



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

November 7, 2013

Mr. B. L. Ivey
Vice President, Regulatory Affairs
Southern Nuclear Operating Company
P.O. Box 1295
Bin B022
Birmingham, AL 35201

**SUBJECT: VOGTLE ELECTRIC GENERATING PLANT UNITS 3 AND 4 – NRC INTEGRATED
INSPECTION REPORTS 05200025/2013-004 and 05200026/2013-004**

Dear Mr. Ivey:

On September 30, 2013, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Vogtle Electric Generating Plant (VEGP) Units 3 and 4. The enclosed inspection report documents the inspection results, which the inspectors discussed on October 2, 2013, with Mr. Mark Rauckhorst, Vogtle 3 & 4 Construction Vice President, and other members of your staff.

The inspection examined a sample of construction activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel.

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

If you contest this NCV, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington DC 20555-0001; with copies to the Regional Administrator, Region II; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector office at the VEGP Units 3 & 4.

If you disagree with the cross-cutting aspect assigned to this 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 III, and the NRC Resident Inspector office at the VEGP Units 3 & 4.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the

NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Website at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

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

Sincerely,

/RA/

Michael Ernstes, Branch Chief
Construction Projects Branch 4
Division of Construction Projects

Docket Nos.: 05200025, 05200026

License Nos.: NPF-91, NPF-92

Enclosure: Inspection Report 05200025/2013-004
and 05200026/2013-004
w/Attachment: Supplemental Information

cc w/encl: (See pages 2-3)

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Sincerely,

/RA/

Michael Ernstes, Chief
 Construction Projects Branch 4
 Division of Construction Projects

Docket Nos.: 05200025, 05200026
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 and 05200026/2013-004
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cc w/encl: (See pages 2-3)

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NAME	A. Artayet	S. Smith	L. Caselli	C. Abbott	J. Fuller	C. Huffman	T. Fanelli
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cc w/encl:
Resident Manager
Oglethorpe Power Corporation
Alvin W. Vogtle Road
7821 River Road
Waynesboro, GA 30830

Rita Kilpatrick
250 Arizona Ave
Atlanta, GA 30307

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

Lucious Abram
Commissioner-
Burkes County Commissioner
P.O. Box 1626
Waynesboro, GA 30830

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

Ms. Michele Boyd
Legislative Director
Energy Program
Public Citizens Critical Mass Energy
And Environmental Program
215 Pennsylvania Avenue, SE
Washington, DC 20003

Lisa Higdon
Southern Nuclear Op. Co
Document Control Coordinator
42 Inverness Center Parkway
Attn: B236
Birmingham, AL 35201

Stephen E. Kuczynski
Chairman, President and CEO
Southern Nuclear
P.O. Box 1295
Birmingham, AL 35201

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

Mr. Joseph A. (Buzz) Miller
Executive Vice President
Southern Nuclear Operating Company
241 Ralph McGill Blvd
BIN 10240
Atlanta, GA 30308-3374

Resident Inspector
Vogtle Plant
8805 River Road
Waynesboro, GA 30830

Director
Consumer's Utility
Counsel Division
Governor's Office of Consumer Affairs
2 Martin Luther King, Jr. Drive
Plaza Level East, Suite 356
Atlanta, GA 30334-4600

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

Mr. James C. Hardeman
Environmental Radiation Program Manager
Environmental Protection Division
Georgia Dept. of Natural Resources
4220 International Pkwy, Suite 100
Atlanta, GA 30354-3906

Elaine Sikes
Burke County Library
130 Highway 24 South
Waynesboro, GA 30830

Mr. Jerry Smith
Commissioner
District 8
Augusta-Richmond County Commission
1332 Brown Road
Hephzibah, GA 30815

Gene Stilp
1550 Fishing Creek Valley Road
Harrisburg, PA 17112

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

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

Email

agaughtm@southernco.com (Amy Aughtman)
agbaker@southernco.com (Ann Baker)
awc@nei.org (Anne W. Cottingham)
bhwhite@southernco.com (Brian Whitley)
Bill.Jacobs@gdsassociates.com (Bill Jacobs)
blivey@southernco.com (Pete Ivey)
bob.masse@opc.com (Resident Manager)
bwwaites@southernco.com (Brandon Waites)
chmahan@southernco.com (Howard Mahan)
collinlj@westinghouse.com (Leslie Collins)
courtney@georgiawand.org (Courtney Hanson)
crpierce@southernco.com (C.R. Pierce)
csguinn@southernco.com (Candace Guinn)
cwaltman@roe.com (C. Waltman)
dahjones@southernco.com (David Jones)
danawill@southernco.com (Dana Williams)
david.hinds@ge.com (David Hinds)
david.lewis@pillsburylaw.com (David Lewis)
david.siefken@hq.doe.gov (David Siefken)
delongra@westinghouse.com (Rich DeLong)
dgbost@southernco.com (Danny Bost)
dlfulton@southernco.com (Dale Fulton)
drculver@southernco.com (Randy Culver)
ed.burns@earthlink.net (Ed Burns)
edavis@pegasusgroup.us (Ed David)
erg-xl@cox.net (Eddie R. Grant)
G2NDRMDC@southernco.com (SNC Document Control)
james1.beard@ge.com (James Beard)
jamiller@southernco.com (Buzz Miller)
jbtomase@southernco.com (Janice Tomasello)
jenmorri@southernco.com (Jennifer Buettner)
jhall@southernco.com (Jennifer Hall)
jim@ncwarn.org (Jim Warren)
jmgidden@southernco.com (John Giddens)
Joseph_Hegner@dom.com (Joseph Hegner)
jranalli@meagpower.org (Jerry Ranalli)
jrjohnso@southernco.com (Randy Johnson)
jtdavis@southernco.com (Jim Davis)
jtgasser@southernco.com (Jeff Gasser)
karen.patterson@ttnus.com (Karen Patterson)
karlg@att.net (Karl Gross)
kim.haynes@opc.com (Kim Haynes)
kmseiber@southernco.com (Kristin Seibert)
KSutton@morganlewis.com (Kathryn M. Sutton)

kwaugh@impact-net.org (Kenneth O. Waugh)
lchandler@morganlewis.com (Lawrence J. Chandler)
ldperry@southernco.com (Leigh D. Perry)
maria.webb@pillsburylaw.com (Maria Webb)
mark.beaumont@wsms.com (Mark Beaumont)
markus.popa@hq.doe.gov (Markus Popa)
matias.travieso-diaz@pillsburylaw.com (Matias Travieso-Diaz)
mcintyba@westinghouse.com (Brian McIntyre)
mdrauckh@southernco.com (Mark Rauckhorst)
media@nei.org (Scott Peterson)
mike.price@opc.com (M.W. Price)
MSF@nei.org (Marvin Fertel)
nirsnet@nirs.org (Michael Mariotte)
nlhender@southernco.com (Nancy Henderson)
Nuclaw@mindspring.com (Robert Temple)
patriciaL.campbell@ge.com (Patricia L. Campbell)
Paul@beyondnuclear.org (Paul Gunter)
pbessette@morganlewis.com (Paul Bessette)
randall@nexusamllc.com (Randall Li)
rhenry@ap.org (Ray Henry)
RJB@NEI.org (Russell Bell)
russpa@westinghouse.com (Paul Russ)
sabinski@suddenlink.net (Steve A. Bennett)
sblanton@balch.com (Stanford Blanton)
sfrantz@morganlewis.com (Stephen P. Frantz)
sjackson@meagpower.org (Steven Jackson)
skauffman@mpr.com (Storm Kauffman)
skuczyns@southernco.com (Steve Kuczynski)
sroetger@psc.state.ga.us (Steve Roetger)
stephan.moen@ge.com (Stephan Moen)
taterrel@southernco.com (Todd Terrell)
tlubnow@mpr.com (Tom Lubnow)
Tom.Bilik@nrc.gov (Thomas Bilik)
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)
weave1dw@westinghouse.com (Doug Weaver)
whelmore@aol.com (Bill Elmore)

Letter to B. L. Ivey from Michael E. Ernstes dated November 7, 2013

SUBJECT: VOGTLE ELECTRIC GENERATING PLANT UNITS 3 AND 4 - NRC INTEGRATED
INSPECTION REPORTS 05200025/2013-004 and 05200026/2013-004

Distribution w/encl:

Region II Regional Coordinator, OEDO (D. Huyck)

M. Brown, NRO

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G. Khouri, RII

T. Steadham, RII

J. Kent, RII

J. Fuller, RII

C. Abbott, RII

C. Huffman, RII

ConE_Resource@nrc.gov

NRO_cROP_Resource@nrc.gov

PUBLIC

U.S. NUCLEAR REGULATORY COMMISSION
Region II

Docket Numbers: 5200025
5200026

License Numbers: NPF-91
NPF-92

Report Numbers: 05200025/2013004
05200026/2013004

Licensee: Southern Nuclear Operating Company, Inc.

Facility: Vogtle Electric Generating Plant Unit 3
Vogtle Electric Generating Plant Unit 4

Location: Waynesboro, GA

Inspection Dates: July 1, 2013 through September 30, 2013

Inspectors: C. Abbott, Resident Inspector, DCP
A. Artayet, Senior Construction Inspector, DCI
L. Castelli, Senior Construction Inspector, DCI
T. Fanelli, Construction Inspector, DCI
J. Fuller, Senior Resident Inspector, DCP
C. Huffman, Resident Inspector, DCP
S. Smith, Senior Construction Inspector, DCI

Accompanying Personnel: None

Approved by: M. Ernstes, Chief
Construction Projects Branch 4
Division of Construction Projects

Enclosure

SUMMARY OF FINDINGS

Inspection Report (IR) 05200025/2013004, 05200026/2013004; 07/01/2013 through 09/30/2013; Vogtle Unit 3, Vogtle Unit 4, routine integrated inspection report.

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

A. NRC-Identified and Self Revealed Findings

Cornerstone: Procurement/Fabrication

- Green. The inspectors identified an ITAAC finding of very low safety significance (Green) and associated non-cited violation (NCV) of 10 CFR Part 50, Appendix B, Criterion VII, "Control of Purchased Material, Equipment, and Services," for SNC's failure, through their contractor Chicago Bridge and Iron (CB&I), to perform adequate inspections of safety-related embed plates at supplier facilities and failure to perform adequate examinations of these embed plates upon delivery, to assure the plates conformed to the procurement documents. The violation was entered into the licensee's corrective action program as condition report (CR) 695726 and corrective action record (CAR) 207908, to ensure actions were taken to correct the condition.

The performance deficiency had greater than minor safety significance because it was associated with the process and material control attributes of the Procurement / Fabrication Cornerstone and adversely affected the cornerstone objective of ensuring that the licensee's programs and processes were adequately developed and implemented for procurement and fabrication activities. The finding represented an ITAAC finding because it was material to the acceptance criteria of Vogtle Unit 3 ITAACs 762 and 763, in that, if left uncorrected, the licensee could not show that the acceptance criteria of these ITAACs were met. The finding was evaluated under the construction significance determination process as outlined in IMC 2519, Appendix A. The finding was of very low safety significance (Green) because the nonconforming embed plates had not been installed in the nuclear island, and the licensee was able to demonstrate in their Part 21 evaluation, that, if left uncorrected, the affected portions of the structure would have been able to meet their design functions. The finding had a cross-cutting aspect in the area of baseline inspection, corrective action program A.5(c). (Section 1P03.1)

B. Licensee-Identified Violations

No findings were identified.

REPORT DETAILS

Summary of Plant Construction Status

During this inspection period, the licensee placed the initial lift of concrete in the Unit 3 containment vessel bottom head, in the Unit 3 nuclear island, and continued with installation of reinforcing steel in the Unit 4 nuclear island.

1. CONSTRUCTION REACTOR SAFETY

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

1A01 (Unit 3) ITAAC No. 86 / Family: 05F

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 86 (2.1.03.11):

Design Commitment	Inspections, Tests, Analysis	Acceptance Criteria
11. The RPV beltline material has a Charpy upper-shelf energy of no less than 75 ft-lb.	Manufacturing tests of the Charpy V-Notch specimen of the RPV beltline material will be performed.	A report exists and concludes that the initial RPV beltline Charpy upper-shelf energy is no less than 75 ft-lb.

The inspectors used the following NRC inspection procedures/sections to perform this inspection:

- 65001.05 - Inspection of ITAAC-Related Installation of Reactor Pressure Vessel and Internals
- 65001.05-02.07 - Records Review
- 65001.05-02.08 - Problem Identification and Resolution
- 65001.F- Inspection of the ITAAC-Related Design and Fabrication Requirements
- 65001.F-02.04-Problem Identification and Resolution

The inspectors reviewed the contents of certified material test reports (CMTRs) for the results of chemical analysis, tensile testing, and impact testing performed for the Doosan Heavy Industries and Construction Company to determine whether the initial fracture toughness and upper-shelf energy requirements of the ferritic steel forging materials for the upper shell, lower shell (active core area), transition ring, and welding procedure specifications that include weld filler metal and heat affected zone qualifications for both girth welds of the Unit 3 reactor pressure vessel beltline region were performed in accordance with the:

- 1998 Edition including 2000 Addenda of the American Society of Mechanical Engineers (ASME) Section III Code, Division 1, Subsection NB for Class 1 Components;

- ASME Section II, Part A, SA-508, Grade 3, Class 1, Specification for Quenched and Tempered Vacuum-Treated Carbon and Alloy Steel Forgings for Pressure Vessels;
- ASME Section II, Part C, SFA-5.23, Specification for Low-Alloy Steel Electrodes and Fluxes for Submerged Arc Welding (SAW);
- ASME Section II, Part C, SFA-5.5, Specification for Low-Alloy Steel Electrodes for Shielded Metal Arc Welding (SMAW);
- ASME Section IX, Welding and Brazing Qualifications;
- Westinghouse Electric Company, APP-MV01-Z0-101, Design Specification for AP1000 Reactor Vessel;
- 10 CFR 50 Appendix G, Section IV, Fracture Toughness Requirements; and
- Unit 3 Updated Final Safety Analysis Report.

The inspectors reviewed the results of drop-weight impact testing and specimen removal locations and orientations with respect to the working direction to determine whether the nil-ductility transition temperature (Tndt) selections using a duplicate test at the lowest no-break temperature were conducted in accordance with ASME Section III, Subarticle NB-2300, Fracture Toughness Requirements for Materials.

The inspectors reviewed the results of Charpy V-notch impact testing and specimen removal locations and orientations with respect to the working direction to determine whether the upper-shelf energy and lateral expansion values at or above Tndt + 60°F were no less than 75 ft-lbs and 35 mils in accordance with 10 CFR Part 50, Appendix G and ASME Section III, Subarticle NB-2300, Fracture Toughness Requirements for Materials, respectively.

b. Findings

No findings were identified.

1A02 (Unit 3) ITAAC No. 93 / Family: 06B

.1 Resident ITAAC Inspection

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 93 (2.2.01.03a):

Design Commitment	Inspections, Tests, Analysis	Acceptance Criteria
3.a) Pressure boundary welds in components identified in Table 2.2.1-1 as ASME Code Section III meet ASME Code Section III requirements.	Inspection of the as-built pressure boundary welds will be performed in accordance with the ASME Code Section III.	A report exists and concludes that the ASME Code Section III requirements are met for non-destructive examination of pressure boundary welds.

