin, as specified in IEEE Std. 323-1974
- post-accident conditions, including time and submergence, where applicable

The inspectors reviewed the EQSR, EQDP, and applicable test procedures and test records related to the qualification for the expected environment to verify that qualification activities were adequately controlled and that the methodology conformed to IEEE Std. 323-1974. The inspectors reviewed the environmental profiles documented in APP-VP-GW-030, "Plant Environmental Conditions," to verify that the tested profiles enveloped the actual worst case environmental conditions that would be expected. The inspectors reviewed test procedures and test records to verify that the qualification was in conformance with IEEE Std. 323-1974 and that the valve actuator was qualified in conformance with IEEE Std. 382-1996, "IEEE Standard for Qualification of Actuators for Power-Operated Valve Assemblies With Safety-Related Functions for Nuclear Power Plants."

b. Findings

No findings were identified.

3P03 Reactor Vessel Material Surveillance

- 50054 - Reactor Vessel Material Surveillance Program
- 50054-02.01 - General Inspection Guidance
- 50054-02.02 - Specific Requirements

a. Inspection Scope

The inspectors performed a direct inspection of the licensee's documentation to verify that the reactor vessel (RV) surveillance capsule program, as described in the COL, was in compliance with commitments and regulatory requirements. Specifically, the review focused on the following program attributes:

- The RV specimen guide baskets were designed, fabricated, and installed as required by the design document and operational program description.
- The capsules are designed, fabricated, and installed as required by the design documents and operational program description.
- Test specimens that were included in the capsules conformed to the surveillance capsule program.

The inspectors reviewed the design documents to verify that the RV specimen guide baskets were appropriately designed and contained sufficient instructions to ensure construction and orientation that would satisfy design commitments. Specifically, design documents were reviewed to ensure that the RV specimen guide baskets conformed to the ASME Boiler and Pressure Vessel Code Sections III and IX 1998 edition with 2000 addenda, requirements for attachment to RV internals and ASTM requirements for proper placement to ensure lead factors between 1 and 3. Initial

design documentation (Revision 15 of the AP1000 Design Control Document) identified that the RV specimen guide baskets would be welded to the outer wall of the core barrel and at a modified circumferential location of 45 degree azimuth instead of the original proposal of 29.7 degree azimuth.

The licensee is in the process of revising UFSAR Subsection 5.3.2.6, as it currently states that RV material specimens are contained in guide baskets that are welded to the outside of the core barrel as shown in UFSAR Figure 5.3-4; however, figure 5.3-4 indicates that the baskets are bolted to the core barrel. The UFSAR revision will change the UFSAR description of “welded” to match the design of “bolted.” The inspectors reviewed the design change paperwork to verify that design change specifications were properly screened and that the design did not adversely impact the original design.

In order to satisfy the licensee’s commitment to ASTM E-185 “Standard Practice for Design of Surveillance Programs for Light-Water Moderated Nuclear Power Reactor Vessels,” (1982 edition) the specimen guide baskets will be located azimuthally near the lowest fluence locations at 135, 225, and 315 degrees. The original population of eight specimen capsules was maintained by reconfiguring to three guide baskets at the 135 and 315 degree azimuthal locations and two baskets at the 225 degree location. This reconfiguration resulted in calculated lead factors of 1.8 to 2.3. The inspectors reviewed the calculations associated with lead factor determination and the design change documentation to ensure proper screening methodology was utilized.

The inspectors reviewed design, purchasing, and construction paperwork to verify that the RV surveillance capsule samples and specimen guide baskets complied with the updated design specifications. Specifically, the inspectors reviewed:

- licensee documentation, including Units 3 and 4 Reactor Vessel Surveillance Materials Quality Release & CoC, to verify that the materials and construction of the RV specimen guide baskets conformed with the requirements of the current design specifications;
- welding documentation contained in "8 Reactor Vessel Surveillance Capsules," to verify that they conformed with the specified welding procedures, qualifications, and materials; and
- fabrication documentation of RV specimen guide baskets with the associated welds and bolting to verify that they met the requirements of the design specification and/or ASME BPVC Section III and Section IX.

The inspectors reviewed the RV specimen capsule documentation to verify that the capsules were designed and fabricated in accordance with design requirements and encapsulation commitments of ASTM E-185. Specimen encapsulation documentation was reviewed to verify that the specimens would be maintained in a suitable environment within capsules constructed of acceptable materials. Specifically, the inspectors reviewed the following design aspects:

- The capsule assembly design and fabrication documentation was reviewed to verify it conformed to the requirements of the capsule program (i.e. number and type of specimens loaded).
- Helium leak tests were reviewed to ensure the encapsulation would provide an inert environment.

- The capsule assembly design and fabrication documentation was reviewed to verify that the capsule assembly maintained a corrosion-resistant environment to prevent deterioration of specimen surfaces during radiation exposure.
- The capsule assembly design and fabrication documentation was reviewed to ensure that proper welding procedures, welder qualifications, and welding materials were used.

The RV materials surveillance test specimens are required to meet the requirements of ASTM E-185 and 10 CFR Part 50, Appendix H. The inspectors reviewed material selection and test data documentation to verify that the test specimens for the program represent the materials used in the reactor beltline region and included Charpy V-notch impact, tensile, and compact tension specimens from the limiting beltline region. The review also ensured that each capsule would contain Charpy V-notch impact specimens of weld heat-affected-zone metal, as well as dosimeters and thermal monitors to measure the integrated neutron flux and temperature in the individual test capsules.

b. Findings

No findings were identified.

4. OTHER INSPECTION RESULTS

4OA6 Meetings, Including Exit
Exit Meeting.

