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

May 12, 2017

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

SUBJECT: VOGTLE ELECTRIC GENERATING PLANT UNITS 3 AND 4 - NRC INTEGRATED INSPECTION REPORTS 05200025/2017001, 05200026/2017001

Dear Mr. Yox:

On March 31, 2017, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at Vogtle Electric Generating Plant (VEGP) Units 3 and 4. The enclosed inspection report documents the inspection results, which the inspectors discussed on April 13, 2017 with Mr. Mark Rauckhorst and other members of your staff.

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

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

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

If you disagree with the cross-cutting aspects assigned to either finding, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the Regional Administrator, Region II, and the NRC Resident Inspector office at the Vogtle Electric Generating Plant Units 3 and 4.

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

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

Sincerely,

/**RA/**

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

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

Enclosure: NRC Inspection Report (IR) 05200025/2017001, 05200026/2017001
w/ attachment: Supplemental Information

cc:

Resident Manager
Oglethorpe Power Corporation
Alvin W. Vogtle Nuclear Plant
7821 River Road
Waynesboro, GA 30830

Office of the Attorney General
40 Capitol Square, SW
Atlanta, GA 30334

Southern Nuclear Op. Co.
Document Control Coordinator
42 Inverness Center parkway
Attn: B236
Birmingham, AL 35242

Anne F. Appleby
Olgethorpe Power Corporation
2100 East Exchange Place
Tucker, GA 30084

County Commissioner
Office of the County Commissioner
Burke County Commission
Waynesboro, GA 30830

Mr. Wayne Guilfoyle
Commissioner
District 8
Augusta-Richmond County Commission
4940 windsor Spring Rd
Hephzibah, GA 30815

Gwendolyn Jackson
Burke County Library
130 Highway 24 South
Waynesboro, GA 30830

Mr. Reece McAlister
Executive Secretary
Georgia Public Service Commission
Atlanta, GA 30334

Resident Inspector
Plant Vogtle 3&4
8805 River Road
Waynesboro, GA 30830

Mr. Barty Simonton
Team Leader
Environmental Radiation Program
Air Protection Branch
Environmental Protection Division
4244 International Parkway, Suite 120
Atlanta, GA 30354-3906

Mr. Robert E. Sweeney
IBEX ESI
4641 Montgomery Avenue
Suite 350
Bethesda, MD 20814

George B. Taylor, Jr.
2100 East Exchange Pl
Atlanta, GA 30084-5336

Brian H. Whitley
Director Regulatory Affairs
42 Inverness Center Parkway
BIN B237
Birmingham, AL 35242

Email

agaughtm@southernco.com (Amy Aughtman)
annacom@westinghouse.com (Michael J. Annacone)
awc@nei.org (Anne W. Cottingham)
Bartley.Higgins@hq.doe.gov (Bartley Higgins)
becky@georgiawand.org (Becky Rafter)
bhwhitley@southernco.com (Brian Whitley)
Bill.Jacobs@gdsassociates.com (Bill Jacobs)
bjadams@southernco.com (Brad Adams)
burrouno@westinghouse.com (Nicholle Burroughs)
bwwaites@southernco.com (Brandon Waites)
castelca@westinghouse.com (Curtis Castell)
comerj@westinghouse.com (James Comer)
couturgf@westinghouse.com (Gerald Couture)
crenshjw@westinghouse.com (John Crenshaw)
crpierce@southernco.com (C.R. Pierce)
dahjones@southernco.com (David Jones)
david.hinds@ge.com (David Hinds)
david.lewis@pillsburylaw.com (David Lewis)
dgbost@southernco.com (Danny Bost)
dlfulton@southernco.com (Dale Fulton)
drculver@southernco.com (Randy Culver)
durhamdc@westinghouse.com (David Durham)
ed.burns@earthlink.net (Ed Burns)
edavis@pegasusgroup.us (Ed David)
erg-xl@cox.net (Eddie R. Grant)
fdhundle@southernco.com (Forrest Hundley)
G2NDRMDC@southernco.com (SNC Document Control)
graysw@westinghouse.com (Scott W. Gray)
james1.beard@ge.com (James Beard)
jannina.blanco@pillsburylaw.com (Jannina Blanco)
jantol1dj@westinghouse.com (David Jantosik)
jenmorri@southernco.com (Jennifer Buettner)
JHaswell@southernco.com (JHaswell)
jim@ncwarn.org (Jim Warren)
John.Bozga@nrc.gov (John Bozga)
Joseph_Hegner@dom.com (Joseph Hegner)
jpredd@southernco.com (Jason R. Redd)
jranalli@meagpower.org (Jerry Ranalli)
jtgasser@southernco.com (Jeff Gasser)
karen.patterson@ttnus.com (Karen Patterson)
karlg@att.net (Karl Gross)
kdfili@southernco.com (Karen Fili)
kim.haynes@opc.com (Kim Haynes)
kmseiber@southernco.com (Kristin Seibert)

kmstacy@southernco.com (Kara Stacy)
KSutton@morganlewis.com (Kathryn M. Sutton)
kwaugh@impact-net.org (Kenneth O. Waugh)
lchandler@morganlewis.com (Lawrence J. Chandler)
markus.popa@hq.doe.gov (Markus Popa)
mcintyba@westinghouse.com (Brian McIntyre)
mdmeier@southernco.com (Mike Meier)
media@nei.org (Scott Peterson)
Melissa.Smith@Hq.Doe.Gov (Melissa Smith)
Michael.Kuca@hq.doe.gov (Michael Kuca)
mike.price@opc.com (M.W. Price)
mlgraves@southernco.com (Michelle Graves)
MSF@nei.org (Marvin Fertel)
myox@southernco.com (Mike Yox)
nirsnet@nirs.org (Michael Mariotte)
Nuclaw@mindspring.com (Robert Temple)
patriciaL.campbell@ge.com (Patricia L. Campbell)
Paul@beyondnuclear.org (Paul Gunter)
pbessette@morganlewis.com (Paul Bessette)
r.joshi15@comcast.net (Ravi Joshi)
randall@nexusamllc.com (Randall Li)
rjarrett@southernco.com (Robyn Jarrett)
RJB@NEI.org (Russell Bell)
Ronald.Jones@scana.com (Ronald Jones)
russpa@westinghouse.com (Paul Russ)
rwink@ameren.com (Roger Wink)
sabinski@suddenlink.net (Steve A. Bennett)
sara@cleanenergy.org (Sara Barczak)
sblanton@balch.com (Stanford Blanton)
sfrantz@morganlewis.com (Stephen P. Frantz)
Shiva.Granmayeh@hq.doe.gov (Shiva Granmayeh)
sjackson@meagpower.org (Steven Jackson)
skauffman@mpr.com (Storm Kauffman)
sroetger@psc.state.ga.us (Steve Roetger)
stephan.moen@ge.com (Stephan Moen)
taterrel@southernco.com (Todd Terrell)
tom.miller@hq.doe.gov (Tom Miller)
TomClements329@cs.com (Tom Clements)
Vanessa.quinn@dhs.gov (Vanessa Quinn)
Wanda.K.Marshall@dom.com (Wanda K. Marshall)
wasparkm@southernco.com (Wesley A. Sparkman)
wayne.marquino@gmail.com (Wayne Marquino)
weave1dw@westinghouse.com (Doug Weaver)
x2gabeck@southernco.com (Gary Becker)

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NAME	C. Jones	R. Kellner	A. Nielsen	D. Harmon	P. Carman	H. Je	J. Lizardi	J. Fuller	S. Temple
DATE	05/04/2017	05/04/2017	05/04/2017	05/04/2017	05/05/2017	05/10/2017	05/10/2017	05/09/2017	05/09/2017
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NAME	C Even	T. Chandler	P. Braxton	T. Brimfield	R. Mathis	T. Steadham	N. Coovert	A. Artayet	J. Christensen
DATE	05/10/2017	05/05/2017	05/11/2017	05/10/2017	05/09/2017	05/10/2017	05/09/2017	05/11/2017	05/10/2017
OFFICE	RII: DCO	RII: DCO	RII: DCO						
SIGNATURE	**/RA via email/**	**/RA via email/**	**JH**						
NAME	A. Lerch	C. Cheung	J. Heisserer						
DATE	05/08/2017	05/08/2017	05/12/2017						

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V. Hall, NRO
C. Weber, NRO
C. Haney, RII
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R. Nease, RII
A. Artayet, RII
P. Braxton, RII
T. Brimfield, RII
P. Carman
T. Chandler, RII
J. Christensen, RII
C. Cheung, RII
N. Coovert, RII
C. Even, RII
J. Fuller, RII
D. Harmon, RII
P. Heher, RII
H. Je, RII
C. Jones, RII
R. Kellner
G. Khouri, RII
A. Lerch, RII
J. Lizardi, RII
R. Mathis, RII
A. Nielsen. RII
T. Steadham, RII
S. Temple, RII
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U.S. NUCLEAR REGULATORY COMMISSION
Region II

Docket Numbers:	5200025 5200026
License Numbers:	NPF-91 NPF-92
Report Numbers:	05200025/2017001 05200026/2017001
Licensee:	Southern Nuclear Operating Company, Inc.
Facility:	Vogtle Electric Generating Plant Unit 3 Vogtle Electric Generating Plant Unit 4
Location:	Waynesboro, GA
Inspection Dates:	January 1, 2017 through March 31, 2017
Inspectors:	A. Artayet, Senior Construction Inspector, DCO P. Braxton, Resident Inspector, DCO T. Brimfield, Resident Inspector, DCO P. Carman, Construction Inspector, DCO T. Chandler, Resident Inspector, DCO C. Cheung, Construction Project Inspector, DCO J. Christensen, Construction Inspector, DCO N. Coovert, Senior Construction Inspector, DCO C. Even, Construction Project Manager, DCO J. Fuller, Senior Resident Inspector, DCO D. Harmon, Construction Inspector, DCO H. Je, Construction Inspector, DCO C. Jones, Senior Construction Inspector, DCO R. Kellner, Senior Health Physicist, DRS A. Lerch, Construction Inspector, DCO J. Lizardi-Barreto, Construction Inspector, DCO R. Mathis, Construction Inspector, DCO A. Nielsen, Senior Health Physicist, DRS T. Steadham, Senior Construction Inspector, DCO S. Temple, Resident Inspector, DCO
Accompanying Personnel:	Lauren Kent, Reactor Operations Engineer, NRO Jorge Cintron, Electrical Engineer, NRR Sheila Ray, Senior Electrical Engineer, NRR Yuken Wong, Senior Mechanical Engineer, NRO
Approved by:	Jamie Heisserer, Branch Chief Construction Inspection Branch 1 Division of Construction Oversight

Enclosure

SUMMARY OF FINDINGS

Inspection Report (IR) 05200025/2017001, 05200026/2017001; 01/01/2017 through 03/31/2017; Vogtle Electric Generating Plant Units 3 and 4, Inspection of the ITAAC-Related Welding Program.

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

A. NRC-Identified and Self Revealed Findings

Green. The inspectors identified an ITAAC finding of very low safety significance (Green) and associated NCV of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," for the licensee's failure to identify nonconforming welds between seismic category I structural modules associated with the Unit 4 In-Containment Refueling Water Storage Tank steel wall (IRWST) – module CA03. Specifically, the license failed to identify that welds 880718-A12 and 880717-A09 were nonconforming to section 5.11.5 of American Welding Society (AWS) Code D1.6:1999, in that these welds contained multiple locations of weld reinforcement that exceeded 1/8 inch and did not have a gradual transition to the plane of the base metal surface. The licensee entered this finding in their corrective action program as Corrective Action, Prevention and Learning (CAPAL) 100451345, Nonconformance and Disposition Report (N&D) SV4-CA03-GNR-000049, and SV4-CA03-GNR-000050. The licensee reworked the welds and restored compliance with the approved design.

The inspectors determined the performance deficiency was more than minor because Question 3 provided in IMC 0613, Appendix E was answered "Yes." Specifically, the inspectors considered the rework required to restore welds 880718-A12 and 880717-A09 to design requirements, to be substantive, based on the linear feet of nonconforming weld and because the rework invalidated the surface examinations that had already been performed... Using Appendix A, "AP1000 Construction Significance Determination Process," of IMC 2519, "Construction Significance Determination Process," the inspectors concluded this finding was of very low safety significance (Green) because the licensee demonstrated with reasonable assurance that the design function of the IRWST steel wall would not be impaired by the deficiency (Step 9 of Appendix A). This finding was cross-cutting in the area of Problem Identification and Resolution, Identification, because individuals did not identify issues completely, accurately, and in a timely manner in accordance with the corrective action program. [P.1] (Section 1A34)

B. Licensee-Identified Violations

None

REPORT DETAILS

Summary of Plant Construction Status

During this reporting period in Unit 3, the concrete was poured in the shield building courses 05 and 06. Additional reinforced concrete walls of the East side of the shield building were poured up to 117'6". In containment, concrete was placed up to 105'2" in parts of containment. Concrete was poured in the East steam generator compartment. In the auxiliary building, all concrete floors were poured up to 82'6". Components to be installed into containment continued to arrive onsite, specifically 14" squib valves and the Passive Residual Heat Removal (PRHR) heat exchanger.

In Unit 4, concrete was placed in parts of containment up to 87'6". In the Auxiliary building, walls and floors at 82'6" were installed. CA20, which makes up portions of areas 5 and 6 in the radiological controlled auxiliary building was placed and concrete poured up to 85'. In the shield building, the structural steel module courses 01 and 02 were placed. Concrete was poured on the west side of the shield building up to 103' and on the east side to 90'6". All submodules of CA03, which makes up the west wall of the IRWST were upended and welding is in progress.

1. CONSTRUCTION REACTOR SAFETY

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

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

1A01 (Unit 3) ITAAC Number 2.1.02.02a (13) / Family 06F

a. Inspection Scope

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

- 65001.06-02.01 - General Installation
- 65001.06-02.02 - Component Welding
- 65001.B-02.04-Production Controls
- 65001.B-02.05-Inspection
- 65001.F-02.02-Fabrication Records Review
- 65001.F-02.03-Observation of Fabrication Activities

The inspectors observed numerous construction activities associated with the installation of the Unit 3 "B" Steam Generator. Prior to the installation of the "B" steam generator intermediate level (SGIL) and lower level (SGLL) lateral support brackets, the inspectors observed the development and machining of the associated overlay weldments on the steam generator cubicle walls to determine if:

- design requirements in the approved fabrication procedures were in accordance with NF-4441 of the American Society of Mechanical Engineers (ASME) code;

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

The inspectors observed the installation of the two SGIL brackets and the SGLL bracket for the “B” steam generator to the weldments on the steam generator cubicle walls to determine if:

- design requirements in the approved fabrication procedures were in accordance with NF-4441 ASME code;
- installation requirements, including proper location, placement, dimensions, alignment, and other mounting requirements were specified in the approved quality assurance traveler;
- specially trained personnel and special tools were available to perform the work;
- correct drawings and work procedures were available to the workers at the work site;
- hold points were observed and Quality Control (QC) inspections were conducted as required;
- lifting and rigging was performed in accordance with approved procedures;
- welding area was sufficiently protected from inclement conditions;
- preheating of the weldment was performed in accordance with the WPS;
- welding surfaces were smooth, uniform, and free from significant surface discontinuities such as cracks;
- welding surfaces were free from paint, oil, rust, scale, slag, grease, moisture, or other harmful materials detrimental to welding;
- weld joint geometry, including root opening and fit-up tolerances, were as specified in the approved WPS; and
- welding variables specified in the WPS were routinely verified.

On December 12, 2016, the inspectors observed the in-process liquid penetrant (PT) examination of the west support bracket (SN#NS40519-2B) to determine whether the examination was performed in accordance with procedure GQP-9.7, "Solvent Removable Liquid Penetrant Examination and Acceptance Standards for Welds, Base Materials, and Cladding," Revision 17. During the examination, the inspectors verified that the QC inspectors correctly evaluated the indication in accordance with the acceptance criteria of ASME Section III, NF-5350, "Liquid Penetrant Acceptance Standards." The inspectors reviewed the personnel certifications for the inspectors involved with the examination to determine whether the inspectors were qualified and certified according to the contractor's quality assurance program. The inspectors also reviewed certification records for the consumables and measuring & test equipment

(M&TE) used during the examination to determine whether the penetrant, cleaner, and developer were qualified for use on stainless steel materials and the M&TE was properly calibrated at the time of the examination.

The inspectors reviewed the contractor's PT procedure, GQP-9.7, to determine whether it conformed with Article 6, "Liquid Penetrant Examination," of ASME Section V and NF-5350 of ASME Section III, 1998 edition through 2001 addenda.

After installation of the “B” SGIL and SGLL lateral support brackets, the inspectors preformed a fabrication records review of the six quality assurance travelers used to install the overlay weldments and the brackets. The inspectors verified that the QC travelers are adequate to furnish evidence of activities affecting quality, and that the weld overlays and brackets conform to applicable codes, standards, regulations, and quality and technical standards.

b. Findings

No findings were identified.

1A02 (Unit 3) ITAAC Number 2.1.02.03a (15) / Family 06B

a. Inspection Scope

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

- 65001.B-02.01-Program and Procedures Review
- 65001.B-02.02-Welding Procedure Qualification
- 65001.B-02.03-Welder Qualification
- 65001.B-02.05-Inspection

The inspectors performed a review of the contractor PCI Energy Services' (PCI) welding and nondestructive examination (NDE) programs to determine if they met the requirements of the ASME Boiler and Pressure Vessel Code Section III – Division 1 Subsection NB, Class 1 Components, 1998 Edition, 2000 addenda and 10 CFR Part 50, Appendix B, Quality Assurance Criteria For Nuclear Power Plants and Fuel Reprocessing Plants. The inspectors reviewed a selection of procedures governing the programs such as welding filler metal control, welder qualification process, procedures, travelers, and written practice for qualifying NDE personnel. The inspectors reviewed PCI's machine and manual Gas Tungsten Arc Welding (GTAW) welding procedures and associated qualification records to verify they were written and qualified in accordance with ASME Section III and the current edition of ASME Boiler and Pressure Vessel Code Section IX, Welding and Brazing Qualifications The inspectors also reviewed PCI's PT examination procedure to determine if it was written and demonstrated to the Authorized Nuclear Inspector (ANI) in accordance with the requirements of ASME Sections III and ASME Boiler and Pressure Vessel Code Section V, Nondestructive Examination, 1998 Edition 2000 addenda. The inspectors reviewed a sample of welder and PT examiner qualification records to determine if personnel performing welding and NDE were qualified in accordance with the

requirements of PCI's procedures and ASME Sections III, IX, and V. Lastly, the inspectors performed a walk-down of PCI's rod room storage and issuance trailer to determine if weld filler metals were being stored and issued in accordance with the requirements of PCI's procedure and ASME NQA-1, Quality Assurance Requirements of Nuclear Facility Applications, 1994 Edition.

The inspectors reviewed the quality assurance requirements flow down from Westinghouse to PCI, as they related to welding program documentation and procedures. Specifically, the inspectors reviewed the following documents to verify that document control requirements were correctly flowed into implementing procedures used for welding the safety-related Reactor Coolant System (RCS):

- Westinghouse's QMS-A, "Westinghouse Electric Company Quality Management System," Rev. 7
- WECTEC's PQAP, "Vogtle Units 3 & 4 Project – Project Quality Assurance Plan," Rev. 005
- QAM 01.00, "WECTEC LLC Quality Assurance Manual," Rev. 00.01
- SV0-PL01-Z0-550000, "RCL Piping, Support, and Vessel Installation", Rev. 5
- PCI's "NPT/NA ASME Quality Assurance Manual," Rev. 12

b. Findings

No findings were identified.

1A03 (Unit 3) ITAAC Number 2.1.02.03b (16) / Family 03B

a. Inspection Scope

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

- 65001.03-02.01 - Purchase and Receipt of Materials
- 65001.03-02.02 - Storage and Handling
- 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

The inspectors observed the weld preparation activities performed on the loop B RCS piping prior to the piping being transported to the nuclear island. Specifically, the inspectors observed the layout and weld prep machining of the reactor vessel ends of the loop 2 hot leg (L001B) and the two loop 2 cold legs (L002C and L002D). The inspectors observed the layout and weld prep activities to verify that the:

- layout and weld prep were performed in accordance with the approved Quality Assurance Traveler (910962-001, Rev. 0);
- final weld surface geometry and counter-boring depth met the tolerances listed in the Traveler;
- final weld surface geometry and counter-boring depth were properly documented in the Traveler; and
- M&TE used to measure the weld prep geometry and counter-boring depth were properly documented in the Traveler.

The inspectors also observed performance of PT of the complete weld prep area, including the bevel and the inside diameter counterbore of loop 2 hot leg (L001B). The inspectors observed the PT to verify that the:

- proper cleaner, penetrant, and developer materials were used;
- cleaning was performed in accordance with the approved procedure, and the minimum and maximum evaporation times were met;
- penetrant was properly applied and the applicable dwell time was allowed to expire prior to removal of the penetrant;
- excess penetrant was removed using approved methods and the minimum and maximum permitted evaporation times were met prior to application of the developer;
- developer was applied in accordance with the approved procedure;
- final interpretation of any indications was performed after allowing the penetrant to bleed out; and
- post PT cleaning was performed promptly once interpretation of indications was complete.

