



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

September 14, 2017

Mr. Jeffrey B. Archie
Chief Nuclear Officer
South Carolina Electric and Gas
P.O. Box 88
Jenkinsville, SC 29065-0088

**SUBJECT: VIRGIL C. SUMMER NUCLEAR STATION UNITS 2 AND 3 – NRC
INTEGRATED INSPECTION REPORTS 05200027/2017003,
05200028/2017003**

Dear Mr. Archie:

On July 31, 2017, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at Virgil C. Summer Nuclear Station Units 2 and 3. All NRC inspection activities were suspended on this date when SCE&G stopped construction activities on the VCSNS Units 2 & 3 site and placed the two partially-constructed nuclear units in a terminated status, consistent with the Commission's policy statement on deferred and terminated plants. The enclosed inspection report provides a historical documentation of the inspection results should construction of the projects be resumed. These inspections were conducted after the last inspection reporting period and prior to the cancellation of the project on July 31, 2017. The results were not discussed as typically done in an exit meeting due to the announcement to abandon the construction of Units 2 and 3.

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.

One NRC-identified finding of very low safety significance (Green) was identified during this inspection. This finding was determined to involve a violation of NRC requirements. However, because of its very low safety significance, and because the issue was entered into your corrective action program, the NRC is treating this issue as a non-cited violation (NCV) in accordance with Section 2.3.2.a of the NRC Enforcement Policy.

Also, one NRC-identified violation of unknown safety significance was identified during this inspection. Information on this issue compiled prior to the cancellation of the project is captured in this report.

If you contest these violations, 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.

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

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

Sincerely,

/RA/

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

Docket Nos.: 5200027, 5200028

License Nos: NPF-93, NPF-94

Enclosure: NRC Inspection Report (IR) 05200027/2017003, 05200028/2017003
w/Attachment: Supplemental Information

SUBJECT: VIRGIL C. SUMMER NUCLEAR STATION UNITS 2 AND 3 – NRC
 INTEGRATED INSPECTION REPORTS 05200027/2017003,
 05200028/2017003

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DATE	09/08/2017	09/13/2017	09/13/2017	09/13/2017	09/12/2017	09/11/2017	09/11/2017	09/08/2017	09/14/2017

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U.S. NUCLEAR REGULATORY COMMISSION
Region II

Docket Numbers: 5200027
5200028

License Numbers: NPF-93
NPF-94

Report Numbers: 05200027/2017003
05200028/2017003

Licensee: South Carolina Electric & Gas

Facility: Virgil C. Summer Nuclear Station Unit 2
Virgil C. Summer Nuclear Station Unit 3

Location: Jenkinsville, SC

Inspection Dates: July 1, 2017 through July 31, 2017

Inspectors: C. (Mac) Read, Resident Inspector, DCO
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D. Harmon, Construction Inspector, DCO
K. McCurry, Construction Inspector, DCO
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Approved by: Michael Ernstes, Branch Chief
Construction Inspection Branch 3

Enclosure

SUMMARY OF FINDINGS

Inspection Report (IR) 05200027/2017003, 05200028/2017003; 07/01/2017 through 07/31/2017; Virgil C. Summer Nuclear Station Unit 2, Virgil C. Summer Nuclear Station Unit 3, Routine Integrated Inspection Report.

This report covers a one-month period of inspection by regional and resident inspectors, and announced Inspections, Tests, Analysis, and Inspection Criteria (ITAAC) inspections by regional inspectors. One Green non-cited violation (NCV) and one violation (VIO) of unknown safety significance, both associated with the Procurement/Fabrication cornerstone were identified consistent with the NRC Enforcement Policy, Section 2.3. The significance of most findings is indicated by their color (Green, White, Yellow, or Red) using Inspection Manual Chapter (IMC) 2519, "Construction Significance Determination Process." Construction Cross Cutting Aspects are determined using IMC 0613, "Power Reactor Construction Inspection Reports." The NRC's program for overseeing the construction of commercial nuclear power reactors is described in IMC 2506, "Construction Reactor Oversight Process General Guidance and Basis Document."

A. NRC-Identified and Self Revealed Findings

Green: The 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 IX, "Special Processes," for South Carolina Electric & Gas Company's (SCE&G) failure to assure that special processes, including welding, were controlled and accomplished using qualified procedures in accordance with applicable codes, standards, specifications, criteria, and other special requirements. The licensee entered this finding into their corrective action program under condition report (CR) number CR-NND-17-30967 and WEC Corrective Action, Prevention, and Learning (CAPAL) System Discrete Issue (DI) 100484092. Due to the decision to abandon the construction of Units 2 and 3, shortly after this finding was identified, no corrective actions will be pursued at this time, and this NCV will remain open.

The finding was associated with the Procurement/Fabrication Cornerstone. The finding was considered more than minor because the performance deficiency, if left uncorrected, would represent a condition adverse to quality that would render the quality of the systems, structures or components (SSCs) indeterminate and the performance deficiency would require substantive corrective actions to correct. The inspectors utilized IMC 2519, "Construction Significance Determination Process," to evaluate the finding and determined that the finding was of very low safety significance (Green). This was determined because the licensee would have been able to requalify the welding procedures by performing additional impact tests to qualify the procedure instead of removing and replacing the welds. The finding was determined to be an ITAAC finding because it was material to the acceptance criteria of Unit 2 ITAAC 2.1.02.02a and 2.2.03.02a and Unit 3 ITAAC 2.2.03.02a. The acceptance criterion of this ITAAC requires that the American Society of Mechanical Engineers (ASME) Code Section III design reports exist for the as-built components identified in Table 2.2.3-1 as ASME Code Section III. This finding is associated with violations of ASME Code Section III and would have prevented an accurate design report from existing because the welds were not made using procedures qualified by the requirements of the ASME Code Section III. The inspectors determined that this finding was not related to any of the cross-cutting aspects discussed in IMC 0613, Appendix F, "Construction Cross-Cutting Components and Aspects." (Section 1A01)

TBD: The inspectors identified an ITAAC finding of unknown safety significance (TBD) and associated violation (VIO) of 10 CFR Part 50 Appendix B, Criterion IX, "Special Processes," regarding inadequate radiographs of Class 1 and 3 components. Specifically, numerous radiographic films of welds in the Unit 2 pressurizer, Unit 2 accumulator tank (ACC) A, Unit 2 core make-up tank (CMT) B, Unit 3 ACC B, and Unit 3 CMT B were found to not meet the quality requirements of ASME Code Section III, Division 1, 1998 Edition including 2000 Addenda. The licensee initiated the following corrective action documents to capture the identified issues: CR-17-30869, CR-17-30963, CR-17-31003, DI 100481162, DI 100483875, and DI 100485005. However, due to the decision to abandon the construction of Units 2 and 3, shortly after this finding was identified, no corrective actions will be pursued nor will the safety significance of the matter be determined. Therefore, this VIO will remain open.

The finding was associated with the Procurement/Fabrication Cornerstone. This performance deficiency was considered more than minor because, if left uncorrected, it represented a condition adverse to quality that rendered the quality of the system, structure or component (SSC) indeterminate, and the performance deficiency would require substantive corrective actions to correct since the welds would need to be reexamined. The inspectors utilized IMC 2519, "Construction Significance Determination Process," to evaluate the finding and determined that it was a violation with unknown safety significance because welds within multiple trains of the reactor coolant system (RCS) and passive core cooling system (PXS) systems are of indeterminate quality until reexamination. The finding was determined to be an ITAAC finding because it was material to the acceptance criteria of Unit 2 ITAAC 2.1.02.03a and 2.2.03.03a and Unit 3 ITAAC 2.2.03.03a. The acceptance criteria of these ITAAC require that a report exists and concludes that the ASME Code Section III requirements are met for non-destructive examination of pressure boundary welds. This finding is associated with violations of ASME Code Section V which is required by ASME Code Section III. The inspectors did not determine a cross-cutting aspect because the decision to abandon the construction of Units 2 and 3 came before sufficient information was gathered.

B. Licensee-Identified Violations

None

REPORT DETAILS

Summary of Plant Construction Status

In Unit 2, work continued inside containment to fit-up and weld the reactor coolant piping to the west steam generator. Additionally, floor module CA35 was installed in containment, and the pressurizer was placed in the pressurizer compartment. In the auxiliary building, walls were progressing up to the 117' elevation.

In Unit 3, construction and assembly continued for the steel-composite shield panels, which make up the shield building. Welding progressed on the embed plates that hold the CA01 module to the concrete floor, which makes up the steam generator, pressurizer and refueling cavity. Concrete preparation was ongoing for the west side of containment up to elevation 96'. Auxiliary building walls were progressing up to the 100' elevation.

On July 31, 2017, SCANA made an announcement to abandon the construction of Units 2 and 3. This report is the final inspection report for V.C. Summer Units 2 and 3. It summarizes any inspections conducted for these two units starting on July 1, 2017, and ending on July 31, 2017 when the decision to abandon the two units was announced.

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 2.1.02.02a (13) / Family 06F
(Unit 2) ITAAC Number 2.2.03.02a (159) / Family 06F
(Unit 3) ITAAC Number 2.2.03.02a (159) / Family 06F

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 2.1.02.02a (13) and 2.2.03.02a (159) for Unit 2 and 2.2.03.02a (159) for Unit 3. The inspectors used the following NRC IPs/sections to perform this inspection:

- 65001.06-02.02 - Component Welding

The inspectors reviewed a sample of welding procedures and supporting procedure qualification records used to weld the components listed below in order to verify they had been written and qualified in accordance with the requirements of ASME Code, Sections III and IX, 1998 Edition including 2000 Addenda:

- Unit 2 Pressurizer
- Unit 2 ACC A (Serial No. 4581)
- Unit 2 CMT B (Serial No. 4600)
- Unit 3 ACC B (Serial No. 4584)
- Unit 3 CMT B (Serial No. 4602)

b. Findings

Introduction

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 IX, "Special Processes," for the licensee's failure to assure that special processes, including welding, were controlled and accomplished using qualified procedures in accordance with applicable codes, standards, specifications, criteria, and other special requirements.

Description

On July 21 2017, while conducting a review of welding records associated with the Unit 2 pressurizer, Unit 2 accumulator tank (ACC) A, Unit 2 core make-up tank (CMT) B, Unit 3 ACC B, and Unit 3 CMT B, the inspectors identified that a number of Mangiarotti welding procedures had not been qualified in accordance with the ASME Code. Specifically, the inspectors found that test specimens in welding procedure qualification record (PQR) WQ 1429 had not been impact tested as required. PQR WQ 1429 qualified multiple welding procedures that were used to weld all of the components in the scope of this inspection.

The inspectors noted that exemption (c) of NB-2431, which states "Tensile and impact tests shall be made, in accordance with this paragraph, of welding materials which are used to join P-Nos. 1, 3, 4, 5, 6, 7, 9, and 11 base materials in any combination, with the exceptions listed in (a) through (d) below: (c) welding material used for GTAW root deposits with a maximum of two layers;" was not applicable since NB-2430, "Weld Metal Tests" gives requirements for testing of welding filler metal by itself and is not related to the testing done for a welding procedure qualification. Additionally, many of the welding procedures qualified by WQ 1429 permitted gas tungsten arc weld (GTAW) root welding up to three passes.

Analysis

The inspectors determined that the failure to meet 10 CFR Part 50, Appendix B, Criterion IX, represented a performance deficiency. This performance deficiency was considered more than minor because, if left uncorrected, it represented a condition adverse to quality that rendered the quality of the systems, structures or components (SSCs) indeterminate and the performance deficiency would require substantive corrective actions to correct.

The finding was determined to be an ITAAC finding because it was material to the acceptance criteria of Unit 2 ITAAC 2.1.02.02a and 2.2.03.02a and Unit 3 ITAAC 2.2.03.02a. The acceptance criterion of this ITAAC requires that the ASME Code Section III design reports exist for the as-built components identified in Table 2.2.3-1 as ASME Code Section III. This finding is associated with violations of ASME Code Section III and would have prevented an accurate design report from existing because the welds were not made using procedures qualified by the requirements of the ASME Code Section III.

The inspectors concluded that this finding was associated with the Procurement/Fabrication Cornerstone, listed at the end of Appendix B, "Issue Screening," of IMC 0613. The inspectors utilized IMC 2519, "Construction Significance Determination Process," to evaluate the finding and determined that the finding was of very low safety significance (Green). This was determined because the licensee would have been able to requalify the welding procedures by performing additional impact tests to qualify the procedure instead of removing and replacing the welds.

The inspectors determined that this finding was not related to any of the cross-cutting aspects discussed in IMC 0613, Appendix F, "Construction Cross-Cutting Components and Aspects."

Enforcement

10 CFR, Part 50, Appendix B, Criterion IX, "Special Processes," requires, in part, that measures shall be established to assure that special processes, including welding, are controlled and accomplished using qualified procedures in accordance with applicable codes, standards, specifications, criteria, and other special requirements.