On July 20, 2017, the inspectors presented the inspection results to Mike Yox, Vogtle 3 & 4 Regulatory Affairs Director, along with other licensee and contractor staff members. The inspectors stated that no proprietary information would be included in the inspection report.

4OA7 Licensee-Identified Violations.

None

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee and Contractor Personnel

D. Muetzel, Principal Engineer, Safety System AP1000 Hardware Engineering WEC
D. Lucas, Principal Engineer, Electro-Mechanical Product Engineering WEC
B. Neff, WEC Principal Engineer
A. Narvett, WEC Principal Engineer
R. Constantino, WEC System Test 3 Manager
B. Hirmanpour, Southern Nuclear Company – VEGP 3&4, Digital Systems, HFE and Cyber Compliance, Regulatory Affairs and ITAAC
J. Scaramazza, Southern Nuclear Company - Engineering
D. Mickinac, Southern Nuclear Company - Engineering
J. Aufdenkampe, Southern Nuclear Company - Engineering
K. D Fili, Southern Nuclear Company - Site Vice President
B. Harbin, Southern Nuclear Company - Equipment Qualification Engineer
L. Pritchett, Southern Nuclear Company - Licensing
A. Pugh, Southern Nuclear Company - Licensing
K. Roberts, Southern Nuclear Company - Licensing
F. Hundley, SNC PICAP Manager
C. Calia, SNC PICAP Manager
N. Wetherell, WEC Site Operations Director
L. Reaves, WEC Functional Employee Concerns Manager
A. Pope, WEC Global Director Nuclear Safety Culture
J. March, SNC Concerns and Compliance Lead
T. Edwards, SNC Employee Concerns Coordinator
J. Johnson, SNC Employee Concerns Coordinator
D. Rose, WECTEC Employee Concerns Manger
M. Washington, SNC Licensing
M. Yox, SNC Reg Affairs Director
JD. Williams, SNC Site Operations Director
J. Todd, SNC Security and EP Project Manager
L. Buckley, WECTEC Licensing
J. Watkins, WEC Licensing
A. Miller, WEC Licensing Engineer
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R. Wessel, WEC Principal Engineer
G. Riegel, WEC Principal Engineer
A. Trupiano, WEC Principal Engineer
S. Willoughby, WEC Senior Engineer
S. DiTomasso, WEC Licensing Manager
P. Russ, WEC Director, New Plant Licensing
B. Schelger, WEC Senior Engineer
S. Feder, WEC Senior Engineer
E. Drake, WEC Principal Engineer
K. Durrwachter, SNC Licensing Engineer
K. Pigg, WECTEC Licensing

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Item Number	Type	Status	Description
05200025/2017002-01/ 05200026/2017002-01	NCV	Open	Thermal Stress Analysis Not Performed for 14-inch ADS Squib Valves IAW with ASME Section III
05200025/2017002-02/ 05200026/2017002-02	URI	Open	Extrapolation of Functional Qualification for PV11 MOVs

LIST OF DOCUMENTS REVIEWED

Section 1A01

Design Documents

APP-GW-Z0-002, “AP1000 ASME Section III Piping System Design Specification,” Revision 2, Dated 9/15/2016
APP-PV70-V2-003, “14” Squib Valve Assembly Drawing Sheet 1 of 3, Revision 3, Dated 4/20/2016
APP-PV70-V2-005, “14” Squib Valve Assembly Drawing Sheet 3 of 3, Revision 3, Dated 4/20/2016
APP-PV70-VDR-101001, “Compilation of Design Reports for PV70 Datasheet 101,” Revision 0, 8/19/2014
APP-PV70-VDR-103, “Prototype Functional Testing Report Summary,” Revision 0, Dated 3/4/2015
APP-PV70-VDR-104, “Structural Analysis Report for 14” Squib Valves,” Revision 0, Dated 3/5/2015
APP-PV70-Z0-001, “Squib (Pyrotechnic Actuated) Valves, ASME Boiler and Pressure Vessel Code, Section III Class 1,” Revision 6, Dated 7/17/2014
APP-PV70-Z0R-001, “PV70 Squib (Pyrotechnic Actuated) Valves, ASME Section III Class 1, Data Sheet Report,” Revision 7, Dated 6/1/2012
WEC Letter DCP_DCP_008831, "ADS-4 Squib Valve Thermal Evaluation," Dated 7/17/2017

Transient Documents

APP-PV70-Z0Y-001, “Plant and System Transients Applicable to PV70 Valves,” Revision 1, Dated 8/1/2011
APP-PXS-M3C-038, “Squib Valve Functional Requirements for Stage 4 ADS Valves,” Revision 8, Dated 12/15/2016
APP-PXS-M3C-205, “Passive Core Cooling System (PXS) Design Transients,” Revision 4, Dated 3/9/2011
APP-RCS-M3C-046, "AP1000 PRHR Inlet and ADS 4th Stage B - Thermal Stratification Analysis," Revision 5
APP-RCS-M3C-051, “Design Transients for the AP1000 RCS Class A, B and C Valves and the RCS Class A Piping,” Revision 0, Dated 8/2/2007
APP-SSAR-GSC-130, “AP1000 Plant Small-Break LOCA Steady-State Model,” Revision 2, Dated 9/4/2014
APP-SSAR-GSC-131, “AP1000 Plant Small-Break Loss-of-Coolant Accident (SBLOCA) 2-Inch & 10-Inch Cold Leg Break and Inadvertent ADS Transients,” Revision 1, Dated 2/11/2015

Procedures
QA-2.11, “Registered Professional Engineer Qualification,” Revision 0.0, Dated 1/8/2016
W2-8.4-105, “Signing and Sealing by Professional Engineers,” Revision 0.0, Dated 1/8/2016

