UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
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ATLANTA, GEORGIA 30303-1257

February 14, 2012

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

SUBJECT: SOUTHERN NUCLEAR OPERATING COMPANY VOGTLE ELECTRIC GENERATING PLANT UNITS 3 AND 4 - NRC INTEGRATED INSPECTION REPORTS 05200011/2011-004, 05200025/2011-006, 05200026/2011-004

Dear Mr. Miller:

On December 31, 2011, 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 with Mr. Mark Raukhorst, Vogtle 3 & 4 Construction Vice President, and other members of your staff on January 5, 2012.

The inspection examined a sample of construction activities conducted under your early site permit (ESP) and limited work authorization as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your ESP. The inspectors also examined a sample of pre-construction activities that could affect the quality of safety-related structures, systems, and components, and were associated with the proposed inspections, tests, analyses and acceptance criteria (ITAACs) submitted in your application for a combined license for two Westinghouse Advanced Passive (AP1000) pressurized water reactors designated as VEGP Units 3 and 4. Within these areas, the inspection consisted of the selected examination of procedures and representative records, observations of activities, and interviews with personnel.

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

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 you choose to provide one for cases where a response is not required, will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's document system (ADAMS), accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room). To the extent possible, your response should not include any personal privacy or proprietary, information so that it can be made available to the Public without redaction.

Sincerely,

/RA/

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

Docket Nos.: 5200011
5200025
5200026

Early Site Permit Number: ESP-004

Enclosure: NRC Inspection Report 05200011/2011-004; 05200025/2011-006; 05200026/2011-004 w/attachment: Supplemental Information

cc w/ encls: (See next page)

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Docket Nos.: 5200011
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DATE	2/13/2012	2/13/2012	2/13/2012	2/14/2012	2/14/2012		
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Letter to Buzz Miller from Michael Ernstes, dated February 14, 2012

SUBJECT: SOUTHERN NUCLEAR OPERATING COMPANY VOGTLE ELECTRIC GENERATING PLANT UNITS 3 AND 4 - NRC INTEGRATED INSPECTION REPORTS 05200011/2011-004, 05200025/2011-006, 05200026/2011-004

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U.S. NUCLEAR REGULATORY COMMISSION
Region II

Docket Numbers:	052000011; 05200025; 05200026
License Number.:	Early Site Permit (ESP) Number ESP-004
Report Numbers:	05200011/2011-004; 05200025/2011-006; 05200026/2011-004
Licensee:	Southern Nuclear Operating Company, Inc. (SNC)
Facility:	Vogtle Electric Generating Plant (VEGP) Units 3 and 4
Location:	Waynesboro, GA
Inspection Dates:	October 1 through December 31, 2011
Inspectors:	Justin D. Fuller, Senior Construction Resident Inspector, Region II Coleman B. Abbott, Construction Resident Inspector, Region II Alain Artayet, Senior Construction Inspector, Region II John Bartleman, Senior Construction Inspector, Region II Joseph Brady, Senior Construction Inspector, Region II Patrick Donnelly, Construction Project Inspector, Region II Elaine Heher, Construction Inspector, Region II Jonathan Kent, Construction Project Inspector, Region II Denise Terry-Ward, Construction Inspector, Region II
Accompanying Personnel:	Mike Brown, Reactor Operations Engineer, HQ/NRO Clint Smith, Construction Inspector (trainee), Region II
Approved by:	Michael Ernstes, Construction Projects Branch 4, Chief Division of Construction Projects

SUMMARY OF FINDINGS

Inspection Report (IR) 05200011/2011-004, IR 05200025/2011-006, IR 05200026/2011-004; October 1, 2011 through December 31, 2011; Vogtle Electric Generating Plant (VEGP) Units 3 and 4, routine integrated inspection report.

The report covered a three-month period of inspection by resident inspectors and two region-based inspection teams, and no findings of significance were identified.

The Nuclear Regulatory Commission's (NRC's) program for overseeing the construction of commercial nuclear power reactors is described in Inspection Manual Chapter (IMC) 2506, "Construction Reactor Oversight Process General Guidance and Basis Document."

A. NRC-Identified Findings and Licensee-Identified/Self-Revealing Violations Evaluated as Findings.

   No findings were identified.

B. Licensee-Identified and Self-Revealing Violations Not Evaluated as Findings

   None

REPORT DETAILS

A. ITAAC-RELATED INSPECTIONS

ITAAC related inspection report details are located in Section C in conjuction with the Waterproofing Membrane (WPM) NOV follow-up.

B. NON-ITAAC-RELATED INSPECTIONS

1. Inspection Procedure (IP) 35007, "Quality Assurance Program Implementation and Pre-Construction Activities"

   a. Inspection Scope

   The inspectors performed a direct inspection of a sample of construction related quality assurance program (QAP) activities, to determine whether SNC, and where appropriate their contractors, had developed adequate procedures to implement the applicable project quality requirements and effectively implemented those procedures during the performance of construction activities authorized by the VEGP ESP and Limited Work Authorization (LWA).

   (1) Inspection Scope (IP 35007 – Appendix 7, "Inspection of Criterion VII – Control of Purchased Material and Services")

   The inspectors reviewed a sample of routine surveillances and final supplier surveillance checklists by Shaw to determine whether the licensee adequately implemented Section 7.1, "Acceptance of Items or Service," of their Nuclear Development Quality Assurance Manual (NDQAM). Surveillances are performed to assess the quality of purchased items and services, whether purchased directly or through contractors. The inspectors reviewed the surveillance reports to determine whether (1) the report was an adequate record of an activity affecting quality, (2) the report was completed in accordance with the licensee's quality assurance program implementing Nuclear Development (ND) procedure ND-QA-006, "Supplier Quality Surveillance," and (3) any issues identified by the licensee were appropriately identified (documented) and corrected in accordance with the project quality requirements.