The inspectors observed in-process construction activities associated with the Vogtle Unit 3 RCS piping to determine whether welding and inspection activities were performed in accordance with applicable quality and technical requirements. Specifically, the inspectors observed activities associated with the welding of the following pipes to the Unit 3 Reactor Pressure Vessel (RPV):

- Hot Leg - RCS - L001B
- Cold Leg - RCS - L002C
- Cold Leg - RCS - L002D

The inspectors observed the in-process welding of the above pipes to the RPV to determine if the welding was performed within the ranges allowed by WPS numbers 8 MN-GTAW and 8 MC-GTAW, and the requirements of ASME Boiler and Pressure Vessel Code Section III Division I – Subsection NB, Class 1 Components, 1998 Edition, 2000 addenda. Specifically, the inspectors observed the in-process welding of the following welds:

- SV3-RCS-PL01-FW-BCL04 (Cold Leg L002C to RPV)
- SV3-RCS-PL01-FW-BCL06 (Cold Leg L002D to RPV)
- SV3-RCS-PL01-FW-BHL01 (Hot Leg L001B to RPV)

The inspectors reviewed the completed weld records and in-process weld travelers 910962-003, 910962-004, and 910962-005 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 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 Quality Assurance (QA) program requirement;
- required inspections were identified in the traveler withhold points, as appropriate; and
- accepted, rejected, and repaired items were documented in written reports.

The inspectors performed a vertical slice inspection of welding of the B side hot and cold legs to the reactor vessel safe-ends while welding was stopped at 66% complete (weld numbers: SV3-RCS-PL01-FW-BHL01, SV3-RCS-PL01-FW-BCL04, & SV3-RCS-PL01-FW-BCL06) to determine if the welds were made in accordance with the ASME Code Section III, 10 CFR Part 50 Appendix B, and the Updated Final Safety Analysis Report (UFSAR). The inspectors performed a walk down of the area to determine if welding had been protected from wind, rain, moisture, and other adverse weather, and to determine if the weld area was clean and free of rust, oil or other contaminants. The inspectors also entered the reactor and loop piping to visually inspect the weld root to ensure that grinding and welding performed on the inside diameter had not compromised the quality of the material. The inspectors reviewed the travelers associated with the three welds to determine if the work process had been properly controlled and fully documented including traceability of welders, materials, and inspectors. The inspectors reviewed reports of PT examinations performed on weld prep surfaces to ensure that the exams required by the ASME Code Section III had been performed and found acceptable. The inspectors also reviewed the qualification records of the NDE examiners and a sample of the welder's qualification records to determine if the personnel involved had been qualified in accordance with the written practice and ASME Code Section III. The inspectors also reviewed the Certificates of Compliance (CoC) and Certified Material Test Reports (CMTRs) associated with the filler metal that was in use to determine if it had been procured in accordance with 10 CFR Part 21, 10 CFR Part 50 Appendix B, and had been tested and found to meet the requirements of the ASME Boiler and Pressure Vessel Code Section II, Materials, 1998 Edition 2000 addenda. The inspectors reviewed the welding procedures that were in use and their associated procedure qualification records (PQRs) to determine if they had been written and qualified in accordance with ASME Code Sections III and IX and that they were capable of producing sound quality welds.

The inspectors reviewed N&D SV3-MV01-GNR-00002 and performed interviews regarding the factory weld end preparations on three of the Unit 3 reactor vessel nozzles that had been measured and found not to meet design requirements to determine if the issue had been processed correctly in accordance with procedure, APP-GW-GAP-428, "Nonconformance and Disposition Report (N&D)", Rev. 11. The inspectors reviewed higher level Westinghouse program document, W2-5.1-101, “Westinghouse Corrective Action Program,” Rev. 3.0, to determine when a Condition Report should be written by Westinghouse. The inspectors also reviewed the out-of-tolerance issue against the requirements in 10 CFR Part 21, “Reporting of Defects and Noncompliance,” and the licensee’s procedure requirements in W2-5.1-201, "Identification and Reporting of Conditions Adverse to Nuclear Safety", Rev. 0.1 to verify if the deviation required additional notifications.

The inspectors reviewed PCI's welding and NDE programs to determine if they met the requirements of the ASME Code Section III and 10 CFR Part 50 Appendix B. The inspectors reviewed a selection of procedures governing PCI's welding and NDE programs such as welding filler metal control, welder qualification process, procedures, travelers, and written practice for qualifying NDE personnel. The inspectors also reviewed PCI's PT procedure and demonstration record to determine if it had been written and demonstrated in accordance with the requirements of ASME Sections III and V. Lastly the inspectors performed a walk-down to the PCI welding filler metal storage and issuance trailer to determine if welding filler metal was being stored and issued in accordance with their procedure and the requirements of ASME NQA-1.

The inspectors reviewed the quality assurance requirements flow down from Westinghouse to PCI, as they related to welding program documentation and procedures. Specifically, the inspectors reviewed the following documents to verify that document control requirements were correctly flowed into implementing procedures used for welding the safety-related RCS:

- Westinghouse's QMS-A, "Westinghouse Electric Company Quality Management System," Rev. 7
- WECTEC's PQAP, "Vogtle Units 3 & 4 Project – Project Quality Assurance Plan," Rev. 005
- QAM 01.00, "WECTEC LLC Quality Assurance Manual," Rev. 00.01
- SV0-PL01-Z0-550000, "RCL Piping, Support, and Vessel Installation", Rev. 5
- PCI's "NPT/NA ASME Quality Assurance Manual," Rev. 12

b. Findings

No findings were identified.

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

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 2.1.02.05a.ii (20). The inspectors used the following NRC IPs/sections to perform this inspection:

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

The inspectors reviewed documents, specifically Equipment Qualification Data Package (EQDP) APP-PV18-VBR-002 and Equipment Qualification Summary Report (EQSR) APP-PV18-VBR-001 for vacuum relief valves (commodity PV18), and interviewed personnel to verify if:

- the licensee was using the appropriate design basis parameters for qualification and that the design basis was appropriately translated into Structures, Systems, and Components (SSCs) qualification test or qualification analysis;

- limiting design basis parameters were used as input for the qualification of the SSC and that the necessary design basis documents and calculations, as appropriate, were correctly incorporated into the qualification program for the SSC;
- required qualifications of SSCs were adequately completed and controlled in accordance with regulatory requirements, applicable industry standards, design specifications, and approved procedures; and
- licensee records established an adequate basis for acceptance of the ITAAC with qualification criteria attributes.

The inspectors reviewed problems identified during the qualification process, including test anomalies and evaluated corrective action documents to determine the effectiveness of the licensee's corrective measures.

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

- RCS-PL-V010A, ADS Discharge Header A Vacuum Relief Valve (PV18)

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

In particular, the inspectors reviewed active mechanical equipment to verify that it was analyzed in accordance with ASME QME-1-2007 and if electrical components of the valves were tested in accordance with Institute of Electrical and Electronics Engineers (IEEE) 344-1987, and the pressure boundaries of the ASME Class 1, 2, and 3 valves were analyzed to ASME Section III Code edition 1998 – 2000. The inspectors also reviewed the qualification using static analysis for rigid valves and testing with required input motion for in-line equipment to verify that the methodologies were consistent with the QME-1-2007 provisions. Finally, the inspectors reviewed the documents to verify that the applicable procedures required the piping analyst to verify if the piping acceleration would not exceed the SSE level in which the valves were qualified.

b. Findings

No findings were identified.

1A05 (Unit 3) ITAAC Number 2.1.02.08d.iii (34) / Family 03A

a. Inspection Scope

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

- 65001.07-02.01 - General Installation
- 65001.07-02.04 - Testing and Verification
- 65001.F-02.02-Fabrication Records Review
- 65001.F-02.04-General QA Review

The inspectors reviewed documents and records associated with the Unit 3 fourth-stage automatic depressurization system (ADS) valves (S/Ns 0920-164451-3-1, 0920-164451-3-2, 0920-164451-3-3, and 0920-164451-3-4) to verify that the as-manufactured flow area met the acceptance criteria. Specifically, the inspectors reviewed critical dimensional reports from the valve vendor and design documents to verify the as-manufactured flow area met the acceptance criteria of ITAAC 2.1.02.08d.iii (greater than or equal to 67 square inches). During the time of the inspection, the valve serial numbers listed above were not associated with a licensee component ID. The documents reviewed were associated with 14 inch ADS squib valves fabricated by the vendor, which were the same type of valves identified in the Westinghouse valve data sheet and Section 5.4.6.2 of the UFSAR for the design of the fourth-stage ADS valves.

b. Findings

No findings were identified.

1A06 (Unit 3) ITAAC Number 2.1.02.08d.iv (35) / Family 07E

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 2.1.02.08d.iv (35). The inspectors used the following NRC IPs/sections to perform this inspection:

- 65001.07-02.01 - General Installation
- 65001.07-02.04 - Testing and Verification
- 65001.F-02.02-Fabrication Records Review
- 65001.F-02.04-General QA Review

The inspectors reviewed documents and records associated with the Unit 3 stage 1, 2, and 3 ADS valves to verify that the effective flow area met the acceptance criteria. Specifically, the inspectors reviewed flow test reports and calculations from the valve vendor and design documents to verify the effective flow area met the acceptance criteria of ITAAC 2.1.02.08d.iv (greater than or equal to 4.6 square inches for stage 1 and greater than or equal to 19 square inches for stages 2 and 3). During the time of the inspection, the valves were not associated with a licensee component ID. The documents reviewed were associated with 4 inch (stage 1) and 8 inch (stage 2 and 3) motor operated globe valves fabricated by the vendor, which were the same type of valves identified in the Westinghouse valve data sheets and Section 5.4.6.2 of the UFSAR for the design of the stage 1, 2, and 3 ADS valves. The inspectors reviewed these documents to determine if there was a link between the type of valves in the vendor valve flow test reports and calculations and the valve component IDs referenced in the design documents and UFSAR.

b. Findings

No findings were identified.

1A07 (Unit 3) ITAAC Number 2.2.01.05.ii (99) / Family 11E
(Unit 4) ITAAC Number 2.2.01.05.ii (99) / Family 11E

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 2.2.01.05.ii (99). The inspectors used the following NRC IPs/sections to perform this inspection:

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

The inspectors reviewed documents, specifically EQDPs APP-PV18-VBR-002, APP-PV03-VBR-014, and APP-PV03-VBR-002 and EQSRs APP-PV03-VBR-013, APP-PV03-VBR-001 for vacuum relief valves (commodity PV18), swing check valves and nozzle check valves (PV03), and interviewed personnel to verify if:

- the licensee was using the appropriate design basis parameters for qualification and that the design basis was appropriately translated into SSCs qualification test or qualification analysis;
- limiting design basis parameters were used as input for the qualification of the SSC and that the necessary design basis documents and calculations, as appropriate, were correctly incorporated into the qualification program for the SSC;
- required qualifications of SSCs were adequately completed and controlled in accordance with regulatory requirements, applicable industry standards, design specifications, and approved procedures; and
- licensee records established an adequate basis for acceptance of the ITAAC with qualification criteria attributes.

The inspectors reviewed problems identified during the qualification process, including test anomalies and evaluated corrective action documents to determine the effectiveness of the licensee's corrective measures.

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

- VFS-PL-V803A, Vacuum Relief Containment Isolation Check Valve A – IRC (PV18)
- FPS-PL-V052, Fire Water Containment Isolation Supply Check Valve – Inside (PV03 – Swing Check)
- SFS-PL-V037, Spent Fuel Pool Cooling System (SFS) Discharge Line Containment Isolation Check Valve – IRC (PV03 – DRV-Z nozzle check)

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

In particular, the inspectors reviewed active mechanical equipment to verify that it was analyzed in accordance with ASME QME-1-2007 and if electrical components of the valves were tested in accordance with IEEE 344-1987, and the pressure boundaries of the ASME Class 1, 2, and 3 valves were analyzed to ASME III Code edition 1998 – 2000. The inspectors also reviewed the qualification using static analysis for rigid valves and testing with required input motion for in-line equipment to verify that the methodologies were consistent with the QME-1-2007 provisions. Finally, the inspectors reviewed the documents to verify that the applicable procedures required the piping analyst to verify if the piping acceleration would not exceed the SSE level in which the valves were qualified.

b. Findings

No findings were identified.

1A08 (Unit 3) ITAAC Number 2.2.01.06a.i (101) / Family 08E
(Unit 4) ITAAC Number 2.2.01.06a.i (101) / Family 08E

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 2.2.01.06a.i (101). The inspectors used the following NRC IPs/sections to perform this inspection:

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

The inspectors reviewed documents, specifically EQDPs APP-EY01-VBR-004 and APP-PV10-VBR-006 and EQSRs APP-EY01-VBR-003 and APP-PV10-VBR-004 for electrical penetrations (commodity EY01) and Air Operated Valve (AOV) plug valves (commodity PV10), and interviewed personnel to verify if:

- the licensee was using the appropriate design basis parameters for qualification and that the design basis was appropriately translated into SSCs qualification test or qualification analysis;
- limiting design basis parameters were used as input for the qualification of the SSC and that the necessary design basis documents and calculations, as appropriate, were correctly incorporated into the qualification program for the SSC;
- required qualification of SSCs was adequately completed and controlled in accordance with the requirements in 10 CFR 50.49, applicable methodology in the UFSAR, regulatory guidance, and IEEE standards;
- the documented qualified life was consistent with the results of the qualification activities; and
- licensee records established an adequate basis for acceptance of the ITAAC with qualification criteria attributes and that the qualification report concluded that the SSC can withstand the conditions that would exist before, during, and following a design basis accident without loss of safety function for the time required to perform the safety function.

The inspectors reviewed problems identified during the qualification process, including test anomalies and evaluated corrective action documents to determine the effectiveness of the licensee's corrective measures and if requirements of IEEE Std. 323-1974 were met.

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

- IDSA-EY-P12Y, Electrical Penetration P12 (EY01)
- WLS-PL-V055, Sump Discharge Containment Isolation Valve – IRC (PV10 – AOV plug) including the valve, actuator, and solenoid

The inspectors reviewed the EQSR and portions of the EQDP for the Electrical Penetration Assemblies to verify that the equipment was adequately qualified in accordance with IEEE 317-1983, "IEEE Standard for Electric Penetration Assemblies in Containment Structures for Nuclear Power Generating Stations," Section 6, "Qualification."

The inspectors reviewed the EQSR, EQDP, and applicable test procedures and test records related to the qualification for the expected environment to verify that qualification activities were adequately controlled and that the methodology conformed to applicable regulatory guidance and industry standards. The inspectors reviewed the environmental profiles documented in APP-VP-GW-030, "Plant Environmental Conditions," to verify that the tested profiles enveloped the actual worse case environmental conditions that would be expected. The inspectors reviewed test procedures and test records to verify that the qualification was in conformance with ASME QME-1 and that the valve actuator was qualified in conformance with IEEE Std. 382-1996, "IEEE Standard for Qualification of Actuators for Power-Operated Valve Assemblies With Safety-Related Functions for Nuclear Power Plants."

b. Findings

No findings were identified.

1A09 (Unit 3) ITAAC Number 2.2.01.06d.i (105) / Family 08E
(Unit 4) ITAAC Number 2.2.01.06d.i (105) / Family 08E

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 2.2.01.06d.i (105). The inspectors used the following NRC IPs/sections to perform this inspection:

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

The inspectors reviewed documents, specifically EQDP APP-EY01-VBR-004 and EQSR APP-EY01-VBR-003 for electrical penetrations (commodity EY02), and interviewed personnel to verify if:

- the licensee was using the appropriate design basis parameters for qualification and that the design basis was appropriately translated into SSCs qualification test or qualification analysis;
- limiting design basis parameters were used as input for the qualification of the SSC and that the necessary design basis documents and calculations, as appropriate, were correctly incorporated into the qualification program for the SSC;
- required qualification of SSCs was adequately completed and controlled in accordance with the requirements in 10 CFR 50.49, applicable methodology in the UFSAR, regulatory guidance, and IEEE standards;
- the documented qualified life was consistent with the results of the qualification activities; and
- licensee records established an adequate basis for acceptance of the ITAAC with qualification criteria attributes and that the qualification report concluded that the SSC can withstand the conditions that would exist before, during, and following a design basis accident without loss of safety function for the time required to perform the safety function.

The inspectors reviewed problems identified during the qualification process, including test anomalies and evaluated corrective action documents to determine the effectiveness of the licensee's corrective measures and if requirements of IEEE Std. 323-1974 were met.

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

- ECS-EY-P01X, Electrical Penetration P01, (EY02)
- ECS-EY-P19Z, Electrical Penetration P19, (EY02)

The inspectors reviewed the EQSR and portions of the EQDP for the Electrical Penetration Assemblies to verify that the equipment was adequately qualified in accordance with IEEE 317-1983, "IEEE Standard for Electric Penetration Assemblies in Containment Structures for Nuclear Power Generating Stations," Section 6, "Qualification."

The inspectors reviewed applicable test procedures and test records related to the qualification for harsh environment to verify that qualification activities were adequately controlled and if the methodology conformed to applicable regulatory guidance and industry standards. The inspectors reviewed the environmental profiles documented in APP-VP-GW-030, "Plant Environmental Conditions," to verify that the tested profiles enveloped the actual worse case environmental conditions that would be expected.

b. Findings

No findings were identified.

1A10 (Unit 3) ITAAC Number 2.2.02.05a.ii (127) / Family 14E
(Unit 4) ITAAC Number 2.2.02.05a.ii (127) / Family 14E

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 2.2.02.05a.ii (127). The inspectors used the following NRC IPs/sections to perform this inspection:

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

The inspectors reviewed documents, specifically EQDPs APP-JE52-VBR-006 and APP-PV03-VBR-014 and EQSRs APP-JE52-VBR-005 and APP-PV03-VBR-013 for pressure and flow sensors (commodity JE52 – NLI) and swing check valves (PV03), and interviewed personnel to verify if:

- the licensee was using the appropriate design basis parameters for qualification and that the design basis was appropriately translated into SSC qualification test or qualification analysis;
- limiting design basis parameters were used as input for the qualification of the SSC and that the necessary design basis documents and calculations, as appropriate, were correctly incorporated into the qualification program for the SSC;
- required qualifications of SSCs were adequately completed and controlled in accordance with regulatory requirements, applicable industry standards, design specifications, and approved procedures; and
- licensee records established an adequate basis for acceptance of the ITAAC with qualification criteria attributes.

The inspectors reviewed problems identified during the qualification process, including test anomalies, and evaluated corrective action documents to determine the effectiveness of the licensee's corrective measures.

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

- PCS-JE-PT005, Containment Pressure Sensor (JE52 – NLI)
- PCS-JE-PT006, Containment Pressure Sensor (JE52 – NLI)
- PCS-JE-PT007, Containment Pressure Sensor (JE52 – NLI)
- PCS-JE-PT008, Containment Pressure Sensor (JE52 – NLI)
- PCS-JE-FT001, PCS Water Delivery Flow Sensor (JE52 – NLI)
- PCS-JE-FT002, PCS Water Delivery Flow Sensor (JE52 – NLI)
- PCS-JE-FT003, PCS Water Delivery Flow Sensor (JE52 – NLI)
- PCS-JE-FT004, PCS Water Delivery Flow Sensor (JE52 – NLI)
- PCS-PL-V039, PCCWST Long Term Makeup Line Check Valve (PV03 – Swing Check)

The inspectors performed these reviews to verify that the commodity codes listed in the EQDP were qualified consistent with the requirements specified in the UFSAR. Documentation for testing was evaluated to verify that the test response spectra (TRS) were accurately measured and enveloped the certified seismic design response spectra (CSDRS) defined in section 3.7 of the UFSAR and the respective required response spectra (RRS) defined for the various equipment locations. The

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

In particular, the inspectors reviewed active mechanical equipment to verify that it was analyzed in accordance with ASME QME-1-2007 and verify that the pressure boundaries of the ASME Class 1, 2, and 3 valves were analyzed to ASME Section III Code edition 1998 – 2000. The inspectors also reviewed the qualification using static analysis for rigid valves and testing with required input motion for in-line equipment to verify that the methodologies were consistent with the QME-1-2007 provisions. Finally, the inspectors reviewed the documents to verify that the applicable procedures required the piping analyst to verify if the piping acceleration would not exceed the SSE level in which the valves were qualified.

