UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
245 PEACHTREE CENTER AVENUE NE, SUITE 1200
ATLANTA, GEORGIA 30303-1257

February 13, 2017

Mr. Ronald A. Jones
Vice President, New Nuclear Operations
South Carolina Electric and Gas
P.O. Box 88 (Mail Code P40)
Jenkinsville, SC 29065-0088

SUBJECT: VIRGIL C. SUMMER NUCLEAR STATION UNITS 2 AND 3 - NRC INTEGRATED INSPECTION REPORTS 05200027/2016004, 05200028/2016004

Dear Mr. Jones:

On December 31, 2016, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at Virgil C. Summer Nuclear Station Units 2 and 3. The enclosed inspection report documents the inspection results, which the inspectors discussed on January 12, 2017, with you, Mr. Jeffrey Archie 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.

Three NRC-identified findings of very low safety significance (Green) were identified during this inspection. These findings were determined to involve a violation of NRC requirements. However, because of their very low safety significance, and because the issues were entered into your corrective action program, the NRC is treating the issues as non-cited violations (NCV) in accordance with Section 2.3.2.a of the NRC Enforcement Policy.

If you contest these NCVs, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington DC 20555-0001; with copies to the Regional Administrator, Region II; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector office at the Virgil C. Summer Nuclear Station Units 2 and 3.

If you disagree with the cross-cutting aspects assigned to either 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 Virgil C. Summer Units 2 and 3.

In accordance with 10 CFR 2.390, “Public inspections, exemptions, requests for withholding,” of the NRC's "Agency Rules of Practice and Procedure," a copy of this letter, its enclosure, and your response (if any), will be made available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system ADAMS. ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room). To the extent possible, your response should not include any personal privacy or proprietary information so that it can be made available to the public without redaction.

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

Sincerely,

/RA/

Michael Ernstes, Branch Chief
Construction Inspection Branch 3
Division of Construction Oversight

Docket Nos.: 5200027, 5200028
License Nos: NPF-93 (Unit 2), NPF-94 (Unit 3)

Enclosure: NRC Inspection Report (IR) 05200027/2016004
and 05200028/2016004
w/Attachment: Supplemental Information

cc w/encl: (See page 5)

Letter to R. Jones from Mike Ernstes dated

SUBJECT: VIRGIL C. SUMMER NUCLEAR STATION UNITS 2 AND 3 - NRC INTEGRATED INSPECTION REPORTS 05200027/2016004, 05200028/2016004

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U.S. NUCLEAR REGULATORY COMMISSION
Region II

Docket Numbers:	5200027 5200028
License Numbers:	NPF-93 NPF-94
Report Numbers:	05200027/2016004 05200028/2016004
Licensee:	South Carolina Electric & Gas
Facility:	Virgil C. Summer Nuclear Station Unit 2 Virgil C. Summer Nuclear Station Unit 3
Locations:	Jenkinsville, SC and Cranberry Township, PA
Inspection Dates:	October 1, 2016 through December 31, 2016
Inspectors:	C. Abbott, Vendor Inspector, DCIP A. Artayet, Senior Construction Inspector, DCO P. Carman, Construction Inspector, DCO L. Castelli, Senior Construction Inspector, DCO G. Crespo, Senior Construction Inspector, DCO P. Donnelly, Resident Inspector, DCO D. Harmon, Construction Inspector, DCO P. Heher, Construction Project Manager, DCO J. Hickman, Emergency Preparedness Inspector, DRS J. Jacobson, Vendor Inspector, DCIP N. Karlovich, Resident Inspector, DCO G. Khouri, Senior Construction Inspector, DCO J. Lizardi-Barreto, Construction Inspector, DCO T. Nazario, Senior Resident Inspector, DCO D. Piccirillo, Senior Construction Inspector, DCO A. Ponko, Senior Construction Inspector, DCO C. (Mac) Read, Resident Inspector, DCO S. Sanchez, Emergency Preparedness Inspector, DRS T. Steadham, Senior Construction Inspector, DCO K. Steddenbenz, Construction Inspector, DCO J. Walker, Resident Inspector, DCO
Accompanying Personnel:	Lauren Kent, Reactor Operations Engineer, NRO Alexander Tsirigotis, Mechanical Engineer, NRO/DEIA/MEB Yuken Wong, Sr. Mechanical Engineer, NRO/DEIA/MEB
Approved by:	Michael Ernstes, Branch Chief Construction Inspection Branch 3 Division of Construction Oversight

Enclosure

SUMMARY OF FINDINGS7

Inspection Report (IR) 05200027/2016004, 05200028/2016004; 10/01/2016 through 12/31/2016; Virgil C. Summer Nuclear Station Unit 2, Virgil C. Summer Nuclear Station Unit 3, routine integrated inspection report.

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. Three green non-cited violations (NCVs) associated with the Inspection/Testing and the Design/Engineering cornerstones were identified consistent with the NRC Enforcement Policy, Section 2.3 and the enforcement guidance outlined in enforcement guidance memorandum number EGM-11-006. 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 inspectors identified an ITAAC finding of very low safety significance (Green) and associated non-cited violation (NCV) of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," for South Carolina Electric and Gas (licensee), through their contractor, Carolina Energy Services (contractor), failure to provide adequate guidance to quality control inspectors, resulting in an indeterminate quality of the machined ends of the reactor coolant loop piping. The licensee entered this issue into their corrective action program as Condition Report (CR)-NND-16-02095, and the EPC entered the issue into their corrective action program as Discrete Issue (DI) 100428204.

The finding was associated with the Inspection/Testing Cornerstone. The inspectors determined the performance deficiency was more than minor following the guidance in IMC 0613, "Power Rector Construction Inspection Reports," Appendix E, because it was similar to Example 7, which states, in part, that "Inspectors identified that a licensee's procedure was not adequate. The Performance Deficiency is not minor if the procedure didn't adequately implement technical or quality requirements leaving a quality process or construction activity unacceptable or indeterminate." The inadequate procedure and subsequent inadequate inspection resulted in the quality of the reactor coolant loop piping to be indeterminate and required re-inspection following engineering evaluation and procedural changes.

The finding was evaluated under the construction significance determination process as outlined in IMC 2519, "Construction Significance Determination Process." The inspectors determined the finding was of very low safety significance (Green) because the piping was re-inspected following the procedure changes, and the piping was determined to be satisfactory. The inspectors determined that this finding had a cross-cutting aspect in the area of Human Performance for training, because had the organization ensured a knowledgeable, technically competent workforce, the inspection may have been of sufficient quality despite the inadequate procedure, or the quality control inspectors could have identified the inadequate procedure. [H.9] (Section 1A05)

Green: The inspectors identified an ITAAC finding of very low safety significance (Green) and associated non-cited violation (NCV) of Title 10 of the Code of Federal Regulations (10 CFR) Part 50, Appendix B, Criterion III, "Design Control" for South Carolina Electric & Gas Company's (SCE&G) failure through their contractor Westinghouse Electric Company (WEC) to adequately implement measures to assure that design inputs are correctly translated into design documents. The licensee entered this finding into their corrective action program as SCE&G Condition Report (CR) CR-NND-16-01990 and WEC Corrective Action, Prevention, and Learning (CAPAL) System Issue ID 100423100.

The finding was associated with the Design/Engineering Cornerstone. The finding was considered more than minor because the performance deficiency represented a substantive failure to adequately implement a quality assurance process that rendered the quality of an structure, system, or component (SSC) indeterminate. The inspectors evaluated the finding in accordance with IMC 2519, "Construction Significance Determination Process," and determined the finding was of very low safety significance because the licensee was able to demonstrate with reasonable assurance that the design function of the in-containment refueling water storage tank (IRWST) would not be impaired. The inspectors determined that the finding represented an ITAAC finding because it was material to the acceptance criteria of VCSNS Units 2 and 3 ITAAC 760, in that, if left uncorrected, the licensee may not have been able to demonstrate that the acceptance criteria of these ITAAC were met. The acceptance criteria of these ITAAC require that all deviations between the as-built structures and the approved designs be reconciled to verify that the as-built structures will withstand the design basis loads without a loss of structural integrity or other safety-related functions. The inspectors determined that the failure to adequately implement measures to assure that design inputs are correctly translated into design documents may have resulted in a deviation from the approved design that would not have been reconciled by the licensee. The inspectors determined the finding had a cross-cutting aspect in the Human Performance area because the detailed design documentation for the CA03 module did not provide evidence that the design was performed in accordance with quality assurance requirements, and that the IRWST would have performed satisfactorily in service. [H.7] (Section 1A18)

B. Licensee-Identified Violations

None

REPORT DETAILS

Summary of Plant Construction Status

In Unit 2, concrete was placed in the reinforced section of the shield building from azimuth 177 to 182 from elevation 100'-0" through 109'-10" and on the east side of containment up to elevation 105'-2". Work continued in preparation of the east steam generator lift and set, including initiating welding of the east reactor coolant loop piping to the reactor vessel nozzles and installation of the lower and intermediate lateral steam generator support brackets to the walls of CA01.

In Unit 3, the CA01 module was lifted into the containment vessel. The CA01 module comprises the two steam generator compartments, the pressurizer compartment, and a fuel transfer cavity. Concrete was placed for the final reinforced concrete section on the west side of the shield building from azimuth 182 to 342 from elevation 96'6" to 100'0". Concrete was also placed into the transition panels of the steel composite panels above the final reinforced concrete section from elevation 100'0" to 103'6".

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 2) ITAAC Number 2.1.01.06.ii (7) / Family 13E
(Unit 3) ITAAC Number 2.1.01.06.ii (7) / Family 13E

a. Inspection Scope

The inspectors performed document reviews associated with ITAAC Number 2.1.01.06.ii (7). The inspectors used the following NRC Inspection Procedures (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 the Equipment Qualification Data Packages (EQDPs) for the following components:

- Refueling Machine (FHS-FH-01)
- Fuel Handling Machine (FHS-FH-02)

For the components listed above, the inspectors reviewed the analysis reports to verify that the design codes and standards, analysis methodology, and seismic response spectra were consistent with the Westinghouse Electric Company (WEC) design

specifications, and the acceptance criteria as stated in the design specifications and ITAAC were met. The inspectors determined whether the design specifications and analysis reports used the most up-to-date seismic response spectrum input.

b. Findings

No findings were identified.

1A02 (Unit 2) ITAAC Number 2.1.01.07.iv (11) / Family 13F
(Unit 3) ITAAC Number 2.1.01.07.iv (11) / Family 13F

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 2.1.01.07.iv (11). The inspectors used the following NRC IPs/sections to perform this inspection:

- 65001.F-02.01 - Design Document Review

The inspectors reviewed the following technical reports associated with the spent fuel storage racks to determine that the racks could withstand design basis dropped spent fuel assembly loads and maintain the calculated effective neutron multiplication factor required by 10 CFR 50.68(1) limits:

- APP-GW-GLR-033, "Spent Fuel Storage Racks Structural/Seismic Analysis," Revision (Rev.) 5
- APP-GW-GLR-029, "AP1000 Spent Fuel Storage Racks Criticality Analysis," Rev. 4

b. Findings

No findings were identified.

1A03 (Unit 2) 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:

- 65001.03-02.01 - Purchase and Receipt of Materials
- 65001.03-02.02 - Storage and Handling
- 65001.03-02.07 - Review of Records
- 65001.03-02.08 - Problem Identification and Resolution
- 65001.F-02.01 - Design Document Review
- 65001.F-02.02 - Fabrication Records Review
- 65001.F-02.04 - General QA Review

The inspectors reviewed procurement and fabrication records associated with the Unit 2 reactor coolant system (RCS) loop piping to verify that materials met the applicable requirements of design documents and the American Society of Mechanical Engineers (ASME) Section III Code. The inspectors reviewed records for hot leg line number L001A, serial number L0903382; cold leg line number L002B, serial number L1102582; and cold leg line number L002D, serial number L1102577. Specifically, the inspectors reviewed quality assurance data packages, certificates of conformance, certified material test reports, nondestructive examination reports, and test reports to verify the materials' chemical composition, mechanical properties, and fabrication requirements were met.

The inspectors reviewed ASME Code Form NPP-1 reports, weld records, nondestructive examination reports, and certified material test reports related to the attachments (thermowell bosses and pressurizer spray scoop half-cap) on the RCS pipe lines listed above. The inspectors reviewed these records to ensure the attachments fabricated by sub-contractors were in accordance with the design specifications and ASME Code requirements.

The inspectors performed an independent inspection and measurements of a sample of branch nozzles and thermowell bosses for hot leg L001A and cold L002B to determine whether critical attributes and arrangements conformed to design requirements. The inspectors checked storage conditions to verify that the material met storage and handling requirements.

The inspectors reviewed a sample of nonconforming reports related to out of tolerance dimensional measurements on the RCS piping legs. The inspectors reviewed these reports to determine whether the conditions were properly evaluated against ASME Code requirements and design specifications and received the appropriate amount of review.

b. Findings

No findings were identified.

1A04 (Unit 2) ITAAC Number 2.1.02.02b (14) / Family 03F
(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:

- 65001.16-02.02 - Design Input
- 65001.16-02.03 - Design Documents
- 65001.16-02.04 - Design Analysis
- 65001.16-02.05 - Design Verification
- 65001.20 - Inspection of Safety-Related Piping Design Acceptance Criteria (DAC) Related ITAAC

The inspectors interviewed personnel and reviewed documents associated with the RCS piping design at the Westinghouse world headquarters facility at Cranberry Township, PA, to verify if the piping design was completed in accordance with the requirements contained in the Updated Final Safety Analysis Report (UFSAR), ASME Section III, and 10 CFR 50.55a. Specifically, the inspectors performed this review to determine if:

- processes used for piping design calculations, design control, and records control met the technical and quality requirements contained in the UFSAR and the ASME Code, Section III, Subsections NCA and NB; and
- design drawings, specifications, and records were consistent with the analyzed configurations.

The inspectors performed these reviews for the following lines:

- Reactor Coolant Loop Hot and Cold Legs (RCS-L001A/B and RCS-L002A/B/C/D)
- Pressurizer Spray Piping (RCS-L106, -L110A/B, -L212A/B, -L213, and -L215)

The inspectors reviewed the applicable piping design specifications for each line to verify the methodology used and the design inputs were as specified in the UFSAR and as required by the ASME Code. The inspectors reviewed aspects such as the code year and edition and code cases; materials, manufacturing, testing and examination, and quality assurance requirements; design inputs; and load conditions and combinations. The inspectors reviewed the Design Reports / Stress Reports to determine if the design met the applicable design specification and that the design was developed using the methodology called out in the UFSAR and the ASME Code.

The inspectors reviewed piping analysis reports to determine if:

- calculations were readily retrievable, controlled, and identified by subject, originator, reviewer, approver, and date and revisions were easily retrievable and subjected to the same rigor of the original approval;
- documentation included the objective, inputs and their sources, background data, assumptions, and computer inputs and conclusions; and
- design verification was performed by a competent individual or group other than those who performed the original design.

For the piping analyses calculations, the inspectors reviewed the Design Reports / Stress Reports to verify if the resulting design met the design specification and that the design was developed using the methodology called out in the UFSAR and the ASME Code. The inspectors reviewed the piping analyses to determine if the following were adequately evaluated:

- pipe size, schedule, wall thickness, and materials;
- loading combinations;
- modeling of additional masses due to weight from support members/snubbers/springs and branch piping;
- assumptions and open items (e.g., valve weight) in the design report;
- piping package model scope including decoupling criteria;

- thermal and seismic analysis including damping value, response spectra/time history input, and seismic anchor movement;
- dynamic analysis considerations such as valve open/closure events;
- ASME Code stress qualification delineated in Subsection NB-3600; and
- overall functional capability of the piping system

b. Findings

No findings were identified.

1A05 (Unit 2) ITAAC Number 2.1.02.03b (16) / Family 03B

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 2.1.02.03b (16). The inspectors used the following NRC IPs/sections to perform this inspection:

- 65001.03-02.02 - Storage and Handling
- 65001.03-02.03 - Installation and Welding
- 65001.03-02.07 - Review of Records
- 65001.03-02.08 - Problem Identification and Resolution
- 65001.A.02.03 - Independent Assessment/Measurement Inspection
- 65001.B-02.01 - Program and Procedures Review
- 65001.B-02.02 - Welding Procedure Qualification
- 65001.B-02.03 - Welder Qualification
- 65001.B-02.04 - Production Controls
- 65001.F-02.03 - Observation of Fabrication Activities

Inspectors performed a direct inspection of reactor coolant loop piping machining in preparation for installation in the Unit 2 containment building. The inspectors observed work activities for the east steam generator hot leg (L001B) and two cold legs (L002C and L002D). The ends of the pipes were machined to fit-up to the east side of the reactor pressure vessel. Inspectors observed work activities to verify:

- machining and surface finishing was accomplished under controlled conditions and in accordance with applicable specifications, drawings, and approved procedures;
- key pipe critical dimensions and materials satisfied design specifications, requirements, and relevant ITAAC;
- deviations from the design due to as-built conditions were identified and documented appropriately; and
- records reflected that completed work met design specifications and acceptance criteria.

The inspectors observed the quality control inspections of the machined pipe ends to verify:

- measuring and test equipment was controlled and within calibration date;

- inspectors were qualified to perform the inspections;
- inspectors maintained independence from the fabrication crew;
- inspectors performed activities in accordance with applicable specifications, drawings, and approved procedures;
- procedures were adequate to perform the inspections;
- deviations from the design due to as-built conditions were identified and documented appropriately; and
- records reflected that completed inspections met design specifications and acceptance criteria.

The inspectors observed NDE of the reactor vessel nozzle and fit-up activities associated with the east steam generator hot leg and cold legs. Specifically, the inspectors observed the liquid dye penetrant test on the east reactor vessel nozzles prior to fit-up on the hot and cold legs to determine if the requirements of procedure CGQP-9.7, "Liquid Penetrant Examination and Acceptance Standards for Welds, Base Materials and Cladding" were met. The inspectors also reviewed the quality control inspectors' qualification records to determine if the personnel performing the work were properly qualified. The inspectors observed fit-up activities in the field and performed independent inspections of the as-fit configuration to determine if the applicable requirements of ASME Boiler and Pressure Vessel (B&PV) Code, Section III, Division 1 - Subsection NB, for Class 1 components were met.

The inspectors observed welding of the reactor coolant system associated with the east steam generator. Specifically, the inspectors observed the fit-up and welding of field weld BCL04 between RCS line L002D to the reactor vessel north east cold leg nozzle and BHL01 between RCS line L001B and the reactor vessel east hot leg nozzle by subcontractor Carolina Energy Services to determine if it was being welded in accordance with the approved welding program and the applicable requirements of ASME B&PV Code, Section III, Division 1 - Subsection NB, for Class 1 components. The inspectors checked to verify if the following attributes were within the limits of the welding procedure:

- Shielding gas type and flow rate
- Weld area cleanliness
- The weld was protected from wind and moisture
- Amperes and voltage
- Wire feed speed
- Travel speed
- Oscillation and pulsing variables
- Preheat and interpass temperatures
- Welding filler metal type, size, and classification

The inspectors reviewed a sample of certified material test reports (CMTRs) associated with the weld filler material to verify that the chemical analysis and mechanical properties were in accordance with the requirements of the 1998 Edition including 2000 Addenda of the ASME Section III, Subsection NB, for Class 1 Components.

The inspectors additionally reviewed a sample of Carolina Energy Services' welding program, procedures, and qualification records to determine if they were written and qualified in accordance with the applicable code and quality requirements. The inspectors reviewed the welding procedure that was being used to weld the reactor

coolant system, CWPS-8-8-T-A01, Rev. 4, and the associated procedure qualification records to determine if it had been written and qualified in accordance with ASME Code Sections III and IX. The inspectors reviewed the traveler being used to determine if the work steps and sequences were planned, controlled, executed, and signed to ensure adequate control of the work. The inspectors also reviewed a sample of welder qualification records to determine if they had been qualified in accordance with the requirements of ASME Section IX.

b. Findings

Introduction

The inspectors identified an ITAAC finding of very low safety significant (Green) and associated non-cited violation (NCV) of 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," for the licensee's, through their subcontractor's, failure to provide adequate guidance to quality control inspectors, resulting in an indeterminate quality of the machined ends of the reactor coolant loop piping.

Description

On November 3, 2016, inspectors observed machining and inspections of the Unit 2 reactor coolant loop piping in preparation for welding onto the reactor pressure vessel. The inspectors identified that during the quality control inspection of the machined surfaces, quality control inspectors failed to measure the entire circumference of the pipe to determine if the acceptance criteria were satisfied. Specifically, for five of the seven dimensional attributes of the machined surfaces, the inspectors only measured a single point on the end of the pipe rather than measuring around the entire pipe. Upon review of procedure PI-4403001, "VC Summer Unit 2 RCL Piping Machining," Rev. 1, the inspectors identified insufficient requirements on how many points to measure and how to measure those dimensions. As a result of quality control inspectors following the procedure, an insufficient number of sample points were measured for five of the seven dimensions. Following an evaluation by engineering, the procedure was revised to require three sample points spaced 120 degrees apart, which were necessary to establish the plane of the counterboring machine. The quality control inspectors were retrained on the revised procedure and how to accurately measure each dimension. The licensee entered this issue into their corrective action program as CR-NND-16-02095, and the EPC contractor entered the issue into their corrective action program as Discrete Issue (DI) 100428204. The inspectors determined that the failure to provide requirements on how to measure the pipe was contrary to 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," which requires, in part, that "activities affecting quality shall be prescribed by documented instructions, procedures, or drawings, of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions, procedures, or drawings."