The inspectors used the following NRC inspection procedures/sections to perform this inspection:

- 65001.B-02.05 – Inspection
- 65001.B-02.06 – Records

The inspectors reviewed the Radiographic Testing (RT) film for the completed horizontal girth weld between the Vogtle Unit 3 containment vessel lower ring courses 1 (S1) and 2 (S2) to determine whether the completed weld met the acceptance standards specified by Subsection NE-5320, "Radiographic Acceptance Standards," of ASME Section III, Article NE-5000, "Examination." This included a review of the radiographs of repaired areas. For these repair areas, the inspectors reviewed the original film, and reviewed the final (acceptable) film for each of these areas to determine if the rejectable indications were adequately repaired. Specifically, the inspectors reviewed RT Report number U3-131 to determine if the weld and RT record met the requirements of CB&I RT procedure CMS-830-15-PR-45154, "Radiographic Examination ASME Section III, Division 1 – Subsection NE," Rev. 1.

b. Findings

No findings were identified.

1A03 (Unit 3) ITAAC No. 761 / Family: 01F

.1 Resident ITAAC Inspection

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 761 (3.3.00.02a.i.b):

Design Commitment	Inspections, Tests, Analysis	Acceptance Criteria
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.

The inspectors used the following NRC inspection procedures/sections to perform this inspection:

- 65001.02-02.01 – Inspection of Concrete Placement

- 65001.02-02.06 – Record Review

The inspectors observed safety-related grouting activities associated with the Vogtle Electric Generating Plant Unit 3 nuclear island containment vessel bottom head (CVBH). The grouting activities were associated with the spacing between the top of the previously placed concrete pedestal and the bottom of the CVBH. During this inspection, the NRC inspectors independently performed pre-placement and placement grouting inspections, to determine whether grouting activities were performed in accordance with the following specifications, drawings, and procedures:

- SV3-CC01-Z0-027, "Safety Related Concrete Testing Services," Rev. 3;
- SV3-CC01-Z0-031, "Safety Related Placing Concrete and Reinforcing Steel," Rev. 2;
- SV3-1010-CR-101, "Nuclear Island Basemat Reinforcement Area Below Containment Vessel Installation Sequence," Rev. 3;
- SV3-1010-CR-107, "Nuclear Island Basemat Concrete Reinforcement Area Below Containment Vessel Construction Joint," Rev. 2;
- 132175-102-002-00002, "Containment Vessel Bottom Head Foundation Grouting Plan," Rev. 2;
- 132175-J300.13-000048, "Fluid Grout 100 SP Data Sheet," Rev. D; and
- 132175-J300.13-000068, "Fluid Grout 100 Data Sheet," Rev. A.

Prior to grout placement activities, the NRC inspectors independently verified the following:

- the concrete substrate was prepared in accordance with design specification SV3-CC01-Z0-031, "Safety Related Placing Concrete and Reinforcing Steel," Rev. 2;
- the concrete substrate had reached the required design strength; and
- the concrete surface was roughened and that loosened aggregate and other identified unsound material was removed.

The NRC inspectors reviewed a sample of CB&I quality control (QC) inspection reports to determine whether CB&I QC inspectors performed adequate cleanliness inspections of the underside of the containment vessel bottom head and whether the concrete surface profile was acceptable prior to grout placement. The following CB&I QC inspection reports were reviewed:

- C112-002-13-0076, "Pre-placement Nuclear Island Concrete: SV3 Pedestal CJ Prep" Rev. 0;
- C113-001-13-0001, "Placement – Grout Placement: CVBH Underside Surface to Radius 34'-6" Rev. 0; and
- C113-001-13-0005, "Placement – Grout Placement, Pedestal Check for Contaminants" Rev. 0.

The NRC inspectors also reviewed CB&I QC inspection plan F-C113-001, "Placement: Grout Placement," Rev. 2, to determine whether the CB&I quality control organization appropriately identified inspection points (hold, notification and/or routine) in accordance with the technical requirements specified in design document SV3-CC01-Z0-031. During this review, the NRC inspectors reviewed CB&I nuclear quality assurance

directive (QAD) 10.68, "Inspection Planning," Rev. 2, to ensure that the grout placement inspection plan was developed in accordance with quality procedures. Specifically, the NRC inspectors reviewed this plan to determine whether the CB&I QC inspection plan required personnel to verify the following attributes during the grout preparation and placement activities:

- grout was mixed in accordance with manufacturer's instructions;
- grout compressive strength cylinders were obtained in accordance with manufacturer's recommendations; and
- grout curing activities were in accordance with manufacturer's instructions.

During grouting activities, the NRC inspectors independently verified the following:

- mixed grout temperatures remained within specifications and manufacturer's recommendations;
- CVBH internal temperatures were maintained within design specifications and procedures;
- grout mixing was performed in accordance with specifications and manufacturer's recommendations; and
- safety related grout materials were appropriately controlled and identifiable.

b. Findings

No findings were identified.

1A04 (Unit 3) ITAAC No. 763 / Family: 01F

.1 Resident ITAAC Inspection

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 763 (3.3.00.02a.i.d):

Design Commitment	Inspections, Tests, Analysis	Acceptance Criteria
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.

The inspectors used the following NRC inspection procedures/sections to perform this inspection:

- 65001.01 – Inspection of ITAAC-Related Foundations & Buildings
- 65001.01-02.05 – Steel Structures
- 65001.01-02.06 – Records
- 65001.02-02.01 – Inspection of Concrete Placement
- 65001.02-02.06 – Record Review

The inspectors performed an independent review of auxiliary building Wall 1, located at the south end of the auxiliary building, structural reinforcement (rebar) and embed plate installation at elevation 66'-6" to 82'-6", prior to wall 1 concrete placement. Specifically, the inspectors observed the location of rebar and embed plates installed in area 5 of wall 1, between column lines I and J-2, to determine whether the as-built structure conformed to the following calculation, design drawings, and engineering design and coordination report (E&DCR):

- SV3-1200-CR-950, "Auxiliary Building Areas 5 & 6 Concrete Reinforcement Wall 1 Elevation," Rev. 1;
- SV3-1210-CR-950, "Auxiliary Building Areas 5 & 6 Concrete Reinforcement Wall 1 Sections & Details EL 66'-6"," Rev. 1;
- APP-1210-GEF-125, "Concrete Placement Release Auxiliary Building Wall 1 up to EL 82'-6"," Rev. 0; and
- Westinghouse design calculation, APP-1200-CCC-106, "Auxiliary Building Wall 1 Reinforcement Design," Rev. 6.

During this inspection, the inspectors independently verified whether the field installed rebar size, spacing, grade of material and minimum required reinforcement was installed in accordance with the above design documents. The inspectors also measured both horizontal and vertical lap splices as well as clear cover distances to determine whether field conditions conformed to American Concrete Institute (ACI) 349-01, "Code Requirements for Safety Related Concrete Structures."

Prior to concrete placement, the inspectors reviewed as-built survey data to determine whether the embed plates were installed in accordance with the following Westinghouse Electric Company (WEC) design drawings:

- SV3-1215-CE-960, "Auxiliary Building Area 5, Embedments Wall 1, Elevation 66'-6" North View," Rev. 4;
- SV3-1215-CEX-960, "Auxiliary Building Area 5 Wall 1 Embedments Index, Elev. 66'-6" North View," Rev. 3; and
- SV3-CE01-CE-002, "Standard Embedment Plates Deformed Wire Anchor (DWA) Type," Rev. 3.

The inspectors performed a record review of embed plate material test reports supplied by the fabricator, to determine whether the records confirmed the requisite material characteristics, performance tests, nondestructive tests, and other specification requirements. The records reviewed were for the embed plates that will support the precast concrete floors that are located on auxiliary building Wall 1. The inspectors reviewed the records to determine whether the embedded plate anchor material

conformed to American Society for Testing & Materials (ASTM) A496, "Standard Specification for Steel Wire, Deformed for Concrete Reinforcement."

The inspectors performed a direct observation of wall 1 concrete placement activities, and independently verified the following:

- the placement was cleaned and the construction joint preparation was as specified;
- forms were secure, leak-proof, and free from water;
- QC pre-placement inspection was completed before any concrete was placed;
- concrete placement temperatures remained within specifications;
- concrete was sampled at the proper frequency for determination of temperature, slump, air content, and unit weight;
- samples and testing techniques conformed to the procedures specified in applicable ASTM standards;
- concrete batch tickets were reviewed for verification of proper mix;
- time limit between mixing and delivery was not exceeded, and the total number of revolutions of the truck mixer was not exceeded;
- concrete placement drop distances were not exceeded;
- proper vibration techniques during placement; and
- inspections during placement were performed by qualified QC personnel.

b. Findings

No findings were identified.

.2 Resident ITAAC Inspection

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 763 (3.3.00.02a.i.d):

The inspectors used the following NRC inspection procedures/sections to perform this inspection:

- 65001.B-02.02 – Welding Procedure Qualification
- 65001.B-02.04 – Production Controls
- 65001.B-02.05 – Inspection
- 65001.B-02.06 – Records

The inspectors observed the in-process welding of the Vogtle Unit 3 auxiliary building module (CA20) to determine if the welding was performed within the ranges allowed by welding procedure specification number WPS2-1.1M71, and the requirements of the American Welding Society (AWS) D1.1:2000, "Structural Welding Code - Steel." Specifically, the inspectors observed the in-process welding of weld number CV0380-2, which joined submodule CA20-10 to CA20-11. 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.

The inspectors reviewed the completed weld records and in-process work package (SV3-CA20-S4W-CV0308, "CA20 Subassembly 1 Wall Submodule Erection," revision 0) for the following welds associated with the Vogtle Unit 3 CA20 module:

- CV0376-1, submodule CA20-01 to CA20-02 (Plate 1A to Plate 2A); and
- CV0376-03-RW1, submodule CA20-02 to CA20-03 (Plate 2A to Plate 3A).

The inspectors reviewed the procedure qualification records (PQRs) that were associated with WPS2-1.1M71 to determine whether the welding procedure was properly qualified in accordance with the AWS D1.1:2000 Code. Specifically, the inspectors reviewed PQR record numbers SP160 and SP154. The inspectors reviewed these PQRs and compared the ranges qualified to the requirements of Table 4.5, "PQR Essential Variable Changes Requiring WPS requalification for SMAW, SAW, GMAW, FCAW, and GTAW," of the AWS D1.1:2000 Code.

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, nondestructive examination (NDE) records;
- the records were appropriately retained and stored in accordance with Quality Assurance (QA) program requirement;
- required inspections were identified in the traveler with hold points, as appropriate; and
- accepted, rejected, and repaired items were documented in written reports.

The inspectors reviewed a sample of the ultrasonic (UT) and magnetic particle (MT) examination records for weld number CV 0376-1 to determine whether the required examination was 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 3), MISTRAS MT procedure (100-MT-302, "Magnetic Particle Examination in Accordance with AWS Structural Steel Welding Code," revision 2), 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-2012-UT-009
- V-2012-UT-011
- V-13-UT-310-0089
- V-2012-MT-030
- V-2012-MT-065
- V-2012-MT-087
- V-2012-MT-101
- V-13-MT-302-102

The inspectors performed an independent visual inspection of welds CV0376-1 and CV0376-03-RW1, 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.

b. Findings

No findings were identified.

.3 Resident ITAAC Inspection

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 763 (3.3.00.02a.i.d):

The inspectors used the following NRC inspection procedures/sections to perform this inspection:

- 65001.01-02.05 – Steel Structures
- 65001.B-02.05 – Inspection
- 65001.A.02.02 – Installation Records Review
- 65001.A.02.03 – Independent Assessment/Measurement Inspection

The inspectors performed a visual inspection of a sample of safety-related, seismic category I structural submodules associated with module CA20. The inspectors compared these as-built submodules to their respective design drawings, which are listed in the documents reviewed section of this report, to independently determine whether these submodules conformed to the approved design; and to determine whether any structural deviations were present that had not been dispositioned by the licensee. Specifically, the inspectors examined the following submodules: CA20-10, CA20-11, CA20-12, CA20-14, CA20-16 and CA20-17.

The inspectors verified that a sample of submodule fabrication and welding met the applicable code requirements (American Institute of Steel Construction [AISC] N690, "American National Standard Specification for the Design, Fabrication, and Erection of Steel Safety-related Structures for Nuclear Facilities," 1994 edition; AWS D1.1, "Structural Welding Code - Steel," 2000 edition; and AWS D1.6, "Structural Welding Code - Stainless Steel," 1999 edition) and the applicable design drawings and general notes (see Documents Reviewed Section). Specifically, the inspectors performed visual observations and independently measured a sample of structural welds to determine whether:

- as-fabricated condition matched the applicable design drawings with respect to layout and dimensions;
- an adequate marking system was used to maintain the identity of material from storage to installation;
- nonconforming materials were adequately identified and segregated;

- structural steel was protected from corrosion caused by exposure to weather; and
- shear studs, faceplates, steel channel, angle iron, rebar, mechanical threaded couplers, and pipe sleeves were installed in accordance with drawings.

The inspectors observed rework activities associated with submodules CA20-10, CA20-12, and CA20-14, which were performed as a corrective actions to structural deviations identified in WEC IR 12-230-M004. The inspectors observed in-process and completed work to verify that the reworked condition was in conformance with the applicable design requirements. The inspectors examined weld joint profiles, plate fit-up, and completed welds to determine whether the module construction met the Updated Final Safety Analysis Report (UFSAR) requirement that the CA20 faceplates be fully developed by their joining welds.

The inspectors observed nondestructive examination of field welding for the walls of a portion of CA20. Specifically, the inspectors observed Mistras personnel perform magnetic particle inspection on field weld 6 (submodules CA20-03 to CA20-04) and ultrasonic testing on field weld 8 (submodules CA20-04 to CA20-05). The inspectors verified that the magnetic particle testing was performed in accordance with Mistras procedure number 100-MT-302, "Magnetic Particle Examination of Welds in Accordance with AWS Structural Steel Welding Code," revision 2. The inspectors verified that the ultrasonic testing conformed with the requirements of AWS D1.1 Section 6 Part F and Mistras procedure number 100-UT-310, "Ultrasonic Examination of Welds in Accordance with AWS Structural Steel Welding Code," revision 5.

The inspectors reviewed the MT and UT inspection results for CA20 field welds 6 and 8, as documented in the following Mistras inspection reports, to determine whether inspection sampling met code requirements and inspection results were properly documented:

- 132175-QA-306-V-13-UT-310-050;
- 132175-QA-306-V-13-UT-310-044;
- 132175-QA-306-V-13-MT-302-455; and
- 132175-QA-306-V-13-MT-302-460.

b. Findings

No findings were identified.

1A05 (Unit 3) ITAAC No. 774 / Family: 01A

.1 Resident ITAAC Inspection

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 774 (3.3.00.02f):

Design Commitment	Inspections, Tests, Analysis	Acceptance Criteria
2.f) The key dimensions of nuclear island structures are defined on Table 3.3-5.	An inspection will be performed of the as-built configuration of the nuclear island structures.	A report exists and concludes that the key dimensions of the as-built nuclear island structures are consistent with the dimensions defined on Table 3.3-5.

The inspectors used the following NRC inspection procedures/sections to perform this inspection:

- 65001.01-02.04 – Key Dimensions and Volumes

The inspectors performed a direct inspection and independent measurements of the installed containment sump (KQ11) to determine whether the distance from the bottom of the containment sump to the top surface of the embedded containment shell met the requirements established in Appendix C, Table 3.3-5, "Key Dimensions of Nuclear Island Building Features" of the Vogtle Unit 3 license. The inspectors reviewed E&DCR number APP-KQ11-GEF-022, "Clarification of Measuring Points for Bottom of Reactor Containment Sump (KQ11)," revision 0 to determine whether measurements were taken at the required locations. The inspectors reviewed measurement documentation provided in SV3-KQ11-KQK-ME2245, "KQ11 Containment Sump (MT-02) As Build & ITAACs 2.3.10.01, 3.3.00.02F & 3.3.00.09," to verify that key dimensions were recorded and matched the actual construction.

b. Findings

No findings were identified.