Quality Assurance Records
SV3-PV70-VQQ-002, “Quality Release & Certificate of Conformance for PV70 Squib Valves,” Revision 1, Dated 2/24/2017

Qualification Records
F-2.11-1 Professional Engineer’s Qualification Record, RPE-44911-09-2015, Dated 9/15/2015
F-QA-2.11-1 Professional Engineer’s Qualification Record, RPE-29749-03-206, Dated 3/23/2016

Licensing Documents
APP-FSAR-GLN-699, “AP1000 Licensing Applicability Determination and 10 CFR 50.59 , 10 CDR 52 Appendix D Section VIII Screening: DCP APP-GW-GEE-5051, DP-855; DCP APP-GW-GEE-5054, DP-861; LAR-114,” Revision C
Vogtle Electric Generating Plant, Units 3 and 4 Updated Final Safety Analysis Report (UFSAR), Revision 5.2, Section 15.6

Deviation Notice
APP-PV70-GNR-011, “14 Inch Squib Valve Outlet Support Hole Location Deviation Notice,” Revision 0, Dated 10/4/2011
APP-PV70-GNR-326, “Squib Valve Deviation Notice (14” Body S/N TN-2712-2, -3, -4, -5, -7, -14, -16, -17, -25, -26, -29), Revision 1, Dated 6/4/2012
APP-PV70-GNR-339, “Squib Valve Deviation Notice (14” Body S/N TN-2712-5), Revision 0, Dated 3/28/2012

Corrective Action Documents
CR 10379762
CR 10389193
CR 10379823
CAPAL 100478099
CAPAL 100478313
CAPAL 100478387
CAPAL 100478597
CAPAL 100481984

Section 1A02
SV3-PH01-V1-001, AP-1000 Steam Generator Support System Assembly Views, Rev. 1
SV3-PH01-V1-002, AP-1000 Steam Generator Vertical Column Support System Assembly & Details, Rev. 1
SV3-PH01-V1-003, AP-1000 Steam Generator Vertical Column Support Details, Rev. 1
SV3-PH01-V1-006, AP-1000 Steam Generator Upper Lateral Support Assembly & Details, Rev. 1
SV3-PH01-V2-001, AP-1000 Steam Generator Lower Lateral Support Assembly & Details, Rev. 1
SV3-PH01-V2-002, AP-1000 Steam Generator Intermediate Lateral Support Assembly & Details, Rev. 1
SV3-PH01-V8-009, AP-1000 Steam Generator Lateral Supports, Field Welding Options to Meet ASME NF-4441, Rev. 0

ASME Section III, Subsection NF – 1998 Edition through 2000 Addenda, “Supports”
SV0-PH01-GEF-000010, SGLL SGIL Dims W, X, Y, and Z, Rev.0
SV3-PH01-GNR-000007, CA01 Southeast SGUL Support, Rev.0
SV3-PH01-GNR-000862, CA01 Northeast SGUL Support, Rev.0
PCI Quality Assurance Traveler No. 911082-011, Weld Overlay for Vogtle Unit 3 SG “A” Intermediate Lateral Support “A”, Rev. 0
PCI Quality Assurance Traveler No. 911082-012, Weld Overlay for Vogtle Unit 3 SG “A” Intermediate Lateral Support “B”, Rev. 0
PCI Quality Assurance Traveler No. 911082-013, Bracket Install for Vogtle Unit 3 SG “A” Intermediate Lateral Support “A”, Rev. 0
PCI Quality Assurance Traveler No. 911082-014, Bracket Install for Vogtle Unit 3 SG “A” Intermediate Lateral Support “B”, Rev. 0
PCI Quality Assurance Traveler No. 911082-015, Weld Overlay for Vogtle Unit 3 SG “A” Lower Lateral Support, Rev. 0
PCI Quality Assurance Traveler No. 911082-016, Bracket Install for Vogtle Unit 3 SG “A” Lower Lateral Support, Rev. 0
WPS AWS 1-11-SA-MC-FCAW-A5.20, Rev. 0
WPS 3-3 MC-FCAW-NF, Rev. 0
WPS 3-3 SA-FCAW-NF, Rev. 0
WPS 1-3 MN-GTAW-SA/MC-FCAW-NF, Rev. 0

Section 1A03
WEC Purchase Order 500269770 to Tioga Pipe Supply Company, Inc., June 16, 2008
QA Data Package, SV3-PL01-VQQ-002, Rev. 1, PO# 4500269770 - AP1000 Reactor Coolant Loop (RCL) Piping (Table), QR-13-158 Rev. 1, Page 2 of 1097
Tioga Pipe Supply Company, Inc., ASME Quality System Certificate, QSC-467
IBF S.p.A., ASME Quality System Certificate (Corporate), QSC-600
IBF Operating Instruction for Ultrasonic Examination of Hot Leg, TS-0800001, Rev. 04
IBF Liquid Penetrant Examination Procedure, TS-0800002, Rev. 02
IBF Test Plan for Evaluating the In-Service Inspectability of the AP1000 SA-376 TP316LN Hot Leg/Cold Leg and SA-312 TP316LN Surge Line Piping Forging, TS-0800003, Rev. 02
IBF Operating Instruction for Ultrasonic Examination of Cold Leg, TS-0800004, Rev. 03
WEC Purchase Order 4500435847 to Carolina Energy Solutions, LLC, May 17, 2012
WEC Carolina Energy Solutions, LLC, Certificate of Authorization (Corporate), N-3492
WEC Carolina Energy Solutions, LLC, NPT Certificate of Authorization, N-3492-1
WEC-CES WPS CWPS-8-8-TS-A01, Rev. 1 (supported by PQRs 063 and 600)
WEC-CES PQR 063, Rev. 6 (unlimited thickness P-No. 8 manual GTAW)
WEC AP1000 Primary Coolant Loop Piping Spool Pieces, APP-PL01-V6-001, Rev. 4
WEC AP1000 RCS Hot and Cold Leg RTD Thermowell Installation, APP-PY72-V8-001, Rev. 0