ASME Boiler and Pressure Vessel (B&PV) Code Section III, Subsections NB and ND, paragraph NX-4335.1 (a), state in part that "impact tests of the weld metal shall be required for welding procedure qualification tests for production weld joints exceeding 5/8 in. (16 mm) in thickness when the weld will be made on the surface or penetrate base material that requires impact testing in accordance with NB-2310."

Additionally, ASME Code Section III, Subsections NB and ND, paragraph NX-4334 (b) states, "Weld deposit of each process in a multiple process weld shall, where possible, be included in the impact test specimens. When each process cannot be included in the full-size impact test specimen at the 1/4t location required by this Section, additional full-size specimens shall be obtained from locations in the test weld that will ensure that at least a portion of each process has been included in full-size test specimens. As an alternative, additional test welds can be made with each process so that full-size specimens can be tested for each process."

Contrary to the above, as of July 21, 2017, the licensee did not establish measures to assure that welding was accomplished using qualified procedures in accordance with applicable codes. Specifically, procedure qualification record WQ 1429, which supported qualification of welding procedures used to weld the ACCs, CMTs, and pressurizer, all more than 5/8" inch thick on base metals requiring impact testing, was not impact tested.

Because this violation was of very low safety significance (Green) and was entered into the licensee's corrective action program under condition report (CR) number 17-30967 and discrete issue (DI) 100484092, this violation is being treated as a non-cited violation (NCV 05200027/2017003-01 and 05200028/2017003-01, Failure to Establish Qualified Welding Procedures), consistent with Section 2.3.2 of the NRC Enforcement Policy and Enforcement Guide Memorandum (EGM) 11-006.

Due to the decision to abandon the construction of Units 2 and 3, shortly after this finding was identified, no corrective actions will be pursued at this time and this NCV will remain open.

1A02 (Unit 2) ITAAC Number 2.1.02.02a (13) / Family 06F

a. Inspection Scope

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

- 65001.06-02.05 - Problem Identification and Resolution
- 65001.F-02.01 - Design Document Review
- 65001.F-02.02 - Fabrication Records Review

The inspectors reviewed fabrication records associated with the following Unit 2 reactor coolant system (RCS) components, which have been accepted on site, to verify the pressure boundary materials listed met the applicable requirements of ASME Code Section III, 1998 Edition including 2000 Addenda, and Westinghouse (WEC) design and fabrication specifications:

- Steam Generator 1 (Serial No. VS2-RCS-MB-01)
 - Channel Head
 - Tubesheet
 - Tubes
 - Primary Inlet Nozzle
 - Primary Outlet Nozzles
- Reactor Coolant Pump (RCP) Casing 1A (Serial No. 1289)
- Pressurizer (Serial No. 4591)
 - Upper and Lower Heads
 - Upper, Intermediate, and Lower Shells
 - Safety Nozzle and Safe-End
 - Surge Nozzle and Safe-End

The inspectors reviewed design documents to determine whether the documents adequately define the final design of the steam generator, RCP casing, and pressurizer. Specifically, the inspectors reviewed material and fabrication attributes of the parts identified above to ensure the ASME Section III Code, WEC design report, design drawings, and the updated final safety analysis report (UFSAR) requirements were captured in the final as-built condition of the components.

The inspectors reviewed the following fabrication records for the above components to verify compliance with applicable design documents, codes, standards, regulations, and quality and technical requirements:

- Purchase Orders and Certificates of Conformance to verify compliance with 10 CFR Part 21; 10 CFR Part 50, 50.55(e) and Appendix B; ASME Section III, Division 1 (Ed. 1998 Add. 2000); and NQA-1 (Ed. 1994) requirements were appropriately specified;

- Certified Material Test Reports (CMTRs) to verify the materials were properly heat treated, met the specified chemical, mechanical, impact, and nondestructive testing requirements, and that no repairs were made without approval from the purchaser;
- ASME Code data reports to ensure ASME Section III Code requirements were met, specifically the traceability of materials was maintained, the key dimensions met the design, the components were hydrostatically tested at the appropriate design pressure and temperature and received acceptable results, and an authorized nuclear inspector (ANI) signed off on the report; and
- The final quality data packages to verify the records were complete, accurate, reviewed and approved by the responsible organization(s), and provided evidence that the quality and code requirements were satisfied.

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

b. Findings

Introduction

The inspectors identified Unresolved Items (URIs) associated with certified material test reports (CMTRs) for pressure retaining material of the Unit 2 pressurizer. Specifically, the inspectors identified the following two performance deficiencies:

- (1) The maximum allowed chromium content was exceeded in the chemical product analyses for the pressurizer upper shell in accordance with ASME Code Section III.
- (2) Tensile and impact testing was not performed in the required locations for the pressurizer upper and lower heads in accordance with the associated Westinghouse material specification.

Description

On July 21, 2017, while conducting a review of welding records associated with the Unit 2 pressurizer, the inspectors identified CMTRs for the base material that did not conform with Section II of the ASME Code and applicable procurement documents. Specifically, the inspectors identified the following two performance deficiencies:

- (1) The chromium content in a chemical product analysis, recorded in CMTR 90 for the pressurizer upper shell, exceed the maximum allowed by code. ASME Section III states, in part, when a requirement for a material, or for the examination or testing of a material, is to be in accordance with a specification, the reference is to material specifications in Section II. ASME Section II, Part A, SA-508, Supplementary Requirement S15, Product Analysis, which Westinghouse committed to, states in part "more than one forging per heat shall be subject to product analysis by either the manufacturer or purchaser." Table 1, Chemical Requirements, allows a maximum chromium composition of 0.25 percent (SA-788 allows an additional

tolerance up to 0.06 percent). However, CMTR 90 recorded a chromium composition of 0.696 percent.

The licensee initiated CR 17-30962 and DI 100484051 to track, disposition, and correct the issue. However, decision to abandon the construction of Units 2 and 3, shortly after this issue was identified, no corrective actions will be pursued at this time. This item was classified as a URI because the decision to abandon the construction of Units 2 and 3 occurred before the licensee could ascertain whether the recorded value was a typographical error and the actual results could be obtained from the sub-supplier. This unresolved item will remain open, identified as URI 05200027/2017003-02 and 05200028/2017003-02, "Maximum Chromium Content Exceeded in the Pressurizer Upper Shell CMTR."

- (2) Test results provided in CMTRs 174 and 175 for the pressurizer upper and lower heads respectively do not meet the requirements imposed by Westinghouse Material Specification APP-VL51-Z0-041 for SA-508 Grade 3 Class 2 forgings, Revision (Rev.) 0. Specifically, Section 3.7.3.1, "Upper & Lower Head Forgings," states "tests shall be performed on samples taken at two locations 180° apart on the rim of each head and from a location adjacent to each of the nozzles." The pressurizer upper head has three nozzles, including the sampled safety relief nozzle, and the lower head has the surge line nozzle. However, the CMTRs only record tensile testing on the rim of the heads and not adjacent to each of the nozzles.

As a result, Section 3.6.4, which states "samples for product analysis shall be taken from material adjacent to each tensile specimen," would imply missing products analyses as well. Similarly, Section 3.7.7 states, in part, "Charpy-V notch tests shall be performed for each location at a temperature not higher than the T_{ndt} temperature plus 60°F, and these tests were not performed at the nozzles."

Additionally, ASME Section III, NB-2223.2, "Very Thick and Complex Forgings," may be applicable if the Certificate Holder specified the nozzles as "surfaces of the finished product subjected to high tensile stresses in service."

The licensee initiated CR 17-31013 and DI 100485548 to track, disposition, and correct the issue. However, due to the decision to abandon the construction of Units 2 and 3, shortly after this issue was identified, no corrective actions will be pursued at this time. This item was classified as a URI because the decision to abandon the construction of Units 2 and 3 occurred before the licensee could provide an "use-as-is" disposition and associated justification. This unresolved item will remain open, identified as URI 05200027/2017003-03 and 05200028/2017003-03, "Inadequate Tensile and Impact Testing Locations for the Pressurizer Upper and Lower Heads."

1A03 (Unit 2) ITAAC Number 2.1.02.03a (15) / Family 06B

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 2.1.02.03a (15). The inspectors used the following NRC IPs/sections to perform this inspection:

- 65001.06-02.02 - Component Welding
- 65001.06-02.05 - Problem Identification and Resolution
- 65001.B-02.02 - Welding Procedure Qualification
- 65001.B-02.03 - Welder Qualification
- 65001.B-02.04 - Production Controls
- 65001.B-02.05 - Inspection
- 65001.B-02.06 - Records
- 65001.F-02.02 - Fabrication Records Review

The inspectors reviewed welding and nondestructive examination (NDE) records for the steam generator, reactor coolant pump (RCP) casing, and pressurizer to determine if pressure boundary welds were welded and examined in accordance with the applicable procurement specifications and sections of ASME Code Section III, Division 1, 1998 Edition including 2000 Addenda. Specifically, the inspectors selected the following welds:

- Steam Generator 1 (Serial No. VS2-RCS-MB-01)
 - Weld No. 101-92, Tube to tubesheet plug seal welds
 - Weld No. 102-51, Channel head stainless steel cladding
 - Weld No. 107-51, Channel head inlet nozzle stainless steel cladding
 - Weld No. 110-51A & B, Channel head outlet nozzle Inconel® buttering
 - Weld No. 5101-71, Girth weld between the tubesheet and channel head
- RCP Casing 1A (Serial No. 1289)
 - Weld No. 201-96A & B, Girth welds between the channel head outlet nozzles and reactor cooling pump (RCP) casings
- Pressurizer (Serial No. 4591)
 - Weld No. CL-046, Cladding of the surge nozzle
 - Weld No. BT-047, Buttering of the surge nozzle
 - Weld No. CW-001, Girth weld between the upper head and upper shell
 - Weld No. CW-003, Girth weld between the intermediate shell and lower shell
 - Weld No. CW-031, Safety nozzle safe-end to buttering
 - Weld No. CW-048, Surge nozzle safe-end to buttering

For each weld, the inspectors reviewed:

- welding monitoring sheets and weld maps to verify traceability of weld number to welders, welding procedures, and materials used;
- CMTRs for the weld filler metals (used in the steam generator welds) to verify requirements for chemical composition, mechanical properties, impact testing, and nondestructive examination were met in accordance with the ASME Code;
- welding procedure specifications and supporting procedure qualification records (for the steam generator welds) to verify that applicable essential, nonessential, and supplementary essential (fracture toughness) variables for each welding process used in the WPSs were in accordance with the requirements of the ASME Code;
- welder qualification test reports to verify each welder was assigned a unique identification number and demonstrated their skills by performing specific qualification tests which were fully documented for essential variables in accordance with the ASME Code; and

- heat treatment reports to determine that the welds were post weld heat treated at adequate holds times and temperatures in accordance with the welding procedure and ASME Code.

Additionally, the inspectors reviewed final NDE reports to verify examinations were properly performed and found acceptable by certified level II or III personnel and in accordance with the applicable sections of the ASME Code. Specifically, the inspectors reviewed:

- liquid penetrant examination reports to verify there were no recordable defects on the surface of the weld;
- magnetic particle examination reports to verify the proper yoke lifting power, visible light source, and surface temperature requirements were met to ensure adequate performance of the test;
- ultrasonic examination reports to verify use of calibration blocks, couplant type, straight and various angled beam transducers with appropriate sizes and frequencies, and location mapping of indications; and
- radiography examination reports to verify the penetrameter, sensitivity, density, and geometric unsharpness were within the allowable ranges with no rejectable indications in the welds.

The inspectors also reviewed the radiographic film for the applicable pressure boundary welds sampled to determine if the film met the quality requirements of Section V of the ASME Code and that the welds were free of rejectable defects and met the acceptance requirements of Section III Division 1 of the ASME Code.

The inspectors reviewed nonconformance reports (NCRs) and welding defect notices (WDNs) to verify:

- adequate disposition of rework and repair for nonconforming conditions and weld metal rejects during in-process activities were properly identified, dispositioned, and documented;
- actions were taken using repair travelers with subsequent re-examination by the original method of identification for final acceptance; and
- nonconformances were handled in accordance with the requirements of 10 CFR Part 50 Appendix B, Criterion 15.

Lastly, the inspectors reviewed corrective action documents issued during the inspection to verify that issues were entered into the licensee and/or applicable contractor corrective action program in accordance with program requirements.

b. Findings

Introduction

An ITAAC finding, the significance of which was not determined, against 10 CFR Part 50 Appendix B, Criterion IX, "Special Processes," was identified by the inspectors regarding inadequate radiographs of Class 1 and 3 components. Specifically, numerous radiographic films of welds in the Unit 2 pressurizer, Unit 2 accumulator tank (ACC) A,

Unit 2 core make-up tank (CMT) B, Unit 3 ACC B, and Unit 3 CMT B were found to not meet the quality requirements of ASME Code Section III, Division 1, 1998 Edition including 2000 Addenda.

Description

On July 21 2017, while conducting a review of welding records associated with the components listed above, the inspectors identified a number of radiograph films which did not meet the film quality requirements of ASME Section V. Specifically, the inspectors found two films that exceeded the maximum allowable density, one that had film defects which could mask large weld defects, and numerous instances in radiographic testing reports where the documented density range exceeded that which is allowed by ASME Section V.