1A06 (Unit 3) ITAAC No. 814 / Family: 01A

.1 Resident ITAAC Inspection

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 814 (3.3.00.09):

Design Commitment	Inspections, Tests, Analysis	Acceptance Criteria
9. The reactor cavity sump has a minimum concrete thickness as shown in Table 3.3-5 between the bottom of the sump and the steel containment.	An inspection of the as-built containment building internal structures will be performed.	A report exists and concludes that the reactor cavity sump has a minimum concrete thickness as shown on Table 3.3-5 between the bottom of the sump and the steel containment.

The inspectors used the following NRC inspection procedures/sections to perform this inspection:

- 65001.01-02.04 – Key Dimensions and Volumes

The inspectors performed a direct inspection and independent measurements of the installed containment sump (KQ11) to determine whether the distance from the bottom of the containment sump to the top surface of the embedded containment shell met the requirements established in Appendix C, Table 3.3-5, "Key Dimensions of Nuclear Island Building Features" of the Vogtle Unit 3 LICENSE. The inspectors reviewed E&DCR number APP-KQ11-GEF-022, "Clarification of Measuring Points for Bottom of Reactor Containment Sump (KQ11), " revision 0 to determine whether measurements were taken at the required locations. The inspectors reviewed measurement documentation provided in SV3-KQ11-KQK-ME2245, "KQ11 Containment Sump (MT-02) As Build & ITAACs 2.3.10.01, 3.3.00.02F & 3.3.00.09," to verify that key dimensions were recorded and matched the actual construction.

b. Findings

No findings were identified.

1A07 (Unit 4) ITAAC No. 91 / Family: 06F

.1 Resident ITAAC Inspection

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 91 (2.2.01.02a):

Design Commitment	Inspections, Tests, Analysis	Acceptance Criteria
2.a) The components identified in Table 2.2.1-1 as ASME Code Section III are designed and constructed in accordance with ASME Code Section III requirements.	Inspection will be conducted of the as-built components as documented in the ASME design reports.	The ASME Code Section III design reports exist for the as-built components identified in Table 2.2.1-1 as ASME Code Section III.

The inspectors used the following NRC inspection procedures/sections to perform this inspection:

- 65001.06-02.01 – General Installation
- 65001.F-02.02 – Fabrication Records Review
- 65001.F-02.03 – Observation of Fabrication Activities

The inspectors reviewed CB&I receiving inspection reports (RIR) number U4-143 for the Vogtle Unit 4 lower equipment penetration sleeve insert plate (H02); to determine whether CB&I performed an adequate receipt inspection of the CMTRs and code data reports provided by the material supplier. The inspectors reviewed the receiving

inspection records for the lower equipment hatch penetration sleeve and insert plate to determine whether CB&I had verified the following dimensions, which were designated tier 2* information in Section 3.8.2.1.3, "Equipment Hatches," and Figure 3.8.2-2, "Equipment Hatches," of the Vogtle Units 3 and 4 UFSAR:

- inside diameter of the sleeve;
- diameter of the insert plate; and
- minimum thickness of the insert plate.

Furthermore, the inspectors performed an independent inspection of the thickness of the insert plate to verify the measurements recorded by CB&I on their RIR during receipt inspection.

The inspectors also reviewed the related N-2 ASME Code Data Reports for H02 (Part number IN-4898 [National Board Number 2826]), to determine whether the code data report met the requirements of ASME Section III. The inspectors performed an independent review of the CMTRs for the insert plate and for the penetration sleeve to determine whether the materials met the following quality and technical requirements:

- Section 3.8.2.6, Materials, Quality Control, and Special Construction Techniques," of the Vogtle Units 3 and 4 UFSAR;
- APP-MV50-Z0-002, "AP1000 Containment Vessel Equipment Hatch," revision 3;
- SA-738 Grade B, "Specification for the Pressure Vessel Plates, Heat-Treated, Carbon-Manganese-Silicon Steel, for Moderate and Lower Temperature Service," 2001 Edition with 2002 addenda;
- SA-20, "Standard Specification for General Requirements for Steel Plates for Pressure Vessels," including Supplementary Requirements S1, S3, S5, and S6;
- APP-MV50-Z0-037, "AP1000 Containment Vessel: SA-738 Grade B Plates," Rev. 4;
- MS-SA-738B-2889, "Material Specification for SA 738 Grade B Steel Plate AP1000 Nuclear Containment Vessel," Rev. 4;
- ASME Section III, Division I, Subsection NE, 2001 edition through 2002 addenda; and
- 10 CFR Part 50, Appendix B.

Specifically, the following CMTRs were reviewed to determine whether chemical and mechanical properties (including applicable impact testing, drop weight testing, grain size, and carbon equivalency), heat treatment, and required nondestructive examination met the above requirements:

- penetration Sleeve: Heat 5-8184 / D2395 A, CMTR number 6151-1;
- penetration Sleeve: Heat 5-8184 / BK361 A, CMTR number 6151-2;
- insert Plate: Heat 5-8184 / C2198A, CMTR number 6151-3;
- insert Plate: Heat 6-1392 / MT206 A, CMTR number 6151-6;
- insert Plate: Heat 6-1392 / MT234 B, CMTR number 6151-5; and
- insert Plate: Heat 6-1392 / MT234 A, CMTR number 6151-5.

b. Findings

No findings were identified.

.2 Resident ITAAC Inspection

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 091 (2.2.01.02a):

The inspectors used the following NRC inspection procedures/sections to perform this inspection:

- 65001.06-02.01 – General Installation
- 65001.F-02.02 – Fabrication Records Review
- 65001.F-02.03 – Observation of Fabrication Activities

The inspectors reviewed CB&I RIR number U4-090 for the Vogtle Unit 4 lower personnel airlock insert plate (H03); to determine whether CB&I performed an adequate receipt inspection of the CMTRs and code data reports supplied by the material supplier. The inspectors reviewed the receiving inspection records for the lower personnel airlock insert plate to determine whether CB&I had verified the minimum thickness of the insert plate, which was designated tier 2* information in Section 3.8.2.1.4, "Personnel Airlocks," and Figure 3.8.2-3, "Personnel Airlock," of the Vogtle Units 3 and 4 UFSAR. Furthermore, the inspectors performed an independent inspection of the thickness of the insert plate to verify the measurements recorded by CB&I on their RIR during receipt inspection.

The inspectors also reviewed the related N-2 ASME Code Data Reports for H03 (Part number IN-4894 [National Board Number 2829]), to determine whether the code data report met the requirements of ASME Section III. The inspectors performed an independent review of the CMTRs for the insert plate and for the penetration sleeve to determine whether the materials met the following quality and technical requirements:

- Section 3.8.2.6, Materials, Quality Control, and Special Construction Techniques," of the Vogtle Units 3 and 4 UFSAR;
- APP-MV50-Z0-002, "AP1000 Containment Vessel Equipment Hatch," Rev. 3;
- SA-738 Grade B, "Specification for the Pressure Vessel Plates, Heat-Treated, Carbon-Manganese-Silicon Steel, for Moderate and Lower Temperature Service," 2001 Edition with 2002 addenda;
- SA-20, "Standard Specification for General Requirements for Steel Plates for Pressure Vessels," including Supplementary Requirements S1, S3, S5, and S6;
- APP-MV50-Z0-037, "AP1000 Containment Vessel: SA-738 Grade B Plates," Rev. 4;
- MS-SA-738B-2889, "Material Specification for SA 738 Grade B Steel Plate AP1000 Nuclear Containment Vessel," Rev. 4;
- ASME Section III, Division I, Subsection NE, 2001 edition through 2002 addenda; and
- 10 CFR Part 50, Appendix B.

Specifically, the following CMTRs were reviewed to determine that chemical and mechanical properties (including applicable impact testing, drop weight testing, grain

size, and carbon equivalency), heat treatment, and required nondestructive examination met the above requirements:

- insert Plate: Heat 6-1723 / CY044A, CMTR number 6307-1; and
- penetration Sleeve: Heat 6-1723 / CY064A, CMTR number 6306-1;

b. Findings

No findings were identified.

1A08 (Unit 4) ITAAC No. 093 / Family: 06B

.1 Resident ITAAC Inspection

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 093 (2.2.01.03a):

The inspectors used the following NRC inspection procedures/sections to perform this inspection:

- 65001.B-02.04-Production Controls

On August 8, 2013, the inspectors observed the in-process welding of the lower equipment hatch (H02) to determine whether welding was performed in accordance with WPS E91TG-H4 revision 7. The inspectors observed the in-process welding from the inside of the containment vessel lower ring to determine if the welding was performed within the ranges allowed by the WPS and the requirements of ASME Section III, Article NE-4000. During the welding, the inspectors also observed CB&I's process for maintaining the required preheat requirements established by section 7.2.2.5 of the containment vessel design specification, and the QC verification of heat input. Additionally, the inspectors verified the following:

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

b. Findings

No findings were identified.

.2 Resident ITAAC Inspection

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 093 (2.2.01.03a):

The inspectors used the following NRC inspection procedures/sections to perform this inspection:

- 65001.06-02.02 – Component Welding
- 65001.B-02.05 – Inspection
- 65001.B-02.06 – Records
- 65001.11-02.05 – Nondestructive Examination

On August 8, 2013, the inspectors observed CB&I QC perform liquid penetrant testing (PT) of weld number U4-S1-A2/A3, which was associated with the first course (S1) of the lower ring of the Vogtle Unit 4 containment vessel. The inspectors observed the inspection to determine whether the examination was performed in accordance with CB&I procedure CMS-15-PR-45163, "Liquid Penetrant Examination Color Contrast, Water Washable, ASME Section III, Division 1 - Subsection NE," revision 1. The inspectors also verified that the following measuring and test equipment (M&TE) and consumables were properly calibrated or qualified in accordance with the CB&I quality assurance program: penetrant (batch numbers 12-F47 and 114-G47), cleaner (batch number 03-J4), developer (batch number 19-F6), Fluke 62 Mini Infrared thermometer (serial number 18560013), visible light meter (serial number 10070200040), and garden sprayer relief valve (serial number GSRV-03). Furthermore, the inspectors reviewed the NDE certification of qualification and recent eye examination record for the Level I inspector (identification number 2837218) who performed the examination. The inspectors also reviewed CB&I's PT report number U4-027 to determine whether the examination was recorded in accordance with the CB&I PT procedure, and that this record was sufficient to furnish evidence of an activity affecting quality.

b. Findings

No findings were identified.

.3 Resident ITAAC Inspection

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 093 (2.2.01.03a):

The inspectors used the following NRC inspection procedures/sections to perform this inspection:

- 65001.B-02.05 – Inspection
- 65001.11-02.05 – Nondestructive Examination
- 65001.11-02.04 – Post Weld Heat Treatment

From September 10 - 30, 2013, the inspectors observed the in-process post weld heat treatment (PWHT) of the Vogtle Unit 4 containment vessel, course S1, vertical weld numbers B4-A6 to B4-A7, B4-A8 to B4-A9, B4-A10 to B4-A11, and B4-A11 to B4-A12. The inspectors observed the PWHT activity to determine whether the PWHT was performed in accordance with NE-4620, "Postweld Heat Treatment," of the ASME Section III Code, Subsection NE, 2001 edition through the 2002 addenda. The inspectors also verified that the PWHT operations were performed in accordance with CB&I procedure number 165766-830-15-PR-000001, "Post Weld Heat Treat Procedure Shell Course S1 Vertical Seams," revision 6.

The inspectors reviewed procedure number 165766-830-15-PR-000001 to determine whether it properly incorporated the requirements of section NE-4620 of the ASME Section III code. Specifically, the inspectors verified that the following attributes of the PWHT operation were consistent with the code requirements:

- PWHT time and temperature;
- holding times at temperature;
- PWHT heating and cooling rates; and
- minimum width of the local heat treatment band.

The inspectors reviewed the PWHT traveler used in the field for weld numbers B4-A7 to B4-A6, B4-A11 to B4-A12, and B4-A8 to B4-A9, to ensure the process was approved by the ANI, the steps were being adhered to, and QC checks were being performed. The inspectors observed real-time temperature data and reviewed the Post Weld Heat Treatment Time Temperature Tabulations to verify heat up rates, temperatures, soak times, and cool down rates were in compliance with ASME Section III, Subsection NE. The inspectors also reviewed the thermal history sheet and supporting documentation for these welds and the associated SA-738 Grade B plates, to ensure PWHT cumulative times did not exceed qualification allowances established in ASME Section III, Subsection NE. Upon completion of the PWHT operations for these three welds, the inspectors reviewed the revised thermal history sheets to verify that the PWHT time at temperature was correctly logged.

The inspectors performed an independent visual inspection of portions of the welds listed above, to verify that welds had not cracked after the PWHT operation.

The inspectors reviewed a sample of the Radiographic Testing (RT) film and RT reports for the following Unit 4 course S1 (Lower ring) vertical welds:

- RT Report U4-067, Weld: B4-A7 to B4-A6;
- RT Report U4-070, Weld: B4-A8 to B4-A9; and
- RT Report U4-065, Weld: B4-A11 to B4-A12.

The inspectors reviewed the above RT reports and sample of associated RT film to determine whether the completed welds met the acceptance standards specified by Subsection NE-5320, "Radiographic Acceptance Standards," of ASME Section III, Article

NE-5000, "Examination," and CB&I RT procedure CMS-830-15-PR-45154, "Radiographic Examination ASME Section III, Division 1 – Subsection NE," Rev. 1.

b. Findings

No findings were identified.

1A09 (Unit 4) ITAAC No. 761 / Family: 01F

.1 Resident ITAAC Inspection

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 761 (3.3.00.02a.i.b):

The inspectors used the following NRC inspection procedures/sections to perform this inspection:

- 65001.01-02.01 – Procedures
- 65001.01-02.06 – Records
- 65001.F-02.02 – Fabrication Records Review
- 65001.F-02.03 – Observation of Fabrication Activities
- 65001.02-02.01 – Inspection of Concrete Placement
- 65001.02-02.06 – Record Review

The inspectors performed a field inspection of construction activities associated with ITAAC 3.3.00.02a.i.b for the nuclear island basemat layers 1 through 3 for the Shield Building area at the Vogtle Unit 4 site. The field activities applied the guidance in Inspection Procedure (IP) 65001.01, "Inspection of ITAAC Related Foundation and Buildings," IP 65001.02, "Inspection of ITAAC Related Installation of Structural Concrete" and IP 65001.F, "Inspection of ITAAC-Related Design and Fabrication Requirements." The inspectors conducted inspections of the concrete reinforcing steel placement, reviewed documents and applicable design drawings and specifications, and interviewed licensee personnel to verify construction activities were being conducted in accordance with design documents and applicable processes and procedures. Specifically, the inspectors verified:

- structural concrete work, design and installation was completed in accordance with applicable specifications, drawings, and approved procedures;
- key building critical dimensions, materials, and separation satisfied design specifications, requirements, and relevant ITAAC;
- licensee records established an adequate basis for the acceptance of ITAAC with design and fabrication attributes; and
- records reflected that completed work meets design specifications and acceptance criteria.

The inspectors performed independent measurements and observations on sample areas of the basemat reinforcing steel for the Unit 4 nuclear island structures. Specifically, the inspectors observed the Shield Building area basemat reinforcing steel

placement, specifically basemat reinforcing steel layers 1 through 3 and mechanical reinforcing steel splices. In addition, the inspectors reviewed various documents within the work packages and design control documents for the reinforcing steel, to verify:

- reinforcing steel was controlled and placement performed in accordance with the applicable specifications, codes, drawings, and procedures;
- analyses, calculations, functional assessments, engineering evaluations and other design reports, were consistent with the safety significance and inspection resources, so that reinforcing steel placement conformed to design drawings, and all nonconforming conditions were appropriately resolved;
- the licensee had established an effective method for tracking, evaluating, and dispositioning changes or modifications to the design;
- reinforcing steel was located properly in the structure, secured, free of concrete or excessive rust, and have proper clearances; and
- licensee had confirmed reinforcing steel conformed to design drawings and there were no unanalyzed deviations from design.