Analysis

The inspectors determined that the failure to provide adequate guidance to quality control inspectors represented a performance deficiency. The performance deficiency was considered more than minor and similar to Example 7 of IMC 0613, which states, in part, that "Inspectors identified that a licensee's procedure was not adequate. The Performance Deficiency is not minor if the procedure didn't adequately implement technical or quality requirements leaving a quality process or construction activity unacceptable or indeterminate." The insufficient number of sample points resulted in the quality of the reactor coolant loop piping to be indeterminate and required re-inspection following engineering evaluation, procedural changes, and retraining.

The inspectors determined that the finding represented an ITAAC finding because it was material to the acceptance criteria of VCSNS Unit 2 ITAAC 16 (2.1.02.03b), in that, if left uncorrected, the licensee may not have been able to demonstrate that the acceptance criteria of this ITAAC was met. The acceptance criteria of this ITAAC requires that inspection of the as-built pressure boundary welds will be performed in accordance with the ASME Code Section III. The inspectors determined that the failure to adequately perform a quality control inspection prior to weld fit-up may have resulted in a non-compliance with the ASME Code Section III and design requirements.

The inspectors concluded that this finding was associated with the Inspection/Testing Cornerstone. The inspectors evaluated the finding under the construction significance determination process as outlined in IMC 2519, Appendix A. The inspectors determined the finding was of very low safety significance (Green) because the piping was re-inspected following the procedure changes, and the piping was determined to be satisfactory. The inspectors screened the finding for a possible construction crosscutting aspect in accordance with Appendix F, "Construction Cross-Cutting Components and Aspects" of IMC 0613. This finding has a cross-cutting aspect in the area of Training, because had the organization ensured a knowledgeable, technically competent workforce, the inspection may have been of sufficient quality despite the inadequate procedure, or the quality control inspectors could have identified the inadequacies of the procedure. [H.9]

Enforcement

10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," requires, in part, that "activities affecting quality shall be prescribed by documented instructions, procedures, or drawings, of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions, procedures, or drawings." Contrary to the above, during the inspection of the reactor coolant loop piping, the licensee's subcontractor failed to provide adequate guidance on how to perform the measurements on the ends of the pipe, including how many sample points to take for each dimension and how to measure those dimensions. The licensee entered this issue into their corrective action program as CR-NND-16-02095, and the EPC contractor entered the issue into their corrective action program as DI 100428204. The EPC contractor took immediate actions to revise procedures, retrain personnel, and perform the inspections. Because this violation was of very low safety significance (Green) and it was entered into the corrective action program, this violation is being treated as a non-cited violation (NCV 05200027/2016004-01), "Failure to Provide Adequate Procedures for Quality Control Inspections of Safety-Related Piping," consistent with Section 2.3.2 of the NRC Enforcement Policy and EGM 11-006.

Since all corrective actions have been fully implemented, and since the piping was re-inspected and found satisfactory, this NCV is closed because it no longer impacts the acceptance criteria of VCSNS Unit 2 ITAAC 16 (2.1.02.03b).

1A06 (Unit 2) ITAAC Number 2.1.03.03 (72) / Family 05F

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 2.1.03.03 (72). The inspectors used the following NRC IPs/sections to perform this inspection:

- 65001.05-02.03 - RPV Installation
- 65001.05-02.04 - Installed Vessel Protection
- 65001.05-02.08 - Problem Identification and Resolution

The inspectors performed an inspection of construction activities associated with the installation of the Unit 2 reactor vessel. Prior to concrete placement inside the Unit 2 reactor cavity to elevation 98'-0", the inspectors reviewed the installation of the reactor vessel main embedments of the four reactor vessel supports to determine if:

- Embedments were installed in accordance with the approved procedures and drawings; and
- Embedments were located properly in the structure, were secured properly and free of concrete and excessive rust, and had proper clearances.

The inspectors observed the installation and mounting of the Unit 2 reactor vessel supports. The inspectors observed machining of the embedment plates and positioning of the reactor vessel supports on the embedment plates. The inspectors observed the boring and tapping of dowel stud holes through the reactor vessel support flange and embedment plates to determine if:

- Nonconformance reports documenting deficiencies identified during the boring and tapping of dowel stud holes through the reactor vessel support flange and embedment plates had been documented and properly dispositioned;
- Dowel stud holes were machined in accordance with the approved procedures and drawings;
- Individuals performing the machining activities were qualified to perform the associated work procedures;
- Supervisors and Quality Control (QC) inspectors provided appropriate oversight during the installation activities; and
- Adequate foreign material exclusion controls were put in place following the boring of the dowel stud holes.

The inspectors observed the installation of the Unit 2 reactor vessel onto the reactor vessel supports in the reactor cavity. Specifically, the inspectors observed the upending and installation of the reactor vessel, reviewed the approved installation procedure, and reviewed the applicable rigging plan to determine if the:

- Reactor vessel rigging was properly installed on the heavy lift derrick prior to the lift;
- Reactor vessel and J-skid were upended in accordance with the approved lift procedure;
- Foreign material (i.e., tape and sheet plastic) were removed from the exterior of the vessel prior to installation in the reactor cavity;
- Reactor vessel did not make physical contact with the metal reflective insulation package while being inserted into the reactor cavity; and
- Reactor vessel was properly placed on the reactor vessel support leveling screws.

In addition, the inspectors reviewed survey data to determine if the final location and orientation of the reactor vessel met FSAR and design requirements. Specifically, the inspectors reviewed drawing VS2-1220-CCK-800000, "Unit 2 Nuclear Island As-Built Key Dimensions at Elev. 100'-0",” to determine if the requirements of Tier 1, Table 3.3-5 dimension X7 were met, and reviewed the hot and cold leg nozzle elevation, and vessel radial alignment results in traveler QAT-4403081-001-RV to determine if the final reactor vessel location met design requirements.

b. Findings

No findings were identified.

1A07 (Unit 2) ITAAC Number 2.1.03.06.ii (76) / Family 05E
(Unit 3) ITAAC Number 2.1.03.06.ii (76) / Family 05E

a. Inspection Scope

The inspectors performed document reviews associated with ITAAC Number 2.1.03.06.ii (76). 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
- 65001.E - Inspection of the ITAAC-Related Qualification Program

The inspectors reviewed the EQDPs for the following components:

- Excore Source Range Detectors (RXS-JE-NE001A, RXS-JE-NE001B, RXS-JE-NE001C, and RXS-JE-NE001D)
- Excore Intermediate Range Detectors (RXS-JE-NE002A, RXS-JE-NE002B, RXS-JE-NE002C, and RXS-JE-NE002D)
- Excore Power Range Detectors (RXS-JE-NE003A, RXS-JE-NE003B, RXS-JE-NE003C, RXS-JE-NE003D, RXS-JE-NE004A, RXS-JE-NE004B, RXS-JE-NE004C, and RXS-JE-NE004D)

The inspectors reviewed the WEC design specifications to verify that the seismic classification, and implementation of standards from the Institute of Electrical and Electronic Engineers (IEEE) 344-1987 and ASME QME-1-2007, test methodologies,

and required response spectra were consistent with the FSAR descriptions. The inspectors reviewed the test reports to verify that the design codes and standards, test methodology, and seismic response spectra were consistent with the design specifications, and the acceptance criteria as stated in the design specifications and ITAAC were met. The inspectors reviewed test reports to verify that the test response spectra enveloped the required response spectra, including a 10 percent margin, as specified in IEEE 344 - 1987. Additionally, the inspectors verified that the functionality of the detectors was monitored during and after the tests as specified in IEEE 344-1987.

The inspectors reviewed seismic design criteria to verify that the number of safe shutdown earthquake cycles for the test was consistent with the provisions in IEEE 344-1987. The inspectors reviewed the Seismic Floor Response Spectra and Soil Structure Interaction Analysis of High Frequency Spectra to verify that required response spectra enveloped the certified seismic design response spectra and hard rock high frequency spectra for high frequency sensitive equipment as stated in the FSAR. The inspectors also reviewed the revised response spectra from the later seismic analysis to verify that the test response spectra used in the test enveloped the revised response spectra with the margin specified in IEEE 344-1987.

b. Findings

No findings were identified.

1A08 (Unit 2) ITAAC Number 2.1.03.09a.i (81) / Family 09F
(Unit 3) ITAAC Number 2.1.03.09a.i (81) / Family 09F

a. Inspection Scope

The inspectors performed document reviews associated with ITAAC Number 2.1.03.09a.i (81). 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 - Inspection of the ITAAC-Related Qualification Program

The inspectors reviewed the EQDPs for the following components:

- Excore Source Range Detectors (RXS-JE-NE001A, RXS-JE-NE001B, RXS-JE-NE001C, and RXS-JE-NE001D)
- Excore Intermediate Range Detectors (RXS-JE-NE002A, RXS-JE-NE002B, RXS-JE-NE002C, and RXS-JE-NE002D)
- Excore Power Range Detectors (RXS-JE-NE003A, RXS-JE-NE003B, RXS-JE-NE003C, RXS-JE-NE003D, RXS-JE-NE004A, RXS-JE-NE004B, RXS-JE-NE004C, and RXS-JE-NE004D)

The inspectors reviewed WEC documentation including qualification reports, test plans, and evaluations that were developed as required by 10 CFR 50.49. The inspectors

also interviewed WEC staff responsible for the environmental qualification of the source range, intermediate range, and power range nuclear instrument detectors. The inspectors reviewed EQDPs and related documents for Nuclear Instrumentation Detectors in order to verify that the components covered by this commodity code were adequately qualified. The inspectors focused on:

- Harsh Environment Qualifications
- Thermal Aging
- Radiation Aging
- LOCA Testing

The inspectors reviewed applicable test procedures and test records related to qualification for harsh environment to verify that qualification activities were adequately controlled and that methodologies conformed to applicable regulatory guidance and industry standards. The inspectors reviewed the environmental profiles to determine if they enveloped the accident analysis data documented in APP-GW-VP-030, AP1000 Plant Environmental Conditions, and APP-GW-VPR-008, Evaluation of Environmental Conditions Envelope Exceedances. The inspectors reviewed WEC's component specific evaluations of the impacts on the qualification testing that was performed. The inspectors reviewed the evaluation of intermediate range detectors contained in WEC document, APP-JE92-VPR-001, to determine if the WEC specified Zone 1 (in-containment) profile utilized for performing the testing was conservative and provided appropriate margins for pressure and temperature.

b. Findings

No findings were identified.

1A09 (Unit 2) ITAAC Number 2.2.01.05.ii (99) / Family 11E
(Unit 3) ITAAC Number 2.2.01.05.ii (99) / Family 11E

a. Inspection Scope

The inspectors performed document reviews 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 associated EQDP and Equipment Qualification Summary Report (EQSR), limited to valve CAS–PL-V204, to determine if the valve qualification provided evidence that WEC design specifications acceptance criteria requirements were met.

The inspectors reviewed the design change to the WEC design specification to verify that the impact on the EQDP and EQSR were properly evaluated, to determine whether they received a proper level of engineering review, and if the changes were incorporated into all affected documents. The inspectors reviewed the licensing impact

determination screening associated with Appendix 3D of the UFSAR. The inspectors evaluated these changes to verify that the identified departures were adequately described and justified, and were supported by screening evaluations that conformed to the requirements of site-approved procedures and the requirements of 10 CFR Part 52, Appendix D, Section VIII, "Processes for Changes and Departures."

b. Findings

No findings were identified.

1A10 (Unit 2) ITAAC Number 2.2.03.02b (160) / Family 03F
(Unit 3) ITAAC Number 2.2.03.02b (160) / Family 03F

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 2.2.03.02b (160). The inspectors used the following NRC IPs/sections to perform this inspection:

- 65001.16-02.02 - Design Input
- 65001.16-02.03 - Design Documents
- 65001.16-02.04 - Design Analysis
- 65001.16-02.05 - Design Verification
- 65001.20.02.04 - Design Inspection
- 65001.20 - Inspection of Safety-Related Piping DAC-Related ITAAC

The inspectors interviewed personnel and reviewed documents associated with the passive core cooling system (PXS) piping design at the Westinghouse world headquarters facility at Cranberry Township, PA, to verify if the piping design was completed in accordance with the requirements contained in the UFSAR, ASME Section III, and 10 CFR 50.55a. Specifically, the inspectors performed this review to determine if:

- processes used for piping design calculations, design control, and records control met the technical and quality requirements contained in the UFSAR and the ASME Code, Section III, Subsections NCA and NB; and
- design drawings, specifications, and records were consistent with the analyzed configurations.

The inspectors performed these reviews for the following lines:

- Core Makeup Tank A Inlet Line (RCS-L118A; PXS-L007A, -L015A, -L016A, -L017A, -L018A, -L020A, and -L021A)

The inspectors reviewed the applicable piping design specifications for each line to verify the methodology used and the design inputs were as specified in the UFSAR and as required by the ASME Code. The inspectors reviewed aspects such as the code year and edition and code cases; materials, manufacturing, testing and examination, and quality assurance requirements; design inputs; and load conditions and

combinations. The inspectors reviewed the Design Reports / Stress Reports to determine if the design met the applicable design specification and that the design was developed using the methodology called out in the UFSAR and the ASME Code.

The inspectors reviewed piping analysis reports to determine if:

- calculations were readily retrievable, controlled, and identified by subject, originator, reviewer, approver, and date and revisions were easily retrievable and subjected to the same rigor of the original approval;
- documentation included the objective, inputs and their sources, background data, assumptions, and computer inputs and conclusions; and
- design verification was performed by a competent individual or group other than those who performed the original design.

For the piping analyses calculations, the inspectors reviewed the Design Reports / Stress Reports to verify if the resulting design met the Design Specification and that the design was developed using the methodology called out in the UFSAR and the ASME Code. The inspectors reviewed the piping analyses to determine if the following were adequately evaluated:

- pipe size, schedule, wall thickness, and materials;
- loading combinations;
- modeling of additional masses due to weight from support members/snubbers/springs and branch piping;
- assumptions and open items (e.g., valve weight) in the design report;
- piping package model scope including decoupling criteria;
- thermal and seismic analysis including damping value, response spectra/time history input, and seismic anchor movement;
- dynamic analysis considerations such as valve open/closure events;
- ASME Code stress qualification delineated in Subsection NB-3600; and
- overall functional capability of the piping system

b. Findings

No findings were identified.

1A11 (Unit 2) ITAAC Number 2.2.03.05a.ii (166) / Family 14E
(Unit 3) ITAAC Number 2.2.03.05a.ii (166) / Family 14E

a. Inspection Scope

The inspectors performed document reviews 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 the EQDPs for the following components:

- PXS PRHR Heat Exchangers (PXS-ME-01)
- PXS Core Makeup Tanks (PXS-MT-02A and PXS-MT-02B)
- PXS Accumulator Tanks (PXS-MT-01A and PXS-MT-01B)

The inspectors reviewed WEC design specifications to verify if the following are consistent with the UFSAR descriptions:

- seismic and quality group classifications
- design codes (ASME Boiler and Pressure Vessel Code edition 1998 – 2000)
- analysis methodologies
- load combinations
- damping ratio
- required response spectra

The inspectors reviewed the analysis reports to verify that the design code, analysis methodology, and seismic response spectra were consistent with the design specifications, and the acceptance criteria as stated in the design specifications and ITAAC were met. The inspectors verified that the WEC seismic analysis used the certified seismic design response spectra for the component seismic analysis is consistent with the UFSAR. The inspectors reviewed the updated seismic response spectra and the acceptance criteria in the reconciliation document to verify that the seismic analysis based on the earlier seismic response spectra were valid.

b. Findings

No findings were identified.

1A12 (Unit 2) ITAAC Number 2.3.02.02b (286) / Family 03F
(Unit 3) ITAAC Number 2.3.02.02b (286) / Family 03F

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 2.3.02.02b (286). The inspectors used the following NRC IPs/sections to perform this inspection:

- 65001.16-02.02 - Design Input
- 65001.16-02.03 - Design Documents
- 65001.16-02.04 - Design Analysis
- 65001.16-02.05 - Design Verification
- 65001.20.02.04 - Design Inspection
- 65001.20 - Inspection of Safety-Related Piping DAC-Related ITAAC

The inspectors interviewed personnel and reviewed documents associated with the chemical and volume control system (CVS) piping design at the Westinghouse world headquarters facility at Cranberry Township, PA, to verify if the piping design was completed in accordance with the requirements contained in the UFSAR, ASME

Section III, and 10 CFR 50.55a. Specifically, the inspectors performed this review to determine if:

- processes used for piping design calculations, design control, and records control met the technical and quality requirements contained in the UFSAR and the ASME Code, Section III, Subsections NCA, NC, and ND; and
- design drawings, specifications, and records were consistent with the analyzed configurations.

The inspectors performed these reviews for the following lines:

- CVS Letdown Containment Penetration Line (CVS-L051); and
- CVS Makeup Containment Penetration Line (CVS-L053).

The inspectors reviewed the applicable piping design specifications for each line to verify the methodology used and the design inputs were as specified in the UFSAR and as required by the ASME Code. The inspectors reviewed aspects such as the code year and edition and code cases; materials, manufacturing, testing and examination, and quality assurance requirements; design inputs; and load conditions and combinations. The inspectors reviewed the Design Reports / Stress Reports to determine if the design met the applicable design specification and that the design was developed using the methodology called out in the UFSAR and the ASME Code.

The inspectors reviewed piping analysis reports to determine if:

- calculations were readily retrievable, controlled, and identified by subject, originator, reviewer, approver, and date and revisions were easily retrievable and subjected to the same rigor of the original approval;
- documentation included the objective, inputs and their sources, background data, assumptions, and computer inputs and conclusions; and
- design verification was performed by a competent individual or group other than those who performed the original design.

For the piping analyses calculations, the inspectors reviewed the Design Reports / Stress Reports to verify if the resulting design met the Design Specification and that the design was developed using the methodology called out in the UFSAR and the ASME Code. The inspectors reviewed the piping analyses to determine if the following were adequately evaluated:

- pipe size, schedule, wall thickness, and materials;
- loading combinations;
- modeling of additional masses due to weight from support members/snubbers/springs and branch piping;
- assumptions and open items (e.g., valve weight) in the design report;
- piping package model scope including decoupling criteria;
- thermal and seismic analysis including damping value, response spectra/time history input, and seismic anchor movement;
- dynamic analysis considerations such as valve open/closure events;
- ASME Code stress qualification delineated in Subsection NX-3600; and
- overall functional capability of the piping system

b. Findings

No findings were identified.

1A13 (Unit 2) ITAAC Number 2.5.02.02.ii (523) / Family 10E
(Unit 3) ITAAC Number 2.5.02.02.ii (523) / Family 10E

a. Inspection Scope

The inspectors performed document reviews associated with ITAAC Number 2.5.02.02.ii (523). 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 seismic qualification test results and associated EQDP and EQSR for the AP1000 MCR/RSW transfer panels to verify that qualification activities were adequately controlled and that methodologies conformed to applicable regulatory guidance and industry standards. The inspectors reviewed calculations to determine if the testing results provided evidence that the MCR/RSW Transfer Panel was shown to bound the revised combined Certified Seismic Design Response Spectra and Hard Rock High Frequency spectra (including a 10 percent margin as specified by IEEE Std 323-1974) and the spectrum defined in Subsection 3.7.2 of the UFSAR. The inspectors reviewed calibration date information to verify that the calibration of test measuring and recording equipment was up-to-date.

b. Findings

No findings were identified.

1A14 (Unit 2) ITAAC Number 2.5.02.03 (525) / Family 10E
(Unit 3) ITAAC Number 2.5.02.03 (525) / Family 10E

a. Inspection Scope

The inspectors performed document reviews associated with ITAAC Number 2.5.02.03 (525). 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 the EQDP and EQSR for the AP1000 MCR/RSW transfer panels to verify that qualification activities were adequately controlled and that

methodologies conformed to applicable regulatory guidance and industry standards. The inspectors reviewed test results of applied and induced electrical interferences as specified by the electromagnetic compliance qualification report including:

- surge withstand capabilities;
- electromagnetic interference;
- radio frequency interference, and;
- electrostatic discharge.

The inspectors reviewed the test results to verify that signal applied to the MCR/RSW Transfer Panel maintained the signal integrity throughout the tests. The inspectors reviewed the test set up and interviewed the engineering staff to verify that methods used to test the transfer switches under each of these interference conditions were adequate, as specified in the Equipment Qualification EMC Test Procedure.

b. Findings

No findings were identified.

1A15 (Unit 2) ITAAC Number 2.5.02.04 (526) / Family 10E
(Unit 3) ITAAC Number 2.5.02.04 (526) / Family 10E

a. Inspection Scope

The inspectors performed document reviews associated with ITAAC Number 2.5.02.04 (526). 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 the EQDP and EQSR for the AP1000 MCR/RSW transfer panels, which are located in stairwell S05 and considered a mild environment, to verify that qualification activities were adequately controlled and that methodologies conformed to applicable regulatory guidance and industry standards.
The inspectors reviewed test results that covered ambient temperature, humidity, pressure, and mechanical vibration conditions of the MCR/RSW Transfer Panel to verify compliance with WEC design specification acceptance criteria requirements. The inspectors reviewed Zone 2 environmental conditions stated in APP-GW-VP-030, AP1000 Plant Environmental Conditions, to verify that Zone 2 conditions enveloped the mild environment.

The inspectors reviewed the method used to simulate anticipated life time operating cycles of the equipment. The inspectors verified that the method used to determine the number of cycles provided adequate operational aging effects in accordance with IEEE Std 323-1974 (including a 10 percent margin as specified by IEEE Std 323-1974).

b. Findings

No findings were identified.

1A16 (Unit 2) ITAAC Number 2.6.09.01 (641) / Family 17X

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 2.6.09.01 (641). The inspectors used the following NRC IPs/sections to perform this inspection:

- 65001.17-02.07 - Bullet Resisting Physical Barriers

The inspectors performed an inspection for the above ITAAC. The details of this inspection are Security Related and included in the non-public security report 05200027/2016404.

b. Findings

No findings were identified.

