



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

November 7, 2016

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

SUBJECT: VOGTLE ELECTRIC GENERATING PLANT UNITS 3 AND 4 – NRC  
INTEGRATED INSPECTION REPORTS 05200025/2016003,  
05200026/2016003

Dear Mr. Yox:

On September 30, 2016, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Vogtle Electric Generating Plant (VEGP) Units 3 and 4. The enclosed inspection report documents the inspection results, which the inspectors discussed on October 5, 2016 with Mr. Mark Rauckhorst, Vogtle 3&4 Executive Vice President Construction, and other members of your staff.

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

Based on the results of this inspection, no findings of significance were identified.

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

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

Sincerely,

**/RA/**

Jamie Heisserer, Chief  
Construction Inspection Branch 1  
Division of Construction Oversight

Docket Nos.: 5200025, 5200026

License Nos: NPF-91, NPF-92

Enclosure: NRC Inspection Report (IR) 05200025/2016003, 05200026/2016003  
w/attachment: Supplemental Information

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

Sincerely,

**/RA/**

Jamie Heisserer, Chief  
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w/attachment: Supplemental Information

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DATE	10/26/2016	10/25/2016	10/28/2016	11/01/2016	10/26/2016	11/01/2016	10/31/2016	10/28/2016	11/02/2016	11/02/2016	11/07/2016
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**U.S. NUCLEAR REGULATORY COMMISSION**  
**Region II**

Docket Numbers: 5200025  
5200026

License Numbers: NPF-91  
NPF-92

Report Numbers: 05200025/2016003  
05200026/2016003

Licensee: Southern Nuclear Operating Company, Inc.

Facility: Vogtle Electric Generating Plant Units 3 & 4

Location: Waynesboro, GA

Inspection Dates: July 1, 2016 through September 30, 2016

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P. Braxton, Resident Inspector, DCO  
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J. Christensen, Construction Inspector, DCO  
B. Davis, Senior Construction Inspector, DCO  
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Odunayo Ayegbusi, Reliability and Risk Analyst, NRO

Approved by: Jamie Heisserer, Branch Chief  
Construction Inspection Branch 1  
Division of Construction Oversight

Enclosure

## **SUMMARY OF FINDINGS**

Inspection Report (IR) 05200025/2016003, 05200026/2016003; 07/01/2016 through 09/30/2016; Vogtle Electric Generating Plant Unit 3, Vogtle Electric Generating Plant Unit 4, routine integrated inspection report.

This report covers a three month period of inspection by regional and resident inspectors, and announced Inspections, Tests, Analysis, and Inspection Criteria (ITAAC) inspections by regional inspectors. The NRC's program for overseeing the construction of commercial nuclear power reactors is described in Inspection Manual Chapter (IMC) 2506, "Construction Reactor Oversight Process General Guidance and Basis Document.

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

None

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

None



## REPORT DETAILS

### **Summary of Plant Construction Status**

During this reporting period in Unit 3, concrete was placed in course 04 of the shield building, and courses 05 and 06 were placed into the nuclear island. Installation for floors in the auxiliary building at elevation 82'6" resumed with some floors being placed. Onsite work began on pipe for the passive core cooling system (PXS) including receipt acceptance and limited welding work. Rebar work began on the east side of the shield building. Concrete was placed on east side inside containment up to 87'6" and rebar work began from 87'6" to 96'.

For Unit 4, concrete was placed under the containment vessel from elevation 82'6" to 90'6" (east)/96'. CA20, which makes up portions of areas 5 and 6 of the radiologically controlled auxiliary building was set into the Nuclear Island and additional interior walls were placed on the non-radiologically controlled auxiliary building. Submodules for CA03, which forms the west wall of the In-containment refueling water storage tank began to arrive onsite and were up-ended for assembly.

### **1. CONSTRUCTION REACTOR SAFETY**

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

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

##### **1A01 (Unit 3) ITAAC Number 2.2.01.02a (91) / Family 06F**

##### **a. Inspection Scope**

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

- 65001.11-02.01 - Purchase Orders
- 65001.11-02.07 - Offsite Fabrication of Assemblies
- 65001.F-02.02-Fabrication Records Review
- 65001.F-02.04-General QA Review

The inspectors reviewed fabrication records associated with the Unit 3 containment vessel, top head, plates C3-A15, C3-A30, C3-B8, C3-B17, and C3-C1 to verify that materials met the applicable requirements of the American Society of Mechanical Engineers (ASME) Code, Section III. Specifically, the inspectors reviewed receiving inspection reports, certified material test reports, and ultrasonic examination reports to verify the materials' chemical composition, mechanical properties, and fabrication requirements were met. For plates received as fabricated assemblies, the inspectors

reviewed N-2 data reports to verify that the assemblies were fabricated in accordance with the design specifications and ASME Code requirements.

b. Findings

No findings were identified.

1A02 (Unit 3) ITAAC Number 2.2.01.03a (93) / Family 06B

a. Inspection Scope

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

- 65001.11-02.03 - Installation and Welding
- 65001.11-02.05 - Nondestructive Examination
- 65001.B-02.01-Program and Procedures Review
- 65001.B-02.02-Welding Procedure Qualification
- 65001.B-02.03-Welder Qualification
- 65001.B-02.04-Production Controls
- 65001.B-02.05-Inspection
- 65001.B-02.06-Records
- 65001.F-02.02-Fabrication Records Review
- 65001.F-02.03-Observation of Fabrication Activities
- 65001.F-02.04-General QA Review

The inspectors observed welding activities and reviewed fabrication records associated with pressure boundary welds of the Unit 3 containment vessel, top head to verify that pressure boundary welds were performed in accordance with ASME Code, Section III. The inspectors observed in-process welding of one longitudinal weld (U3-TH4-B8/B9), reviewed welding and inspection records for two longitudinal welds (U3-TH4-A14/A15 and U3-TH4-A29/A30), and performed an independent inspection of a sample of radiographic film for one weld (U3-TH4-A29/A30).

The inspectors reviewed weld records for longitudinal welds U3-TH4-A14/A15 and U3-TH4-A29/A30 to determine whether:

- the welding activity was properly documented in the weld traveler;
- records provided adequate traceability to all aspects of the welding activity, including traceability to the welder or welding operator who performed the work;
- the records adequately documented reference to procedure and welder qualifications, inspector qualifications, weld material certifications and receipt inspection reports, weld data or process records (travelers), weld maps, weld inspection records, Nondestructive Examination (NDE) records;
- the records were appropriately retained and stored in accordance with Quality Assurance (QA) program requirement;

- required inspections were identified in the traveler with hold points, as appropriate; and
- accepted, rejected, and repaired items were documented in written reports.

The inspectors observed in-process submerged arc welding of weld seam U3-TH4-B8/B9 to ensure the following:

- work was conducted in accordance with a "traveler," weld data record or similar document which coordinated and sequenced the welding and inspection operations;
- the welding procedure used was the latest revision and appropriate for the work performed;
- the weld joint was sufficiently protected from inclement conditions;
- minimum preheat and maximum interpass temperature met the requirements of the welding procedure specification (WPS);
- surfaces to be welded were smooth, uniform, and free from surface discontinuities such as cracks or seams, and free from paint, oil, rust, scale, slag, grease, moisture or other harmful foreign materials that could be detrimental to welding for at least 2 inches from the weld joint;
- the filler metal type and size was in compliance with the WPS;
- the weld joint was traceable to the welders; and
- welding machine variables were correctly set.

The inspectors reviewed three WPSs to verify they were available, up to date, accurate, and in conformance with the ASME Code requirements, specifying all applicable essential, nonessential, and supplementary essential variables. The inspectors reviewed the supporting nine procedure qualification records (PQRs) to verify the specific ranges of welding variables listed in the WPSs were appropriately qualified and the type and number of qualification tests required received acceptable results. The inspectors reviewed 11 welder or welding operator performance qualification records to determine whether the welders or welding operators were assigned a unique identification number and demonstrated their skill by performing specific performance qualification tests, the qualification testing conditions and qualification limits were fully documented, and the appropriate number of acceptable test results was achieved.

The inspectors reviewed two certified material test reports (CMTRs) for filler metal to verify traceability between welds and conformance with the applicable Code specifications and WPSs. The inspectors reviewed these reports to ensure the materials' chemical composition, mechanical properties, fracture toughness requirements, and fabrication requirements were met.

The inspectors performed an independent inspection of a sample of radiographic film taken during the radiographic (RT) examination of weld U3-TH4-A29/A30 to verify that the radiography met the requirements of ASME Section III Code. The inspectors reviewed the film to determine whether indications shown on the radiographs of welds were characterized in accordance with applicable Code sections; the image quality indicators were properly certified, selected, and placed; film quality and density met applicable Code requirements; and measuring and test equipment was properly calibrated.

b. Findings

No findings were identified.

1A03 (Unit 3) ITAAC Number 2.2.01.04a.ii (96) / Family 06Fa. Inspection Scope

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

- 65001.F-02.02-Fabrication Records Review
- 65001.F-02.03-Observation of Fabrication Activities
- 65001.F-02.04-General QA Review

The inspectors reviewed fabrication records associated with pressure boundary materials of the Unit 3 containment vessel top head to verify that the fracture toughness requirements were in accordance with ASME Code, Section III. The inspectors reviewed CMTRs for plates (C3-A15, C3-A30, C3-B8, C3-B17, and C3-C1) and weld filler metal used for the longitudinal welds of plates (C3-A29 to C3-A30 and C3-A14 to C3-A15) to verify the materials met applicable Charpy V-notch impact testing requirements. For plates received as fabricated assemblies, the inspectors reviewed N-2 data reports to verify that the assemblies were fabricated in accordance with the design specifications and ASME Code requirements.

b. Findings

No findings were identified.

1A04 (Unit 3) ITAAC Number 2.2.03.02b (160) / Family 03Fa. Inspection Scope

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

- 65001.03-02.01 - Purchase and Receipt of Materials
- 65001.03-02.02 - Storage and Handling
- 65001.F-02.02-Fabrication Records Review

The inspectors reviewed fabrication records and performed a visual inspection of the following PXS pipe lines that are presently stored at the Vogtle site:

- SV3-PXS-PLW-019-1; Line SV3-PXS-PL-L021A, 8" DVI A Header from CMT A Injection Header to Reactor Vessel (ASME Class 1, schedule 160 ASME SA-312 Grade TP316LN, seamless); and

- SV3-PXS-PLW-026-1; Line SV3-PXS-PL-L021B, 8" DVI B Header from CMT B Injection Header to Reactor Vessel (ASME Class 1, schedule 160 ASME SA-312 Grade TP316LN, seamless).

The inspectors reviewed the manufacturing records for the pipes listed above to determine whether the selected materials conformed to the design requirements specified by the relevant purchase order. The inspectors reviewed the contractor's receipt inspection reports to determine whether the inspection was performed according to Quality Control (QC) Inspection Plan F-Q445-008, "Receipt Inspection: CB&I Procured ASME III Items."

On July 1, 2016, the inspectors performed a walk down of the Level D storage area where the Vogtle Unit 3 Direct Vessel Inspection (DVI) Lines (L021A and L021B) were stored to determine conformance with ASME NQA-1-1994, 10 CFR Part 50, Appendix B, and applicable project procedures and specifications. Specifically the inspectors verified the following:

- the storage area met the requirements of Level D storage;
- there was no evidence of mechanical damage or corrosion to the pipe's outside surface;
- the as-built pipe length and diameter matched the supplier's records;
- the markings matched the documentation supplied by the manufacturer and were in accordance with ASME Section III, 1998 Edition through 2000 addenda; and
- the pipe ends were sealed with caps and were not stored on the ground.

The inspectors performed a direct inspection of these two piping lines to verify that the pipes were traceable to the supplier's records, markings on the pipe were clear and legible, the pipe was clean and there was no evidence of damage such corrosion, deep scratches or gouges. The inspectors verified that the pipe ends were properly sealed and the pipes were not stored in direct contact with the ground.

The inspectors reviewed the WECTEC Certificates of Compliance for both spool pieces to verify that they were signed by the supplier, source inspector, and authorized nuclear inspector.

The inspectors reviewed the procurement and fabrication records to verify the following:

- the purchase order appropriately specified the applicable quality and technical requirements and 10 CFR Part 21;
- that the fabrication records were adequate to furnish evidence of activities affecting quality and evidence that the pipes conformed with the applicable codes, standards, regulations, and quality and technical requirements; and
- the certified material test reports were traceable to materials used during fabrication and the materials conformed with the specified material specifications for chemical and mechanical properties.

Specifically, the inspectors reviewed the following documentation for SV3-PXS-PLW-019-1 and SV3-PXS-PLW-026-1:

- As-built shop sketch
- Shop Traveler including weld data and Visual Testing (VT) report
- Manufacturer's Certificate of Compliance

- NDE reports
- QC bend report
- Heat treatment records
- Nonconformance reports
- Passivation report.

The inspectors reviewed the quality control bending reports for SV3-PXS-PLW-019-1 and SV3-PXS-PLW-026-1 to verify that the supplier measured the wall thicknesses before and after bending in the proper locations and that the post bend minimum wall thickness was in accordance with SV3-PL02-Z0-001, "Piping Class Sheets and Standard Details," Rev. 5.

The inspectors reviewed supplier nonconformance report number NCR-2016-23 to determine whether the nonconforming condition was in accordance with applicable codes, standards, regulations, and quality and technical requirements.

The inspectors reviewed the certified material test reports for the SA312 Grade TP316LN, 8" schedule 160 ASME Class 1 pipe (Heat Number 06971 for L021A and L021B) to determine whether the material conformed with SA-312, "Specification for Seamless and Welded Austenitic Stainless Steel Pipes."

The inspectors reviewed the hydrostatic test report for both spool pieces to verify conformance with APP-GW-P0-007, SA-312, and SA-530.

b. Findings

No findings were identified.

1A05 (Unit 3) ITAAC Number 2.2.03.02b (160) / Family 03F

a. Inspection Scope

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

- 65001.03-02.01 - Purchase and Receipt of Materials
- 65001.03-02.03 - Installation and Welding
- 65001.03-02.05 - Pressure Testing
- 65001.03-02.06 - Nondestructive Examination (NDE)
- 65001.03-02.07 - Review of Records
- 65001.F-02.02-Fabrication Records Review

The inspectors observed welding activities and reviewed welding records associated with PXS piping to verify applicable codes, standards, specifications, and procedure requirements were met. Specifically, the inspectors performed the following tasks

related to a pipe support welded to the DVI line B from the in-containment refueling water storage tank (IRWST):

- observed in-process welding;
- observed visual inspection;
- observed liquid penetrant examination;
- reviewed associated CMTRs;
- reviewed engineering & design coordination reports (E&DCRs);
- reviewed weld data records;
- reviewed WPSs with supporting PQRs;
- reviewed personnel qualification records; and
- reviewed NDE reports.

The inspectors observed in-process welding of weld number SV3-PXS-PLW-029-171 to verify that a sample of welding variables were within the ranges allowed by the WPS and ASME Code, specifically amperage, voltage, and travel speed. The inspectors also witnessed visual inspection by the welder, field engineer, and QC inspector to verify proper hold points were signed off and the inspectors followed the applicable inspection plan, F-S562-005, "Pipe Welding / Braze; ASME Section III Visual Pipe Weld Inspection," revision 2. The inspectors independently visually inspected the weld to verify the surface and size of the weld met the ASME Code and applicable design drawings. The inspectors also observed the liquid penetrant examination to verify:

- penetrant, developer, and cleaning products were adequate;
- appropriate dwell times were met;
- the test temperature was within the required range;
- there were no recordable defects on the surface of the weld; and
- the examiner followed procedure 100-PT-301, "Liquid Penetrant Examination in Accordance with ASME Section V, Article 6," revision 12.

The inspectors observed measuring and test equipment (M&TE), specifically multimeters and thermometers (V-2Z-0030, V-AP-0052, and E4092015620), to verify they were properly calibrated and traceable. The inspectors reviewed qualifications of the welders, QC personnel, and NDE personnel to verify personnel were uniquely identified and qualifications were completed and maintained in accordance with applicable industry codes and standards. The inspectors also observed licensee oversight of the same welding activities, M&TE verifications, and personnel qualification assurance to determine whether the licensee implemented adequate oversight over their programs and processes.

The inspectors reviewed the various records stated above to verify:

- the base material and weld filler metal were adequately certified as demonstrated by Certificates of Compliance and CMTRs that recorded acceptable results for chemistry, mechanical, and impact properties;
- receipt inspection of the material was conducted in accordance with applicable procedures, traceability was maintained, and inspection reports recorded satisfactory results;
- E&DCRs were appropriately created, justified, approved, and incorporated into impacted design drawings or other affected documents;

- work was conducted in accordance with weld data sheets that (1) properly referenced the applicable WPSs, drawings, and work package, (2) provided adequate hold points for QC signatures, and (3) provided traceability between welding material heat numbers, welders, M&TE, NDE reports, and QC inspections for each weld;
- welding material requisitions (WMRs) from the associated work package selected the correct WPS, base material, filler material, and joint type;
- WPSs were available, up to date, accurate, and in conformance with code requirements;
- supporting PQRs appropriately qualified the specific ranges of welding variables listed in the WPS, and the type and number of qualification tests required received acceptable results; and
- NDE reports for liquid penetrant examination and vacuum box leak testing showed proper review and acceptable results.

b. Findings

No findings were identified.