In addition, inspectors reviewed applicable design specifications, E&DCRs associated with the basemat rebar installation to determine whether deviations from requirements were effectively resolved.

b. Findings

No findings were identified.

1A10 (Unit 4) ITAAC No. 762 / Family: 01F

.1 Resident ITAAC Inspection

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 762 (3.3.00.02a.i.c):

Design Commitment	Inspections, Tests, Analysis	Acceptance Criteria
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.

The inspectors used the following NRC inspection procedures/sections to perform this inspection:

- 65001.01-02.01 – Procedures
- 65001.01-02.06 – Records
- 65001.F-02.02 – Fabrication Records Review
- 65001.F-02.03 – Observation of Fabrication Activities
- 65001.02-02.01 – Inspection of Concrete Placement
- 65001.02-02.06 – Record Review

The inspectors performed a field inspection of construction activities associated with ITAAC 3.3.00.02a.i.c for the nuclear island basemat layers 1 through 2 for the non-radiological portion of the auxiliary building at the Vogtle Unit 4 site. The field activities applied the guidance in IP 65001.01, “Inspection of ITAAC-Related Foundation and Buildings,” IP 65001.02, “Inspection of ITAAC Related Installation of Structural Concrete” and IP 65001.F, “Inspection of ITAAC-Related Design and Fabrication Requirements.” The inspectors conducted inspections of the concrete reinforcing steel placement, reviewed documents and applicable design drawings and specifications, and interviewed licensee personnel to verify construction activities were being conducted in accordance with design documents and applicable processes and procedures. Specifically, the inspectors verified:

- structural concrete work, design and installation was completed in accordance with applicable specifications, drawings, and approved procedures;
- key building critical dimensions, materials, and separation satisfied design specifications, requirements, and relevant ITAAC;
- licensee records established an adequate basis for the acceptance of ITAAC with design and fabrication attributes; and
- records reflected that completed work met the design specifications and acceptance criteria.

The inspectors performed independent measurements and observations on sample areas of the basemat reinforcing steel for the proposed Unit 4 nuclear island structures. Specifically, the inspectors observed the non-radiological portion of the auxiliary building basemat reinforcing steel placement, including basemat reinforcing steel layers 1 through 2 and mechanical reinforcing steel splices. In addition, the inspectors reviewed various documents within the work packages and design control documents for the reinforcing steel, to verify:

- reinforcing steel was controlled and placement performed in accordance with the applicable specifications, codes, drawings, and procedures;
- analyses, calculations, functional assessments, engineering evaluations and other design reports, were consistent with the safety significance and inspection resources, so that reinforcing steel placement conformed to design drawings, and all nonconforming conditions were appropriately resolved;
- the licensee had established an effective method for tracking, evaluating, and dispositioning changes or modifications to the design;
- reinforcing steel is located properly in the structure, secured, free of concrete or excessive rust, and have proper clearances; and

- licensee had confirmed reinforcing steel conforms to design drawings and there were no deviations from design

In addition, inspectors reviewed applicable design specifications, E&DCRs associated with the basemat rebar installation to determine whether deviations from requirements were effectively resolved.

b. Findings

No findings were identified.

1A11 (Unit 4) ITAAC No. 763 / Family: 01F

.1 Resident ITAAC Inspection

a. Inspection Scope

The inspectors performed a direct inspection of construction activities associated with ITAAC Number 763 (3.3.00.02a.i.d):

The inspectors used the following NRC inspection procedures/sections to perform this inspection:

- 65001.01-02.01 – Procedures
- 65001.01-02.06 – Records
- 65001.F-02.02 – Fabrication Records Review
- 65001.F-02.03 – Observation of Fabrication Activities
- 65001.02-02.01 – Inspection of Concrete Placement
- 65001.02-02.06 – Record Review

The inspectors performed a field inspection of construction activities associated with ITAAC 3.3.00.02a.i.d for the nuclear island basemat layers 1 through 2 for the radiological portion of the auxiliary building at the Vogtle Unit 4 site. The field activities applied the guidance in IP 65001.01, “Inspection of ITAAC-Related Foundation and Buildings,” IP 65001.02, “Inspection of ITAAC Related Installation of Structural Concrete” and IP 65001.F, “Inspection of ITAAC-Related Design and Fabrication Requirements.” The inspectors conducted inspections of the concrete reinforcing steel placement, reviewed documents and applicable design drawings and specifications, and interviewed licensee personnel to verify construction activities were being conducted in accordance with design documents and applicable processes and procedures. Specifically, the inspectors verified:

- structural concrete work, design and installation were completed in accordance with applicable specifications, drawings, and approved procedures;
- key building critical dimensions, materials, and separation satisfied design specifications, requirements, and relevant ITAAC;
- licensee records established an adequate basis for the acceptance of ITAAC with design and fabrication attributes; and
- records reflected that completed work met the design specifications and acceptance criteria.

The inspectors performed independent measurements and observations on sample areas of the basemat reinforcing steel for the proposed Unit 4 nuclear island structures. Specifically, the inspectors observed the radiological portion of the auxiliary building basemat reinforcing steel placement, including basemat reinforcing steel layers 1 through 2 and mechanical reinforcing steel splices. In addition, the inspectors reviewed various documents within the work packages and design control documents for the reinforcing steel, to verify:

- reinforcing steel was controlled and placement performed in accordance with the applicable specifications, codes, drawings, and procedures;
- analyses, calculations, functional assessments, engineering evaluations and other design reports, were consistent with the safety significance and inspection resources, so that reinforcing steel placement conformed to design drawings, all nonconforming conditions were appropriately resolved;
- the licensee had established an effective method for tracking, evaluating, and dispositioning changes or modifications to the design;
- reinforcing steel was located properly in the structure, secured, free of concrete or excessive rust, and had proper clearances; and
- licensee had confirmed reinforcing steel conforms to design drawings and there were no deviations from design.

In addition, inspectors reviewed applicable design specifications, E&DCRs associated with the basemat rebar installation to determine whether deviations from requirements were effectively resolved.

b. Findings

No findings were identified.

1P01 Quality Assurance Implementation, Appendix 3, Inspection of Criterion III – Design Control (35007)

.1 Resident Program Inspection

a. Inspection Scope

The inspectors reviewed a sample of E&DCRs, to determine whether the licensee was effectively implementing its design control program. During this inspection, the inspectors focused on the design activities that were associated with WEC issued for construction design drawings related to the following Unit 3 nuclear island construction activities:

- reinforcing steel installation;
- embedment plate installation; and
- concrete placement activities.

The inspectors selected for review, a sample of E&DCRs that were associated with the aforementioned construction activities, to determine whether:

- the field changes received the proper level of engineering review in accordance with the licensee procedures;
- affected calculations, drawings, and analyses were identified; and
- affected design documents were reviewed to ensure continued applicability and that all design input assumptions remain valid.

During this inspection, for both technical and procedural compliance, the inspectors reviewed the following E&DCRs:

- SV0-CR01-GEF-000047, "Anchors bolts & holes MUD MAT," Rev. 0;
- SV3-CR01-GEF-000085, "Rebar Clearance to Embedded Items," Rev. 0; and
- SV0-CC01-GEF-000165, "Modify 18" Lift requirement," Rev. 0.

.b Findings

No findings were identified.

.2 Resident Program Inspection

a. Inspection Scope

The inspectors reviewed E&DCR APP-1000-GEF-058, "Nuclear Island Basemat - Optional Construction Joint Between CA20 Module and Containment Vessel," revision 0 to determine whether this change was performed in accordance with procedure number APP-GW-GAP-420, "Engineering and Design Coordination Report." The inspectors also evaluated these design changes for conformance to 10 CFR Part 50, Appendix B, Criterion III, "Design Control," and Supplement 3S-1, "Supplementary Requirements for Design Control," of ASME NQA-1-1994. The inspectors also reviewed the licensing impact determination screening associated with this design change to determine whether the change was properly evaluated against the current licensing basis as described in the Vogtle Unit 3 and Unit 4 UFSAR and was performed in accordance with procedure APP-GW-GAP-420. Furthermore, the inspectors reviewed this E&DCR to determine whether the change received the proper level of engineering review and was incorporated into all affected documents. The inspectors also reviewed AP1000 calculation APP-1200-CCC-103, "Auxiliary Building Wall 4 Reinforcement Design," revision 3, which was an impacted document identified in the E&DCR, to determine whether the design change was properly incorporated.

b. Findings

No findings were identified.

1P02 Quality Assurance Implementation, Appendix 6, Inspection of Criterion VI - Document Control (35007)

.1 Resident Program Inspection

a. Inspection Scope

On July 30, 2013, the inspectors performed a walkdown of the Vogtle Unit 4 nuclear island, and reviewed work package number SV4-1000-CRW-CV1265, "Unit 4 Nuclear Island Installation of Reinforcing Steel for the Basemat," revision 4. From this work package, the inspectors selected two drawings and two procedures for comparison to the CB&I electronic record database (master list of controlled documents) to verify the following:

- that the correct versions of these documents were issued to construction personnel, who performed safety-related construction activities;
- that any changes posted against these documents, not yet incorporated in a new revision, were listed on the controlled copy in the field;
- that the controlled documents were accessible to all workers in the area;
- that the controlled documents contained the required signatures, and were marked in accordance with the quality assurance program requirements; and
- that these documents were reviewed and approved by authorized personnel.

b. Findings

No findings were identified.

1P03 Quality Assurance Implementation, Appendix 7, Inspection of Criterion VII – Control of Purchased Material, Equipment, and Services (35007)

.1 NCV 05200025/2013004-01, Inadequate Source and Receipt Inspections of Safety Related Embed Plates

a. Inspection Scope

To evaluate the effectiveness of CB&I's source and receipt inspection process, the inspectors performed an independent inspection of a sample of safety-related embed plates. The embed plates selected had been through the CB&I receipt inspection process and were released for installation in the Vogtle Unit 3 nuclear island. The inspectors measured the bend diameter of the deformed wire anchors attached to the embed plates to determine whether the bend diameter met the requirements of Section 7.2, Minimum Bend Diameters," of ACI 349-01, "Code Requirements for Nuclear Safety Related Concrete Structures." Furthermore, the inspectors compared these embed plates to the technical requirements established, in part, by:

- SV3-CC01-Z0-031, "Safety Related Placing Concrete and Reinforcing Steel," Rev. 1; and
- SV3-SS01-Z0-003, "Design Specification for Embedded and Miscellaneous Steel," Rev. 2.

The inspectors reviewed a sample of CB&I QC inspection reports for these embed plates to determine whether the receipt inspection was performed in accordance with QC inspection plan F-Q445-011, "Receipt Inspection – Non ASME," revision 2. The inspectors reviewed these inspection records to verify that CB&I had documented their determination that the embed plates complied with all applicable quality and technical requirements specified by purchase order (PO) 132175-CE01.01.

Specifically, the inspectors reviewed the following QC inspection reports:

- Q445-12-1431, "Embeds," Rev. 0
- Q445-12-1374, "Steel Embedments," Rev. 0
- Q445-12-1393, "Steel Embedments," Rev. 0

b. Findings

Failure to perform adequate receipt and source inspections of safety-related embed plates

Introduction

The inspectors identified an ITAAC finding of very low safety significance (Green) and associated non-cited violation of 10 CFR Part 50, Appendix B, Criterion VII, "Control of Purchased Material, Equipment, and Services," for SNC's failure, through their contractor CB&I, to perform adequate inspections of safety-related embed plates at supplier facilities and failure to perform adequate examinations of these embed plates upon delivery, to assure the plates conformed to the procurement documents.

Description

SNC delegated certain safety-related procurement activities for the Vogtle Unit 3 and 4 construction project to CB&I through an Engineering, Procurement and Construction Agreement between SNC and a consortium consisting of WEC and CB&I. On behalf of SNC, CB&I procured safety-related embed plates, and performed the required source and receipt inspections to verify that the embed plates conformed with the technical and quality requirements passed down to the supplier through the purchase order. The inspectors identified that SNC and CB&I failed to perform adequate inspections of these safety-related embed plates at supplier facilities and failed to perform adequate examinations of the embed plates upon delivery, to assure that these materials conformed to the procurement documents.

Purchase Order Number 132175-CE01.01, required CB&I's vendor to provide embed plates in accordance with WEC design specification SV3-SS01-Z0-003, "Embedded and Miscellaneous Steel." Section 4.3.2.5, "Embedment," of SV3-SS01-Z0-003 states, in part, that "embedments shall be fabricated in accordance with the applicable requirements of the AISC Specification/Code [AISC N690-1994, American National Standard Specification for the Design, Fabrication, and Erection of Steel Safety-Related Structures for Nuclear Facilities]."

Section, Q1.22, "Anchor Bolts and Embedments," of AISC N690-1994, requires in part, that "the design of steel embedments shall be in accordance with ACI 349, Appendix B." Section B.2.2 of ACI 349-01, Appendix B, "Anchoring to Concrete," states in part, that

“reinforcement used as part of the embedment shall be designed in accordance with other parts of the code.” ACI 349-01, Chapter 7, “Details of Reinforcement,” Section 7.2, “Minimum bend diameters,” requires in part, that “the diameter of bends measured on the inside of the bar shall not be less than the values specified in Table 7.2.”

On July 13, 2013, the NRC inspectors identified that bent deformed wire anchors, which were attached to safety-related embed plates, did not meet the aforementioned requirements. Specifically, the bent DWAs failed to meet Table 7.2 of ACI 349-01, in that, the measured bend diameter of bent DWAs failed to meet the minimum bend diameter specified by this table. Specifically, Table 7.2 required that for number 6 bar size DWAs, the minimum bend diameter shall not be less than 6 times the nominal diameter of the bar, which for number 6 size DWAs is equal to 4.5 inches. Using a verified template, provided by the licensee, the inspectors identified that the minimum bend diameter was less than six times the nominal diameter. Upon identification of the issue, CB&I and SNC personnel performed an extent of condition review and determined that all embed plates with bent DWAs, onsite as of July 13, 2013, were not in conformance with Table 7.2 of ACI 349-01. The licensee identified that some of these bent DWAs were less than five times the nominal diameter of the DWA. As of July 13, 2013, there were 858 embed plates onsite. CB&I documented the issue in nonconformance and disposition report (N&D) SV0-CE01-GNR-000012, “DWA minimum bend diameter,” which required CB&I to scrap the nonconforming embed plates. None of the nonconforming embed plates had been installed in the nuclear island, but approximately 101 embed plates were issued to the field and released for installation in the nuclear island.

Analysis

The inspectors determined that SNC's failure to perform adequate inspections of safety-related embed plates at supplier facilities and failure to perform adequate examinations of embed plates upon delivery was contrary to the requirements of 10 CFR Part 50, Appendix B, Criterion VII, and was a performance deficiency.

The inspectors determined that the issue was more than minor because it was associated with the process and material control attributes of the Procurement / Fabrication Cornerstone and adversely affected the cornerstone objective of ensuring that the licensee's programs and processes were adequately developed and implemented for procurement and fabrication activities.

Furthermore, the inspectors determined the finding represented an ITAAC finding because it was material to the acceptance criteria of Vogtle Unit 3 ITAACs 762 and 763, in that, if left uncorrected, the licensee could not show that the acceptance criteria of these ITAACs were met. The inspectors determined that the failure of these embed plates to meet ACI 349-01 requirements, represented a nonconformance with the approved structural design, that if left uncorrected, represented a deviation from the design that would not have been reconciled by the licensee. The acceptance criteria of Vogtle Unit 3 ITAACs 762 and 763 requires that all deviations between the as-built structures in the non-radiologically controlled and radiologically controlled areas of the auxiliary building, respectively, and the approved design be reconciled (evaluated) such that the as-built structure would withstand the design basis loads without a loss of structural integrity or other safety-related functions.