The inspectors reviewed documentation for a sample of safety-related components to verify that qualifications of items based upon similar design, manufacture, and installed configuration were adequately justified. The documentation for each affected component was reviewed to confirm that evaluations compared physical attributes, design basis accident environments, and analyzed seismic events. Documentation to show equipment qualification based upon equivalency was evaluated for the following pressure transmitters:

- PCS-JE-PT005, Containment Pressure Sensor (JE52 – NLI)
- PCS-JE-PT006, Containment Pressure Sensor (JE52 – NLI)
- PCS-JE-PT007, Containment Pressure Sensor (JE52 – NLI)
- PCS-JE-PT008, Containment Pressure Sensor (JE52 – NLI)
- PCS-JE-FT001, PCS Water Delivery Flow Sensor (JE52 – NLI)
- PCS-JE-FT002, PCS Water Delivery Flow Sensor (JE52 – NLI)
- PCS-JE-FT003, PCS Water Delivery Flow Sensor (JE52 – NLI)
- PCS-JE-FT004, PCS Water Delivery Flow Sensor (JE52 – NLI)

b. Findings

No findings were identified.

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

a. Inspection Scope

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

- 65001.06-02.01 - General Installation
- 65001.06-02.04 - Testing and Verification
- 65001.F-02.02-Fabrication Records Review
- 65001.F-02.04-General QA Review

The inspectors reviewed procurement and fabrication records associated with the Unit 3 passive core cooling system (PXS) core makeup tank (CMT) B to verify that materials met the applicable requirements of design documents and the ASME

Section III Code. Specifically, the inspectors reviewed quality assurance data packages, fabrication control plans, CoCs, CMTRs, ASME Code Form N-1 reports, ASME Code Form N-2 reports, and test reports to verify the materials' chemical composition, mechanical properties, fracture toughness requirements, and fabrication requirements were met for the following items of the CMT B:

- shell barrel (vendor item 1-05/2)
- upper head petal 1 (vendor item 3/1-05/2, plate 242074)
- upper head petal 2 (vendor item 3/1-05/2, plate 243511)
- lower head crown (vendor item 2/2-05/2, plate 241551)
- lower head petal 3 (vendor item 3/2-05/2, plate 244402)
- lower head petal 4 (vendor item 3/2-05/2, plate 244401)
- inlet central nozzle (vendor item 4/1-05/2)
- inlet nozzle safe-end (vendor item 5/1-05/2)
- outlet nozzle safe-end (vendor item 5/2-05/2)
- nozzle sample level tap N-5a (vendor item 34-05/2.1)

b. Findings

No findings were identified.

1A12 (Unit 3) ITAAC Number 2.2.03.03a (161) / Family 06B

a. Inspection Scope

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

- 65001.06-02.01 - General Installation
- 65001.06-02.02 - Component Welding
- 65001.06-02.04 - Testing and Verification
- 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-02.04-General QA Review

The inspectors reviewed fabrication records associated with pressure boundary welds of the Unit 3 PXS CMT B to verify that pressure boundary welds were performed in accordance with design documents and ASME Section III Code. Specifically, the inspectors reviewed quality assurance data packages, fabrication control plans, QC welding monitoring records, NDE reports, ASME Code Form N-1 reports, ASME Code Form N-2 reports, CMTRs, postweld heat treatment (PWHT) records, and hydrostatic test reports related to the following pressure boundary welds and material cladding:

- CW-001/1 (shell to upper head circumferential weld);
- CW-002/2 (lower head crown to petals circumferential weld);
- LW-013/1-3 (upper head petal 1 to petal 2 longitudinal weld);
- LW-014/1-1 (lower head petal 3 to petal 4 longitudinal weld);

- CW-041 (inlet nozzle circumferential weld)
- CW-041 (inlet nozzle safe-end circumferential weld)
- BT-024 (inlet nozzle weld buttering)
- CL-003 (shell cladding)

The inspectors reviewed fabrication control plans for the welds above determine whether:

- welding complies with the requirements in the WPS;
- the welding activity was properly documented in weld data or process records (travelers);
- 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, travelers, weld maps, weld inspection records, and NDE records;
- 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 QC welding monitoring records for the welds sampled to ensure the following:

- work was conducted in accordance with a traveler, which coordinated and sequenced the welding and inspection operations;
- the welding procedure used was appropriate for the work performed;
- minimum preheat and maximum interpass temperature met the requirements of the WPS;
- the filler metal type and size was in compliance with the WPS;
- the weld joint was traceable to the welder or welding operator; and
- welding machine variables were correctly set.

The inspectors reviewed NDE records - radiographic (RT), ultrasonic (UT), magnetic particle (MT), PT, and visual (VT) - for the welds sampled to determine if both in-process and completed weld inspections were performed and fabrication control plans contained appropriate inspection hold points. The inspectors reviewed the NDE records to determine if examinations were performed in accordance with ASME Code and the results conform to the requirements of ASME Code. The inspectors reviewed heat treatment records for the welds sampled to determine if PWHT was performed in accordance with ASME Code requirements.

The inspectors reviewed ASME Code Form N-1 reports, ASME Code Form N-2 reports, and hydrostatic test reports to verify final welds were fabricated and tested in accordance with ASME Code requirements.

The inspectors reviewed a sample of WPSs to verify they were in conformance with ASME Code requirements. The inspectors reviewed the supporting 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 a sample of 9 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 a sample of 9 CMTRs for filler metal to verify traceability between welds and conformance with the applicable ASME 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 a sample of nonconformance reports related to the fabrication of the CMT B. The inspectors reviewed these report to determine if the conditions were properly evaluated; received the appropriate amount of review; and that weld repairs, when performed, were conducted in accordance with ASME Code requirements.

b. Findings

No findings were identified.

1A13 (Unit 3) ITAAC Number 2.2.03.05a.ii (166) / Family 14E
(Unit 4) ITAAC Number 2.2.03.05a.ii (166) / Family 14E

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 2.2.03.05a.ii (166). The inspectors used the following NRC IPs/sections to perform this inspection:

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

The inspectors reviewed documents, specifically EQDPs APP-PV14-VBR-002, APP-PV03-VBR-014, and APP-PV03-VBR-004 and EQSRs APP-PV14-VBR-001, APP-PV03-VBR-013, and APP-PV03-VBR-003 for HPNS control valves (commodity PV14 – Fisher) and swing check valves and nozzle check valves (PV03), and interviewed personnel to verify if:

- the licensee was using the appropriate design basis parameters for qualification and that the design basis was appropriately translated into SSC qualification test or qualification analysis;
- limiting design basis parameters were used as input for the qualification of the SSC and that the necessary design basis documents and calculations, as appropriate, were correctly incorporated into the qualification program for the SSC;
- required qualifications of SSCs were adequately completed and controlled in accordance with regulatory requirements, applicable industry standards, design specifications, and approved procedures; and
- licensee records established an adequate basis for acceptance of the ITAAC with qualification criteria attributes.

The inspectors reviewed problems identified during the qualification process, including test anomalies and evaluated corrective action documents to determine the effectiveness of the licensee's corrective measures.

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

- PXS-PL-V042, Nitrogen Supply Containment Isolation Valve (PV14 – Fisher)
- PXS-PL-V028A, Accumulator A Discharge Check Valve (PV03 – Swing Check)
- PXS-PL-V016A, CMT A Discharge Check Valve (PV03 – ERZ Nozzle Check)

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

In particular, the inspectors reviewed active mechanical equipment to verify that it was analyzed in accordance with ASME QME-1-2007 and that electrical components of the valves were tested in accordance with IEEE 344-1987, and the pressure boundaries of the ASME Class 1, 2, and 3 valves were analyzed to ASME Section III Code edition 1998 – 2000. The inspectors also reviewed the qualification using static analysis for rigid valves and testing with required input motion for in-line equipment to verify that the methodologies were consistent with the QME-1-2007 provisions. Finally, the inspectors reviewed the documents to verify that the applicable procedures required the piping analyst to verify if the piping acceleration would not exceed the SSE level in which the valves were qualified.

b. Findings

No findings were identified.

1A14 (Unit 3) ITAAC Number 2.2.05.05a.ii (260) / Family 12E
(Unit 4) ITAAC Number 2.2.05.05a.ii (260) / Family 12E

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 2.2.05.05a.ii (260). The inspectors used the following NRC IPs/sections to perform this inspection:

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

The inspectors reviewed documents, specifically EQDP APP-JE52-VBR-006 and EQSR APP-JE52-VBR-005 for pressure sensors (commodity JE52 – NLI) and interviewed personnel to verify if:

- the licensee was using the appropriate design basis parameters for qualification and that the design basis was appropriately translated into SSC qualification test or qualification analysis;
- limiting design basis parameters were used as input for the qualification of the SSC and that the necessary design basis documents and calculations, as appropriate, were correctly incorporated into the qualification program for the SSC;
- required qualifications of SSCs were adequately completed and controlled in accordance with regulatory requirements, applicable industry standards, design specifications, and approved procedures; and
- licensee records established an adequate basis for acceptance of the ITAAC with qualification criteria attributes.

The inspectors reviewed problems identified during the qualification process, including test anomalies and evaluated corrective action documents to determine the effectiveness of the licensee's corrective measures.

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

- VES-JE-PDT004B, MCR Differential Pressure Sensor B (JE52 – NLI)
- VES-JE-PDT004A, MCR Differential Pressure Sensor A (JE52 – NLI)

The inspectors performed these reviews to verify that the commodity codes listed in the EQDP were qualified consistent with the requirements specified in the UFSAR. Documentation for testing was evaluated to verify that the TRS were accurately measured and enveloped the CSDRS defined in section 3.7 of the UFSAR and the respective RRS defined for the various equipment locations. The inspectors also reviewed the design codes, analysis and testing methodologies, load combinations, seismic acceleration, and required input motion to verify consistency with the UFSAR requirements.

b. Findings

No findings were identified.

1A15 (Unit 3) ITAAC Number 2.5.01.03d (514) / Family 10E
(Unit 4) ITAAC Number 2.5.01.03d (514) / Family 10E

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 2.5.01.03d (514). The inspectors used the following NRC IPs/sections to perform this inspection:

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

The inspectors reviewed documents, specifically EQDP APP-DAS-VBR-003 and EQSR APP-DAS-VBR-002 for the Diverse Actuation System (DAS) in the area of

electromagnetic compatibility (EMC) to verify that the DAS was qualified for EMC in accordance with regulatory requirements, the licensing bases, and the acceptance criteria of the ITAAC. The inspectors reviewed the qualification summary report and data package to verify that the qualification was conducted in accordance with the specification, the results met the acceptance criteria stated in the design specification and the ITAAC, and that the results stated the qualified life of the SSC.

The inspectors reviewed test reports to verify that testing was performed in conformance with Regulatory Guide 1.180, as committed to in the UFSAR and included applicable MIL-STD-461E and IEC 61000-4 series tests. The tests results were reviewed to verify that the DAS was qualified to demonstrate the capability to withstand electrical surges (SWC) and electromagnetic interference (EMI), radio frequency interference (RFI), and electrostatic discharge (ESD) conditions that exist where the DAS equipment is located in the plant.

The inspectors also reviewed test results to verify that test anomalies were identified, documented, and resolved in accordance with the equipment qualification program. The inspectors evaluated resolutions to test anomalies that required modifications to the DAS to verify that quality attributes that demonstrate EMC qualification were maintained. Alternate qualification methods that were used in place of conventional testing were evaluated to verify that those alternate methods were employed while maintaining compliance with regulatory requirements and the licensing bases. The inspectors reviewed the DAS EMC equipment qualification records to verify that they were auditable, clear, and complete in order to support the closure of the ITAAC. In addition, the inspectors assessed the licensee's review and acceptance of APP-DAS-VBR-002 and APP-DAS-VBR-003 to verify that the PCD review was completed and documented.

b. Findings

No findings were identified.

1A16 (Unit 3) ITAAC Number 2.5.02.02.ii (523) / Family 10E
(Unit 3) ITAAC Number 2.5.02.02.ii (523) / Family 10E

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 2.5.02.02.ii (523). The inspectors used the following NRC IPs/sections to perform this inspection:

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

The inspectors reviewed documents, specifically EQDP APP-JY50-VBR-003 and EQSR APP-JY50-VBR-002 for the reactor trip switchgear (commodity JY50) and interviewed personnel to verify if:

- the licensee was using the appropriate design basis parameters for qualification and that the design basis was appropriately translated into SSC qualification test or qualification analysis;
- limiting design basis parameters were used as input for the qualification of the SSC and that the necessary design basis documents and calculations, as appropriate, were correctly incorporated into the qualification program for the SSC;
- required qualifications of SSCs were adequately completed and controlled in accordance with regulatory requirements, applicable industry standards, design specifications, and approved procedures; and
- licensee records established an adequate basis for acceptance of the ITAAC with qualification criteria attributes.

The inspectors reviewed problems identified during the qualification process, including test anomalies and evaluated corrective action documents to determine the effectiveness of the licensee's corrective measures.

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

- PMS-JD-RTSA, Reactor Trip Switchgear, Division A (JY50)
- PMS-JD-RTSB, Reactor Trip Switchgear, Division B (JY50)
- PMS-JD-RTSC, Reactor Trip Switchgear, Division C (JY50)
- PMS-JD-RTSD, Reactor Trip Switchgear, Division D (JY50)

The inspectors performed these reviews to verify that the commodity codes listed in the EQDP were qualified consistent with the requirements specified in the UFSAR. Documentation for testing was evaluated to verify that the TRS were accurately measured and enveloped the CSDRS defined in section 3.7 of the UFSAR and the respective RRS defined for the various equipment locations. The inspectors also reviewed the design codes, analysis and testing methodologies, load combinations, seismic acceleration, and required input motion to verify consistency with the UFSAR requirements.

b. Findings

No findings were identified.

1A17 (Unit 3) ITAAC Number 2.5.02.03 (525) / Family 10E
(Unit 4) ITAAC Number 2.5.02.03 (525) / Family 10E

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 2.5.02.03 (525). The inspectors used the following NRC IPs/sections to perform this inspection:

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

The inspectors reviewed the equipment qualification and interviewed personnel for the following SSCs in the area of EMC:

- PMS-JD-RTSA, Reactor Trip Switchgear, Division A, Commodity Code JY50, EQDP No. APP-JY50-VBR-003
- PMS-JD-RTSB, Reactor Trip Switchgear, Division B, Commodity Code JY50, EQDP No. APP-JY50-VBR-003
- PMS-JD-RTSC, Reactor Trip Switchgear, Division C, Commodity Code JY50, EQDP No. APP-JY50-VBR-003
- PMS-JD-RTSD, Reactor Trip Switchgear, Division D, Commodity Code JY50, EQDP No. APP-JY50-VBR-003

The inspectors reviewed the qualification summary report and data package to verify that the qualification was conducted in accordance with the specification, the results met the acceptance criteria stated in the design specification and the ITAAC, and that the results stated the qualified life of the SSC. The inspectors specifically reviewed APP-JY50-VBR-002, "Equipment Qualification Summary Report for the Reactor Trip Switchgear for Use in the AP1000 Plant," and APP-JY50-VBR-003, "Equipment Qualification Data Package for the Reactor Trip Switchgear for Use in the AP1000 Plant" to verify that the SSCs were qualified for EMC in accordance with regulatory requirements, the licensing bases, and the acceptance criteria of the ITAAC. The inspectors reviewed test reports to verify that testing was performed in conformance with Regulatory Guide 1.180, as committed to in the UFSAR and included applicable MIL-STD-461E and IEC 61000-4 series tests. The tests results were reviewed to verify that the SSCs were qualified to demonstrate SWC, EMI, RFI, and ESD conditions that exist where the SSCs will be located in the plant.

The inspectors also reviewed test results to verify that test anomalies were identified, documented, and resolved in accordance with the equipment qualification program. The inspectors evaluated resolutions to test anomalies that required modifications to the SSCs to verify that quality attributes that demonstrate EMC qualification were maintained. Alternate qualification methods that were used in place of conventional testing were evaluated to determine that those alternate methods were employed while maintaining compliance with regulatory requirements and the licensing bases.

The inspectors reviewed EMC equipment qualification records to ensure they were auditable, clear, and complete in order to support the closure of the ITAAC. In addition, the inspectors assessed the licensee's review and acceptance of APP-JY50-VBR-002 and APP-JY50-VBR-003 to verify that the PCD review was completed and documented.

b. Findings

No findings were identified.

1A18 (Unit 3) ITAAC Number 2.5.02.04 (526) / Family 10E
(Unit 4) ITAAC Number 2.5.02.04 (526) / Family 10E

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 2.5.02.04 (526). The inspectors used the following NRC IPs/sections to perform this inspection:

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

The inspectors reviewed documents, specifically EQDP APP-JY50-VBR-003 and EQSR APP-JY50-VBR-002 for the reactor trip switchgear (commodity JY50) and interviewed personnel to verify if:

- the licensee was using the appropriate design basis parameters for qualification and that the design basis was appropriately translated into SSCs qualification test or qualification analysis;
- limiting design basis parameters were used as input for the qualification of the SSC and that the necessary design basis documents and calculations, as appropriate, were correctly incorporated into the qualification program for the SSC;
- required qualification of SSCs was adequately completed and controlled in accordance with the requirements in 10 CFR 50.49, applicable methodology in the UFSAR, regulatory guidance, and IEEE standards;
- the documented qualified life was consistent with the results of the qualification activities; and
- licensee records established an adequate basis for acceptance of the ITAAC with qualification criteria attributes and that the qualification report concluded that the SSC can withstand the conditions that would exist before, during, and following a design basis accident without loss of safety function for the time required to perform the safety function.

The inspectors reviewed problems identified during the qualification process, including test anomalies and evaluated corrective action documents to determine the effectiveness of the licensee's corrective measures and if requirements of IEEE Std. 323-1974 were met.

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

- PMS-JD-RTSA, Reactor Trip Switchgear, Division A (JY50)
- PMS-JD-RTSB, Reactor Trip Switchgear, Division B (JY50)
- PMS-JD-RTSC, Reactor Trip Switchgear, Division C (JY50)
- PMS-JD-RTSD, Reactor Trip Switchgear, Division D (JY50)

The inspectors reviewed test procedures and test reports that covered applicable environmental conditions to verify that the Reactor Trip Switchgear was tested in accordance with the applicable design specification acceptance criteria requirements. The inspectors reviewed the Zone 4 environmental conditions stated in APP-VP-GW-030, "Plant Environmental Conditions," to verify that the tested profiles enveloped the actual worse case environmental conditions that would be expected. The inspectors reviewed the method used to simulate anticipated operating cycles of

the equipment to verify that the method used to determine the number of cycles provided adequate operational aging effects in accordance with IEEE Std. 323-1974.

b. Findings

No findings were identified.

1A19 (Unit 3) ITAAC Number 2.5.02.07b (535) / Family 10E
(Unit 4) ITAAC Number 2.5.02.07b (535) / Family 10E

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 2.5.02.07b (535). The inspectors used the following NRC IPs/sections to perform this inspection:

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

The inspectors reviewed the design basis of the Protection and Safety Monitoring System (PMS) - Data Display and Processing System (DDS) isolators to determine if isolation devices prevent credible faults from propagating into the PMS when PMS process signals are provided to the DDS. The inspectors reviewed the following design bases documents to verify that the licensee was using the appropriate design basis parameters for the fiber optic cable qualification, and verify that the design basis was appropriately translated into the qualification summary report, APP-PMS-VBR-015, “Protection and Safety Monitoring System Isolation Summary Report for Use in the AP1000 Plant,” Rev. 1.

- UFSAR version 5.2
- WCAP-15776, “Safety Criteria for the AP1000 Instrumentation and Control Systems,” Rev. 1
- IEEE 384-2008, IEEE Standard Criteria for Independence of Class 1E Equipment and Circuits,” dated December 2008
- APP-EW31-Z0-003, “AP1000 Fiber-Optic Design Specification for Instrumentation & Control System use Outside of Containment, Class 1E Applications,” Rev. 0
- APP-EW31-Z0-004, “AP1000 Fiber-Optic Design Specification for Instrumentation & Control System use Outside of Containment, Non-Class 1E Applications,” Rev. 0
- APP-GW-GEE-5308, “Fault Testing Requirements for Fiber Optic Isolation Devices in WCAP-15776,” Rev. 0

The inspectors noted that LDCR-2016-069, “Fault Testing Requirements For Fiber Optic Isolation Devices,” Version 1, removed the UFSAR commitment/requirement to install isolators on fiber optic cables in the PMS-DDS interface. The inspectors reviewed WCAP-15776 and IEEE 384-2008 to ensure design documents incorporated the changes reflecting that qualification testing was not required for fiber optic cables as specified by engineering analysis. In addition, the inspectors reviewed Branch Technical Position 7-11, “Guidance On Application And Qualification Of Isolation Devices,” Rev. 6, to verify the adequacy of using fiber optic cables as isolation devices. The inspectors reviewed the changes to the UFSAR to ensure that the scope

of changes were limited to the electrical isolation qualification of fiber optic cables and that the changes were appropriately screened and implemented in accordance with the design and licensing basis.

The inspectors reviewed qualification/test report APP-PMS-VPR-002, "AP1000 Safety Systems and Hardware Engineering Class 1E/Non-Class 1E Test Report for Fault Testing of AP1000 PMS Isolation Barriers," Rev. 2, to verify that the fiber optic cables were qualified in accordance with WCAP-15776 and IEEE 384-2008 as referenced in the UFSAR.