During a review of a sample of radiographs of pressure boundary welds on the Unit 2 pressurizer, the inspectors noted two large blemishes on film between 0-1 of weld CW-003 each running from top to bottom through the area of interest. ASME Code Section V, paragraph T-271, requires that all radiographs be free from blemishes that could mask or confuse discontinuities in the area of interest.

During a review of a sample of radiographs of pressure boundary welds on the Unit 3 CMT B (Serial Number 4602), the inspectors noted that the density of films between 4-5 and 5-6 of weld CW-035 was darker than 4.0. The licensee then re-checked the film using a calibrated densitometer by qualified RT personnel and confirmed that the density was too high. ASME Code Section V, paragraph T-282.1, "Density Limitations," allows a maximum density of 4.0 for either single or composite viewing and allows a tolerance of 0.05 for variations between readings. In both films the density was measured above 4.05.

During a review of radiographic examination reports from Mangiarotti in the quality assurance (QA) data packages, the inspectors noted that many of the reports recorded measured film density ranges that exceed the allowable tolerances. ASME Code Section V, paragraph T-282.2 allows a density variation range of minus 15 percent to plus 30 percent from the density measured at the image quality indicator (IQI). The inspectors measured the density of two of those films directly (film 2-3 of weld CW-035 and film 0-1 of weld CW-041, both from Unit 3 Core Makeup Tank B) with the licensee and confirmed that they were outside the allowable density range, and that there were not additional IQIs placed in darker and lighter areas of the radiographs.

The films which were listed on radiographic test (RT) reports with reported densities outside of code allowable were:

- Unit 2 Pressurizer: Weld CW-031EX film 3-0. Weld CW-001 films 2-3, 3-4, 4-5, 18-19.
- Unit 2 Core Makeup Tank B: Weld CW-001/2 films: 24-25, 26-27, 27-28, 28-29, 29-30, 30-31, 35-36 through 47-0. Weld CW-001/2 films: 2-3, 5-6, 9-10 through 17-18.
- Unit 2 Accumulator A: Weld LW013/3 film 13-14, Weld CW-024/2 films 2-3, 3-4, 4-5, 7-0. Weld CW-024/1 all films. Weld CW-024/2 all films.

- Unit 3 Core Makeup Tank B: Weld CW-041 films 0-1, 2-3. Weld CW-035 films: 2-3, 4-5, 7-8, 8-9, 10-11, 12-13, 15-0. Weld CW-001/1 films: 3-4, 4-5, 5-6, 6-7, 8-9, 12-13, 21-22, 22-23, 27-28. Weld CW-001/2 all films.
- Unit 3 Accumulator B: Weld CW-024/1 all films. Weld CW-024/2 all films. Weld HTBT-021/1 films 2-3, 3-0. Weld HTBT-021/2 film 1-2. Weld HTBT-021/1 films 1-2, 2-3.

Analysis

The inspectors determined that the failure to ensure that NDE was performed in accordance with the applicable codes and standards was a performance deficiency. This performance deficiency was considered more than minor because, if left uncorrected, it represented a condition adverse to quality that rendered the quality of the systems, structures or components (SSCs) indeterminate, and the performance deficiency would require substantive corrective actions to correct since the welds would need to be reexamined.

The finding was determined to be an ITAAC finding because it was material to the acceptance criteria of Unit 2 ITAAC 2.1.02.03a and 2.2.03.03a and Unit 3 ITAAC 2.2.03.03a. The acceptance criteria of these ITAAC require that a report exists and concludes that the ASME Code Section III requirements are met for non-destructive examination of pressure boundary welds. This finding is associated with violations of ASME Code Section V which is required by ASME Code Section III.

The inspectors concluded that this finding was associated with the Procurement/Fabrication Cornerstone, listed at the end of Appendix B, "Issue Screening," of IMC 0613. The inspectors utilized IMC 2519, "Construction Significance Determination Process," to evaluate the finding and determined that it was a violation with unknown safety significance because welds within multiple trains of the RCS and PXS systems are of indeterminate quality until reexamination. The inspectors did not determine a cross-cutting aspect because the decision to abandon the construction of Units 2 and 3 occurred before sufficient information was gathered.

Enforcement

10 CFR, Part 50, Appendix B, Criterion IX, "Special Processes," requires, in part, that measures shall be established to assure that special processes, including welding and NDE, are controlled and accomplished using qualified procedures in accordance with applicable codes, standards, specifications, criteria, and other special requirements.

The applicable code, ASME B&PV Code Section V, 1998 Edition including 2000 Addenda, paragraph T-281, "Quality of Radiographs," states in part that "all radiographs shall be free from mechanical, chemical, or other blemishes to the extent that they do not mask and are not confused with the image of any discontinuity in the area of interest of the object being radiographed."

Additionally, Section V, paragraph T-282.1, "Density Limitations," states in part that "the maximum density shall be 4.0 for either single or composite viewing."

Additionally, Section V, paragraph T-282.2, "Density Variation," (a) states in part that "if the density of the radiograph anywhere through the area of interest varies by more than minus 15% or plus 30% from the density through the body of the hole IQI or adjacent to the designated wire of a wire IQI, within the minimum/maximum allowable density ranges specified in T-282.1, then an additional IQI shall be used for each exceptional area or areas and the radiograph retaken."

Contrary to the above, as of July 21, 2017, the licensee did not establish measures to assure that NDE was accomplished using qualified procedures in accordance with applicable codes. Specifically, radiographs were identified with:

- Blemishes that could mask and confuse the image of a discontinuity in the area of interest;
- Density in excess of 4.0; and
- Density variations through the area of interest that varied by more than -15 percent or +30 percent from the density at the IQI without additional IQIs having been placed in the exceptional areas.

This issue is being treated as a violation with a safety significance which is not determined (VIO 05200027/2017003-04 and 05200028/2017003-04, Failure to Ensure Adequate Radiographic Film Quality). The licensee initiated the following corrective action documents to capture the identified issues: CR-17-30869, CR-17-30963, CR-17-31003, DI 100481162, DI 100483875, and DI 100485005. However, due to the decision to abandon the construction of Units 2 and 3, shortly after this finding was identified, no corrective actions will be pursued nor will the safety significance of the matter be determined. This violation will remain open.

1A04 (Unit 2) ITAAC Number 2.1.02.03a (15) / Family 06B
(Unit 2) ITAAC Number 2.2.03.03a (161) / Family 06B
(Unit 3) ITAAC Number 2.2.03.03a (161) / Family 06B

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 2.1.02.03a (15) and 2.2.03.02a (159) for Unit 2 and 2.2.03.02a (159) for Unit 3. The inspectors used the following NRC IPs/sections to perform this inspection:

- 65001.F-02.02 - Fabrication Records Review

The inspectors reviewed CMTRs for weld filler metal which was used to weld pressure boundary welds on the components listed below in order to verify requirements for chemical composition, mechanical properties, impact testing, and nondestructive examination were in accordance with ASME Code Sections II and III, 1998 Edition including 2000 Addenda:

- Unit 2 Pressurizer
- Unit 2 ACC A (Serial No. 4581)
- Unit 2 CMT B (Serial No. 4600)
- Unit 3 ACC B (Serial No. 4584)

- Unit 3 CMT B (Serial No. 4602)

b. Findings

Introduction

The inspectors identified an Unresolved Item (URI) associated with required testing of weld filler material used in pressure boundary welds of RCS and PXS components. Specifically, the inspectors identified numerous weld filler metal CMTRs from Mangiarotti that did not document the drop weight tests that were required to be performed, which was determined to be a performance deficiency.

Description

On July 21 2017, while conducting a review of welding records associated with the Unit 2 pressurizer, Unit 2 accumulator tank (ACC) A, Unit 2 core make-up tank (CMT) B, Unit 3 ACC B, and Unit 3 CMT B, the inspectors identified that a large number of Mangiarotti weld filler metal CMTRs did not document the results of individual drop weight tests. The drop-weight section of the CMTRs was marked NA, however the RT NDT obtained was listed in the final results section. Two specific examples identified were the CMTR for heat number 341492009, which was used in weld CW-001/2 on Unit 2 CMT B and the CMTR for heat number 342044003, which was used in weld CW-003 on the Unit 2 pressurizer.

ASME Code Section III, paragraph NB-2321.1, "Drop Weight Tests," states in part that "the results, orientation, and location of all tests performed to meet the requirements of NB-2330 shall be reported in the Certified Material Test Report." Additionally, paragraph NCA-3862.1, "Material Certification," (a) states that "the Certified material test report shall include the actual results of all required chemical analyses, tests, and examinations."

The licensee initiated CR 17-30971 and Discrete Issue 100484134 to track, disposition, and correct the issue. However, due to the decision to abandon the construction of Units 2 and 3, shortly after this issue was identified, no corrective actions will be pursued at this time. This item was classified as a URI because the decision to abandon the construction of Units 2 and 3 occurred before the licensee could ascertain whether the tests had been performed and if documentation of the tests could be located from the sub-suppliers. This unresolved item will remain open, identified as URI 05200027/2017003-05 and 05200028/2017003-05, "Missing Drop-Weight Test Data on Weld Filler Metal CMTRs."

1A05 (Unit 2) ITAAC Number 2.2.03.02a (159) / Family 06F

a. Inspection Scope

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

- 65001.06-02.05 - Problem Identification and Resolution
- 65001.F-02.01 - Design Document Review
- 65001.F-02.02 - Fabrication Records Review

The inspectors reviewed fabrication records associated with the following Unit 2 passive core cooling system (PXS) components, which had been accepted on site, to verify the pressure boundary materials listed met the applicable requirements of ASME Code Section III, 1998 Edition including 2000 Addenda, and Westinghouse (WEC) design and fabrication specifications:

- Accumulator Tank A (Serial No. 4581)
 - Shell Petals
 - Upper Crown
 - Lower Crown
 - Manway Nozzle
- Core Make-up Tank B (Serial No. 4600)
 - Shell Barrel
 - Upper Head Crown
 - Upper Head Petals
 - Lower Head Crown
 - Lower Head Petals
 - Outlet Central Nozzle

The inspectors reviewed design documents to determine whether the documents adequately defined the final design of the accumulator and core make-up tank. Specifically, the inspectors reviewed material and fabrication attributes of the parts identified above to ensure the ASME Section III Code, WEC design report, design drawings, and the UFSAR requirements were captured in the final as-built condition of the components.

The inspectors reviewed the following fabrication records for the above components to verify compliance with applicable design documents, codes, standards, regulations, and quality and technical requirements:

- Purchase Orders and Certificates of Conformance to verify compliance with 10 CFR Part 21; 10 CFR Part 50, 50.55(e) and Appendix B; ASME Section III, Division 1 (Ed. 1998 Add. 2000); and NQA-1 (Ed. 1994) requirements were appropriately specified;
- Certified Material Test Reports (CMTRs) to verify the materials were properly heat treated, met the specified chemical, mechanical, impact, and nondestructive testing requirements, and that no repairs were made without approval from the purchaser;
- ASME Code data reports to ensure ASME Section III Code requirements were met, specifically the traceability of materials was maintained, the key dimensions met the design, the components were hydrostatically tested at the appropriate design pressure and temperature and received acceptable results, and an authorized nuclear inspector (ANI) signed off on the report; and
- The final quality data packages to verify the records were complete, accurate, reviewed and approved by the responsible organization(s), and provided evidence that the quality and code requirements were satisfied.

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

- Findings

No findings were identified.

1A06 (Unit 2) ITAAC Number 2.2.03.02a (159) / Family 06F

- a. Inspection Scope

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

- 65001.07-02.01 – General Installation

The inspectors reviewed quality records and performed direct inspection of construction activities associated with the Passive Core Cooling System in the Containment Building of V.C. Summer Unit 2. Specifically, the inspectors observed installation activities associated with containment sump recirculation line PXS-PL-L131A. Inspectors observed installation and welding activities associated with motor-operated valve PXS-PL-V117A.

The inspectors observed installation activities and reviewed quality records to determine if:

- the valve was installed in the proper location and orientation;
- all foreign matter was removed from the valve prior to installation;
- precautions to prevent valve damage during placement and mounting were used;
- valve temperatures were maintained below operating temperatures during welding activities;
- the latest drawings, work procedures, and manufacturer's recommendations were available to installers;
- installation hold points were observed and quality inspections were conducted in accordance with site procedures; and
- design features to provide overpressure protection were satisfied.

Due to the suspension of all construction activities on July 31, 2017, the inspectors were unable to complete all planned inspections to fully verify the required criteria for the ITAAC. The inspectors did not review valve fabrication records to determine if the valve was made of the correct materials, permitted adequate volumetric flow rate, was adequately supported and restrained for seismic events, and complied with clearance requirements. The inspectors did not review a sample of nonconformance reports and other design deviation documents associated with the valves and associated piping segments. Additional samples are required to complete the ITAAC.

b. Findings

No findings were identified.