The inspectors determined that the finding was associated with the Procurement/Fabrication Cornerstone. The inspectors determined the finding could be evaluated using the SDP in accordance with IMC 2519, "Construction Significance Determination Process," Appendix A, "AP1000 Construction Significance Determination Process" because the finding was not related to either a security or operational program and was determined to be an ITAAC finding. The inspectors determined that the finding was associated with several different systems, in that, seismic category I supports would be attached to these embed plates; however, the highest risk system was associated with the LOW risk column. The inspectors determined that the finding did not represent a repetitive significant condition adverse to quality; therefore, the risk significance is GREEN (Step 9). The inspectors also evaluated the finding under the assumption that the embed plates were part of the auxiliary building structure, which is associated with the INTERMEDIATE risk column. Because the nonconforming embed plates had not yet been installed in the nuclear island, and the licensee was able to demonstrate in their Part 21 evaluation, that, if left uncorrected, the affected portions of the structure would have been able to meet their design functions, the risk significance is GREEN (Steps 9 and 12 of IMC 2519, Appendix A).

The inspectors screened the finding for a possible construction safety focus component aspect in accordance with Appendix F, "Construction Safety Focus Components and Aspects," of IMC 0613, "Power Reactor Construction Inspection Reports." The finding had a cross-cutting aspect in the area of Baseline Inspection, corrective action program A.5(c), because the licensee, SNC, did not thoroughly evaluate previous issues adequately, such that the resolutions and corrective actions were adequate to ensure that problems were resolved. Specifically, SNC's failure to perform adequate inspections of safety-related embed plates at supplier facilities and failure to perform adequate examinations of embed plates upon delivery was similar to previously identified notice of violation (NOV) 05200025/2012004-02, where nuclear island reinforcing steel (rebar) did not meet ACI 349-01 minimum bend diameter requirements. The corrective actions for this NOV failed to consider that bent DWAs welded to embed plates were also subject to the bend diameter requirements of ACI 349-01. The previous violation also involved similar embed plates from the same supplier that failed to meet applicable technical requirements. The inspectors noted that some of the embed plates associated with the new violation were onsite at the time NOV 05200025/2012004-02 was issued.

Enforcement

Criterion VII, "Control of Purchased Material, Equipment, and Services," of Appendix B, "Quality Assurance Program Criteria for Nuclear Power Plants and Fuel Reprocessing Plants," to 10 CFR Part 50, "Domestic Licensing of Production and Utilization Facilities," states, in part, that "Measures shall be established to assure that purchased material, equipment, and services, whether purchased directly or through contractors and subcontractors, conform to the procurement documents. These measures shall include provisions, as appropriate, for source evaluation and selection, objective evidence of quality furnished by the contractor or subcontractor, inspection at the contractor or subcontractor source, and examination of products upon delivery."

Purchase Order Number 132175-CE01.01, required CB&I's vendor to provide embed plates in accordance with WEC, design specification SV3-SS01-Z0-003, "Embedded and Miscellaneous Steel." Section 4.3.2.5, "Embedment," of SV3-SS01-Z0-003 states, in

part, that “embedments shall be fabricated in accordance with the applicable requirements of the AISC Specification/Code [AISC N690-1994, American National Standard Specification for the Design, Fabrication, and Erection of Steel Safety-Related Structures for Nuclear Facilities].”

Section, Q1.22, “Anchor Bolts and Embedments,” of AISC N690-1994, requires in part, that “the design of steel embedments, shall be in accordance with ACI 349, Appendix B.” Section B.2.2 of ACI 349-01, states in part, that “reinforcement used as part of the embedment shall be designed in accordance with other parts of the code.” Section 7.2, “Minimum bend diameters,” of ACI 349-01, requires in part, that “the diameter of bends measured on the inside of the bar shall not be less than the values specified in Table 7.2, Minimum Diameters of Bend.”

Contrary to the above, as of August 21, 2013, Southern Nuclear Operating Company, through its contractor CB&I, failed to perform adequate inspections of safety-related embed plates at supplier facilities and failed to perform adequate examinations of embed plates upon delivery, to assure that these embed plates conformed to the procurement documents. Specifically, during source and receipt inspections, CB&I failed to identify that the deformed wire anchor bend diameter, associated with 858 embed plates, did not meet the minimum bend diameters specified by Table 7.2 of ACI 349-01; therefore, the embed plates did not conform to purchase order 132175-CE01.01. This violation is being treated as an NCV, consistent with Section 2.3.2 of the Enforcement Policy. The violation was entered into the licensee’s corrective action program as condition report (CR) 695726 and corrective action record (CAR) 207908, to ensure actions are taken to correct the condition. (NCV 05200025/2013004-01; Inadequate Source and Receipt Inspections of Safety Related Embed Plates.”)

The licensee’s immediate corrective action included the performance of an apparent cause evaluation to identify the possible causes of the issue, and to evaluate the effectiveness of the licensee’s corrective actions to previously cited NOV 05200025/2012004-02 “As-Built Submodule CA20-04, Auxiliary Building Embed Plates, and Nuclear Island Reinforcement Steel Not In Accordance With Procurement Documents”. In addition to N&D SV0-CE01-GNR-000012, CB&I initiated CAR 2013-1246 to evaluate the potential reportability of the issue under 10 CFR Part 21, and CAR 2013-1280 to evaluate a potential adverse trend related to source and receipt inspection activities.

.2 Resident Program Inspection

a. Inspection Scope

The inspectors reviewed Nuclear Development Quality Assurance (NDQA) assessment report number NDQA-2013-S037, which was performed by the licensee to determine whether Premier Technologies Incorporated adequately performed the Unit 4 integrated head package 350 Drawing stack-up and coatings applications for the integrated head package components. The inspectors reviewed NDQA-2013-S037 to determine whether the licensee used the appropriate design documents, procedures and codes to make their assessment. The inspectors reviewed the assessment reports to determine whether the licensee had adequately implemented the quality requirements of 10 CFR Part 50, Appendix B, Criterion VII, “Control of Purchased Material, Equipment, and

Services,” and Section 7, “Control of Purchased Material, Equipment, and Services,” of the SNC Nuclear Development Quality Assurance Manual (NDQAM).

Furthermore, the inspectors reviewed the above assessment results to determine whether the licensee had appropriately assessed the effectiveness of the control of quality by Premier Technologies Incorporated at intervals consistent with the importance, complexity, and quantity of the product or services. The inspectors also reviewed these reports to determine whether (1) the reports were adequate records of an activities affecting quality, (2) the reports were completed in accordance with the licensee’s quality assurance program implementing procedures, and (3) any issues identified by the licensee were appropriately identified (documented) and corrected in accordance with the project quality requirements.

b. Findings

No findings were identified.

.3 Resident Program Inspection

a. Inspection Scope

The inspectors reviewed Nuclear Development Quality Assurance Assessment (NDQAA) Report Numbers NDQA-2013-S021 and NDQA-2013-S022, which were performed by the licensee to determine whether CB&I personnel adequately assembled and inspected tapered threaded reinforcing steel (rebar) for the containment vessel bottom head rebar mat at elevation 71'-6", in accordance with the appropriate construction site instructions and procedures. The inspectors reviewed the assessment reports to determine whether the licensee had adequately implemented the quality requirements of 10 CFR Part 50, Appendix B, Criterion VII, “Control of Purchased Material, Equipment, and Services,” and Section 7, “Control of Purchased Material, Equipment, and Services,” of the SNC NDQAM.

Furthermore, the inspectors reviewed the above assessment results to determine whether the licensee had appropriately assessed the effectiveness of the control of quality by CB&I at intervals consistent with the importance, complexity, and quantity of the product or services. The inspectors also reviewed these reports to determine whether (1) the reports were adequate records of activities affecting quality, (2) the reports were completed in accordance with the licensee’s quality assurance program implementing procedures, and (3) any issues identified by the licensee were appropriately identified (documented) and corrected in accordance with the project quality requirements.

b. Findings

No findings were identified.

1P04 Quality Assurance Implementation, Appendix 10, Inspection of Criterion X – Inspection (35007)

.1 Resident Program Inspection

a. Inspection Scope

The inspectors reviewed CB&I QC inspection documentation to verify implementation of the licensee's process for conducting and documenting inspection results associated with the following unit 3 nuclear island construction activities:

- reinforcing steel installation;
- embedment plate installation; and
- concrete placement activities.

The inspectors observed CB&I QC inspectors perform three inspections of safety-related concrete placement activities. Specifically, the inspectors observed CB&I QC perform inspections of the following wall placements, in accordance with QC inspection plan F-C-113, "Placement and Grout: Safety Related Placing Concrete (Nuclear Island)," Rev. 7:

- Wall placement 1 – (Column line 1, between column lines I and J-2);
- Wall placement 2 – (Column line I, between column lines 4 and 5); and
- Wall placement 4 – (Column line 1, between column lines J-2 and N).

During this observation, the inspectors determined the following:

- whether CB&I QC inspectors conducting the inspections were qualified to conduct the inspection;
- CB&I QC inspections were performed by individuals other than those who performed or directly supervised the work being inspected;
- inspection activities were performed at the required frequency for each work operation;
- mandatory hold points were complied with and witnessed by the licensee's designated representatives;
- work did not proceed without satisfactorily accepted QC inspection reports-written authorization;
- whether the CB&I QC inspectors had the current implementing drawings and appropriate tools to conduct the inspection;
- whether the as-built configurations were installed and erected as described by drawings and construction specifications- the NRC inspector made physical measurements where appropriate; and
- if as-built configurations were installed differently from the original drawings, such changes were approved and controlled prior to CB&I QC acceptance.

Upon completion of field observations of CB&I QC inspectors and their respective safety-related inspection activities, the inspectors sampled the following QC inspection reports for the activities performed:

- C112-002-13-0131
- C112-002-13-0115

- C112-002-13-0116
- C112-002-13-0150
- C113-13-0012

During this review, the inspectors verified the following:

- 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;
- identification or reference to inspection criteria, sampling plan, or reference documents used to determine acceptance;
- resolution of corrective actions for noted nonconformance or deficiency; and
- inspection results were documented and complete.

b. Findings

No findings were identified.

1P05 Quality Assurance Implementation, Appendix 12, Inspection of Criterion XII – Control of Measuring and Test Equipment (35007)

.1 Resident Program Inspection

a. Inspection Scope

On August 8, 2013, the inspectors observed CB&I QC perform a PT inspection of weld number U4-S1-A2/A3, which was associated with the first course (S1) of the lower ring of the Vogtle Unit 4 containment vessel. The inspectors verified that the following M&TE were properly calibrated and qualified in accordance with the CB&I quality assurance program: Fluke 62 Mini Infrared thermometer (serial number 18560013), visible light meter (serial number 10070200040), and garden sprayer relief valve (serial number GSRV-03). The inspectors also verified that the M&TE was properly labeled and was traceable to the associated calibration records.

b. Findings

No findings were identified.

1P06 Quality Assurance Implementation, Appendix 13, Inspection of Criterion XIII – Handling, Storage, and Shipping (35007)

.1 Resident Program Inspection

a. Inspection Scope

The inspectors performed a walkdown of several of the CB&I controlled storage areas to determine whether CB&I had controlled the storage of safety-related equipment to prevent damage or deterioration. Specifically, the inspectors observed the storage areas to determine whether CB&I was adequately implementing Section 13, "Handling,

Storage, and Shipping," of SWSQAP 1-74A, "CB&I Standard Nuclear Quality Assurance Program," revision B; and Quality Standard (QS) 13.11, "Material/Equipment Storage," revision C. The inspectors examined the following items in the CB&I designated storage areas for compliance with program requirements:

- submodules (CA04, CA20);
- piping (caps, plugs);
- welding filler material;
- threaded connections;
- stainless steel leak chase;
- stainless steel backing plate; and
- Nelson studs.

The inspectors observed storage areas to ensure the following storage requirements were properly implemented:

- storage areas were properly designated;
- materials were properly segregated to avoid deleterious effects;
- threaded connections were properly protected;
- pipes and penetrations were properly sealed; and
- materials were properly supported.

b. Findings

No findings were identified.

.2 Resident Program Inspection

a. Inspection Scope

The inspectors performed a field walk-down of a sample of safety related items that were received on site, such as reinforcing steel and embed plates. During this field observation, the inspectors toured the on-site laydown yards and storage facilities, to determine whether the items were properly stored in accordance with the following technical requirements:

- SV3-CR01-Z0-011, "Furnishing of Safety-Related Reinforcing Steel," Rev. 2
- SV3-SS01-Z0-003, "Design Specification for Embedded and Miscellaneous Steel," Rev. 2.

The inspectors toured these Level D storage areas to verify that they complied with the requirements established by Section 6, "Storage," of ASME NQA-1-1994, Subpart 2.2, such as:

- access to the Level D storage areas were controlled as designated by the responsible organization;
- items were stored on cribbing or equivalent to allow for air circulation and to avoid trapping water; and
- items were stored in an areas marked and designated for storage that was well drained, and reasonably removed from the actual construction area and traffic.

The inspectors also reviewed the SNC observation report documented in technical evaluation 620326, "Level B Storage Grout Monitoring 122 Building," dated 7/15/13, on the safety related grout used for the Unit 3 containment vessel bottom head foundation grouting to the basemat. The inspectors reviewed this surveillance to determine whether the licensee performed adequate oversight to ensure safety related items were stored within the appropriate conditions specified by the manufacturer's recommendations. The inspectors specifically verified whether the licensee observed that the grout was stored within the required temperature controls and in accordance with ASME NQA-1-1994 Level B storage requirements.

b. Findings

No findings were identified.

1P07 Quality Assurance Implementation, Appendix 15, Inspection of Criterion XV – Nonconforming Materials, Parts, or Components (35007)

.1 Resident Program Inspection

a. Inspection Scope

Inspection of QA Program Implementation

The inspectors reviewed a sample of nonconformance reports and field deviation reports (FDRs), to determine whether the conditions were adequately reviewed and accepted, rejected, repaired, or reworked in accordance with the QA program implementing documents for the control of nonconforming material, parts, and components. The inspectors compared these N&D and FDR reports to Section 15, "Nonconforming Materials, Parts, or Components," of the CB&I (formerly Shaw) quality assurance program (SWSQAP 1-74A, Rev. B) and CB&I procedure QS 15.1, "Nonconformance & Disposition Report," revision 2. The inspectors reviewed N&D reports associated with both Units 3 and 4.

The inspectors toured several of the on-site Level B, C, and D storage areas to confirm that the licensee had established areas for segregating and controlling nonconforming items. The inspectors selected a sample of nonconforming items in storage to determine if the items were segregated or marked to preclude inadvertent use, further processing, delivery, or installation.

The inspectors selected the following evaluations of nonconforming items that the licensee either rejected, repaired, reworked, or accepted through evaluation:

- FDR SV3-MV01-GNR-037, "Un-Calibrated Pressure Gauge on Nitrogen Purge System of Reactor Pressure Vessel Closure Head," Rev. 0;
- FDR SV3-MV01-GNR-036, "Vogtle Unit 3 RV, Spent Desiccant," Rev. 0;
- SV3-MV50-GNR-046, "Vogtle Unit 3 - Deviation Notice for the Containment Vessel Bottom Head Center Location Out of Tolerance," Rev. 0;
- V-ND-12-0237, "Pipe Spools were noted having rust, gouge, dings and/or identification issues";
- SV3-CC01-GNR-000067, "Exceeded Lift Height for U3 Aux. Building Wall Placement #1," Rev. 0;

- SV3-CC01-GNR-000069, "Exceeded Lift Height for 7th Lift - Wall Placement 1; U3 Aux. Building," Rev. 0;
- SV3-CC01-GNR-000046, "Five Star Products Quality Assurance Audit Finding," Rev. 0; and
- SV3-CC01-GNR-000049, "NI Pedestal Concrete Elevations," Rev. 0.