The inspectors reviewed APP-PMS-VBR-015 to verify that the documentation included a licensee or contractor review of the ITAAC record and documentation that the ITAAC requirements had been met.

b. Findings

No findings were identified.

1A20 (Unit 3) ITAAC Number 2.5.02.07e (538) / Family 10D
(Unit 4) ITAAC Number 2.5.02.07e (538) / Family 10D

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 2.5.02.07e (538). The inspectors used the following NRC IPs/sections to perform this inspection:

- 65001.D-02.03-Test Results Review

The inspectors reviewed APP-PMS-VBR-015, "AP1000 Protection and Safety Monitoring System Isolation Summary Report for Use in the AP1000 Plant," Rev. 1 to ensure that the licensee's summary report concluded that isolation devices prevent credible faults from propagating into the PMS.

The inspectors reviewed the following test reports to ensure that the evaluation of test result had been performed correctly:

- PMS Isolation Summary
- Common Mode Fault Test
- Traverse Mode Fault Test
- Short Circuit/Open Circuit/Grounded Circuit Test

Specifically, the inspectors reviewed the "as-run" procedures to verify that individual steps and data sheets were properly initialed, dated and completed. The inspectors also verified that all data had been recorded where required and within acceptance tolerances. Additionally, the inspectors verified that test deficiencies and procedure changes were properly identified and that all test changes were reviewed, approved, and properly annotated. The inspectors reviewed all test anomalies and deficiencies to verify that they had been documented and resolved, including any retests.

The inspectors also reviewed the test summary and results evaluation. Specifically, the inspectors used independent technical analysis and judgement of the results to ensure that the evaluation of results had been performed correctly. Finally, the inspectors reviewed the acceptance of the test results and evaluation to verify that the licensee had performed an independent review and accepted the tests results in accordance with established administrative requirements.

b. Findings

No findings were identified.

1A21 (Unit 3) ITAAC Number 2.6.03.02.ii (598) / Family 08E
(Unit 4) ITAAC Number 2.6.03.02.ii (598) / Family 08E

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 2.6.03.02.ii (598). The inspectors used the following NRC IPs/sections to perform this inspection:

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

The inspectors reviewed documents, specifically EQDP APP-DD01-VBR-002 and EQSR APP-DD01-VBR-001 for the 250 VDC distribution panels (commodity DD01) and interviewed personnel to verify if:

- the licensee was using the appropriate design basis parameters for qualification and that the design basis was appropriately translated into SSC qualification test or qualification analysis;
- limiting design basis parameters were used as input for the qualification of the SSC and that the necessary design basis documents and calculations, as appropriate, were correctly incorporated into the qualification program for the SSC;
- required qualifications of SSCs were adequately completed and controlled in accordance with regulatory requirements, applicable industry standards, design specifications, and approved procedures; and
- licensee records established an adequate basis for acceptance of the ITAAC with qualification criteria attributes.

The inspectors reviewed problems identified during the qualification process, including test anomalies and evaluated corrective action documents to determine the effectiveness of the licensee's corrective measures.

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

- IDSA-DD-1, Division A 250 VDC Distribution Panel (DD01)
- IDSB-DD-1, Division B 250 VDC Distribution Panel (DD01)
- IDSC-DD-1, Division C 250 VDC Distribution Panel (DD01)
- IDSD-DD-1, Division D 250 VDC Distribution Panel (DD01)

The inspectors performed these reviews to verify that the commodity codes listed in the EQDP were qualified consistent with the requirements specified in the UFSAR. Documentation for testing was evaluated to verify that the TRS were accurately measured and enveloped the CSDRS defined in section 3.7 of the UFSAR and the respective RRS defined for the various equipment locations. The inspectors also reviewed the design codes, analysis and testing methodologies, load combinations, seismic acceleration, and required input motion to verify consistency with the UFSAR requirements.

b. Findings

No findings were identified.

1A22 (Unit 3) ITAAC Number 3.2.00.01b (740) / Family 16F
(Unit 4) ITAAC Number 3.2.00.01b (740) / Family 16F

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 3.2.00.01b (740). The inspectors used the following NRC IPs/sections to perform this inspection:

- 65001.D-02.03-Test Results Review

The inspectors reviewed APP-OCD-GER-120, "AP1000 Human Factors Engineering Design Verification Report," Rev. 2, to ensure that the licensee's summary report concluded that the Human Factors Engineering (HFE) Design Verification and Validation program was conducted in conformance with the implementation plan, APP-OCS-GEH-120, "AP1000 Human Factors Engineering Design Verification Plan," Rev. 3, and included verification that the Human System Interface (HSI) design was consistent with the AP1000-specific design guidelines developed for each HSI resource as defined in the UFSAR.

The inspectors independently reviewed the test results to ensure they support the conclusions made in the summary report. Finally, the inspectors reviewed the acceptance of the test results and evaluation, to verify that the licensee had performed an independent review and accepted the tests results in accordance with established administrative requirements.

b. Findings

No findings were identified.

1A23 (Unit 3) ITAAC Number 3.2.00.01c.i (741) / Family 16F
(Unit 4) ITAAC Number 3.2.00.01c.i (741) / Family 16F

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 3.2.00.01c.i (741). The inspectors used the following NRC IPs/sections to perform this inspection:

- 65001.D-02.03-Test Results Review

The inspectors reviewed APP-OCS-GER-320, "AP1000 Human Factors Engineering Integrated System Validation Report," Rev. 3, to ensure that the licensee's summary report concluded that the HFE Integrated System Validation (ISV) was conducted in conformance with the implementation plan, APP-OCS-GEH-320, "AP1000 Human Factors Engineering Integrated System Validation Plan," Rev. 6, and that the test scenarios listed in the implementation plan for ISV were executed in conformance with the plan and UFSAR and noted human deficiencies were addressed.

The inspectors independently reviewed the test results to ensure they support the conclusions made in the summary report. Finally, the inspectors reviewed the acceptance of the test results and evaluation to verify that the licensee had performed an independent review and accepted the tests results in accordance with established administrative requirements.

b. Findings

No findings were identified.

1A24 (Unit 3) ITAAC Number 3.3.00.02a.i.a (760) / Family 01F

a. Inspection Scope

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

- 65001.02-02.01 - Inspection of Concrete Placement
- 65001.02-02.03 - Special Considerations
- 65001.02-02.07 - Problem Identification and Resolution
- 65001.02-02.08 - Construction Interface Concerns

The inspectors reviewed quality records and performed direct inspection of construction activities associated with the containment internal structures for Vogtle Unit 3. Specifically, the inspectors observed construction activities associated with the east steam generator compartment walls of the CA01 Module, which makes up the walls of the steam generator, reactor vessel, and pressurizer compartments, between elevation 87'-6" and 147'-0".

The inspectors observed concrete pre-placement activities, including review of the concrete placement and contingency plans included in the work package, to determine whether pre-placement planning and training had been completed, preparation and cleanliness of the module and formwork had been completed, coordination of concrete

activities with other disciplines was completed in accordance with procedural requirements, and the pre-placement inspection was performed by QC before any concrete was placed. Prior to concrete placement, the inspectors independently reviewed a sample of design changes, nonconformances, and deviations to determine whether:

- any differences between the as-built and as-designed SSCs were documented and dispositioned in accordance with approved modification or change procedures;
- the interchange of design information between designers, constructors, inspectors, and managers regarding constructability issues and field changes was performed in accordance with procedural requirements;
- design change activities were completed in accordance with applicable specifications, drawings, and approved procedures;
- nonconformance resolutions and design change documentation demonstrated adequacy of design by reference to analyses, calculations, bounding condition checks, functional assessments, testing, and/or engineering evaluations;
- the documents adequately defined the final design and arrangement of these SSCs and were consistent with the design commitments and requirements of the technical specifications, the UFSAR, and code commitments; and
- inspection and documentation of installation activities for areas that would become inaccessible after concrete placement were performed in accordance with procedural requirements.

b. Findings

No findings were identified.

1A25 (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:

- 65001.01-02.01 - Procedures
- 65001.01-02.07 - Identification and Resolution of Problem
- 65001.02-02.01 - Inspection of Concrete Placement
- 65001.02-02.02 - Laboratory Testing
- 65001.02-02.07 - Problem Identification and Resolution
- 65001.A.02.04 - Review As-built Deviations/Nonconformance
- 65001.F-02.04-General QA Review

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 131’-6” and 149’-6” and azimuths 173 and 342 degrees. The inspectors reviewed a sample of approved implementing procedures and specifications to determine whether the documents:

- met the requirements specified in the quality assurance program and the UFSAR;
- 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 QC inspection to ensure that the as-built condition met specified design requirements, drawings and material specifications;
- required measuring and test equipment to be calibrated and maintained in accordance with approved calibration procedures and vendor requirements; and
- provided qualification requirements for craft and QC inspection personnel performing installation and testing activities.

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 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 American Society for Testing and Materials (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 interviewed licensee and contractor personnel to determine whether:

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

The inspectors reviewed a sample of nonconformances to verify if:

- 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.

1A26 (Unit 3) ITAAC Number 3.3.00.02a.i.c (762) / Family 01F

a. Inspection Scope

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

- 65001.01 - Inspection of ITAAC-Related Foundations & Buildings
- 65001.01-02.07 - Identification and Resolution of Problem
- 65001.02-02.01 - Inspection of Concrete Placement
- 65001.02-02.02 - Laboratory Testing
- 65001.02-02.07 - Problem Identification and Resolution
- 65001.08-02.05 - Inspection of Station Grounding and Surge Protection
- 65001.A- As-Built Attributes for SSCs associated with ITAAC
- 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

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 3. Specifically, the inspectors observed construction activities associated with the floor sections at elevation 100’-0” between column lines L, I, 9.2, and 11.

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

- the installation activities met applicable quality and technical requirements established by approved procedures, specifications, and drawings 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;
- reinforcing steel and embedments were secured and free of contaminants and excessive rust; and
- forms were secure, leak tight, and free from debris or excess water.

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

- the latest approved procedures, drawings, and other work instructions were available at the installation area;
- the installation, inspection, and testing sequences were maintained;
- the licensee had verified that the items to be installed or welded met specified requirements;
- the items being installed or welded were not damaged prior to installation;
- materials, tools, and other equipment being used were qualified and approved in accordance with site procedures;
- 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 observed concrete pre-placement activities to determine whether pre-placement planning and training had been completed, including observing the final pre-placement inspection performed by QC, 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, deviations were adequately captured and addressed, and preparation and cleanliness of the formwork had been completed. The inspectors performed as-built field inspections of the station grounding grid and grounding connection hardware to determine whether the installation of the system was performed in accordance with specifications and design requirements. The inspectors observed concrete delivery operations, placement activities and reviewed batch plant records to determine whether:

- accepted procedures and specifications 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;
- 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;
- the time limit between mixing and placement was not been exceeded;
- temperature limits were not exceeded;
- placement drop distances did not exceed specification requirements and did not result in segregation;

- vibrators were handled and operated to ensure adequate consolidation and avoid voiding or honeycombing;
- concrete was placed in accordance with the concrete placement plan; 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 to determine whether:

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

The inspectors reviewed a sample of nonconformances and design changes 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.

1A27 (Unit 3) ITAAC Number 3.3.00.02a.i.d (763) / Family 01F

a. Inspection Scope

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

- 65001.02-02.01 - Inspection of Concrete Placement
- 65001.B-02.05-Inspection

The inspectors observed contractor QC inspectors perform a final visual inspection of two rebar welds in the seismic category I floor between column lines 4 and 7.3 and lines I and J-1. The inspectors also performed an independent visual inspection of these rebar welds to determine whether the welds met the requirements of AWS D1.4:

1998 edition. Specifically, the inspectors verified that weld numbers 888573-001 and -030 were acceptable per Section 7, "Inspection," of the AWS D1.4 Code.

The inspectors reviewed the completed weld records and in-process work package SV3-1220-CRW-CV1701 for the above welds.

b. Findings

No findings were identified.

1A28 (Unit 3) ITAAC Number 3.3.00.02a.ii.a (764) / Family 01A

a. Inspection Scope

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

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

The inspectors reviewed the dimensions specified in Table 3.3-1 of Appendix C of the Vogtle Unit 3 COL for the North, East, and West reactor vessel cavity walls from 83' to 98', and reviewed measuring and surveying records associated with the wall sections to determine whether:

- the records reflected the as-built facility and furnished documentary evidence that the applicable quality and technical requirements were met;
- the activities were conducted in accordance with the licensee's quality assurance program requirements; and
- there were any identified deviations.

Additionally, the inspectors reviewed procedures to determine whether the methodology used to gather and interpret the data was appropriate and would produce sufficient records to document that completed work met the design specifications and acceptance criteria. The inspectors also assessed the methods and controls used by the licensee to verify that the as-built dimensions conformed to the licensing basis.

b. Findings

No findings were identified.

1A29 (Unit 3) ITAAC Number 3.3.00.03b (778) / Family 01A

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 3.3.00.03b (778). The inspectors used the following NRC IPs/sections to perform this inspection:

- 65001.01-02.01 - Procedures
- 65001.01-02.04 - Key Dimensions and Volumes
- 65001.01-02.06 - Records

The inspectors reviewed the density requirements specified in section 12.3.2.2 of the Vogtle Unit 3 UFSAR for the following concrete placements:

- the Unit 3 nuclear island placement 13M horizontal RC SC connection, which comprises the placement in the shield building SC panels from 100-0” to 103’-2” between line N and Q;
- shield building courses 3 and 4 (pour 2675), which comprises the placement in the shield building SC panels from 123'6" to 131'6" between line N and Q;
- the shield wall RC04 placement (pour 3201), which comprises the reinforced concrete placement in the shield building from 100' to 117'6" between azimuth 53.4° and 96.9°;
- shield building courses 5 and 6 (pour 3124), which comprises the placement in the shield building SC panels from 131'-6” to 149’-6” between line N and Q; and
- shield building main steam/feedwater area placement between 117'-6" and 133'-9.5".

The inspectors reviewed density records associated with the wall sections to determine whether the records reflected the as-built facility and furnished documentary evidence that the applicable quality and technical requirements were met and there were any identified deviations.

b. Findings

No findings were identified.

1A30 (Unit 3) ITAAC Number 3.5.00.06 (831) / Family 19A

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 3.5.00.06 (831). The inspectors used the following NRC IPs/sections to perform this inspection:

- 65001.19-02.02b-In-Process Installation

The inspectors reviewed the quality release data packages and certificates of conformance for the following effluent radiation monitors to determine whether these items stored in the on-site warehouse had a certificate of conformance documenting the monitor's tag number, part number, and serial number:

- VFS-RE101
- VFS-RE102
- VFS-RE103
- VFS-RE104A
- VFS-RE104B
- TDS-RE001

b. Findings

No findings were identified.

1A31 (Unit 4) ITAAC Number 2.1.02.03a (15) / Family 06B
(Unit 4) ITAAC Number 2.1.02.03b (16) / Family 03B

a. Inspection Scope

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

- 65001.B-02.01-Program and Procedures Review
- 65001.B-02.02-Welding Procedure Qualification
- 65001.B-02.03-Welder Qualification
- 65001.B-02.05-Inspection

The inspectors performed a review of the contractor PCI Energy Services' (PCI) welding and NDE programs to determine if they met the requirements of the ASME Code Section III and 10 CFR Part 50 Appendix B. The inspectors reviewed a selection of procedures governing the program such as: welding filler metal control, welder qualification process, procedures, travelers, and written practice for qualifying NDE personnel. The inspectors reviewed PCI's machine and manual GTAW welding procedures and associated qualification records to verify they had been written and qualified in accordance with ASME Code Sections III and IX. The inspectors also reviewed PCI's PT examination procedure to determine if it had been written and demonstrated in accordance with the requirements of ASME Sections III and V. The inspectors reviewed a sample of welder qualification and PT examiner qualification records to determine if the personnel performing welding and NDE were qualified in accordance with their procedures and ASME Code Sections III, IX, and V. Lastly the inspectors performed a walk-down to the PCI welding filler metal storage and issuance trailer to determine if welding filler metal was being stored and issued in accordance with their procedure and the requirements of ASME NQA-1.

The inspectors reviewed the quality assurance requirements flow down from Westinghouse to PCI, as they related to welding program documentation and procedures. Specifically, the inspectors reviewed the following documents to verify that document control requirements were correctly flowed into implementing procedures used for welding the safety-related RCS:

- Westinghouse's QMS-A, "Westinghouse Electric Company Quality Management System," Rev. 7
- WECTEC's PQAP, "Vogtle Units 3 & 4 Project – Project Quality Assurance Plan," Rev. 005
- QAM 01.00, "WECTEC LLC Quality Assurance Manual," Rev. 00.01
- SV0-PL01-Z0-550000, "RCL Piping, Support, and Vessel Installation", Rev. 5
- PCI's "NPT/NA ASME Quality Assurance Manual," Rev. 12

b. Findings

No findings were identified.

1A32 (Unit 4) ITAAC Number 2.1.02.08d.iii (34) / Family 03A

a. Inspection Scope

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

- 65001.07-02.01 - General Installation
- 65001.07-02.04 - Testing and Verification
- 65001.F-02.02-Fabrication Records Review
- 65001.F-02.04-General QA Review

The inspectors reviewed documents and records associated with the Unit 4 forth-stage ADS valves (S/Ns 0920-164452-3-1, 0920-164452-3-2, 0920-164452-3-3, and 0920-164452-3-4) to verify that the as-manufactured flow area met the acceptance criteria. Specifically, the inspectors reviewed critical dimensional reports from the valve vendor and design documents to verify the as-manufactured flow area met the acceptance criteria of ITAAC 2.1.02.08d.iii (greater than or equal to 67 square inches). During the time of the inspection, the valve serial numbers listed above were not associated with a licensee component ID. The documents reviewed were associated with 14 inch ADS squib valves fabricated by the vendor, which were the same type of valves identified in the Westinghouse valve data sheet and Section 5.4.6.2 of the UFSAR for the design of the forth-stage ADS valves.

b. Findings

No findings were identified.

1A33 (Unit 4) ITAAC Number 2.1.02.08d.iv (35) / Family 07E

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 2.1.02.08d.iv (35). The inspectors used the following NRC IPs/sections to perform this inspection:

- 65001.07-02.01 - General Installation
- 65001.07-02.04 - Testing and Verification
- 65001.F-02.02-Fabrication Records Review
- 65001.F-02.04-General QA Review

The inspectors reviewed documents and records associated with the Unit 4 stage 1, 2, and 3 ADS valves to verify that the effective flow area met the acceptance criteria. Specifically, the inspectors reviewed flow test reports and calculations from the valve vendor and design documents to verify the effective flow area met the

acceptance criteria of ITAAC 2.1.02.08d.iv (greater than or equal to 4.6 square inches for stage 1 and greater than or equal to 19 square inches for stages 2 and 3). During the time of the inspection, the valves were not associated with a licensee component ID. The documents reviewed were associated with 4 inch (stage 1) and 8 inch (stage 2 and 3) motor operated globe valves fabricated by the vendor, which were the same type of valves identified in the Westinghouse valve data sheets and Section 5.4.6.2 of the UFSAR for the design of the stage 1, 2, and 3 ADS valves. The inspectors reviewed these documents to determine if there was a link between the type of valves in the vendor valve flow test reports and calculations and the valve component IDs referenced in the design documents and UFSAR.

b. Findings

No findings were identified.

1A34 (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.A.02.03 - Independent Assessment/Measurement Inspection
- 65001.A.02.04 - Review As-built Deviations/Nonconformance
- 65001.B-02.04-Production Controls
- 65001.B-02.05-Inspection

The inspectors observed construction activities associated with the Vogtle Unit 4 IRWST - CA03 module to determine whether these activities were performed in accordance with the applicable quality and technical requirements. Specifically, the inspectors verified that welding and NDE activities were compliant with the AWS D1.6:1999, "Structural Welding Code - Stainless Steel," and 10 CFR Part 50, Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants."