1A07 (Unit 2) ITAAC Number 2.2.03.03a (161) / Family 06B

a. Inspection Scope

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

- 65001.06-02.02 - Component Welding
- 65001.06-02.05 - Problem Identification and Resolution
- 65001.B-02.03 - Welder Qualification
- 65001.B-02.04 - Production Controls
- 65001.B-02.06 – Records

The inspectors reviewed welding and NDE records for Unit 2 accumulator (ACC) A (Serial No. 4581) and core makeup tank (CMT) B (Serial No. 4600) to determine if pressure boundary welds were welded and inspected in accordance with the applicable procurement specifications and portions of ASME Code, Section III, 1998 Edition including 2000 Addenda. Specifically, the inspectors selected weld numbers CW-015/1, LW-13/2, and NZ-025 from ACC A, and weld numbers BT-031, BT-053, CL-030, CW-001/2, CW-040, CW-054, and LW-013/1-1 from CMT B. For each weld the inspectors reviewed:

- welding monitoring sheets to verify traceability of weld number to welders, welding procedures, and materials used;
- welder qualification test records to determine if the welders had been qualified in accordance with the ASME Code;
- heat treatment reports to determine if the welds were post weld heat treated in accordance with the welding procedure and ASME Code;
- nondestructive testing reports to determine if the welds were examined and were acceptable in accordance with the ASME Code and applicable procurement specifications; and
- radiographic film to verify the film met the quality requirements of Section V of the ASME Code and the welds were free of rejectable defects and met the acceptance requirements of Section III, Division 1 of the ASME Code.

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

b. Findings

See finding documentation under Section 1A03 of this report.

1A08 (Unit 2) ITAAC Number 2.2.03.03b (162) / Family 03Ba. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 2.2.03.03b (162). The inspectors used the following NRC IPs/sections to perform this inspection:

- 65001.03-02.03 - Installation and Welding
- 65001.03-02.06 - Nondestructive Examination (NDE)
- 65001.03-02.07 - Review of Records
- 65001.B-02.04 - Production Controls
- 65001.B-02.05 - Inspection
- 65001.B-02.06 - Records

The inspectors reviewed quality records and performed direct inspection of construction activities associated with the passive core cooling system in the containment building of V.C. Summer Unit 2. Specifically, the inspectors observed welding activities associated with line PXS-PL-L131A, which is part of the line that connects the containment sump to the direct vessel injection (DVI) line A. Inspectors observed welding activities associated with field weld FW-1, which is the first weld downstream of motor-operated valve PXS-PL-V117A. Additionally, inspectors observed nondestructive examination of the first welds on both sides of PXS-PL-V117A.

The inspectors observed welding activities and reviewed quality records for FW-1 of drawing VS2-PXS-PLW-01B to determine if:

- piping was installed at the proper location in the plant;
- welding procedures complied with the codes and standards specified in the design documents;
- welding procedures, detailed drawings and instructions, and weld data sheets were at the work station
- surfaces to be welded had been prepared, cleaned, and inspected in accordance with applicable procedures;
- piping material and welding consumables were of the specified type and grade and were uniquely identified;
- gas purging was used in accordance with the applicable procedure and was provided to shield the welding operation from adverse environmental conditions;
- preheat and interpass temperatures were maintained in accordance with applicable procedure requirements and manufacturer's recommendations and were adequately checked by qualified measuring equipment.
- welding equipment, including power cables and gas lines, were in good condition;
- welding consumable cleanliness was maintained;
- control and identification of welds rods after being issued to the welder were maintained in accordance with procedures;
- interpass cleaning and grinding were conducted in accordance with the applicable procedures; and
- welders' identities were recorded by stamping the weld and on quality records.

The inspectors observed visual and liquid penetrant examination of FW-1 of drawing VS2-PXS-PLW-01B and FW-2 of drawing VS2-PXS-PLW-01C and reviewed quality records to determine if:

- the NDE procedures were in accordance with the applicable code as specified in the design specification;
- appropriate inspection hold points were included in the work package;
- the NDE was performed in strict accordance with the procedure by examiners that were qualified for that NDE method;
- the temperature of the weld surface was within that qualified for the procedure;
- the surfaces of the materials were adequately cleaned prior to testing;
- adequate dwell time was allowed for penetrant penetration; and
- indications were properly measured and evaluated in accordance with applicable codes and site procedures.

The inspectors reviewed the weld documentation package for FW-1 of drawing VS2-PXS-PLW-01B to determine if:

- documentation was thorough, accurate, and in accordance with the site procedures and applicable codes;
- identification and traceability of piping materials and welding consumables was maintained;
- welding and NDE procedures, welders, and examiners were identified for each weld;
- NDE results indicated that all acceptance criteria were met; and
- the work package conformed to site procedures and was approved by the proper authority.

Due to the suspension of all construction activities on July 31, 2017, the inspectors were unable to complete all planned inspections to fully verify the required criteria for the ITAAC. Specifically, for the above welds, the inspectors did not review the qualification records for the two welders, the qualification records for the quality control (QC) inspector who performed the visual and liquid penetrant testing, or the certified material test reports for the weld filler material. Furthermore, additional welding and NDE samples are required to complete the ITAAC.

b. Findings

No findings were identified.

1A09 (Unit 2) ITAAC Number 2.2.03.08c.iv.01 (183) / Family 03A

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 2.2.03.08c.iv.01 (183). The inspectors used the following NRC IPs/sections to perform this inspection:

- 65001.03-02.07 - Review of Records
- 65001.A - As-Built Attributes for SSCs associated with ITAAC

The inspectors reviewed quality records of construction activities associated with the passive core cooling system in the containment building of V.C. Summer Unit 2. Specifically, the inspectors reviewed survey data associated with line PXS-PL-L112A and PXS-PL-112B which are embedded piping that connect the in-containment refueling water storage tank (IRWST) sumps to the direct vessel injection (DVI) lines. Inspectors reviewed as-built surveys to determine whether the records reflected the as-built facility and furnished documentary evidence that the applicable quality and technical requirements were met. Specifically, inspectors reviewed the survey data to determine if the highest elevation of the piping was located at the IRWST sump.

Due to the suspension of all construction activities on July 31, 2017, the inspectors were unable to complete all planned inspections to fully verify the required criteria for the ITAAC. Specifically, ITAAC 2.2.03.08c.iv.01 requires verification that the maximum elevation of the top inside surface of the IRWST injection lines is less than the elevation of the IRWST bottom inside surface. Inspectors did not visually inspect the connection of the IRWST injection lines to the IRWST sumps. Furthermore, inspectors did not review three applicable nonconformance reports in order to validate that the as-built conditions met design requirements:

- VS2-PXS-GNR-000078
- VS2-PXS-GNR-000094
- VS2-PXS-GNR-000105

b. Findings

No findings were identified.

1A10 (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:

- 65001.01-02.05 - Steel Structures
- 65001.01-02.06 - Records
- 65001.B-02.02 - Welding Procedure Qualification
- 65001.F-02.01 - Design Document Review
- 65001.F-02.02 - Fabrication Records Review

Inspectors conducted planning to review design, construction, and in-process welding of U2 containment internal structures (CIS) structural frame modules SPL-18, Seq. 1 & 2, and SPL-51, Seq. 1 and 2. However, due to the suspension of all construction activities on July 31, 2017, the inspectors were unable to complete any of the planned inspections.

b. Findings

No findings were identified.

1A11 (Unit 2) ITAAC Number 3.3.00.02a.i.d (763) / Family 01Fa. 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.02.03 - Independent Assessment/Measurement Inspection
- 65001.A.02.04 - Review As-built Deviations/Nonconformance

The inspectors reviewed quality records and performed direct inspection of construction activities associated with the radiologically controlled area of the auxiliary building for V.C. Summer Unit 2. Specifically, the inspectors observed construction activities associated with the wall section along column line 1 between column lines J-2 and N between elevations 100'-0" and 117'-6":

The inspectors observed installation activities associated with formwork, embedments, and steel reinforcement, including horizontal and vertical reinforcing steel bars, shear reinforcement, and bar splices, to determine whether:

- the installation activities met applicable quality and technical requirements established by approved procedures, specifications, and drawings;
- reinforcing steel and embedments were located properly in the structure, were sized as specified in drawings and calculations, and had proper clearances;
- reinforcing steel and embedments were secured and free of contaminants and excessive rust; and
- forms were secure, leak tight, and free from debris or excess water.

The inspectors performed independent inspections and measurements to determine whether the steel reinforcement, embedments, and formwork, including the critical attributes of the wall, conformed to the design specifications, drawings, and license commitments.

The inspectors reviewed a sample of certified material test reports to verify that rebar materials met quality and testing requirements and that receipt inspections were performed. The inspectors reviewed a sample of inspection and installation records to determine whether:

- the records were adequate to furnish evidence of activities affecting quality;
- the requisite material characteristics were documented;
- the records were reviewed and approved by the responsible organization; and
- the as-built SSCs conformed to applicable codes, standards, quality requirements, and technical requirements.

The inspectors reviewed a sample of completed QC inspection reports to determine if the records confirmed that adequate concrete production, placement, and inspection

activities were performed; that the installation of embedded components was properly controlled; and that objective test results were available to demonstrate compliance with quantitative acceptance criteria.

The inspectors reviewed a sample of nonconformances to verify:

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

The inspectors observed concrete pre-placement activities to determine whether pre-placement planning had been completed and the pre-placement inspection was performed by quality control before any concrete was placed. Prior to concrete placement, the inspectors independently evaluated preparation and cleanliness of the rebar and formwork. 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;
- batch tickets were reviewed for verification of proper mix, transport time, and placement location;
- mixing time and rotations were adequate;
- placement drop distances did not exceed specification requirements and did not result in segregation;
- concrete did not segregate as it flowed into the forms;
- inspection during placement was performed as required; and
- records were produced, reviewed, and indicated mix, location, time placed, temperature of the concrete mix, and ambient conditions.

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

- concrete temperature, slump, air content, and unit weight were determined at the proper location and frequency as required by procedures, specifications, and American Society for Testing and Materials (ASTM) standards;
- sample collection and testing techniques conformed to the procedures, specifications, and ASTM standards; and
- concrete strength test sample cylinders were made in accordance with site procedures and ASTM standards.

b. Findings

No findings were identified.

1A12 (Unit 3) ITAAC Number 2.2.03.02a (159) / Family 06Fa. Inspection Scope

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

- 65001.06-02.05 - Problem Identification and Resolution
- 65001.F-02.01 - Design Document Review
- 65001.F-02.02 - Fabrication Records Review

The inspectors reviewed fabrication records associated with the following Unit 3 passive core cooling system (PXS) components, which had been accepted on site, to verify the pressure boundary materials listed met the applicable requirements of ASME Code Section III, 1998 Edition including 2000 Addenda, and Westinghouse (WEC) design and fabrication specifications:

- Accumulator Tank B (Serial No. 4584)
 - Shell Petals
 - Upper Crown
 - Lower Crown
 - Outlet Nozzle
- Core Make-up Tank B (Serial No. 4602)
 - Shell Barrel
 - Upper Head Crown
 - Upper Head Petals
 - Lower Head Crown
 - Lower Head Petals
 - Manway Nozzle
 - Inlet Central Nozzle
 - Inlet Nozzle Safe-End

The inspectors reviewed design documents to determine whether the documents adequately defined the final design of the accumulator and core make-up tank. Specifically, the inspectors reviewed material and fabrication attributes of the parts identified above to ensure the ASME Section III Code, WEC design report, design drawings, and the UFSAR requirements were captured in the final as-built condition of the components.

The inspectors reviewed the following fabrication records for the above components to verify compliance with applicable design documents, codes, standards, regulations, and quality and technical requirements:

- Purchase Orders and Certificates of Conformance to verify compliance with 10 CFR Part 21; 10 CFR Part 50, 50.55(e) and Appendix B; ASME Section III, Division 1 (Ed. 1998 Add. 2000); and NQA-1 (Ed. 1994) requirements were appropriately specified;
- Certified Material Test Reports (CMTRs) to verify the materials were properly heat treated, met the specified chemical, mechanical, impact, and nondestructive

testing requirements, and that no repairs were made without approval from the purchaser;

- ASME Code data reports to ensure ASME Section III Code requirements were met, specifically the traceability of materials was maintained, the key dimensions met the design, the components were hydrostatically tested at the appropriate design pressure and temperature and received acceptable results, and an authorized nuclear inspector (ANI) signed off on the report; and
- The final quality data packages to verify the records were complete, accurate, reviewed and approved by the responsible organization(s), and provided evidence that the quality and code requirements were satisfied.

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

b. Findings

No findings were identified.