1A17 (Unit 2) ITAAC Number 3.2.00.01a (739) / Family 16F
(Unit 3) ITAAC Number 3.2.00.01a (739) / Family 16F

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 3.2.00.01a (739). The inspectors used the following NRC IPs/sections to perform this inspection:

- 65001.23-App A.03.06 - ISV Performance Tests

The inspectors reviewed documents and records identified by the licensee to support closure of ITAAC 3.2.00.01.a (739). The review was performed to verify that the inspected activities appropriately support ITAAC closure and included interviews with responsible licensee personnel. Specifically, the inspectors reviewed the changes from APP-OCS-GER-220, "Human Factors Engineering Task Support Verification," Rev. 0 to Rev. 1, to determine if the revision was in conformance with the implementation plan APP-OCS-GEH-220, “AP1000 Human Factors Engineering Task Support Verification Plan,” Rev. 4. The inspectors reviewed GER-220 to verify that the Task Support Verification included verification that the information and controls provided by the human-system interface (HSI) match the display and control requirements generated by the function-based task analysis and the operational sequence analysis and to verify that any additional exceptions were documented as human engineering discrepancies (HEDs). APP-OCS-GER-220 is the summary report for the task support verification (TSV) activity and the Principal Closure Document (PCD) for ITAAC 739. In addition, the inspectors assessed the licensee’s review and acceptance of GER-220 Rev. 1 to verify that the PCD review was completed and documented in accordance with

procedure, NND-AP-0032, “Implementation of Inspections, Tests, Analyses and Acceptance Criteria (ITAAC).”

b. Findings

No findings were identified.

1A18 (Unit 2) ITAAC Number 3.3.00.02a.i.a (760) / Family 01F
(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:

- 65001.01-02.05 - Steel Structures
- 65001.A.02.04 - Review As-built Deviations/Nonconformance
- 65001.B-02.04 - Production Controls
- 65001.B-02.05 - Inspection
- 65001.B-02.06 - Records
- 65001.F-02.01 - Design Document Review
- 65001.F-02.02 - Fabrication Records Review
- 65001.F-02.03 - Observation of Fabrication Activities

The inspectors reviewed the design of the CA03 structural module which forms the western curved wall of the in-containment refueling water storage tank (IRWST). Specifically, the inspectors reviewed detailed design documents, engineering and design coordination reports (E&DCRs), and nonconformance and disposition reports (N&Ds) to confirm:

- the design was being implemented in accordance with regulatory requirements and licensee commitments
- any design changes were appropriately evaluated and implemented in accordance with established measures; and
- any design deviations or nonconforming conditions were appropriately identified, documented, and dispositioned in accordance with established measures.

For Unit 2, the inspectors also performed direct inspection of field welding activities associated with the embedded steel columns supporting the IRWST. Specifically, the inspectors reviewed as-built deviations from the original design in nonconformance and disposition report N&D VS2-CA03-GNR-000069, "CA03 Bearing Surface Area OOT," to determine if the condition was properly evaluated against the licensing basis and the original design analysis, and the justification was code compliant. The inspectors then observed in-process welding of the CA03 column landing plates to the embed plates as well as welding of studs to the columns in accordance with the aforementioned N&D. The inspectors observed in-process welding of field welds VS2-CA03-CAK-001-FW-08-003 and VS2-CA03-VWK-800121-FW-09-SB-1001 through 1030 to determine if the welding was taking place in accordance with the weld data record. Specifically, the inspectors compared the gas type, flow rate, voltage, current, and filler material size

and type to the welding procedure required by the weld data record and the welding conditions to those specified in Section 5.4 of the stainless steel general welding specification, GWS-5. In addition, the inspectors observed QC perform final visual inspections of field welds VS2-CA03-CAK-001-FW-07-001 and -002 connecting the landing plates to the embed plates and performed independent inspections of the weld to determine if the design and code requirements were met. The inspectors also performed independent inspection on field welds VS2-CA03-VWK-800121-FW-13-SB-1015 through 1030 and of VS2-CA03-VWK-800121-FW-14-SA-1001 through 1014, which joined the studs to the columns, to determine if the design and code requirements were met. The welds were inspected for leg and throat size, undercut, lack of fusion and porosity.

b. Findings

Introduction

The inspectors identified an ITAAC finding of very low safety significance (Green) and associated non-cited violation (NCV) of Title 10 of the Code of Federal Regulations (10 CFR) Part 50, Appendix B, Criterion III, “Design Control” for South Carolina Electric & Gas Company’s (SCE&G) failure, through their contractor Westinghouse Electric Company (WEC), to adequately implement measures to assure that design inputs are correctly translated into design documents.

Description

Engineering and Design Coordination Report (E&DCR) APP-1100-GEF-150, “CIS Additions; Thermal Reduction Factor, Mass Model, and Flooding,” revised the design assumptions, load combinations, and analysis results applicable to the detailed design of containment internal structures (CIS) including the CA03 structural module which forms the western curved wall of the in-containment refueling water storage tank (IRWST).

During the week of October 17, 2016, the inspectors determined that the design changes documented in E&DCR APP-1100-GEF-150 were not incorporated into the following CA03 calculations: APP-1100-S2C-008, “AP1000 CA03 Structural Module (IRWST) Steel Wall Qualification,” Rev. 4; and APP-1100-S2C-014, “AP1000 CA03 Structural Module (IRWST) External Connections Qualification,” Rev. 1.

The inspectors noted that WEC Procedure APP-GW-GAP-341, “AP1000 Plant Program Design Change Control,” Rev. 0, Section 7.4 states, in part, that all design changes shall be reviewed for the comprehensive effect of the change, and the overall effect of changes are identified by listing (and subsequent tracking) of impacted and affected documents associated with a design change. The inspectors also noted that WEC procedure APP-GW-GAP-420, “Engineering and Design Coordination Reports,” Rev. 10, Subsection 7.9.1 states, in part: “E&DCRs shall identify all impacted and affected documents that are under configuration control.”

The inspectors determined that the design changes documented in E&DCR APP-1100-GEF-150 are material to the design of the CA03 structural module. However, the impacts to APP-1100-S2C-008 and APP-1100-S2C-014 from these design changes are

not evaluated in E&DCR APP-1100-GEF-150, nor are APP-1100-S2C-008 and APP-1100-S2C-014 identified as affected documents in E&DCR APP-1100-GEF-150.

The inspectors concluded that the quality of the CA03 structural module was indeterminate, given that the design changes documented in E&DCR APP-1100-GEF-150 were not incorporated into all the affected CA03 design documents, nor was an evaluation completed to determine the impacts from these design changes to the detailed design of the CA03 module.

Analysis

The inspectors determined that the failure to adequately implement measures to assure that design inputs are correctly translated into design documents was contrary to the requirements of 10 CFR Part 50, Appendix B, Criterion III, and was a performance deficiency.

The finding was considered more than minor because the performance deficiency represented a substantive failure to adequately implement a quality assurance process that rendered the quality of a structure, system, and component (SSC) indeterminate.

The inspectors determined that the finding represented an ITAAC finding because it was material to the acceptance criteria of VCSNS Units 2 and 3 ITAAC 760 (3.3.00.02a.i.a), in that, if left uncorrected, the licensee may not have been able to demonstrate that the acceptance criteria of these ITAAC were met. The acceptance criteria of these ITAAC require that all deviations between the as-built structures and the approved designs be reconciled to verify that the as-built structures will withstand the design basis loads without a loss of structural integrity or other safety-related functions. The inspectors determined that the failure to adequately implement measures to assure that design inputs are correctly translated into design documents may have resulted in a deviation from the approved design that would not have been reconciled by the licensee.

The inspectors concluded the finding was associated with the Design/Engineering Cornerstone. The inspectors evaluated the finding in accordance with IMC 2519, “Construction Significance Determination Process,” and determined the finding was of very low safety significance because the licensee was able to demonstrate with reasonable assurance that the design function of the IRWST would not be impaired.

The inspectors reviewed the finding for a possible cross-cutting aspect in accordance with IMC 0613 Appendix F, “Construction Cross-Cutting Areas and Aspects,” and determined the finding has a cross-cutting aspect in the Human Performance area because the detailed design documentation for the CA03 module did not provide evidence that the design was performed in accordance with quality assurance requirements, and that the IRWST would have performed satisfactorily in service. [H.7].

Enforcement

10 CFR Part 50, Appendix B, Criterion III requires, in part, that measures shall be established to assure that design inputs are correctly translated into design documents and design changes are subject to design control measures commensurate with those applied to the original design.

Contrary to the above, on October 21, 2013, the licensee, through their contractor Westinghouse, failed to adequately implement measures to assure that design inputs are correctly translated into design documents. Specifically, the design changes documented in E&DCR APP-1100-GEF-150, "CIS Additions; Thermal Reduction Factor, Mass Model, and Flooding," were not incorporated into all of the detailed design calculations for the CA03 structural module which forms the western curved wall of the IRWST.

Because this violation was of very low safety significance (Green) and was entered into the licensee's corrective action program as SCE&G Condition Report (CR) CR-NND-16-01990 and WEC Corrective Action, Prevention, and Learning (CAPAL) System Issue ID 100423100, it is being treated as a non-cited violation (NCV), consistent with Section 2.3.2 of the Enforcement Policy (NCV 05200027/2016004-02 and NCV 05200028/2016004-02).

Since the corrective actions have not been fully implemented, this NCV will remain open until the NRC can verify that the acceptance criteria of Units 2 & 3 ITAAC 760 (3.3.00.02a.i.a) are not impacted.

1A19 (Unit 2) 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.A.02.02 - Installation Records Review

The inspectors reviewed quality records and performed direct inspection of construction activities associated with the containment vessel for Summer Unit 2. Specifically, the inspectors observed concrete construction activities associated with the following portions of the CA01 structural module:

- West wall of the east steam generator compartment from el 87'6" to 145'
- South wall of the east steam generator compartment from el 87'6" to 145'
- North wall of the east steam generator compartment from el 87'6" to 145'
- East wall of the east steam generator compartment from el 93' to 145'

The inspectors observed concrete pre-placement activities to determine whether pre-placement planning and training had been completed (including appropriate considerations for hot weather, cold weather, mass concrete, pumping, and contingency preparations for stopping a concrete placement) and the pre-placement inspection was performed by QC before any concrete was placed. Prior to concrete placement, the inspectors independently evaluated whether the placement configuration met design requirements included in the work packages, all deviations were adequately captured and addressed, and preparation and cleanliness of the

formwork had been completed. In addition, 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 indicate mix, location, time placed, water additions, temperature of the concrete mix, and ambient conditions.

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

- concrete temperature, slump flow, 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;
- 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 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.

The inspectors reviewed a sample of nonconformances to verify:

- the licensee was identifying problems 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.

1A20 (Unit 2) ITAAC Number 3.3.00.02a.i.c (762) / Family 01F

a. Inspection Scope

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

- 65001.01 - Inspection of ITAAC-Related Foundations & Buildings
- 65001.01-02.01 - Procedures
- 65001.01-02.05 - Steel Structures
- 65001.01-02.07 - Identification and Resolution of Problem
- 65001.02-02.01 - Inspection of Concrete Placement
- 65001.02-02.07 - Problem Identification and Resolution
- 65001.A - As-Built Attributes for SSCs associated with ITAAC
- 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

The inspectors performed a direct inspection of the in-process construction activities associated with the composite steel floor system and composite concrete precast floor system at elevation 100'-0" in the non-radiologically controlled area of the auxiliary building. The area inspected with regard to the composite steel floors was from column lines 7.3 to 11, and between column lines I and P. The area inspected with regard to the composite concrete precast floors was precast panel 1231-CP-S01, which is located in Area 1 between column lines P and Q, and shield building wall and column line 9.3 and at elevation 100’-0”. The inspectors performed this inspection to determine whether in-process construction activities were being performed in conformance with the approved design documents and that any deviations from the design were properly identified, evaluated, and documented to provide assurance that these structural components were capable of withstanding design loads without loss of structural integrity and any safety related functions.

Prior to performing direct field inspections, the inspectors reviewed a sample of design calculations, design drawings, and specifications for both floor systems to determine whether:

- design inputs were correctly identified and documented, and that their selection was reviewed and approved by the responsible engineering group;
- design outputs were translated into 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; and

- the documents were consistent with the design commitments and requirements of the technical specifications, the UFSAR, and code commitments.

While performing direct field inspections of the composite steel floor system, the inspectors performed direct measurements of the structural beams supporting the floors and the structural steel connecting the floor to the walls to determine whether the structural steel was the correct shape, size, and spacing. The material test reports for the structural steel were reviewed by the inspectors to determine whether the material was of the correct grade and material composition. The inspectors also observed the installation of the metal decking to determine whether the decking material was installed in accordance with the approved design and was of the correct material and size. Additionally, the inspectors verified that the studs installed along the top flange of steel beams were at the appropriate spacing and the connecting welds were free of discontinuities and consistently had a 360° flash at the base of each stud.

While performing direct field inspections of the composite concrete precast floor system, the inspectors independently measured a sample of horizontal lap splices, reinforcement spacing, shear reinforcement, and clear cover dimensions to determine if field conditions conformed to regulatory and design requirements, including American Concrete Institute (ACI) Code 349-01. In addition, the inspectors verified that steel reinforcement was the appropriate size, free of excessive rust, and had the required concrete cover. For both floor systems, the inspectors reviewed a sample of nonconformances to determine whether:

- the licensee was identifying problems 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.

For the composite steel floor system the inspectors performed a record review of the receipt inspection reports, procurement information and material test reports from the applicable work package. During this record review, the inspectors review the documentation to determine whether the records confirmed the requisite material characteristics, performance tests, nondestructive tests, and other specification requirements. The records reviewed were for the Area 1 Structural Steel as well as the Type 2 studs that are located in the non-radiological control portion of the auxiliary building.

Additionally, during the review of the composite steel floor system, the inspectors determined whether the Area 1 structural steel material conformed to American Society for Testing & Materials (ASTM) A36, “Standard Specification for Carbon Structural Steel,” and A572, “Standard Specification for High-Strength Low-Alloy Columbium-Vanadium Structural Steel.” During this review, the inspectors also determined whether the mechanical properties for the Type 2 stud material met the required ultimate tensile strength; yield strength; and percent elongation requirements as specified in American Welding Society (AWS) D1.1, Table 7.1, “Mechanical Property Requirements for Studs.” The inspectors also utilized ASTM A370, “Standard Test Methods and Definitions for Mechanical Testing of Steel Products,” to determine whether the

mechanical property testing of the headed studs were tested in accordance with the applicable sections of the aforementioned ASTM.

In addition to the record review completed for the composite steel floor system, the inspectors verified by direct inspection that the items on-site matched what was ordered by procurement. Purchase order documents were reviewed to determine whether both regulatory and quality requirements were included in the procurement document. The inspectors specifically verified the following:

- procurement documents appropriately specified acceptable quality, technical, and 10 CFR Part 21/10 CFR 50.55(e) requirements;
- fabrication and procurement specifications are consistent with the design commitments and requirements documented in the licensing basis (i.e. FSAR, design control document (DCD) and, if applicable, technical specifications); and
- fabrication records and receipt packages are adequate to furnish evidence that activities affecting quality and SSCs conform to applicable codes, standards, regulations, and quality and technical requirements.

b. Findings

No findings were identified.

1A21 (Unit 2) 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
- 65001.01-02.07 - Identification and Resolution of Problem
- 65001.02-02.01 - Inspection of Concrete Placement
- 65001.02-02.07 - Problem Identification and Resolution
- 65001.A - As-Built Attributes for SSCs associated with ITAAC
- 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

The inspectors performed a direct inspection of construction activities associated with concrete composite floors located in the radiologically controlled area of the auxiliary building. Specifically, the inspectors reviewed design documents and observed fabrication of precast floor panels that are intended for use as elements of the reinforced concrete composite floors in areas 3, 4, 5, and 6 at elevation 82’-6”. During this inspection, the inspectors reviewed design, procurement and construction aspects of these precast panels to verify compliance with regulatory requirements and licensee commitments, including applicable sections of the UFSAR and American Concrete Institute (ACI) Code 349-01. The inspectors observed in-process fabrication of precast

panels 1226-CP-S01 and 1225-CP-S02 which are located in areas 5 and 6 between column lines J-1 and J-4, and column lines 1 and 2 at elevation 82'-6."

The inspectors reviewed applicable design calculations, design drawings, design specifications, and interviewed licensee personnel to determine whether work activities were being performed in accordance with approved procedures, specifications and codes. In addition, inspectors reviewed applicable Engineering and Design Coordination Reports (E&DCRs) associated with these precast panels' design and installation activities to determine if deviations from requirements were effectively dispositioned.

The inspectors independently measured a sample of horizontal lap splices, reinforcement spacing, shear reinforcement, and clear cover dimensions to determine if field conditions conformed to regulatory and design requirements, including ACI Code 349-01. In addition, the inspectors verified that steel reinforcement in the panels identified above was the appropriate size, free of excessive rust, had the required concrete cover, and proper clearances. The inspectors determined if:

- the applicable revisions of approved procedures, drawings, and instructions were being followed;
- non-conforming items were clearly identified and dispositioned;
- the licensee was identifying problems at an appropriate threshold and entering them into the corrective action program; and
- any design changes or field modifications relevant to the work observed were properly controlled and processed in accordance with quality and technical requirements.

b. Findings

No findings were identified.

1A22 (Unit 2) 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
- 65001.01-02.05 - Steel Structures
- 65001.01-02.07 - Identification and Resolution of Problem
- 65001.02 - Inspection of ITAAC-Related Installation of Structural Concrete
- 65001.02-02.01 - Inspection of Concrete Placement
- 65001.02-02.07 - Problem Identification and Resolution
- 65001.A - As-Built Attributes for SSCs associated with ITAAC
- 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

The inspectors reviewed work activities associated with the design, procurement and construction of reinforced concrete floors of the radiologically controlled area of the auxiliary building listed below.

- floor located between column lines 2 to 3 and J-2 to K-2 at elevation 90'-3"
- floor located between column lines 2 to 4 and K-2 to L-2 at elevation 92'-8½"

The inspectors reviewed design documents and E&DCRs to verify the design was consistent with the licensing basis and applicable codes and standards and met quality assurance requirements: updated final safety analysis report (UFSAR); "Code Requirements for Nuclear Safety Related Concrete Structures (ACI 349-01)"; and 10 CFR Part 50 Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Processing Plants"; respectively. Specifically, the inspectors reviewed load combinations, design assumptions, implementation of design method, code compliance checks, and translation of design analysis results into construction documents. The inspectors also reviewed design documentation and records to determine whether the design and design verification processes were performed and documented in accordance with applicable quality assurance requirements.

The inspectors observed in process installation of concrete reinforcement in the floor located between column lines 2 to 4 and K-2 to L-2 at elevation 92'-8½" to verify bar sizes, spacing, location, and length were consistent with construction drawings.

b. Findings

No findings were identified.

1A23 (Unit 2) 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:

- 65001.01-02.06 - Records
- 65001.A.02.02 - Installation Records Review
- 65001.A.02.03 - Independent Assessment/Measurement Inspection

The inspectors measured the thickness and reviewed concrete density records for walls in the non-radiological controlled area of the auxiliary building to verify compliance with Table 3.3-1 of Appendix C of the V.C. Summer Unit 2 COL and other requirements. Specifically, the inspectors sampled the following walls in the non-radiological controlled area of the auxiliary building:

- Column Line K wall from Lines 7.3 to 11, elevations 82'6" – 100'0"
- Column Line L wall from the shield building to line to 11, elevations 82'6" – 100'0"
- Column Line M wall from the shield building to line to 11, elevations 82'6" – 100'0"

- Column Line P wall from the shield building to line to 11, elevations 82'6" – 100'0"

The wall thickness measurements were taken after concrete was placed. In addition, the inspectors reviewed the following concrete field testing & compression data records to determine that the wet concrete density results as-tested throughout the concrete placement exceeded the requirement in Section 12.3.2.3 of the UFSAR.

- C-16-00098, "Self Consolidating Concrete Field Testing and Compressing Data Record"
- C-16-00020, "Self Consolidating Concrete Field Testing and Compressing Data Record"
- C-16-00003, "Self Consolidating Concrete Field Testing and Compressing Data Record"
- C-16-00076, "Self Consolidating Concrete Field Testing and Compressing Data Record"

b. Findings

No findings were identified.

1A24 (Unit 2) ITAAC Number 3.3.00.14 (820) / Family 17E

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 3.3.00.14 (820). The inspectors used the following NRC IPs/sections to perform this inspection:

- 65001.17-02.07 - Bullet Resisting Physical Barriers

The inspectors performed an inspection for the above ITAAC. The details of this inspection are Security Related and included in the non-public security report 05200027/2016404.

b. Findings

No findings were identified.

1A25 (Unit 2) ITAAC Number C.3.8.01.02.03 (845) / Family 18D
(Unit 3) ITAAC Number C.3.8.01.02.03 (845) / Family 18D

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number C.3.8.01.02.03 (845). The inspectors used the following NRC IPs/sections to perform this inspection:

- 65001.18-02.05 - Notification Methods and Procedures
- 65001.D-02.03 - Test Results Review
- 71114-02 - Alert and Notification System Evaluation

The inspectors evaluated the adequacy of the licensee's methods for testing and maintaining the alert and notification system in accordance with NRC Inspection Procedures 71114, Attachment 02, Alert and Notification System Evaluation, and 65001.18, Inspection of Emergency Planning ITAAC Section 02-05, Notification Methods and Procedures. The applicable planning standard, 10 CFR Part 50.47(b)(5), and its related 10 CFR Part 50, Appendix E requirements were used as reference criteria. The criteria contained in NUREG-0654, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants," Rev. 1, were also used as a reference.