The inspectors observed the in-process assembly of the CA03 module to determine whether the licensee had established adequate controls to ensure that the module was constructed in accordance with the Vogtle UFSAR. Specifically, during the inspector's observations of the in-process fit-up, welding, and inspection activities, the inspectors verified the following attributes:

- the identity of the submodules were in accordance with the latest approved-for-construction drawings, equipment lists, specifications, and established procedures;
- the latest approved-for-construction procedures, drawings, manuals, and other work instructions were available at the installation area;
- the submodules were not damaged prior to assembly and that nonconformances associated with the submodules had been resolved or were properly being tracked in accordance with the quality assurance program requirements;

- the applicable revisions of approved procedures, drawings, and instructions were being followed;
- processes, materials, tools, and other equipment used were qualified and approved in accordance with site procedures;
- the installation, inspection, and testing sequences were maintained according to the work package;
- nonconforming items were clearly identified, segregated, and dispositioned;
- design changes or field modifications relevant to the work observed were properly controlled and processed in accordance with quality and technical requirements;
- inspection and test reports were current, accurate, and complete; and
- the item(s) were located, installed, assembled, or connected in accordance with the latest approved-for-construction drawings, manufacturer's instructions, and procedures;

The inspectors observed the in-process fit-up and welding of a sample of complete joint penetration welds between CA03 modules to determine whether the welding was performed within the ranges allowed by the WPS and the AWS D1.6:1999, "Structural Welding Code - Stainless Steel." During this inspection, the inspectors verified that a sample of welding variables were within the ranges allowed by the WPS and AWS D1.6:1999 Code, such as: filler metal size and classification, voltage, amperage, travel speed, shielding gas composition, and shielding gas flow rate. Specifically, the inspectors observed the in-process welding of the following welds:

- 880716-A04 and 880716-B04 (submodule CA03-03 to CA03-04)
- 880718-A14 and 880718-B14 (submodule CA03-13 to CA03-14)

Furthermore, during the in-process welding, the inspectors verified the following attributes:

- the work was conducted in accordance with a traveler (weld data sheet) that provided for the proper sequencing of the work and that this weld data sheet properly referenced the applicable procedures, drawings, specifications;
- the weld data sheet established adequate hold points as required by the quality inspection plan;
- the weld joint was sufficiently protected from inclement conditions such as high wind;
- surfaces to be welded were smooth, uniform, and free from significant surface discontinuities such as cracks or seams, and free from paint, oil, rust, scale, slag, grease, moisture or other harmful foreign materials that would be detrimental to welding;
- the weld joint geometry, including root opening and fit-up tolerances, was in accordance with the applicable WPS;
- the temperature of the base material at the joint prior to welding met the minimum preheat requirements specified in the welding procedure; and
- the maximum interpass temperature was checked to ensure that it did not exceed the value specified in the welding procedure;
- other welding variables specified in the WPS were routinely verified by QC;
- the weld was traceable to the welder;
- the filler metal and backing bar (as applicable) used in the joint were traceable and were qualified materials in accordance with the AWS D1.6:1999 Code; and
- tack welds between the backing bar (as applicable) and base material were fabricated by qualified welders using qualified WPSs.

The inspectors also performed an independent visual inspection of a sample of welds, including tack welds, associated with the assembly of the Unit 4 CA03 module. Specifically, the inspectors reviewed the condition of the welds to determine if they met the requirements of AWS D1.6:1999 with regard to size, length, and location of welds. The inspectors also completed this visual inspection to determine if any of the following conditions were present: cracks, excessive reinforcement, lack of fusion, undercut, and porosity.

The inspectors performed an independent visual inspection of the following welds:

- 880717-A09-RW2 (submodule CA03-08 to CA03-09)
- 880718-A12 and 880718-B12 (submodule CA03-11 to CA03-12)
- 880718-A13 (repair cavity of weld between submodule CA03-12 to CA03-13)
- 880718-A14 and 880718-B14 (submodule CA03-13 to CA03-14)
- 880718-A15 (submodule CA03-14 to CA03-15)

The inspectors reviewed in-process and completed weld and NDE records to determine whether the welds were completed according to the AWS D1.6:1999 code. Specifically, the inspectors reviewed welding records for the welds listed above and a sample of NDE reports listed on the weld data sheets.
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;
- 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

Introduction

The inspectors identified an ITAAC finding of very low safety significance (Green) and associated NCV of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," for the licensee's failure to identify nonconforming welds associated with the Unit 4 IRWST steel wall (CA03 module).

Description

On February 16, 2017, the inspectors performed an independent visual inspection of a sample of complete joint penetration welds between submodules associated with the Vogtle Unit 4 IRWST module (CA03). The inspectors determined that field weld 880718-A12, a complete joint penetration weld between submodules CA03-11 and CA03-12, did not comply with section 5.11.5, “Groove Welds,” of AWS D1.6, “Structural Welding Code – Stainless Steel,” 1999 edition. The inspectors measured weld reinforcement that exceeded the 1/8 inch maximum and did not have a gradual transition to the plane of the base metal surface. The inspectors noted that this weld was previously inspected and accepted by QC personnel.

Upon identification of this issue, the licensee re-inspected 880718-A12 and confirmed that the weld contained multiple areas of nonconforming weld reinforcement along the approximately 33 feet of weld length. On February 22, 2017, the licensee initiated

N&D number SV4-CA03-GNR-000048 (superseded by SV4-CA03-GNR-000049 on February 24, 2017) and CAPAL 100451345 to identify, correct, and begin a limited cause analysis. Moreover, the license re-inspected the only other similar weld that had been previously inspected and accepted by QC (880717-A09), which was also determined to contain multiple areas that failed to meet section 5.11.5 of the AWS D1.6:1999 code. The licensee initiated SV4-CA03-GNR-000050 on March 3, 2017, to identify and correct the nonconforming areas of weld 880717-A09.

The engineering dispositions for the N&Ds listed above were "rework"; therefore, the licensee restored each nonconforming weld to original requirements. The licensee demonstrated with reasonable assurance, that if left uncorrected, the design function of the as-built IRWST steel wall would not be impaired by the deficiency.

The inspectors determined that the QC inspectors could have reasonably been expected to identify these nonconforming conditions during the final visual examinations for welds 880718-A12 and 880717-A09. The failure to comply with the AWS D1.6:1999 code represents a structural deviation associated with the IRWST, a nuclear island critical structural section as identified by Table 3.3-7, “Nuclear Island Critical Structural Sections,” of Appendix C, “Vogtle Electric Generating Plant Unit 4 Inspections, Tests, Analyses, and Acceptance Criteria,” of the Vogtle COL. The inspectors considered the rework required to restore welds 880718-A12 and 880717-A09 to design requirements, to be substantive, based on the linear feet of nonconforming weld and because the rework invalidated the surface examinations that had already been performed.

Analysis

The inspectors determined that the failure to identify that welds 880718-A12 and 880717-A09 were nonconforming to section 5.11.5 of AWS D1.6:1999 was contrary to 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," and was a performance deficiency. The inspectors determined the performance deficiency was more than minor because Question 3 provided in IMC 0613, Appendix E was answered “Yes.” Specifically, the finding was determined to be more than minor because the inspectors considered the rework required to restore welds 880718-A12 and 880717-A09 to design requirements, to be substantive, based on the linear feet of nonconforming weld and because the rework invalidated the surface examinations that had already been performed..

The inspectors determined the finding represented an ITAAC finding because it was material to the acceptance criteria of Vogtle Unit 4 ITAAC 3.3.00.02a.i.a. The failure of the as-built IRWST wall to meet the approved design represented a deviation from the approved design that would not have been reconciled by the licensee, as required by the acceptance criteria of ITAAC 3.3.00.02a.i.a.

The inspectors concluded this finding was associated with the Construction Reactor Safety - Inspection/Testing Cornerstone.

Using Appendix A, “AP1000 Construction Significance Determination Process,” of IMC 2519, “Construction Significance Determination Process,” the inspectors concluded this finding was of very low safety significance (Green) because the licensee

demonstrated with reasonable assurance that the design function of the IRWST steel wall would not be impaired by the deficiency (Step 9 of Appendix A).

This finding was cross-cutting in the area of Problem Identification and Resolution, Identification, because individuals did not identify issues completely, accurately, and in a timely manner in accordance with the corrective action program. [P.1]

Enforcement

10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," requires, in part, that conditions adverse to quality, such as nonconformances, are promptly identified and corrected.

Section 5.11.5, “Groove Welds,” of AWS D1.6, “Structural Welding Code – Stainless Steel,” 1999 edition, states in part, “Groove welds shall be made with minimum weld reinforcement unless otherwise specified. Reinforcement shall not exceed 1/8 inch in height and shall have a gradual transition to the plane of the base metal surface.”

Contrary to the above, prior to February 16, 2017, the licensee failed to identify and correct conditions adverse to quality associated with the construction of a seismic category I structure (the Vogtle Unit 4 in-containment refueling water storage tank steel wall), in that QC inspectors failed to identify that welds 880718-A12 and 880717-A09 were nonconforming to section 5.11.5 of AWS D1.6:1999. Specifically, QC inspectors failed to identify that these welds contained multiple locations of weld reinforcement that exceeded 1/8 inch and did not have a gradual transition to the plane of the base metal surface.

The licensee demonstrated with reasonable assurance that the as-built IRWST steel wall would have been able to meet its design function. Moreover, as of April 27, 2017, the licensee completed rework on welds 880718-A12 and 880717-A09 and re-inspected the welds with satisfactory results.

Because this violation was of very low safety significance (Green) and it was entered into the licensee’s corrective action program as CAPAL 100451345, N&D SV4-CA03-GNR-000049, and SV4-CA03-GNR-000050, this violation is being treated as an NCV (NCV 05200026/2017001-01, Failure to identify nonconforming CA03 welds) consistent with Section 2.3 of the NRC Enforcement Policy and EGM 11-006. This NCV was opened and closed in this report because the licensee has appropriately reworked and re-inspected the nonconforming welds; therefore, the acceptance criteria of ITAAC 3.3.00.02a.i.a is no longer impacted.

1A35 (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.A.02.03 - Independent Assessment/Measurement Inspection
- 65001.B-02.04-Production Controls
- 65001.B-02.05-Inspection

On January 26, 2017, the inspectors conducted a walk-down of fabrication work for the Unit 4 CA02 wall, which forms the east wall of the IRWST. The inspectors observed the in-process welding of four fillet welds for direct weld attachments to the module wall. Specifically, the inspectors observed the fit-up and tack welds for field welds 881630-CA02.L-1, -2 to determine whether the tack welds met the requirements of the WPS and the AWS D1.6:1999 code. The inspectors also observed the final weld condition for field welds 881892-CA02.M01, -2 to determine whether the final weld met the requirements of the WPS and the AWS D1.1, Structural Welding Code – Steel, 2000 code.

The inspectors also reviewed the in-process welding 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.

b. Findings

No findings were identified.

1A36 (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-02.04-Production Controls

The inspectors observed the in-process weld fit-up for two embed plates to the Unit 4 CA01 module. Specifically, the inspectors observed the tack welding of embed plates B-017 and B-018 to the CA01-16 and CA01-15 submodules, which form part of the north reactor cavity wall from 83' 0" - 98' 0". During the welding of the tack welds, the inspectors observed the amperage and voltage to verify they were within the limits established by the approved WPS. The inspectors performed an independent visual

inspection of the tack welds to determine whether the welds met the requirements of the AWS D1.6:1999 Code.

The inspectors reviewed the in-process 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; and
- required inspections were identified in the traveler with hold points, as appropriate.

b. Findings

No findings were identified.

1A37 (Unit 4) ITAAC Number 3.3.00.02a.i.b (761) / Family 01F

a. Inspection Scope

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

- 65001.01 - Inspection of ITAAC-Related Foundations & Buildings
- 65001.01-02.01 - Procedures
- 65001.01-02.05 - Steel Structures
- 65001.01-02.06 - Records
- 65001.01-02.07 - Identification and Resolution of Problem
- 65001.02-02.01 - Inspection of Concrete Placement
- 65001.02-02.02 - Laboratory Testing
- 65001.02-02.03 - Special Considerations
- 65001.02-02.06 - Record Review
- 65001.02-02.07 - Problem Identification and Resolution
- 65001.02-02.09 - Concrete Quality Process Problems
- 65001.A- As-Built Attributes for SSCs associated with ITAAC
- 65001.A.02.01 - Observation of in-Process Installation Activities
- 65001.A.02.02 - Installation Records Review
- 65001.A.02.03 - Independent Assessment/Measurement Inspection
- 65001.A.02.04 - Review As-built Deviations/Nonconformance
- 65001.B-02.05-Inspection
- 65001.B-02.06-Records
- 65001.F- Inspection of the ITAAC-Related Design and Fabrication Requirements
- 65001.F-02.02-Fabrication Records Review

The inspectors reviewed quality records and performed direct inspection of construction activities associated with the Shield Building for Vogtle Unit 4. Specifically, the inspectors observed construction activities associated with the following areas:
- reinforced concrete dish located approximately between azimuths 173 and 342 degrees and elevations 94’-0" and 100’-0”

- reinforced concrete/steel concrete composite (RC/SC) horizontal transition located approximately between azimuths 173 and 342 degrees and elevations 100’-0” and 103’-6”
- RC/SC vertical transition located approximately at azimuth 182 degrees and between elevations 103’-6” and 125'-3"

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

- met the requirements specified in the QA 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 QC inspection to ensure that the as-built condition met specified design requirements, drawings and material specifications; and
- provided qualification requirements for craft and QC inspection personnel performing installation and testing activities.

The inspectors reviewed a sample of work packages for reinforcing steel, welding, formwork, and concrete placement to determine whether:

- the latest approved procedures, drawings, and other work instructions were available at the installation area;
- the licensee had verified that the items to be installed met specified requirements;
- the installation, inspection, and testing sequences were maintained;
- the items being installed were not damaged prior to installation;
- 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.

For the RC/SC horizontal transition, the inspectors reviewed the completed weld records, nondestructive testing reports, and in-process work package (SV4-1208-SCW-CV6994, "Course 1 Unit 4 Shield Building") for the following welds associated with course 1 of the Vogtle Unit 4 shield building from 100'-0" to 103'-6":

- CV12240-01JK-I (Panel 01J to 01K)
- CV12240-01JK-O (Panel 01J to 01K)
- CV12240-01LM-I (Panel 01L to 01M)
- CV12240-01LM-O (Panel 01L to 01M)
- CV12240-01NP-I (Panel 01N to 01P)
- CV12240-01NP-O (Panel 01N to 01P)
- CV12240-01MN-2-O (Support Plate 01M to Support Plate 01N)

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

The inspectors reviewed a sample of the UT and MT examination records for the above welds to determine whether the required examinations were performed in accordance with the MISTRAS UT procedure (100-UT-310, "Ultrasonic examination of welds in accordance with AWS Structural Welding Code D1.1," Revision 6), MISTRAS MT procedure (100-MT-302, "Magnetic Particle Examination in Accordance with AWS Structural Steel Welding Code," Revision 3), and the AWS D1.1:2000, Structural Welding Code - Steel. The inspectors also reviewed the UT and MT procedures for conformance to the AWS D1.1:2000 Code. Specifically, the inspectors reviewed the following UT and MT examination reports: V-17-MT-3002-0413 and V-17-UT-310-0104.

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

For the reinforced concrete dish and RC/SC horizontal transition, the inspectors observed installation activities associated with formwork and steel reinforcement, including vertical reinforcing steel bars 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;
- reinforcing steel was located properly in the structure, were sized as specified in drawings, had proper clearances, was secured, and was free of contaminants and excessive rust; and
- forms were secure, leak tight, and free from debris or excess water.

For the reinforced concrete dish and RC/SC horizontal transition, the inspectors observed concrete pre-placement activities to determine whether pre-placement planning and training had been completed and the pre-placement inspection was performed by QC before any concrete was placed. The inspectors reviewed the concrete placement plan included in the work package to determine whether it included appropriate considerations for mass concrete, large placements, contingencies for unexpected events or accidents, preparations for potential weather-related emergencies, and contingency preparations for stopping a concrete placement earlier than designed. Prior to concrete placement, the inspectors independently evaluated whether the reinforcing steel met drawings and specifications included in the work packages, deviations were adequately captured and addressed, and preparation and cleanliness of the formwork had been completed. The inspectors observed concrete placement activities, interviewed licensee personnel, and reviewed

associated documentation from the work package for the concrete placement to determine whether:

- accepted procedures and specifications were followed throughout the concrete placement;
- the pump trucks used to deliver the concrete to the point of placement were of suitable size and condition for the work;
- each batch ticket was reviewed for verification of proper mix, transport time, placement location, and amount of temper water being added at the truck delivery point;
- mixing time and rotations were adequate, including after any additions were made;
- placement drop distances did not exceed specification requirements and did not result in segregation;
- 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;
- special attention was given to areas of high reinforcing steel congestion and material was consolidated within the RC/SC horizontal transition modules such that excess concrete was observed exiting the vent holes in the horizontal support plates;
- 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 concrete placement, the inspectors observed in-process concrete testing to determine whether:

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

The inspectors reviewed concrete test results to determine whether:

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

The inspectors observed curing activities to determine whether curing was in accordance with specifications and procedures with regard to the method, materials, duration, temperature, inspections, and records. The inspectors performed independent inspection and measurements of the as-built concrete, including finishes and dimensions, to determine whether the as-built configuration met the design specifications.

The inspectors reviewed procedures and installation instructions for mechanical splicing operations of the RC/SC horizontal and vertical transition, specifically for the installation of the heavy hex nuts and flat washers to the reinforcement bars, to determine whether the design requirements were properly translated into installation instructions. For the RC/SC horizontal transition, the inspectors observed the installation of the heavy hex nuts and flat washers to the vertical reinforcement to verify they were installed in accordance with applicable requirements. For the both RC/SC vertical and horizontal transitions, the inspectors reviewed installation and inspection records and independently verified adequate installation of the heavy hex nuts and flat washers to the reinforcement bars to determine whether:

- the installation of the mechanical connections were properly controlled;
- acceptance criteria were defined and satisfied;
- each splice was documented and documentation included materials used, location, crew, type of splice, and heat number as applicable;
- inspections were performed by qualified inspection personnel;
- the recorded information was complete, accurate, and met the licensing basis, and conformed to applicable specifications; and
- the records were reviewed and approved by the responsible organization.

The inspectors observed the storage of the heavy hex nuts and flat washers for the RC/SC horizontal transition to determine whether the storage conditions met applicable quality and technical requirements. The inspectors reviewed the markings on the heavy hex nuts and washers to determine whether the markings were in accordance with the applicable quality and technical requirements.

The inspectors reviewed a sample of design changes and 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.

1A38 (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:

- 65001.01-02.05 - Steel Structures
- 65001.A.02.02 - Installation Records Review
- 65001.A.02.03 - Independent Assessment/Measurement Inspection
- 65001.A.02.04 - Review As-built Deviations/Nonconformance
- 65001.B-02.05-Inspection

- 65001.B-02.06-Records

The inspectors observed the in-process welding of the Vogtle Unit 4 CA20 module basemat attachment brackets to determine if the welding was performed within the ranges allowed by WPS WPS2-1.1S03 Rev. 6, and the requirements of the AWS D1.1:2000, "Structural Welding Code - Steel." The inspectors verified that the following welding parameters were within the ranges allowed by the WPS: filler metal size and classification, voltage, travel speed, wire feed speed, shielding gas composition, and shielding gas flow rate. Specifically, the inspectors observed in-process welding of the following welds in work package SV4-CA20-CAW-850102:

- 881097-E24-1 and E24-2
- 881097-E25-1 and E25-2
- 881097-E47-1 and E47-2
- 881097-E48-1 and E48-2
- 881097-E54-1 and E54-2
- 881097-E55-1 and E55-2

The inspectors performed an independent visual inspection of the following welds 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 5.24.1, "Fillet Welds," of AWS D1.1:2000:

- 881097-E24-1 and E24-2
- 881097-E25-1 and E25-2
- 881097-E47-1 and E47-2
- 881097-E48-1 and E48-2
- 881097-E54-1 and E54-2
- 881097-E55-1 and E55-2
- 881097-E95-1 and E95-2
- 881097-E96-1 and E96-2
- 881097-E97-1 and E97-2
- 881097-E106-1 and E106-2
- 881097-E134-1 and E134-2
- 881097-E135-1 and E135-2
- 881097-E136-1 and E136-2
- 881097-E144-1 and E144-2
- 881097-E145-1 and E145-2
- 881097-E146-1 and E146-2
- 881097-E169-1 and E169-2
- 881097-E174-1 and E174-2
- 881097-E178-1 and E178-2
- 881097-E187-1 and E187-2
- 881097-E188-1 and E188-2
- 881097-E190-1 and E190-2

The inspectors reviewed the in-process and completed weld records for the welds listed above 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;
- records adequately documented the following attributes: reference to procedure and welder qualifications, inspector qualifications, weld material certifications and receipt inspection reports, weld data or process records (travelers), weld maps, weld inspection records, and NDE records;
- records were appropriately retained and stored in accordance with QA program requirements;
- required inspections were identified in the traveler with hold points, as appropriate; and
- accepted, rejected, and repaired items were documented in written reports.

The inspectors reviewed a sample of 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
- that 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.

b. Findings

No findings were identified.

1A39 (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:

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

The inspectors reviewed quality records and performed direct inspection of construction activities associated with the radiologically controlled area of the Auxiliary Building for Vogtle Unit 4. Specifically, the inspectors observed construction activities associated with the precast panel panels 1225-CP-S01 (between column lines 1, 2, I, and J-1) and 1225-CP-S05 (column lines 7, 7.3, I, and the Shield Building) for the floor at elevation 82’-6”.

For both precast panels 1225-CP-S01 and 1225-CP-S05, the inspectors reviewed a sample of design 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.

For precast panel 1225-CP-S01, the inspectors observed installation activities associated with formwork, embedments, and steel reinforcement, including horizontal and vertical reinforcing steel bars, shear reinforcement, hooks extending above the precast panel, 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;
- penetrations, reinforcing steel, and embedments were located properly in the structure and had proper clearances;
- reinforcing steel and embedments were secured and free of contaminants and excessive rust; and
- forms were secure, leak tight, and free from debris or excess water.