1A06 (Unit 3) ITAAC Number 2.2.03.03b (162) / Family 03B

a. 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:

- 65001.03-02.01 - Purchase and Receipt of Materials
- 65001.03-02.03 - Installation and Welding
- 65001.03-02.06 - Nondestructive Examination (NDE)
- 65001.03-02.07 - Review of Records
- 65001.03-02.08 - Problem Identification and Resolution
- 65001.B-02.01-Program and Procedures Review
- 65001.B-02.02-Welding Procedure Qualification
- 65001.B-02.03-Welder Qualification
- 65001.B-02.04-Production Controls
- 65001.B-02.05-Inspection
- 65001.B-02.06-Records
- 65001.F-02.02-Fabrication Records Review
- 65001.F-02.03-Observation of Fabrication Activities
- 65001.F-02.04-General QA Review

The inspectors reviewed welding and inspection records of two butt welds associated with the welding of the Vogtle Unit 3 PXS pipe line L112B (IRWST injection line B to DVI line B). The inspectors reviewed the completed weld records associated with



work package SV3-PXS-P0W-ME3240 for the following welds: SV3-PXS-PLW-029-1, SV3-PXS-PLW-029-2, and SV3-PXS-PLW-029-2-RW1.

The inspectors reviewed weld records to determine whether:

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

The inspectors reviewed the RT examination records for the welds listed above to determine whether the required examinations were performed in accordance with the MISTRAS procedure 100-RT-302, ASME Section III, Subsection NC, and ASME Section V, Article 2. Additionally, the inspectors performed an independent inspection of the radiograph to determine whether indications shown on the radiographs of welds were characterized and documented in accordance with ASME Section III, Subsection NC, and ASME Section V, Article 2. For the welds listed above, the inspectors reviewed RT Level II and Level III NDE qualifications to verify personnel were qualified to the applicable processes and procedures.

The inspectors reviewed a sample of CMTRs and WMRs for the weld filler material to determine conformance with ASME Section II, Part C, SFA 5.9 for Type ER308L, the applicable weld filler material procurement specification, and the applicable WPS.

The inspectors reviewed the WPS and associated PQRs for the welds listed above to determine if the WPS met the requirements of ASME Section IX, the supporting PQRs appropriately qualified the specific ranges of welding variables listed in the WPS, and the type and number of qualification tests required received acceptable results. The inspectors also reviewed a sample of welder qualifications to verify personnel were qualified to the applicable process, material, and position.

The inspectors reviewed a corrective action report (CAR) related to work package SV3-PXS-P0W-ME3240. The inspectors reviewed this report to determine if the actions taken were appropriate for the situation and that the CAR received the appropriate amount of review.

b. Findings

No findings were identified.

1A07 (Unit 3) ITAAC Number 3.3.00.02a.i.a (760) / Family 01F

a. Inspection Scope

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

- 65001.01-02.05 - Steel Structures
- 65001.B-02.04-Production Controls

On July 7, 2016 the inspectors observed the in-process welding of an overlay plate (SRR-15-01569; A4-038) to the Vogtle Unit 3 CA01 module (Weld Number CV6238-38) to determine if the welding was performed within the ranges allowed by the WPS and the requirements of American Welding Society (AWS) D1.1:2000. At the welding lead, the inspectors made an independent measurement of the welding current and voltage to verify that the welder was welding within the ranges allowed by WPS2-1.1S02.

Additionally, the inspectors verified the following:

- work was conducted in accordance with a "traveler," weld data record or similar document which coordinated and sequenced the welding and inspection operations;
- the welding procedure used was the latest revision;
- the weld joint was sufficiently protected from inclement conditions;
- surfaces to be welded were smooth, uniform, and free from surface discontinuities such as cracks or seams, and free from paint, oil, rust, scale, slag, grease, moisture or other harmful foreign materials that could be detrimental to welding for at least 2 inches from the weld joint;
- the temperature of the base material at the joint, prior to welding, met the preheat requirements of the WPS;
- the welder had in his possession the correct size and classification of filler material that was indicated on the welding material requisition form;
- the interpass temperatures did not exceed the maximum value specified in the WPS; and
- the weld joint was traceable to the welders.

b. Findings

No findings were identified.

1A08 (Unit 3) ITAAC Number 3.3.00.02a.i.b (761) / Family 01F

a. Inspection Scope

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

- 65001.01-02.05 - Steel Structures

- 65001.A.02.03 - Independent Assessment/Measurement Inspection
- 65001.A.02.04 - Review As-built Deviations/Nonconformance
- 65001.B-02.06-Records
- 65001.F-02.02-Fabrication Records Review

For two Vogtle Unit 3 shield building steel composite modules (SV3-1208-SC-01E and SV3-1208-SC-01D) the inspectors observed the contractor's receipt inspection activities, reviewed manufacturing and inspection records, reviewed a sample of certified material test reports, reviewed a sample of weld travelers, and performed independent visual inspections and measurements of the modules to determine whether the applicable quality and technical requirements specified in the purchase order had been satisfied. Specifically, the inspectors verified that welding and nondestructive testing was performed according to AWS D1.1:2000 and American Institute of Steel Construction (AISC) N-690-1994 requirements.

On June 23, 2016, the inspectors observed contractor QC personnel perform the receipt inspection of Vogtle Unit 3 Shield Building panels 01D and 01E to determine whether the receipt inspection was performed according to QC inspection plan F-Q445-004, Quality Standard (QS) 07.01, and Nuclear Quality Assurance Directive (QAD) 07.14. The inspectors also performed an independent visual inspection of the modules at this time to determine the following:

- the modules were stored in the appropriate storage level area, and this area met the applicable requirements of ASME NQA-1-1994;
- the modules' markings were legible and matched the procurement documents;
- protective covers and caps were in place to protect threaded connections; and
- the modules were not damaged from shipping and met the shipping and cleanliness requirements specified by SV3-1208-Z0-001, "Specification for the Fabrication and Field Erection of the SC Panels for the AP1000 Shield Building";

The inspectors noted that the physical properties, dimensions, weld preparations, and general workmanship were inspected by the contractor at the supplier's facility prior to arrival at the Vogtle site. The inspectors reviewed the contractor's source inspection reports, certificates of conformance, and supplier documentation packages to determine whether the modules were in compliance with the applicable quality and technical requirements specified in the purchase order.

The inspectors made independent measurements of a sample of module dimensions that were specified by design drawings such as base metal thickness, shield building wall thickness, module length, tie bar spacing and bolt hole spacing.

Prior to installation in the nuclear island, the inspectors performed independent visual inspections and measurements of the welds to determine whether they met the design drawings, including type, size, and location. Additionally, the inspectors performed independent inspection of the welds to verify they met visual inspection acceptance criteria for the applicable design and fabrication codes, including cracks, lack of fusion, undercut, porosity, weld size, and other visual defects. The inspectors reviewed a sample of weld records provided by the fabricator to determine whether:

- records provided adequate traceability to all aspects of the welding activities, including traceability to the welder who performed the work;
- the records adequately documented weld material certifications, weld data or process records, weld inspection records, and nondestructive examination records;
- required inspections were identified with hold points as required by the design codes; and
- accepted, rejected, and repaired items were documented.

Moreover, the inspectors made independent measurements of a sample of module dimensions that were specified by design drawings such as base metal thickness, shield building wall thickness, module length, tie bar spacing, and bolt hole spacing.

The inspectors reviewed a sample of documents (nonconformance and disposition reports [N&Ds]) that were used to identify differences between the as-designed and as-built shield building panels to determine if:

- the difference, if not corrected to comply with the as-designed conditions, was properly documented and incorporated in the final as-built drawings;
- the difference, if corrected to comply with the as-designed configuration, was completed and accepted by qualified personnel;
- the condition was properly documented and evaluated against the current licensing basis; and
- any differences between documents used for construction and the corresponding document used for a design analysis were appropriately reconciled with the design report by the person or organization responsible for the design.

The inspectors reviewed a sample of the shield building steel composite shop drawings to determine whether the shape, size, dimensions, type, and grade of material conformed to the approved specifications and design drawings that were included in purchase order number P-D100.SB003 (Purchase Order Line Item 1). The inspectors reviewed a sample of certified material test reports to determine whether the actual material used to fabricate panels 01D and 01E were compliant with the American Society of Testing Materials (ASTM) specifications and SV3-VL52-Z0-572, "Material Specification for ASTM A572 Grade 50 for SC Shield Building," Rev. 0. The inspectors performed a direct inspection of a sample of the materials used to fabricate panels 01D and 01E to verify that markings on the material matched the fabrication records and CMTRs. The inspectors verified that the material was protected from corrosion as specified by specification SV3-1208-Z0-001.

During the review of a sample of welding and nondestructive testing records for panels 01D and 01E the inspectors verified that the identification of welds and welders was maintained for each weld and nondestructive examination methods and acceptance criteria were appropriately specified and that the visual, surface, and volumetric examination sampling requirements were specified and had been met for a sample of welds.

#### b. Findings

No findings were identified.

1A09 (Unit 3) ITAAC Number 3.3.00.02a.i.b (761) / Family 01F

a. Inspection Scope

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

- 65001.01-02.05 - Steel Structures
- 65001.B-02.05-Inspection
- 65001.B-02.06-Records

The inspectors reviewed E&DCR number SV0-1208-GEF-000026, "Shield Building NDE Allowance," which was associated with the nondestructive testing of the Vogtle 3 and 4 Shield Building steel composite wall. The inspectors reviewed this E&DCR to determine whether the change received the proper level of engineering review and was incorporated into all affected documents. The inspectors also verified that this design change was performed in accordance with Domestic AP1000 Project Procedure (DAPP) 5-14, "AP1000 Engineering and Design Coordination Report."

The inspectors evaluated this design change for conformance to 10 CFR Part 50, Appendix B, Criterion III, "Design Control," and Supplement 3S-1, "Supplementary Requirements for Design Control," of ASME NQA-1-1994. The inspectors reviewed the licensing impact determination screening associated with this design change to determine whether the change was properly evaluated against the current licensing basis as described in the Vogtle Unit 3 and Unit 4 updated final safety analysis report (UFSAR) and was performed in accordance with procedure DAPP 5-18, "AP1000 Licensing Basis Reviews." Furthermore, the inspectors reviewed this design change to determine whether the change received the proper level of engineering review and was incorporated into all affected documents.

b. Findings

No findings were identified.

1A10 (Unit 3) ITAAC Number 3.3.00.02a.i.b (761) / Family 01F

a. Inspection Scope

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

- 65001.01-02.07 - Identification and Resolution of Problem

- 65001.02-02.01 - Inspection of Concrete Placement
- 65001.02-02.03 - Special Considerations
- 65001.02-02.07 - Problem Identification and Resolution
- 65001.A.02.04 - Review As-built Deviations/Nonconformance

The inspectors reviewed quality records and performed direct inspection of construction activities associated with the Shield Building for Vogtle Unit 3. Specifically, the inspectors observed construction activities associated with steel composite panels along the west side between elevations 123'-6" and 131'-6".

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

- concrete was batched in accordance the specified mix design;
- specifications, procedures, codes, and design requirements were followed;
- each truck was measured and each trip received proper ticketing and documentation;
- batch records were generated, controlled, and indicated placement location, mix, volume, date, time, and special instructions;
- transporting equipment was suitable, reliable, and in an acceptable condition;
- the time limit between mixing and placement was not been exceeded;
- temperature limits were not exceeded;
- test results were being utilized at the batch plant to adjust mix proportions, as allowed by the procedures and specifications, to optimize concrete mix characteristics for the placement; and
- remixing in the truck after required water additions conformed to the appropriate standards, including the amount of water allowed as called out in the concrete mix design specifications.

The inspectors reviewed the concrete placement plan included in the work package to determine whether pre-placement planning had been completed, including appropriate considerations for hot weather and mass concrete. The inspectors observed concrete placement activities to determine whether:

- accepted procedures and specifications were followed throughout the concrete placement;
- the equipment used was suitable and sized for the work;
- each batch ticket was reviewed for verification of proper mix, transport time, placement location, and amount of temper water being added at the truck delivery point;
- placement drop distances did not exceed specification requirements and did not result in segregation;
- vibrators were approved and calibrated;
- vibrators were handled and operated to ensure adequate consolidation and avoid voiding or honeycombing, including vertical operation and penetration through the new concrete into the previously placed layer;
- concrete was placed in lifts in accordance with the concrete placement plan;
- inspection during placement was performed as required; and
- records were produced, reviewed, and indicated mix, location, time placed, water additions, temperature of the concrete mix, and ambient conditions.

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

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

The inspectors reviewed test results from in-process testing to determine whether:

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

The inspectors reviewed a sample of design changes and nonconformances included in the work package to verify:

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

b. Findings

No findings were identified.

1A11 (Unit 3) ITAAC Number 3.7.00.01 (841) / Family 16F

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 3.7.00.01 (841). The inspectors used the following NRC IPs/sections to perform this inspection:

- 65001.16-02.01 - Design Procedures
- 65001.16-02.02 - Design Input
- 65001.16-02.03 - Design Documents
- 65001.16-02.04 - Design Analysis
- 65001.F-02.01-Design Document Review
- 65001.F-02.04-General QA Review

The inspection team reviewed the principal closure document for the Design Reliability Assurance Program (D-RAP) ITAAC to confirm that all components from the AP1000 Design Control Document, Tier 1, Table 3.7–1 had been included in its scope. To maximize the extent of the review, the team designed a stratified sample of documents. Procurement documents and installation drawings relevant to various disciplines were selected. Both safety-related and non-safety related SSC's were selected, based in part on risk importance measures.

For each of the components in the sample, the staff reviewed the design documents to confirm that the appropriate programs had been used in their preparation. The inspectors reviewed the signatures of the design documents and installation drawings to verify that they were made by qualified personnel. The inspectors also reviewed the qualification process to verify that each person was adequately qualified to sign the documents.

The team also examined procedures used for design review, design document verification, document control, and qualification of personnel to verify thoroughness and completion. The inspectors selected a sample of design disciplines and reviewed specific competencies required for qualification to verify that the personnel were adequate to be signing the documents.

b. Findings

No findings were identified.

1A12 (Unit 4) ITAAC Number 2.2.01.02a (91) / Family 06F

a. Inspection Scope

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

- 65001.11-02.01 - Purchase Orders
- 65001.F-02.02-Fabrication Records Review
- 65001.F-02.04-General QA Review

The inspectors reviewed fabrication records associated with the Unit 4 containment vessel, upper ring, plates B4-C47, B4-D25, B4-D29, B4-E15, and B4-E20 to verify that materials met the applicable requirements of the ASME Code, Section III. Specifically, the inspectors reviewed receipt inspection reports, certified material test reports, and ultrasonic examination reports to verify the materials' chemical composition, mechanical properties, and fabrication requirements were met.

b. Findings



No findings were identified.

1A13 (Unit 4) ITAAC Number 2.2.01.03a (93) / Family 06B

a. Inspection Scope

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

- 65001.11-02.03 - Installation and Welding
- 65001.11-02.05 - Nondestructive Examination
- 65001.B-02.01-Program and Procedures Review
- 65001.B-02.02-Welding Procedure Qualification
- 65001.B-02.03-Welder Qualification
- 65001.B-02.04-Production Controls
- 65001.B-02.05-Inspection
- 65001.B-02.06-Records
- 65001.F-02.02-Fabrication Records Review
- 65001.F-02.03-Observation of Fabrication Activities
- 65001.F-02.04-General QA Review

The inspectors observed welding activities and reviewed fabrication records associated with pressure boundary welds of the Unit 4 containment vessel, upper ring to verify that pressure boundary welds were performed in accordance with ASME Code, Section III. The inspectors observed in-process welding and reviewed welding and inspection records of one circumferential weld (course S9 to course S10), reviewed welding and inspection records for two longitudinal welds (U4-S9-E15/E16 and U4-S10-C46/C47), and performed an independent inspection of a sample of radiographic film for two welds (U4-S9-E15/E16 and U4-S10-C46/C47).

The inspectors reviewed weld records for circumferential weld U4-S9/S10 and longitudinal welds U4-S9-E15/E16 and U4-S10-C46/C47 to determine whether:

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

The inspectors observed in-process submerged arc welding of weld seam U4-S9/S10 to ensure the following:

- work was conducted in accordance with a "traveler," weld data record or similar document which coordinated and sequenced the welding and inspection operations;
- the welding procedure used was the latest revision and appropriate for the work performed;
- the weld joint was sufficiently protected from inclement conditions;
- minimum preheat and maximum interpass temperature met the requirements of the WPS;
- surfaces to be welded were smooth, uniform, and free from surface discontinuities such as cracks or seams, and free from paint, oil, rust, scale, slag, grease, moisture or other harmful foreign materials that could be detrimental to welding for at least 2 inches from the weld joint;
- the filler metal type and size was in compliance with the WPS;
- the weld joint was traceable to the welders; and
- welding machine variables were correctly set.