The inspectors reviewed the results of the Alert Notification System (ANS) siren test, "PMTS 1509177-001 CORRECTED," to verify that the licensee met the acceptance criteria for this ITAAC and the criteria listed in the V.C. Summer Radiation Emergency Plan for Units 2 and 3. The inspectors also interviewed and observed personnel responsible for system performance, siren maintenance, and siren testing. Inspection Procedure 71114, Attachment 02, is satisfied on a biennial basis for Unit 1 (Operating Unit) which shares the alert and notification system with Units 2 and 3.

b. Findings

No findings were identified.

1A26 (Unit 2) ITAAC Number C.3.8.03.01 (874) / Family 03F
(Unit 3) ITAAC Number C.3.8.03.01 (874) / Family 03F

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number C.3.8.03.01 (874). The inspectors used the following NRC IPs/sections to perform this inspection:

- 65001.16-02.02 - Design Input
- 65001.16-02.03 - Design Documents
- 65001.16-02.03 - Design Documents
- 65001.16-02.04 - Design Analysis
- 65001.16-02.05 - Design Verification
- 65001.20.02.04 - Design Inspection
- 65001.20 - Inspection of Safety-Related Piping DAC-Related ITAAC

The inspectors interviewed personnel and reviewed documents associated with the piping design acceptance criteria (DAC) ITAAC at the Westinghouse world headquarters facility at Cranberry Township, PA, to verify if the piping design was completed in accordance with the requirements contained in the UFSAR, ASME Section III, and 10 CFR 50.55a. Specifically, the inspectors performed this review to determine if:

- licensee records established an adequate basis for the eventual closure of the piping DAC ITAAC;

- processes used for piping DAC engineering calculations, design control, and records control met the technical and quality requirements contained in the UFSAR and the ASME Code, Section III, Subsections NCA, NB, NC, ND, and NF; and
- design drawings, specifications, and records were consistent with the analyzed configurations.

The inspectors performed these reviews for the following piping DAC lines:

- APP-CVS-PLR-100, “CVS Letdown from Penetration 002 IRC 2”
- APP-CVS-PLR-530, “CVS Makeup from Penetration C03 ORC”
- APP-PXS-PLR-010, “Direct Vessel Injection Line A”
- APP-PXS-PLR-050, “CMT 2A Supply Line”
- APP-RCS-PLR-020, “Pressurizer Spray, Auxiliary Spray, and CVS Supply and Return”
- APP-RCS-PLR-050, “Reactor Coolant Loop”

The inspectors reviewed the applicable piping design specifications for each piping segment to verify the methodology used and the design inputs were as specified in the UFSAR and as required by the ASME Code. The inspectors reviewed aspects such as the code year and edition and code cases; materials, manufacturing, testing and examination, and quality assurance requirements; design inputs; and load conditions and combinations. The inspectors reviewed the Design Reports / Stress Reports to determine if the design met the applicable design specification and that the design was developed using the methodology called out in the UFSAR and the ASME Code. The inspectors reviewed the computer codes used to perform safety related calculations to verify they were adequately validated and verified. The inspectors also observed a demonstration of the computer codes to verify if the design inputs (such as pipe dimensions, diameters, orientations, materials, welds, and supports) matched the as designed isometrics and drawings.

The inspectors reviewed the licensee’s engineering and QA procedures related to piping DAC design control and design change to determine if:

- piping design activities were being properly performed in compliance with the approved engineering procedures and applicable design documents such as specifications, drawings, and calculations;
- specifications, analyses, and other design documents were sufficiently integrated to ensure adequate control and consistent practices; and
- design inputs and assumptions were maintained, controlled and updated as required, and were readily available to the licensee.

The inspectors reviewed piping analysis and pipe hanger reports to determine if:

- calculations were readily retrievable, controlled, and identified by subject, originator, reviewer, approver, and date and revisions were easily retrievable and subjected to the same rigor of the original approval;
- documentation included the objective, inputs and their sources, background data, assumptions, and computer inputs and conclusions; and
- design verification was performed by a competent individual or group other than those who performed the original design.

For the piping analyses and pipe hanger stress calculations, the inspectors reviewed the Design Reports / Stress Reports to verify if the resulting design met the design specification and that the design was developed using the methodology called out in the UFSAR and the ASME Code. The inspectors reviewed the piping analyses to determine if the licensee adequately evaluated the following:

- pipe size, schedule, wall thickness, and materials;
- loading combinations;
- modeling of additional masses due to weight from support members/snubbers/springs and branch piping;
- assumptions and open items (e.g., valve weight) in the design report;
- piping package model scope including decoupling criteria;
- thermal and seismic analysis including damping value, response spectra/time history input, and seismic anchor movement;
- dynamic analysis considerations such as valve open/closure events;
- ASME Code stress qualification delineated in Subsections NX-3600; and
- overall functional capability of the piping system

The inspectors reviewed the pipe hanger calculations to determine if the licensee adequately evaluated the following:

- pipe support inputs and load combinations;
- pipe support base plate and anchor bolt design;
- seismic self-weight excitation;
- design of supplementary steel;
- consideration of friction forces;
- pipe support gaps and clearances;
- instrumentation line support criteria; and
- pipe deflection limits
-

b. Findings

No findings were identified.

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:

- 65001.01-02.05 - Steel Structures

The inspectors performed direct measurements and reviewed the condition of the Unit 3 submodule CA03_02 in the laydown yard. The inspectors inspected the submodule in the laydown yard to verify that the shape, size and dimensions conformed to the approved design drawings.

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:

- 65001.01-02.01 - Procedures
- 65001.01-02.05 - Steel Structures
- 65001.01-02.06 - Records
- 65001.A.02.03 - Independent Assessment/Measurement Inspection
- 65001.B-02.03 - Welder Qualification
- 65001.B-02.04 - Production Controls
- 65001.B-02.05 - Inspection
- 65001.B-02.06 - Records
- 65001.F-02.04 - General QA Review

The inspectors observed in-process machine gas metal arc welding (GMAW) root pass on seam weld No VS3-CA01-VWK-800193-FW-3130-012, which is located between submodules CA01_031 and CA01_30. The weld joined two A240 duplex steel plates which are part of the outside portion of the plant north wall of the west steam generator compartment. Specifically, the inspectors reviewed drawings, welding procedures, welder qualification records, weld records, and material issue records to determine if the identification of welds and welders was maintained for each weld and the welders were qualified. In addition, the inspectors verified welding parameters such as amperage, voltage, pre-heat temperature, shielding gas flow rate, shielding gas type, and that the appropriate type of filler metal used was in accordance with welding procedure specifications. The inspectors also reviewed a material transfer request to verify that the backing bar was in accordance with the welding procedure.

The inspectors reviewed the final ultrasonic (UT), root weld liquid penetration (PT), and final PT examination reports for the weld listed above to determine whether the required examinations were performed in accordance with approved procedures and AWS D1.6:1999, “Structural Welding Code - Stainless Steel.” The inspectors reviewed the final visual examination report and performed an independent visual inspection of the weld to determine whether the final weld satisfied the requirements of Sections 5.11, "Weld Profiles," and 6.28.1, "Visual Inspection,” of AWS D1.6:1999.

b. Findings

No findings were identified.

1A29 (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
- 65001.02-02.06 - Record Review
- 65001.A - As-Built Attributes for SSCs associated with ITAAC
- 65001.A.02.01 - Observation of in-Process Installation Activities
- 65001.A.02.02 - Installation Records Review

The inspectors observed concrete placement activities associated with the Unit 3 Layers 3 and 4. Layers 3 and 4 are located inside the containment vessel bottom head from elevations 80'0" to 83'0" and 80'0" to 84'6", respectively. The inspectors observed concrete pre-placement activities to determine whether pre-placement planning and training had been completed (including appropriate considerations for mass concrete, pumping, and contingency preparations for stopping a concrete placement) and the pre-placement inspection was performed by QC before any concrete was placed. Prior to concrete placement, the inspectors independently evaluated whether deviations were adequately captured and addressed and preparation and cleanliness of the formwork and rebar had been completed. 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;
- 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;
- the use of vibrators was appropriate; and
- inspection and oversight during placement was performed as required.

The inspectors observed concrete delivery operations and reviewed batch plant records to determine whether:

- batch records were generated, controlled, and indicated placement location, mix, volume, date, time, and special instructions;
- the time limit between mixing and placement was not exceeded;
- temperature limits were not exceeded; and
- water was adjusted to account for moisture content of aggregates.

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

- concrete temperature, slump flow, air content, and unit weight were determined at the proper location and frequency;
- sample collection and testing techniques conformed to the procedures, specifications, and ASTM standards; and

- concrete strength test sample cylinders were made at the required location and frequency.

The inspectors interviewed licensee and contractor personnel to determine whether:

- 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.

1A30 (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:

- 65001.01-02.06 - Records
- 65001.01-02.07 - Identification and Resolution of Problem
- 65001.02-02.01 - Inspection of Concrete Placement
- 65001.02-02.06 - Record Review
- 65001.02-02.07 - Problem Identification and Resolution
- 65001.A - As-Built Attributes for SSCs associated with ITAAC
- 65001.A.02.01 - Observation of in-Process Installation Activities
- 65001.A.02.02 - Installation Records Review
- 65001.A.02.03 - Independent Assessment/Measurement Inspection
- 65001.A.02.04 - Review As-built Deviations/Nonconformance
- 65001.F-02.04 - General QA Review

The inspectors observed and reviewed the installation of reinforcing steel for Unit 3 Layers 3 and 4. Layers 3 and 4 are located inside the containment vessel bottom head from elevations 80'0" to 83'0" and 80'0" to 84'6", respectively. The inspectors observed reinforcing steel placement and reviewed applicable design drawings and specifications to determine whether structural concrete work was being performed in accordance with design specifications and approved procedures. Specifically, the inspectors verified:

- structural concrete design and construction was accomplished under controlled conditions and in accordance with applicable procedures, specifications, drawings, and approved procedures;
- key building critical dimensions and materials satisfied design specifications, requirements, and relevant ITAAC;
- deviations from the design due to as-built conditions were identified and documented appropriately;

- records reflected that completed work met design specifications and acceptance criteria;
- reinforcing steel installation was controlled and performed in accordance with the applicable specifications, codes, drawings, and procedures; and
- reinforcing steel was located properly in the structures, secured, free of excess rust, and had proper clearances.

b. Findings

No findings were identified.

1A31 (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:

- 65001.01-02.01 - Procedures
- 65001.01-02.06 - Records
- 65001.A.02.01 - Observation of in-Process Installation Activities
- 65001.B-02.03 - Welder Qualification
- 65001.B-02.04 - Production Controls
- 65001.B-02.05 - Inspection
- 65001.B-02.06 - Records
- 65001.F-02.02 - Fabrication Records Review
- 65001.F-02.03 - Observation of Fabrication Activities
- 65001.F-02.04 - General QA Review

The inspectors reviewed welding and fabrication records, and observed in-process welding of weld VS3-CA03-VWK-800069-FW-01. The weld joined two duplex stainless steel plates of submodule CA03_17, which is part of the in-containment refueling water storage tank steel wall.

The inspectors observed in-process gas tungsten arc welding of two plates associated with work package VS3-CA03-S5W-850017 for weld VS3-CA03-VWK-800069-FW-01. The inspectors observed the following welding activities:

- Ensure work was conducted in accordance with a "traveler," weld data record or similar document which coordinated and sequenced the welding and inspection operations;
- Welding procedure specification (WPS) used was the latest revision and appropriate for the work performed;
- Weld joint was sufficiently protected from inclement conditions; minimum preheat and maximum interpass temperature met the requirements of the WPS;
- Surfaces to be welded were smooth, uniform, and free from surface discontinuities or other harmful foreign materials that could be detrimental to welding;
- Weld filler metal type and size was in compliance with the WPS;
- Weld joint was traceable to the welders;

- Shielding gas flow and composition met the requirements of the WPS; and
- Welding machine variables were correctly set.

The inspectors reviewed weld records to determine whether records provided adequate traceability to all aspects of the welding activity, including traceability to the welder who performed the work and the weld filler metal used. The inspectors reviewed welder qualifications to verify the welder performing the work was qualified to the applicable processes and procedures.

The inspectors reviewed a sample of certified material test reports (CMTRs) for the base material used in weld VS3-CA03-VWK-800069-FW-01 to determine conformance with ASTM A240 and design documents. The inspectors reviewed a sample of CMTRs and material issue records (MIRs) for the weld filler material to determine conformance with SFA 5.9 and additional material specifications for ER2209.

The inspectors reviewed the liquid penetrant (PT) examination record for the repair root weld associated with the weld listed above to determine whether the required examinations were performed in accordance approved procedures and AWS D1.6:1999, "Structural Welding Code – Stainless Steel."

The inspectors observed submodule assembly welding of submodule CA03-01 of module CA03. Specifically the inspectors observed tack welding during the fit-up process of weld VS3-CA03-VW-K-800067-FW-01-WL-001 to determine if it was being done in accordance with the welding procedure and AWS welding code. The inspectors checked to determine if the following variables were in accordance with the requirements:

- The filler metal was the size and classification required by the welding procedure
- The shielding gas was of the type and at the flow rate required by the welding procedure
- The weld joint was clean and free of grease, oil, paint, and other deleterious materials
- The welding polarity was as required by the welding procedure
- The welding area was adequately protected from wind, rain, or other adverse environments
- The welding procedure was in the area and available to give direction to the welder

The inspectors reviewed welder qualification records to determine individual qualifications were in accordance with the requirements of AWS welding code.

b. Findings

No findings were identified.

1A32 (Unit 3) ITAAC Number 3.3.00.02a.i.b (761) / Family 01F

a. Inspection Scope

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

- 65001.01-02.06 - Records
- 65001.02-02.01 - Inspection of Concrete Placement
- 65001.02-02.06 - Record Review
- 65001.A.02.01 - Observation of in-Process Installation Activities
- 65001.F-02.04 - General QA Review

The inspectors observed concrete placement activities associated with the Unit 3 CA20 wedge area, which is the area between the CA20 module in the auxiliary building and the shield wall. Self-consolidating concrete was placed in the area from EL. 82'-6" to 89'-6". The inspectors observed concrete pre-placement activities to determine whether pre-placement inspection was performed by QC before any concrete was placed. The inspectors independently verified cleanliness of the formwork and rebar prior to concrete placement. 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;
- 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 and oversight during placement was performed as required.

The inspectors observed concrete delivery operations and reviewed batch plant records to determine whether:

- batch records were generated, controlled, and indicated placement location, mix, volume, date, time, and special instructions;
- the time limit between mixing and placement was not exceeded;
- temperature limits were not exceeded; and
- water was adjusted to account for moisture content of aggregates.

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

- concrete temperature, slump flow, air content, and unit weight were determined at the proper location and frequency;
- sample collection and testing techniques conformed to the procedures, specifications, and ASTM standards; and
- concrete strength test sample cylinders were made at the required location and frequency.

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.

1A33 (Unit 3) ITAAC Number 3.3.00.02a.i.c (762) / Family 01F

a. Inspection Scope

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

- 65001.01 - Inspection of ITAAC-Related Foundations & Buildings
- 65001.01-02.06 - Records
- 65001.01-02.07 - Identification and Resolution of Problem
- 65001.A - As-Built Attributes for SSCs associated with ITAAC
- 65001.A.02.01 - Observation of in-Process Installation Activities
- 65001.A.02.02 - Installation Records Review
- 65001.A.02.04 - Review As-built Deviations/Nonconformance
- 65001.F-02.03 - Observation of Fabrication Activities

The inspectors observed and reviewed the installation of reinforcing steel for column line 7.3 from elevation 82’6” to 100’0" of Unit 3. Column line 7.3 runs from the outer wall of the auxiliary building to the shield building and separates the radioactive and nonradioactive sides of the auxiliary building. The inspectors observed reinforcing steel placement and reviewed applicable design drawings and specifications to determine whether structural concrete work was being performed in accordance with design specifications and approved procedures. Specifically, the inspectors verified:

- structural concrete design and construction was accomplished under controlled conditions and in accordance with applicable procedures, specifications, drawings, and approved procedures;
- key building critical dimensions and materials satisfied design specifications, requirements, and relevant ITAAC;
- deviations from the design due to as-built conditions were identified and documented appropriately;
- records reflected that completed work met design specifications and acceptance criteria;
- reinforcing steel installation was controlled and performed in accordance with the applicable specifications, codes, drawings, and procedures; and
- reinforcing steel was located properly in the structures, secured, free of excess rust, and had proper clearances.

b. Findings

No findings were identified.

1A34 (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 - Inspection of ITAAC-Related Foundations & Buildings
- 65001.01-02.05 - Steel Structures
- 65001.01-02.07 - Identification and Resolution of Problem
- 65001.02-02.01 - Inspection of Concrete Placement
- 65001.02-02.07 - Problem Identification and Resolution
- 65001.F - Inspection of the ITAAC-Related Design and Fabrication Requirements
- 65001.F-02.01 - Design Document Review

The inspectors reviewed work activities associated with the design, procurement and construction of reinforced concrete floors of the radiologically controlled area of the auxiliary building listed below.

- floor located between column lines 2 to 3 and J-2 to K-2 at elevation 90'-3"
- floor located between column lines 2 to 4 and K-2 to L-2 at elevation 92'-8½"

The inspectors reviewed design documents and E&DCRs to verify the design was consistent with the licensing basis and applicable codes and standards and met quality assurance requirements: UFSAR; “Code Requirements for Nuclear Safety Related Concrete Structures (ACI 349-01)”; and 10 CFR Part 50 Appendix B, “Quality Assurance Criteria for Nuclear Power Plants and Fuel Processing Plants”; respectively. Specifically, the inspectors reviewed load combinations, design assumptions, implementation of design method, code compliance checks, and translation of design analysis results into construction documents. The inspectors also reviewed design documentation and records to determine whether the design and design verification processes were performed and documented in accordance with applicable quality assurance requirements.

b. Findings

No findings were identified.

1A35 (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
- 65001.02-02.06 - Record Review
- 65001.02-02.07 - Problem Identification and Resolution
- 65001.A - As-Built Attributes for SSCs associated with ITAAC
- 65001.A.02.01 - Observation of in-Process Installation Activities
- 65001.A.02.02 - Installation Records Review
- 65001.A.02.03 - Independent Assessment/Measurement Inspection
- 65001.A.02.04 - Review As-built Deviations/Nonconformance
- 65001.F-02.03 - Observation of Fabrication Activities
- 65001.F-02.04 - General QA Review

The inspectors observed and reviewed the installation of reinforcing steel in precast floor panels, which are the lower portion of the floors, at elevation 82'-6" of Room 12255 in the Unit 3 auxiliary building. Six floor panels are used to construct the floor of Room 12255 and cover from Lines 5 to 7.3 and from Line I to the shield building. Inspectors inspected the reinforcing steel for panels 1223-CP-S01 and 1223-CP-S03. The inspectors observed reinforcing steel placement and reviewed applicable design drawings and specifications to determine whether work was being performed in accordance with design specifications, applicable codes and standards, and approved procedures. Specifically, the inspectors verified:

- structural concrete design and construction was accomplished under controlled conditions and in accordance with applicable procedures, specifications, drawings, and approved procedures;
- key building critical dimensions and materials satisfied design specifications, requirements, and relevant ITAAC;
- deviations from the design due to as-built conditions were identified and documented appropriately; and
- reinforcing steel was located properly in the structures, secured, free of excess rust, and had proper clearances.

Additionally, the inspectors observed concrete placement activities for panel 1223-CP-S04. 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;
- 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;
- the use of vibrators was appropriate; and
- inspection and oversight during placement was performed as required.

The inspectors observed concrete delivery operations and reviewed batch plant records to determine whether:

- batch records were generated, controlled, and indicated placement location, mix, volume, date, time, and special instructions;
- the time limit between mixing and placement was not exceeded;
- temperature limits were not exceeded; and

- water was adjusted to account for moisture content of aggregates.

Inspectors reviewed the concrete testing records to determine if:

- concrete temperature, slump flow, air content, and unit weight were determined at the proper location and frequency;
- sample collection and testing techniques conformed to the procedures, specifications, and ASTM standards; and
- concrete strength test sample cylinders were made at the required location and frequency.

b. Findings

No findings were identified.

1A36 (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
- 65001.02-02.08 - Construction Interface Concerns
- 65001.A.02.03 - Independent Assessment/Measurement Inspection
- 65001.A.02.04 - Review As-built Deviations/Nonconformance

The inspectors observed and reviewed the installation of reinforcing steel from elevation 66'-6" to 82'-6" on the interior wall between rooms 12171 and 12172 in the auxiliary building of Unit 3. The inspectors observed reinforcing steel placement and reviewed applicable design drawings and specifications to determine whether work was being performed in accordance with design specifications and approved procedures. Specifically, the inspectors verified:

- structural concrete design and construction was accomplished under controlled conditions and in accordance with applicable procedures, specifications, drawings, and approved procedures;
- key building critical dimensions and materials satisfied design specifications, requirements, and relevant ITAAC;
- deviations from the design due to as-built conditions were identified and documented appropriately; and
- reinforcing steel was located properly in the structures, secured, free of excess rust, and had proper clearances.

b. Findings

No findings were identified.

1A37 (Unit 3) ITAAC Number 3.3.00.03a (777) / Family 01A

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 3.3.00.03a (777). The inspectors used the following NRC IPs/sections to perform this inspection:

- 65001.01-02.04 - Key Dimensions and Volumes
- 65001.01-02.06 - Records
- 65001.02-02.06 - Record Review

Inspectors reviewed documentation related to the shield wall between the Unit 3 reactor vessel cavity and the reactor coolant drain tank room from elevations 71'6"- to 83'-0". This wall provides shielding during normal plant operations. Inspectors reviewed survey reports for the wall thickness to determine if the wall met the minimum thickness required by the UFSAR Table 3.3-1. Inspectors also reviewed concrete wet density test results from the Layer 1A concrete placement from elevations 71'-6" to 76'-6", which covered the thinnest part of the shield wall. These records were reviewed to determine if the UFSAR density requirements for general shielding design were met.

b. Findings

No findings were identified.