For precast panel 1225-CP-S05, the inspectors observed concrete placement activities to determine whether:

- accepted procedures and specifications were followed throughout the concrete placement;
- the equipment used was suitable and sized for the work;
- each batch ticket was reviewed for verification of proper mix, transport time, placement location, and amount of temper water being added at the truck delivery point;
- mixing time and rotations were adequate, including after any additions were made;
- placement drop distances did not exceed specification requirements and did not result in segregation;
- 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.

For precast panel 1225-CP-S05, the inspectors observed curing activities to determine whether curing was in accordance with specifications and procedures with regard to the method, materials, duration, temperature, inspections, and records. The inspectors performed independent inspection and measurements of the as-built concrete, including finishes, locations of embedments, and dimensions, to determine whether the as-built configuration met the design specifications. The inspectors reviewed the inspection results, test results, and the in-process work package for

reinforcing steel, embedments, formwork, and concrete placement to determine whether:

- activities were controlled and accomplished in accordance with the quality assurance program;
- the latest approved procedures, drawings, and other work instructions were available at the installation area;
- inspection and test reports were current, accurate, and complete;
- inspection records provided evidence that the timing of events and time-dependent work activities were consistent with their specification requirements;
- nonconforming items were clearly identified, segregated if possible, and dispositioned;
- 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 records were reviewed and approved by the responsible organization;
- the recorded information was complete, accurate, and met the licensing basis and ITAAC requirements, and conformed to applicable specifications;
- the concrete placement was subjected to an integrated review before acceptance; and
- the as-built SSCs conformed to applicable codes, standards, quality requirements, and technical requirements.

b. Findings

No findings were identified.

1A40 (Unit 4) ITAAC Number 3.5.00.06 (831) / Family 19A

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 3.5.00.06 (831). The inspectors used the following NRC IPs/sections to perform this inspection:

- 65001.19-02.02b-In-Process Installation

The inspectors reviewed the quality release data packages and certificates of conformance for the following effluent radiation monitors to determine whether these items stored in the on site warehouse had a certificate of conformance documenting the monitor's tag number, part number, and serial number:

- VFS-RE101
- VFS-RE102
- VFS-RE103
- VFS-RE104A
- VFS-RE104B
- TDS-RE001

b. Findings

No findings were identified.

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

1P01 Construction QA Criterion 10

- 35007-A10 - Appendix 10. Inspection of Criterion X – Inspection
- 35007-A10.04 - Inspection Requirements and Guidance
- 35007-A10.04.01 - Inspection of QA Implementing Documents
- 35007-A10.04.02 - Inspection of QA Program Implementation

a. Inspection Scope

The NRC inspectors reviewed a sample of procedures and QC inspection plans to determine whether the licensee's implementing documents for conducting inspections met the requirements of applicable codes and design specifications, complied with the NRC approved Quality Assurance Program Document (QAPD), and included appropriate provisions for:

- examinations and measurements for each work operation, where necessary;
- methods used to perform inspections, including M&TE requirements;
- frequency inspections and sampling requirements;
- hold and witness points;
- acceptance criteria;
- documentation of nonconformances and unsatisfactory conditions;
- inspection documentation requirements; and
- inspection personnel are other than those who perform or directly supervise the work being inspected.

The NRC inspectors observed the following in-process QC inspections and made independent physical measurements where appropriate:

- QC final visual inspection of weld repairs for U4 CA03 horizontal stiffeners;
- marking transfer on material for an ASME pipe penetration associated with the PXS System.

The NRC inspectors observed these activities to determine whether:

- the licensee's effectively implemented the QA program;
- there was conformance with applicable acceptance criteria;
- the items inspected were marked accurately to reflect its inspection status;
- inspections were performed by qualified individuals other than those who performed or directly supervised the work being inspected; and
- mandatory hold points were witnessed by the QC inspector.

The inspectors evaluated a sample of QC inspection reports, work packages, and associated documentation to verify inspections were performed at the required frequencies, mandatory hold points were complied with and witnessed by the QC inspectors, and the inspectors had the current implementing documents and appropriate tools to conduct the inspections. Additionally, the NRC inspectors reviewed the inspection documentation to verify that the results were documented, detailed, complete, and included:

- observation or type of method used to perform inspection;

- item inspected and date of inspection;
- identification of person conducting inspection;
- M&TE used during inspection;
- reference to inspection criteria, sampling plan, or reference documents used to determine acceptance; and
- results of inspection performed.

b. Findings

No findings were identified.

1P02 Construction QA Criterion 16

- 35007-A16 - Appendix 16. Inspection of Criterion XVI – Corrective Action
- 35007-A16.04.02 - Inspection of QA Program Implementation

a. Inspection Scope

Daily Corrective Action Program Review

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 no 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 the contractors' 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 Engineering, Procurement, and Construction (EPC) consortium 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 EPC consortium 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.

Selected Issues for Follow-Up Inspection

The inspectors selected a sample of issues entered in the corrective action programs for a more in-depth focused review to determine if the handling of these issues was consistent with the applicable quality assurance program requirements and 10 CFR Part 50, Appendix B. The inspectors reviewed these corrective action documents and observed associated field implementation of corrective actions to determine if:

- conditions adverse to quality were promptly, completely, and accurately identified
- conditions were appropriately screened;
- extent of condition, generic implication, trending, and causal analyses were completed as appropriate;
- corrective actions were developed and implemented in a timely manner;
- for significant conditions adverse to quality, the cause was determined, corrective actions were taken to prevent recurrence, and the cause and corrective actions taken were documented and reported to appropriate levels of management;
- the licensee and their contractors properly evaluated and reported, if necessary, the condition in accordance with 10 CFR 50.55(e) and 10 CFR 21;
- utilization of parallel processes, design changes, document revisions, and other related programs was consistent with approved procedures and ensured that the conditions were adequately evaluated and corrected; and
- coordination across disciplines, work groups, and management organizations was sufficient to ensure that the interchange of information was completed in accordance with procedural requirements, including timeliness.

Specifically, the inspectors reviewed the following corrective action records and associated documents:

- SNC Condition Report (CR) 10092366, bars contacted by drill bit
- CR 10248343, Annex Building Floor Thickness
- CR 10271212, Failures to Follow Corrective Action Program Procedures

- CR 10310847, Overlay Plate Out of Gap Tolerance

b. Findings

No findings were identified.

1P03 Construction QA Criterion 9

- 35007-A9.04 - Inspection Requirements and Guidance

a. Inspection Scope

The inspectors reviewed a sample of structural carbon steel and stainless steel welding procedures to determine if the welding program still met the AWS D1.1 and D1.6 welding code requirements. Specifically the inspectors reviewed eight welding procedures and changes thereto along with a selection of PQRs to verify that non-administrative changes were within the applicable code requirements.

b. Findings

No findings were identified.

1P04 ITAAC Management

- 40600-02.01 - Programmatic Controls for ITAAC Closure

a. Inspection Scope

The inspectors reviewed the changes to the ITAAC management program, which controls the tracking of construction activities that relate to ITAAC completion. The inspectors reviewed the process and procedures related to ITAAC preservation, which is a process that tracks portions of long-term ITAAC to determine if the licensee's process satisfied the requirements of 10 CFR 52.99 and Regulatory Guide (RG) 1.215.

In addition, the inspectors reviewed Corrective Action and QA procedures that screen corrective action documents for ITAAC applicability to determine if the proper controls were in place to identify and correct conditions that would invalidate an ITAAC.

b. Findings

No findings were identified.

3. OPERATIONAL READINESS

Cornerstones: Operational Programs

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

3P01 Environmental Qualification

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

a. Inspection Scope

The inspectors reviewed documents for the following commodity codes, EY01, EY02, PV10, and JY50 and interviewed personnel to verify if:

- the licensee was using the appropriate design basis parameters for qualification and that the design basis was appropriately translated into SSCs qualification test or qualification analysis;
- limiting design basis parameters were used as input for the qualification of the SSC and that the necessary design basis documents and calculations, as appropriate, were correctly incorporated into the qualification program for the SSC;
- required qualification of SSCs was adequately completed and controlled in accordance with the requirements in 10 CFR 50.49, applicable methodology in the UFSAR, regulatory guidance, and IEEE standards;
- the documented qualified life was consistent with the results of the qualification activities; and
- licensee records established an adequate basis for acceptance of the ITAAC with qualification criteria attributes and that the qualification report concluded that the SSC can withstand the conditions that would exist before, during, and following a design basis accident without loss of safety function for the time required to perform the safety function.

The inspectors reviewed problems identified during the qualification process, including test anomalies and evaluated corrective action documents to determine the effectiveness of the licensee's corrective measures and if requirements of IEEE Std. 323-1974 were met.

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

- IDSA-EY-P12Y, Electrical Penetration P12 (EY01)
- WLS-PL-V055, Sump Discharge Containment Isolation Valve – IRC (PV10 – AOV plug) including the valve, actuator, and solenoid
- ECS-EY-P01X, Electrical Penetration P01 (EY02)
- ECS-EY-P19Z, Electrical Penetration P19 (EY02)
- PMS-JD-RTSB, Reactor Trip Switchgear, Division B (JY50)
- PMS-JD-RTSC, Reactor Trip Switchgear, Division C (JY50)
- PMS-JD-RTSD, Reactor Trip Switchgear, Division D (JY50)
- PMS-JD-RTSA, Reactor Trip Switchgear, Division A (JY50)

The inspectors reviewed the EQSR and portions of the EQDP for the Electrical Penetration Assemblies to verify that the equipment was adequately qualified in accordance with IEEE 317-1983, "IEEE Standard for Electric Penetration Assemblies

in Containment Structures for Nuclear Power Generating Stations," Section 6, "Qualification."

The inspectors reviewed the EQSR, EQDP, and applicable test procedures and test records related to the qualification for the expected environment to verify if qualification activities were adequately controlled and if the methodology conformed to applicable regulatory guidance and industry standards. The inspectors reviewed the environmental profiles documented in APP-VP-GW-030, "Plant Environmental Conditions," to verify if the environmental conditions enveloped the harsh environment. The inspectors reviewed test procedures and test records to determine if the qualification was in conformance with ASME QME-1 and if the valve actuator was qualified in conformance with IEEE Std. 382-1996, "IEEE Standard for Qualification of Actuators for Power-Operated Valve Assemblies With Safety-Related Functions for Nuclear Power Plants."

b. Findings

No findings were identified.

3P02 Non-licensed Plant Staff Training Program

- 41501-02.02 - Non-licensed Staff Training

a. Inspection Scope

Inspection Procedure 41501 – Review of Training and Qualification Programs. Section 02.02.a.6 and 02.02b
The inspectors reviewed the qualification program for Radiation Protection (RP) personnel and training records for current staff (One RP Manager, multiple RP Supervisors, and multiple RP Technicians). The inspectors reviewed training program procedures for RP technicians and leadership training expectations for RP management personnel. The inspectors also discussed training of radiation workers with licensee staff. The inspectors noted that the licensee's RP training program has been accredited by the National Nuclear Accrediting Board and that the program elements are the same as those used at Vogtle Units 1 and 2.

The licensee's activities and programs were evaluated against 10 CFR 19 and UFSAR Appendix 12AA. The inspectors completed line item 02.02.a.6 and 02.02b of this inspection procedure.

b. Findings

No findings were identified.

3P03 Radiation Protection

- 83535-02.01 - Radioactive Material and Contamination Control
- 83535-02.02 - In-Plant Surveys and Monitoring
- 83536-02.02 - Equipment

a. Inspection Scope

The inspectors evaluated implementation of the RP operational program elements required to be in place prior to the initial receipt of radioactive sources (Milestone 1), as identified in Appendix 12AA of the UFSAR.

Inspection Procedure 83535 – Part 52, Control of Radioactive Material and Contamination, Surveys, and Monitoring. Sections 02.01.a. and 02.02.b.1 through 02.02.b.5

The inspectors performed a walkdown of Building 322 where radiation monitors containing radioactive sources are being stored prior to installation. The inspectors evaluated the licensee's radiological controls including area postings and labeling of the individual containers. The inspectors also reviewed recent survey results for Building 322 and observed gamma-sensitive portable survey meters ready for use. In addition, the inspectors evaluated RP operational program procedures that have been issued for the following tasks:

- frequency, performance, and review of radiological surveys
- receipt and control of radioactive material
- posting of radiologically controlled areas and labeling of radioactive material

The licensee's activities and programs were evaluated against 10 CFR 20 and UFSAR Appendix 12AA. The inspectors completed line items 02.01.a. and 02.02.b.1 through 02.02.b.5 of this inspection procedure.

Inspection Procedure 83536 – Part 52, Facilities and Equipment. Section 02.02.g.

The inspectors performed a walkdown of Building 322 where radiation monitors containing radioactive sources are being stored prior to installation. The inspectors also discussed key control of the warehouse with licensee staff. In addition, the inspectors reviewed RP program procedures related to the identification, storage, and control of discrete radioactive sources. Controls for Special Nuclear Materials were not reviewed during this inspection and will be evaluated at a later date.

The licensee's activities and programs were evaluated against 10 CFR 20 and UFSAR Appendix 12AA. The inspectors completed line item 02.02.g of this inspection procedure.

b. Findings

No findings were identified.

4. OTHER INSPECTION RESULTS

4OA6 Meetings, Including Exit

On April 13, 2017, the inspectors presented the inspection results to Mark Rauckhorst, Executive Vice President Vogtle 3&4 Construction, along with other licensee and contractor staff members. The inspectors stated that no proprietary information would be included in the inspection report.

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensees and Contractor Personnel

M. Washington, SNC Licensing Engineer
J. Jimenez, ITAAC Engineer
D. Muetzel, WEC Principal Engineer Safety Systems AP1000 Hardware Engineering
B. Hirmanpour, SNC Digital Systems Regulatory Affairs and ITAAC
N. Bailey, WEC Principal Engineer
G. Cesare, WEC Engineer
S. Channarasappa, WEC EQ Fellow Engineer
A. Doinisi, WEC Design Engineer
M. Humphrey, SNC Design Oversight
L. Jesso, WEC Principal Engineer
D. Martin, WEC EQ Engineer
J. Mears, WEC Principal Engineer - Equipment Qualification
C. Perego, WEC Senior Engineer
N. Roll, WEC Engineer – Equipment Qualification
R. Wessell, WEC Principal Engineer

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Item Number	Type	Status	Description
05200026/2017001-01	Non Cited Violation	Open/ Closed	Failure to identify nonconforming CA03 welds

LIST OF DOCUMENTS REVIEWED

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SV3-PH01-V1-001, AP-1000 Steam Generator Support System Assembly Views, Rev. 1
SV3-PH01-V1-002, AP-1000 Steam Generator Vertical Column Support System Assembly & Details, Rev. 1
SV3-PH01-V1-003, AP-1000 Steam Generator Vertical Column Support Details, Rev. 1
SV3-PH01-V1-006, AP-1000 Steam Generator Upper Lateral Support Assembly & Details, Rev. 1
SV3-PH01-V2-001, AP-1000 Steam Generator Lower Lateral Support Assembly & Details, Rev. 1
SV3-PH01-V2-002, AP-1000 Steam Generator Intermediate Lateral Support Assembly & Details, Rev. 1
SV3-PH01-V8-009, AP-1000 Steam Generator Lateral Supports, Field Welding Options to Meet ASME NF-4441, Rev. 0
ASME Section III, Subsection NF – 1998 Edition through 2000 Addenda, “Supports”
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SV3-PH01-GNR-000007, CA01 Southeast SGUL Support, Rev.0
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GQP-9.7, "Solvent Removable Liquid Penetrant Examination and Acceptance Standards for Welds, Base Materials, and Cladding," Revision 17;
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Certificate of Calibration, Light Meter S/N A.072244;
Certificate of Calibration, Digital Thermometer S/N 36090168WS;

PCI Quality Assurance Traveler No. 911082-001, Weld Overlay for Vogtle Unit 3 SG “B” Intermediate Lateral Support “A”, Rev. 0
PCI Quality Assurance Traveler No. 911082-002, Weld Overlay for Vogtle Unit 3 SG “B” Intermediate Lateral Support “B”, Rev. 0
PCI Quality Assurance Traveler No. 911082-003, Bracket Install for Vogtle Unit 3 SG “B” Intermediate Lateral Support “A”, Rev. 0
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Westinghouse
APP-GW-GAH-010, “Project Quality Assurance Program Interface Plan for Domestic AP1000 Projects, Rev. 8
QMS-A, "Westinghouse Electric Company Quality Management System", Rev. 7

WEC 23.33, “Interface Agreement - Phased Integration of the WECTEC QAM with the Westinghouse QMS,” Rev. 3.0

WECTEC
#132175-2376, “Schedule of Required Vendor Data (SORVD),” Rev. 3, 9/14/16
Quality Rating List, 3/3/17
NEPG04-26, “Engineering Input to Subcontracts,” Rev. 07.00
NEPP04-62, “Preparation of a Schedule of Required Vendor Data (SORVD),” Rev. 0.0
PQAP, “Vogtle Units 3 & 4 Project – Project Quality Assurance Plan,” Rev. 005
QAM 01.00, “WECTEC LLC Quality Assurance Manual,” Rev. 00.01
QS 03.01, “Standard QA Program Requirements in Procurement Documents,” Rev. 07.00
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GQP-5.0, "Instructions and Procedures", Rev. 17
GQP-8.1, "Process Traveler," Rev. 19
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GQP-9.6, "Visual Examination of Welds,” Rev. 15
GQP-9.7, "Solvent Removable Liquid Penetrant Examination and Acceptance Standards for Welds, Base Materials, and Cladding (40-125 degrees F)", Rev. 17
GWS-1, "ASME Applications", Rev. 1
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NDE PT Level II Personnel Certificate for SAP # 97454
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WPQ, Welder Performance Qualification, for Stamp No. M1299
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"Nuclear Development Quality Assurance Manual", Rev. 15

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SV3-PL01-Z0-200, "Reactor Coolant Loop Seamless Forged and Formed Pipe Fabrication Specification," Revision 0;
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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-PL01-V6-001, "AP1000 Primary Coolant Loop Piping Spool Pieces," Revision 0;
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APP-GW-GAP-428, "Nonconformance and Disposition Report (N&D)", Rev. 11
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APP-GW-VP-010, "Equipment Qualification Methodology and Documentation Requirements for AP1000 Safety-Related Valves and Valve Appurtenances", Revision 3
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APP-PV70-Z0R-001, "PV70 Squib (Pyrotechnic Actuated) Valves, ASME Section III Class 1, Data Sheet Report," Revision 7
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Section 1A10
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Section 1A11
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W3-PCF-00-10-008, Mangiarotti Fabrication Control Plan for Assembly of Small Nozzles, Revision 4
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Welding Monitoring Records for CL-003, 02/08/2011
Welding Monitoring Records for CW-001/1, 12/02/2012
Welding Monitoring Records for CW-002/2, 01/09/2012
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Welding Monitoring Records for CW-050, 12/21/2011
Welding Monitoring Records for LW-013/1-3, 10/06/2011
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PQR, WQ 1360

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Non Conformity Report NCR-1860, Radiographic Test Postponed, Revision 0
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Section 1A13
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Section 1A14
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Section 1A15
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Section 1A18
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Section 1A20
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Section 1A21
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Section 1A23
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Section 1A24
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SV0-CC01-GEF-000358, “CA01 Concrete Placement Drop Height,” Revision 0

SV0-CC01-GEF-000358, “CA01 Concrete Placement Drop Height,” Revision 1
SV0-CC01-GEF-000361, “Supersede E&DCR SV0-CC01-GEF-000358 - 30' drop height for CA01,” Revision 0
SV3-CA01-GNR-000961, “SV3-CA01-13 J-Hooks Violate Clear Spacing,” Revision 0
SV3-CE01-GNR-000219, “CA01 Embeds Charpy Testing for Embedded plates (01-034, 01-035),” Revision 0
VSG-CC01-GEF-000263, “CA20 concrete drop height,” Revision 0
Work Package SV3-CA01-CCW-850001, “U3 CA01 Concrete Placement, Wall Placements #1 through #4, #5, #6b, #17, and #18 from Approximate Elev. 87’6” to 147’0”,” Revision 1.0

Section 1A25
Concrete Data
AMEC Concrete Field and Lab Test Data, Set ID 2017VEGP7177T, 2/22/2017
AMEC Concrete Field and Lab Test Data, Set ID 2017VEGP7177P, 2/22/2017
AMEC Concrete Field and Lab Test Data, Set ID 2017VEGP7178, 2/22/2017
AMEC Concrete Field and Lab Test Data, Set ID 2017VEGP7179, 2/22/2017
AMEC Concrete Field and Lab Test Data, Set ID 2017VEGP7180, 2/22/2017
Concrete/Grout Delivery Ticket # 43782, Pour # 3124, 01/24/2017
Concrete/Grout Delivery Ticket # 43787, Pour # 3124, 01/24/2017
Concrete/Grout Delivery Ticket # 43795, Pour # 3124, 01/24/2017
Concrete/Grout Delivery Ticket # 43806, Pour # 3124, 01/24/2017
Concrete/Grout Delivery Ticket # 43822, Pour # 3124, 01/24/2017