The inspectors reviewed three WPSs to verify they were available, up to date, accurate, and in conformance with the ASME Code requirements, specifying all applicable essential, nonessential, and supplementary essential variables. The inspectors reviewed the supporting nine PQRs to verify the specific ranges of welding variables listed in the WPSs were appropriately qualified and the type and number of qualification tests required received acceptable results. The inspectors reviewed 15 welder or welding operator performance qualification records to determine whether the welders or welding operators were assigned a unique identification number and demonstrated their skill by performing specific performance qualification tests, the qualification testing conditions and qualification limits were fully documented, and the appropriate number of acceptable test results was achieved.

The inspectors reviewed four CMTRs for filler metal to verify traceability between welds and conformance with the applicable Code specifications and WPSs. The inspectors reviewed these reports to ensure the materials' chemical composition, mechanical properties, fracture toughness requirements, and fabrication requirements were met.

The inspectors reviewed RT examination reports welds U4-S9-E15/E16 and U4-S10-C46/C47 to determine whether the required examinations were performed in accordance with ASME Code, Section III. The inspectors performed an independent inspection of a sample of radiographic film taken during the RT examination of welds U4-S9-E15/E16 and U4-S10-C46/C47 to verify that the radiography met the requirements of ASME Code, Section III. The inspectors reviewed the film to determine whether indications shown on the radiographs of welds were characterized in accordance with applicable Code sections; the image quality indicators were properly certified, selected, and placed; film quality and density met applicable Code requirements; and measuring and test equipment was properly calibrated.

b. Findings

No findings were identified.

1A14 (Unit 4) ITAAC Number 2.2.01.04a.ii (96) / Family 06F

a. Inspection Scope

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

- 65001.F-02.02-Fabrication Records Review
- 65001.F-02.04-General QA Review

The inspectors reviewed fabrication records associated with pressure boundary materials of the Unit 4 containment vessel, upper ring to verify that the fracture toughness requirements were met in accordance with ASME Section III Code. The inspectors reviewed CMTRs for plates (B4-C47, B4-D25, B4-D29, B4-E15, and B4-E20), weld filler metal used for the longitudinal welds of plates (B4-C46 to B4-C47 and B4-E15 to B4-E16), and a sample of weld filler metal used in one circumferential weld (course S9 to course S10). The CMTRs were reviewed to verify the materials met applicable Charpy V-notch impact testing requirements.

b. Findings

No findings were identified.

1A15 (Unit 4) ITAAC Number 2.2.02.07b.iii (140) / Family 06F

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 2.2.02.07b.iii (140). The inspectors used the following NRC IPs/sections to perform this inspection:

- 65001.06 - Inspection of ITAAC-Related Installation of Mechanical Components
- 65001.F-02.01-Design Document Review
- 65001.F-02.02-Fabrication Records Review
- 65001.F-02.03-Observation of Fabrication Activities
- 65001.F-02.04-General QA Review

The inspectors observed in-process coating activities being performed on the interior of the containment vessel seven feet above the operating deck and higher (Panels B4-E11, B4-C23, B4-C26, B4-D14, B4-D23, and B4-E1). The inspectors reviewed Westinghouse Design Specification APP-GW-Z0-604, "Design Specifications for the

Application of Protective Coatings to Systems, Structures, and Components for the AP1000 Reactor Plant for All Systems", revision 8 and 9 as guidance for the inspection and to determine whether the procedures met the requirements of the UFSAR, the design specification, industry standards, and manufacturer's recommendations.

Specifically, the inspectors reviewed the Westinghouse Design Specification to verify that the coatings applied to the internal portions of the containment vessel were properly classified as inorganic zinc Service Level I coatings as described in the UFSAR. The inspectors also verified that these coatings were classified as safety-related coatings as required to be procured under 10 CFR Part 50, Appendix B.

The inspectors walked down the storage area of the coating and abrasive medium to determine whether the procedural requirements and manufacturer's recommendations for storage were being followed. Specifically, the inspectors observed the storage area to verify cleanliness, inventory and the required temperature/humidity were adequately monitored. Additionally, the inspectors observed the blasting of the containment vessel surface to determine whether the requirements of ASTM D4285 and the work procedures were followed. Specifically, the inspectors observed:

- blotter testing to ensure no water or oil residue will be dispersed to the surface during blasting;
- environmental conditions were suitable and not predisposed to precipitate dew on the surface; and
- blasted areas were painted within four hours of abrasive blasting and before rust bloom occurs.

The inspectors reviewed documentation for coatings on the interior of the containment vessel. Specifically, the inspectors reviewed the Environmental Conditions Log for panels B4-E11, B4-C23, B4-C26, B4-D14, B4-D23, and B4-E1 to verify that the environmental conditions were in accordance with the Westinghouse Design Specification. Additionally, the inspectors verified that the calibration was current for the environmental testing equipment gauges. The inspectors reviewed work travelers for the application of the inorganic zinc coating on the containment vessel to determine whether hold points were observed.

The inspectors observed mixing of the coating for the containment vessel lower and middle rings to determine if the coatings were mixed according to the correct proportions, the mixture was constantly agitated, and the outlined procedures were followed. The inspectors reviewed the Pre Coating Material Inspection Log to verify that the components of the inorganic zinc coating were not expired and were the correct components as defined in the Westinghouse Design Specification. As a part of this observation the inspectors reviewed the training records to ensure current training/qualification of the applicator and to determine whether the applicator was qualified and certified for the work performed. Specifically, that the worker was certified to the actual coating being applied.

b. Findings

No findings were identified.

1A16 (Unit 4) ITAAC Number 3.3.00.02a.i.a (760) / Family 01F

a. Inspection Scope

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

- 65001.01 - Inspection of ITAAC-Related Foundations & Buildings
- 65001.01-02.01 - Procedures
- 65001.01-02.05 - Steel Structures
- 65001.01-02.06 - Records
- 65001.01-02.07 - Identification and Resolution of Problem
- 65001.A.02.03 - Independent Assessment/Measurement Inspection
- 65001.A.02.04 - Review As-built Deviations/Nonconformance
- 65001.B-02.05-Inspection
- 65001.B-02.06-Records
- 65001.F-02.01-Design Document Review
- 65001.F-02.02-Fabrication Records Review

The inspectors reviewed quality records and performed independent verification of construction activities associated with the containment internal structures for Vogtle Unit 4. Specifically, the inspectors sampled the following steel concrete composite submodules associated with structural module CA01, which forms the reactor vessel cavity, steam generator compartments, and pressurizer compartment, prior to on-site assembly:

- CA01-01, which is part of the south and east refueling cavity walls from elevation 98'-0" to 135'-3"
- CA01-07, which is part of the south east corner of the east steam generator compartment from elevation 98'-0" to 158'-0"
- CA01-31, which is part of the north wall of the west steam generator compartment from elevation 103'-0" to 153'-0" and the west wall of the pressurizer compartment from elevation 107'-2" to 160'-0"
- CA01-37, which is part of the fuel transfer canal

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

- met the requirements specified in the quality assurance program and the UFSAR, including the reconciliation of construction deviations in critical dimensions and tolerances;
- correctly translated requirements from applicable codes and standards;
- described work controls, approved work processes, and inspection requirements;
- included appropriate quantitative and/or qualitative acceptance criteria for determining that the prescribed activities were accomplished satisfactorily;

- clearly prescribed acceptable methods of quality control inspection to ensure that the as-built condition met specified design requirements, drawings and material specifications; and
- provided qualification requirements for craft and quality control inspection personnel performing installation and testing activities.

The inspectors reviewed a sample of design drawings and design changes to determine whether the documents adequately defined the final design and arrangement of these submodules, critical attributes associated with the ITAAC were correctly identified, and the documents were consistent with code requirements and the UFSAR. The inspectors reviewed a sample of fabrication records to determine whether they were complete, accurate, and provided evidence that the quality and code requirements were satisfied. The inspectors reviewed a sample of certified material test reports to verify that materials meet the specified design, material, and mechanical testing requirements. The inspectors reviewed a sample of inspection records to determine whether:

- the records were adequate to furnish evidence of activities affecting quality
- the requisite material characteristics were documented;
- performance tests, nondestructive tests, material certification, chemical and physical tests, and other specification requirements were performed and documented as required;
- installation, inspection, and testing sequences were maintained;
- the records were reviewed and approved by the responsible organization;
- the recorded information was complete, accurate, met the licensing basis, and conformed to applicable specifications;
- the items were correctly shipped, stored, and maintained in such a manner as to demonstrate conformance with design and procedure requirements; and
- the as-fabricated submodule conformed to applicable codes, standards, quality requirements, and technical requirements.

The inspectors performed independent inspection and measurements of the size, spacing, and dimensions of headed reinforcement, plates, angles, reinforcement hooks, and mechanical couplers to determine whether:

- fabrication was completed in accordance with applicable specifications, drawings, and approved procedures;
- any nonconforming conditions were identified by the licensee and were adequately documented in the corrective action program; and
- the as-built configuration was in accordance with the final design and UFSAR.

The inspectors reviewed tagging and markings on a sample of the submodules to determine whether the marking system was adequate to identify the material and inspection status during storage and installation. The inspectors observed the storage of the submodules to determine whether the submodules were stored and maintained in accordance with applicable quality and technical requirements.

The inspectors performed independent inspection and measurements of the welds to determine whether they met the design drawings, including type, size, and location. Additionally, the inspectors performed independent inspection of the welds to verify they met visual inspection acceptance criteria for the applicable design and

fabrication codes, including cracks, lack of fusion, undercut, porosity, weld size, and other visual defects. The inspectors reviewed a sample of weld records provided by the fabricator to determine whether:

- records provided adequate traceability to all aspects of the welding activities, including traceability to the welder who performed the work;
- the records adequately documented weld material certifications, weld data or process records, weld inspection records, and nondestructive examination records;
- required inspections were identified with hold points as required by the design codes; and
- accepted, rejected, and repaired items were documented.

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.

b. Findings

No findings were identified.

1A17 (Unit 4) ITAAC Number 3.3.00.02a.i.a (760) / Family 01F

a. Inspection Scope

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

- 65001.01-02.05 - Steel Structures
- 65001.B-02.01-Program and Procedures Review
- 65001.B-02.02-Welding Procedure Qualification
- 65001.B-02.03-Welder Qualification
- 65001.B-02.04-Production Controls
- 65001.B-02.05-Inspection
- 65001.B-02.06-Records

The inspectors inspected vertical weld seams inside the associated with the assembly of the CA01 structural module. The inspectors observed the completed weld joint and reviewed documentation for the weld between the faceplates on the east and west

walls of submodules CA01-20 to CA01-21 which form part of the west refueling cavity wall inside containment.

Specifically, the inspectors observed the completed welds for CV15611-L16 and L17 welds. For these welds the inspectors reviewed design documents, weld data sheets, applicable design drawings, work packages, WPS, PQR, welder qualifications and specifications to verify construction and quality control activities, were being conducted in accordance with design documents and applicable codes, processes and procedures. In addition the inspectors observed quality control inspectors perform visual inspection of weld CV15611-L16. The inspectors verified:

- contractors performing safety-related work had approved implementing procedures that described administrative and procedural controls, approved work processes, and inspection requirements;
- procedures clearly prescribed acceptable methods of quality control inspection which ensured that the as-built condition met specified design requirements, drawings and material specifications;
- design calculations met applicable codes and certified design criteria;
- WPS were qualified in conformance to AWS D1.6 Structural Welding Code - Stainless Steel;
- WPSs were available, up to date and accurate;
- welding positions qualified for a WPS were in accordance with AWS D1.6 Structural Welding Code - Stainless Steel;
- the WPS specified all the applicable essential, nonessential supplementary variables referenced in AWS D1.6 Structural Welding Code - Stainless Steel.
- welding personnel demonstrated their skill by performing specific performance qualification tests prescribed by AWS D1.6;
- performance qualification tests were fully documented;
- each weld was traceable to the welder;
- work was conducted in accordance with a weld data record or similar document which coordinated and sequences all operations, referenced procedures and instructions, established hold points, and provided for production welding and inspection signoffs;
- inspection procedures ensured that the size, length, and location of welds conform to design requirements;
- acceptance criteria for completed welds were in accordance with AWS D1.6 Structural Welding Code - Stainless Steel; and
- weld profile tolerances were suitable and met code requirements.

Additionally, the inspectors reviewed a sample of design output documents, design criteria, E&DCRs, and N&Ds included in the work package, to verify that AISC N690, AWS D1.6, and UFSAR welding requirements were being adequately implemented; and any nonconforming conditions, including deviations from the approved design, were being appropriately identified, evaluated, and dispositioned according to approved procedures and processes.

b. Findings

No findings were identified.



1A18 (Unit 4) ITAAC Number 3.3.00.02a.i.b (761) / Family 01Fa. Inspection Scope

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

- 65001.01-02.06 - Records
- 65001.02-02.01 - Inspection of Concrete Placement
- 65001.02-02.03 - Special Considerations
- 65001.02-02.09 - Concrete Quality Process Problems

The inspectors reviewed quality records and performed direct inspection of construction activities associated with the Shield Building for Vogtle Unit 4. Specifically, the inspectors observed construction activities associated with the eastern side of the Shield Building basemat dish and interior wall for the lower manway from approximately azimuth 337° to 186° between elevation 82'-6" and 90'-6".

The inspectors observed concrete pre-placement activities to determine whether pre-placement planning and training had been completed, including appropriate considerations for hot weather and mass concrete, and the pre-placement inspection was performed by quality control before any concrete was placed. Prior to concrete placement, the inspectors independently evaluated whether the reinforcing steel met drawings and specifications included in the work packages, all deviations were adequately captured and addressed, and preparation and cleanliness of the formwork had been completed. The inspectors observed concrete placement activities, observed concrete delivery operations, and reviewed batch plant records to determine whether:

- specifications, procedures, codes, and design requirements were followed throughout the concrete placement;
- concrete was batched in accordance the specified mix design;
- the equipment used was suitable and sized for the work and performed as required;
- each truck was measured and each trip received proper ticketing and documentation;
- batch records were generated, controlled, and indicated placement location, mix, volume, date, time, and special instructions;
- each batch ticket was reviewed for verification of proper mix, transport time, and placement location;
- the time limit between mixing and placement was not exceeded;
- temperature limits were not exceeded;
- mixing time and rotations were adequate;
- placement drop distances did not exceed specification requirements and did not result in segregation;
- concrete was placed in lifts in accordance with the concrete placement plan; and

- inspection during placement was performed as required.

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

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

The inspectors reviewed test results to determine whether:

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

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

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

b. Findings

No findings were identified.

1A19 (Unit 4) ITAAC Number 3.3.00.02a.i.c (762) / Family 01F

a. Inspection Scope

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

- 65001.01-02.07 - Identification and Resolution of Problem
- 65001.02-02.01 - Inspection of Concrete Placement
- 65001.02-02.07 - Problem Identification and Resolution
- 65001.A.02.01 - Observation of in-Process Installation Activities
- 65001.A.02.03 - Independent Assessment/Measurement Inspection
- 65001.A.02.04 - Review As-built Deviations/Nonconformance
- 65001.F-02.01-Design Document Review

The inspectors reviewed quality records and performed direct inspection of construction activities associated with the non-radiologically controlled area of the Auxiliary Building for Vogtle Unit 4. Specifically, the inspectors observed construction activities associated with the floor sections at elevation 82'-6" between column lines Q and L and between the shield building and column line 11.

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

- the documents adequately defined the final design and arrangement of these SSCs;
- critical attributes associated with the ITAAC were correctly identified and documented for review and approval by responsible engineering personnel; and
- the documents were consistent with the design commitments and requirements of the technical specifications, the UFSAR, and code commitments.

The inspectors observed installation activities associated with formwork, embedments, and steel reinforcement, including horizontal reinforcing steel bars, shear reinforcement, steel reinforcement extending into the walls at 82'-6", and bar splices to determine whether:

- the installation activities met applicable quality and technical requirements established by approved procedures, specifications, and drawings included in the work packages;
- piping, penetrations, reinforcing steel, and embedments were located properly in the structure, were sized as specified in drawings and calculations, and had proper clearances; and
- reinforcing steel and embedments were secured and free of concrete or excessive rust.

The inspectors observed the storage of reinforcing steel bars and hooks to determine whether the storage conditions met applicable quality and technical requirements. The inspectors performed independent inspection and measurements to determine whether the steel reinforcement, embedments, and formwork conformed to the design specifications. The inspectors performed independent inspection and measurements

to determine whether the as-built concrete thickness of completed wall sections were in accordance with the final design, the ITAAC, and UFSAR.

The inspectors reviewed a sample of in-process work packages for reinforcing steel, embedments, and formwork to determine whether:

- the latest approved procedures, drawings, and other work instructions would be included in the work packages;
- the licensee had verified that the items to be installed met specified requirements;
- the items being installed were not damaged prior to installation;
- materials, tools, and other equipment being used were qualified and approved in accordance with site procedures;
- nonconforming items were clearly identified, segregated if possible, and dispositioned;
- inspection and test reports were current, accurate, and complete; and
- design changes, field modifications, and nonconformances associated with the work observed were properly controlled and processed in accordance with the approved quality assurance program.