<u>RCL Hot Leg LOO1A</u>:
IBF CMTR1300006 for SA376-TP316LN pipe (L0903404, Heat-No. 05756), 72 pages, Rev. 00, 29/01/2013
FORONI S.p.A., CMTR 2010/1995, ingot chemical analysis for Heat-No. 05756, Rev. 0, 30/9/2010
IBF Heat Treatment Report HTR1200054,Rev. 00, solution annealing, 10/10/2012
IBF Material Test Report MTR1300003, Rev. 0, ASTM A262, Practice E corrosion testing, 09/01/2013
IBF Material Test Report MTR1300003, Rev. 0, mechanical testing, 17/11/2012
Exova, Test Report 170159, Rev. 0, chemical analysis, 16/11/2012

IBF Dye Penetrant Test Report L130000082, 100% of the outside and inside surfaces, 16/01/2013
IBF Ultrasonic Test Report U130000150,100% of the accessible volume, 17/01/2013
IBF Ultrasonic Test Report U130000151,100% of volume weld fit-up areas X 4T for in-service inspectability, 17/01/2013
IBF CMTR1300002 for SA182-F316LN, thermowell boss fitting (L1205580, Heat-No. 06187, Item 6), 62 pages, Rev. 00, 16/01/13
FORONI S.p.A., CMTR 2011/1894, ingot chemical analysis for Heat-No. 06187, Rev. 0, 8/7/2011
IBF Heat Treatment Report HTR1200076, Rev. 00, solution annealing, 19/01/12
IBF Material Test Report MTR1200187, Rev. 0, mechanical testing, 25/01/2012
IBF Dye Penetrant Test Report PTR120001032, 100% of the accessible surfaces, 19/12/2012
IBF Visual and Dimensional Check Report VDR1201154, Rev. 00, 21/12/2012
IBF Marking Record MR-1200224, Rev. 00, 20/12/12
WEC Carolina Energy Solutions (CES) Weld Traveler WT-4401704-48 for Wide Range (WR) Thermowell Boss N20A to Hot Leg 06 pipe, 2/17/14
CES Weld Material Withdrawal Slip 0918 for Shop Weld (SW) No. 48, 7/29/13
Weldstar Certificate of Compliance/Conformance for Arcos, ER316/316L, 3/32" & 1/8" diameters X 36", Heat-No. 742369, Lot & Control-Nos., CT9617 & DT9617, respectively, 7/27/2012
Arcos CMTR for SFA 5.9, ER316/316L, 3/32" diameter X 36", Lot/Heat-No. CT9617 - 742369, 6/15/2012
CES Report of NDE, Visible, Solvent Removable Liquid Penetrant Examination 4401704-PT-0220 for SW-48 root pass, 7/26/13
CES Report of NDE, Visible, Solvent Removable Liquid Penetrant Examination 4401704-PT-0227 for SW-48 first 1/2" weld deposit, 7/29/13
CES Report of NDE, Visible, Solvent Removable Liquid Penetrant Examination 4401704-PT-0249 for SW-48 second 1/2" weld deposit, 8/1/13
CES Report of NDE, Visible, Solvent Removable Liquid Penetrant Examination 4401704-PT-0314 for SW-48 final weld, 9/4/13
WEC-CES Form NPP-1, ASME Data Report for fabricated piping subassemblies for RCL piping hot leg A (S/N L0903404-RCS-PL-L001A)

<u>RCL Hot Leg LOO1B</u>:
IBF CMTR1300005 for SA376-TP316LN pipe (L0903401, Heat-No. 05805), 75 pages, Rev. 00, 23/01/2013
FORONI S.p.A., CMTR 2010/2682, ingot chemical analysis for Heat-No. 05805, Rev. 0, 27/11/2010
IBF Heat Treatment Report HTR1200053, Rev. 00, solution annealing, 05/10/2012
IBF Material Test Report MTR1300002, Rev. 0, ASTM A262, Practice E corrosion testing, 09/01/2013
IBF Material Test Report MTR1300002, Rev. 0, mechanical testing, 09/01/2013
Exova, Test Report 170158, Rev. 0, chemical analysis, 16/11/2012
IBF Dye Penetrant Test Report L120001135, 100% of the outside and inside surfaces, 20/12/12
IBF Ultrasonic Test Report U130000126,100% of the accessible volume, 08/01/2013
IBF Ultrasonic Test Report U130000128,100% of volume weld fit-up areas X 4T for in-service inspectability, 08/01/2013
IBF Marking Record MR1300001, Rev. 00, 17/01/2013
WEC-CES Form NPP-1, ASME Data Report for fabricated piping subassemblies for RCL piping hot leg B (S/N L0903401-RCS-PL-L001B)