Miscellaneous
Quality Inspection Report C113-17-10006, “Placing Safety Related Concrete,” 01/24/17
SV3-1208-CCK-001, “Shield Building Construction Joint Locations & Concrete Compressive Strengths Rollout View,” Revision 2
Work Package SV3-1208-CCW-851005, “SV3 Shield Bldg Courses 5 & 6 Concrete,” Revision 1.0

Nonconformance & Disposition Reports
SV3-CC01-GNR-000386, “Course 5 & 6 Foreign Material,” Revision 0
SV3-CC01-GNR-000388, “Unit 3 Panel 06J Foreign Material,” Revision 0
SV3-CC01-GNR-000389, “Course 5 & 6 Placement Exceeded Lift Height,” Revision 0

Procedures and Specifications
APP-GW-GAP-428, “Nonconformance and Disposition Report,” Revision 10
SV3-CC01-Z0-026, “Safety Related Mixing and Delivering Concrete,” Revision 6
SV3-CC01-Z0-027, “Safety Related Concrete Testing Services,” Revision 5
SV3-CC01-Z0-031, “Safety Related Placing Concrete and Reinforcing Steel,” Revision 7

Section 1A26
Concrete Data
AMEC Concrete Field and Lab Test Data, Set ID 2017VEGP7249, 3/2/2017
Concrete/Grout Delivery Ticket # 44442, Pour # 3177, 02/21/2017
Concrete/Grout Delivery Ticket # 44443, Pour # 3177, 02/21/2017
Concrete/Grout Delivery Ticket # 44444, Pour # 3177, 02/21/2017
Concrete/Grout Delivery Ticket # 72086, Pour # 3177, 02/21/2017
Concrete/Grout Delivery Ticket # 72087, Pour # 3177, 02/21/2017
Concrete/Grout Delivery Ticket # 72088, Pour # 3177, 02/21/2017
Concrete/Grout Delivery Ticket # 72089, Pour # 3177, 02/21/2017

Concrete/Grout Delivery Ticket # 72090, Pour # 3177, 02/21/2017
Concrete/Grout Delivery Ticket # 72092, Pour # 3177, 02/21/2017
Concrete/Grout Delivery Ticket # 72093, Pour # 3177, 02/21/2017

Engineering & Design Coordination Reports
APP-1230-GEF-545, “Updates for PL6 and PL8 in Stairwell 5,” Revision 0
APP-CR01-GEF-850142, “Wall 9.3 Wall K.8 intersection,” Revision 0
SV0-CR01-GEF-000803, “Alternate Closed Tie Configuration at Pen’s Area 1 & 2,” Revision 0
SV0-CR01-GEF-000804, “EL. 100’-0” Pipe Pen Interference with East-West Bar,” Revision 0
SV3-CR01-GEF-000236, “Pipe interference #5 C.L. 11,” Revision 0

Miscellaneous
Specification SV3-CC01-Z0-026, “Safety Related Mixing and Delivering Concrete,” Revision 6
Specification SV3-CC01-Z0-027, “Safety Related Concrete Testing Services,” Revision 5
Specification SV3-CC01-Z0-031, “Safety Related Placing Concrete and Reinforcing Steel,” Revision 7
SV3-1230-CR-993, “Auxiliary Building Concrete Reinforcement Secondary Walls El 100’-0” (Sheet 4),” Revision 4
Work Package SV3-1232-C0W-850000, “Unit 3 Auxiliary El. 100 Ft. Area 2 - Civil - Floors,” Revision 0

Nonconformance & Disposition Report
SV3-CR01-GNR-000282, “L-Line Dowel Out of Location,” Revision 0
SV3-CR01-GNR-000587, “Rebar spacing in M-line wall at N. 1078'-9"; EL 82'-6" to 100'-0",” Revision 0
SV3-CR01-GNR-000655, “Room 12301 Formsaver Elevations,” Revision 0
SV3-CR01-GNR-000657, “Room 12302 Formsaver Elevations,” Revision 0

Section 1A27
Weld Data Sheets for weld numbers 888573-001 and -030;
WPS8-1.1S03;
Work Package SV3-1220-CRW-CV1701;

Section 1A28
APP-GW-IT-001, Guidelines for Concrete Wall and Slab Thickness Measurements, Rev. 0
NCSP 03-03, Construction Engineering, Rev. 01.03
NCSP 03-24, Field Surveying, Rev. 04.02
SV3-1120-CCK-887089, Unit 3 Reactor Vessel Cavity Wall Concrete Thickness, 11/16

Section 1A29
VSC25754, Concrete Field and Lab Test Data, 2/2016
VSC27679, Concrete Field and Lab Test Data, 8/2016
VSC30793, Concrete Field and Lab Test Data, 3/2017
VCS30072, Concrete Field and Lab Test Data, 1/2017
VCS30494, Concrete Field and Lab Test Data, 2/2017

Section 1A30
SV3-RMS-VQQ-012, "Quality Release Data Package," Revision 0;
SV3-RMS-VQQ-043, "Quality Release Data Package," Revision 0;
SV3-RMS-ITR-002, "Inspection Report Confirming Effluent Radiation Monitors Exist, ITAAC 3.5.00.06," Revision 1;

Section 1A31

Westinghouse

APP-GW-GAH-010, “Project Quality Assurance Program Interface Plan for Domestic AP1000 Projects, Rev. 8
QMS-A, "Westinghouse Electric Company Quality Management System", Rev. 7
WEC 23.33, “Interface Agreement - Phased Integration of the WECTEC QAM with the Westinghouse QMS,” Rev. 3.0

WECTEC

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Quality Rating List, 3/3/17
NEPG04-26, “Engineering Input to Subcontracts,” Rev. 07.00
NEPP04-62, “Preparation of a Schedule of Required Vendor Data (SORVD),” Rev. 0.0
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QAM 01.00, “WECTEC LLC Quality Assurance Manual,” Rev. 00.01
QS 03.01, “Standard QA Program Requirements in Procurement Documents,” Rev. 07.00
QS 04.03, “Office Procurement and the Selection of Suppliers, “Rev. 07.00
QS 05.01, “Standard Procedural System,” Rev. 08.01
QS 07.17, “Supplier QA Program Evaluation & Quality Rating List Management,” Rev. 00.00
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PCI Energy Services

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Audit Report # 2015-E07, NIAC Audit of PCI Energy Services QA Program, dated July 7-9, 2015, Rev. 1
GQP-5.0, "Instructions and Procedures", Rev. 17
GQP-8.1, "Process Traveler," Rev. 19
GQP-9.0, "Training, Qualification, Examination, and Certification of NDE Personnel in Accordance with SNT-TC-1A and CP-189," Rev. 16
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GQP-9.6, "Visual Examination of Welds,” Rev. 15
GQP-9.7, "Solvent Removable Liquid Penetrant Examination and Acceptance Standards for Welds, Base Materials, and Cladding (40-125 degrees F)", Rev. 17
GWS-1, "ASME Applications", Rev. 1
NDE Certification of Inspection, Examination and Testing Personnel for SAP # 79116
NDE Certification of Inspection, Examination and Testing Personnel for SAP # 97454
NDE Certification of Inspection, Examination and Testing Personnel for SAP # 98853
NDE PT Level II Personnel Certificate for SAP # 79116
NDE PT Level II Personnel Certificate for SAP # 97454
NDE PT Level II Personnel Certificate for SAP # 98853
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NDE VT Level II Personnel Certificate for SAP # 97454
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"NPT/NA ASME Quality Assurance Manual," Rev. 12 and Rev. 13
PQR, Procedure Qualification Record, 062, Rev. 3, 2/14/89
PQR, Procedure Qualification Record, 063, Rev. 6 4/16/14
PQR, Procedure Qualification Record, 600, Rev. 8, 1/23/2017
PQR, Procedure Qualification Record, 864, Rev. 2, 3/24/10
PQR, Procedure Qualification Record, 899, Rev. 4, 8/25/15

PS-01 Procedure Supplement Rev. 0 to GQP-9.7
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WCP-3, "Weld Material Control", Rev. 2
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WPQ, Welder Performance Qualification, for Stamp No. M098
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WPQ, Welder Performance Qualification, for Stamp No. M1217
WPQ, Welder Performance Qualification, for Stamp No. M1219
WPQ, Welder Performance Qualification, for Stamp No. M1291
WPQ, Welder Performance Qualification, for Stamp No. M1299
WPQ, Welder Performance Qualification, for Stamp No. M1586
WPQ, Welder Performance Qualification, for Stamp No. M2338
WPS, Welding Procedure Specification, 8 MC-GTAW, Rev. 16
WPS, Welding Procedure Specification, 8 MN-GTAW, Rev. 7

Section 1A32
APP-FSAR-GLN-699, "AP1000 Licensing Applicability Determination and 10 CFR 50.59 / 10 CFR 52 Appendix D Section VIII Screening: DCP APP-GW-GEE-5051, DP-855; DCP APP-GW-GEE-5054, DP-861; LAR-114," Revision C
APP-PV70-Z0R-001, "PV70 Squib (Pyrotechnic Actuated) Valves, ASME Section III Class 1, Data Sheet Report," Revision 7
SPX 10.5.077, "Measurement of 14" Shear Cap Inner Diameter Report," Revision 0
SPX Form 7.12.105-4, "Squib Valve Assembly Critical Dimensions," Part Number 403677, Serial Number 0920-164452-3-1, Revision 3
SPX Form 7.12.105-4, "Squib Valve Assembly Critical Dimensions," Part Number 403677, Serial Number 0920-164452-3-2, Revision 3
SPX Form 7.12.105-4, "Squib Valve Assembly Critical Dimensions," Part Number 403677, Serial Number 0920-164452-3-3, Revision 3
SPX Form 7.12.105-4, "Squib Valve Assembly Critical Dimensions," Part Number 403677, Serial Number 0920-164452-3-4, Revision 3
SV3-PV70-V2-003, "14" [350] ADS Squib Valve Assembly," Revision 1
SV3-PV70-V2-005, "14" [350] ADS Squib Valve Assembly," Revision 1
SV4-PV70-VBR-001, "Shear Cap Flow Area," Revision 0
Vogtle Electric Generating Plant Unit 4 Amendment to Facility Combined License, Amendment No. 62, 12/29/2016

Section 1A33
APP-FSAR-GLN-699, "AP1000 Licensing Applicability Determination and 10 CFR 50.59 / 10 CFR 52 Appendix D Section VIII Screening: DCP APP-GW-GEE-5051, DP-855; DCP APP-GW-GEE-5054, DP-861; LAR-114," Revision C
APP-PV01-VDR-131003, "4 Inch Motor Operated Globe Valves, APP-PV01-Z0D-131, Effective Flow Area Calculation," Revision 0
APP-PV01-VDR-132003, "8 Inch Motor Operated Globe Valve, APP-PV01-Z0D-132, Cv Test Results and Analysis Report," Revision 0
APP-PV01-Z0D-131, "PV01 Datasheet 131," Revision 5
APP-PV01-Z0D-132, "PV01 Datasheet 132," Revision 5
APP-PV01-Z0R-001, "3" and Larger Motor Operated Gate and Globe Valves, ASME Boiler and Pressure Vessel Code Section III Class 1, 2, and 3," Revision 8
Flowserve RAL-7666, "Valve Flow Characteristics," Revision 2

Vogtle Electric Generating Plant Unit 4 Amendment to Facility Combined License, Amendment No. 62, 12/29/2016

Section 1A34

Procedures
WPS5-10H.10HT70, Revision 8;
F-S561-004, “Structural Weld Inspection: AWS D1.1/D1.6 Structural Modules,” Revision 20 Change 1;
Drawings and Specifications:

SV4-CA03-S4K-880715, “CA03 Wall Submodule Assembly (01, 02, 03),” Revision 0;
SV4-CA03-S4K-880716, “CA03 Wall Submodule Assembly (03, 04, 05, 06, and 07),” Revision 0;
SV4-CA03-S4K-880717, “CA03 Wall Submodule Assembly (07, 08, 09, 10, 11),” Revision 0;
SV4-CA03-S4K-880718, "CA03 Wall Submodule Assembly Weld Map (11, 12, 13, 14, 15);
SV4-CA03-S4K-880719, “CA03 Wall Submodule Assembly (15, 16, 17),” Revision 1;
SV4-GW-S9-104, “AP1000 Structural Modules General Notes – V,” Revision 2;
GWS-5, “AWS D1.6 – Stainless Structural Steel General Welding Specification,” Revision 4;
Weld Data Sheets for Weld Numbers:
880716-A04 and 880716-B04, 880718-A14 and 880718-B14, 880717-A09-RW2, 880718-A12 and 880718-B12, 880718-A13, 880718-A14 and 880718-B14, 880718-A15.
880717-A09-RW1, -RW2;
880718-A12-RW1;

Nonconformance Reports:
SV4-CA03-GNR-000001
SV4-CA03-GNR-000028
SV4-CA03-GNR-000037
SV4-CA03-GNR-000041
SV4-CA03-GNR-000044
SV4-CA03-GNR-000045
SV4-CA03-GNR-000049
SV4-CA03-GNR-000050

Section 1A35
Drawings and Specifications
SV4-CA02-S4K-881892, "OLP's and Direct Welded Attachments," Revision 1;

Procedures
WPS2-1.1S03;
Weld Data Sheets for 881630-CA02.L-1, -2;
Weld Data Sheets for 881892-CA02.M01, -2;

Section 1A36
Drawings and Specifications
SV4-CA01-S4K-881475, "CA01 SA3 Basemat Installation," Revision 0;
SV4-CA01-S4-702, "Containment Building Areas 2&3 Module CA01 Subassembly 03 Structural Outline - Basemat Connections Plan View," Revision 2;

Welding Records:
Weld Data Sheet for Weld Number 881475-6
Weld Data Sheet for Weld Number 881475-7

Section 1A37
Concrete Data
AMEC Concrete Field and Lab Test Data, Set ID 2017VEGP7260, 3/24/17
AMEC Concrete Field and Lab Test Data, Set ID 2017VEGP7261, 3/24/17
AMEC Concrete Field and Lab Test Data, Set ID 2017VEGP7262, 3/24/17
AMEC Concrete Field and Lab Test Data, Set ID 2017VEGP7263, 3/24/17
AMEC Concrete Field and Lab Test Data, Set ID 2017VEGP7264, 3/24/17
Concrete/Grout Delivery Ticket # 72124, Pour # 3191, 02/24/2017
Concrete/Grout Delivery Ticket # 72131, Pour # 3191, 02/24/2017
Concrete/Grout Delivery Ticket # 72138, Pour # 3191, 02/24/2017
Concrete/Grout Delivery Ticket # 72141, Pour # 3191, 02/24/2017
Concrete/Grout Delivery Ticket # 72152, Pour # 3191, 02/24/2017
Concrete/Grout Delivery Ticket # 72160, Pour # 3191, 02/24/2017
Concrete/Grout Delivery Ticket # 72164, Pour # 3191, 02/24/2017

Engineering & Design Coordination Reports
APP-1208-GEF-295, “Shield Building Wall, RC/SC Fastener Installation Requirements,” Revision 0
APP-1208-GEF-295, “Shield Building Wall, RC/SC Fastener Installation Requirements,” Revision 1
APP-1208-GEF-327, “Shield Building RC/SC Panels- Hex nut inspection requirements,” Revision 0
APP-1208-GEF-327, “Shield Building RC/SC Panels- Hex nut inspection requirements,” Revision 1
APP-1208-GEF-398, “Shield Building RC/SC Panels- Hex nut inspection,” Revision 0
APP-1238-GEF-009, “E&DCR for West Shield Horizontals (D1West),” Revision 0
SV0-CR01-GEF-000866, “13M Placement Coupler and Lap Splice Location,” Revision 0
SV4-CC01-GEF-000036, “Unit 4 CJ for Placement X to place Shield Wall Concrete Stand,” Revision 0
SV4-CC01-GEF-000036, “Unit 4 CJ for Placement X to place Shield Wall Concrete Stand,” Revision 1
SV4-CC01-GEF-000040, “U4 CJ West Shield Wall Az. 182.25 El 94’ to 100’,” Revision 0

Miscellaneous
APP-1238-CCC-001, “Shield Building Reinforced Concrete Design – Below West Wall Between EL. 87’-6” to EL. 100’-0”,” Revision 2
SNC CR 10182243
SV4-1208-SC-101, "Shield Building Steel Wall Panels El. 100'-0" to El. 248'-61/2" Location and Identification Rollout View," Revision 4
SV4-1208-SCK-CV12240, "Course 1 Weld Map for Unit 4 Shield Building," Revision 0
SV4-1208-SCK-CV12258, "Shield Building Unit 4 Weld Details," Revision 0
WECTEC Surveillance No. S-132175-2017-101, “Review of Concrete Delivery Equipment for Concrete Placement under SV4-1208-CCW-851001,” 02/28/17
WECTEC Surveillance No. S-132175-2017-102, “Review of Concrete Delivery Tickets for Concrete Placement under SV4-1208-CCW-851001,”
WECTEC Surveillance No. S-132175-2017-103, “Review of Work Management for SV4-1208-CCW-851001 for Concrete Placement,” 02/28/17

WECTEC Surveillance No. S-132175-2017-123, “Review of In-process concrete testing for SV4-1208-CVW-851001,”
Westinghouse CAPAL 100367241

Nonconformance & Disposition Report
SV4-1208-GNR-000002, "Shield Building Root Gap U4 01K to 01L & 01M to 01N," Revision 0
SV4-1208-GNR-000004, "Shield Building Pan 01J Cover Plate Weld Removal Unit 4," Revision 0
SV4-CR01-GNR-000176, “Unit 4 Placement 13M West Shield Wall, a missing U-Bar at AZ. 191.725,” Revision 0
SV4-CR01-GNR-000176, “Unit 4 Placement 13M West Shield Wall, a missing U-Bar at AZ. 191.725,” Revision 1
SV4-CR01-GNR-000193, “Bars Left out of 13M,” Revision 0
SV4-CR01-GNR-000194, “Crack Control Spacing 13M Placement,” Revision 0
SV4-CR01-GNR-000195, “#11 U-bar Spacing 13M Placement,” Revision 0
SV4-CR01-GNR-000199, “Unit 4 post inspection of the 13M placement 2 issues found,” Revision 0
SV4-CR01-GNR-000201, “Unit 4 13M Nuts and Washers Storage Requirement Violation,” Revision 0

Nondestructive Testing Reports
Infrared Thermometer Verification Report for IR Serial Number E4092016493
Magnetic Particle Examination Report Number V-17-MT-3002-0413 (CV12240-01JK-I, CV12240-01JK-O, CV12240-01LM-I, CV12240-01LM-O, CV12240-01NP-I, CV12240-01NP-O)
Ultrasonic Examination Report Number V-17-UT-310-0104 (CV12240-01JK-I, CV12240-01JK-O, CV12240-01LM-I, CV12240-01LM-O, CV12240-01NP-I, CV12240-01NP-O)

Procedures and Specifications
100-MT-302, "Magnetic Particle Examination in Accordance with AWS Structural Steel Welding Code," Revision 3
100-UT-310, "Ultrasonic examination of welds in accordance with AWS Structural Welding Code D1.1," Revision 6
F-S561-006, "Shield Building AWS D1.1 Structural Welding of the SC Panels and FQ/MS Weldment / Erection Tolerances," Revision 3 Change 1
SV4-1208-Z0-001, "Specification for the Fabrication and Field Erection of the SC Panels and the Conical Roof Steel Structure for the AP1000 Shield Building," Revision 2
SV4-CC01-Z0-026, “Safety Related Mixing and Delivering Concrete,” Revision 6
SV4-CC01-Z0-027, “Safety Related Concrete Testing Services,” Revision 5
SV4-CC01-Z0-031, “Safety Related Placing Concrete and Reinforcing Steel,” Revision 7
SV4-CR01-Z0-010, “Specification for Supply and Installation of Mechanical Splices for Reinforcing Steel,” Revision 8
WPS2-1.1F20-SB (FCAW) Revision 6
WPS2-1.1S20-SB (SMAW) Revision 5

Quality Inspection Reports
C113-17-10022, “Placing Safety Related Concrete,” 02/24/17
C155-17-10021, “CIVIL – Fabrication and Erection of Structural Steel,” 03/08/17
C155-17-10023, “CIVIL – Fabrication and Erection of Structural Steel,” 03/22/17
S561-16-17827, “(Shield Building) AWS D1.1 Structural Welding of the SC Panels and FW/MS Weldment / Erection Tolerances,” 08/17/16