During the review of the above N&D reports, the inspectors determined if the reports properly identified the nonconforming items, and if the systems for initiating, processing, and closing nonconformances were adhered to. The inspectors specifically determined if:

- reportability screening and evaluations under 10 CFR Part 21 and 10 CFR 50.55(e) were performed;
- the disposition, such as use-as-is, reject, repair, or rework of nonconforming items were properly identified and documented;
- adequate technical justification for the acceptability of a nonconforming item, dispositioned repair, or use-as-is was appropriately documented;
- nonconformances to design requirements dispositioned use-as-is or repair were subjected to design control measures commensurate with those applied to the original design;
- the as-built records properly reflected the accepted deviation, if applicable;
- controls were implemented to preclude the inadvertent use of nonconforming items and that nonconforming items were marked or tagged and segregated; and
- repaired or reworked items were reexamined in accordance with applicable procedures and with the original acceptance criteria unless the disposition had established alternate acceptance criteria.

b. Findings

No findings were identified.

1P08 Quality Assurance Implementation, Appendix 16, Inspection of Criterion XVI – Corrective Action (35007)

.1 Resident Program Inspection

a. Inspection Scope

Daily Corrective Action Program Review

As part of the various inspection procedures discussed in previous sections of this report, the inspectors routinely reviewed conditions adverse to quality that were identified by the licensee, and their contractors, to verify the issues 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. Attributes reviewed included:

- 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;

- 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 root and contributing causes, as well as actions to preclude recurrence for significant conditions adverse to quality; and
- completion of corrective actions in a timely manner commensurate with the safety significance of the issue.

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 EPC consortium's corrective action programs. The inspectors attended several weekly management review committee meetings at the site and held discussions with licensee and EPC consortium personnel responsible for the screening and correction of the issues to determine whether:

- the licensee and the 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.

The inspectors also observed the licensee's interface of Corrective Action Processes (ICAP) corrective action review board meeting held on September 30, 2013.

Selected Issues for Follow-Up Inspection

Based on the inspectors' routine screening of corrective action records, the inspectors selected a sample of issues entered in the corrective action programs to determine if the handling of these issues was consistent with the applicable quality assurance program requirements and 10 CFR Part 50, Appendix B. Specifically, the inspectors reviewed the corrective action records listed in the documents reviewed section of this report. The inspectors reviewed these corrective action documents to determine whether:

- conditions adverse to quality were promptly identified and corrected;
- classification and prioritization of the resolution of the problem was commensurate with its safety significance;
- 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;
- conditions were appropriately screened;
- the licensee and their contractors properly evaluated and reported the condition in accordance with 10 CFR 50.55(e) and 10 CFR 21;
- the identification and correction of design deficiencies were being adequately addressed;
- extent of condition was being adequately addressed; and
- appropriate corrective actions were developed and implemented.

b. Findings

No findings were identified.

4. OTHER ACTIVITIES

4OA5 Other Activities

.1 VIO 05200025/2012-004-01: "Failure to Translate CA01 and CA20 Design Requirements Into Specifications and Drawings" (Closed)

The inspectors performed a review of the licensee's actions to correct VIO 05200025/2012-004-01, "Failure to Translate CA01 and CA20 Design Requirements Into Specifications and Drawings," identified in 05200025/2012-004 (ML12319A458). The review was to determine whether the corrective actions associated with the commitments made in their response to the NOV, dated December 14, 2012, (ML12354A357), were met and were sufficient to adequately correct the issues. This violation was associated with the licensee's failure to translate the regulatory and design basis requirements established, in part, by ACI 349-01, and AISC N690-94 into specifications, drawings, and instructions for the design and fabrication of Seismic Category I structural submodules CA20-04, CA20-07A, CA20-08A, CA20-29, and CA01-24.

The inspectors reviewed SNC CAR 196714 and CR 528334, which were written to address this violation. The inspectors reviewed the Westinghouse Electric Company corrective action documents listed in the documents reviewed section of this report. The inspectors performed inspections of calculations, rework and repair performed as result of these corrective actions at the Vogtle site to ensure the examples identified in the NOV were addressed. Furthermore, the inspectors noted that SNC credited license amendment request (LAR) 13-06, "Modules Obstructions and Details" as a corrective action to this violation. The NRC approved the amendment on October 8, 2013. (ML13266A114)

The inspectors determined that the licensee took adequate corrective actions to address this violation. No additional findings were identified. VIO 05200025/2012-004-01 is closed.

.2 Construction Deficiency Report (CDR) 05200025; 05200026/ND13-0841: 10 CFR 50.55(e) Report Regarding Control of Purchased Material, Equipment, and Services for AP1000 Project Vogtle Units 3&4 (Closed)

On December 6, 2012, root cause analysis for CAR 2012-0874 conducted by CB&I, a member of the Consortium that is EPC Contractor for the Licensees of Vogtle 3&4, concluded that quality assurance programmatic issues could have produced a defect. The inspectors previously identified this issue and documented a violation with an associated green finding in Section 4OA2.8 of NRC Inspection Report 05200025/2012-004; 05200026/2012-004. The inspectors reviewed the information contained in the CDR and determined that the information did not change the original assessment contained in the above inspection report. This CDR is closed.

.3 VIO 05200025/2012-009-01 and 05200026/2012-009-01: “Inadequate Design Control of Software Development” (Closed)

From September 16th to September 26, 2013, the inspectors performed a direct inspection of construction activities associated with ITAAC Number 550 (2.5.02.11) and ITAAC 551 (2.5.02.12).

In March 2012, following inspection of the protection and monitoring system (PMS) software requirements, SNC was issued a violation (VIO 05200025/2012009-01 & 05200026/2012009-01) for multiple performance deficiencies regarding ITAAC related digital instrumentation and control development (ML12171A058). The licensee responded to the NOV in a letter dated July 19, 2012, (ML12205A298), and the NRC acknowledged their response in letter dated July 30, 2012, (ML12213A046). In June 2013, following inspection of the licensee’s NOV corrective actions (ML13207A241) the inspectors determined that corrective actions were not sufficiently complete in the areas of verification and validation (V&V) independence, training in licensing basis requirements, the scope of reusable software element document (RSED) evaluations and licensing basis gap evaluation. Because the inspectors were not able to assess the adequacy in these areas, the violation remained open.

A follow up inspection, associated with this violation, is documented in IR 05200025/2013-003 and 05200026/2013-003 (ML13207A241).

(a) ITAAC Number 550 (2.5.02.11)

The inspectors assessed through sampling whether the RSE and RSED followed the proscribed lifecycle process, including the associated independent verification and validation (IV&V) tasks to assess whether SNC’s oversight of IV&V for the Vogtle project adequately addressed unused code and assessed hazards associated with using RSEDs that contain unused code. The inspectors assessed whether the RSEDs were adequately ranked in accordance with the hazards identified. The inspectors reviewed the software hazard analysis, the software V&V task report that addressed the software hazard analysis, the software requirements specification, and the V&V phase summary report, APP-PMS-GER-021.

The inspectors assessed the independence of SNC’s V&V activities as documented in various phase output documents, phase summary reports, software program management plans, organization, and by interviewing the V&V management and engineers. The inspectors reviewed IVV_Task_Report_Concept_Review_APP-ISIP-JQR-007_Rev4, Task Report for System Requirements Review and Concept Documentation Evaluation, to determine if SNC V&V activities were performed by individuals independent of the design team. The inspectors reviewed WNA-WI-00420-WAPP work instruction for the two task reports to determine the basis for SNC’s review of user needs, which are based on procedures, guidelines, work instructions, and products with respect to licensing and regulatory compliance. The inspectors reviewed CAP-IR 13-269-M055 that was initiated to address two inspector concerns and determined the CAP-IR adequately captured the issues. Specifically, it addressed that the task reports were insufficient to demonstrate technical disclosure and that the user needs addressing licensing commitments as specified within Institute for Electronic and Electrical Engineers (IEEE) Standard 1074-1995, Regulatory Guide (RG) 1.173, and IEEE 1012-1998 were not addressed in the work instruction as user needs.

Based on the results of this inspection, the inspectors determined that corrective actions were adequate and this violation is closed.

(b) ITAAC Number 551 (2.5.02.12)

The inspectors reviewed the AP1000 Protection and Safety Software Verification and Validation Plan, WNA-PV-00054-WAPP, to determine the IV&V training activities. The inspectors assessed the software development skill training matrixes for the IV&V safety test personnel to ensure that project specific training in the areas of applicable regulatory requirements and codes and standards was defined and maintained. The inspectors assessed the matrices to ensure the software test team had completed the required training.

The inspectors assessed the independence of SNC's V&V activities as documented in various phase output documents, phase summary reports, software program management plans, organization, and by interviewing the V&V management and engineers. The inspectors reviewed IVV_Task_Report_Concept_Review_APP-ISIP-JQR-007_Rev4, Task Report for System Requirements Review and Concept Documentation Evaluation, to determine if SNC V&V activities were performed by individuals independent of the design team. The inspectors reviewed WNA-WI-00420-WAPP work instruction for the two task reports to determine the basis for SNC's review of user needs, which are based on procedures, guidelines, work instructions, and products with respect to licensing and regulatory compliance. The inspectors reviewed CAP-IR 13-269-M055 that was initiated to address two inspector concerns and determined the CAP-IR adequately captured the issues. Specifically, it addressed that the task reports were insufficient to demonstrate technical disclosure and that the user needs addressing licensing commitments as specified within IEEE Standard 1074-1995, RG 1.173, and IEEE 1012-1998 were not addressed in the work instruction as user needs.

The inspectors assessed the licensing basis gap evaluation performed for IEEE Standard 1074-1995. The inspectors reviewed the AP1000 SPM, WCAP 16096-P-4, to verify that the activities for performing a software hazard analysis were identified in the life cycle model. The inspectors noted that the SPM required preparation and IV&V review of the software safety analysis for each phase of the software life cycle. Further, the inspectors noted that the Design Process for Common Q Safety Systems, NABU-DP-00014-GEN Rev 6, identified that a software hazards analysis shall be developed by the design team and reviewed by the IV&V team and further specified that the development is in accordance with WNA-WI-00408-GEN, Common Q Software Hazard Analysis Report Work Instruction.

Based on the results of this inspection, the inspectors determined that corrective actions were adequate this violation is closed.

4OA6 Meetings, Including Exit

.1 Exit Meeting Summary

On October 2, 2013, the inspectors presented the inspection results to Mr. Mark Rauckhorst, Vogtle 3 & 4 Construction Vice President, along with other licensee and consortium staff members. The inspectors stated that no proprietary information would be included in the inspection report.

KEY POINTS OF CONTACT

Licensees and Contractor Personnel

SNC

R. Askew - Construction Oversight
S. Brannan - Supplier Compliance Inspector
C. Defnall - Supplier Compliance Field Specialist
M. Edmondson - Supplier Compliance Manager
O. Fernando - Supplier Compliance Engineer
C. Harvell - Supplier Compliance Engineer
D. Jones - V.P. Technical Compliance
T. O'Brien - Modules Compliance Supervisor
B. Whitley - Director of Regulatory Affairs
M. Yox - Licensing

CB&I

G. Findlay - Power QC Inspector
V. Perez Houtman - Field Engineer
L. Smith - QC Inspector
W. Terrell - Weld Manager
J. Wright - QC Inspector

WEC

G. Couture - Licensing
N. Bailey – ITAAC

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

<u>Item Number</u>	<u>Type</u>	<u>Status</u>	<u>Description</u>
05200025/2012004-01	VIO	Closed	Failure to Translate CA01 and CA20 Design Requirements Into Specifications and Drawings (Section 4OA5.1)
CDR ND13-0841	CDR	Open/Closed	CDR 10 CFR 50.55(e) Report Regarding Control of Purchased Material, Equipment, and Services for AP1000 Project Vogtle Units 3&4 (Section 4OA5.2)
05200025/2012009-01; 05200026/2012009-01	VIO	Closed	Inadequate Design Control of Software Development (Section 4OA5.3)
05200025/2013004-01	NCV	Open	Inadequate Source and Receipt Inspections of Safety Related Embed Plates (1PO3.1)

LIST OF DOCUMENTS REVIEWED

Section 1A01:

SNC, Vogtle Unit 3 ITAAC Closure Notice, dated August 1, 2013, Docket No. 52-025, Completion of ITAAC 2.1.03.11 (Index Number 86)

WEC, SV0-MV01-Z5-001, Appendix 3 Technical Requirements for the AP1000 Reactor Vessel Purchase Order for the Vogtle Project, Rev. 4

WEC, APP-MV01-Z0-101, Design Specification for AP1000 Reactor Vessel For System: Reactor Coolant System (RCS), Rev. 10

Doosan, Purchase Order 2010024769, U.S. AP1000 Vogtle and V.C. Summer RPV for ASME Submerged Arc Welding (SAW) wire and flux

Doosan, Purchase Specification PS-11102AA, General Purchasing Requirements for Standard AP1000 Project, Rev. 4

Doosan, ASME Code Data Report Form N-2 for Vogtle Plant Unit 3 Reactor Vessel Assembly, Part Serial Number N07049-10101, National Board No. DN-3198

Japan Steel Works (JSW), CMTR JQA-09-060 dated 6/22/2009 (includes the Nikko Inspection Services CMTR MET-09-050, dated 3/18/2009, for testing services), ASME SA-508, Grade 3, Class 1, Heat-No. 08W172-1-1 for the upper shell of the AP1000 Vogtle 3 reactor vessel

Japan Steel Works (JSW), CMTR JQA-09-101 dated 8/21/2009 (includes the Nikko Inspection Services CMTR MET-09-086, dated 6/15/2009, for testing services), ASME SA-508, Grade 3, Class 1, Heat-No. 09W4-1-1 for the lower shell of the AP1000 Vogtle 3 reactor vessel

Japan Steel Works (JSW), CMTR JQA-09-061 dated 6/22/2009 (includes the Nikko Inspection Services CMTR MET-09-051, dated 3/18/2009, for testing services), ASME SA-508, Grade

3, Class 1, Heat-No. 08D1090-1-1 for the transition ring of the AP1000 Vogtle 3 reactor vessel

Kobe Steel, CMTR KN-1481, dated 01/07/2011, for ASME Section II, Part C, SFA-5.23, SAW wire with ID-No. GZ005499727 and flux ID-No. OKGY610.

Chosun Welding Co., Ltd., CMTR TR-P1066, dated 11/04/2010, for ASME Section II, Part C, SFA-5.5, SMAW electrodes with Lot-No. P244217

Doosan, Welding Procedure Specification, A-MA-0303-216, Rev. 1, dated 5/31/2010, with supporting Procedure Qualification Records QA-M-0303-044 dated 5/24/2010, QA-A-0303-032 dated 11/25/1999, and QA-A-0303-032-1 dated 5/31/2010 for Shielded Metal Arc Welding and Submerged Arc Welding on P-No. 3 Group-No. 3 material combinations with Post Weld Heat Treatment.