RCL Cold Leg LOOP-1A:
IBF CMTR1200197 for SA376-TP316LN pipe (L1200714, Heat-No. 06524), 67 pages, Rev. 00, 12/12/2012
FORONI S.p.A., CMTR 2010/0826, ingot chemical analysis for Heat-No. 06524, Rev. 0, 19/3/2012
IBF Heat Treatment Report HTR1200040, Rev. 00, solution annealing, 21/09/2012
IBF Material Test Report MTR1200161, Rev. 0, ASTM A262, Practice A corrosion testing, 09/01/2013
IBF Material Test Report MTR1200161, Rev. 0, ASTM A262, Practice E corrosion testing, 16/11/2012
IBF Material Test Report MTR1200161, Rev. 0, mechanical testing, 16/11/2012
Exova, Test Report 169927, Rev. 0, chemical analysis, 31/10/2012
IBF Dye Penetrant Test Report L120000923, 100% of the outside surfaces and full bands 1000mm at each beveled ends of the inside surfaces, 12/11/2012
IBF Ultrasonic Test Report U120002343,100% of the accessible volume, 12/11/2012
IBF Ultrasonic Test Report U120002344,100% of volume ends (width > actual fit up + two thickness') for in-service examination, 12/11/2012
IBF Marking Record MR1200198, Rev. 00, 17/01/2012
IBF CMTR1300003 for SA182-F316LN, 90 degree. 1" diameter (Special Bored) boss fitting (L120557301, Heat-No. 06187, Item 43), 52 pages, Rev. 00, 16/01/13
IBF Heat Treatment Report HTR1200076, Rev. 00, solution annealing, 19/01/12
IBF Dye Penetrant Test Report PTR120001050, 100% of the accessible surfaces, 19/12/2012
IBF Visual and Dimensional Check Report VDR1201193, Rev. 00, 21/12/2012
IBF Marking Record MR-1200218, Rev. 00, 20/12/12
WEC Carolina Energy Solutions (CES) Weld Traveler WT-4401704-20 for Boss N19A to Cold Leg 04 pipe, 2/17/2014
CES Weld Material Withdrawal Slip 0918 for Shop Weld (SW) No. 19 (Heat-No. 742369), 7/18/13
CES Report of NDE, Visible, Solvent Removable Liquid Penetrant Examination 4401704-PT-0080 for SW-20 root pass, 7/12/13
CES Report of NDE, Visible, Solvent Removable Liquid Penetrant Examination 4401704-PT-0085 for SW-20 first 1/2" weld deposit, 7/12/13
CES Report of NDE, Visible, Solvent Removable Liquid Penetrant Examination 4401704-PT-0100 for SW-20 second 1/2" weld deposit, 7/16/13
CES Report of NDE, Visible, Solvent Removable Liquid Penetrant Examination 4401704-PT-0145 for SW-20 final weld, 7/22/13
WEC-CES Form NPP-1, ASME Data Report for fabricated piping subassemblies for RCL piping cold leg 1A (S/N L1200714-RCS-PL-L002A)

RCL Cold Leg LOOP-1B:
IBF CMTR1200196 for SA376-TP316LN pipe (L1200713, Heat-No. 06496), 67 pages, Rev. 00, 14/12/2012
FORONI S.p.A., CMTR 2010/0659, ingot chemical analysis for Heat-No. 06496, Rev. 0, 6/3/2012
IBF Heat Treatment Report HTR1200037, Rev. 00, solution annealing, 19/09/2012
IBF Material Test Report MTR1200160, Rev. 0, ASTM A262, Practice E corrosion testing, 31/10/2012
IBF Material Test Report MTR1200160, Rev. 0, mechanical testing, 31/10/2012
Exova, Test Report 169926, Rev. 0, chemical analysis, 31/10/2012
IBF Dye Penetrant Test Report L120000891, 100% of the outside surfaces and full bands 1000mm at each beveled ends of the inside surfaces, 7/11/2012

IBF Ultrasonic Test Report U120002268,100% of the accessible volume, 7/11/2012
IBF Ultrasonic Test Report U120002310,100% of volume ends (width > actual fit up + two thickness') for in-service examination, 08/11/2012
IBF Marking Record MR1200198, Rev. 00, 17/01/2012
IBF CMTR1300004 for SA403-WP316LN, Pressurizer Spray Scoop (L1205570, Heat-No. 06187, Item 32), 18 pages, Rev. 00, 16/01/13
IBF Heat Treatment Report HTR1200076, Rev. 00, solution annealing, 19/01/12
IBF Material Test Report MTR1200186, Rev. 0, mechanical testing for scoop half pipe cap (WP316LN), 25/01/2012
IBF Dye Penetrant Test Report PTR120001035, 100% of the accessible surfaces, 12/01/2013
IBF Visual and Dimensional Check Report VDR1201155, 2 pages, Rev. 00, 14/01/2013
IBF Marking Record MR-1200214, Rev. 00, 14/01/13
WEC Carolina Energy Solutions (CES) Weld Traveler WT-4401704-49 for Pressurizer Spray Scoop N11B to Cold Leg 03 pipe, 2/17/2014
CES Weld Material Withdrawal Slip 0903 for Shop Weld (SW) No. 49 (Heat-No. 742369 and 743940), 7/23/13
Weldstar Certificate of Compliance/Conformance for Arcos, ER316/316L, 3/32" & 1/8" diameters X 36", Heat-No.743940, Lot & Control-Nos., CT9776 & DT9776, respectively, 3/6/2013
Arcos CMTR for SFA 5.9, ER316/316L, 1/8" diameter X 36", Lot/Heat-No. DT9776 - 743940, 2/20/2013
CES Report of NDE, Visible, Solvent Removable Liquid Penetrant Examination 4401704-PT-0135 for SW-49 root pass, 7/22/13
CES Report of NDE, Visible, Solvent Removable Liquid Penetrant Examination 4401704-PT-0146 for SW-49 2nd pass, 7/23/13
CES Report of NDE, Visible, Solvent Removable Liquid Penetrant Examination 4401704-PT-0161 for SW-49 3rd pass, 7/23/13
CES Report of NDE, Visible, Solvent Removable Liquid Penetrant Examination 4401704-PT-0162 for SW-49 4th pass, 7/23/13
CES Report of NDE, Visible, Solvent Removable Liquid Penetrant Examination 4401704-PT-0184 for SW-49 final weld, 7/24/13
WEC-CES Form NPP-1, ASME Data Report for fabricated piping subassemblies for RCL piping cold leg 1B (S/N L1200713-RCS-PL-L002B)