The inspectors reviewed a sample of nonconformances to verify:

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

b. Findings

No findings were identified.

1A20 (Unit 4) ITAAC Number 3.3.00.02a.i.d (763) / Family 01F

a. Inspection Scope

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

- 65001.01 - Inspection of ITAAC-Related Foundations & Buildings
- 65001.01-02.01 - Procedures
- 65001.01-02.05 - Steel Structures
- 65001.01-02.06 - Records
- 65001.A.02.01 - Observation of in-Process Installation Activities
- 65001.A.02.02 - Installation Records Review

- 65001.A.02.04 - Review As-built Deviations/Nonconformance
- 65001.B-02.01-Program and Procedures Review
- 65001.B-02.02-Welding Procedure Qualification
- 65001.B-02.03-Welder Qualification
- 65001.B-02.04-Production Controls
- 65001.B-02.05-Inspection
- 65001.B-02.06-Records
- 65001.F- Inspection of the ITAAC-Related Design and Fabrication Requirements
- 65001.F-02.01-Design Document Review
- 65001.F-02.02-Fabrication Records Review
- 65001.F-02.03-Observation of Fabrication Activities

The inspectors observed installation activities and reviewed documents related to the installation of the steel floor of the spent fuel pool of the Vogtle Unit 4 CA20 module. The inspectors observed in-process welding of the ledger angle to CA20-22B and CA20-25 (weld CV13386-5T) which supports the spent fuel pool floor submodule CA20-50 and reviewed welding and inspection records of the weld joining spent fuel pool floor submodules CA20-47 and CA20-48 (weld CV13387-1).

The inspectors observed in-process shielded metal arc welding of a ledger angle associated with work package SV4-CA20-S4W-CV6879 for weld CV13386-5T which supports spent fuel pool floor submodule CA20-50. The inspectors observed welding activities to ensure the following:

- work was conducted in accordance with a "traveler," weld data record or similar document which coordinated and sequenced the welding and inspection operations;
- the welding procedure used was the latest revision and appropriate for the work performed;
- the weld joint was sufficiently protected from inclement conditions;
- surfaces to be welded were smooth, uniform, and free from surface discontinuities such as cracks or seams, and free from paint, oil, rust, scale, slag, grease, moisture or other harmful foreign materials that could be detrimental to welding for at least 2 inches from the weld joint;
- the filler metal type and size was in compliance with the WPS;
- the weld joint was traceable to the welders; and
- welding machine variables were correctly set.

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

The inspectors reviewed a sample of CMTRs for the ledger angle material used in weld CV13386-5T to determine conformance with section 4.0, "Materials," of SV4-CA20-S5Y-00003, "Auxiliary Building Areas 5 & 6 Module CA20 Submodules General Notes II," Rev. 3, ASTM A992, and design documents. The inspectors reviewed a

sample of CMTRs and WMRs for the weld filler material to determine conformance with material specification DMD-M-NS-55\_8018\_C1\_SMAW-02 and SFA 5.5 for Type E8018-C1 and the applicable WPS.

The inspectors reviewed the completed weld records associated with work package SV4-CA20-S4W-CV6879 for weld CV13387-1 which joins spent fuel pool floor submodules CA20-47 and CA20-48. The inspectors reviewed these weld records to determine whether:

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

The inspectors reviewed the ultrasonic (UT) examination records for weld CV13387-1 to determine whether the required examinations were performed in accordance with the MISTRAS UT procedure (100-UT-310, "Ultrasonic Examination of Welds in Accordance with the AWS Structural Welding Code D1.1," Rev. 6), and the AWS D1.1:2000, Structural Welding Code - Steel.

The inspectors reviewed the magnetic particle (MT) examination records for the welds listed above to determine whether the required examinations were performed in accordance with the MISTRAS MT procedure (100-MT-302, "Magnetic Particle Examination in accordance with AWS Structural Welding Code," Rev. 3), and the AWS D1.1:2000, Structural Welding Code - Steel.

The inspectors reviewed a sample of CMTRs and WMRs for the weld filler material used in weld CV13387-1 to determine conformance with SFA 5.5 for Type E8018-C1 H4R, SFA 5.28 for Type ER80S-Ni1, and the applicable WPSs. The inspectors reviewed a sample of the CMTRs for the backing bar material used for the weld to determine conformance with section 4.0, "Materials," of SV4-CA20-S5Y-00003, "Auxiliary Building Areas 5 & 6 Module CA20 Submodules General Notes II," Rev. 3, and ASTM A36.

The inspectors reviewed a sample of WPSs used for weld CV13387-1 to determine if they were appropriate for the material and work performed. The inspectors also reviewed a sample of welder qualifications to verify personnel were qualified to the applicable processes and procedures.

The inspectors reviewed an N&D report related to work package SV4-CA20-S4W-CV6879. The inspectors reviewed this report to determine if the condition was properly evaluated and that the N&D received the appropriate amount of review. No design deviations were reviewed.

b. Findings

No findings were identified.

1A21 (Unit 4) ITAAC Number 3.3.00.02a.i.d (763) / Family 01F

a. Inspection Scope

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

- 65001.01-02.01 - Procedures
- 65001.01-02.05 - Steel Structures
- 65001.01-02.06 - Records
- 65001.02-02.06 - Record Review
- 65001.B-02.06-Records
- 65001.F-02.02-Fabrication Records Review

The inspectors observed the assembly of the Vogtle Unit 4 CA20 module in the modular assembly building. The inspectors reviewed welding and inspection records, and performed independent visual examinations for welds associated with the welding of submodules CA20-25 to CA20-22B (inside face, column line 4 wall from K2 to L-2 from 66'6" to 135'3").

Specifically, the inspectors reviewed these weld records associated with work package SV4-CA20-S4W-CV5628 to determine whether:

- the welding activity was properly documented in the work traveler;
- records provided adequate traceability to all aspects of the welding activity;
- the records were appropriately retained and stored in accordance with QA program requirement; and
- accepted, rejected, and repaired items were documented in written reports.

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

The inspectors reviewed a sample of E&DCRs to determine whether these changes were performed in accordance with procedure APP-GW-GAP-420, "Engineering and Design Coordination Report." The inspectors evaluated these design changes for conformance to 10 CFR Part 50, Appendix B, Criterion III, "Design Control."

b. Findings

No findings were identified.

1A22 (Unit 4) ITAAC Number 3.7.00.01 (841) / Family 16F

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 3.7.00.01 (841). The inspectors used the following NRC IPs/sections to perform this inspection:

- 65001.16-02.01 - Design Procedures
- 65001.16-02.02 - Design Input
- 65001.16-02.03 - Design Documents
- 65001.16-02.04 - Design Analysis
- 65001.F-02.01-Design Document Review
- 65001.F-02.04-General QA Review

The inspection team reviewed the principal closure document for the D-RAP ITAAC to confirm that all components from the AP1000 Design Control Document, Tier 1, Table 3.7–1 had been included in its scope. To maximize the extent of the review, the team designed a stratified sample of documents. Procurement documents and installation drawings relevant to various disciplines were selected. Both safety-related and non-safety related SSC's were selected, based in part on risk importance measures.

For each of the components in the sample, the staff reviewed the design documents to confirm that the appropriate programs had been used in their preparation. The inspectors reviewed the signatures of the design documents and installation drawings to verify that they were made by qualified personnel. The inspectors also reviewed the qualification process to verify that each person was adequately qualified to sign the documents.

The team also examined procedures used for design review, design document verification, document control, and qualification of personnel to verify thoroughness and completion. The inspectors selected a sample of design disciplines and reviewed specific competencies required for qualification to verify that the personnel were adequate to be signing the documents.

b. Findings

No findings were identified.

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

1P01 Construction QA Criterion 3



a. Inspection Scope

The inspectors reviewed AP1000 Westinghouse Electric Company (WEC) design control documents to verify implementation of their program was performed in accordance with 10 CFR Part 50, Appendix B, Criterion III, "Design Control;" ASME NQA-1-1994, Supplement 3S-1, "Supplementary Requirements for Design Control;" and applicable industry standards and project procedures. Specifically, the inspectors reviewed a sample of design specifications, welding filler material specifications, design drawings, and E&DCRs to verify that:

- welding requirements stated in the design specifications for PXS piping and piping supports met the requirements of ASME Section III, Subsections NB, NC, ND, and NF;
- those welding requirements were adequately reflected in design drawings and material specifications;
- design changes were initiated and performed in accordance with procedure APP-GW-GAP-420, "Engineering and Design Coordination Report;"
- E&DCRs received the proper level of engineering review and approved changes were adequately incorporated into all affected documents; and
- licensing impact determination screenings associated with each change were properly evaluated against the current licensing basis as described in the Vogtle Unit 3 and Unit 4 UFSAR.

WEC is designing the PXS system for both Vogtle Unit 3 and Vogtle Unit 4 using the procedures and processes listed here. Therefore this section also applies to ITAAC 2.2.03.03a and 2.2.03.03b for both units 3 & 4.

b. Findings

No findings were identified.

1P02 Construction QA Criterion 4

a. Inspection Scope

The inspectors reviewed a sample of Chicago Bridge and Iron and Shaw Nuclear procurement documents, now adopted by WECTEC, to verify implementation of the WECTEC quality assurance program was performed in accordance with 10 CFR Part 50, Appendix B, Criterion IV, "Procurement Document Control" and applicable industry standards and project procedures. Specifically, the inspectors reviewed welding filler material procurement specifications, CMTRs, and design specifications related to ASME piping to verify the following:

- technical, design, and regulatory requirements were met for the items;
- tests, inspections, and special processes were identified and appropriate for the items;
- specifications differing from the original design documents were reviewed and approved by qualified technical personnel;

- certifications identified the specific procurement requirements met by the purchase item, such as codes, standards, and specific design requirements; and
- procurement documents contained requirements to provide appropriate documentation of quality, including component traceability.

WECTEC is building the PXS system for both Vogtle Unit 3 and Vogtle Unit 4 using the procedures and processes listed here. Therefore this section also applies to ITAAC 2.2.03.03a and 2.2.03.03b for both units 3 & 4.

b. Findings

No findings were identified.

1P03 Construction QA Criterion 7

a. Inspection Scope

The inspectors reviewed surveillance report CMP-NI-2016-7-12030, "Review of contractor's rigging plan for Unit 4 CA20 Lift/Set activities," which was performed by Southern Nuclear Company (SNC), the licensee, to ensure the subcontractor's implementation of the rigging plan for the lift and set of the Unit 4 CA20 module was done in accordance with applicable procedures, codes, and standards. Additionally, the inspectors reviewed surveillance report S-132175-2016-082, "Jack and Weigh, Transport, Lift and Setting of CA20 Module NI4," which was performed by WEC, the contractor, to verify supporting documentation and activities associated with the lift and set of the Unit 4 CA20 module were completed by the subcontractor in accordance with requirements.

The inspectors performed direct observation of surveillance activities performed by SNC and Westinghouse during the lift and set of the Unit 4 CA20 module, including planning, pre-job briefings, rigging, transporting, jacking and weighing, leveling, lifting, and setting. The inspectors observed these surveillance activities to determine whether the licensee and contractor had adequately implemented the quality requirements of 10 CFR Part 50, Appendix B, Criterion VII, "Control of Purchased Material, Equipment, and Services," Section 7, "Control of Purchased Material, Equipment, and Services," of the SNC Nuclear Development Quality Assurance Manual; and applicable procedures.

The inspectors reviewed the SNC surveillance results to determine whether the licensee had appropriately assessed the effectiveness of the control of quality by WEC and their subcontractors. Additionally, the inspectors reviewed the WEC surveillance results to determine whether the contractor had appropriately assessed the effectiveness of the control of quality by their subcontractors. The inspectors also reviewed these reports to determine whether:

- the reports were adequate records of activities affecting quality;
- the reports were completed in accordance with the licensee's quality assurance program implementing procedures; and

- any issues identified were appropriately documented and corrected in accordance with the project quality requirements.

b. Findings

No findings were identified.

1P04 Construction QA Criterion 9

a. Inspection Scope

The inspectors reviewed WECTEC's QAM-Section 29, "ASME Section III Program Application for AP1000 Fleet Projects" and associated controlling documents for welding, postweld heat treatment (PWHT), and NDE to determine whether the control of these special processes were in accordance with:

- 10 CFR Part 50, Appendix B, Criterion IX, "Control of Special Processes";
- ASME NQA-1-1994, Supplement 9S-1, "Supplementary Requirements for Control of Processes"; and
- ASME Section III, Division 1.

The inspectors reviewed whether the combinations of manual, semi-automatic, and machine WPSs with supporting PQRs for the various types of welding were qualified in accordance with ASME Section IX, "Welding and Brazing Qualifications". Specifically, the inspectors reviewed the following WECTEC welding program attributes to determine if the Gas Tungsten Arc Welding (GTAW), Shielded Metal Arc Welding (SMAW), Gas Metal Arc Welding (GMAW), and Flux Core Arc Welding (FCAW) processes using certified welders and welding operators were all prepared, tested, and qualified in accordance with the requirements of ASME Section IX:

- WECTEC's QA Manual described effective operational control of welding procedure qualifications for conglomerated companies of different names;
- WPSs were qualified in accordance with the requirements of WECTEC's procedure PQ-1 for the applicable nonessential and essential variables, and supplementary essential variables delineated in the Code for impact testing;
- references made within WPSs adequately addressed weld groove/joint geometry, base metal preparation, use of nonmetallic retainers, gas nozzle size, tacking, cleaning, oscillation, limits of heat input, up/downhill welding progression, and peening;
- WPSs and supporting documents address PWHT limitations for qualification testing equivalent to be encountered for production welds, including at least 80% of the aggregate times at temperature(s);
- welding processes and welder performance qualification tests were documented and records were certified;
- welder/operator qualifications were successfully tested and controlled in accordance with WECTEC procedure WQ-1 using a Welder Qualification Test Index that links WPQ test numbers with a WPS and performance qualification essential variables for specific test coupon thicknesses and diameters, use or omission of backing material and gas, and test positions;

- instructions required monitoring of welder/operator performance qualifications to control six months continuity and ensure the welders/operators used each process during that time period; and
- welders/operators who were qualified for a given welding process were required to requalify, if any essential variable for a process were changed beyond the limits specified on qualification records.

The inspectors observed the time monitored storage, distribution, and traceability of GTAW bare rods and SMAW electrodes (using stationary and portable ovens) by designated attendants at the Weld Material Issue Station #7 to determine whether the issuance of weld filler metals were controlled in accordance with the requirements of WECTEC procedure FMC-1. The inspectors verified continuity of welder certifications, accuracy and signature approval of the WMRs for the scope of work, and using the electronic Material Issue Record (MIR) for issue/return of weld filler metal.

The inspectors reviewed WECTEC's procedure PWHT-1 and subcontractor Superheat FGH's procedure QEP-NSOP-06 to determine whether the following attributes for local controlled preheat, postbaking, and PWHT were addressed in accordance with the applicable requirements of ASME Section III, Division 1:

- preheat and postbaking hold times;
- exemptions to mandatory PWHT;
- uniform heating of weldments at holding/soak temperature and time limits;
- heating and cooling rates;
- minimum width of heat controlled band width;
- attachment of thermocouple wires using capacitor discharge methods;
- calibrated measuring and monitoring instruments;
- documentation and heat treatment records; and
- use of PWHT subcontractors.

The inspectors reviewed (MISTRAS's) written practice for the qualification and certification of NDE personnel, and contents of the 300 series qualified NDE procedures PT-301, MT-301, RT-301, and RT-302 to determine whether methods, techniques, and acceptance criteria were in accordance with the applicable requirements of ASNT SNT-TC-1A, CP-189, and ASME Section V, "Nondestructive Examination," Articles 1, 2, 6, 7, 22, 24, and 25. Specifically, the inspectors reviewed a sample of computed RT examination reports for two welds performed on the PXS piping to determine whether the required examinations were performed and documented in accordance with:

- methods and techniques described in MISTRAS procedure 100-RT-302;
- ASME Section III, Subsection NC; and
- ASME Section V, Article 2.

In addition, the inspectors also reviewed a sample of RT Level II and Level III NDE qualifications and certifications to verify personnel were qualified to the applicable processes and procedures (including annual visual near-distance acuity, color contrast, and brightness discrimination).

WECTEC is building the PXS system for both Vogtle Unit 3 and Vogtle Unit 4 using the procedures and processes listed here. Therefore this section also applies to ITAAC 2.2.03.03a and 2.2.03.03b for both units 3 & 4.

b. Findings

No findings were identified.

1P05 Construction QA Criterion 10

a. Inspection Scope

The inspectors reviewed WECTEC's QAM-Section 29, "ASME Section III Program Application for AP1000 Fleet Projects," to determine whether the program for inspection activities using QC/ANI hold points was established and implemented in conformance with:

- applicable procedures;
- 10 CFR Part 50, Appendix B, Criterion X, "Inspection";
- ASME NQA-1-1994, Supplement 10S-1, "Supplementary Requirements for Inspection"; and
- ASME Section III, Division 1.