Weld Records
CV12240-01JK-I
CV12240-01JK-O
CV12240-01LM-I
CV12240-01LM-O
CV12240-01MN-2-O
CV12240-01NP-I
CV12240-01NP-O

Work Packages
SV4-1000-CRW-CV1736, “Unit 4, West Shield Wall Rebar Below 100’ Elevation,” Revision 1.1
SV4-1208-CCW-851001, “Unit 4 Shield Building Placement 13M and SC Course 1 Concrete Fill,” Revision 1.0
SV4-1208-CCW-851002, “Unit 4 Shield Building Course 2 Concrete Fill,” Revision 2.0
SV4-1208-SCW-CV6994, "Course 1 Unit 4 Shield Building,” Revision 1.0
SV4-1208-SCW-CV6994, Course 1 Unit 4 Shield Building,” Revision 1.0

Section 1A38
Drawings and Specifications:
SV4-1215-CE-005, "Auxiliary Building Area EL 66’-6” CA20 Basemat Interface Embedment & Recess Locations," Revision 5;
SV4-1215-CE-006, "Auxiliary Building Area 6 EL 66’-6” CA20 Basemat Interface Embedment & Recess Locations," Revision 4;
SV4-CA20-S4-520, "Auxiliary building Areas 5&6 CA20 Module Basemat Attachment Bracket Installation Details," Revision 0;
SV4-CA20-CAK-881097, "U4 CA20 Basemat Attachment Bracket Weld Map," Revision 1;

Work Package
SV4-CA20-CAW-850102, Revision 0;

Procedures
WPS2-1.1S03, Revision 6 and 7;

Inspection Records / Reports
IR S561-17-10263

Corrective Action Records

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SV4-CA20-GNR-000125, "CA20 Attachment Bracket partial installed over temp attachment," revision 0;
SV4-CA20-GNR-000126, "CA20 Unit 4 attachment bracket E9 installed over temp attachment," Revision 0;
SV4-CA20-GNR-000148, "Unit 4 CA20 Attachment Bracket E97 Gap," Revision 0;
SV4-CA20-GNR-000130, "CA20-64 Engine Block E43 Failure to Achieve Fit-up," Revision 0;

CAPAL 100384197;
CAPAL 100414312;

Section 1A39
AMEC Concrete Field and Lab Test Data, Set ID 2017SCC0586, 3/23/2017

Concrete/Grout Delivery Ticket # 72099, Pour # 3197, 02/22/2017
Quality Inspection Report C112-17-10408, “Pre-placement: Concrete,” 2/22/17, Revision 1
Quality Inspection Report C112-17-10409, “Pre-placement: Concrete,” 2/22/17
Quality Inspection Report C113-17-10020, “Placing Safety Related Concrete,” 2/22/17
Quality Inspection Report C113-17-10021, “Placing Safety Related Concrete,” 2/22/17
SV4-1223-GNR-000001, “Precast Panel Stirrup Spacing for 1223-CP-S01,” Revision 0
Work Package SV4-1220-CPW-CV1418, “Fabrication of Unit 4 Auxiliary Building Precast Concrete Panels at El.82’6”,” Revision 1.1

Section 1A40
SV4-RMS-VQQ-012, "Quality Release Data Package," Revision 0;
SV4-RMS-VQQ-043, "Quality Release Data Package," Revision 0;
SV4-RMS-ITR-002, "Inspection Report Confirming Effluent Radiation Monitors Exist, ITAAC 3.5.00.06," Revision 1;

Section 1P01
Drawings
SV3-PXS-PLK-ME7321, “Weld Map for Penetration SV3-11202-ML-P03,” Revision 2
SV4-CA03-S4K-881975, “CA03 Angle Installations (SM11 to SM12) Weld Map,” Revision 1
SV4-CA03-S5B-11001, “Containment Building Module CA03-Submodule CA03_11 Bill of Materials,” Revision 0
SV4-CA03-S5B-12001, “Containment Building Module CA03-Submodule CA03_12 Bill of Materials,” Revision 0

Engineering and Design Coordination Reports
APP-CA03-GEF-008, “CA03 Horizontal Stiffeners - Track Welding,” Revision 0
SV3-ML05-GEF-000019, “Modification to SV3-11202-ML-P03/P04 Seismic Guides,” Revision 0

Miscellaneous
Quality Inspection Plan F-S561-004, “Structural Weld Inspection-Modules, and “Fabrication" and "Submodule Assembly" Tolerances,” Revision 19.2
Welding Procedure Specification WPS2-1.1T70, Revision 4

Quality Inspection Reports
M330-17-10008, “Component Supports; ASME Section III NF Supports Class 1, 2 & 3 Fabrication and Installation,” 01/25/17
M330-17-10009, “Component Supports; ASME Section III NF Supports Class 1, 2 & 3 Fabrication and Installation,” 01/25/17
S561-17-10142, “Structural Weld Inspection-Modules, and “Fabrication” and “Submodule Assembly” Tolerances,” 01/12/17

Work Packages
SV3-PXS-P0W-ME2964, “SV3-PXS-P0W-ME2964,” Revision 1.0
SV3-PXS-P0W-ME2965, “ASME Section III - Fabrication/Installation of Isometric # SV3-PXS-PLW-01D (Line Numbers PXS-PL-L109, L132A),” Revision 1.0
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Section 1P02
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LIST OF ACRONYMS

ADS	Automatic Depressurization System
ANI	Authorized Nuclear Inspector
AOV	Air Operated Valve
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
AWS	American Welding Society
CAPAL	Corrective Action, Prevention and Learning
CFR	Code of Federal Regulations
CMT	Core Makeup Tank
CMTR	Certified Material Test Report
CoC	Certificates of Compliance
COL	Combined License
CR	Condition Report
CSDRS	Certified Seismic Design Response Spectra
DAS	Diverse Actuation System
DDS	Data Display and Processing System
DCO	Division of Construction Oversight
EMC	Electromagnetic Compatibility
EMI	Electromagnetic Interference
EPC	Engineering, Procurement, and Construction
EQDP	Equipment Qualification Data Package
EQSR	Equipment Qualification Summary Report
ESD	Electrostatic Discharge
GTAW	Gas Tungsten Arc Welding
HFE	Human Factors Engineering
HSI	Human System Interface
IEEE	Institute of Electrical and Electronics Engineers
IMC	Inspection Manual Chapter
IP	Inspection Procedure
IRWST	In-Containment Refueling Water Storage Tank
ISV	Integrated System Validation
ITAAC	Inspections, Tests, Analysis, and Inspection Criteria
M&TE	Measuring & Test Equipment
MT	Magnetic Particle Testing
N&D	Nonconformance and Disposition Report
NCV	Non-Cited Violation
NDE	Non-Destructive Examination
NRC	Nuclear Regulatory Commission
PMS	Protection and Safety Monitoring System
PQR	Procedure Qualification Records
PRHR	Passive Residual Heat Removal
PT	Liquid Penetrant exam
PWHT	Postweld Heat Treatment
PXS	Passive Core Cooling System
QA	Quality Assurance
QAPD	Quality Assurance Program Document
QC	Quality Control
RC/SC	Reinforced Concrete/Steel Concrete Composite
RCS	Reactor Coolant System

RG	Regulatory Guide
RFI	Radio Frequency Interference
RP	Radiation Protection
RPV	Reactor Pressure Vessel
RRS	Required Response Spectra
RT	Radiographic Testing
SGIL	Steam Generator Intermediate Level
SGLL	Steam Generator Lower Level
SSC	Structure, System, and Component
SWC	Surge Withstand Capability
TRS	Test Response Spectra
UFSAR	Updated Final Safety Analysis Report
UT	Ultrasonic Testing
VEGP	Vogtle Electric Generating Plant
VT	Visual Testing
WEC	Westinghouse Electric Company
WPS	Welding Procedure Specifications

ITAAC INSPECTED

No.	ITAAC No.	Design Commitment	Inspections, Tests, Analysis	Acceptance Criteria
13	2.1.02.02a	2.a) The components identified in Table 2.1.2-1 as ASME Code Section III are designed and constructed in accordance with ASME Code Section III requirements.	Inspection will be conducted of the as-built components as documented in the ASME design reports.	The ASME Code Section III design reports exist for the as-built components identified in Table 2.1.2□1 as ASME Code Section III.
15	2.1.02.03a	3.a) Pressure boundary welds in components identified in Table 2.1.2□1 as ASME Code Section III meet ASME Code Section III requirements.	Inspection of the as-built pressure boundary welds will be performed in accordance with the ASME Code Section III.	A report exists and concludes that the ASME Code Section III requirements are met for non-destructive examination of pressure boundary welds.
16	2.1.02.03b	3.b) Pressure boundary welds in piping identified in Table 2.1.2-2 as ASME Code Section III meet ASME Code Section III requirements.	Inspection of the as-built pressure boundary welds will be performed in accordance with the ASME Code Section III.	A report exists and concludes that the ASME Code Section III requirements are met for non-destructive examination of pressure boundary welds.
20	2.1.02.05a.ii	5.a) The seismic Category I equipment identified in Table 2.1.2□1 can withstand seismic design basis loads without loss of safety function.	ii) Type tests, analyses, or a combination of type tests and analyses of seismic Category I equipment will be performed.	ii) A report exists and concludes that the seismic Category I equipment can withstand seismic design basis loads without loss of safety function.
34	2.1.02.08d.iii	8.d) The RCS provides automatic depressurization during design basis events.	iii) Inspections of each fourth-stage ADS valve will be conducted to determine the flow area through each valve.	iii) The flow area through each fourth-stage ADS valve is > 67 in2.

No.	ITAAC No.	Design Commitment	Inspections, Tests, Analysis	Acceptance Criteria
35	2.1.02.08d.iv	8.d) The RCS provides automatic depressurization during design basis events.	iv) Type tests and analysis will be performed to determine the effective flow area through each stage 1,2,3 ADS valve.	iv) A report exists and concludes that the effective flow area through each stage 1 ADS valve > 4.6 in2 and each stage 2,3 ADS valve is > 21 in2.
99	2.2.01.05.ii	5. The seismic Category I equipment identified in Table 2.2.1□1 can withstand seismic design basis loads without loss of structural integrity and safety function.	ii) Type tests, analyses, or a combination of type tests and analyses of seismic Category I equipment will be performed.	ii) A report exists and concludes that the seismic Category I equipment can withstand seismic design basis dynamic loads without loss of structural integrity and safety function.
101	2.2.01.06a.i	6.a) The Class 1E equipment identified in Table 2.2.1-1 as being qualified for a harsh environment can withstand the environmental conditions that would exist before, during, and following a design basis accident without loss of safety function for the time required to perform the safety function.	i) Type tests, analyses, or a combination of type tests and analyses will be performed on Class 1E equipment located in a harsh environment.	i) A report exists and concludes that the Class 1E equipment identified in Table 2.2.1-1 as being qualified for a harsh environment can withstand the environmental conditions that would exist before, during, and following a design basis accident without loss of safety function for the time required to perform the safety function.

No.	ITAAC No.	Design Commitment	Inspections, Tests, Analysis	Acceptance Criteria
105	2.2.01.06d.i	6.d) The non-Class 1E electrical penetrations identified in Table 2.2.1-1 as being qualified for a harsh environment can withstand the environmental conditions that would exist before, during, and following a design basis accident without loss of containment pressure boundary integrity.	i) Type tests, analyses, or a combination of type tests and analyses will be performed on non□Class 1E electrical penetrations located in a harsh environment.	i) A report exists and concludes that the non-Class 1E electrical penetrations identified in Table 2.2.1□1 as being qualified for a harsh environment can withstand the environmental conditions that would exist before, during, and following a design basis accident without loss of containment pressure boundary integrity.
127	2.2.02.05a.ii	5.a) The seismic Category I components identified in Table 2.2.2□1 can withstand seismic design basis loads without loss of safety function.	ii) Type tests, analyses, or a combination of type tests and analyses of seismic Category I components will be performed.	ii) A report exists and concludes that the seismic Category I components can withstand seismic design basis loads without loss of safety function.
159	2.2.03.02a	2.a) The components identified in Table 2.2.3-1 as ASME Code Section III are designed and constructed in accordance with ASME Code Section III requirements.	Inspection will be conducted of the as-built components as documented in the ASME design reports.	The ASME Code Section III design reports exist for the as□built components identified in Table 2.2.3□1 as ASME Code Section III.
161	2.2.03.03a	3.a) Pressure boundary welds in components identified in Table 2.2.3-1 as ASME Code Section III meet ASME Code Section III requirements.	Inspection of the as-built pressure boundary welds will be performed in accordance with the ASME Code Section III.	A report exists and concludes that the ASME Code Section III requirements are met for non-destructive examination of pressure boundary welds.

No.	ITAAC No.	Design Commitment	Inspections, Tests, Analysis	Acceptance Criteria
166	2.2.03.05a.ii	5.a) The seismic Category I equipment identified in Table 2.2.3□1 can withstand seismic design basis loads without loss of safety function.	ii) Type tests, analyses, or a combination of type tests and analyses of seismic Category I equipment will be performed.	ii) A report exists and concludes that the seismic Category I equipment can withstand seismic design basis dynamic loads without loss of safety function. For the PXS containment recirculation and IRWST screens, a report exists and concludes that the screens can withstand seismic dynamic loads and also post-accident operating loads, including head loss and debris weights.
260	2.2.05.05a.ii	5.a) The seismic Category I equipment identified in Table 2.2.5□1 can withstand seismic design basis loads without loss of safety function.	ii) Type tests, analyses, or a combination of type tests and analyses of seismic Category I equipment will be performed.	ii) A report exists and concludes that the seismic Category I equipment can withstand seismic design basis loads without loss of safety function.
514	2.5.01.03d	3.d) The DAS has electrical surge withstand capability (SWC), and can withstand the electromagnetic interference (EMI), radio frequency (RFI), and electrostatic discharge (ESD) conditions that exist where the DAS equipment is located in the plant.	Type tests, analyses, or a combination of type tests and analyses will be performed on the equipment.	A report exists and concludes that the DAS equipment can withstand the SWC, EMI, RFI and ESD conditions that exist where the DAS equipment is located in the plant.
523	2.5.02.02.ii	2. The seismic Category I equipment, identified in Table 2.5.2-1, can withstand seismic design basis loads without loss of safety function.	ii) Type tests, analyses, or a combination of type tests and analyses of seismic Category I equipment will be performed.	ii) A report exists and concludes that the seismic Category I equipment can withstand seismic design basis loads without loss of safety function.

No.	ITAAC No.	Design Commitment	Inspections, Tests, Analysis	Acceptance Criteria
525	2.5.02.03	3. The Class 1E equipment, identified in Table 2.5.2-1, has electrical surge withstand capability (SWC), and can withstand the electromagnetic interference (EMI), radio frequency interference (RFI), and electrostatic discharge (ESD) conditions that would exist before, during, and following a design basis accident without loss of safety function for the time required to perform the safety function.	Type tests, analyses, or a combination of type tests and analyses will be performed on the equipment.	A report exists and concludes that the Class 1E equipment identified in Table 2.5.2□1 can withstand the SWC, EMI, RFI, and ESD conditions that would exist before, during, and following a design basis accident without loss of safety function for the time required to perform the safety function.
526	2.5.02.04	4. The Class 1E equipment, identified in Table 2.5.2-1, can withstand the room ambient temperature, humidity, pressure, and mechanical vibration conditions that would exist before, during, and following a design basis accident without loss of safety function for the time required to perform the safety function.	Type tests, analyses, or a combination of type tests and analyses will be performed on the Class 1E equipment identified in Table 2.5.2-1.	A report exists and concludes that the Class 1E equipment identified in Table 2.5.2-1 can withstand the room ambient temperature, humidity, pressure, and mechanical vibration conditions that would exist before, during, and following a design basis accident without loss of safety function for the time required to perform the safety function.
535	2.5.02.07b	7.b) The PMS provides process signals to the DDS through isolation devices.	Type tests, analyses, or a combination of type tests and analyses of the isolation devices will be performed.	A report exists and concludes that the isolation devices prevent credible faults from propagating into the PMS.

No.	ITAAC No.	Design Commitment	Inspections, Tests, Analysis	Acceptance Criteria
538	2.5.02.07e	7.e) The PMS receives signals from non-safety equipment that provides interlocks for PMS test functions through isolation devices.	Type tests, analyses, or a combination of type tests and analyses of the isolation devices will be performed.	A report exists and concludes that the isolation devices prevent credible faults from propagating into the PMS.
598	2.6.03.02.ii	2. The seismic Category I equipment identified in Table 2.6.3□1 can withstand seismic design basis loads without loss of safety function.	ii) Type tests, analyses, or a combination of type tests and analyses of seismic Category I equipment will be performed.	ii) A report exists and concludes that the seismic Category I equipment can withstand seismic design basis loads without loss of safety function.
740	3.2.00.01b	1. The HFE verification and validation program is performed in accordance with the HFE verification and validation implementation plan and includes the following activities: b) HFE design verification	b) An evaluation of the implementation of the HFE design verification will be performed.	b) A report exists and concludes that: HFE design verification was conducted in conformance with the implementation plan and includes verification that the HSI design is consistent with the AP1000 specific design guidelines (compiled as specified in the third acceptance criteria of design commitment 3) developed for each HSI resource.
741	3.2.00.01c.i	1. The HFE verification and validation program is performed in accordance with the HFE verification and validation implementation plan and includes the following activities: c) Integrated system validation	c) (i) An evaluation of the implementation of the integrated system validation will be performed.	c) (i) A report exists and concludes that: The test scenarios listed in the implementation plan for integrated system validation were executed in conformance with the plan and noted human deficiencies were addressed.

No.	ITAAC No.	Design Commitment	Inspections, Tests, Analysis	Acceptance Criteria
760	3.3.00.02a.i.a	2.a) The nuclear island structures, including the critical sections listed in Table 3.3-7, are seismic Category I and are designed and constructed to withstand design basis loads as specified in the Design Description, without loss of structural integrity and the safety-related functions.	i) An inspection of the nuclear island structures will be performed. Deviations from the design due to as-built conditions will be analyzed for the design basis loads.	i.a) A report exists which reconciles deviations during construction and concludes that the as-built containment internal structures, including the critical sections, conform to the approved design and will withstand the design basis loads specified in the Design Description without loss of structural integrity or the safety-related functions.
761	3.3.00.02a.i.b	2.a) The nuclear island structures, including the critical sections listed in Table 3.3-7, are seismic Category I and are designed and constructed to withstand design basis loads as specified in the Design Description, without loss of structural integrity and the safety-related functions.	i) An inspection of the nuclear island structures will be performed. Deviations from the design due to as-built conditions will be analyzed for the design basis loads.	i.b) A report exists which reconciles deviations during construction and concludes that the as-built shield building structures, including the critical sections, conform to the approved design and will withstand the design basis loads specified in the Design Description without loss of structural integrity or the safety-related functions.

No.	ITAAC No.	Design Commitment	Inspections, Tests, Analysis	Acceptance Criteria
762	3.3.00.02a.i.c	2.a) The nuclear island structures, including the critical sections listed in Table 3.3-7, are seismic Category I and are designed and constructed to withstand design basis loads as specified in the Design Description, without loss of structural integrity and the safety-related functions.	i) An inspection of the nuclear island structures will be performed. Deviations from the design due to as-built conditions will be analyzed for the design basis loads.	i.c) A report exists which reconciles deviations during construction and concludes that the as-built structures in the non-radiologically controlled area of the auxiliary building, including the critical sections, conform to the approved design and will withstand the design basis loads specified in the Design Description without loss of structural integrity or the safety-related functions.
763	3.3.00.02a.i.d	2.a) The nuclear island structures, including the critical sections listed in Table 3.3-7, are seismic Category I and are designed and constructed to withstand design basis loads as specified in the Design Description, without loss of structural integrity and the safety-related functions.	i) An inspection of the nuclear island structures will be performed. Deviations from the design due to as-built conditions will be analyzed for the design basis loads.	i.d) A report exists which reconciles deviations during construction and concludes that the as-built structures in the radiologically controlled area of the auxiliary building, including the critical sections, conform to the approved design and will withstand the design basis loads specified in the Design Description without loss of structural integrity or the safety-related functions.

No.	ITAAC No.	Design Commitment	Inspections, Tests, Analysis	Acceptance Criteria
764	3.3.00.02a.ii.a	2.a) The nuclear island structures, including the critical sections listed in Table 3.3-7, are seismic Category I and are designed and constructed to withstand design basis loads as specified in the Design Description, without loss of structural integrity and the safety-related functions.	ii) An inspection of the as□built concrete thickness will be performed.	ii.a) A report exists that concludes that the containment internal structures as-built concrete thicknesses conform to the building sections defined in Table 3.3-1.
778	3.3.00.03b	3. Walls and floors of the nuclear island structures as defined on Table 3.3□1 except for designed openings or penetrations provide shielding during normal operations.	Inspection of the as-built nuclear island structures wall and floor thicknesses will be performed.	b) A report exists and concludes that the shield walls of the shield building structures as defined in Table 3.3-1 except for designed openings or penetrations are consistent with the concrete wall thicknesses provided in Table 3.3-1.
831	3.5.00.06	6. The effluent radiation monitors listed in Table 3.5-3 are provided.	Inspection for the existence of the monitors will be performed.	Each of the monitors listed in Table 3.5-3 exists.