RCL Cold Leg LOOP-2A:
IBF CMTR1200190 for SA376-TP316LN pipe (L1200712, Heat-No. 06470), 69 pages, Rev. 00, 14/12/2012
FORONI S.p.A., CMTR 2012/0426, ingot chemical analysis for Heat-No. 06470, Rev. 0, 14/2/2012
IBF Heat Treatment Report HTR1200031, Rev. 00, solution annealing, 31/08/2012
IBF Material Test Report MTR1200158, Rev. 0, ASTM A262, Practice E corrosion testing, 09/10/2012
IBF Material Test Report MTR1200158, Rev. 0, mechanical testing, 09/10/2012
Exova, Test Report 169924, Rev. 0, chemical analysis, 31/10/2012
IBF Dye Penetrant Test Report L120000846, 100% of the outside surfaces and full bands 1000mm at each beveled ends of the inside surfaces, 10/10/2012
IBF Ultrasonic Test Report U120002093,100% of the accessible volume, 18/10/2012
IBF Ultrasonic Test Report U120002094,100% of volume ends (width > actual fit up + two thickness') for in-service examination, 18/10/2012
IBF Marking Record MR1200191, Rev. 00, 10/11/2012

WEC-CES Form NPP-1, ASME Data Report for fabricated piping subassemblies for RCL piping cold leg 2A (S/N L1200712-RCS-PL-L002C)

RCL Cold Leg LOOP-2B:
IBF CMTR1200191 for SA376-TP316LN pipe (L1200696, Heat-No. 06482), 69 pages, Rev. 00, 14/12/2012
FORONI S.p.A., CMTR 2012/0561, ingot chemical analysis for Heat-No. 06482, Rev. 0, 27/2/2012
IBF Heat Treatment Report HTR1200032, Rev. 00, solution annealing, 04/09/2012
IBF Material Test Report MTR1200159, Rev. 0, ASTM A262, Practice E corrosion testing, 09/10/2012
IBF Material Test Report MTR1200159, Rev. 0, mechanical testing, 09/10/2012
Exova, Test Report 169925, Rev. 0, chemical analysis, 31/10/2012
IBF Dye Penetrant Test Report L120000857, 100% of the outside surfaces and full bands 1000mm at each beveled ends of the inside surfaces, 15/10/2012
IBF Ultrasonic Test Report U120002106,100% of the accessible volume, 18/10/2012
IBF Ultrasonic Test Report U120002107,100% of volume ends (width > actual fit up + two thickness') for in-service examination, 18/10/2012
IBF Marking Record MR1200192, Rev. 00, 10/11/2012
WEC-CES Form NPP-1, ASME Data Report for fabricated piping subassemblies for RCL piping cold leg 2B (S/N L1200696-RCS-PL-L002D)

Section 1A04
APP-PV70-VBR-005, “Equipment Qualification Data Package for 14” Squib Valves for Use in the AP1000 Plant,” Revision 1
APP-PV70-VDR-101001, “Compilation of Design Reports for PV70 Datasheet 101,” Revision 1
APP-PV01-VBR-014, “Equipment Qualification Data Package for Flowserve Globe Stop Valves with Limitorque Motor Operators for Use in the AP1000 Plant,” Revision 1
APP-PV01-VPR-001 “Functional Qualification Summary and Analysis Report per ASME QME-1-2007,” Revision 0
APP-GW-G1-002, “AP1000 Equipment Qualification Methodology,” Revision 5
APP-PV70-Z0-001, “Squib (Pyrotechnic Actuated) Valves, ASME Boiler and Pressure Vessel Code, Section III, Class 1
APP-GW-VP-010, “Equipment Qualification Methodology and Documentation Requirements for AP1000 Safety-Related Valves and Valve Appurtenances,” Revision 2
APP-JE62-VPR-003, “AP1000 Reactor Coolant Pump Speed Sensor Equipment Qualification Seismic Test Report,” Revision 0
Clark Testing Laboratory Report No. T5314, “Vibration Aging Test of Westinghouse Electric RCP Speed Sensor,” Dated August 2011
APP-JE62-VBR-002, “AP1000 Equipment Qualification Data Package for Reactor Coolant Pump Speed Sensor for Use in the AP1000 Plant,” Revision 1
APP-JE62-VBR-001, “AP1000 Equipment Qualification Summary Report for Reactor Coolant Pump Speed Sensor for Use in the AP1000 Plant,” Revision 1
APP-JE62-VPC-002, “AP1000 Reactor Coolant Pump Speed Sensor Equipment Qualification Seismic Response Spectra Calculation,” Revision 1
APP-JE62-VPP-005, “AP1000 Reactor Coolant Pump Speed Sensor Equipment Qualification Seismic Test Procedure,” Revision 1
APP-PV01-VBR-012, “Equipment Qualification Data Package for the FlowServe Flex Wedge Gate Valves with Limitorque Motor Operators for Use in the AP1000 Plant”, Revision 1
APP-PV01-VBR-011, “Equipment Qualification Summary Report for the FlowServe Flex Wedge Gate Valves with Limitorque Motor Operators for Use in the AP1000 Plant”, Revision 1

APP-PV01-VBR-013, “Equipment Qualification Summary Report for Flowserve Globe Stop Valves with Limitorque Motor Operators for Use in the AP1000 Plant,” Revision 1
APP-PV70-VBR-004, “Equipment Qualification Summary Report for 14” Squib Valves for Use in the AP1000 Plant,” Revision 1