The inspectors reviewed weld travelers to verify field welding examination activities were performed in accordance with the requirements of (WECTEC's) QA Manual. Specifically, the inspectors verified:

- completed QC hold points for material verification inspections;
- fit-up and tack inspections;
- final VT examinations;
- final liquid penetrant (PT) examinations;
- final computed RT examinations; and
- traceability to CMTRs and welders/operators for safety-related pressure boundary welds .

The inspectors reviewed WECTEC procedures and inspection plans for conducting visual examinations to verify the requirements were in accordance with industry codes and standards. The inspectors also witnessed a visual examination performed by QC personnel and reviewed the applicable qualifications to verify the inspection plan was followed, appropriate hold points were signed-off prior to and after the inspection, and personnel qualifications were adequately completed and maintained.

The inspectors reviewed a sample of computed RT examination reports for two welds performed on the PXS piping to determine whether the required final examination hold points were signed-off on the weld traveler and interpretation of indications shown on the radiographic images were characterized in accordance with ASME Section III, Subsection NC, for Class 2 Components.

WECTEC is building the PXS system for both Vogtle Unit 3 and Vogtle Unit 4 using the procedures and processes listed here. Therefore this section also applies to ITAAC 2.2.03.03a and 2.2.03.03b for both units 3 & 4.

b. Findings

No findings were identified.

1P06 Construction QA Criterion 16

a. Inspection Scope

Daily Corrective Action Program Review

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

- classification, prioritization, and evaluation for reportability (i.e., 10 CFR 50.55(e)) of conditions adverse to quality;
- complete and accurate identification of the problem in a timely manner commensurate with its significance and ease of discovery;
- screening of items entered into the CAP to determine the proper level of evaluation;
- identification and correction of procurement documents errors, deviations from procurement document requirements, defective items, poor workmanship, incorrect vendor instructions, significant recurring deficiencies at both vendor shops and on site, and generic procurement related deficiencies;
- identification and correction of design deficiencies;
- consideration of extent of condition, generic implications, common cause, and previous occurrences;
- classification and prioritization of the resolution of the problem commensurate with its safety significance;
- identification of corrective actions that are appropriately focused to correct the problem;
- identification of root and contributing causes, as well as actions to preclude recurrence for significant conditions adverse to quality;
- completion of corrective actions in a timely manner commensurate with the safety significance of the issue;
- provisions for escalating to higher management those corrective actions that are not adequate or not timely; and
- conditions adverse to quality were trended to proactively identify potential adverse trends and potential common cause problems, and the trending results were reported to management.

### Routine Review of Items Entered into the Corrective Action Program

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

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

#### b. Findings

No findings were identified.

### 1P07 Construction QA Criterion 16

#### a. Inspection Scope

Based on nonconformances associated with safety-related structural modules documented in eight corrective action documents (four of which were NRC-identified and four were licensee-identified), the licensee determined that CB&I failed to both perform adequate module inspections and to take appropriate corrective actions to address the nonconformances. All eight of these corrective action documents, identified as CRs 823683, 824468, 835092, 837191, 837111, 850266, 861037, and 862311, were previously reviewed as documented in NRC inspection report 05200025/2016007, 05200026/2016007 (ML16245A895) so the inspectors did not further review the technical issues identified in these CRs as part of this inspection.

On September 14, 2014, the licensee submitted letter ND-14-1513 to request that CB&I Power evaluate ineffective and untimely corrective actions safety related modules and submodules. ND-14-1513 documented the failure of CB&I Power to perform adequate inspections of safety related materials at supplier facilities as well as their failure to perform adequate examinations of products prior to delivery onsite.

In response to ND-14-1513, CB&I Power initiated level 1 CAR 2014-1961 on October 1, 2014, and performed a root cause analysis to determine the cause of the failure to ensure consistent supplier quality with AP 1000 Modules. On February 04, 2015, an evaluation of the root cause analysis results concluded that a significant QA program breakdown had occurred that could have produced a defect. Consequently, a report

was made to the NRC on February 9, 2015, via Event Notification 50798 in accordance with 10CFR50.55(e)(4)(iii) and 10CFR50.55(e)(5)(i).

The inspectors reviewed the events and circumstances related to the issue, including the referenced corrective action documents, to determine if the licensee:

- effectively classified, prioritized, and evaluated the condition for reportability;
- completely and accurately identified the problem in a timely manner, commensurate with its significance and ease of discovery;
- reported the issue in accordance with the reporting requirements of 10CFR50.55(e);
- identified the cause and implemented corrective actions to prevent recurrence of similar deficiencies;
- considered the extent of condition, generic implications, common cause, and previous occurrences;
- classified and prioritized corrective actions commensurate with the safety significance of the issue;
- identified corrective actions that were appropriately focused to correct the problem; and
- completed corrective actions in a timely manner commensurate with the safety significance of the issue

b. Findings

No findings were identified.

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

##### 4OA6 Meetings, Including Exit

On October 5, 2016, the inspectors presented the inspection results to Mr. Mark Rauckhorst, Vogtle 3 & 4 Vogtle 3&4 Executive Vice President Construction, along with other licensee and contractor staff members. The inspectors stated that no proprietary information would be included in the inspection report.



## **SUPPLEMENTAL INFORMATION**

### **KEY POINTS OF CONTACT**

#### **Licensees and Contractor Personnel**

F. Willis, SNC Licensing Manager  
J. Watkins, WEC Licensing Supervisor  
S. Hand, CB&I Services Quality Manager  
H. Agha, SNC Licensing Engineer  
M. Washington, SNC Licensing Supervisor  
A. Buckley, WECTEC Licensing Engineer  
P. Shaw, WEC Licensing Engineer  
M. Jones, SNC Engineering Supervisor  
A. Wilcher, SNC Construction Compliance Civil Supervisor  
D. Gillahan, SNC Construction Compliance Mechanical Supervisor  
K. Clough, SNC Construction Civil Engineering Supervisor  
B. Hirmanpour, SNC Licensing  
M. Klinvex, WEC Licensing  
S. DiTommaso, WEC Licensing  
J. Petagno, WEC Engineering  
G. Cesare, WEC Engineering  
C. Landon, WEC Engineering  
M. Evans, WEC Engineering  
N. Rish, WECTEC Welding Manager

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

<u>Item Number</u>	<u>Type</u>	<u>Status</u>	<u>Description</u>
None			

## LIST OF DOCUMENTS REVIEWED

### Section 1A01

#### Design Documents

SV3-MV50-Z0-001, "AP1000 Containment Vessel Design Specification," Rev. 1

#### Receiving Inspection Reports

Receiving Inspection Report No. U3-287, 03/11/2015

Receiving Inspection Report No. U3-302, 03/03/2015

Receiving Inspection Report No. U3-321, 04/02/2015

Receiving Inspection Report No. U3-323, 04/02/2015

#### ASME N-2 Data Reports

Form N-2 for C3-A15 (IN-5068), 07/16/2013

Form N-2 for C3-A30 (IN-5083), 08/08/2013

Form N-2 for C3-C1 (IN-5086), 08/06/2013

#### Certified Material Test Reports

CMTR from JFE Steel Corporation, No. 6406-6 for Heat No. 6-6882 / Plate No. JE169 A, 11/06/2012

CMTR from JFE Steel Corporation, No. 6406-11 for Heat No. 6-6371 / Plate No. HG425 A, 11/06/2012

CMTR from JFE Steel Corporation, No. 6411-8 for Heat No. 4-0515 / Plate No. JG286 A, 11/21/2012

CMTR from JFE Steel Corporation, No. 6411-17 for Heat No. 6-6884 / Plate No. J8085 B, 11/21/2012

CMTR from JFE Steel Corporation, No. 6413-1 for Heat No. 4-0517 / Plate No. JY153 A, 11/22/2012

CMTR from JFE Steel Corporation, No. 6413-2 for Heat No. 4-0515 / Plate No. JY154 A, 11/22/2012

CMTR from JFE Steel Corporation, No. 6413-5 for Heat No. 4-0517 / Plate No. K9022 A, 11/22/2012

CMTR from JFE Steel Corporation, No. 6419-8 for Heat No. 6-8582 / Plate No. KG383 A, 12/12/2012

CMTR from JFE Steel Corporation, No. 6419-17 for Heat No. 4-0515 / Plate No. K3035 A, 12/12/2012

#### Nondestructive Examination Reports

Inspection Results of Ultrasonic Testing Report from JFE Steel Corporation, No. H24-211, 11/06/2012

Inspection Results of Ultrasonic Testing Report from JFE Steel Corporation, No. H24-215, 11/21/2012

Inspection Results of Ultrasonic Testing Report from JFE Steel Corporation, No. H24-225, 11/26/2012

Inspection Results of Ultrasonic Testing Report from JFE Steel Corporation, No. H24-231, 12/12/2012

### Section 1A02

#### Design Documents

SV3-MV50-Z0-001, "AP1000 Containment Vessel Design Specification," Rev. 1

Weld Records

Traveler - Nuclear, U3-TH4-A14/A15, Weld TH4 Course Longitudinal Seam, Rev. 0  
 Traveler - Nuclear, U3-TH4-A29/A30, Weld TH4 Course Longitudinal Seam, Rev. 0

Welding Procedure Specification / Procedure Qualification Records

WPS E9018M H4 R, Rev. 8  
 WPS E91TG-H4, Rev. 12  
 WPS Eni4 / OK 10.72, Rev. 8  
 PQR 13087, 05/01/2012  
 PQR 12676, 12/18/2009  
 PQR 12677, 12/18/2009  
 PQR 12690, 12/17/2009  
 PQR 12691, 01/04/2010  
 PQR 12723, 03/08/2010  
 PQR 12749, 04/07/2010  
 PQR 12750, 04/07/2010  
 PQR 12757, 05/03/2010

Welder or Welding Operator Performance Qualification

Welder or Welding Operator Performance Qualification for ID No 63009296, Dated 02/22/2011  
 Welder or Welding Operator Performance Qualification for ID No 63009296, Dated 04/20/2011  
 Welder or Welding Operator Performance Qualification for ID No 63009296, Dated 07/02/2015  
 Welder or Welding Operator Performance Qualification for ID No 63013016, Dated 12/15/2011  
 Welder or Welding Operator Performance Qualification for ID No 63021159, Dated 12/13/2012  
 Welder or Welding Operator Performance Qualification for ID No 63076332, Dated 04/07/2015  
 Welder or Welding Operator Performance Qualification for ID No 63077447, Dated 07/06/2016  
 Welder or Welding Operator Performance Qualification for ID No 63081804, Dated 10/22/2014  
 Welder or Welding Operator Performance Qualification for ID No 63081804, Dated 11/03/2014  
 Welder or Welding Operator Performance Qualification for ID No 63109489, Dated 07/16/2015  
 Welder or Welding Operator Performance Qualification for ID No 63126066, Dated 10/07/2015

Certified Material Test Reports

CMTR from The Lincoln Electric Company, Customer PO No. 879733 Rev. 2, Lot 1204D  
 CMTR from ESAB Welding & Cutting Products, Customer PO No. 698615-1, Lot No. 2H005T01

**Section 1A03**Design Documents

SV3-MV50-Z0-001, "AP1000 Containment Vessel Design Specification," Rev. 1

ASME N-2 Data Reports

Form N-2 for C3-A15 (IN-5068), 07/16/2013  
 Form N-2 for C3-A30 (IN-5083), 08/08/2013  
 Form N-2 for C3-C1 (IN-5086), 08/06/2013

Certified Material Test Reports

CMTR from JFE Steel Corporation, No. 6406-6 for Heat No. 6-6882 / Plate No. JE169 A,  
 11/06/2012

CMTR from JFE Steel Corporation, No. 6406-11 for Heat No. 6-6371 / Plate No. HG425 A, 11/06/2012  
 CMTR from JFE Steel Corporation, No. 6411-8 for Heat No. 4-0515 / Plate No. JG286 A, 11/21/2012  
 CMTR from JFE Steel Corporation, No. 6411-17 for Heat No. 6-6884 / Plate No. J8085 B, 11/21/2012  
 CMTR from JFE Steel Corporation, No. 6413-1 for Heat No. 4-0517 / Plate No. JY153 A, 11/22/2012  
 CMTR from JFE Steel Corporation, No. 6413-2 for Heat No. 4-0515 / Plate No. JY154 A, 11/22/2012  
 CMTR from JFE Steel Corporation, No. 6413-5 for Heat No. 4-0517 / Plate No. K9022 A, 11/22/2012  
 CMTR from JFE Steel Corporation, No. 6419-8 for Heat No. 6-8582 / Plate No. KG383 A, 12/12/2012  
 CMTR from JFE Steel Corporation, No. 6419-17 for Heat No. 4-0515 / Plate No. K3035 A, 12/12/2012  
 CMTR from The Lincoln Electric Company, Customer PO No. 879733 Rev. 2, Lot 1204D  
 CMTR from ESAB Welding & Cutting Products, Customer PO No. 698615-1, Lot No. 2H005T01

#### **Section 1A04**

##### Drawings / Specifications:

SV3-PXS-PLW-019, "Passive Core Cooling System Containment Building Room 11206/11105 DVI-A to Reactor Vessel," Rev. 2;  
 SV3-PXS-PLW-026, "Passive Core Cooling System Containment Building Room 11105/11204 DVI-B to Reactor Vessel," Rev. 1  
 SV3-GW-P0-007, "AP1000 Specification for Shop Fabricated Piping," Rev. 7;  
 SV3-PL02-Z0-001, "Piping Class Sheets and Standard Details," Rev. 5  
 E&DCR APP-PXS-GEF-383, "Remove Shop Weld on APP-PXS-PLW-026," Rev. 0;  
 E&DCR APP-ML05-GEF-073, "Errors on APP-ML05-V2-221," Rev. 0;

##### Procedures:

SV3-GW-VH-001, "AP1000 Site Receiving, Inspection, and Storage Requirements for System Materials and Equipment," Rev 2;  
 QC Inspection Plan F-Q445-008, "Receipt Inspection: CB&I Procured ASME III Items," Rev. 5  
 CHG:5;

##### QA Data Package / Manufacturing Records:

QA Documentation Package Vogtle Unit 3, PO Number J132175-C601.02, Packing List / Shipping Number 295123 (CB&I Laurens);  
 QA Documentation Package Vogtle Unit 3, PO Number J132175-C601.02, Packing List / Shipping Number 294327 (CB&I Laurens);  
 Shop Sketch, As Built 890300-42-00366 Rev. 3A  
 Heat Treatment Reports for Spool Number 00366 (SV3-PXS-PLW-019-1R1) and Spool Number 00374 (SV3-PXS-PLW-026-1);  
 CMTR1300035 (Heat 06971 - SV3-PXS-PLW-019-1R1 and SV3-PXS-PLW-026-1)

##### Inspection / Examination Reports:

Receipt Inspection Reports Q445-16-11587 (SV3-PXS-PLW-019-1R1 [L021A]) and Q445-16-11585 (SV3-PXS-PLW-026-1 [L021B]);

Corrective Action Documents  
NCR-2016-23

**Section 1A05**

Certified Material Test Reports

4974203, ES-RAXM, Lot No. 1030J, 12/07/2011

4974203, ES-RAXL, Lot No. 1030K, 12/07/2011

Spool No. 890300-40-00800/R1, Piece Mark No. SV3-PXS-PLW-029-1, Heat No. F119140, 07/31/2014

Spool No. 890300-40-00801/R0, Piece Mark No. SV3-PXS-PLW-029-2, Heat No. F119140, 01/06/2014

Spool No. 890300-40-00802/R0, Piece Mark No. SV3-PXS-PLW-029-3, Heat No. F119140, 01/07/2014

Design Drawings

SV3-ML05-V2-425-R2, "AP1000 Duplex Penetration 11305-ML-P01 (SP10) Details," Revision 2

SV3-PXS-M6-002-R4, "Piping and Instrumentation Diagram Passive Core Cooling System,"

Revision 4

SV3-PXS-PLK-840000, "Penetration Material SV3-PXS-PLW-029," Revision 0

SV3-PXS-PLW-029-R0, "Passive Core Cooling System Containment Building Room 11207 from IRWST to DVI-B," Revision 0

Engineering & Design Coordination Reports

APP-ML05-GEF-154, "Addition of Identifying Weld Number," Revision 0

APP-ML05-GEF-155, "Penetration Testing Correction," Revision 0

APP-ML05-GEF-175, "11305-ML-P01/P02 Missing Weld," Revision 0

APP-ML05-GEF-194, "ML05 Weld Detail Clarification," Revision 0

APP-PXS-GEF-116, "E&DCR to Delete Pipe End Prep Note on Various PXS Drawings Related to IRWST and Containment Recirculation Screens," Revision 0

APP-PXS-GEF-306, "E&DCR to Update Pipe End Prep Note on Various PXS Drawings Related to IRWST and Containment Recirculation Screens," Revision 0

APP-PXS-GEF-398, "Remove Conflicting Hydro Test Requirements from Design Drawings," Revision 0