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

1P01 Construction QA Criterion 16

a. Inspection Scope

Daily Corrective Action Program Review

As part of the various inspections discussed in previous sections of this report, the inspectors routinely reviewed issues during inspection activities and plant status reviews to verify they were being entered into the licensee's corrective action program at an appropriate threshold. The inspectors verified that adequate attention was being given to timely corrective actions and any adverse trends were identified and addressed. The inspectors reviewed corrective action program procedures and evaluated implementation of these procedures, including changes, to determine whether the procedures contained guidance for the following attributes:

- classification, prioritization, and evaluation for reportability (i.e., 10 CFR 50.55(e)) of conditions adverse to quality;
- complete and accurate identification of the problem in a timely manner commensurate with its significance and ease of discovery;
- screening of items entered into the CAP to determine the proper level of evaluation;
- identification and correction of procurement documents errors, deviations from procurement document requirements, defective items, poor workmanship, incorrect

vendor instructions, significant recurring deficiencies at both vendor shops and on site, and generic procurement related deficiencies;
- identification and correction of design deficiencies;
- consideration of extent of condition, generic implications, common cause, and previous occurrences;
- classification and prioritization of the resolution of the problem commensurate with its safety significance;
- identification of corrective actions that are appropriately focused to correct the problem;
- identification of root and contributing causes, as well as actions to preclude recurrence for significant conditions adverse to quality;
- completion of corrective actions is in a timely manner commensurate with the safety significance of the issue;
- provisions for escalating to higher management those corrective actions that are not adequate or not timely; and
- conditions adverse to quality were trended to pro-actively identify potential adverse trends and potential common cause problems, and the trending results were reported to management.

Routine Review of Items Entered into the Corrective Action Program

On a routine basis, the inspectors screened a sample of issues entered into the licensee and the contractor's corrective action programs. The inspectors attended several weekly management review committee meetings at the site and held discussions with licensee and contractor personnel responsible for the screening and correction of the issues to determine if:

- the licensee and the contractor were identifying equipment, human performance, and program issues at an appropriate threshold and were entering the issues into their respective corrective action programs;
- the licensee and the contractor appropriately classified the issues and took appropriate short-term corrective actions;
- conditions adverse to quality were controlled in accordance with each company's quality assurance program; and
- potential adverse trends were appropriately identified and corrected by the licensee or their contractors.

b. Findings

No findings were identified.

3. OPERATIONAL READINESS

Cornerstones: Operational Programs

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

3P01 Environmental Qualification

a. Inspection Scope

The inspectors reviewed the EQDPs and interviewed the WEC staff responsible for the environmental qualification of the MCR/RSW Transfer Panel and the following Nuclear Instrumentation Detectors:

- Excore Source Range Detectors (RXS-JE-NE001A, RXS-JE-NE001B, RXS-JE-NE001C, and RXS-JE-NE001D)
- Excore Intermediate Range Detectors (RXS-JE-NE002A, RXS-JE-NE002B, RXS-JE-NE002C, and RXS-JE-NE002D)
- Excore Power Range Detectors (RXS-JE-NE003A, RXS-JE-NE003B, RXS-JE-NE003C, RXS-JE-NE003D, RXS-JE-NE004A, RXS-JE-NE004B, RXS-JE-NE004C, and RXS-JE-NE004D)

Specifically, the inspectors reviewed the qualification files to determine if they contained:

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

b. Findings

No findings were identified.

4. OTHER INSPECTION RESULTS

4OA6 Meetings, Including Exit

On January 12, 2017, the inspectors presented the inspection results to R. Jones, V.C. Summer 2 & 3 Vice President, Nuclear Construction and Startup, and J. Archie, V.C. Summer 2 & 3 Senior Vice President and Chief Nuclear Officer, along with other licensee and WECTEC staff members. The inspectors stated that no proprietary information would be included in the inspection report.

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensees and Contractor Personnel

M. Askew, Fluor Civil/Structural FE
T. Bonnette, Supervisor, Emergency Preparedness (EP)
R. Justice, General Manager, Nuclear Power Operations
G. Lippard, Vice President, Nuclear Operations
M. Moore, Supervisor, Nuclear Licensing (NL)
S. Reese, Specialist, NL
T. Tharp, Supervisor, EP
B. Thompson, Manager, NL
R. Williamson, Manager, Emergency Services
C. Baucom, Licensing and Regulatory Compliance
R. Thompson, Supervisor, ITAAC
K. Accornero, Principal Engineer, WEC Engineering Center of Excellence Quality
T. Nowicki, Principal Engineer, WEC AP1000 Piping, Supports, and Mechanical Modules
P. Kotwicki, Fellow Engineer, WEC AP1000 Piping, Supports, and Mechanical Modules
N. Costanzo, Principal Engineer, WEC AP1000 Piping, Supports, and Mechanical Modules
M. Paharia, Manager, WEC AP1000 Piping, Supports, and Mechanical Modules
M. Wilkie, Director, WEC Mechanical Engineering
S. DiTommaso, Manager, WEC AP1000 ITAAC & Inspection Support
P. Russ, Director, U.S Licensing & Regulatory Support
M. Klinvex, Sr. Licensing Engineer, WEC AP1000 ITAAC & Inspection Support
J. Iacovino, Summer 2&3 Technical Program Manager, WEC Technical Integration
J. Semanco, Principal Engineer, WEC Technical Integration
A. Wank, Sr. Licensing Engineer, WEC AP1000 ITAAC & Inspection Support
B. Bedford, Director, WEC Site Mechanical & Electrical Engineering
L. Hare, SCANA Engineering
B. Chamberlain, SCANA Engineering
G. Sanders, SCANA Licensing
A. Rice, SCANA Licensing

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Item Number	Type	Status	Description
05200027/2016004-01	Non-Cited Violation	Open/Closed	Failure to Provide Adequate Procedures for Quality Control Inspections of Safety-Related Piping (Section 1A05)
05200027/2016004-02	Non-Cited Violation	Open	Failure to adequately implement measures to assure that design inputs are correctly translated into CA03 module design documents (Section 1A18)

05200028/2016004-02	Non-Cited Violation	Open	Failure to adequately implement measures to assure that design inputs are correctly translated into CA03 module design documents (Section 1A18)

LIST OF DOCUMENTS REVIEWED

Section 1A01

APP-1000-S2C-056, “Nuclear Island Seismic Floor Response Spectra,” Rev. 1;
APP-1000-S2C-056, “Nuclear Island Seismic Floor Response Spectra,” Rev. 2;
APP-1000-S2C-181, “AP1000 Nuclear Island Seismic Floor Response Spectra Envelopes,” Rev. 0;
APP-1000-S2C-160, “Design Input of Nuclear Island Floor Response Spectra,” Rev. 1;
APP-1000-S2C-172, “Design Nuclear Island Floor response Spectra for AP1000 Fuel Handling Equipment,” Rev. 0;
APP-GW-S2R-012, “Reconciliation of Design Floor Response Spectra for AP1000 Nuclear Island,” Rev. 1;
APP-GW-G1-002, “AP1000 Equipment Qualification Methodology,” Rev. 5;
APP-GW-G1-003, “AP1000 Seismic Design Criteria,” Rev. 6;
APP-FH01-Z0-001, “Design Specification for AP1000 Refueling Machine,” Rev. 2;
APP-FH01-S2C-001, “AP1000 Refueling Machine Seismic Analysis Report,” Rev. 1;
APP-FH01-S2C-003, “AP1000 Refueling Machine Seismic Analysis,” Rev. 0;
APP-FH02-Z0-001, “Design Specification for AP1000 Refueling Machine,” Rev. 2;
APP-FH02-S2C-001, “AP1000 Fuel Handling Machine Seismic Analysis Report,” Rev. 1;
APP-FH02-S2C-002, “AP1000 Fuel Handling Machine Seismic Analysis Report,” Rev. 1.

Section 1A02

APP-GW-GLR-033, "Spent Fuel Storage Racks Structural/Seismic Analysis," Rev. 5;
APP-GW-GLR-029, "AP1000 Spent Fuel Storage Racks Criticality Analysis," Rev. 4.

Section 1A03

Quality Assurance Records

VS2-PL01-VQQ-002, “Quality Release and Certificate of Conformance Reactor Coolant Loop Hot and Cold Legs,” Rev. 1;
VS2-PL01-VQQ-005, “Quality Release and Certificate of Conformance,” Rev. 4;
ASME Code Form NPP-1 from WEC Caroline Energy Solutions for Welding of Thermowell Boss attachments to Reactor Coolant Loop Piping Cold Leg 1B, Serial # L1102582-RCS-PL-L002B, 12/13/2013;
ASME Code Form NPP-1 from WEC Caroline Energy Solutions for Welding of Thermowell Boss attachments to Reactor Coolant Loop Piping Cold Leg 2B, Serial # L1102577-RCS-PL-L002D, 12/13/2013;
ASME Code Form NPP-1 from WEC Caroline Energy Solutions for Welding of Thermowell Boss attachments to Reactor Coolant Loop Piping Hot Leg A, Serial # L0903382-RCS-PL-L001A, 12/13/2013;
QPD1200007, “Final Quality Assurance Data Package and Final Report,” IBF, Cold Leg Pipe 27.12” OD x 22.00” ID x 2.56” THK ASME SA376 TP316LN, Item L1102577, Rev. 1;

QPD1200011, “Final Quality Assurance Data Package and Final Report,” IBF, Hot Leg Pipe 37.50” OD x 31.00” ID x 3.25” THK ASME SA376 TP316LN, Item L0903382, Rev. 1.

Design Documents

APP-PL01-Z0-200, “Reactor Coolant Loop Seamless Forged and Formed Pipe Fabrication Specification,” Rev. 6;
APP-PL01-Z0-201, “Reactor Coolant Loop Piping Fabrication Specification Including Welding,” Rev. 1

Design Drawings

APP-PL01-V6-001, “AP1000 Primary Coolant Loop Piping Spool Pieces Hot Leg,” Rev. 5;
APP-PL01-V6-004, “AP1000 Primary Coolant Loop Details Section Views,” Rev. 3;
APP-PL01-V6-005, “AP1000 Primary Coolant Loop Piping Spool Pieces Cold Leg,” Rev. 0;
APP-PL01-V8-002, “AP1000 Standard 90 Degree RCS Boss for Hot and Cold Leg Installation,” Rev. 1;
VS2-PL01-V8-001, “AP1000 Standard 90 Degree Branch Connection Installations,” Rev. 1;
VS2-PY72-V8-001, “AP1000 RCS Hot and Cold Leg RTD Thermowell Installation,” Rev. 0.

Certificate of Conformance / Material Test Reports

Certificate of Conformance from Tioga Pipe Supply Company, Cold Leg Group 02, Loop 2B, 22BTA L002D, 27.12” OD x 22.00” ID Seamless Pipe, Heat # 06198, 05/29/2012;
Certificate of Conformance from Tioga Pipe Supply Company, Cold Leg Group 03, Loop 1B, 22BTA L002B, 27.12” OD x 22.00” ID Seamless Pipe, Heat # 06208, 05/29/2012;
Certificate of Conformance from Tioga Pipe Supply Company, Hot Leg-Group 06, 31 BTA L001A, 37.50” OD x 31.00” ID Seamless Pipe, Heat # 05563, 05/30/2012;
Certificate of Conformance 4085 from Forgiatura Moriandini, Serial # L1102577, 01/09/2011;
Certificate of Conformance 4084 from Forgiatura Moriandini, Serial # L1102582, 09/23/2011;
Certificate of Compliance / Conformance from Weldstar, Customer PO # 4500443066, Lot CT9617 and DT9617, 08/06/2012;
Certified Material Test Report 2011/1139 from Foroni S.p.A., Heat # 05563, 06/09/2010;
Certified Material Test Report 2011/1894 from Foroni S.p.A., Heat # 06187, 07/08/2011;
Certified Material Test Report 2011/1969 from Foroni S.p.A., Heat # 06198, 07/18/2011;
Certified Material Test Report 2011/2088 from Foroni S.p.A., Heat # 06208, 07/26/2011;
Certified Material Test Report CMTR1200067 from IBF, Serial # L1102577, 05/28/2012;
Certified Material Test Report CMTR1200068 from IBF, Serial # L1102582, 05/28/2012;
Certified Material Test Report CMTR1200073 from IBF, Serial # L0903382, 05/30/2012;
Certified Material Test Report CMTR1200124 from IBF, Heat # 06187, 12/02/2013;
Certified Material Test Report CMTR1200127 from IBF, Heat # 06187, 12/02/2013;
Certified Material Test Report CMTR1200128 from IBF, Heat # 06187, 12/02/2013;
Certified Material Test Report CMTR1200132 from IBF, Heat # 06187, 12/02/2013;
Certified Material Test Report CMTR1200135 from IBF, Heat # 06187, 12/02/2013;
Certified Material Test Report CMTR1200136 from IBF, Heat # 06187, 12/02/2013;
Certified Material Test Report CMTR1200138 from IBF, Heat # 06187, 12/02/2013;
Heat Treatment Report HTR 1200002 from IBF, 12/02/2013;
Heat Treatment Report HTR 1200035 from IBF, Serial # L1102577, 12/02/2013;
Heat Treatment Report HTR 1100061 from IBF, Serial # L1102582, 12/30/2011;
Heat Treatment Report 6059/01/1 from Forgiatura Moriandini, Heat # 05563, 11/25/2011;
Material Test Report MTR1100035 from IBF, Heat # 05563, 11/24/2011;
Material Test Report MTR1100132 from IBF, Heat # 06198, 12/05/2011;
Material Test Report MTR1200015 from IBF, Heat # 06187, 01/18/2012;
Material Test Report MTR1200016 from IBF, Heat # 06187, 01/25/2012;

Material Test Report MTR1200017 from IBF, Heat # 06187, 02/12/2013;
Material Test Report MTR1200018 from IBF, Heat # 06187, 01/25/2012;
Material Test Report MTR1200019 from IBF, Heat # 06187, 02/12/2013;
Material Test Report MTR1200022 from IBF, Heat # 06208, 02/06/2012;
Test Report 158696 from Exova to IBF, Heat # 05563, 11/25/2010;
Test Report 163775 from Exova to IBF, Heat # 06198, 10/18/2011;
Test Report 164064 from Exova to IBF, Heat # 06208, 11/07/2011;
Test Report 164431 from Exova to IBF, Heat # 05563, 11/24/2011;
Test Report 164804 from Exova to IBF, Heat # 06198, 12/05/2011;
Test Report 165354 from Exova to IBF, Heat # 06208, 02/08/2012.

Nondestructive Examination / Test Reports

Dye Penetrant Test Report L120000073 from IBF, Serial # L1102577, Heat # 06198, 02/17/2012;
Dye Penetrant Test Report L120000084 from IBF, Serial # L1102582, Heat # 06208, 02/22/2012;
Dye Penetrant Test Report L120000136 from IBF, Serial # L0903382, Heat # 05563, 03/14/2012;
Hardness Check Report HDR1200122 from IBF, Serial # L1102577, Heat # 06198, 02/26/2012;
Hardness Check Report HDR1200123 from IBF, Serial # L1102582, Heat # 06208, 02/26/2012;
Hardness Check Report HDR1200126 from IBF, Serial # L0903382, Heat # 05563, 03/11/2012;
Ultrasonic Test Report U120000217 from IBF, Serial # L1102577, Heat # 06198, 02/24/2012;
Ultrasonic Test Report U120000218 from IBF, Serial # L1102577, Heat # 06198, 02/24/2012;
Ultrasonic Test Report U120000228 from IBF, Serial # L1102582, Heat # 06208, 02/24/2012;
Ultrasonic Test Report U120000229 from IBF, Serial # L1102582, Heat # 06208, 02/24/2012;
Ultrasonic Test Report U120000353 from IBF, Serial # L0903382, Heat # 05563, 03/19/2012;
Ultrasonic Test Report U120000354 from IBF, Serial # L0903382, Heat # 05563, 03/19/2012;
Visual and Dimensional Check Report VDR1200064 from IBF, Serial # L1102577, Heat # 06198, 02/17/2012;
Visual and Dimensional Check Report VDR1200093 from IBF, Serial # L1102582, Heat # 06208, 02/28/2012;
Visual and Dimensional Check Report VDR1200105 from IBF, Serial # L0903382, Heat # 05563, 03/16/2012.

Nonconforming Reports

IBF Nonconformity Report (NCR) S000000721, “Lingot for Hot Leg Group 6,” Rev. 0;
IBF Nonconformity Report (NCR) S000001049, “Cold Leg Pipe 27.12” OD x 22.00” ID x 2.56” THK ASME SA376 TP316LN,” Rev. 0;
IBF Nonconformity Report (NCR) S000001059, “Cold Leg Pipe 27.12” OD x 22.00” ID x 2.56” THK ASME SA376 TP316LN,” Rev. 0;
IBF Nonconformity Report (NCR) S000001064, “Hot Leg Pipe 37.50” OD x 31.00” ID x 3.25” THK ASME SA376 TP316LN – ODL L0903382,” Rev. 0;
VS2-PL01-GNR-010, “Tioga Deviation Notice TPS 11-10 for SCANA Unit 2 Reactor Coolant Loop, Hot Leg – Group 05 – Intrados Wall Thinning,” Rev. 1;
VS2-PL01-GNR-018, “Tioga Deviation Notice TPS 12-08 for SCANA Unit 2 Reactor Coolant Loop, Cold Leg – Group 02 – Out of Tolerance As Built Dimensions,” Rev. 0;
VS2-PL01-GNR-020, “Tioga Deviation Notice TPS 12-10 for SCANA Unit 2 Reactor Coolant Loop, Cold Leg – Group 03 – Out of Tolerance As Built Dimensions,” Rev. 0;
VS2-PL01-GNR-022, “Tioga Deviation Notice TPS 12-12 for SCANA Unit 2 Reactor Coolant Loop, Hot Leg – Group 06 – Out of Tolerance As Built Dimensions,” Rev. 0;
Westinghouse Procurement Advisory Release (PAR) 4500269783-075-0, 06/01/2010;

Westinghouse Procurement Advisory Release (PAR) 4500269783-144-0, 03/13/2012;
Westinghouse Procurement Advisory Release (PAR) 4500269783-146-0, 04/05/2012;
Westinghouse Procurement Advisory Release (PAR) 4500269783-148-0, 04/11/2012.

Section 1A04

Design Specifications:
APP-GW-P1-001, “Piping Design Criteria for AP1000,” Rev. 1;
APP-PH02-Z0-001, “AP1000 ASME Section III Class 1, 2, and 3 and Seismic Category II Pipe Supports/Tubing Supports/Instrument Rack Supports,” Rev. 3;
APP-PL02-Z0-101, “AP1000 Class 1 Piping and Non-Class 1 Extensions Design Specification,” Rev. 4.

Procedures:
W2-8.4-102, “Design Document Verification,” Rev. 0.0.

Piping Analysis Reports:
APP-RCS-PLR-020, “AP1000 RCS Pressurizer Spray, Auxiliary Spray, and CVS Supply and Return Piping PIPESTRESS Analysis and PSFATSTR,” Rev. 2;
APP-RCS-PLR-050, “AP1000 Reactor Coolant Loop (RCL): Piping Qualification,” Rev. 4.

Section 1A05

CGQP-9.7, "Liquid Penetrant Examination and Acceptance Standards for Welds, Base Materials and Cladding," Rev. 2;
98861, "NDE PT Level II Personnel Certificate," dated 10/22/2016;
97439, "NDE PT Level II Personnel Certificate," dated 10/8/2016;
98158, "NDE PT Level II Personnel Certificate," dated 10/8/2016;
CES-01, "General Welding Procedure," Rev. 6;
CES-04, "Weld Material Control," Rev. 5;
CES-08, "Preheating," Rev. 4;
Welding procedure, CWPS-8-8-T-A01, Rev. 4;
Procedure Qualification Records 62 (Rev. 3), 63 (Rev. 6), 600 (Rev. 6), 864 (Rev. 2), and 899 (Rev. 4);
Weld Traveler QAT-4403001-01;
Welder Qualification Records for welders CES0922 (7/28/16), CS0448 (9/18/13), CES0674 (1/26/16), & CES0321 (10/4/16);
DI 100428204, "NRC observations - RCL Piping," dated 11/7/2016;
CES Quality Assurance Program Manual, Rev. 5;
PI-4403001-014, "VC Summer Unit 2 RCL Piping Machining," Rev. 1;
NCR VCS-16-100, "RCL Pipe Installation," dated 11/3/2016;
Arcos, CMTR 156682, Heat-No. 540811 and Lot-No. CF0270, SFA-5.9, 316/316L, 3/32” X 36”, purchased and supported by Weldstar, Certificate of Compliance, dated 8/10/2016 and 8/16/2016, respectively, (CES-0358);
Arcos, CMTR 156778, Heat-No. 540811 and Lot-No. DF0270, SFA-5.9, 316/316L, 1/8” X 36”, purchased and supported by Weldstar, Certificate of Compliance (same as above), dated 8/15/2016 and 8/16/2016, respectively, (CES-0359);
Arcos, CMTR 159743, Heat-No. 543872 and Lot-No. XF0334, SFA-5.9, 316/316L, 0.035” X 10 lbs. spools, purchased and supported by Weldstar, Certificate of Compliance, both dated 9/13/2016 (CES-0360).