1A13 (Unit 3) ITAAC Number 2.2.03.03a (161) / Family 06B

a. Inspection Scope

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

- 65001.06-02.02 - Component Welding
- 65001.06-02.05 - Problem Identification and Resolution
- 65001.B-02.03 - Welder Qualification
- 65001.B-02.04 - Production Controls
- 65001.B-02.06 - Records

The inspectors reviewed welding and NDE records for Unit 3 ACC B (Serial No. 4584) and CMT B (Serial No. 4602) to determine if pressure boundary welds were welded and inspected in accordance with the applicable procurement specifications and portions of ASME Code, Section III, 1998 Edition including 2000 Addenda. Specifically, the inspectors selected weld numbers BT-011, CL-007, CW-015/2, LW-013/6, and NZ-036 from ACC B, and weld numbers CW-001/1, CW-002/2, CW-035, CW-050, and LW-014/1-1 from CMT B. For each weld the inspectors reviewed:

- welding monitoring sheets to verify traceability of weld number to welders, welding procedures, and materials used;
- welder qualification test records to determine if the welders had been qualified in accordance with the ASME Code;
- heat treatment reports to determine if the welds were post weld heat treated in accordance with the welding procedure and ASME Code;
- nondestructive testing reports to determine if the welds were examined and were acceptable in accordance with the ASME Code and applicable procurement specifications; and

- radiographic film to verify the film met the quality requirements of Section V of the ASME Code and the welds were free of rejectable defects and met the acceptance requirements of Section III, Division 1 of the ASME Code.

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

b. Findings

See finding documentation under Section 1A03 of this report.

4. OTHER INSPECTION RESULTS

4OA6 Meetings, Including Exit

Due to the announcement to abandon the construction of Units 2 and 3 on July 31, 2017, no quarterly exit meeting was conducted.

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensees and Contractor Personnel

J. Weathersby, SCE&G Licensing Engineer - ITAAC
C. Baucom, Licensing and Regulatory Compliance, Westinghouse
A. Rice, Manager, SCE&G Units 2 & 3 Nuclear Licensing
B. Thompson, Manager, SCE&G Unit 1 Nuclear Licensing

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

<u>Item Number</u>	<u>Type</u>	<u>Status</u>	<u>Description</u>
05200027/2017003-01 05200028/2017003-01	NCV	Open	Failure to Establish Qualified Welding Procedures (Section 1A01)
05200027/2017003-02	URI	Open	Maximum Chromium Content Exceeded in the Pressurizer Upper Shell CMTR (Section 1A02)
05200027/2017003-03	URI	Open	Inadequate Tensile and Impact Testing Locations for the Pressurizer Upper and Lower Heads (Section 1A02)
05200027/2017003-04 05200028/2017003-04	VIO	Open	Failure to Ensure Adequate Radiographic Film Quality (Section 1A03)
05200027/2017003-05 05200028/2017003-05	URI	Open	Missing Drop-Weight Test Data on Weld Filler Metal CMTRs (Section 1A04)

LIST OF DOCUMENTS REVIEWED

Section 1A01

Unit 2 Pressurizer

Welding Procedure Specifications: W2-WPS-00-00-005 Rev. 4, W2-WPS-00-00-017 Rev. 6, W2-WPS-00-00-014 Rev. 3, W2-WPS-00-00-002 Rev. 6,
Welding Procedure Qualification Records: WQ 1337, WQ 1485, WQ 1426, WQ 1432, WQ 1465, WQ 1358, WQ 1359, WQ 1429, WQ 1429,

Unit 2 ACC A (SN 4581)

Welding Procedure Specifications: W4-WPS-00-00-001 Rev. 6, W4-WPS-00-00-001 Rev. 5, W4-WPS-00-00-002 Rev. 5, W4-WPS-00-00-002 Rev. 3,
Welding Procedure Qualification Records: WQ 1359, WQ 1429, WQ 1360

Unit 2 CMT B (SN 4600)

Welding Procedure Specifications: W3-WPS-00-00-002 Rev. 5, W3-WPS-00-00-006 Rev. 4, W3-WPS-00-00-012 Rev. 2, W3-WPS-00-00-021 Rev. 1, W3-WPS-00-00-001 Rev. 5
Welding Procedure Qualification Records: WQ 1359, WQ 1360, WQ 1333, WQ 1405, WQ 1358, WQ 1429

Unit 3 ACC B (SN 4584)

Welding Procedure Specifications: W4-WPS-00-00-009 Rev. 2, W4-WPS-00-00-005 Rev. 3, W4-WPS-00-00-002 Rev. 5
Welding Procedure Qualification Records: WQ 1405, WQ 1337, WQ 1485, WQ 1429

Unit 3 CMT B (SN 4602)

Welding Procedure Specifications: W3-WPS-00-00-008 Rev. 3
Welding Procedure Qualification Records: WQ 1358, WQ 1359

Section 1A02

Westinghouse Material Specifications

APP-VL51-Z0-002, "Material Specification for SA-508/508M Grade 3 Class 2 Forgings (Section III-NB)," Rev. 4
APP-VL51-Z0-041, "Material Specification for SA-508/SA-508M Grade 3 Class 2 Forgings," Rev. 0
APP-VL51-Z0-124, "Material Specification for SA-240 Type 304L (UNS S30403) Stainless Steel Plate," Rev. 1
APP-VL52-Z0-303, "Material Specification for SA-533 Type B Class 1 Carbon Steel Plate," Rev. 1

Unit 2 Steam Generator 1 (manufactured by Doosan)

AP1000-COC-SG-N08032-01, "Certificate of Conformance (Doosan)," Rev. 2
APP-MB01-VQP-002, "Preheat, Hydrogen Bake and Post Weld Heat Treatment Requirements for Steam Generator Fabrication," Rev. 0
APP-MB01-Z0-101, "Design Specification for AP1000 Steam Generator for RCS," Rev. 12
APP-MP01-M2-001, "AP1000 Reactor Coolant Pump Design Specification," Rev. 6
CMTR No. 0YUE901190129013, SB-163 UNS N06690, Heat Nos. F021037 and F021038, dated September 10, 2010
CMTR No. CN2010040034, SA508 GR.3 CL.2, Heat Nos. 2B96343 and 2C96344, dated May 12, 2010

CMTR No. CN2010120032, SA508 GR.3 CL.2, Heat Nos. 2B96563, 2C96564, and 2B96565, dated January 6, 2011

CMTR No. G001, SB-163 UNS N06690, Heat No. F021037, dated July 9, 2010

Form N-1 Certificate Holder's Data Report for Nuclear Vessels* As Required by the Provisions of the ASME Code, Section III, Division 1 (Manufactured and certified by Westinghouse Electric Company, for South Carolina Electric & Gas) for Unit 2 Heat Ex. (SG) Serial No. VS2-RCS-MB-01, dated April 5, 2017

Form N-2 Certificate Holder's Data Report for Identical Nuclear Parts and Appurtenances* As Required by the Provisions of the ASME Code, Section III (Manufactured and certified by Doosan Heavy Industries & Construction Co. for Westinghouse Electric Company) for Unit 2 Steam Generator, Serial No. VS2-RCS-MB-01 (N08032-01), dated November 5, 2014

Form N-2 Certificate Holder's Data Report for Identical Nuclear Parts and Appurtenances* As Required by the Provisions of the ASME Code, Section III (Manufactured and certified by WEC Carolina Energy Solutions for Westinghouse Electric Company) for Unit 2 Reactor Coolant Pump Serial No. 1289, dated October 31, 2013

Form N-2 Certificate Holder's Data Report for Identical Nuclear Parts and Appurtenances* As Required by the Provisions of the ASME Code, Section III (Manufactured and certified by WEC Carolina Energy Solutions for Westinghouse Electric Company) for Unit 2 Reactor Coolant Pump Serial No. 1293, dated October 31, 2013

Form N-5 Certificate Holder's Data Report for Installation or Shop Assembly of Nuclear Power Plant Components, Supports, and Appurtenances* As Required by the Provisions of the ASME Code, Section III, Division 1 (Manufactured and certified by Doosan Heavy Industries & Construction Co. for Westinghouse Electric Company) for Unit 2 Steam Generator, Serial No. VS2-RCS-MB-01 (N08032-01), and Reactor Coolant Pumps, Serial Nos. 1289 and 1293, dated October 24, 2016

QR-14-2868, "Quality Release & Certificate of Conformance (Westinghouse)," Steam Generator SN VS2-RCS-MB-01, Rev. 2

QVD-N08032-01, "Quality Verification Documentation for VC Summer #2A Steam Generator Assembly," Rev. 3

VCSA-SG-BM-TM, "Tabulation of Material," M/O No. N08032, VC Summer #2A, dated October 24, 2016

WM-APVC1000SG-104, "Weld Map for Channel Head Ass'y," Rev. 5

WM-APVC1000SG-106, "Weld Map for Final Vessel Assembly," Rev. 5

Unit 2 RCP Casing 1A (manufactured by CW-EMD and CES, and welded by Doosan)

4401721-020COC-01, "Certificate of Conformance (CES)," dated January 21, 2015

CES Project No. 4401721-02, "Quality Assurance Data Package," RCP Casing SN 1289, Rev. 1

CMTR No. 3977007-13573i, SA-351 CF8A, Cast No. 78337, dated January 10, 2010

Form N-2 Certificate Holder's Data Report for Identical Nuclear Parts and Appurtenances* As Required by the Provisions of the ASME Code, Section III (Manufactured and certified by WEC Carolina Energy Solutions for Westinghouse Electric Company) for Unit 2 Reactor Coolant Pump Serial No. 1289, dated October 31, 2013

QR-13-3583, "Quality Release & Certificate of Conformance (Westinghouse)," RCP Casing Buttering SN 1289, Rev.. 2

QR-13-557, "Quality Release & Certificate of Conformance (Westinghouse)," RCP Casing SN 1289, Rev. 2

Report No. 12/6373, "Radiographic Report," RCP Casing SN 1289, dated September 11, 2012

SFEL Order No. 3977007, "Certificate of Compliance (SFEL)," RCP Casing SN 1289, dated October 2, 2015

Unit 2 Pressurizer (manufactured by Mangiarotti)

APP-MV20-Z0-100, "AP1000 Pressurizer Design Specification for RCS System," Rev. 10
 APP-MV20-Z0-200, "AP1000 Pressurizer Fabrication Specification," Rev. 2
 CMTR No. 172, SA508 GR.3 CL.2, Heat No. 91832, dated September 20, 2010
 CMTR No. 173, SA508 GR.3 CL.2, Heat No. 91956, dated September 2, 2010
 CMTR No. 174, SA508 GR.3 CL.2, Heat No. 00462, dated October 18, 2010
 CMTR No. 175, SA508 GR.3 CL.2, Heat No. 92402, dated November 2, 2010
 CMTR No. 90, SA508 GR.3 CL.2, Heat No. 91958, dated September 20, 2010
 CMTR1100139, SA182 F316LN, Heat No. 05280, dated September 28, 2011
 CMTR1100141, SA182 F316LN, Heat No. 05252, dated September 28, 2011
 Form N-1 Certificate Holder's Data Report for Nuclear Vessels* As Required by the Provisions of the ASME Code, Section III, Division 1 (Manufactured and certified by Westinghouse Electric Company, for South Carolina Electric & Gas) for Unit 2 Pressurizer Serial No. 4591, dated September 23, 2015
 Form N-2 Certificate Holder's Data Report for Identical Nuclear Parts and Appurtenances* As Required by the Provisions of the ASME Code, Section III (Manufactured and certified by Mangiarotti for Westinghouse Electric Company) for Unit 2 Pressurizer Serial No. 4591, dated September 25, 2015
 N019-CofC-05, "Certificate of Conformance (Mangiarotti)," Serial No. 4591, Rev. 01
 QR-14-3239, "Quality Release & Certificate of Conformance (Westinghouse)," Pressurizer SN 4591, Rev. 1
 W2-FDP-00-05-001, "Final Data Package," VC Summer Unit 2 AP1000 Pressurizer SN# 4591, Order No. 4500274164, Rev. 07

Section 1A03

Unit 2 Steam Generator 1 (manufactured by Doosan)

General:

APP-MB01-V2-101, AP1000 Steam Generator Channel Head Assembly (General Notes), Rev. 9

APP-MB01-V2-102, AP1000 Steam Generator Channel Head Assembly, Rev. 8

APP-MB01-VQP-002, Preheat, Hydrogen Bake and Post Weld Heat Treatment Requirements for Steam Generator Fabrication, Rev. 0

APP-MB01-VW-011, Supplemental Welding Requirements for Steam Generator Fabrication, Rev. 0

APP-RCS-Z0-101, Design Specification for Installation of AP1000 Reactor Coolant Pump Casing to Steam Generator Outlet Nozzle Weld, Rev. 0

APP-VL51-GER-001, Fracture Toughness of Pressure Boundary Steels with Higher Yield Strength, Rev. 0

APP-VL53-Z0-011, Thermally Treated Alloy UNS N06690 (Alloy 690) Tubing for AP1000, Rev. 4

Tabulation of Material (Filler Material), M/O N08032 (7 pages)

VS2-MB01-V1-001, AP1000 Steam Generator Outline (Bill of Materials), Rev. 5

VS2-MB01-V1-002, AP1000 Steam Generator Outline (Dimensions), Rev. 4

VS2-MB01-V1-003, AP1000 Steam Generator Outline (Bottom/Top Views), Rev. 4

WEC, APP-VW30-Z0-110, AP1000 Filler Material Specification: SFA-5.11 ENiCrFe-7 (UNS W86152) Nickel Alloy Electrodes for SMAW of ASME Section III Applications, Rev. 0