Miscellaneous

J132175-MIR-16-01076, Stores Requisition for SV3-PXS-PLW-029-1, SV3-PXS-PLW-029-2, and SV3-PXS-PLW-029-3, 03/03/2016

Weld Data Sheet for Weld No. SV3-PXS-PLW-029-171 from Work Package No. SV3-PXS-P0W-ME3240, Revision 0

Welding Material Requisition No. 174487, 174490, 179401, 179407, and 179409 for Heat Nos. 1030J and 1030K

Nondestructive Examination Records

V-16-PT-301-1295, "Liquid Penetrant Examination Report"

V-16-LT-302-008, "Vacuum Box Examination Report"

Personnel Qualifications

Record of Welder Performance Qualification Test - ASME Section IX for Welder No. RJT6063, 04/09/2014

Welder Qualification Report - ASME Section IX for Welder No. RJT6063, 05/02/2016

Certification of Qualification - Special Process, 562 Pipe Welding and Brazing, 12/28/2015  
 Eye Test Certification, 11/17/2015  
 NDT Certification Record No. 17225, 12/05/2015  
 Visual Acuity Record No. 512257, 06/21/2016

#### Procedures

WECTEC Inspection Plan No. F-S562-005, "Pipe Welding / Braze; ASME Section III Visual Pipe Weld Inspection," Revision 2  
 (Mistras) 100-PT-301, "Liquid Penetrant Examination in Accordance with ASME Section V, Article 6," Revision 12  
 (Mistras) 521-VB-LT-301, "Vacuum Box Leak Testing in Accordance with API 650," Revision 1

#### Westinghouse Specifications

SV3-GW-P0-007, "AP1000 Specification for Shop Fabricated Piping," Revision 4  
 APP-PL02-Z0-001, "AP1000 Standard Piping Specifications Class JBB/JBC," Revision 10  
 APP-PXS-M6X-004, "PXS Pipe Line Designation Table," Revision 1

#### Welding Procedure Specifications/Procedure Qualification Records

WPS1-8.8T01, Revision 8  
 PQ574, Revision 1  
 PQ589, Revision 1  
 PQ595, Revision 0  
 WPS1-8.8M01, Revision 0  
 PQ569, Revision 0

#### **Section 1A06**

##### Design Documents

SV3-GW-P0-008, "AP1000 Specification for Field Fabricated Piping and Installation, ASME III, Code Classes 1, 2, and 3 and ASME B31.1," Revision 4;  
 SV3-GW-VFY-001, "AP1000 Weld End Configuration for Stainless Steel, Carbon Steel and Alloy Steel Auxiliary Piping Components," Revision 1;  
 SV3-PXS-PLW-02E, "Passive Core Cooling System Containment Building Room 11207 IRWST to DVI-B & RNS Pump Suction," Revision 1;  
 SV3-PXS-PLW-029, "Passive Core Cooling System Containment Building Room 11207 from IRWST to DVI-B," Revision 0

##### Welding / Inspection Records

Welding Records for: SV3-PXS-PLW-029-1, SV3-PXS-PLW-029-2, and SV3-PXS-PLW-029-2-RW1;  
 V-16-RT-302-0130 (Final RT Report for SV3-PXS-PLW-029-1), Dated 07/11/2016;  
 V-16-RT-302-0145 (Final RT Report for SV3-PXS-PLW-029-2-RW1), Dated 07/11/2016;  
 WMR # 145662, Dated 03/10/2016;  
 WMR # 145663, Dated 03/11/2016;  
 WMR # 145664, Dated 03/11/2016;  
 WMR # 145665, Dated 03/14/2016;  
 WMR # 145666, Dated 03/15/2016;  
 WMR # 145679, Dated 03/08/2016;  
 WMR # 145681, Dated 03/09/2016;  
 WMR # 145685, Dated 03/09/2016;  
 WMR # 148791, Dated 03/07/2016;

WMR # 155877, Dated 04/01/2016;  
 WMR # 155885, Dated 03/18/2016;  
 WMR # 155886, Dated 03/18/2016;  
 WMR # 155887, Dated 03/19/2016;  
 WMR # 155892, Dated 03/30/2016;  
 WMR # 155894, Dated 03/31/2016;  
 Welder Performance Qualification Test # 1SS-02, ID 3221, Dated 07/24/2015;  
 Welder Performance Qualification Test # 1SS-02, ID 5885, Dated 11/06/2014;  
 RT Level II Certification # 15580, Dated 04/28/2015;  
 RT Level II Certification # 16168, Dated 07/17/2015;  
 RT Level III Certification # 10674, Dated 06/14/2013;  
 RT Level III Certification # 17420, Dated 01/05/2016;  
 RT Level III Certification # 18526, Dated 06/20/2016

#### Material Test Reports

Certificate of Conformance and Certified Material Test Report from The Lincoln Electric Company, Customer PO # 695750-000 3P, Lot 1030J;  
 Certificate of Conformance and Certified Material Test Report from The Lincoln Electric Company, Customer PO # 695750-000 3P, Lot 1030K

#### Weld Filler Material Specifications

TR-5.9-308L / 316L, "ER308L / ER316L Stainless Steel Bare Wire / Rods," Revision 0

#### Procedures

100-RT-302, "Radiographic Examination Using Computed Radiography In Accordance with ASME Section V, Article 2," Revision 4;  
 WCP-1, "Welding Control Procedure," Revision 9;  
 WPS1-8.8T01, Revision 9;  
 PQR PQ574, Revision 1;  
 PQR PQ589, Revision 1;  
 PQR PQ595, Revision 0

#### Corrective Action Reports

CB&I CAR 2016-1201

#### **Section 1A07**

##### Work Control Documents:

In-process welding record for weld number CV6238-38 (Work Package SV3-CA01-S4W-CV3233);

##### Procedures:

Welding Procedure Specification Number WPS2-1.1S02, Rev. 2;

##### Drawings and Design Changes:

SV3-CA01-S4K-CV6238, "Weld Map for CA01-02 Overlay Plates and Attachments East Side," Rev. 4;  
 E&DCR APP-CA01-GEF-638, "Addition of Spreader Plates to CA01," Rev. 0;  
 SV3-CA01-S4-04302, "Containment Building Area 4 Module CA01 Subassembly 04 Structural Outline - Elevation Views Outfitted-I," Rev. 0;

##### Misc. Documents:

Welding Material Requisition (WMR) Number 178924;

### **Section 1A08**

#### Specifications / Drawings:

SV3-1208-Z0-001, "Specification for the Fabrication and Field Erection of the SC Panels for the AP1000 Shield Building," Rev. 1;  
 SV3-VL52-Z0-572, "Material Specification for ASTM A572 Grade 50 for SC Shield Building," Rev. 0;  
 SV3-1208-SC-100, "Shield Building Steel Wall Panels El. 100'0" to El. 248'-61/2" General Notes," Rev. 2;  
 SV3-1208-SC-904, "Shield Building Steel Wall Panels El. 100'0" to El. 248'-61/2" Typical Details (Sheet 4)," Rev. 2;  
 SV3-1208-SC-906, "Shield Building Steel Wall Panels El. 100'0" to El. 248'-61/2" Typical Details (Sheet 6)," Rev. 5;  
 SV3-1208-SC-907, "Shield Building Steel Wall Panels El. 100'0" to El. 248'-61/2" Typical Details (Sheet 7)," Rev. 2;  
 [Panel 01E] SV3-1208-SC-201, "Shield Building Steel Wall Panels El. 100'0" to El. 248'-61/2" Connection Panel Group 20," Rev. 2;  
 [Panel 01D] SV3-1208-SC-321, "Shield Building Steel Wall Panels El. 100'0" to El. 248'-61/2" Connection Panel Group 32," Rev. 2

#### Engineering and Design Coordination Reports:

APP-1208-GEF-181, "Shield Building – Revise Finish Weld Profiles," Rev. 0;

#### Procedures:

QS 07.01, "Receiving Process," Rev. 1;  
 QAD 07.14, "Receiving Inspection," Rev. 03.01;  
 QC inspection plan F-Q445-004, "Receipt Inspection – Modules – Structural," Rec. 3 Change 5;

#### Inspection Reports:

132175-D100.SB003-NNI-VA-202 (WECTEC Type "B" Inspection Report – Source Inspection Report for Panel 01D);  
 132175-D100.SB003-NNI-VA-195 (WECTEC Type "B" Inspection Report – Source Inspection Report for Panel 01E);

#### Supplier / Manufacturer Documentation Packages:

SV3-1208-SC-01E Documentation Package for AP1000 Shield Building Structural Modules, Group 20 NNI JO 7340-F;  
 SV3-1208-SC-01D Documentation Package for AP1000 Shield Building Structural Modules, Group 32 NNI JO 7340-F;  
 NNI and WECTEC Certificates of Conformance for SV3-1208-SC-01E and SV3-1208-SC-01D;  
 Work Instruction / Welding / Inspection records for the assembly of SV3-1208-SC-01E outer panel (weld number 7340-F-101-001);  
 Work Instruction / Welding / Inspection records for the assembly of SV3-1208-SC-01E inner panel (weld number 7340-F-101-002);  
 Work Instruction / Welding / Inspection records for the assembly of SV3-1208-SC-01D wall attachment (Weld number 7340-F-100-010);  
 QC No. 12NNI095, CMTR for panel plate 2003A and 2004B (Panel 01E), Heat No. 4504977;  
 QC No. 14NNI007, CMTR for panel plate 3216A and 3217A, Heat No. 3508603;  
 QC No. 15NNI003, CMTR for #11 Lenton Couplers EL36C3JQ, Heat Nos. L8089 & L8112



Corrective Action and Nonconformance and Disposition Reports:

APP-1208-GNR-850443, "NNI NCR 1615A SV3-1208-SC-01E Critical Dimensions Out of Tolerance," Rev. 0;

APP-1208-GNR-850438, "NNI NCR 1558A, WPS 1070 used incorrectly, SV3-1208-SC-01E," Rev. 0;

APP-1208-GNR-850444, "NCR 1614B SV3-1208-SC-01E Critical Dimensions Out of Tolerance," Rev. 0;

**Section 1A09**

Engineering and Design Coordination Report

E&DCR SV0-1208-GEF-000026, "Shield Building NDE Allowance," Revision 0;

Procedures

DAPP 5-14, "AP1000 Engineering and Design Coordination Report," Revision 7;

DAPP 5-18, "AP1000 Licensing Basis Reviews," Revision 09.01;

**Section 1A10**

Concrete/Grout Delivery Ticket # 42169, Pour # 2797, 08/22/2016

Concrete/Grout Delivery Ticket # 42170, Pour # 2797, 08/22/2016

Concrete/Grout Delivery Ticket # 42171, Pour # 2797, 08/22/2016

Concrete/Grout Delivery Ticket # 42172, Pour # 2797, 08/22/2016

Concrete/Grout Delivery Ticket # 42173, Pour # 2797, 08/22/2016

Concrete/Grout Delivery Ticket # 42174, Pour # 2797, 08/22/2016

Concrete/Grout Delivery Ticket # 42175, Pour # 2797, 08/22/2016

Concrete/Grout Delivery Ticket # 42176, Pour # 2797, 08/22/2016

Concrete/Grout Delivery Ticket # 42177, Pour # 2797, 08/22/2016

Concrete/Grout Delivery Ticket # 42178, Pour # 2797, 08/22/2016

Concrete/Grout Delivery Ticket # 42179, Pour # 2797, 08/22/2016

Concrete/Grout Delivery Ticket # 42180, Pour # 2797, 08/22/2016

Concrete/Grout Delivery Ticket # 42181, Pour # 2797, 08/22/2016

Concrete/Grout Delivery Ticket # 42182, Pour # 2797, 08/22/2016

Concrete/Grout Delivery Ticket # 42183, Pour # 2797, 08/22/2016

Concrete/Grout Delivery Ticket # 42184, Pour # 2797, 08/22/2016

Concrete/Grout Delivery Ticket # 42185, Pour # 2797, 08/22/2016

Concrete/Grout Delivery Ticket # 42186, Pour # 2797, 08/22/2016

Concrete/Grout Delivery Ticket # 42187, Pour # 2797, 08/22/2016

Concrete/Grout Delivery Ticket # 42188, Pour # 2797, 08/22/2016

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APP-JE52-Z0R-001, Rev 3, "AP1000 Class 1E Pressure and Differential Pressure Transmitters Data Sheet Report"

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SV4-CA20-S4-03006, "Auxiliary Building Areas 5 & 6 CA20 Module Subassembly 3 Wall 4 Internal Face Structural Outline Sections & Details," Revision 0;

SV4-CA20-S4-03010, "Auxiliary Building Areas 5 & 6 CA20 Module Subassembly 3 Structural Outline Sections & Details," Sheet 1, Revision 3;

SV4-CA20-S4B-03001, "Auxiliary Building Areas 5 & 6 CA20 Module Subassembly 3 Bill of Materials," Revision 0;

SV4-CA20-S4K-CV13386, "CA20-47, 48, 49, & 50 Installation of Ledger Angles," Revision 9;

SV4-CA20-S4K-CV13387, "CA20-47, 48, 49, & 50 Installation of Submodule Floors," Revision 2;

SV4-CA20-S5Y-00003, "Auxiliary Building Areas 5 & 6 Module CA20 Submodules General Notes II," Revision 7;

SV4-CA20-S5Y-00004, "Auxiliary Building Areas 5 & 6 Module CA20 Submodules General Notes II," Revision 3;

SV4-CA20-S5Y-00201, "Auxiliary Building Areas 5 & 6 Module CA20 Standard Welding Details," Revision 0

**Welding / Inspection Records**

Welding Records for: CV13386-5T and CV13387-1;

S561-16-17507 (VT Report for CV13387-1);

V-16-MT-302-2270 (MT Report for CV13387-1);  
 V-16-UT-310-0952 (UT Report for CV13387-1);  
 WMR # 186877, 08/03/2016;  
 WMR # 187810, 08/06/2016;  
 WMR # 188793, 08/09/2016;  
 Welder Performance Qualification Test # 2CS-03, ID 5844, 02/26/2015;  
 Welder Performance Qualification Test # 2CS-03, ID 8664, 06/27/2014;  
 Welder Performance Qualification Test # 2CS-05, ID 7999, 03/24/2015;  
 Welder Performance Qualification Test # 2CS-07-O, ID 7999, 08/04/2015;  
 Welding Filler Material Procurement Specification, DMD-M-NS-55\_8018\_C1\_SMAW-02,  
 11/17/2014

#### Material Test Reports

Certificate of Conformance and Certified Material Test Report from The Lincoln Electric Company, Customer PO # 132175-FPR12-01836-4, Lot 1068F;  
 Certificate of Conformance and Certified Material Test Report from The Lincoln Electric Company, Customer PO # 132175-FPR12-01836-7, Lot 1229P;  
 Certificate of Conformance and Certified Material Test Report from The Lincoln Electric Company, Customer PO # 132175-FPR12-01836-7, Lot 1231K;  
 Certified Material Test Report from Edgen Murray Corporation, Customer PO # 2786-00008, ASTM A992, Heat # JW14102030;  
 Certified Material Test Report from Edgen Murray Corporation, Customer PO # 766659 OI, ASTM A36, Heat # JI5426

#### Procedures

GWS-2, "AWS D1.1 - Structural Steel General Welding Specification," Revision 5;  
 100-MT-302, "Magnetic Particle Examination in accordance with AWS Structural Welding Code," Revision 3;  
 100-UT-310, "Ultrasonic Examination of Welds in Accordance with the AWS Structural Welding Code D1.1," Revision 6;  
 WPS2-1.1M73, Revision 10;  
 WPS2-1.1S03, Revision 6

#### Nonconformance and Disposition Reports

SV4-CA20-GNR-000094, "SA3 Ledger Angle Fit Up," Revision 0

#### **Section 1A21**

Work Package SV4-CA20-S4W-CV5628, "CA20-25 to CA20-22B"  
 IR S561-16-11779  
 IR V-16-PT-304-0290  
 IR Q445-15-11633  
 IR Q445-15-10419  
 Weld Record CV13176-L26-1, Rev. 0  
 Weld Record CV13176-L26-1-RW1, Rev. 0  
 Weld Record CV13176-L26-2, Rev. 1  
 Weld Record CV13176-L26-3, Rev. 1  
 Weld Record CV13176-L26-4, Rev. 1  
 Weld Record CV13176-L26-8, Rev. 8  
 SV0-CA20-GEF-000052, "CA-20-SWD-16B Fillet Weld Callouts," Rev 0  
 APP-CA20-GEF-1458, "Weld Callout at Top and Bottom of Leak Chase," Rev. 0

APP-CA20-GEF-1513, "CA20 - Tolerance Clarification," Rev. 0  
 Drawing SV4-CA20-S4K-CV12202, Rev. 1  
 Drawing SV0-0000-MHK-R10572, Rev. 1