Doosan, Welding Procedure Specification, A-M-0303-152, Rev. 1, dated 5/24/2010, with supporting Procedure Qualification Record QA-M-0303-044, dated 5/24/2010 for SMAW only on P-No. 3 Group-No. 3 material combinations with PWHT

Section 1A02.1:

CB&I Radiographic Report U3-131;

CB&I RT procedure CMS-830-15-PR-45154, "Radiographic Examination ASME Section III, Division 1 – Subsection NE," Rev. 1; and

RT Film for shots: 0-1, 0-1R1, 3-4, 3-4R1, 3-4R2, 6-7, 11-12, 12-13, 61-62, 92-93, 126-127, 126-127R1, 143-144, 143-144R1, 144-145.

Section 1A03.1:

SV3-CC01-Z0-027, "Safety Related Concrete Testing Services," Rev. 3

SV3-CC01-Z0-031, "Safety Related Placing Concrete and Reinforcing Steel," Rev. 2

SV3-1010-CR-101, "Nuclear Island Basemat Reinforcement Area Below Containment Vessel Installation Sequence," Rev. 3

SV3-1010-CR-107, "Nuclear Island Basemat Concrete Reinforcement Area Below Containment Vessel Construction Joint," Rev. 2

132175-102-002-00002, "Containment Vessel Bottom Head Foundation Grouting Plan," Rev. 2

132175-J300.13-000048, "Fluid Grout 100 SP Data Sheet," Rev. D

132175-J300.13-000068, "Fluid Grout 100 Data Sheet," Rev. A

C112-002-13-0076, "Pre-placement Nuclear Island Concrete: SV3 PEDESTAL CJ PREP," Rev. 0

C113-001-13-0001, "Placement – Grout Placement: CVBH Underside Surface to Radius 34'-6" Rev. 0

C113-001-13-0005, "Placement – Grout Placement, PEDESTAL CHECK FOR CONTAMINANTS," Rev. 0

F-C113-001, "Placement: Grout Placement," Rev. 2

QAD 10.68, "Inspection Planning," Rev. 2

Section 1A04.1:

APP-1200-CCC-106, "Auxiliary Building Wall 1 Reinforcement Design," Rev. 6
 SV3-1200-CR-950, "Auxiliary Building Areas 5 & 6 Concrete Reinforcement Wall 1 Elevation," Rev. 1
 SV3-1210-CR-950, "Auxiliary Building Areas 5 & 6 Concrete Reinforcement Wall 1 Sections & Details EL 66'-6"," Rev. 1
 SV3-1210-CR-950, "Auxiliary Building Areas 5 & 6 Concrete Reinforcement Wall 1 Sections & Details EL 66'-6"," Rev. 1
 APP-1210-GEF-125, "Concrete Placement Release Auxiliary Building Wall 1 up to EL 82'-6"," Rev. 0
 SV3-1215-CE-960, "Auxiliary Building Area 5, Embedments Wall 1, Elevation 66'-6" North View," Rev. 4
 SV3-1215-CEX-960, "Auxiliary Building Area 5 Wall 1 Embedments Index, Elev. 66'-6" North View," Rev. 3
 SV3-CE01-CE-002, "Standard Embedment Plates Deformed Wire Anchor Type," Rev. 3

Section 1A04.2

WPS2-1.1M71, "Machine GMAW of AWS Group I, II, and III (A572 grade 60) steels, Rev. 0;
 Weld Data Sheets for CV0376-1 and CV0376-03-RW1;
 SV3-CA20-S4W-CV0308, "CA20 Subassembly 1 Wall Submodule Erection," Rev. 0;
 100-UT-310, "Ultrasonic examination of welds in accordance with AWS Structural Welding Code D1.1," Rev. 3;
 100-MT-302, "Magnetic Particle Examination in Accordance with AWS Structural Steel Welding Code," Rev. 2;
 Procedure qualification record numbers SP160 and SP154;
 Nondestructive Examination Reports: V-2012-UT-009, V-2012-UT-011, V-13-UT-310-0089, V-2012-MT-030, V-2012-MT-065, V-2012-MT-087, V-2012-MT-101, V-13-MT-302-102;

Section 1A04.3

F-561-004, "Structural Weld Inspection-Modules, AWS D1.1/D1.6," Rev. 6
 100-UT-310, "Ultrasonic Examination of Welds in Accordance with AWS Structural Steel Welding Code," Rev. 5
 100-MT-302, "Magnetic Particle Examination of Welds in Accordance with AWS Structural Steel Welding Code," Rev. 2
 Mistras Ultrasonic Testing Inspection Report 132175-QA-306-V-13-UT-310-050
 Mistras Ultrasonic Testing Inspection Report 132175-QA-306-V-13-UT-310-044
 Mistras Magnetic Particle Testing Inspection Report 132175-QA-306-V-13-MT-302-455
 Mistras Magnetic Particle Testing Inspection Report 132175-QA-306-V-13-MT-302-460
 SV3-CA20-S5-10001 "Auxiliary Building Areas 5 & 6 Module CA20 Submodule CA20_10 Isometric Views," Rev. 0

SV3-CA20-S5-10002 "Auxiliary Building Areas 5 & 6 Module CA20 Submodule CA20_10 Break Down," Rev. 0

SV3-CA20-S5-10003 "Auxiliary Building Areas 5 & 6 Module CA20 Submodule CA20_10 Structural Outline Horizontal Sections/Views," Rev. 0

SV3-CA20-S5-10004 "Auxiliary Building Areas 5 & 6 Module CA20 Submodule CA20_10 Structural Outline Vertical Sections/Views (Sheet 1)," Rev. 0

SV3-CA20-S5-10005 "Auxiliary Building Areas 5 & 6 Module CA20 Submodule CA20_10 Structural Outline Specific Details (Sheet 1)," Rev. 0

SV3-CA20-S5-10006 "Auxiliary Building Areas 5 & 6 Module CA20 Submodule CA20_10 Structural Outline Specific Details (Sheet 2)," Rev. 0

SV3-CA20-S5-10007 "Auxiliary Building Areas 5 & 6 Module CA20 Submodule CA20_10 Structural Outline Vertical Sections/Views (Sheet 2)," Rev. 0

SV3-CA20-S5-11001 "Auxiliary Building Areas 5 & 6 Module CA20 Submodule CA20_11 Isometric Views," Rev. 0

SV3-CA20-S5-11002 "Auxiliary Building Areas 5 & 6 Module CA20 Submodule CA20_11 Break Down," Rev. 0

SV3-CA20-S5-11003 "Auxiliary Building Areas 5 & 6 Module CA20 Submodule CA20_11 Structural Outline Horizontal Sections/Views," Rev. 0

SV3-CA20-S5-11004 "Auxiliary Building Areas 5 & 6 Module CA20 Submodule CA20_11 Structural Outline Vertical Sections/Views," Rev. 0

SV3-CA20-S5-11005 "Auxiliary Building Areas 5 & 6 Module CA20 Submodule CA20_11 Structural Outline Specific Details," Rev. 0

SV3-CA20-S5-12001 "Auxiliary Building Areas 5 & 6 Module CA20 Submodule CA20_12 Isometric Views," Rev. 0

SV3-CA20-S5-12002 "Auxiliary Building Areas 5 & 6 Module CA20 Submodule CA20_12 Break Down," Rev. 0

SV3-CA20-S5-12003 "Auxiliary Building Areas 5 & 6 Module CA20 Submodule CA20_12 Structural Outline Horizontal Sections/Views," Rev. 0

SV3-CA20-S5-12004 "Auxiliary Building Areas 5 & 6 Module CA20 Submodule CA20_12 Structural Outline Vertical Sections/Views (Sheet 1)," Rev. 0

SV3-CA20-S5-12005 "Auxiliary Building Areas 5 & 6 Module CA20 Submodule CA20_12 Structural Outline Specific Details (Sheet 1)," Rev. 0

SV3-CA20-S5-12006 "Auxiliary Building Areas 5 & 6 Module CA20 Submodule CA20_12 Structural Outline Specific Details (Sheet 2)," Rev. 0

SV3-CA20-S5-12007 "Auxiliary Building Areas 5 & 6 Module CA20 Submodule CA20_12 Structural Outline Vertical Sections/Views (Sheet 2)," Rev. 0

SV3-CA20-S5-14001 "Auxiliary Building Areas 5 & 6 Module CA20 Submodule CA20_14 Isometric Views," Rev. 0

SV3-CA20-S5-14002 "Auxiliary Building Areas 5 & 6 Module CA20 Submodule CA20_14 Break Down," Rev. 0

SV3-CA20-S5-14003 "Auxiliary Building Areas 5 & 6 Module CA20 Submodule CA20_14 Structural Outline Horizontal Sections/Views," Rev. 0

SV3-CA20-S5-14004 "Auxiliary Building Areas 5 & 6 Module CA20 Submodule CA20_14 Structural Outline Vertical Sections/Views (Sheet 1)," Rev. 0

SV3-CA20-S5-14005 "Auxiliary Building Areas 5 & 6 Module CA20 Submodule CA20_14 Structural Outline Specific Details (Sheet 1)," Rev. 0

SV3-CA20-S5-14006 "Auxiliary Building Areas 5 & 6 Module CA20 Submodule CA20_14 Structural Outline Specific Details (Sheet 2)," Rev. 0

SV3-CA20-S5-14007 "Auxiliary Building Areas 5 & 6 Module CA20 Submodule CA20_14 Structural Outline Vertical Sections/Views (Sheet 2)," Rev. 0

SV3-CA20-S5-16001 "Auxiliary Building Areas 5 & 6 Module CA20 Submodule CA20_16 Isometric Views," Rev. 0

SV3-CA20-S5-16002 "Auxiliary Building Areas 5 & 6 Module CA20 Submodule CA20_16 Break Down," Rev. 0

SV3-CA20-S5-16003 "Auxiliary Building Areas 5 & 6 Module CA20 Submodule CA20_16 Structural Outline Horizontal Sections/Views," Rev. 0

SV3-CA20-S5-16004 "Auxiliary Building Areas 5 & 6 Module CA20 Submodule CA20_16 Structural Outline Vertical Sections/Views," Rev. 0

SV3-CA20-S5-16005 "Auxiliary Building Areas 5 & 6 Module CA20 Submodule CA20_16 Structural Outline Specific Details," Rev. 0

SV3-CA20-S5-17001 "Auxiliary Building Areas 5 & 6 Module CA20 Submodule CA20_17 Isometric Views," Rev. 0

SV3-CA20-S5-17002 "Auxiliary Building Areas 5 & 6 Module CA20 Submodule CA20_17 Break Down," Rev. 0

SV3-CA20-S5-17003 "Auxiliary Building Areas 5 & 6 Module CA20 Submodule CA20_17 Structural Outline Horizontal Sections/Views," Rev. 0

SV3-CA20-S5-17004 "Auxiliary Building Areas 5 & 6 Module CA20 Submodule CA20_17 Structural Outline Vertical Sections/Views (Sheet 1)," Rev. 0

SV3-CA20-S5-17005 "Auxiliary Building Areas 5 & 6 Module CA20 Submodule CA20_17 Structural Outline Specific Details (Sheet 1)," Rev. 0

SV3-CA20-S5-17006 "Auxiliary Building Areas 5 & 6 Module CA20 Submodule CA20_17 Structural Outline Specific Details (Sheet 2)," Rev. 0

SV3-CA20-S5-17007 "Auxiliary Building Areas 5 & 6 Module CA20 Submodule CA20_17 Structural Outline Vertical Sections/Views (Sheet 2)," Rev. 0

E&DCR APP-CA20-GEF-210, "CA20 Alterations for Ease of Fabrication to Sub-Module 14," Rev. 0

APP-VW20-Z0-023, "Welding Specification for ASTM A240 UNS S32101 Duplex Stainless Steel Plate," Rev. 3

Shaw Modular Solutions APP-CA20-S5-16-200-1600 - Red-line drawings

Section 1A05.1:

APP-1100-ITH-003, "Standard Plant ITAAC 3.3 00.02f Performance and Documentation Plan," Rev. 2;

APP-KQ11-GEF-022, "Clarification of Measuring Points for Bottom of Reactor Containment Sump (KQ11)," Rev. 0;

SV3-KQ11-KQK-ME2245, "KQ11 Containment Sump (MT-02) As Build & ITAAC's 2.3.10.01, 3.3.00.02F & 3.3.00.09," Rev. 1;

Section 1A06.1:

APP-1100-ITH-012, "Standard Plant ITAAC 3.3 00.09 Performance and Documentation Plan," Rev. 0;
 APP-KQ11-GEF-022, "Clarification of Measuring Points for Bottom of Reactor Containment Sump (KQ11)," Rev. 0;
 SV3-KQ11-KQK-ME2245, "KQ11 Containment Sump (MT-02) As Build & ITAAC's 2.3.10.01, 3.3.00.02F & 3.3.00.09," Rev. 1;

Section 1A07.1:

CB&I receiving inspection reports number U4-143;
 N-2 ASME Code Data Reports for H02 (Part number IN-4898 [National Board Number 2826]);
 APP-MV50-Z0-002, "AP1000 Containment Vessel Equipment Hatch," Rev. 3;
 SA-738 Grade B, "Specification for the Pressure Vessel Plates, Heat-Treated, Carbon-Manganese-Silicon Steel, for Moderate and Lower Temperature Service," 2001 Edition with 2002 addenda;
 SA-20, "Standard Specification for General Requirements for Steel Plates for Pressure Vessels," including Supplementary Requirements S1, S3, S5, and S6;
 APP-MV50-Z0-037, "AP1000 Containment Vessel: SA-738 Grade B Plates," Rev. 4;
 MS-SA-738B-2889, "Material Specification for SA 738 Grade B Steel Plate AP1000 Nuclear Containment Vessel," Rev. 4;
 Certified Material Test Reports: 6151-1, 6151-2, 6151-3, 6151-6, 6151-5; and 6151-5

Section 1A07.2

Receiving inspection reports (RIR) number U4-090 for the Vogtle Unit 4 lower personnel airlock insert plate (H03);
 APP-MV50-Z0-002, "AP1000 Containment Vessel Equipment Hatch," Rev. 3;
 SA-738 Grade B, "Specification for the Pressure Vessel Plates, Heat-Treated, Carbon-Manganese-Silicon Steel, for Moderate and Lower Temperature Service," 2001 Edition with 2002 addenda;
 SA-20, "Standard Specification for General Requirements for Steel Plates for Pressure Vessels," including Supplementary Requirements S1, S3, S5, and S6;
 APP-MV50-Z0-037, "AP1000 Containment Vessel: SA-738 Grade B Plates," Rev. 4;
 MS-SA-738B-2889, "Material Specification for SA 738 Grade B Steel Plate AP1000 Nuclear Containment Vessel," Rev. 4;
 CMTR Insert Plate: Heat 6-1723 / CY044A, CMTR number 6307-1; and
 CMTR Penetration Sleeve: Heat 6-1723 / CY064A, CMTR number 6306-1.