WEC, APP-VW40-Z0-050, AP1000 Filler Material Specification: SFA-5.5 Low Alloy Steel Electrodes for SMAW of ASME Section III Applications, Rev. 1

WEC, APP-VW40-Z0-230, AP1000 Filler Material Specification: SFA-5.23 Low Alloy Steel Material for SAW of ASME Section III Applications, Rev. 1

Weld Status / Location of Weld filler Metal for V.C. Summer #2A (8 pages)

WM-APVC1000SG-103, Weld Map for Lower Shell Assembly (weld-no. 302-41), Rev. 5
 WM-APVC1000SG-104, Weld Map for Channel Head Assembly (weld-nos. 102-51, 107-51, 110-51, and 5101-71), Rev. 5
 WM-APVC1000SG-106, Weld Map for Final Vessel Assembly (weld-nos. 101-92 and 201-96), Rev. 5

Weld 101-92:

E120808-001-001, Report of Eddy Current Examination for seal welds 1-50, after channel head to tubesheet weld area PWHT
 E120808-001-002, Report of Eddy Current Examination for seal welds 1-103, after channel head to tubesheet weld area PWHT
 WPS A-T-4343-198, Rev. 2 for seal weld of plug to tube-tubesheet assembly and tube

Weld 102-51:

CMTR 10 055, Bohler Welding Group Heat-No. 95905 and 95900 for SFA-5.9, EQ308L and EQ309L, respectively, for strip cladding, Rev. 01
 CMTR 10 057/1, Bohler Welding Group Heat-No. 95897 and 95900 for SFA-5.9, EQ308L and EQ309L, respectively, for strip cladding, Rev. 0
 CMTR 10 058, Bohler Welding Group Heat-No. 95888 and 95900 for SFA-5.9, EQ308L and EQ309L, respectively, for strip cladding, Rev. 0
 CMTR NQC-09-090, Doosan for Chosun CMTR TR-P0829-2, Oct. 22, 2009
 CMTR NQC-11-054, Doosan for Chosun CMTR TR-P0810-1, 3/15/11
 CMTR TR-P0810-1, Chosun Welding Lot/Heat-Nos. H540174/H01874 and G740195/H01875 for SFA-5.4, E309L-16 and E308L-16, respectively, May 06, 2008
 CMTR TR-P0829-1, Chosun Welding Lot/Heat-Nos. G730201/H02001 for SFA-5.4, E308L-16, Oct. 30, 2008
 CMTR TR-P0829-2, Chosun Welding Lot/Heat-Nos. H540200/H02000 and G740306/H02006 for SFA-5.4, E309L-16 and E308L-16, respectively, Nov. 25, 2008
 CMTR TR-P1007, Chosun Welding Lot/Heat-Nos. H540696/A19296 of 4.0 mm dia. for SFA-5.4, E309L-16; and G730996/A19296 of 3.2 mm dia. and G741096/A19296 of 4.0 mm dia. for SFA-5.4, E308L-16, Mar. 12, 2010
 P120221-013-001, Report of Liquid Penetrant Examination, after PWHT for channel head cladding
 Tables of Certified Welders for ID Nos. AGR, APT, BVU, BXO, EIN, ELW
 Tables of Certified Welding Operators for ID Nos. APT, BVU, BXO, EIN
 U120221-024-002, Report of Ultrasonic Thickness Measurement, after PWHT from clad surface
 U130118-014-001, Report of Ultrasonic Examination, after hydro conducted from outside surface
 WPS A-A-0308-146, Rev. 4
 WPS A-A-0308-147, Rev. 5
 WPS A-M-0308-137, Rev. 5
 WPS A-T-0308-122, Rev. 4

Weld 107-51:

CMTR FT-DS34, Kiswel Lot-Nos. 521011N01 and 541011N01 for SFA-5.22 E308LT1-1 and E309LT1-1, respectively, Rev. 0
 CMTR TR-P1146-1, Chosun Welding Lot/Heat-Nos. 27339402/A27339 for SFA-5.9 ER308L, and A6929402/HA6929 and 02210401/H02210 for SFA-5.9 ER309L, July 06, 2011
 P120221-013-001, Report of Liquid Penetrant Examination, after PWHT for primary inlet nozzle cladding
 Table of Certified Welder for ID No. AAZT
 Tables of Certified Welding Operators for ID Nos. AZT, BVG

U120221-024-001, Report of Ultrasonic Examination, after PWHT conducted from primary inlet nozzle clad surface
 U120221-024-002, Report of Ultrasonic Thickness Measurement, after PWHT from primary inlet nozzle clad surface
 WPS A-F-0308-114, Rev. 3
 WPS A-F-0308-115, Rev. 3
 WPS A-M-0308-137, Rev. 5
 WPS A-T-0308-122, Rev. 4
 WPS A-T-0308-128, Rev. 5

Welds 110-51A & B:

CMTR 098517-001, Special Metals Heat-No. NX8955TK for SFA-5.14, ERNiCrFe-7A, Rev. 5
 CMTR 098517002, Special Metals Heat-No. NX8955TK for SFA-5.14, ERNiCrFe-7A, Rev. 4
 CMTR 098517003, Special Metals Heat-No. NX8955TK for SFA-5.14, ERNiCrFe-7A, Rev. 4
 CMTR 098517004, Special Metals Heat-No. NX8955TK for SFA-5.14, ERNiCrFe-7A, Rev. 3
 P120221-013-001, Report of Liquid Penetrant Examination, after PWHT for both primary outlet nozzles Inconel-690 buttering 110-51A & B
 R120221-022-001, Report of Radiography, after PWHT for primary outlet nozzle buttering area 110-51A
 R120221-023-001, Report of Radiography, after PWHT for primary outlet nozzle buttering area 110-51B
 Tables of Certified Welding Operators for ID Nos. BGW, BOQ, BVL, BWU, EHV
 U120221-025-001, Report of Ultrasonic Examination, after PWHT conducted from buttered end & build-up end for both 110-51A & B
 U120515-038-001, Report of Ultrasonic Examination, after PWHT conducted from buttered end of primary outlet nozzle with straight beam and 45° angle beam; and conducted from inside/outside surfaces of primary outlet nozzle buttering area with 45° angle beam for both 110-51A & B
 WPS A-M-0343-160, Rev. 4
 WPS A-T-0343-148, Rev. 2
 WPS A-T-0343-171, Rev. 7

Weld 302-41:

100885862, Operation 4000 through 4070, Repair Traveler for WDN 100434
 100885862, Operation 4100 through 4220, Repair Traveler for WDN 100441
 CMTR 132208.1, Bohler Welding Group Heat/Lot-No. 701270/2856 for SFA-5.23 EG (EF6 mod.)
 CMTR 135209.1, Bohler Welding Group Heat/Lot-No. 1402536/2857 for SFA-5.23 F11A8-EG-F6*
 M101125-025-001, Report of Magnetic Particle Examination, backgouge of tubesheet to lower shell "A"
 M101210-051-001, Report of Magnetic Particle Examination, after repair welding
 M101221-059-001, Report of Magnetic Particle Examination, after PWHT
 R101202-037-001, Report of Radiography, after PWHT
 Tables of Certified Welding Operators for ID Nos. ANG, BWQ, BXQ, EED, TAP, TMB, TMZ, UGS
 U101210-041-001, Report of Ultrasonic Examination, after repair welding
 U101221-043-001, Report of Ultrasonic Examination, after PWHT
 WDN 100434, Welding Defect Notice, defects were found with NDE-UT and before PWHT
 WDN 100441, Welding Defect Notice, defects after repair welding with NDE-UT and before PWHT

WPS A-M-0303-153, Rev. 4
 WPS A-MA-0303-218, Rev. 6
 WPS A-MA-0303-227, Rev. 2

Weld 5101-71:

101090105-6330, (Depth) Inspection Report after 10:1 repair blending of areas for NCR 120749
 CMTR ME11-DS02, Kiswel Lot-Nos. 101171 of 3.2 mm, 101172 and 101173 of 4.0 mm, and
 101176 for SFA-5.5 E9018M, Rev. 0
 CMTR ME11-DS07, Kiswel Lot-Nos. 101174 and 101175 for SFA-5.5 E9018M of 4.0 & 5.0 mm
 dia., respectively, Rev. 0
 CMTR N07049-Q99-REC06-0002, Doosan for Lot-No. 101175 from Kiswel CMTR ME11-DS07,
 2012-09-17
 CMTR SA11-DS44, Kiswel Heat/Lot-Nos. 249347/3/1 of 4.0 mm and KF1105N01 Mesh 12*60,
 SFA-5.23 F10A(P)4-EM2-M2, Rev. 0
 M120806-074-001, Report of Magnetic Particle Examination, after PWHT for primary side final
 assembly
 M120806-086-001, Report of Magnetic Particle Examination for NCR 120749
 NCR 120749, Nonconformance Report for thickness areas below minimum wall
 R120710-023-001, Report of Radiography, before PWHT for tubesheet to channel head
 Tables of Certified Welders for ID Nos. BGM, BVF, BVW, BWB, BWF, XUM
 Tables of Certified Welding Operators for ID Nos. BVF, BVP, BVW, BWR, XUM
 U120806-057-001, Report of Ultrasonic Examination, after PWHT conducted from outside &
 inside surfaces of tubesheet to channel head
 VC2-NCR-120749-F00, Operation 6330 through 6340, Repair Traveler
 WPS A-M-0303-153, Rev. 4
 WPS A-MA-0303-218, Rev. 6
 WPS A-MA-0303-227, Rev. 2

Unit 2 RCP Casing 1A

Welds 201-96 A & B:

CMTR 085138001, Special Metals Heat-No. NX78W5TK for SFA-5.14, ERNiCrFe-7A, Rev. 2
 CMTR 095862001, Special Metals Heat-No. NX8040TK for SFA-5.14, ERNiCrFe-7A, Rev. 1
 CMTR 096839001, Special Metals Heat-No. NX8040TK for SFA-5.14, ERNiCrFe-7A, Rev. 0
 CMTR 096839002, Special Metals Heat-No. NX8040TK for SFA-5.14, ERNiCrFe-7A, Rev. 0
 CMTR 118786-001A, Special Metals Heat-No. NX8955TK for SFA-5.14, ERNiCrFe-7A, Rev. 1
 CMTR FN-0529, Kobe Steel, Heat-Nos. FF0600112720 & FF7625612721 for SFA-5.9, ER308L
 and ER309L, respectively, Rev. 1
 CMTR NQC-11-241, Doosan for Special Metals CMTRs 096839001 and 096839002, 9/23/2011
 CMTR NQC-11-242, Doosan for Special Metals CMTRs 095862001, 9/23/2011
 CMTR NQC-12-135, Doosan for Special Metals CMTRs 085138001, 7/17/2012
 CMTR TR-P1317, Chosun Welding Heat-Nos. A36144 and HA7363 for SFA-5.9, ER308L and
 ER309L, respectively, May 07, 2013
 NCR 13100778, Nonconformance Report, root gap deviation during fit-up for 201-96B
 NCR 14100144, Nonconformance Report, weld defects after information NDE-RT for 201-96B
 P140113-017-001, Report of Liquid Penetrant Examination, after removal of attachment and
 grinding
 P140515-026-001, Report of Liquid Penetrant Examination, after excavation to assure defects
 removal
 P140616-009-001, Report of Liquid Penetrant Examination, on the repaired weld per each 4
 layers (1st)

P140619-002-001, Report of Liquid Penetrant Examination, on the repaired weld per each 4 layers (2nd)
 P140627-007-001, Report of Liquid Penetrant Examination, on the repaired weld per each 4 layers (3rd)
 P140702-021-001, Report of Liquid Penetrant Examination, on the repaired weld per each 4 layers (4th)
 P140710-013-001, Report of Liquid Penetrant Examination, on the repaired weld per each 4 layers (5th)
 P140710-014-001, Report of Liquid Penetrant Examination, on the repaired weld per each 4 layers (6th)
 P140730-026-001, Report of Liquid Penetrant Examination, Primary Outlet Nozzle A to RCP casing after welding in as-ground condition, 201-96A
 P140730-026-001, Report of Liquid Penetrant Examination, Primary Outlet Nozzle B to RCP casing after welding in as-ground condition, 201-96B
 P140731-005-001, Report of Liquid Penetrant Examination, after repair welding for 201-96B
 R140514-009-001, Report of Radiographic Examination, after excavation for 201-96B
 R140805-021-001, Report of Radiography, after PWHT for 201-96A
 R140805-022-001, Report of Radiography, after PWHT for 201-96B (after repair)
 Table of Certified Welder for ID No. BWR
 Tables of Certified Welding Operators for ID Nos. BSY, BTO, BVZ, BWR
 U140730-037-001, Report of Ultrasonic Examination, after PWHT for both 201-96A & B
 VC2-NCR-13100778-F00, Repair Traveler
 VC2-NCR-14100144-W00, operation 6000 through 6100 Repair Traveler
 WPS A-T-0808-500, Rev. 1
 WPS A-T-0808-501, Rev. 1
 WPS A-T-0843-147, Rev. 2
 WPS A-T-0843-148, Rev. 2