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LIST OF ACRONYMS

ADS	Automatic Depressurization System
ANI	Authorized Nuclear Inspector
AOV	Air Operated Valve
ARGOS	Automated Record Gatherer and Operator Simulator
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 Learning
CES	Carolina Energy Solutions
CIM	Component Interface Module
CIS	Containment Internal Structures
CFR	Code of Federal Regulations
CMT	Core Makeup Tank
CMTR	Certified Material Test Report
CoC	Certificates of Conformance
COL	Combined License
CR	Condition Report
CV	Containment Vessel
CVS	Chemical and Volume Control System
DCO	Division of Construction Oversight
ECP	Employee Concern Programs
EQDP	Equipment Qualification Data Package
EQSR	Equipment Qualification Summary Report
ESF	Engineered Safety Feature
FME	Foreign Material Exclusion
FMEA	Failure Modes and Effects Analysis
FPGA	Field Programmable Gate Array
GTAW	Gas Tungsten Arc Welding
HDL	Hardware Description Language
IEEE	Institute of Electrical and Electronics Engineers
IHI	Ishikawajima-Harima Heavy Industries
IMC	Inspection Manual Chapter
IP	Inspection Procedure
IR	Inspection Report
IRWST	In-Containment Refueling Water Storage Tank
ISE	IV&V simulation environment
ITAAC	Inspections, Tests, Analysis, and Inspection Criteria
IV&V	Independent Verification & Validation
M&TE	Measuring & Test Equipment
MOV	Motor Operated Valves
MT	Magnetic Particle Testing
NCR	Non-Conformance Reports
NCV	Non-Cited Violation
NDE	Non-Destructive Examination
NRC	Nuclear Regulatory Commission
PLS	Plant Control System
PMS	Protection and Safety Monitoring System
PQR	Procedure Qualification Records
PT	Liquid Penetrant exam
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
RT	Radiographic Testing
RTA	Requirements Traceability Analysis
RV	Reactor Vessel
S/N	Serial Numbers
SC	Steel Concrete Composite
SCWE	Safety Conscious Work Environment
SGIL	Steam Generator Intermediate Level
SGLL	Steam Generator Lower Level
SHA	Software Hazards Analysis
SNC	Southern Nuclear Operating Company
SOIS	Standard Input/Output Simulator
SRNC	Safety Remote Node Controller
SSC	Structure, System, and Component
UFSAR	Updated Final Safety Analysis Report
URI	Unresolved Item
UT	Ultrasonic Testing
VEGP	Vogtle Electric Generating Plant
VT	Visual Testing
WEC	Westinghouse Electric Company
WLS	Liquid Radwaste System
WPS	Welding Procedure Specification

ITAAC INSPECTED

No.	ITAAC No.	Design Commitment	Inspections, Tests, Analysis	Acceptance Criteria
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.	Inspection will be conducted of the as-built components as documented in the ASME design reports.	The ASME Code Section III design reports exist for the as-built components identified in Table 2.1.2-1 as ASME Code Section III.
14	2.1.02.02b	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.	Inspection will be conducted of the as-built piping as documented in the ASME design reports.	The ASME code Section III design reports exist for the as-built piping identified in Table 2.1.2-2 as ASME Code Section III.
20	2.1.02.05a.ii	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.	ii) Type tests, analyses, or a combination of type tests and analyses of seismic Category I equipment will be performed.	ii) A report exists and concludes that the seismic Category I equipment can withstand seismic design basis loads without loss of safety function.
24	2.1.02.07a.i	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) Type tests, analyses, or a combination of type tests and analyses will be performed on Class 1E equipment located in a harsh environment.	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.

No.	ITAAC No.	Design Commitment	Inspections, Tests, Analysis	Acceptance Criteria
28	2.1.02.08a.i	8.a) The pressurizer safety valves provide overpressure protection in accordance with Section III of the ASME Boiler and Pressure Vessel Code.	i) Inspections will be conducted to confirm that the value of the vendor code plate rating is greater than or equal to system relief requirements.	i) The sum of the rated capacities recorded on the valve ASME Code plates of the safety valves exceeds 1,500,000 lb/hr.
34	2.1.02.08d.iii	8.d) The RCS provides automatic depressurization during design basis events.	iii) Inspections of each fourth-stage ADS valve will be conducted to determine the flow area through each valve.	iii) The flow area through each fourth-stage ADS valve is > 67 in2.
56	2.1.02.12a.iv	12.a) The automatic depressurization valves identified in Table 2.1.2-1 perform an active safety-related function to change position as indicated in the table.	iv) Tests or type tests of squib valves will be performed that demonstrate the capability of the valve to operate under its design conditions.	iv) A test report exists and concludes that each squib valve changes position as indicated in Table 2.1.2-1 under design conditions.
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.	Inspection will be conducted of the as-built components as documented in the ASME design reports.	The ASME Code Section III design reports exist for the as-built components identified in Table 2.2.1-1 as ASME Code Section III.
93	2.2.01.03a	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.	Inspection of the as-built pressure boundary welds will be performed in accordance with the 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.

No.	ITAAC No.	Design Commitment	Inspections, Tests, Analysis	Acceptance Criteria
96	2.2.01.04a.ii	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.	ii) Impact testing will be performed on the containment and pressure-retaining penetration materials in accordance with the ASME Code Section III, Subsection NE, to confirm the fracture toughness of the materials.	ii) A report exists and concludes that the containment and pressure-retaining penetration materials conform with fracture toughness requirements of the ASME Code Section III.
99	2.2.01.05.ii	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.	ii) Type tests, analyses, or a combination of type tests and analyses of seismic Category I equipment will be performed.	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.
101	2.2.01.06a.i	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.	i) Type tests, analyses, or a combination of type tests and analyses will be performed on Class 1E equipment located in a harsh environment.	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.