Section 1A06

APP-PH01-V8-001, "Reactor Vessel Support, RPV Support Installation Procedure," Steps 1-4, Rev. 2;
APP-PH01-V8-002, "Reactor Vessel Support, RPV Support Installation Procedure," Steps 5-6, Rev. 2;
APP-PH01-V8-003, "Reactor Vessel Support, RPV Support Installation Procedure," Steps 7-14, Rev. 2;
APP-PH01-V8-004, "Reactor Vessel Support, RPV Support Installation Procedure," Steps 15A-20, Rev. 2;
APP-PH01-V1-011, "Reactor Vessel Support, RPV Support General Assembly," Rev. 4;
APP-PH01-V1-012, "Reactor Vessel Support, RPV Support Concrete Embedment General Assembly," Rev. 4;
APP-PH01-V2-217, "Reactor Vessel Support, Interior Anchor Bolt Assembly and Details," Rev. 2;
APP-PH01-V2-218, "Reactor Vessel Support, Main Embedment Assembly and Details," Rev. 3;
APP-PH01-V2-219, "Reactor Vessel Support, RPV Support Hardware Details," Rev. 0;
VS2-RCS-VE-001, "Primary Coolant Loop Outline Equipment Placement Layout," Rev. 0;
VS2-1220-CCK-800000, "Unit 2 Nuclear Island As-Built Key Dimensions at Elev. 100'-0"," Rev. 0;
QAT-4403081-001-SW, "SW Reactor Vessel Support Machining and Installation," Rev. 1;
QAT-4403081-001-SE, "SE Reactor Vessel Support Machining and Installation," Rev. 1;
QAT-4403081-001-NE, "NE Reactor Vessel Support Machining and Installation," Rev. 0;
QAT-4403081-001-NW, "NW Reactor Vessel Support Machining and Installation," Rev. 1;
QAT-4403081-001-RV, "Reactor Vessel Alignment," Rev. 0.

Section 1A07

APP-1000-S2C-056, “Nuclear Island Seismic Floor Response Spectra,” Rev. 1;
APP-1000-S2C-056, “Nuclear Island Seismic Floor Response Spectra,” Rev. 2;
APP-1000-S2C-181, “AP1000 Nuclear Island Seismic Floor Response Spectra Envelopes,” Rev. 0;
APP-1000-S2C-160, “Design Input of Nuclear Island Floor Response Spectra,” Rev. 1;
APP-1100-S2C-106, “Seismic Inputs for Dynamic Analysis of AP1000 Core Makeup Tanks”, Rev. 0;
APP-1000-S2C-172, “Design Nuclear Island Floor response Spectra for AP1000 Fuel Handling Equipment,” Rev. 0;
APP-GW-S2R-012, “Reconciliation of Design Floor Response Spectra for AP1000 Nuclear Island,” Rev. 1;
APP-GW-G1-002, “AP1000 Equipment Qualification Methodology,” Rev. 5;
APP-GW-G1-003, “AP1000 Seismic Design Criteria,” Rev. 6;
APP-JE92-VBR-001, “Equipment Qualification Summary Report for Nuclear Instrumentation System Detectors for Use in the AP1000 Plant,” Rev. 3;
APP-JE92-VBR-002, “Equipment Qualification Data Package for Nuclear Instrumentation System Detectors for Use in the AP1000 Plant,” Rev. 3;
APP-JE92-Z0-001, “AP1000 Excore Source Range Detector Design Specification,” Rev. 4;
APP-JE92-Z0-002, “AP1000 Excore Intermediate Range Detector Design Specification,” Rev. 6;
APP-JE92-Z0-003, “AP1000 Excore Power Range Detector Design Specification,” Rev. 4;
APP-JE92-VPC-002, “AP1000 Nuclear Instrumentation System Intermediate Range Excore Neutron Detector Floor Response Spectra Reconciliation,” Rev. 0.

Section 1A08

APP-GW-G1-002, “AP1000 Qualification Methodology,” Rev. 5, dated 10/21/2016;

APP-GW-VP-030, “AP1000 Environmental Conditions,” Rev. 6, dated 10/19/2016;
APP-SSAR-GSC-157, “AP1000 Long-Term LOCA Containment Integrity Analysis with WGOTHIC,” Rev. 1, dated 2/2/2015;
APP-SSAR-GSC-166, “AP1000 Steamline Break Containment Integrity Analysis,” Rev. 1, dated 11/26/2014;
APP-GW-VPR-008, “Evaluation of Environmental Conditions Envelope Exceedances,” Rev. 0, dated 11/25/2015;
APP-JE92-VBR-001, “Equipment Qualification Summary Report for Nuclear Instrument Detectors for Use in the AP1000 Plant,” Rev. 3, dated 10/17/2016;
WNA-AR-00448-WAPP, “Detector Evaluation for Thermal and Radiation Aging,” Rev. 1, dated March 2015;
APP-JE92-VPH-001, “AP1000 Excore Nuclear Detectors Equipment Qualification Test Plan,” Rev. 0, dated July 2011;
NCTR 11-013, “Mirion Technology Technical Manual for NY-10865 – Source Range Detector Assembly,” Rev. 4, dated 8/4/2016;
NCTR 11-014, “Mirion Technology Technical Manual for NY-10866 – Intermediate Range Detector Assembly,” Rev. 5, dated 8/4/2016;
APP-JE92-Z0-002, “AP1000 Excore Intermediate Range Detector Specification,” Rev. 6, dated 10/6/2016;
Memo from RJ Lee Group, Thermogravimetric Analysis for Calculation of Activation Energy Purchase Order Number 4500385534, dated 5/16/2011;
APP-JE92-Z0-001, “AP1000 Excore Source Range Detector Design Specification,” Rev. 4, dated 10/6/2016;
APP-JE92-Z0-003, “AP1000 Excore Power Range Detector Design Specification,” Rev. 4, dated 10/6/2016;
APP-JE92-VBR-002, “Equipment Qualification Data Package for Nuclear Instrumentation System Detectors for Use in the AP1000 Plant,” Rev. 3, dated 10/17/2016;
K-015991-RA-001, “Kinectrics Inc Test Report for Qualification Testing of AP1000 Excore Neutron Detector Assemblies (IR Detector),” Rev. 1, dated 8/11/2014;
K-015991-PSWI-0001, “Kinectrics Inc Test Procedure for Qualification Testing of AP1000 Excore Neutron Detector Assemblies,” Rev. 7, dated 1/9/2014;
K-015991-PSWI-0001, “Kinectrics Inc Test Procedure for Qualification Testing of AP1000 Excore Neutron Detector Assemblies,” Rev. 6, dated 1/9/2014;
APP-JE92-VPR-001, “DBA Pressure and Temperature Envelope Evaluation for the Mirion Technologies NY-10866A Intermediate Range Neutron Detectors,” Rev. 0, dated 1/24/2015.

Section 1A09

APP-PV10-Z0-001; Design Specification; Ball and Plug Valves, ASME Boiler and Pressure Vessel Code Section III, Class 2 and 3; Rev. 9;
APP-PV10-VBR-008; Equipment Qualification Data Package for Manually Operated Ball Valves for use in the AP1000 Plant; Rev. 2;
APP-PV10-VBR-007; Equipment Qualification Summary Report for Manually Operated Ball Valves for use in the AP1000 Plant; Rev. 2;
APP-PV10-Z0D-102; PV10 Datasheet 102, Rev. 4;
APP-PV10-VDR-102; Compilation of Design Reports for PV10 Datasheet 102; Rev. 0;
APP-PV10-V2-102001; 3” CL 150 Butt Welded Manual Ball Valve; Rev. 0;
APP-PV10-V2-102002; 3” CL 150 Butt Welded Manual Ball Valve; Rev. 1.

Licensing Impact Determination

V.C. Summer 2&3, RN-16-083; correct inconsistencies between UFSAR Figures, Tables and Sections that are clearly discernible; dated: 9/30/16;

V.C. Summer 2&3 UFSAR Chapter 3; Design of Structures, Components, Equipment and Systems; Rev. 4.

Corrective Action Entries:
WEC CAPAL DI 100437324; EQDP Sample in DCD/USFSARs Inconsistencies with EQ Program Documentation; Issue Date: Dec 15, 2016.

Section 1A10

Design Specifications:
APP-GW-P1-001, "Piping Design Criteria for AP1000," Rev. 1;
APP-PH02-Z0-001, "AP1000 ASME Section III Class 1, 2, and 3 and Seismic Category II Pipe Supports/Tubing Supports/Instrument Rack Supports," Rev. 3;
APP-PL02-Z0-101, "AP1000 Class 1 Piping and Non-Class 1 Extensions Design Specification," Rev. 4.

Procedures:
W2-8.4-102, "Design Document Verification," Rev. 0.0.

Piping Analysis Reports:
APP-PXS-PLR-050, "AP1000 CMT 2A Supply Line: Piping Stress Analysis Report," Rev. 0;
APP-PXS-PLR-050, "AP1000 CMT 02A Supply Line (APP-PXS-PLA-050) Piping Stress Analysis Report," Rev. 1;
APP-PXS-PLR-050, "AP1000 CMT 02A Supply Line (APP-PXS-PLR-050) Piping Stress Analysis Report," Rev. 2;
APP-PXS-PLR-050, "Isometric Acceptance Report for APP-PXS-PLR-050," Rev. 3;
APP-PXS-PLR-050, "Isometric Acceptance Report for APP-PXS-PLR-050," Rev. 4;
APP-PXS-PLR-050, "AP1000 CMT 02A Supply Line Piping Stress Analysis Report," Rev. 5;
APP-PXS-PLR-050, "AP1000 CMT 02A Supply Line Piping Stress Analysis Report," Rev. 6.

Section 1A11

APP-1000-S2C-056, "Nuclear Island Seismic Floor Response Spectra," Rev. 1;
APP-1000-S2C-056, "Nuclear Island Seismic Floor Response Spectra," Rev. 2;
APP-1000-S2C-181, "AP1000 Nuclear Island Seismic Floor Response Spectra Envelopes," Rev. 0;
APP-1000-S2C-160, "Design Input of Nuclear Island Floor Response Spectra," Rev. 1;
APP-1100-S2C-106, "Seismic Inputs for Dynamic Analysis of AP1000 Core Makeup Tanks," Rev. 0;
APP-GW-S2R-012, "Reconciliation of Design Floor Response Spectra for AP1000 Nuclear Island," Rev. 1;
APP-GW-G1-002, "AP1000 Equipment Qualification Methodology," Rev. 5;
APP-GW-G1-003, "AP1000 Seismic Design Criteria," Rev. 6;
APP-MT01-Z0-100, "Design Specification for AP1000 Core Makeup Tank for System PXS," Rev. 9;
APP-MT01-Z0R-001, "AP1000 Core Makeup Tank ASME Generic Design Report," Rev. 5;
APP-MT01-Z0R-010, "AP1000 Core Makeup Tank Vessel Shell Analysis," Rev. 5;
APP-MT01-S2C-010, "AP1000 Core Make-Up Tank Support System Structural Analysis," Rev. 3;
APP-MT02-Z0-101, "Design Specification for AP1000 Accumulator Tank for PXS," Rev. 8;
APP-MT02-Z0R-001, "Detailed Analysis of AP1000 Accumulator Tank," Rev. 7;
APP-MT02-Z0R-101, "AP1000 Accumulator Tank Generic Design Report," Rev. 6;

APP-ME02-Z0-01, “Design Specification for AP1000 Passive Residual Heat Removal Heat Exchanger for System PXS,” Rev. 11;
APP-PXS-M8-003, “AP1000 Passive Residual Heat Removal Heat Exchanger Interface Control Document,” Rev. 4;
APP-ME02-Z0R-100, “AP1000 Passive Residual Heat Removal Heat Exchanger Generic Design Report,” Rev. 2;
CAPAL 100437321.

Section 1A12

Design Specifications:
APP-GW-P1-001, “Piping Design Criteria for AP1000,” Rev. 1;
APP-PH02-Z0-001, “AP1000 ASME Section III Class 1, 2, and 3 and Seismic Category II Pipe Supports/Tubing Supports/Instrument Rack Supports,” Rev. 3
APP-PL02-Z0-102, “AP1000 Class 2, 3 Piping and B31.1 Extensions Design Specification,” Rev. 4.

Procedures:
W2-8.4-102, “Design Document Verification,” Rev. 0.0.

Piping Analysis Reports:
APP-CVS-PLR-100, “Piping Analysis Report for Chemical and Volume Control System (CVS) from SCV Penetration CVS-PY-C02/P06 to in-line anchors CVS-PH-11A2051 and Sleeve 11209-ML-P11/SL43, Containment Building Rooms 11300 and 11209, Piping in Module 1132-Q3-05,” Rev. 0;
APP-CVS-PLR-530, “AP1000 Piping Analysis Report for the Chemical and Volume Control System from Anchor CVS-PH-12A0122 to Steel Containment Vessel Penetration CVS-PY-C03/P07,” Rev. 1.

Section 1A13

APP-JW03-VBR-001, “Equipment Qualification Summary Report for the Main Control Room (MCR)/Remote Shutdown Workstation (RSW) Transfer Panel for Use in the AP1000 Plant,” Rev 4, dated: Jan. 08, 2016;
APP-JW03-VBR-002, “Equipment Qualification Data Package for the Main Control Room (MCR) / Remote Shutdown Workstation (RSW) Transfer Panel,” Rev. 3, Aug. 17, 2016;
APP-JW03-VPC-004, “Seismic Qualification of the Main Control Room/Remote Shutdown Workstation Transfer Panel for the AP1000,” Rev. 0, Jul. 24, 2013;
APP-JW03-VPC-005, “Seismic Evaluation of Mounting Bolts and UNISTRUT Channel used for the Main Control Room/Remote Shutdown Workstation Transfer Panel for the AP1000 Plant,” Rev. 0, Jan. 14, 2015;
APP-JW03-VPP-003, “Seismic Test Procedure for the AP1000 Main Control Room (MCR) / Remote Shutdown Workstation (RSW) Transfer Panel,” Rev. 0, Apr. 23, 2012;
APP-OCS-J4-003, “AP1000 Main Control Room/Remote Shutdown Workstation Transfer Panel Design Specification,” Rev. 2, Feb. 10, 2014;
APP-GW-G1-002, “AP1000 Equipment Qualification Methodology,” Rev. 5, Oct. 21, 2016.

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APP-JW03-VBR-001, “Equipment Qualification Summary Report for the Main Control Room (MCR)/Remote Shutdown Workstation (RSW) Transfer Panel for Use in the AP1000 Plant,” Rev. 4, Jan. 08, 2016;

APP-JW03-VBR-002, “Equipment Qualification Data Package for the Main Control Room (MCR) / Remote Shutdown Workstation (RSW) Transfer Panel,” Rev. 3, Aug. 17, 2016;
APP-JW03-VPR-002, “Environmental and Seismic Test Report for the AP1000 Main Control Room (MCR) / Remote Shutdown Workstation (RSW) Transfer Panel," Rev. 0, June 2012;
100395794, “AP1000 Diverse Actuation System – EMC ITAAC – CGD of Calibration of Test Equipment,” Jul 5, 2016;
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CEI / IEC 61000-4-5, Edition 1.1 “Electromagnetic compatibility (EMC) – Part 4-5: Testing and measurement techniques – Surge immunity test,” Apr. 2001;
APP-PMS-ITH-020, “Standard Plant ITAAC 2.5.02.03 Performance Documentation Plan," Rev. 0, Jan. 30, 2013;
APP-GW-G1-002, “AP1000 Equipment Qualification Methodology,” Rev. 5, Oct. 21, 2016.

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APP-JW03-VBR-001, “Equipment Qualification Summary Report for the Main Control Room (MCR)/Remote Shutdown Workstation (RSw) Transfer Panel for Use in the AP1000 Plant,” Rev. 4, Jan. 08, 2016;
APP-JW03-VBR-002, “Equipment Qualification Data Package for the Main Control Room (MCR) / Remote Shutdown Workstation (RSW) Transfer Panel” Rev. 3, Aug. 17, 2016;
APP-JW03-VPR-002, “Environmental and Seismic Test Report for the AP1000 Main Control Room (MCR) / Remote Shutdown Workstation (RSW) Transfer Panel," Rev. 0, June 2012;
APP-PMS-J0M-003, "AP1000 Protection and Safety Monitoring System - Technical Manual," Rev. 0, Oct. 13, 2015.

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See non-public security report 05200027/2016404 for details.

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APP-OCS-GEH-220, “AP100 Human Factors Engineering Task Support Verification Plan,” Rev. 4;
APP-OCS-GER-220, “AP100 Verification Summary Report, Human Factors Engineering Task Support,” Rev. 0 and Rev. 1;
NND-AP-0032, Southern Carolina Electric and Gas Company, V.C. Summer Nuclear Station Unit 2 and 3, Administrative Procedure, “Implementation of Inspections, Tests, Analyses and Acceptance Criteria (ITAAC),” Rev. 6;
NND-AP-0032, Attachment 3, “Principal Closure Document Review Checklist ITAAC 3.2.00.01a Unit 2,” dated August 24, 2016.
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Nonconformance and Disposition (N&D) Reports:
VS2-CA03-GNR-000069, “CA03 Bearing Surface Area OOT,” Rev. 0;
VS2-CA03-GNR-000073, “CA03 Optional 7/8" Studs," Rev. 0.

Calculations:
APP-1100-S2C-005, “Static Analysis of Containment Internal Structures – Thermal Analysis,” Rev. 6;
APP-1100-S2C-006, “Static Analysis of Containment Internal Structures – Load Combinations,” Rev. 5;

APP-1100-S2C-006, “Static Analysis of Containment Internal Structures – Load Combinations,” Rev. 6;
APP-1100-S2C-008, “AP1000 CA03 Structural Module (IRWST) Steel Wall Qualification,” Rev. 4;
APP-1100-S2C-014, “AP1000 CA03 Structural Module (IRWST) External Connections Qualification,” Rev. 1;
APP-1100-S2C-034, “Finite Element Analysis of Containment Internal Structures,” Rev. 3;
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Engineering and Design Coordination Reports (E&DCRs):
APP-1100-GEF-150, “CIS Additions; Thermal Reduction Factor, Mass Model, and Flooding,” Rev. 0;
APP-1100-GEF-219, “CIS Concrete Load Combinations,” Rev. 0;
VSG-CA03-GEF-000021, “CA03 Landing Plate Shims,” Rev. 0;
VSG-CA03-GEF-000042, “CA03 Bearing Area Requirements,” Rev. 0.

Procedures and Specifications:
WEC APP-GW-GAP-341, “AP1000 Plant Program Design Change Control,” Rev. 0;
WEC APP-GW-GAP-420, “Engineering and Design Coordination Reports,” Rev. 10;
GWS-5, "AWS D1.6 - Stainless Structural Steel General Welding Specification,” Rev. 4.

Corrective Action Documents:
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Miscellaneous:
APP-GW-C1-001, “AP1000 Civil/Structural Design Criteria,” Rev. 3;
APP-GW-S1-009, “Design Guide for Thermal Effects on Concrete Structures,” Rev. 1;
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Weld Record 153481, VS2-CA03-CAK-001-FW-08-003, Rev. 1;
Weld Record 168056, VS2-CA03-VWK-800121-FW-09-SB-1001 to 1030, Rev. 1.

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VS2-CC01-Z0-026, "Safety Related Mixing and Delivering Concrete,” Rev. 7;
VS2-CC01-Z0-031, "Safety Related Placing Concrete and Reinforcing Steel,” Rev. 8;
VS2-CA01-GNR-000383, "CA01 East SG Survey,” Rev. 0;
CR-16-00551, "Self Consolidating Concrete Field Testing and Compression Data Record,” Rev. 0.

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Composite Steel Floor System Drawings:
VS2-1200-SS-902, “Auxiliary Building Steel Details Beam and Deck/Panel Seats Sheet 2,” Rev. 6;
VS2-1200-SS-905, “Auxiliary Building Miscellaneous Steel Details Sheet 5,” Rev. 5;
VS2-1200-SS-922, “Auxiliary Building Steel Details Beam and Deck/Panel Seats Sheet 6,” Rev. 0;
VS2-1230-SS-123, “Auxiliary Building Areas 1 & 2 Steel Framing Plan View EL 100’-0”,” Rev. 3;
VS2-1230-CD-201, “Auxiliary Building Area 2 Floor EL 100’-0” Metal Deck Plan Between COL’S I & K,” Rev. 3;

VS2-1230-CD-202, “Auxiliary Building Areas 1 & 2 Floor EL 100’-0” Metal Deck Plan Between COL’S K Thru M,” Rev. 3;
VS2-1230-CD-203, “Auxiliary Building Areas 1 Floor EL 100’-0” Metal Deck Plan Between COL’S M Thru Q,” Rev. 3;
APP-1220-001, “S3C-Auxiliary Building Detail Evaluation Metal Deck Composite Floor at EL. 82’-6” Areas 1&2,” Rev. 1.

Composite Steel Floor System Engineering and Design Coordination Reports:
APP-1200-GEF-208, “Structural Steel Connection 1P-1 Modification, AUX,” Rev. 0;
APP-1200-GEF-562, “Addition of Weld Note for MC Connections,” Rev. 0;
APP-1200-GEF-898, “Steel Connection Modifications & Embedded Plate Group Impact,” Rev. 0
APP-GW-GEF-882, “Revision to APP-GW-C1-001 Table 3,” Rev. 0;
APP-1234-GEF-036, “Modification for the connection 1P-15 Dwg APP-1200-SS-902”;
APP-1000-GEF-207, “Plant Parameter Reference Document Update,” Rev. 0;
APP-GW-GEF-694, “Revision to the Civil Structural Design Criteria APP-GW-C1-001 Section 5.2.4.1,” Rev. 0.

Composite Steel Floor System Nonconformance and Disposition Reports (N&Ds):
VS2-SS01-GNR-000339, “Inadequate Connection Plate Length Room 12211 East,” Rev. 0;
VS2-SS01-GNR-000319, “MC-13 Moment Connection Room 12211, I to J,” Rev. 0.

Composite Steel Floor System Specifications:
APP-SS01-Z0-002, “Erection of Structural Steel,” Rev. 5;
APP-SS01-Z0-004, “Furnishing of Steel Decking and Stay-In-Place Forms,” Rev. 4.