Unit 2 Pressurizer (manufactured by Mangiarotti)

Welding monitoring sheet for pressurizer welds: CL-046, BT-047, CW-031, CW-048, CW-003, CW-001
 Welder Performance Qualification Test Records for welder Numbers: GM C95,
 Heat Treatment Reports: N019-TT-W2-PCF-00-05-002-37
 Ultrasonic Test Reports: N019-UT-W2-PCF-10-05-001-24-02, N019-UT-W2-PCF-10-05-001-22-02, N019-UT-NCR-2329-3, N019-UT-NCR-2430-01, N019-UT-W2-PCF-00-05-003-41, N019-UT-W2-PCF-00-05-002-25, N019-UT-W2-PCF-00-05-002-38
 Liquid Penetrant Test Reports: N019-PT-W2-PCF-10-05-001-24, N019-PT-W2-PCF-10-05-002-38-01
 Magnetic Particle Test Reports: N019-MT-W2-PCF-00-05-002-25, N019-MT-W2-PCF-00-05-002-38
 Ferrite number test reports: LTR-13378, LTR-13379
 Radiographic Test Reports: N019-RT-NCR-2329, N019-RT-NCR-2329-3, N019-RT-NCR-2430-4, N019-RT-W2-PCF-00-05-003-39, N019-RT-W2-PCF-00-05-002-19, N019-RT-W2-PCF-00-05-002-32
 NCRs: NCR-1873, NCR-2004, NCR-2329, NCR-2330, NCR-1502, NCR-2436, NCR-2886

Corrective Action Documents

CR-17-31003
 CR-17-30869
 CR-17-30963
 CR-17-30971

CR-17-30967
 CR-17-30959
 CR-17-31013
 CR-17-30962
 CR-17-30964
 CR-17-30958
 CR-17-30948
 CR-17-30965

Section 1A04

Unit 2 Pressurizer

Weld Filler Metal CMTRs: Heat 525060, Heat 127336, Heat 118177, Heat 132283, Lot 343441004, Lot 343444002, Lot 847, Heat PV126304465

Unit 2 ACC A (SN 4581)

Weld Filler Metal CMTRs: Lot 0234002, Lot 0234002, Heat PV023300183

Unit 2 CMT B (SN 4600)

Weld Filler Metal CMTRs: Lot 0411017, Heat PV023300183, Heat 127492, Heat 127492, Heat PV126304465, Lot 341492009, Lot 847, Lot 5492003

Unit 3 ACC B (SN 4584)

Welding Filler Metal CMTRs: Heat 127492, Heat 525060, Heat 127336, Lot 847, Lot 342044003, Lot 342282012, Heat PV118303546, Air Liquide Welding France welding filler metal CMTR Lot number 342044003

Unit 3 CMT B (SN 4602)

Welding Filler Metal CMTRs: Heat 132441, Heat 132441, Lot 341492010

Section 1A05

Westinghouse Material Specifications

APP-VL51-Z0-002, "Material Specification for SA-508/508M Grade 3 Class 2 Forgings (Section III-NB)," Rev. 4

APP-VL51-Z0-124, "Material Specification for SA-240 Type 304L (UNS S30403) Stainless Steel Plate," Rev. 1

APP-VL52-Z0-303, "Material Specification for SA-533 Type B Class 1 Carbon Steel Plate," Rev. 1

Unit 2 Accumulator A (manufactured by Mangiarotti)

210440-NC-1, "Non-Conformance/Corrective Action Report," Rev. 2

APP-MT02-GEF-005, "Use of SA-508 Grade 3 Class 2 for AP1000 Accumulator Tanks," Rev. 0

APP-MT02-Z0-101, "Design Specification for the AP1000 Accumulator Tank for PXS," Rev. 9

CMTR No. 4798, SA 508 Grade 3 Class 2, Heat No. 01355, dated November 05, 2011

CMTR No. P8123, SA 533 Type B Class 1 and SA 240 Type 304L, Heat Nos. 705398 and 050592, dated May 28, 2010

CMTR-W41005R01-01, Carbon Steel Heat No. 705398, Stainless Steel Heat No. 050592, Rev. 2

COC 210029-18, "Certificate of Compliance," Sphere (6 petals), SA 533 Type B Class 1 + SA 240 Type 304L, dated February 22, 2011

Form N-1 Certificate Holder's Data Report for Nuclear Vessels* As Required by the Provisions of the ASME Code, Section III, Division 1 (Manufactured and certified by Westinghouse Electric Company, for South Carolina Electric & Gas) for Unit 2 Accumulator Tank Serial No. 4581, dated July 22, 2015

Form N-2 Certificate Holder's Data Report for Identical Nuclear Parts and Appurtenances* As Required by the Provisions of the ASME Code, Section III (Manufactured and certified by Mangiarotti for Westinghouse Electric Company) for Unit 2 Accumulator Tank Serial No. 4581, dated July 15, 2015

N017-CofC-05, "Certificate of Conformance (Mangiarotti)," Serial No. 4581, Rev. 03

N017-CofC-08, "Certificate of Conformance (Mangiarotti)," Rev. 00

NCR 210029-011, "Non-Conformity Report," dated February 7, 2011

QR-13-2733, "Quality Release & Certificate of Conformance (Westinghouse)," Rev. 3

SS-2013-03-12-001, "AP1000 Accumulator Tank – Major Weld Repairs," dated April 17, 2013

W4-FDP-00-05-001, "Final Data Package," VC Summer Unit 2/ 1st Component AP1000

Accumulator Tank SN# 4581, Order No. 4500273230, Rev. 04

W4-PLG-00-05-001, "Part List for Job No. N017 – ACC SCANA V.C. Summer 2/1," Revision 06

W4-WB-00-00-001, "Welding List for AP1000 Accumulator Tank for Job Nos. N015-N017-N018," Rev. 8

W4-WLM-00-00-001, "AP1000 Accumulator Tank Weld Location Map," Rev. 0

Unit 2 Core Make-up Tank B (manufactured by Mangiarotti)

APP-MT01-Z0-100, "Design Specification for the AP1000 Core Makeup Tank for System PXS," Rev. 9

APP-MT01-Z0-200, "AP1000 Core Makeup Tank Fabrication Specification," Rev. 2

CMTR 1665, SA 508 GR.3 Cl.1, Heat No. 01355, dated May 7, 2011

CMTR No. S15355, SA 533 Type B Class 1, Heat Nos. 038796, 038797, 038798, and 038799, dated December 18, 2012

CMTR-N096002-02, SA508 Grade 3 Class 1, Heat 600006, dated October 27, 2010

Form N-1 Certificate Holder's Data Report for Nuclear Vessels* As Required by the Provisions of the ASME Code, Section III, Division 1 (Manufactured and certified by Westinghouse Electric Company, for South Carolina Electric & Gas) for Unit 2 Core Makeup Tank Serial No. 4600, dated September 10, 2015

Form N-2 Certificate Holder's Data Report for Identical Nuclear Parts and Appurtenances* As Required by the Provisions of the ASME Code, Section III (Manufactured and certified by Mangiarotti for Westinghouse Electric Company) for Unit 2 Core Makeup Tank Serial No. 4600, dated September 3, 2015

N022-CofC-08, "Certificate of Conformance (Mangiarotti)," Serial No. 4600, Revision 03

NCR 9800417170 head1_crown.NCR1 and head1+2.NCR1, "Non-Conformance/Corrective Action Report," Rev. 0 [use as is dimensional tolerance]

QR-16-402, "Quality Release & Certificate of Conformance (Westinghouse)," Rev. 0

W3-PLG-00-06-001, "Part List for Job No. N022 – CMT SCANA VC Summer 2/2," Rev. 06

W4-FDP-00-08-001, "Final Data Package," VC Summer Unit 2/ 2nd Component, AP1000 Core Make-Up Tank SN# 4600, Order No. 4500278115, Rev. 06

Section 1A06

VS2-PXS-PLW-01B, "Passive Core Cooling System Containment Building Room 11206 Containment Recirc Valves," Rev. 2

VS2-PXS-PLW-01C, "Passive Core Cooling System Containment Building Room 11206 Containment Recirc to DVI-A," Rev. 1

Section 1A07Unit 2 ACC A (SN 4581)

Welding monitoring sheet for unit 2 accumulator A welds: NZ-025, CW-015/1, LW-13/2

Welder Performance Qualification Test Records for welder Numbers: GM 97, GM 94, GM C16, GM D07, GM 34, GM C25,

Heat Treatment Reports: N017-TT-W4-PCF-10-05-001-31,

Ultrasonic Test Reports: N017-UT-W4-PCF-10-05-001-34, N017-UT-W4-PCF-10-05-001-23, N017-UT-W4-RNC1125, N017-UT-W4-PCF-10-05-003-36, N017-UT-W4-PCF-10-05-003-31, N017-UT-W4-PCF-10-05-001-35, N017-UT-W4-PCF-10-05-001-09-R1,

Liquid Penetrant Test Reports: N017-PT-W4-PCF-10-05-001-27, N017-PT-W4-PCF-10-05-003-28, N017-PT-W4-PCF-10-05-003-30, N017-PT-W4-PCF-10-05-003-28

Magnetic Particle Test Reports: N017-MT-W4-PCF-10-05-003-36, N017-MT-W4-PCF-10-05-003-30,

Radiographic Test Reports: N017-RT-W4-PCF-10-05-001-23, N017-RT-W4-PCF-10-05-003-31, N017-RT-W4-PCF-10-05-001-12,2

Unit 2 CMT B (SN 4600)

Welding monitoring sheet for unit 2 core makeup tank B welds: LW-013/1-1, CL-030, BT-031, CW-054, BT-053, CW-001/2, CW-040

Welder Performance Qualification Test Records for welder Numbers: GM B4, GM A3, GM D09, GM 20, GM 59, GM 32, GM 62, GM C05, GM 05, GM 3F, GM B4,

Heat Treatment Reports: N022-TT-W3-PCF-00-06-003-11, N022-TT-W3-PCF-10-06-002-52, N022-TT-W3-PCF-10-06-009-55,

Ultrasonic Test Reports: N022-UT-W3-PCF-10-06-009-57-03, N022-UT-W3-PCF-10-06-002-26, N022-UT-W3-PCF-10-06-002-55, N022-UT-W3-PCF-10-06-002-14, N022-UT-W3-PCF-10-06-002-67, N022-UT-W3-PCF-10-06-003-26,

Liquid Penetrant Test Reports: N022-PT-W3-PCF-10-06-002-22, N022-PT-W3-PCF-10-06-002-59, N022-PT-W3-PCF-10-06-002-59, N022-PT-W3-PCF-10-06-002-23,

Magnetic Particle Test Report N022-MT-W3-PCF-00-06-003-26, N022-MT-W3-PCF-00-06-004-37, N022-MT-W3-PCF-10-06-002-54, N022-MT-W3-PCF-00-06-004-37,

Radiographic Test Reports: N022-RT-W3-PCF-10-06-009.36, N022-RT-W3-PCF-10-06-002-65, N022-RT-W3-PCF-00-06-003-20, N022-RT-W3-PCF-00-06-002.22, N022-RT-NCR-2769-1, N022-RT-W3-PCF-10-08-001.14, N022-RT-W3-PCF-10-08-009.22

Section 1A08

VS2-PXS-PLW-01B, "Passive Core Cooling System Containment Building Room 11206 Containment Recirc Valves," Rev. 2

VS2-PXS-PLW-01C, "Passive Core Cooling System Containment Building Room 11206 Containment Recirc to DVI-A," Rev. 1

Weld Record VS2-PXS-PLW-01B-1, Rev. 0

Weld Record VS2-PXS-PLW-01C-2, Rev. 0

Welding Procedure Specification WPS1-8.8T01, Rev. 9

QC Inspection Procedures F-S562-001 Rev 05.02 and QAD 09.31 Rev. 03.03

Section 1A09

VS2-PXS-P0K-800000, "Verification for Unit 2 Passive Core Cooling System Containment Bldg Room 11305/11206 from IRWST to DVI-A," Rev. 0

VS2-PXS-P0K-800001, "Verification for Unit 2 Passive Core Cooling System Containment Bldg Room 11207 from IRWST to DVI-B," Rev. 0

Section 1A10

None

Section 1A11

APP-CE01-GEF-850060, "Wall 1 Vertical Reinforcing Section Cut Corrections," Rev. 0

Pour card 4639072017, dated 7/12/2017

QC Concrete Field Testing report C113-17-10089, dated 7/12/2017

QC Pre-placement Inspection Reports C112-17-11494 and C112-17-11941, dated 6/7/2017 and 6/14/2017

QC Embedment Plate Inspection Report C112-17-11592, dated 5/2/2017

Rebar Certified Materials Test Reports for Heat 5716241702, dated 1/19/2017 and 2/2/2017