Section 1A08.1:

CB&I welding procedure specification E91TG-H4 Rev. 7;
 APP-MV50-Z0-001, "Containment Vessel Design Specification," Rev. 8

Section 1A08.2

CB&I procedure CMS-15-PR-45163, "Liquid Penetrant Examination Color Contrast, Water Washable, ASME Section III, Division 1 - Subsection NE," Rev. 1;
 CB&I's PT report number U4-027;
 Qualification and certification records for: penetrant (batch numbers 12-F47 and 114-G47), cleaner (batch number 03-J4), developer (batch number 19-F6), Fluke 62 Mini Infrared thermometer (serial number 18560013), visible light meter (serial number 10070200040), and garden sprayer relief valve (serial number GSRV-03);
 Personnel qualification and certification records for employee ID 2837218 (for liquid penetrant testing)

Section 1A08.3:

CB&I procedure number 165766-830-15-PR-000001, "Post Weld Heat Treat Procedure Shell Course S1 Vertical Seams, Rev. 6;
 Traveler Set U4-S1-A11/A12-HT, "PWHT for S1 Vertical Seam";
 Traveler Set U4-S1-A7/A6-HT, "PWHT for S1 Vertical Seam";
 Traveler Set U4-S1-A8/A9-HT, "PWHT for S1 Vertical Seam";
 Thermal History Sheet for Weld B4-A11 to B4-A12, Report Number SK113-7;
 Thermal History Sheet for Weld B4-A6 to B4-A7, Report Number SK113-1;
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 PWHT Chart CH113-7;
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 RT Report U4-067, Weld: B4-A7 to B4-A6;
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 RT Report U4-065, Weld: B4-A11 to B4-A12;
 RT Film for Weld B4-A7 to B4-A6: Film intervals 0-1, 2-3, 3-4, 4-5, 5-6, 8-9, 9-10, 12-13;
 CB&I RT procedure CMS-830-15-PR-45154, "Radiographic Examination ASME Section III, Division 1 – Subsection NE," Rev. 1;

Section 1A09.1:Drawings

SV4-1000-CR-001 Rev. 02, Nuclear Island Basemat Bottom Reinforcement
 SV4-1010-CR-003 Rev. 03, Nuclear Island Basemat Dowel Plan at El 66'-6" Shield Building South-West Quadrant
 APP-1010-CR-004 Rev. 02, Nuclear Island Basemat Dowel Plan at El 66'-6" Shield Building North-West Quadrant
 APP-1010-CR-007 Rev. 02, Nuclear Island Basemat Dowel Plan at El 66'-6" Auxiliary Building Area 3
 SV4-1010-CR-011 Rev. 03, Nuclear Island Basemat Sections & Details
 APP-1010-CR-012 Rev. 00, Auxiliary Building Skin Reinforcement Splices

SV4-1210-CR-901 Rev. 03, Auxiliary Building Basemat Reinforcement Sections NS and Details
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SV4-1000-CR-901 Rev. 04, Nuclear Island Basemat Reinforcement Sections

APP-1210-CR-902 Rev. 04, Auxiliary Building Reinforcement Sections EW and Details EI 66'-6"

SV4-1210-CR-903 Rev. 04, Auxiliary Building Reinforcement Details Pit and Sump Area EI 66'-6"

SV4-1000-CR-904 Rev. 04, Nuclear Island Reinforcement Section Details

SV4-1210-CR-907 Rev. 03, Auxiliary Building Reinforcement Details Pit and Sump Area EI 66'-6"

SV4-1210-CR-908 Rev. 01, Auxiliary Building Reinforcement Sections & Details Pits and Sump
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SV4-CR01-GNR-000012 Rev. 0, Layer 1 & 2 #14 Spacing and Density Unit #4 NI

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SV4-CR01-GEF-000016 Rev. 0, Dimensions for Detail 16 on Unit 4

SV4-CR01-GEF-000010 Rev. 0, NI Basemat Layers 1 & 2 Cadwelds

SV4-CR01-GEF-000012 Rev. 0, U4 NI Layers 1, 2, 4, 5 Couplers

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SV4-1010-CR-011 Rev. 03, Nuclear Island Basemat Sections & Details

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SV4-1210-CR-901 Rev. 03, Auxiliary Building Basemat Reinforcement Sections NS and Details
EI 66'-6"

SV4-1000-CR-901 Rev. 04, Nuclear Island Basemat Reinforcement Sections

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SV4-1000-CR-904 Rev. 04, Nuclear Island Reinforcement Section Details

SV4-1210-CR-907 Rev. 03, Auxiliary Building Reinforcement Details Pit and Sump Area EI 66'-6"

SV4-1210-CR-908 Rev. 01, Auxiliary Building Reinforcement Sections & Details Pits and Sump
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SV4-CR01-GEF-000016 Rev. 0, Dimensions for Detail 16 on Unit 4

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SV4-CR01-GEF-000012 Rev. 0, U4 NI Layers 1, 2, 4, 5 Couplers

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APP-1010-CR-004 Rev. 02, Nuclear Island Basemat Dowel Plan at El 66'-6" Shield Building
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APP-1010-CR-007 Rev. 02, Nuclear Island Basemat Dowel Plan at El 66'-6" Auxiliary Building
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SV4-1010-CR-011 Rev. 03, Nuclear Island Basemat Sections & Details

APP-1010-CR-012 Rev. 00, Auxiliary Building Skin Reinforcement Splices

SV4-1210-CR-901 Rev. 03, Auxiliary Building Basemat Reinforcement Sections NS and Details
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SV4-1000-CR-904 Rev. 04, Nuclear Island Reinforcement Section Details

SV4-1210-CR-907 Rev. 03, Auxiliary Building Reinforcement Details Pit and Sump Area El 66'-
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SV0-CR01-GEF-000047, "Anchors bolts & holes MUD MAT," Rev. 0
 SV3-CR01-GEF-000085, "Rebar Clearance to Embedded Items," Rev. 0
 SV0-CC01-GEF-000165, "Modify 18" Lift requirement," Rev. 0

Section 1P01.2:

Engineering and design coordination reports APP-1000-GEF-058, "Nuclear Island Basemat -
 Optional Construction Joint Between CA20 Module and Containment Vessel," Rev. 0;
 APP-1200-CCC-103, "Auxiliary Building Wall 4 Reinforcement Design," Rev. 3;
 APP-GW-GAP-420, "Engineering and Design Coordination Report," Rev. 7;

Section 1P02.1:

Work package number SV4-1000-CRW-CV1265, "Unit 4 Nuclear Island Installation of
 Reinforcing Steel for the Basemat," Rev. 4
 SV0-CR01-Z0-002, "Placing Concrete and Reinforcing Steel," Rev. 4;
 SV4-1000-CR-001, "Nuclear Island Basemat Bottom Reinforcement," Rev. 2
 Construction Site Instruction (CSI) 3-42-3, "Reinforcing Steel Installation," Rev. 3
 CSI 3-44-7, "Mechanical Splicing of Reinforcing Steel," Rev. 7

Section 1P03.1:

F-Q445-011, "Receipt Inspection – Non ASME," Rev. 2
 QAD 7.14, "Receiving Inspection," Rev. 1
 QS, 7.1, "Receiving Process," Rev. G.1
 SV3-CC01-Z0-031, "Safety Related Placing Concrete and Reinforcing Steel," Rev. 1; and
 SV3-SS01-Z0-003, "Design Specification for Embedded and Miscellaneous Steel," Rev. 2.
 ASME NQA-1-1994
 Q445-12-1431, "Embeds," Rev. 0
 Q445-12-1374, "Steel Embedments," Rev. 0
 Q445-12-1393, "Steel Embedments," Rev. 0

Section 1P03.2:

NDQA-2013-S037, SNC Surveillance Report for the Integrated Head Package at Premier
 Technologies, Inc.

Section 1P03.3:

NDQA-2013-S021, "The assembly to Tapered Threaded Headed Bar Assembly for CVBH rebar
 mat at elevation 71'-6"," Rev. 0

NDQA-2013-S022, "The assembly to Tapered Threaded Headed Bar Assembly for CVBH rebar mat at elevation 71'-6"," Rev. 0

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C112-002-13-0131
 C112-002-13-0115
 C112-002-13-0116
 C112-002-13-0150
 C113-13-0012

Section 1P05.1:

Calibration records for: Fluke 62 Mini Infrared thermometer (serial number 18560013), visible light meter (serial number 10070200040), and garden sprayer relief valve (serial number GSRV-03);

Section 1P06.1:

Technical evaluation 620326, "Level B Storage Grout Monitoring 122 Building," dated 7/15/13
 SV3-CR01-Z0-011, "Furnishing of Safety-Related Reinforcing Steel," Rev. 2
 SV3-SS01-Z0-003, "Design Specification for Embedded and Miscellaneous Steel," Rev. 2.

Section 1P06.2:

SWSQAP 1-74A, "CB&I Standard Nuclear Quality Assurance Program," Rev. B
 CB&I Quality Standard 13.11, "Material/Equipment Storage," Rev. C

Section 1P07.1:

CB&I procedure QS 15.1, "Nonconformance & Disposition Report," Rev. 2;
 WEC procedure WEC 15.4, "Field Deviation Report," Rev. 0 and Rev. 1;
 FDR SV3-MV01-GNR-037, "Un-Calibrated Pressure Gauge on Nitrogen Purge System of Reactor Pressure Vessel Closure Head," Rev. 0
 FDR SV3-MV01-GNR-036, "Vogtle Unit 3 RV, Spent Desiccant," Rev. 0
 SV3-MV50-GNR-046, "Vogtle Unit 3 - Deviation Notice for the Containment Vessel Bottom Head Center Location Out of Tolerance," Rev. 0
 V-ND-12-0237, "Pipe Spools were noted having rust, gouge, dings and/or identification issues";
 SV3-CC01-GNR-000067, "Exceeded Lift Height for U3 Aux. Building Wall Placement #1," Rev. 0;
 SV3-CC01-GNR-000069, "Exceeded Lift Height for 7th Lift - Wall Placement 1; U3 Aux. Building," Rev. 0;
 SV3-CC01-GNR-000046, "Five Star Products Quality Assurance Audit Finding," Rev. 0;
 SV3-CC01-GNR-000049, "NI Pedestal Concrete Elevations," Rev. 0

Section 1P08.1:

CB&I CAR 2013-1298,
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 SNC CR 659406;
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 SNC CR 681254;
 SNC CR 688614;
 SNC CR 691875;
 SNC CR 699522;
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WEC IR-12-206-M051 "ICAP - NRC issue to Southern on CA20-04 Conduit Spacing"
 WEC IR-12-233-M020 "CA20 module studs design drawing differs from FSAR"
 WEC IR-12-267-M006 "CA20-07A and CA20-08A stud clearance minimum violate concrete cover for requirement in ACI 349"
 WEC IR-12-297-M007 "Composite Wall Module minimum stud spacing issue identified by NRC during an Inspection at SMS"
 WEC IR-12-297-M010 "Composite Wall Module minimum stud spacing issue identified by NRC during an Inspection at SMS"
 SNC CAR 196714 "NRC IOC 12-63: Notice of Violation, Appx B Criterion III"

Section 4OA5.3 (a)Task Reports

IVV_Task_Report_Concept_Review_APP-ISIP-JQR-007_Rev4, IV&V Task Report for Protection and Monitoring System Requirements Review and Concept Documentation Evaluation
 IVV_Task_RSED_RTA_WNA-DS-02506-GEN, IV&V Task Report for Requirements Traceability Analysis of WNA-DS-02506-Gen, Rev.1
 IVV_Task_RSED_RTA_WNA-DS-02346-GEN, IV&V Task Report for Requirements Traceability Analysis of WNA-DS-02346, Rev. 1
 RTA-PMS-J1-001a, IVV_Task_RTA_APP-PMS-J0R-001_Rev2_Concept, V&V of Traceability Matrix
 RTA-PMS-J1-001b, IVV_Task_RTA_APP-PMS-J0R-001_Rev2_Concept, V&V of Traceability Matrix
 RTA-PMS-J4-005a, IVV_Task_RTA_APP-PMS-J0R-001_Rev2_Concept, V&V of Traceability Matrix
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RTA-PMS-J4-105a, IVV_Task_RTA_APP-PMS-J0R-001_Rev2_Concept, V&V of Traceability Matrix

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RTA-SFG-Tracing_b, IVV_Task_RTA_APP-PMS-J0R-001_Rev2_Concept, V&V of Traceability Matrix

APP-PMS-GER-021, Rev 3, AP1000 Protection and Safety Monitoring System IV&V Phase Summary Report

Procedures

WNA-WI-00420-WAPP, Rev 0, AP1000 PMS System Requirements Review and Concept Documentation Evaluation Work Instructions

WNA-PV-00054-WAPP, Rev. 2, AP1000 Protection and Safety Monitoring System Software Verification and Validation Plan

Miscellaneous

APP-PMS-J4-003, Rev 5, AP1000 Protection and Safety Monitoring System Subsystem Requirements Specification

Section 4OA5.3 (b)

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IVV_Task_Report_Concept_Review_APP-ISIP-JQR-007_Rev4, IV&V Task Report for Protection and Monitoring System Requirements Review and Concept Documentation Evaluation

IVV_Task_RSED_RTA_WNA-DS-02506-GEN, IV&V Task Report for Requirements Traceability Analysis of WNA-DS-02506-Gen, Rev.1

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RTA-PMS-J1-001a, IVV_Task_RTA_APP-PMS-J0R-001_Rev2_Concept, V&V of Traceability Matrix

RTA-PMS-J1-001b, IVV_Task_RTA_APP-PMS-J0R-001_Rev2_Concept, V&V of Traceability Matrix

RTA-PMS-J4-005a, IVV_Task_RTA_APP-PMS-J0R-001_Rev2_Concept, V&V of Traceability Matrix

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RTA-SFG-Tracing_b, IVV_Task_RTA_APP-PMS-J0R-001_Rev2_Concept, V&V of Traceability Matrix

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WNA-PV-00054-WAPP, Rev. 2, AP1000 Protection and Safety Monitoring System Software Verification and Validation Plan

WNA-WI-00408-GEN, Rev. 0, "Common Q Software Hazard Analysis Report Work Instruction,"

NABU-DP-00014-GEN, Rev. 6 Design Process for Common Q™ Safety Systems

WCAP 16096-P-4, Software Program Manual for Common Q Systems

Miscellaneous

APP-PMS-J4-003, Rev 5, AP1000 Protection and Safety Monitoring System Subsystem Requirements Specification

APP-PMS-J4-020, Rev3, AP1000 System Design Specification for the Protection and Safety Monitoring System

GICP_STI_20130709_NA STG1_13-003, Test Team Training Matrices

LIST OF ACRONYMS

10 CFR	10 Code of Federal Regulations
ACI	American Concrete Institute
ADAMS	Agencywide Documents Access and Management System
AISC	American Institute of Steel Construction
AP1000	Advanced Passive Pressurized Water Reactors
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
AWS	American Welding Society
CA20	Auxiliary Building Module
CB&I	Chicago Bridge and Iron
CDR	Construction Deficiency Report
CMTR	Certified Material Test Reports
CVBH	Containment Vessel Bottom Head
DWA	Deformed Wire Anchor
E&DCR	Engineering and Design Coordination Report
FDR	Field Deviation Report
ICAP	Corrective Action Process
IEEE	Institute for Electronic and Electrical Engineers
IP	Inspection Procedure
IR (NRC)	Inspection Report
IR	Issue Report
ITAAC	Inspections, Tests, Analysis, and Acceptance Criteria
IV&V	Independent Verification and Validation
LAR	License Amendment Request
M&TE	Measuring and Test Equipment
MT	Magnetic Particle Testing
N&D	Nonconformance and Disposition
NCV	Non-cited Violation
NDE	Nondestructive Examination
NDQA	Nuclear Development Quality Assurance
NDQAA	Nuclear Development Quality Assurance Assessment
NDQAM	Nuclear Development Quality Assurance Manual
NOV	Notice of Violation
NRC	Nuclear Regulatory Commission
PQR	Procedure Qualification Records
PT	Liquid Penetrant Testing
PWHT	Post Weld Heat Treatment
QA	Quality Assurance
QAD	Quality Assurance Directive
QAP	Quality Assurance Program
QC	Quality Control
QS	Quality Standard
RG	Regulatory Guide
RIR	Receiving Inspection Reports
RSE	Reusable Software Elements
RSED	Reusable Software Elements Documentation
RT	Radiographic Testing
SAW	Submerged Arc Welding
SMAW	Shielded Metal Arc Welding

UFSAR	Updated Final Safety Analysis Report
UT	Ultrasonic Testing
WEC	Westinghouse Electric Company
WPS	Welding Procedure Specification
V&V	Verification and Validation
IV&V	Independent Verification and Validation