No.	ITAAC No.	Design Commitment	Inspections, Tests, Analysis	Acceptance Criteria
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.	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.
127	2.2.02.05a.ii	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.	ii) Type tests, analyses, or a combination of type tests and analyses of seismic Category I components will be performed.	ii) A report exists and concludes that the seismic Category I components can withstand seismic design basis loads without loss of safety function.
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.	Inspection will be conducted of the as-built components as documented in the ASME design reports.	The ASME Code Section III design reports exist for the as-built components identified in Table 2.2.3-1 as ASME Code Section III.
161	2.2.03.03a	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.	Inspection of the as-built pressure boundary welds will be performed in accordance with the 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.

No.	ITAAC No.	Design Commitment	Inspections, Tests, Analysis	Acceptance Criteria
166	2.2.03.05a.ii	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.	ii) Type tests, analyses, or a combination of type tests and analyses of seismic Category I equipment will be performed.	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.
170	2.2.03.07a.i	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) Type tests, analyses, or a combination of type tests and analyses will be performed on Class 1E equipment located in a harsh environment.	i) A report exists and concludes that 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.
214	2.2.03.12a.i	12.a) The squib valves and check valves identified in Table 2.2.3-1 perform an active safety-related function to change position as indicated in the table.	i) Tests or type tests of squib valves will be performed that demonstrate the capability of the valve to operate under its design condition.	i) A test report exists and concludes that each squib valve changes position as indicated in Table 2.2.3-1 under design conditions.

No.	ITAAC No.	Design Commitment	Inspections, Tests, Analysis	Acceptance Criteria
362	2.3.06.05a.ii	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.	ii) Type tests, analyses, or a combination of type tests and analyses of seismic Category I equipment will be performed.	ii) A report exists and concludes that the seismic Category I equipment can withstand seismic design basis loads without loss of safety function.
534	2.5.02.07a	7.a) The PMS provides process signals to the PLS through isolation devices.	Type tests, analyses, or a combination of type tests and analyses of the isolation devices will be performed.	A report exists and concludes that the isolation devices prevent credible faults from propagating into the PMS.
537	2.5.02.07d	7.d) The PMS ensures that the automatic safety function and the Class 1E manual controls both have priority over the non-Class 1E soft controls.	Type tests, analyses, or a combination of type tests and analyses of the PMS manual control circuits and algorithms will be performed.	A report exists and concludes that the automatic safety function and the Class 1E manual controls both have priority over the non-Class 1E soft controls.
553	2.5.02.14	14. The Component Interface Module (CIM) is developed using a planned design process which provides for specific design documentation and reviews. {Design Acceptance Criteria}	An inspection and or an audit will be performed of the processes used to design the hardware, development software, qualification and testing.	A report exists and concludes that CIM meets the below listed life cycle stages. Life cycle stages: a. Design requirements phase, may be referred to as conceptual or project definition phase b. System definition phase c. Hardware and software development phase, consisting of hardware and software design and implementation d. System integration and test phase e. Installation phase

No.	ITAAC No.	Design Commitment	Inspections, Tests, Analysis	Acceptance Criteria
641	2.6.09.01	1. The external walls, doors,ceiling, and floors in the main control room, the central alarm station, and the secondary alarm station are bullet resistant to at least Underwriters Laboratory Ballistic Standard 752, level 4.	See ITAAC Table 3.3-6, item 14.	See ITAAC Table 3.3-6, item 14.
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.

No.	ITAAC No.	Design Commitment	Inspections, Tests, Analysis	Acceptance Criteria
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.
766	3.3.00.02a.ii.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.	ii) An inspection of the as-built concrete thickness will be performed.	ii.c) A report exists that concludes that as-built concrete thicknesses of the non-radiologically controlled area of the auxiliary building sections conform to the building sections defined in Table 3.3-1.
767	3.3.00.02a.ii.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.	ii) An inspection of the as-built concrete thickness will be performed.	ii.d) A report exists that concludes that the as-built concrete thicknesses of the radiologically controlled area of the auxiliary building sections conform to the building sections defined in Table 3.3-1.

No.	ITAAC No.	Design Commitment	Inspections, Tests, Analysis	Acceptance Criteria
779	3.3.00.03c	3. Walls and floors of the nuclear island structures as defined on Table 3.3-1 except for designed openings or penetrations provide shielding during normal operations.	Inspection of the as-built nuclear island structures wall and floor thicknesses will be performed.	c) A report exists and concludes that the shield walls and floors of the non-radiologically controlled area of the auxiliary building as defined in Table 3.3-1 except for designed openings or penetrations are consistent with the concrete wall thicknesses provided in Table 3.3-1.
780	3.3.00.03d	3. Walls and floors of the nuclear island structures as defined on Table 3.3-1 except for designed openings or penetrations provide shielding during normal operations.	Inspection of the as-built nuclear island structures wall and floor thicknesses will be performed.	d) A report exists and concludes that the shield walls and floors of the radiologically controlled area of the auxiliary building as defined in Table 3.3-1 except for designed openings or penetrations are consistent with the concrete wall thicknesses provided in Table 3.3-1.
820	3.3.00.14	14. The external walls, doors, ceiling, and floors in the main control room, the central alarm station, and the secondary alarm station 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 main control room, the central alarm station, and the secondary alarm station.	A report exists and concludes that the external walls, doors, ceilings, and floors in the main control room, the central alarm station, and the secondary alarm station are bullet-resistant to at least Underwriters Laboratory Ballistic Standard 752, level 4.