Composite Steel Floor System Calculations:
APP-CD01-C1-001, “AP1000 Design Criteria for Steel Decking and Stay-In-Place Forms,” Rev. 2;
APP-1230-SSC-001, “Auxiliary Building Steel Framing Design EL. 100’-0” Areas 1 & 2,” Rev. 0;
APP-1200-S2C-003, “Auxiliary Building Load Combinations and Loads for Finite Element Analysis,” Rev. 2;
APP-1230-CCC-001, “Auxiliary Building Concrete Slab Design EL.100'-0" Areas 1&2,” Rev. 0;
APP-1200-CDC-001, “Nuclear Island Auxiliary Building Structural Calculation for 2 ½”, 3” and 4 ½” Metal Deck,” Rev. 1;
APP-GW-CD-001, “AP1000 Steel Decking and Stay-In-Place Formwork Design Criteria,” Rev. 1;
APP-GW-C1-001, “AP1000 Civil/Structural Design Criteria,” Rev. 3;
APP-1000-S2C-101, “AP1000 Auxiliary Building Data for Finite Element Seismic Analysis,” Rev. 2;
APP-1000-S2C-056, “Nuclear Island Seismic Floor Response Spectra,” Rev. 2;
APP-1200-SSC-001, “Auxiliary Building Floor Seat and Steel Framing Connections,” Rev. 1;
APP-1230-S3C-001, “Auxiliary Building Detail Evaluation Metal Deck Composite Floor at EL. 100’-0” Areas 1 & 2,” Rev. 1;
APP-1200-S3C-900, “Auxiliary Building Floor Seat Steel Framing Connections,” Rev. 0;
APP-1232-S3C-001, “Auxiliary Building Detail Evaluation Metal Deck Composite Floor at EL. 100’-0” Area 2,” Rev. 1.

Composite Steel Floor System Quality Assurance Inspection Reports:
QA Inspection Report, Q445-14-0203, “Safety Related Structural Steel”;
QA Inspection Report, Q445-14-0202, “Safety Related Structural Steel”;
QA Inspection Report, Q445-15-12038, “Receipt Inspection”;

Source Inspection Report, 132177-SS01.00-405-004-001-PVS, “Safety Related Structural Steel”;
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Composite Concrete Precast Floor System Miscellaneous:
DI-OI-041345, The calculation note which supports this drawing has open items, 8/15/2013;
Quality Assurance Inspection Report Number S-561-16-13840, Dated 09/13/2016;
Quality Assurance Inspection Report Number S-561-16-13847, Dated 09/13/2016;
Type ‘A’ Inspection Report Number Q445-14-1605, Dated 08/25/2014;
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Composite Concrete Precast Floor System Engineering and Design Coordination Reports:
APP-1100-GEF-219, CIS Concrete Load Combinations, Rev. 0;
APP-1200-GEF-362, Update to Precast Concrete Panel General Notes, Rev. 0;
VSG-CP01-GEF-000004, Precast Stirrup Spacing Conflict, Rev. 0;
APP-1200-GEF-569, Auxiliary Building Circumferential Reinforcement Termination Details, Rev. 0;
APP-1223-GEF-011, Add Embed Plate Tag Numbers for RFI APP-CE01-GF-850221, Rev. 0;
APP-1223-GEF-071, Slab 1223-CP-S06 Reinforcement Modifications, Rev. 0;
APP-1223-GEF-072, Correction of Errors in APP-1223-S3C-001 Rev. 1, Rev. 0;
VS2-1210-GEF-000074, Form Saver Locations, Area 3, Rev. 0;
VSG-1200-GEF-000047, Precast Penetration Added Bars, Rev. 0.

Composite Concrete Precast Floor System Calculations:
APP-1241-S3C-001, Auxiliary Building Detail Evaluation Concrete Slab at EL. 117'-6" Area 1, Rev. 1;
APP-1242-S3C-001, Auxiliary Building Detail Evaluation Concrete Slab at EL. 117’-6” Area 2, Rev. 1;
APP-1252-S3C-001, Auxiliary Building Detail Evaluation Concrete Slab at EL. 135'-3" Area 2, Rev. 2;
APP-1010-CRR-100, Auxiliary Building Drawing Package Design Review Report, Rev. 5.

Composite Concrete Precast Floor System Specifications:
VS2-AE01-Z0-001, Building Seals of CV and CA Modules, Westinghouse Safety Class E, Seismic Category III, Rev. 4;
VS2-CC01-Z0-026, Safety Related Mixing and Delivering Concrete, Westinghouse Safety Class C, Nuclear Safety Related, Rev. 7;
VS2-CC01-Z0-027, Safety Related Concrete Testing Services, Westinghouse Safety Class C, Nuclear Safety Related, Rev. 5;
SV2-CC01-Z0-031, Safety Related Placing Concrete and Reinforcing Steel, Westinghouse Seismic Category I and II, Safety Class C 'NUCLEAR SAFETY', Westinghouse Seismic Category III, Safety Class E, Rev. 8;
SV2-CR01-Z0-011, Furnishing of Safety Related Reinforcing Steel, Westinghouse Safety Class C, Nuclear Safety Related, Rev. 3.

Composite Concrete Precast Floor System Drawings:
VS2-1030-CR-101, Auxiliary Building Concrete Reinforcement Slab Joint Rebar To Connect With Shield Building EL 100'-0" (Sheet 2), Rev. 3;
VS2-1230-CD-202, Auxiliary Building Areas 1 & 2 Floor EL 100'-0" Metal Deck Plan Between Col's K Thru M, Rev. 5;

VS2-1230-CD-203, Auxiliary Building Area 1 Floor EL 100'-0" Metal Deck Plan Between Col's M Thru Q, Rev. 5;
VS2-1230-CD-205, Auxiliary Building Areas 1 & 2 Floor EL 100'-0" Metal Deck Plan 4 1/2" Deep Deck, Rev. 5;
VS2-1230-CP-123, Auxiliary Building Area 1 Floor EL 100'-0" Concrete Precast Panels Location Drawing, Rev. 5;
VS2-1230-SS-123, Auxiliary Building Areas 1 & 2 Steel Framing Plan View EL 100'-0", Rev. 6;
VS2-1231-CC-103, Auxiliary Building Concrete Outline Area 1 Floor EL 100'-0", Rev. 7;
VS2-1231-CC-113, Auxiliary Building Concrete Outline Area 1 Floor EL 100'-0" Section M & Plan At EL. 109'-0", Rev. 3;
VS2-1231-CEK-800001,WELD MAP-VS2-1230-COW-006-12306-ML-E06, Rev. 0;
VS2-1231-CEK-800002, WELD MAP-VS2-1230-COW-006-12306-ML-E07, Rev. 0;
VS2-1231-CEK-800003, WELD MAP-VS2-1230-COW-006-12306-ML-E08, Rev. 0;
VS2-1231-CEX-101, Auxiliary Building Area 1 EL. 100'-0" Embedments Index Bottom Face, Rev. 1;
VS2-1231-CPX-001, Auxiliary Building Area 1 Floor EL 100'-0" Concrete Precast Panels Drawing Index, Rev. 1;
VS2-1231-CPY-010, Auxiliary Building Area 1 Floor EL 100'-0" Concrete Precast Panel 1231-CP-S01 Layout & Reinforcement Details, Rev. 6;
VS2-1231-CPY-020, Auxiliary Building Area 1 Floor EL 100'-0" Concrete Precast Panel 1231-CP-S02 Layout & Reinforcement Details, Rev. 4;
VS2-1231-CPY-030, Auxiliary Building Area 1 Floor EL 100'-0" Concrete Precast Panel 1231-CP-S03 Layout & Reinforcement Details, Rev. 4;
VS2-1231-CPY-040, Auxiliary Building Area 1 Floor EL 100'-0" Concrete Precast Panel 1231-CP-S04 Layout & Reinforcement Details, Rev. 5;
VS2-1231-E0-103, Auxiliary Building Electrical Penetrations Area 1 Floor EL. 100'-0", Rev. 4;
VS2-1231-E0X-103, Auxiliary Building Electrical Penetrations List Area 1 Floor EL. 100'-0", Rev. 4;
VS2-1231-M0-103, Auxiliary Building HVAC Duct Penetrations Area 1 Floor EL. 100'-0", Rev. 1;
VS2-1231-P0-103, Auxiliary Building Piping Penetrations Area 1 Floor EL. 100'-0", Rev. 2;
VS2-CR01-C8-800351, Auxiliary Building A4-CS-X 1232-CP-S01 Precast Elev. 100'-0", Rev. 4;
VS2-CR01-C8-800352, Auxiliary Building A4-CS-X 1232-CP-S02 Precast Elev. 100'-0", Rev. 3;
VS2-CR01-C8-800353, Auxiliary Building A4-CS-X 1232-CP-S03 Precast Elev. 100'-0", Rev. 2;
VS2-CR01-C8-800354, Auxiliary Building A4-CS-X 1232-CP-S04 Precast Elev. 100'-0", Rev. 3;
VS2-1200-SS-902, Auxiliary Building Steel Details Beam and Deck/Panel Seats, Sheet 2, Rev. 6.

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Miscellaneous:

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Quality Assurance Inspection Report Number S-561-16-13840, Dated 09/13/2016;
Quality Assurance Inspection Report Number S-561-16-13847, Dated 09/13/2016;
Type ‘A’ Inspection Report Number Q445-14-1605, Dated 08/25/2014;
Gerdau Certificate of Compliance and Test Reports for Reinforcing Heat/Batch Numbers 5714128003, 5714186603, 5713914503, and 5713919503.

Engineering and Design Coordination Reports:

APP-1100-GEF-219, CIS Concrete Load Combinations, Rev. 0;
APP-1200-GEF-362, Update to Precast Concrete Panel General Notes, Rev. 0;
APP-1200-GEF-689, Auxiliary Building - Precast Panels EL. 82'-6" & 92'-6" Shear Stirrup Dimensions and General Notes, Rev. 0;

VSG-CP01-GEF-000004, Precast Stirrup Spacing Conflict, Rev. 0;
APP-1200-GEF-569, Auxiliary Building Circumferential Reinforcement Termination Details, Rev. 0;
APP-1223-GEF-011, Add Embed Plate Tag Numbers for RFI APP-CE01-GF-850221, Rev. 0;
APP-1223-GEF-071, Slab 1223-CP-S06 Reinforcement Modifications, Rev. 0;
APP-1223-GEF-072, Correction of Errors in APP-1223-S3C-001 Revision 1, Rev. 0
VS2-1210-GEF-000074, Form Saver Locations, Area 3, Rev. 0;
VSG-1200-GEF-000047, Precast Penetration Added Bars, Rev. 0.

Calculations:
APP-1220-S3C-002, Auxiliary Building Detail Evaluation Concrete Slab at EL. 92'-6'' Areas 3&4, Rev. 2;
APP-1230-S3C-003, Aux Building Detailed Evaluation of Concrete Slab and Precast Panels at El. 100'-0" Areas 5 & 6, Rev. 1;
APP-1234-S3C-001, Auxiliary Building Detail Evaluation Concrete Slab at EL. 1 07'-2" Area 4, Rev. 1;
APP-1246-S3C-001, Auxiliary Building Detail Evaluation Concrete Slab at EL 118'-2 1/2" and EL 125'-0" Area 6, Rev. 1;
APP-1250-S3C-003, Auxiliary Building Detail Evaluation Concrete Slab at EL 153'-3" Areas 5 & 6, Rev. 0;
APP-1010-CRR-100, Auxiliary Building Drawing Package Design Review Report, Rev. 5;
APP-1220-S3C-003, Auxiliary Building Detail Evaluation Concrete Slab at EL. 82'-6'' Areas 5 & 6, Rev. 1;
APP-1223-S3C-001, Auxiliary Building Detail Evaluation Concrete Slab at EL. 82'-6" Area 3, Rev. 1.

Specifications:
VS2-AE01-Z0-001, Building Seals of CV and CA Modules, Westinghouse Safety Class E, Seismic Category III, Rev. 4.
VS2-CC01-Z0-026, Safety Related Mixing and Delivering Concrete, Westinghouse Safety Class C, Nuclear Safety Related, Rev. 7.
VS2-CC01-Z0-027, Safety Related Concrete Testing Services, Westinghouse Safety Class C, Nuclear Safety Related, Rev. 5.
SV2-CC01-Z0-031, Safety Related Placing Concrete and Reinforcing Steel, Westinghouse Seismic Category I and II, Safety Class C 'NUCLEAR SAFETY', Westinghouse Seismic Category III, Safety Class E, Rev. 8.
SV2-CR01-Z0-011, Furnishing of Safety Related Reinforcing Steel, Westinghouse Safety Class C, Nuclear Safety Related, Rev. 3.

Drawings:
VS2-1030-CR-101, Auxiliary Building Concrete Reinforcement Slab Joint Rebar To Connect With Shield Building EL 100'-0" (Sheet 2), Rev. 3;
VS2-1230-CD-202, Auxiliary Building Areas 1 & 2 Floor EL 100'-0" Metal Deck Plan Between Col's K Thru M, Rev. 5;
VS2-1230-CD-203, Auxiliary Building Area 1 Floor EL 100'-0" Metal Deck Plan Between Col's M Thru Q, Rev. 5;
VS2-1230-CD-205, Auxiliary Building Areas 1 & 2 Floor EL 100'-0" Metal Deck Plan 4 1/2" Deep Deck, Rev. 5;
VS2-1230-CP-123, Auxiliary Building Area 1 Floor EL 100'-0" Concrete Precast Panels Location Drawing, Rev. 5;
VS2-1230-SS-123, Auxiliary Building Areas 1 & 2 Steel Framing Plan View EL 100'-0", Rev. 6;

VS2-1231-CC-103, Auxiliary Building Concrete Outline Area 1 Floor EL 100'-0", Rev. 7;
VS2-1231-CC-113, Auxiliary Building Concrete Outline Area 1 Floor EL 100'-0" Section M & Plan At EL. 109'-0", Rev. 3;
VS2-1231-CEK-800001, WELD MAP-VS2-1230-COW-006-12306-ML-E06, Rev. 0;
VS2-1231-CEK-800002, WELD MAP-VS2-1230-COW-006-12306-ML-E07, Rev. 0;
VS2-1231-CEK-800003, WELD MAP-VS2-1230-COW-006-12306-ML-E08, Rev. 0;
VS2-1200-SS-902, Auxiliary Building Steel Details Beam And Deck/Panel Seats, Sheet 2, Rev. 6;
VS2-1220-SSK-040, Unit 2 Auxiliary Building Area5 Deck/Panel Seat Weld Map, Rev. A;
VS2-1220-SS-205, Auxiliary Building Area 5 Miscellaneous Steel Plan View EL. 82'-6," Rev. 2;
VS2-1220-CP-562, Auxiliary Building Area 5 & 6 Floor EL. 82'-6" Concrete Precast Panels Location Drawing, Rev. 2;
VS2-1220-CR-562, Auxiliary Building Area 5 & 6 Concrete Reinforcement Floor EL. 82'-6" Plan View, Rev. 2;
VS2-1220-CR-592, Auxiliary Building Area 5 & 6 Concrete Reinforcement Floor EL. 82'-6" Plan View, Rev. 2;
VS2-1225-CPX-001, Auxiliary Building Areas 5 & 6 Floor EL. 82'-6" Concrete Precast Panels Drawing Index, Rev. 1;
VS2-1225-CPY-020, Auxiliary Building Area 5 Floor EL 82'-6" Concrete Precast Panel 1225-CP-S02 Layout & Reinforcement Details, Rev. 2;
VS2-1226-CPY-011, Auxiliary Building Areas 5 & 6 Floor EL 82'-6" Concrete Precast Panel 1226-CP-S01 Detail Reinforcement (2/2), Rev. 0.

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Miscellaneous:
APP-GW-SUP-001, "Design Methodology for Structural Modules," Rev. 4;
APP-GA-G1-001, "AP1000 Module Design Criteria," Rev. 2.

Calculations:
APP-1230-CAC-001, "Design of Spent Fuel Pit Floor in Module CA20," Rev. 2;
APP-1230-CAC-002, "Design of Cask Loading Pit Floor in Module CA20," Rev. 2;
APP-CA20-S3C-001, "CA20 Connection Design: Module Wall to Module Floor," Rev. 0
APP-CA20-S3C-003, "Auxiliary Building Load Combinations and Loads for Finite Element Analysis," Rev. 2;
APP-CA20-S3C-006, "CA20 Connection Design Calculation: Module Wall to Adjacent Floor," Rev. 3;
APP-CA20-S3C-013, "AP1000 CA20 Structural Module Redline Evaluation," Rev. 0
APP-CA20-S3C-014, "AP1000 CA20 Structural Module Localized Load Mapping," Rev. 0;
APP-CA20-S3C-015, "AP1000 CA20 Structural Module Analysis," Rev. 1;
APP-CA20-S3C-016, "AP1000 CA20 Structural Module Design Evaluation," Rev. 2.

Engineering and Design Coordination Reports (E&DCRs):
APP-GEF-CA20-GEF-228, "Structural Module CA20 Additional information on Justification of the Reinforcement of Submodule 66 at Elev. 74'-6", Rev. 0;
APP-CA20-GEF-1237, "Floor Rebar Modifications to CA20 Sub-modules 43 & 44," Rev. 0;
APP-CA20-GEF-1238, "Floor Rebar Modifications to CA20 Sub-modules 47, 48, 49 & 50," Rev. 0;
APP-CA20-GEF-1350, "Alignment of CA20 Calculations," Rev. 0;
APP-CA20-GEF-1537, "Structural Module CA20, Submodule 66 at Elev. 74'-6" – CAPAL 100170619 closure," Rev. 0;
APP-1200-GEF-271, "Revision to APP-1200-S2C-003 Rev. 1," Rev. 0.

Drawings:
VS2-CA20-S8-204-R0, “Auxiliary Building Areas 5&6 CA20 Module Floor El 90’-3” Cask Loading Pit Bottom Reinforcement – Plan View”;
VS2-CA20-S8-205-R0, “Auxiliary Building Areas 5&6 CA20 Module Floor El 90’-3” Cask Loading Pit Top Reinforcement – Plan View”;
VS2-CA20-S8-206-R0, “Auxiliary Building Areas 5&6 CA20 Module Floor El 92’-8½” Spent Fuel Pool Bottom Reinforcement – Plan View”;
VS2-CA20-S8-207-R0, “Auxiliary Building Areas 5&6 CA20 Module Floor El 92’-8½” Spent Fuel Pool Top Reinforcement – Plan View”;
VS2-CA20-S8-252-R0, “Auxiliary Building Areas 5&6 CA20 Module Floor El 90’-3” Cask Loading Pit Reinforcement Section”;
VS2-CA20-S8-253-R0, “Auxiliary Building Areas 5&6 CA20 Module Floor El 92’-8½” Spent Fuel Pool Reinforcement Section”;
VS2-CA20-S8-282-R0, “Auxiliary Building Areas 5&6 CA20 Module Reinforcement Floor Details Sheet - 3”;
VS2-CA20-S8-283-R1, “Auxiliary Building Areas 5&6 CA20 Module Floor El 90’-3” Cask Loading Pit Reinforcement Floor Details Sheet - 4”;
VS2-CA20-S8-283-R1, “Auxiliary Building Areas 5&6 CA20 Module Connection Adjacent Floor El 82’-6”.

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Drawings:
VS2-1200-CCK-092, Unit 2 AUX. BLDG. Column Line P Wall Thickness As-Built From 7.3 to 11 from Elevations 66’6” to 135’3”, Rev. C, 4/26/16;
VS2-1200-CCK-089, Unit 2 AUX. BLDG. Column Line K Wall Thickness As-Built From 7.3 to 11 from Elevations 66’6” to 135’3”, Rev. C, 4/26/16;
VS2-1200-CCK-090, Unit 2 AUX. BLDG. Column Line L Wall Thickness As-Built From Shield Building Wall to 11 from Elevations 66’6” to Roof, Rev. B, 4/26/16;
VS2-1200-CCK-091, Unit 2 AUX. BLDG. Column Line M Wall Thickness As-Built From Shield BLDG to 11 from Elevations 66’6” to Roof, Rev. B, 4/26/16.

Concrete Density Records:
C-16-00098, "Self Consolidating Concrete Field Testing and Compressing Data Record";
C-16-00020, "Self Consolidating Concrete Field Testing and Compressing Data Record";
C-16-00003, "Self Consolidating Concrete Field Testing and Compressing Data Record";
C-16-00076, "Self Consolidating Concrete Field Testing and Compressing Data Record".

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See non-public security report 05200027/2016404 for details

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Procedures:
EMP-170.003, Warning Siren Maintenance, Rev. 14;
ORG-01, Organizational Performance Improvement Guidelines, Rev. 1;
VCS-EPMP-100, Maintenance of the Early Warning Siren System (EWSS), Rev. 0;
VCS-EPMP-107, Siren Radio System Maintenance, Rev. 0;
V.C. Summer Radiation Emergency Plan - Units 2 & 3, Rev. 7.