## **Section 1A22**

### Program Documents:

APP-GW-GRR-011, Rev 0, "AP1000 Design Reliability Assurance Program Inspections, Tests, Analyses and Acceptance Criteria Report"  
 APP-GW-GAH-020, Rev 6, "AP1000® Plant Systems, Structures, and Components Quality Requirements"  
 APP-GW-GA-200, Rev 2, "AP1000 Quality Assurance Requirements for RTNSS Systems, Structures and Components"  
 APP-GW-GRR-009, Rev 3, "AP1000 Design Reliability Assurance Program"  
 APP-GW-GL-026, Rev 2, "AP1000 Implementation of the Regulatory Treatment of Nonsafety-Related Systems Process"  
 APP-MG02-GA-001, Rev 0, "AP1000 Quality Assurance Requirements for the Supply of Control Rod Drive System Power Supply Hardware"

### Procedures:

W2-2.5-200, Rev 0.2, "Personnel Qualification and Certification Process"  
 W2-6.1-100, Rev 1, "Document Control"  
 W2-6.2-100, Rev 0.1, "Quality Assurance Records"  
 W2-8.4-101, Rev 0, "Design Review"  
 W2-8.4-102, Rev 0, "Design Document Verification"  
 W2-9.4-101, Rev 3, "Control of Purchased Items and Services"

### Purchase Orders:

4500298884, dated 3/30/09  
 4500298889, dated 3/30/09  
 4500328257, dated 12/23/09  
 4500328256, dated 12/23/09  
 4500667254, dated 4/30/15  
 4500667232, dated 4/30/15  
 4500611983, dated 7/29/13  
 4500611985, dated 7/29/13  
 132175-EA02.01, dated 5/14/15  
 132176-EA02.01, dated 5/14/15  
 132177-EA02.01, dated 5/26/15  
 132178-EA02.01, dated 5/26/15  
 4500447617, dated 9/10/12  
 4500448263, dated 9/14/12  
 4500298884, dated 3/30/09  
 4500298889, dated 3/30/09  
 4500328256, dated 12/23/09  
 4500328257, dated 12/23/09  
 4500439554, dated 6/22/12  
 4500445916, dated 8/23/12  
 4500454043, dated 11/9/12  
 4500466697, dated 3/11/13

Design Specifications:

APP-MP08-Z0-001, Rev 7, "RNS Centrifugal RHR Pumps"

APP-MP08-Z5-003, Rev 0, "Appendix 3--Technical and Quality Requirements for AP1000, MP08 RNS Centrifugal Normal RHR Pumps"

APP-JE52-Z0-001, Rev 4, "AP1000 General Design Equipment Specification for Class 1E Pressure and Differential Pressure Transmitters"

APP-JE52-Z0R-001, Rev 3, "AP1000 Class 1E Pressure and Differential Pressure Transmitters Data Sheet Report"

APP-MG02-Z0-001, Rev 1, "AP1000 Rod Drive Power Supply System Design Specification"

APP-PLS-J4-007, Rev 4, "AP1000 Plant Control System and Data Display System – System Design Specification"

APP-PLS-J4-189, Rev 1, "AP1000 Miscellaneous System Control Application Functional Specification for PLS"

APP-EA02-Z0-001, Rev 3, "Design Specification for Non-Class 1E AC Distribution Panels for EDS"

APP-PLS-J0R-001, Rev 0, "AP1000 Nuclear Steam Supply System (NSSS) Pressurizer Water Level Control System (PL) Requirements Traceability Matrix"

APP-PLS-J4-007, Rev 4, "AP1000 Plant Control System and Data Display System – System Design Specification"

APP-PV70-Z5-003, Rev 2, "Appendix 4: Quality Assurance Requirements for the Procurement and Delivery of AP1000 Squib Valves (PV70) In Support of AP1000 Projects"

APP-PV70-Z0-001, Rev 6, "Squib (Pyrotechnic Actuated) Valves, ASME Boiler and Pressure Vessel Code, Section III Class 1"

APP-PV70-Z0R-001, Rev 7, "PV70 Squib (Pyrotechnic Actuated) Valves, ASME Section III Class 1, Data Sheet Report"

APP-MP08-Z0-001, Rev 7, "RNS Centrifugal RHR Pumps"

APP-MP08-Z5-003, Rev 0, "Appendix 3 – Technical and Quality Requirements for AP1000, MP08 RNS Centrifugal Normal RHR Pumps"

APP-MV01-Z0-001, Rev 4, "AP1000 Reactor Pressure Vessel Functional Specification"

APP-PMS-J1-001, Rev 11, "AP1000 Protection and Safety Monitoring System Functional Requirements"

APP-PMS-J0R-001, Rev 3, "AP1000 Protection and Safety Monitoring System Requirements Traceability Matrix"

APP-PMS-J7X-001, Rev 3, "AP1000 Protection and Safety Monitoring System Equipment Classification List"

APP-JE00-J8-001, Rev 10, "AP1000 Guidelines for Instrument Installation"

Drawings:

APP-SGS-PLW-032, Rev 4, "Steam Generator System Auxiliary Building Room 12406 Main Steam Line A"

APP-SGS-PLW-042, Rev 5, "Steam Generator System Auxiliary Building Room 12404 Main Steam Line B"

APP-1215-CE-002, Rev 7, "Auxiliary Building Area 5 Pump RNS-MP-01A Anchor Bolts Locations 112162 - Plan at El 66'-6"

APP-1215-CE-003, Rev 6, "Auxiliary Building Area 5 Pump RNS-MP-01B Anchor Bolts Locations 112163 - Plan at El 66'-6"

APP-MZ12-V1-001, Rev 1, "RNS Pumps A & B Auxiliary Building Area 5 Structural Steel Support Frame Plan and Elevation"

APP-MZ12-V1-002, Rev 1, "RNS Pumps A & B Auxiliary Building Area 5 Pump Supports Plan and Details"

APP-RNS-PLW-09A, Rev 3, "Normal Residual Heat Rem. System Auxiliary Building Room 12162 RNS Pump Suction Lines (pump MP 01A)"  
 APP-RNS-PLW-09B, Rev 3, "Normal Residual Heat Rem. System Auxiliary Building Room 12163 RNS Pump Suction Lines (pump MP 01B)"  
 APP-RNS-PLW-141, Rev 3, "Normal Residual Heat Rem. System Auxiliary Building Room 12162/12262 MP-01A Discharge from Pump to ME-01A"  
 APP-RNS-PLW-161, Rev 3, "Normal Residual Heat Rem. System Auxiliary Building Room 12163/12262 MP-01B Discharge from Pump to ME-01B"  
 APP-CP65-S5-017, Rev 2, "Containment Building Areas 2& 3 Assembled CB 65 VCS Enclosure Assembly Drawing I"  
 APP-CP65-S5-018, Rev 1, "Containment Building Areas 2& 3 Assembled CB 65 VCS Enclosure Assembly Drawing II"  
 APP-FA01-V2-101, Rev 3, "AP1000 Fuel Assembly Interface Parameters 17×17×168 Active Fuel"  
 APP-FA01-V2-102, Rev 3, "AP1000 Fuel Assembly 17×17×168 Active Fuel Sections and Details"

## **Section 1P01**

### Design Drawings

SV3-PXS-M6-001-R2, "Piping and Instrumentation Diagram Passive Core Cooling System," Revision 2  
 SV3-PXS-M6-002-R4, "Piping and Instrumentation Diagram Passive Core Cooling System," Revision 4  
 SV3-PXS-M6-003-R4, "Piping and Instrumentation Diagram Passive Core Cooling System," Revision 4  
 SV3-RCS-M6-001-R5, "Piping and Instrumentation Diagram Reactor Coolant System," Revision 5  
 SV3-RCS-M6-002-R6, "Piping and Instrumentation Diagram Reactor Coolant System," Revision 6  
 SV3-RCS-M6-003-R4, "Piping and Instrumentation Diagram Reactor Coolant System," Revision 4  
 SV3-RCS-M6-004-R4, "Piping and Instrumentation Diagram Reactor Coolant System," Revision 4

### Design Specifications

SV3-GW-P0-007, "AP1000 Specification for Shop Fabricated Piping," Revision 4  
 SV3-GW-P0-008, "AP1000 Specification for Field Fabricated Piping and Installation, ASME III, Code Classes 1, 2, and 3 and ASME B31.1," Revision 4  
 SV3-GW-VLR-002, "Technical Requirements of Stainless Steels, Nickel-Base Alloys, Carbon and Low Alloy Steels, and Welding Materials for the AP1000," Revision 1  
 SV3-GW-VLR-010, "AP1000 Supplemental Fabrication and Inspection Requirement," Revision 2  
 SV3-MB01-VW-021, "Engineering Requirements for Welding Procedure Qualifications for ASME Code Section III-NB Pressure Boundary Overlay And Attachment Welds," Revision 0  
 SV3-PH02-Z0-001, "AP1000 ASME Section III Class 1, 2, and 3 and Seismic Category II Pipe Supports/Tubing Supports/Instrument Rack Supports," Revision 2  
 SV3-PH02-Z0-002, "AP1000 ASME Section III Class 1, 2, and 3 Pipe Supports/Tubing Supports," Revision 3  
 SV3-PL02-Z0-001, "Piping Class Sheets and Standard Details," Revision 5  
 SV3-PL02-Z0-101, "AP1000 Class 1 Piping and Non-Class 1 Extensions Design Specification," Revision 3

SV3-PL02-Z0-102, "AP1000 Class 2, 3 Piping and B31.1 Extensions Design Specification," Revision 3

#### Engineering & Design Coordination Reports

APP-ML05-GEF-154, "Addition of Identifying Weld Number," Revision 0  
 APP-ML05-GEF-155, "Penetration Testing Correction," Revision 0  
 APP-ML05-GEF-175, "11305-ML-P01/P02 Missing Weld," Revision 0  
 APP-ML05-GEF-194, "ML05 Weld Detail Clarification," Revision 0  
 APP-PXS-GEF-116, "E&DCR to Delete Pipe End Prep Note on Various PXS Drawings Related to IRWST and Containment Recirculation Screens," Revision 0  
 APP-PXS-GEF-306, "E&DCR to Update Pipe End Prep Note on Various PXS Drawings Related to IRWST and Containment Recirculation Screens," Revision 0  
 APP-PXS-GEF-398, "Remove Conflicting Hydro Test Requirements from Design Drawings," Revision 0  
 SV0-VW40-GEF-000001, "H2 Extended Interval Testing," Revision 0

#### Welding Filler Material Procurement Specifications

TR-5.1-7018-SMAW, "E7018 Carbon Steel Covered Welding Electrodes," Revision 2  
 TR-5.5-8018-B2-SMAW, "Low-Alloy Steel Electrodes," Revision 1  
 TR-5.9-3XXL-GTAW, "Stainless Steel Bare Wire / Rods," Revision 3  
 TR-5.9-308L / 316L, "ER308L / ER316L Stainless Steel Bare Wire / Rods," Revision 0  
 TR-5.14-NiCrFe-GTAW, "ERNiCrFE-7A / ERNiCrFE-7 Bare Nickel and Nickel-Alloy Welding Rods," Revision 0  
 TR-5.18-70S-X-GTAW, "E70S-X, Carbon Steel Bare Wire," Revision 1  
 TR-5.28-80S-B2-GTAW, "Low Alloy Steel Bare Wire / Rod," Revision 1

#### **Section 1P02**

#### Welding Filler Material Procurement Specifications

TR-5.1-7018-SMAW, "E7018 Carbon Steel Covered Welding Electrodes," Revision 2;  
 TR-5.5-8018-B2-SMAW, "Low-Alloy Steel Electrodes," Revision 1;  
 TR-5.9-3XXL-GTAW, "Stainless Steel Bare Wire / Rods," Revision 3;  
 TR-5.9-308L / 316L, "ER308L / ER316L Stainless Steel Bare Wire / Rods," Revision 0;  
 TR-5.14-NiCrFe-GTAW, "ERNiCrFE-7A / ERNiCrFE-7 Bare Nickel and Nickel-Alloy Welding Rods," Revision 0;  
 TR-5.18-70S-X-GTAW, "E70S-X, Carbon Steel Bare Wire," Revision 1;  
 TR-5.28-80S-B2-GTAW, "Low Alloy Steel Bare Wire / Rod," Revision 1

#### Design Specifications

SV3-GW-P0-007, "AP1000 Specification for Shop Fabricated Piping," Revision 4;  
 SV3-GW-P0-008, "AP1000 Specification for Field Fabricated Piping and Installation, ASME III, Code Classes 1, 2, and 3 and ASME B31.1," Revision 4;  
 SV3-GW-VLR-002, "Technical Requirements of Stainless Steels, Nickel-Base Alloys, Carbon and Low Alloy Steels, and Welding Materials for the AP1000," Revision 1;  
 SV3-GW-VLR-010, "AP1000 Supplemental Fabrication and Inspection Requirement," Revision 2;  
 SV3-MB01-VW-021, "Engineering Requirements for Welding Procedure Qualifications for ASME Code Section III-NB Pressure Boundary Overlay And Attachment Welds," Revision 0  
 SV3-PH02-Z0-001, "AP1000 ASME Section III Class 1, 2, and 3 and Seismic Category II Pipe Supports/Tubing Supports/Instrument Rack Supports," Revision 2

SV3-PH02-Z0-002, "AP1000 ASME Section III Class 1, 2, and 3 Pipe Supports/Tubing Supports," Revision 3  
 SV3-PL02-Z0-001, "Piping Class Sheets and Standard Details," Revision 5  
 SV3-PL02-Z0-101, "AP1000 Class 1 Piping and Non-Class 1 Extensions Design Specification," Revision 3  
 SV3-PL02-Z0-102, "AP1000 Class 2, 3 Piping and B31.1 Extensions Design Specification," Revision 3

#### Material Test Reports

Certificate of Conformance and Certified Material Test Report from The Lincoln Electric Company, Customer PO # 132175-FPR12-01836-8, Lot 1256C;  
 Certificate of Conformance and Certified Material Test Report from The Lincoln Electric Company, Customer PO # 132175-FPR12-01836-9, Lot 1117K;  
 Certificate of Conformance and Certified Material Test Report from The Lincoln Electric Company, Customer PO # 695750-000 3P, Lot 1030J;  
 Certificate of Conformance and Certified Material Test Report from The Lincoln Electric Company, Customer PO # 695750-000 3P, Lot 1030K

#### Corrective Action Reports

SNC Condition Report 10265514  
 WEC CAPAL 100407561

#### **Section 1P03**

Nonconformance & Disposition Report SV4-CA20-GNR-000118, "Final Location of Unit 4 CA20 Exceeds Design Tolerances," Revision 0  
 Procedure ND-CA-VNP-013, "Nuclear Development Compliance Monitoring Program (CMP) Surveillance Program," Version 11.0  
 Procedure QAD 18.12, "Quality Assurance Surveillances," Revision 03.01  
 Surveillance Report CMP-NI-2016-7-12030, "Review of contractor's rigging plan for Unit 4 CA20 Lift/Set activities," 08/24/2016  
 Surveillance Report S-132175-2016-082, "Jack and Weigh, Transport, Lift and Setting of CA20 Module NI4," 08/22/2016  
 Work Package SV4-CA20-CAW-850000, "CA20 Module Installation," Revision 0

#### **Section 1P04**

CWP-1, "Construction Welding Program," Revision 4  
 FMC-1, "Filler Material Control," Revision 7  
 GPS-1, "General Purging Standard," Revision 02.01  
 GWS-1, "ASME General Welding Specification," Revision 5  
 PQ-1, "Welding Procedure Qualification," Revision 8  
 PWHT-1, "Postweld Heat Treatment," Revision 04.01  
 QS 08.12, "Material Identification and Control," Revision 01.04  
 WQ-1, "Qualification of Welders and Welding Operations," Revision 5  
 WQT, "Welder Qualification Test Index," Revision 76

#### WECTEC Welding Procedure Specifications [supporting PQR(s) are linked with indicated Rev.-No.]

WPS1 Index, Revision 66  
 WPS1-1.1GTSM-NF-2, Revision 2  
 WPS1-1.3GT(M)SM-NF-1, Revision 0



WPS1-1.4C20, Revision 2  
 WPS1-1.8GT-NF-1, Revision 2  
 WPS1-1.10HT01, Revision 2  
 WPS1-3.3F-NF-01, Revision 1  
 WPS1-3.3GT(M)SM-NF-3, Revision 1  
 WPS1-4.4C30, Revision 4  
 WPS1-4.8GT(M)-NC-1, Revision 1  
 WPS1-8.8M01, Revision 1  
 WPS1-8.8T01, Revision 9  
 WPS1-8.10HGT-NC-2, Revision 1  
 WPS1-8.10HGT-ND-1, Revision 1  
 WPS1-8.10HGT-NF-6, Revision 1  
 WPS1-8.10HT01, Revision 3  
 WPS1-10H.10T01, Revision 2

MISTRAS NDE Documents:

100-QC-005.2, "Qualification and Certification of Nondestructive Test Personnel," Revision 4  
 100-PT-301, "Liquid Penetrant Examination in Accordance with ASME Section V, Article 6,"  
 Revision 9  
 100-MT-301, "Magnetic Particle Examination in Accordance with ASME Section V, Article 7,"  
 Revision 2  
 100-RT-301, "Radiographic Examination in Accordance with ASME Section V, Article 2,"  
 Revision 1  
 100-RT-302, "Radiographic Examination Using Computed Radiography in Accordance with  
 ASME Section V, Article 2," Revision 4