Rebar Certified Materials Test Reports for Heat 5716098902, dated 11/14/2016 and 11/23/2016

VS2-1200-CR-950, "Auxiliary Building Areas 5 & 6 Concrete Reinforcement Wall 1 Elevation,"

Rev. 7

VS2-1230-CR-950, "Auxiliary Building Areas 5 & 6 Concrete Reinforcement Wall 1 Sections and Details EL 100'-0"," Rev. 3

VS2-1220-CR-950, "Auxiliary Building Areas 5 & 6 Concrete Reinforcement Wall 1 Sections and Details EL 82'-6"," Rev. 4

VS2-1230-CR-991, "Auxiliary Building Concrete Reinforcement Secondary Walls EL 100'-0" (Sheet 2)," Rev. 5

VS2-1236-CE-960, "Auxiliary Building Area 6 Embedments Wall 1 Elevation 100'-0" North View," Rev. 4

VS2-1236-CEX-960, "Auxiliary Building Area 6 Wall 1 Embedments Index EL 100'-0" North View," Rev. 3

VS2-1240-CR-950, "Auxiliary Building Areas 5 & 6 Concrete Reinforcement Wall 1 Sections and Details EL 117'-6"," Rev. 3

VS2-CE01-GNR-000231, "Indeterminate Quality of Stud Welds – VS2 – Shipped (12)," Rev. 0

VSG-CR01-GEF-000505, "Optional CJs on N, 1, and I line walls above Elevation 100'," Rev. 0

Section 1A12Westinghouse Material Specifications

APP-VL51-Z0-002, "Material Specification for SA-508/508M Grade 3 Class 2 Forgings (Section III-NB)," Rev. 4

APP-VL51-Z0-124, "Material Specification for SA-240 Type 304L (UNS S30403) Stainless Steel Plate," Rev. 1

APP-VL52-Z0-303, "Material Specification for SA-533 Type B Class 1 Carbon Steel Plate," Rev. 1

Unit 3 Accumulator B (manufactured by Mangiarotti)

APP-MT02-GEF-005, "Use of SA-508 Grade 3 Class 2 for AP1000 Accumulator Tanks," Rev. 0

APP-MT02-Z0-101, "Design Specification for the AP1000 Accumulator Tank for PXS," Rev. 9

CMTR No. 4805, SA 508 Grade 3 Class 2, Heat No. 01355, dated March 18, 2011

CMTR No. P8134, SA 533 Type B Class 1 and SA 240 Type 304L, Heat Nos. 707232 and 050592, dated October 7, 2010

CMTR-W4-PCF-10-07-R02, Heat SA-533 No. 707232, Heat SA-240 No. 050592 Rev. 0

COC 210029-19, "Certificate of Compliance," Sphere (2 crowns), SA 533 Type B Class 1 + SA 240 Type 304L, dated February 22, 2011

Form N-1 Certificate Holder's Data Report for Nuclear Vessels* As Required by the Provisions of the ASME Code, Section III, Division 1 (Manufactured and certified by Westinghouse

Electric Company, for South Carolina Electric & Gas) for Unit 3 Accumulator Tank Serial No. 4584, dated October 7, 2015

Form N-2 Certificate Holder's Data Report for Identical Nuclear Parts and Appurtenances* As Required by the Provisions of the ASME Code, Section III (Manufactured and certified by Mangiarotti for Westinghouse Electric Company) for Unit 3 Accumulator Tank Serial No. 4584, dated October 7, 2015

N017-CofC-11, "Certificate of Conformance (Mangiarotti)," Serial No. 4584, Rev. 02

N017-CofC-13, "Certificate of Conformance (Mangiarotti)," Rev. 00

QR-13-3791, "Quality Release & Certificate of Conformance (Westinghouse)," Rev. 2

SS-2013-10-07-001, "AP1000 Accumulator Tank – Major Weld Repairs," dated October 7, 2013

W4-FDP-00-08-001, "Final Data Package," VC Summer Unit 3/ 2nd Component AP1000 Accumulator Tank SN# 4584, Order No. 4500273230, Rev. 06

W4-PLG-00-08-001, "Part List for Job No. N017 – ACC SCANA VC Summer 3/2," Rev. 03

W4-WB-00-00-001, "Welding List for AP1000 Accumulator Tank for Job Nos. N015-N017-N018," Rev. 8

W4-WLM-00-00-001, "AP1000 Accumulator Tank Weld Location Map," Rev. 0

Unit 3 Core Make-up Tank B (manufactured by Mangiarotti)

APP-MT01-Z0-100, "Design Specification for the AP1000 Core Makeup Tank for System PXS," Rev. 9

APP-MT01-Z0-200, "AP1000 Core Makeup Tank Fabrication Specification," Rev. 2

CMTR No. 4275, SA508 GR.3 Cl.1, Heat No. 01344, dated May 10, 2011

CMTR No. 6908/11, SA508 GR.3 Cl.1, Heat No. 91980, dated May 29, 2013

CMTR No. 6909/11, SA336 F316LN, Heat No. 05280, dated May 14, 2013

CMTR No. S15359, SA -533 Type B Class 1, Heat Nos. 038811,038819, 038821, 038823, 038824, dated December 18, 2012

CMTR-N096005-02, SA508 Grade 3 Class 1, Heat 600014, dated April 20, 2010

Form N-1 Certificate Holder's Data Report for Nuclear Vessels* As Required by the Provisions of the ASME Code, Section III, Division 1 (Manufactured and certified by Westinghouse Electric Company, for South Carolina Electric & Gas) for Unit 3 Core Makeup Tank Serial No. 4602, dated October 7, 2015

Form N-2 Certificate Holder's Data Report for Identical Nuclear Parts and Appurtenances* As Required by the Provisions of the ASME Code, Section III (Manufactured and certified by Mangiarotti for Westinghouse Electric Company) for Unit 3 Core Makeup Tank Serial No. 4602, dated October 7, 2015

N022-CofC-06, "Certificate of Conformance (Mangiarotti)," Serial Nos. 4598, 4601, 4602, Rev. 00

N022-CofC-12, "Certificate of Conformance (Mangiarotti)," Serial Nos. 4601/4602, Rev. 00

N022-CofC-17, "Certificate of Conformance (Mangiarotti)," Serial No. 4601/4602, Rev. 00

N022-CofC-19, "Certificate of Conformance (Mangiarotti)," Serial No. 4602, Rev. 00

N022-CofC-22, "Certificate of Conformance (Mangiarotti)," Serial No. 4602, Rev. 00

QR-15-306, "Quality Release & Certificate of Conformance (Westinghouse)," CMT SN 4602, Rev. 0

W3-FDP-00-08-001, "Final Data Package," VC Summer Unit 3/ 2nd Component, AP1000 Core Make-Up Tank SN# 4602, Order No. 4500278115, Rev. 07

W3-PLG-00-08-001, "Part List for Job No. N022 – CMT SCANA VC Summer 3/2," Rev.. 05

Section 1A13Unit 3 ACC B (SN 4584)

Welding monitoring sheet for unit 3 accumulator B welds: BT-011, CL-007, NZ-036, CW-015/2, LW-013/6

Welder Performance Qualification Test Records for welder Numbers: GM 68, GM 76, GM C24, GM 51, GM 76,

Heat Treatment Reports: N017-TT-W4-PCF-10-08-003-25.1, N017.04-HTL,

Ultrasonic Test Reports: N017-UT-W4-PCF-10-08-002-38, N017-UT-W4-PCF-10-08-002-23, N017-UT-W4-PCF-10-08-002-22, N017-UT-W4-PCF-10-08-003-25.2, N017-UT-W4-PCF-10-08-003-09, N017-UT-W4-PCF-10-08-001-35

Liquid Penetrant Test Reports: N017-PT-W4-PCF-10-08-002-39,

Magnetic Particle Test Reports: N017-MT-W4-PCF-10-08-003-25.2,

Radiographic Test Reports: N017-RT-W4-PCF-10-08-002-15, N017-RT-W4-PCF-10-08-003-9, N017-RT-W4-PCF-10-08-001-12.2,

Ferrite Number Test Reports: LTR-11382

Unit 3 CMT B (SN 4602)

Welding monitoring sheet for unit 3 CMT welds: CW-050, CW-002/2, LW-014/1-1, CW-035, CW-001/1

Welder Performance Qualification Test Records for welder Numbers: GM E65, GM B14,

Ultrasonic Test Reports: N022-UT-W3-PCF-10-08-009-69, N022-UT-W3-PCF-10-08-002-54-01, N022-UT-W3-PCF-10-08-002-54, N022-UT-W3-PCF-10-08-001-37, N022-UT-W3-PCF-00-08-003-12, N022-UT-W3-PCF-00-08-003-06,

Liquid Penetrant Test Reports: N022-PT-W3-PCF-10-08-009-63, N022-PT-W3-PCF-10-08-009-69,

Magnetic Particle Test Reports: N022-MT-W3-PCF-10-08-002-54, N022-MT-W3-PCF-10-08-001-37, N022-MT-W3-PCF-00-08-003-12,

Radiographic Test Reports: N022-RT-NCR2555-1, N022-RT-NCR-2385-6, N022-RT-NCR-2429-6, N022-RT-W3-PCF-90-14-020-33, N022-RT-W3-PCF-10-08-009-69, N022-RT-W3-PCF-10-08-002-36,

NCRs: NCR-2385, NCR-1897

LIST OF ACRONYMS

10 CFR	Title 10 of the Code of Federal Regulations
ACC	Accumulator Tank
ADAMS	Agency Wide Documents Access & Management System
ANI	Authorized Nuclear Inspector
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
B&PV	Boiler and Pressure Vessel
CAPAL	Corrective Action, Prevention, and Learning
CES	Carolina Energy Services
CIS	Containment Internal Structures
CMT	Core Makeup Tank
CMTR	Certified Material Test Report
CofC	Certificates of Conformance
COL	Combined License
CR	Condition Report
DI	Discrete Issue
DVI	Direct Vessel Injection
FSAR	Final Safety Analysis Report
GTAW	Gas Tungsten Arc Welding
IMC	Inspection Manual Chapter
IP	Inspection Procedure
IQI	Image Quality Indicator
IR	Inspection Report
IRWST	In-containment Refueling Water Storage Tank
ITAAC	Inspections, Tests, Analyses, and Acceptance Criteria
NCRs	Nonconformance Reports
NCV	Non-cited Violation
NDE	Nondestructive Examination
NDT	Nondestructive Testing
NPF	Nuclear Power Facility
NRC	Nuclear Regulatory Commission
PARS	Publically Available Records
PQR	Procedure Qualification Record
PT	Penetrant Testing
PXS	Passive Core Cooling System
QA	Quality Assurance
QC	Quality Control
RCP	Reactor Coolant Pump
RCS	Reactor Coolant System
Rev.	Revision
RT	Radiographic Test
SCE&G	South Carolina Electric and Gas
SG	Steam Generator
SMAW	Shielded Metal Arc Welding
SSC	Structures, Systems, and Components
TBD	To Be Determined
UFSAR	Updated Final Safety Analysis Report

URI	Unresolved Item
UT	Ultrasonic Testing/Examination
VIO	Violation
WEC	Westinghouse Electric Company
WPS	Welding Procedure Specification

ITAAC INSPECTED

No.	ITAAC No.	Design Commitment	Inspections, Tests, Analysis	Acceptance Criteria
13	2.1.02.02a	2.a) The components identified in Table 2.1.2-1 as ASME Code Section III are designed and constructed in accordance with ASME Code Section III requirements.	Inspection will be conducted of the as-built components as documented in the ASME design reports.	The ASME Code Section III design reports exist for the as-built components identified in Table 2.1.2□1 as ASME Code Section III.
15	2.1.02.03a	3.a) Pressure boundary welds in components identified in Table 2.1.2□1 as ASME Code Section III meet ASME Code Section III requirements.	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.
159	2.2.03.02a	2.a) The components identified in Table 2.2.3-1 as ASME Code Section III are designed and constructed in accordance with ASME Code Section III requirements.	Inspection will be conducted of the as-built components as documented in the ASME design reports.	The ASME Code Section III design reports exist for the as□built components identified in Table 2.2.3□1 as ASME Code Section III.
161	2.2.03.03a	3.a) Pressure boundary welds in components identified in Table 2.2.3-1 as ASME Code Section III meet ASME Code Section III requirements.	Inspection of the as-built pressure boundary welds will be performed in accordance with the ASME Code Section III.	A report exists and concludes that the ASME Code Section III requirements are met for non-destructive examination of pressure boundary welds.
162	2.2.03.03b	3.b) Pressure boundary welds in piping identified in Table 2.2.3-2 as ASME Code Section III meet ASME Code Section III requirements.	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
183	2.2.03.08c.iv.01	8.c) The PXS provides RCS makeup, boration, and safety injection during design basis events.	iv) Inspections of the elevation of the following pipe lines will be conducted: 1. IRWST injection lines; IRWST connection to DVI nozzles	iv) The maximum elevation of the top inside surface of these lines is less than the elevation of: 1. IRWST bottom inside surface
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.
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.