Records and Data:

2015 and 2016 V.C. Summer Emergency Planning Calendar mailer to members of the public in the 10-mile EPZ;
Documentation of Quarterly Siren Maintenance for 3rd Quarter 2014 to 2nd Quarter 2016;
Documentation of Bi-weekly Siren Tests and Maintenance for 3rd Quarter 2014 to 2nd Quarter 2016;
FEMA Alert Notification System Design Report Approval Letter, dated 10/21/14;
Siren Annual Maintenance records: 2015 to 2016;
Principle Closure Document for EWSS Annual Full Activation Test, dated 4/11/16;
Federal Commander Digital Telemetry System Reference Manual, Dated 10/08/13;
Federal Signal Corporation 2001-130 Electro-Mechanical Siren Operating Manual, 2015 Edition;
V.C. Summer Alert Notification System Design Report, Rev. 1, Updated 12/01/14;
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Condition Report (CR) 14-05820, Siren 93 battery failure;
CR 14-06385, Siren 12 power failure alarm;
CR 14-06610, Siren 7 battery failure;
CR 14-06644, Siren 20 battery failure;
CR 15-01688, Report of siren going off;
CR 15-02742, Siren 84 battery failure;
CR 15-03055, Siren 49 communications failure;
CR 15-04808, Siren 35 battery failure;
CR 15-05826, During Quarterly Growl Test, 39 sirens indicated battery failure;
CR 15-06676, Trend, increase power drain on sirens since the analog to digital conversion;
CR 15-06976, Siren 90 battery failure;
CR 16-00146, During Quarterly Growl Test, 5 sirens indicated battery failure;
CR 16-00616, Siren 20 battery failure;
CR 16-00702, ANS downward trend;
CR 16-03426, Siren 8 communications failure;
CR 16-04300, Siren 100 communications failure;
CR 16-04913, Siren 42 antenna sweep results below acceptable threshold;
CR 16-04966, Annual Siren Maintenance data sheet incomplete.

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APP-GW-P1-001, “Piping Design Criteria for AP1000,” Rev. 1;
APP-PH02-Z0-001, “AP1000 ASME Section III Class 1, 2, and 3 and Seismic Category II Pipe Supports/Tubing Supports/Instrument Rack Supports,” Rev. 3;
APP-PL02-Z0-101, “AP1000 Class 1 Piping and Non-Class 1 Extensions Design Specification,” Rev. 4;
APP-PL02-Z0-102, “AP1000 Class 2, 3 Piping and B31.1 Extensions Design Specification,” Rev. 4;
APP-PL02-GEF-126, "Updated Building Penetration Information in Piping Design Specs (APP-PL02-Z0-101/102)," Rev. 0;
APP-PL02-GEF-132, "Update of Functional Capability Requirements for Piping Design Specifications," Rev. 0.

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W2-8.6-102, “Validation of Computer Software,” Rev. 0.0;
W2-8.6-103, “Configuration Control of Computer Programs and Systems,” Rev. 0.1;
W2-8.6-106, “Single Application Computer Programs,” Rev. 0.2;
APP-GW-P1-009, “AP1000 Pipe Support Desktop Instructions,” Rev. 0;
APP-GW-PHC-050, “User Manual for GTStrudl Interface Tool,” Rev. 4.

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APP-ML05-V2-425, “AP1000 Duplex Penetration 11305-ML-P01 (SP10) Details,” Rev. 3;
APP-PXS-M6-001, “Piping and Instrumentation Diagram Passive Core Cooling System,” Rev. 10;
APP-PXS-M6-002, “Piping and Instrumentation Diagram Passive Core Cooling System,” Rev. 12;
APP-PXS-PLW-018, “Passive Core Cooling System Containment BLDG Room 11305/11206 from IRWST to DVI-A,” Rev. 4;
APP-PXS-PLW-029, “Passive Core Cooling System Containment Building Room 11207 from IRWST to DVI-B,” Rev. 5.

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APP-CVS-PLR-100, “Piping Analysis Report for Chemical and Volume Control System (CVS) from SCV Penetration CVS-PY-C02/P06 to in-line anchors CVS-PH-11A2051 and Sleeve 11209-ML-P11/SL43, Containment Building Rooms 11300 and 11209, Piping in Module 1132-Q3-05,” Rev. 0;
APP-CVS-PLR-530, “AP1000 Piping Analysis Report for the Chemical and Volume Control System from Anchor CVS-PH-12A0122 to Steel Containment Vessel Penetration CVS-PY-C03/P07,” Rev. 1;
APP-PXS-PLR-010, “AP1000 Direct Vessel Injection Line A (APP-PXS-PLR-010) Piping Stress Analysis Report,” Rev. 6;
APP-PXS-PLR-050, “AP1000 CMT 2A Supply Line: Piping Stress Analysis Report,” Rev. 0;
APP-PXS-PLR-050, “AP1000 CMT 02A Supply Line (APP-PXS-PLA-050) Piping Stress Analysis Report,” Rev. 1;
APP-PXS-PLR-050, “AP1000 CMT 02A Supply Line (APP-PXS-PLR-050) Piping Stress Analysis Report,” Rev. 2;
APP-PXS-PLR-050, “Isometric Acceptance Report for APP-PXS-PLR-050,” Rev. 3;
APP-PXS-PLR-050, “Isometric Acceptance Report for APP-PXS-PLR-050,” Rev. 4;
APP-PXS-PLR-050, “AP1000 CMT 02A Supply Line Piping Stress Analysis Report,” Rev. 5;
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APP-RCS-PLR-050, “AP1000 Reactor Coolant Loop (RCL): Piping Qualification,” Rev. 4.

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APP-GW-PHC-005, “Seismic Acceleration Values for Pipe Support and Tubing Support Design,” Rev. 2;
APP-PXS-PHC-11A0379, “Pipe Support Calculation for APP-PXS-PHC-11A0379," Rev. 0;
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APP-CVS-PHR-530, "Pipe Support Hanger Report for Pipe Analysis Report APP-CVS-PLR-530," Rev. 0;
APP-GW-PLC-254, "Procedure for Evaluating Local Pipe Stresses Due to Interactions of Pipe Supports," Rev. 0;
APP-PH02-GEF-013, "Addition of Piping Penetration Jurisdictional Boundaries to APP-PH02-Z0-001," Rev. 0;
APP-PXS-PHC-11R0008, “Pipe Support Hanger Report for Pipe Analysis Report APP-PXS-PH-11R0008," Rev. 2;
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APP-PXS-PLC-002, “AP1000 DVI Piping Component Fatigue Analysis,” Rev. 1;
APP-PXS-PLC-005, “AP1000 CMT-A and CMT-B Piping Component Fatigue Evaluation,” Rev. 0;
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VS2-PXS-P0W-800001, Hold point to verify V.C. Summer COL License Condition met for APP-PXS-PLR-010, 05/10/2016;
VS2-PXS-P0W-800009, “ASME III Installation of PXS Piping, Anchor, Guide Through Penetration Sleeve 11305-ML-P01 thru CA01,” Hold point to verify V.C. Summer COL License Condition met for APP-PXS-PLR-020, 08/15/2016.

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100376603, “Incorrect Attachments Included with APP-GW-PHC-057,” 07/26/2016;
100434455, “Insufficient Justification for Self-Weight-Excitation Accelerations Used in APP-RCS-PHC-11C1135,” 12/1/2016.

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VS3-CA03-S5-02005-R0, Containment Building Module CA03-Submodule CA03_02 Structural Outline Specific Details, Rev. 0;
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APP-CA03-GEF-108, CA03 Clarifications for Drawings, Rev. 0;
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Pour Card 4072-10-2016, dated 11/3/2016;
F-C113-001, “Concrete Placement Inspection,” Rev. 15.01;
VS3-CC01-Z0-027, “Safety Related Concrete Testing Services, Westinghouse Safety Class C Nuclear Safety Related,” Rev. 5.

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VS3-1100-CCC-005, “Design Calculation, Containment Mass Concrete Reinforcement, Elevation 71'-6" to 83'-0"/84'-6",” Rev. 1;
VS3-1110-CR-520, “Containment Concrete Reinforcement EL 71’-6” up to 83’-0”/84’-6” Plan at EL 80’-0” & 80’-6”,” Rev. 2;
VS3-1110-CR-521, “Containment Concrete Reinforcement EL 71’-6” up to 83’-0”/84’-6” Plan at EL 83’-0”/84’-6”,” Rev. 2;
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VS3-1110-CR-526, “Containment Concrete Reinforcement EL 71’-6” up to 83’-0”/84’-6” West SG Area Dowel Plan,” Rev. 1;
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VS3-1110-CR-529, “Containment Concrete Reinforcement EL 71’-6” up to 83’-0”/84’-6” Sections,” Rev. 2;
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MIR # 167011-048;
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Certificate of Conformance and Certified Material Test Report from the Lincoln Electric Company, Customer PO # 132177F007058, Lot 1238T;
Certificate of Conformance and Certified Material Test Report from the Lincoln Electric Company, Customer PO # 132177F007058, Lot 1238X;
Certification from Consolidated Power Supply, Customer PO # 32657, Heat # 857072-5A;
Certificate of Analysis and Tests from Outokumpu Stainless Plate, Inc., Customer PO # 32657, Heat # 857072-5A.

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F-C113-001, "Concrete Placement Inspection," Rev. 15.01;
VS3-CC01-Z0-027, "Safety Related Concrete Testing Services, Westinghouse Safety Class C Nuclear Safety Related," Rev. 5.

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APP-1220-CR-931, Auxiliary Building Areas 3&4 Concrete Reinforcement Wall 7.3 Sections & Details EL 82'6", Rev. 5;
APP-1232-CR-203, Auxiliary Building Area 2 Concrete Reinforcement Floor EL 100'-0" Plan, Rev. 1.

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VSG-CR01-GEF-000209, J-line Pen Detail at 7.3-line (A3), Rev. 0;
VS3-1220-GEF-000004, 7.3 Line Splice Location, Rev. 0;
VS3-1222-GNR-000011, HVAC Penetration Nonconformance, Rev. 0;
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APP-GA-G1-001, "AP1000 Module Design Criteria," Rev. 2.

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APP-1230-CAC-002, "Design of Cask Loading Pit Floor in Module CA20," Rev. 2;
APP-CA20-S3C-001, "CA20 Connection Design: Module Wall to Module Floor," Rev. 0;
APP-CA20-S3C-003, "Auxiliary Building Load Combinations and Loads for Finite Element Analysis," Rev. 2;
APP-CA20-S3C-006, "CA20 Connection Design Calculation: Module Wall to Adjacent Floor," Rev. 3;
APP-CA20-S3C-013, "AP1000 CA20 Structural Module Redline Evaluation," Rev. 0;
APP-CA20-S3C-014, "AP1000 CA20 Structural Module Localized Load Mapping," Rev. 0;
APP-CA20-S3C-015, "AP1000 CA20 Structural Module Analysis," Rev. 1
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APP-CA20-GEF-1237, "Floor Rebar Modifications to CA20 Sub-modules 43 & 44," Rev. 0;
APP-CA20-GEF-1238, "Floor Rebar Modifications to CA20 Sub-modules 47, 48, 49 & 50," Rev. 0;
APP-CA20-GEF-1350, "Alignment of CA20 Calculations," Rev. 0;
APP-CA20-GEF-1537, "Structural Module CA20, Submodule 66 at Elev. 74'-6" – CAPAL 100170619 closure," Rev. 0;
APP-1200-GEF-271, "Revision to APP-1200-S2C-003 Rev. 1," Rev. 0.

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C113-16-10214, "Conventional concrete Field Testing and Compression Data Record," Rev. 0;
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VS3-CC01-Z0-031, "Safety Related Placement of Concrete and Reinforcing Steel, Westinghouse Seismic Category I and II, Safety Class C "Nuclear Safety", Westinghouse Seismic Category III, Safety Class E," Rev. 8;
VS3-1200-CPY-001, "Auxiliary Building Concrete Precast Panels General Notes," Rev. 2;
VS3-1220-CP-342, "Auxiliary Building Area 3 Floor EL. 82'-6" Concrete Precast Panels Location Drawing," Rev. 1;

VS3-1223-CPY-010, “Auxiliary Building Area 3 Floor EL. 82’-6” Concrete Precast Panel 1223-CP-S01 Layout and Reinforcement Details,” Rev. 1;
VS3-1223-CPY-030, “Auxiliary Building Area 3 Floor EL. 82’-6” Concrete Precast Panel 1223-CP-S03 Layout and Reinforcement Details,” Rev. 1.

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VS3-1210-CR-990, “Auxiliary Building Concrete Reinforcement Secondary Walls Elevation EL 66’-6”,” Rev. 1;
VS3-1210-CR-992, “Auxiliary Building Concrete Reinforcement Secondary Wall Sections and Details EL 66’-6”,” Rev. 2;
VS3-1226-CR-612, “Auxiliary Building Area 6 Concrete Reinforcement Floor EL 82’6” Details,” Rev. 2;
VS3-CC01-Z0-031, “Safety Related Placement of Concrete and Reinforcing Steel, Westinghouse Seismic Category I and II, Safety Class C "Nuclear Safety", Westinghouse Seismic Category III, Safety Class E,” Rev. 8;
VS3-CR01-GEF-000129, “J-4 Wall form Savers,” Rev. 0.

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VS3-1110-CCK-002, “Unit 3 As-built Wall Thickness for shield Wall Between Reactor Vessel Cavity and RCDT Room from Elev. 71’-6” to 83’0”,” Rev. C;
C-15-00461, “Conventional Concrete Field Testing and Compression Data Record,” Rev. 0.

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APP-GW-VP-030, “AP1000 Environmental Conditions,” Rev. 6, dated 10/19/2016;
APP-JE92-VBR-001, “Equipment Qualification Summary Report for Nuclear Instrument Detectors for Use in the AP1000 Plant,” Rev. 3, dated 10/17/2016;
APP-JE92-VPH-001, “AP1000 Excore Nuclear Detectors Equipment Qualification Test Plan,” Rev. 0, dated July 2011;
APP-JE92-VBR-002, “Equipment Qualification Data Package for Nuclear Instrumentation System Detectors for Use in the AP1000 Plant,” Rev. 3, dated 10/17/2016;
APP-JW03-VBR-001, “Equipment Qualification Summary Report for the Main Control Room (MCR)/Remote Shutdown Workstation (RSW) Transfer Panel for Use in the AP1000 Plant,” Rev. 4, Jan. 08, 2016;
APP-JW03-VBR-002, “Equipment Qualification Data Package for the Main Control Room (MCR) / Remote Shutdown Workstation (RSW) Transfer Panel,” Rev. 3, Aug. 17, 2016.

LIST OF ACRONYMS

10 CFR	Title 10 of the Code of Federal Regulations
ACI	American Concrete Institute
ADAMS	Agency Wide Documents Access & Management System
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
AWS	American Welding Society
B&PV	Boiler and Pressure Vessel
CAP	Corrective Action Program
CAPAL	Corrective Action, Prevention, and Learning
CMT	Core Makeup Tank
CMTR	Certified Material Test Report
COL	Combined License
CR	Condition Report
CVCS	Chemical and Volume Control System
DAC	Design Acceptance Criteria
DCD	Design Control Document
DI	Discrete Issue
DVI	Direct Vessel Injection
E&DCR	Engineering and Design Coordination Report
EQDP	Equipment Qualification Data Package
EQSR	Equipment Qualification Summary Report
GMAW	Gas Metal Arc Welding
GTAW	Gas Tungsten Arc Welding
HED	Human Engineering Discrepancy
HIS	Human System Interface
IEEE	Institute of Electrical and Electronics Engineers
IMC	Inspection Manual Chapter
IP	Inspection Procedure
IR	Inspection Report
IRWST	In-containment Refueling Water Storage Tank
ITAAC	Inspections, Tests, Analyses, and Acceptance Criteria
NCV	Non-cited Violation
N&D	Nonconformance and Disposition Reports
NPF	Nuclear Power Facility
NRC	Nuclear Regulatory Commission
NUREG	NRC Technical Report Designation
PARS	Publically Available Records
PCD	Principal Closure Document
PMS	Protection and Safety Monitoring System
PRHR	Passive Residual Heat Removal
PXS	Passive Core Cooling System
QA	Quality Assurance
QAPD	Quality Assurance Program Document
QC	Quality Control
RCS	Reactor Coolant System
Rev.	Revision
RG	Regulatory Guide
RV	Reactor Vessel
SCE&G	South Carolina Electric and Gas

SSC	Structures, Systems, and Components
TSV	Task Support Verification
UFSAR	Updated Final Safety Analysis Report
UT	Ultrasonic Testing/Examination
WEC	Westinghouse Electric Company
WPS	Welding Procedure Specification

ITAAC INSPECTED

No.	ITAAC No.	Design Commitment	Inspections, Tests, Analysis	Acceptance Criteria
7	2.1.01.06.ii	6. The RM and FHM are designed to maintain their load carrying and structural integrity functions during a safe shutdown earthquake.	ii) Type test, analysis, or a combination of type tests and analyses of the RM and FHM will be performed.	ii) A report exists and concludes that the RM and FHM can withstand seismic design basis dynamic loads without loss of load carrying or structural integrity functions.
11	2.1.01.07.iv	7. The new and spent fuel storage racks maintain the effective neutron multiplication factor required by 10 CFR 50.68 limits during normal operation, design basis seismic events, and design basis dropped spent fuel assembly accidents over the spent fuel storage racks.	iv) Analysis of the spent fuel storage racks under design basis dropped spent fuel assembly loads will be performed.	iv) A report exists and concludes that the spent fuel racks can withstand design basis dropped spent fuel assembly loads and maintain the calculated effective neutron multiplication factor required by 10 CFR 50.68(1) limits.
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.
16	2.1.02.03b	3.b) Pressure boundary welds in piping identified in Table 2.1.2-2 as ASME Code Section III meet ASME Code Section III requirements.	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
72	2.1.03.03	3. The components identified in Table 2.1.3-1 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 2.1.3-1 as ASME Code Section III.
76	2.1.03.06.ii	6. The seismic Category I equipment identified in Table 2.1.3□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 loads without loss of safety function.
81	2.1.03.09a.i	9.a) The Class 1E equipment identified in Table 2.1.3-1 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, analysis, or a combination of type tests and analysis 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 2.1.3-1 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.
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.

No.	ITAAC No.	Design Commitment	Inspections, Tests, Analysis	Acceptance Criteria
160	2.2.03.02b	2.b) The piping identified in Table 2.2.3-2 as ASME Code Section III is designed and constructed in accordance with ASME Code Section III requirements.	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 2.2.3-2 as ASME Code Section III.
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.
286	2.3.02.02b	2.b) The piping identified in Table 2.3.2-2 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 2.3.2-2 as ASME Code Section III.
523	2.5.02.02.ii	2. The seismic Category I equipment, identified in Table 2.5.2-1, 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.

No.	ITAAC No.	Design Commitment	Inspections, Tests, Analysis	Acceptance Criteria
525	2.5.02.03	3. The Class 1E equipment, identified in Table 2.5.2-1, has electrical surge withstand capability (SWC), and can withstand the electromagnetic interference (EMI), radio frequency interference (RFI), and electrostatic discharge (ESD) 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.	Type tests, analyses, or a combination of type tests and analyses will be performed on the equipment.	A report exists and concludes that the Class 1E equipment identified in Table 2.5.2□1 can withstand the SWC, EMI, RFI, and ESD 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.
526	2.5.02.04	4. The Class 1E equipment, identified in Table 2.5.2-1, can withstand the room ambient temperature, humidity, pressure, and mechanical vibration 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.	Type tests, analyses, or a combination of type tests and analyses will be performed on the Class 1E equipment identified in Table 2.5.2-1.	A report exists and concludes that the Class 1E equipment identified in Table 2.5.2-1 can withstand the room ambient temperature, humidity, pressure, and mechanical vibration 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.
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.

No.	ITAAC No.	Design Commitment	Inspections, Tests, Analysis	Acceptance Criteria
739	3.2.00.01a	1. The HFE verification and validation program is performed in accordance with the HFE verification and validation implementation plan and includes the following activities: a) HSI Task support verification	a) An evaluation of the implementation of the HSI task support verification will be performed.	a) A report exists and concludes that: Task support verification was conducted in conformance with the implementation plan and includes verification that the information and controls provided by the HSI match the display and control requirements generated by the function-based task analyses and the operational sequence analyses.
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
762	3.3.00.02a.i.c	2.a) The nuclear island structures, including the critical sections listed in Table 3.3-7, are seismic Category I and are designed and constructed to withstand design basis loads as specified in the Design Description, without loss of structural integrity and the safety-related functions.	i) An inspection of the nuclear island structures will be performed. Deviations from the design due to as-built conditions will be analyzed for the design basis loads.	i.c) A report exists which reconciles deviations during construction and concludes that the as-built structures in the non-radiologically controlled area of the auxiliary building, including the critical sections, conform to the approved design and will withstand the design basis loads specified in the Design Description without loss of structural integrity or the safety-related functions.
763	3.3.00.02a.i.d	2.a) The nuclear island structures, including the critical sections listed in Table 3.3-7, are seismic Category I and are designed and constructed to withstand design basis loads as specified in the Design Description, without loss of structural integrity and the safety-related functions.	i) An inspection of the nuclear island structures will be performed. Deviations from the design due to as-built conditions will be analyzed for the design basis loads.	i.d) A report exists which reconciles deviations during construction and concludes that the as-built structures in the radiologically controlled area of the auxiliary building, including the critical sections, conform to the approved design and will withstand the design basis loads specified in the Design Description without loss of structural integrity or the safety-related functions.
777	3.3.00.03a	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.	a) A report exists and concludes that the shield walls and floors of the containment internal structures 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.

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.
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. 15. Deleted	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.
845	C.3.8.01.02.03	2.3 The means exists to notify and provide instructions to the populace within the plume exposure EPZ. [E.6]	2.3 The full test of the ANS capabilities will be conducted.	2.3 The ANS was demonstrated to notify and provide instructions to the public and was demonstrated to meet the design objectives, as stated in the emergency plan.
874	C.3.8.03.01	The American Society of Mechanical Engineers (ASME) Code, Section III piping is designed in accordance with ASME Code, Section III requirements.	Inspection of the ASME Code Design Reports (NCA□3550) and required documents will be conducted for the set of lines chosen to demonstrate compliance.	The ASME Code Design Report(s) (NCA□3550) (certified, when required by ASME Code) exist and conclude that the design of the piping for lines chosen to demonstrate all aspects of the piping design complies with the requirements of the ASME Code section.