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WECTEC Procedures

QS 14.02, "Inspection Report System," Revision 06.01  
 F-S562-005, "Pipe Welding / Braze; ASME Section III Visual Pipe Weld Inspection," Revision 3  
 QAD 09.12, "Visual Examination ASME III NF/NG (Nondestructive)," Revision 05.03

NDE Records

100-RT-302, "Radiographic Examination Using Computed Radiography in Accordance with  
 ASME Section V, Article 2," Revision 4  
 V-16-RT-302-0130 (Final RT Report for SV3-PXS-PLW-029-1), Dated 07/11/2016  
 V-16-RT-302-0145 (Final RT Report for SV3-PXS-PLW-029-2-RW1), Dated 07/11/2016  
 RT Level II Certification # 15580, Dated 04/28/2015  
 RT Level II Certification # 16168, Dated 07/17/2015  
 RT Level III Certification # 10674, Dated 06/14/2013  
 RT Level III Certification # 17420, Dated 01/05/2016  
 RT Level III Certification # 18526, Dated 06/20/2016

**Section 1P06**

Calculations

APP-1010-CCC-004, "Basemat Design, Below Shield Building," Revision 5  
 APP-1100-S2C-034, "Finite Element Solid Shell Model of Containment Internal Structures,"  
 Revision 3

APP-1100-S3C-777, "Containment Internal Structures Design Calculation – CA01, CA02, and CA05 Walls and Connections," Revision 1  
 APP-1100-SUC-003, "General Design of Shear Studs for Structural Modules for Inside Containment and CA20," Revision 5

#### Engineering and Design Coordination Reports

APP-1100-GEF-250, "Additional Check in General Shear Connector Design," Revision 0  
 APP-1208-GEF-240, "Shield Building, SC Panels, Fillet Weld Size Change to C3J Weldable Coupler," Revision 1  
 APP-1208-GEF-251, "Shield Building, SC Panels, Coupler Fillet Weld Size Change EL.100'-0" to EL. 113'-6," Revision 1  
 SV0-AX01-GEF-000001, Sherwin Williams Paint, Rev. 0  
 APP-CR01-GEF-065, "Annulus Tunnel Wall Horizontal Reinforcement Bars," Revision 0  
 SV0-0000-GEF-000224, "VEGP Concrete General Notes Update," Revision 1  
 SV0-0000-GEF-000227, "VEGP Concrete General Notes Update," Revision 0  
 SV0-CC01-GEF-000309, "Curing Period for Mass Concrete," Revision 0

#### Miscellaneous

APP-GW-C1-003, "Selection Manual of Standard Attachments," Rev. 5  
 Management Assessment Plan and Report MA-CONST-2015-0003  
 10CFR21/10CFR50.55(e) Evaluation, Evaluation Identification Number 16-0067 & associated N&D APP-CA01-GNR-851075, "TANE-Toshiba\_NNRK 1622221-A\_Stud missing at break in vert angle\_(CA01\_08\_SV4)

#### Nonconformance & Disposition Reports

SV3-CA01-GNR-000851, "CV7792-3 BMR1 Incorrect Test Method, Magnetic Particle Test of Duplex," Revision 0;  
 SV3-1130-GNR-000002, "Vertical T-Heads interfering with Penetration," Revision 0  
 SV3-CA01-GNR-000798, "OLP-03-067 SM-13 Stud obstruction," Revision 0  
 SV3-CA01-GNR-000804, "CA01 B-plate & OLP Interferences," Revision 0  
 SV3-CA01-GNR-000805, "RV Compartment B-plate Interferences," Revision 0  
 SV3-CA01-GNR-000833, "CA01-42: WDS CV7281-4-BMR 1 Incorrect Preheat," Revision 0  
 SV3-CC01-GNR-000264, "Unit 3 NI Wall Placement 13 Concrete Repairs," Revision 0  
 SV3-CC01-GNR-000267, "Unit 3 NI Wall Placement 7 "Column Line 11" Concrete Repairs," Revision 0  
 SV3-CC01-GNR-000268, "Unit 3 NI Wall Placement 9 "East Face" & 10 "West Face" Concrete Repairs," Revision 0  
 SV3-CC01-GNR-000273, "Formwork Leakage Placement 8BZ," Revision 0  
 SV3-CC01-GNR-000276, "Unit-3 Aux Bldg: Wall Thickness less than design on 11-line," Revision 0  
 SV3-CC01-GNR-000314, "Void underneath CA01\_40 sump," Revision 0  
 SV3-CE01-GNR-000181, "12207-CE-PW919 Out of Tol.," Revision 0  
 SV3-CE01-GNR-000183, "CA02 Landing Plate Out of Tolerance," Revision 0  
 SV3-CR01-GNR-000511, "U3 AUX BLDG Interference," Revision 0  
 SV3-CR01-GNR-000512, "AUX BLDG 4-LINE Splice Length," Revision 0  
 SV3-CR01-GNR-000517, "Annulus Tunnel Ceiling Elev. 100'-0"," Revision 0  
 SV3-CR01-GNR-000518, "Annulus Ceiling Missing #11," Revision 0  
 SV3-CR01-GNR-000520, " Type 3CJ Missing out of 87'-6" East Placement," Revision 0  
 SV3-CR01-GNR-000522, "Embed Plate Clearances 7.2/7.3 Opening," Revision 0  
 SV4-1110-GNR-000001, "Missed QC Inspections," Revision 0  
 SV4-CA05-GNR-000015, "CA05 coupler concrete consolidation clearance," Revision 0

SV4-CA05-GNR-000016, "OLP CA05.25 Additional Clear Spacing Violations," Revision 0  
 SV4-CC01-GNR-000115, "U4 Aux. Bldg Interior Wall Placement #31 – Out of ACI Tolerances,"  
 Revision 0  
 SV4-CC01-GNR-000116, "U4 Aux. Bldg Interior Wall Placement #32 – Out of ACI Tolerances,"  
 Revision 0  
 SV4-CC01-GNR-000118, "U4 Aux. Bldg Interior Wall Placement #30 – Out of ACI Tolerances,"  
 Revision 0  
 SVS-CE01-GNR-000176, "DWA Embed Plates – EL 82'6", " Revision 0

#### Procedures

APP-GW-GAP-428, "Nonconformance and Disposition Report (N&D)," Revision 9  
 APP-GW-GAP-147, "AP1000 Current Licensing Basis Review," Revision 3  
 APP-GW-GAP-106, "Corrective Action Interface," Revision 8  
 APP-GW-GAP-420, "Engineering and Design Coordination Reports," Revision 10  
 CSI 3-35, "Concrete Placement," Revision 0  
 NCSP03-31, "Concrete Placement," Revision 04.01  
 QAD 16.02, "Significance Evaluation Screening," Revision 01.00  
 QAD 15.01, "Nonconformance & Disposition Tagging," Revision 03.00  
 QS 15.01, "Nonconformance & Disposition Report," Revision 06.02  
 QS 15.01, "Nonconformance & Disposition Report," Revision 07.00  
 QS 16.05, "Corrective Action Program," Revision 09.00  
 QS 16.03, "Identifying and Reporting Defects and Failures to Comply under 10CFR21 and  
 10CFR50.55(e)," Revision 05.00  
 W2-5.1-102, "Issue Review Committee," Revision 1.0

#### Quality Assurance Inspection Reports

C112-15-10183, Pre-placement: Concrete, 7/24/15  
 C112-15-10168, Pre-placement: Concrete, 7/28/15  
 C113-15-10013, Placing Safety Related Concrete, 8/17/15  
 C113-15-10020, Placing Safety Related Concrete, 9/3/15  
 C114-15-10079, "Post Placement: Concrete," 11/30/15  
 C114-15-10082, "Post Placement: Concrete," 11/30/15  
 C114-15-10083, "Post Placement: Concrete," 11/30/15

#### SNC Condition Reports

10096219  
 10112015  
 10133540  
 10149630  
 10165743  
 10171978  
 10187794  
 10190173  
 10236402  
 10184054  
 10221404

#### WEC Corrective Action, Prevention and Learnings

100312306  
 100326560  
 100382034

100398482  
 100397655  
 100396972  
 100398091  
 100398240

WECTEC Corrective Action Reports

2015-2076  
 2015-2587  
 2015-4063  
 2015-4478  
 2016-0029  
 2016-0102  
 2016-1158  
 2016-1161  
 2016-1351

**Section 1P07**

CAR 2014-1961

Selected Supplier Quality Scorecard Metrics, dated August 02, 2016  
 Supplier Quality Committee Meeting Minutes, dated August 11, 2016  
 Nuclear Engineering Training Matrix, Rev. 7  
 NUC-SQC-001, "Supplier Quality Committee Charter," dated July 22, 2016  
 APP-GW-GAP-420, "Engineering and Design Coordination Reports," Rev. 10  
 PROC-I-002, "Supplier Source Inspection Coordination," Rev. 5  
 PROC-I-003, "Inspections At Suppliers' Facilities," Rev. 6  
 PROC-I-004, "Qualification And Certification Of Inspection And Test Personnel", Rev. 4  
 PROC-P-024, "Use And Conduct Of Pre-Award Meetings," Rev. 2  
 PROC-P-031, "Use And Conduct Of Supplier Kickoff Meetings," Rev. 2  
 QAD 07.04, "Supplier Quality Performance Management," Rev. 00.00  
 QAD 18.01, "Quality Assurance Audits," Rev. 09.01  
 QAD 18.12, "Quality Assurance Surveillances," Rev. 03.01  
 QAD 18.13, "Quality Assurance Supplier Surveillances," Rev. 03.01  
 QS 03.01, "Standard QA Program Requirements in Procurement Documents," Rev. 06.03  
 QS 04.03, "Office Procurement and the Selection of Suppliers," Rev. 06.00  
 QS 09.04, "Visual Examination - Structural Welding AP1000 Modules - Safety Related," Rev. 03.01  
 QS 16.05, "Corrective Action Program," Rev. 09.00  
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 QS 16.05, "Corrective Action Program," Rev. 06.00  
 QS 18.01, "Quality Audit Program," Rev. 04.00  
 W2-5.1-101, "Westinghouse Corrective Action Program," Rev. 1.0  
 W2-5.1-102, "Issue Review Committee," Rev. 1.0  
 W2-5.1-201, "Identification and Reporting of Conditions Adverse to Nuclear Safety," Rev. 0.0

## LIST OF ACRONYMS

AISC	American Institute of Steel Construction
ASME	American Society of Mechanical Engineers
ASTM	American Society of Testing Materials
AWS	American Welding Society
CAR	Corrective Action Report
CFR	Code of Federal Regulations
CMTR	Certified Material Test Reports
COL	Combined License
DAPP	Domestic AP1000 Project Procedure
DCO	Division of Construction Oversight
D-RAP	Design Reliability Assurance Program
DVI	Direct Vessel Injection
E&DCRs	Engineering and Design Coordination Reports
FCAW	Flux Core Arc Welding
GMAW	Gas Metal Arc Welding
GTAW	Gas Tungsten Arc Welding
IMC	Inspection Manual Chapter
IP	Inspection Procedure
IR	Inspection Report
IRWST	In-containment Refueling Water Storage Tank
ITAAC	Inspections, Tests, Analysis, and Inspection Criteria
M&TE	Measuring and Test Equipment
MIR	Material Issue Record
MT	Magnetic particle Testing
N&D	Nonconformance and Disposition report
NDE	Nondestructive Examination
NRC	Nuclear Regulatory Commission
NRO	Office of New Reactors
PARS	Publicly Available Records
PQR	Procedure Qualification Record
PT	Liquid Penetrant Testing
PWHT	Postweld Heat Treatment
PXS	Passive Core Cooling System
QA	Quality Assurance
QAD	Quality Assurance Directive
QC	Quality Control
QS	Quality Standard
RT	Radiographic Testing
SMAW	Shielded Metal Arc Welding
SNC	Southern Nuclear Company
SSC	System, Structure, or Component
UFSAR	Updated Final Safety Analysis Report

UT	Ultrasonic Testing
VEGP	Vogtle Electric Generating Plant
VT	Visual Testing
WEC	Westinghouse Electric Company
WMR	Welding Material Requisitions
WPS	Welding Procedure Specification

**ITAAC INSPECTED**

No.	ITAAC No.	Design Commitment	Inspections, Tests, Analysis	Acceptance Criteria
91	2.2.01.02a	2.a) The components identified in Table 2.2.1-1 as ASME Code Section III are designed and constructed in accordance with ASME Code Section III requirements.	Inspection will be conducted of the as-built components as documented in the ASME design reports.	The ASME Code Section III design reports exist for the as-built components identified in Table 2.2.1-1 as ASME Code Section III.
93	2.2.01.03a	3.a) Pressure boundary welds in components identified in Table 2.2.1-1 as ASME Code Section III meet ASME Code Section III requirements.	Inspection of the as-built pressure boundary welds will be performed in accordance with the ASME Code Section III.	A report exists and concludes that the ASME Code Section III requirements are met for non-destructive examination of pressure boundary welds.
96	2.2.01.04a.ii	4.a) The components identified in Table 2.2.1-1 as ASME Code Section III retain their pressure boundary integrity at their design pressure.	ii) Impact testing will be performed on the containment and pressure-retaining penetration materials in accordance with the ASME Code Section III, Subsection NE, to confirm the fracture toughness of the materials.	ii) A report exists and concludes that the containment and pressure-retaining penetration materials conform with fracture toughness requirements of the ASME Code Section III.
140	2.2.02.07b.iii	7.b) The PCS wets the outside surface of the containment vessel. The inside and the outside of the containment vessel above the operating deck are coated with an inorganic zinc material.	iii) Inspection of the containment vessel interior coating will be conducted.	iii) A report exists and concludes that the containment vessel interior surface is coated with an inorganic zinc coating above 7' above the operating deck.

No.	ITAAC No.	Design Commitment	Inspections, Tests, Analysis	Acceptance Criteria
160	2.2.03.02b	2.b) The piping identified in Table 2.2.3-2 as ASME Code Section III is designed and constructed in accordance with ASME Code Section III requirements.	Inspection will be conducted of the as-built piping as documented in the ASME design reports.	The ASME Code Section III design reports exist for the as-built piping identified in Table 2.2.3-2 as ASME Code Section III.
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.
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.



No.	ITAAC No.	Design Commitment	Inspections, Tests, Analysis	Acceptance Criteria
761	3.3.00.02a.i.b	2.a) The nuclear island structures, including the critical sections listed in Table 3.3-7, are seismic Category I and are designed and constructed to withstand design basis loads as specified in the Design Description, without loss of structural integrity and the safety-related functions.	i) An inspection of the nuclear island structures will be performed. Deviations from the design due to as-built conditions will be analyzed for the design basis loads.	i.b) A report exists which reconciles deviations during construction and concludes that the as-built shield building structures, including the critical sections, conform to the approved design and will withstand the design basis loads specified in the Design Description without loss of structural integrity or the safety-related functions.
762	3.3.00.02a.i.c	2.a) The nuclear island structures, including the critical sections listed in Table 3.3-7, are seismic Category I and are designed and constructed to withstand design basis loads as specified in the Design Description, without loss of structural integrity and the safety-related functions.	i) An inspection of the nuclear island structures will be performed. Deviations from the design due to as-built conditions will be analyzed for the design basis loads.	i.c) A report exists which reconciles deviations during construction and concludes that the as-built structures in the non-radiologically controlled area of the auxiliary building, including the critical sections, conform to the approved design and will withstand the design basis loads specified in the Design Description without loss of structural integrity or the safety-related functions.

No.	ITAAC No.	Design Commitment	Inspections, Tests, Analysis	Acceptance Criteria
763	3.3.00.02a.i.d	2.a) The nuclear island structures, including the critical sections listed in Table 3.3-7, are seismic Category I and are designed and constructed to withstand design basis loads as specified in the Design Description, without loss of structural integrity and the safety-related functions.	i) An inspection of the nuclear island structures will be performed. Deviations from the design due to as-built conditions will be analyzed for the design basis loads.	i.d) A report exists which reconciles deviations during construction and concludes that the as-built structures in the radiologically controlled area of the auxiliary building, including the critical sections, conform to the approved design and will withstand the design basis loads specified in the Design Description without loss of structural integrity or the safety-related functions.
841	3.7.00.01	1. The D-RAP ensures that the design of SSCs within the scope of the reliability assurance program (Table 3.7-1) is consistent with the risk insights and key assumptions (e.g., SSC design, reliability, and availability).	An analysis will confirm that the design of RAP SSCs identified in Table 3.7-1 has been completed in accordance with applicable D-RAP activities.	An analysis report documents that safety-related SSCs identified in Table 3.7-1 have been designed in accordance with a 10 CFR 50 Appendix B quality program. An analysis report documents that non-safety-related SSCs identified in Table 3.7-1 have been designed in accordance with a program that satisfies quality assurance requirements for SSCs important to investment protection.