   The inspectors reviewed the list of approved surveillances scheduled for 2011 "Shaw, Vogtle 3 & 4 Audit & Surveillance Schedule – 2011, 3rd & 4th Quarter" along with the quality assurance approved surveillance log from Shaw "Shaw Nuclear, Surveillance Log, dated November 14, 2011".

   The inspectors reviewed the Surveillance Schedule to determine which surveillances were performed and to determine if the schedule of proposed audits were maintained and provided coverage of applicable aspects of quality-affecting activities. The inspectors reviewed a sample of surveillance reports and associated corrective action reports (CAR), which were extracted from the "Shaw, Vogtle 3 & 4 Audit & Surveillance Schedule – 2011, 3rd & 4th Quarter" to determine if reports complied with the requirements of quality assurance directive (QAD) 18.12, "QA Surveillances", Revision (Rev.) C and to determine if the required data from the surveillance reports was correctly

translated to the Shaw Nuclear, Surveillance Log as specified in directive QAD 18.12, "QA Surveillances," Rev. C.

The inspectors also inspected a sample of three Southern Nuclear Operating Company (SNC) surveillance qualification records to determine if qualification requirements complied with the requirements of procedure NMP-FO-103, Version 8, "Training and Qualification of Personnel".

(2) Inspection Scope (IP 35007 – Appendix 8, "Inspection of Criterion VIII–Identification and Control of Materials, Parts and Components")

The inspectors reviewed applicable sections of Shaw's Standard Nuclear Quality Assurance Program (SWSQAP 1-74A), Rev. B, and lower tier procedures to determine whether the appropriate implementing documents had been developed to address the quality requirements and commitments for the identification and control of safety related and risk significant items. Specifically, the inspectors reviewed portions of the following Shaw documents:

- SWSQAP 1-74A, Section 7 "Control of Purchased Material, Equipment, and Services," and Section 8, "Identification and Control of Material, Parts, and Components"
- Shaw's QAD 7.14, "Receiving Inspection"
- QAD 14.1, "Inspection Report System Type "A" Inspection Report," Rev. B
- Shaw Nuclear Quality Standard (QS) 7.1, "Receiving Process," Rev. G
- QS 8.13, "Suspect Items and Counterfeit or Fraudulent Material, Items or Components

The inspectors reviewed the above implementing documents to determine whether they provided guidance for the following:

- markings maintained on items are to be traceable
- where physical identification on the item is either impractical or insufficient, physical separation, procedural control, documentation, or other appropriate means may be used to ensure traceability of the item
- identification and traceability of the item includes status of inspection performed
- markings or other means of identification ensure that only specified and accepted items are used to prevent use of incorrect or defective items

The inspectors reviewed a sample of completed type "A" inspection reports related to safety-related nuclear island reinforcing steel to determine whether qualified personnel properly implemented Shaw's process for identification and control of items, and to determine whether items inspected by Shaw quality control (QC) were appropriately controlled adequately to ensure that nonconforming items were not inadvertently installed. Specifically the inspectors reviewed the following type "A" inspection reports:

- Q445-11-0149
- Q445-11-0154
- Q445-11-0157

During the review of the aforementioned type “A” inspection reports, the inspectors reviewed the reports to determine whether associated documentation and records were in agreement with the indicated item and were provided with initial receipt of items.

The inspectors toured the nuclear island rebar level D storage area with Shaw QC personnel, to determine whether:

- the traceability of the item was consistent and accurate with associated records and documentation
- physical markings were in accordance with established technical documents
- associated documentation and records were in agreement with the indicated item in the designated storage area
- attributes identified on inspection plan F-Q445-06 “Receipt Inspection – Reinforcing Steel,” were properly performed by Shaw QC inspectors
- QC inspectors used appropriate standards to perform inspection
- inspectors implemented established measures to detect and prevent the inadvertent use of counterfeit or fraudulent items

(3) Inspection Scope (IP 35007 – Appendix 10, “Inspection of Criterion X – Inspection”)

The inspectors reviewed Shaw quality control inspection work plan F-Q445-06, “Receipt Inspection – Reinforcing Steel” Rev. 0, Rev. 1 and Change 1 to determine whether the work plan was developed in accordance with the following quality documents: quality assurance directive QAD 14.1 “Inspection Report System Type “A” Inspection Report, Rev. B and QAD 10.68, “Inspection Planning”, Rev. 0. The inspectors reviewed a sample of Shaw inspection reports associated with structural reinforcing steel rebar and, steel embeds, which are QL-1 safety related items that required inspection by the Shaw quality control inspector. The inspectors reviewed these inspection reports to verify that inspections and associated documents were performed in accordance with inspection work plan F-Q445-06, Rev. 0, Rev. 1 or Change 1 as required and QAD 14.1 “Inspection Report System Type “A” Inspection Report, Rev. B. The inspectors also performed a field walk-down to verify that reinforcing steel and embeds sampled were located at the work site and had the physical markings such as attached inspection tags.

The inspectors evaluated one unsatisfactory reinforcing steel rebar section identified in inspection report Q455-11-0174 “Reinforcing Steel.” The inspectors examined the documentation for this unsatisfactory reinforcing steel rebar section to determine if a modification, repair or a replacement was performed subsequent to final inspection and if the appropriate re-inspection was performed or required. The inspectors along with the licensee performed a field walk down of the work area associated with inspection report Q455-11-0174 to physically locate the unsatisfactory reinforcing steel rebar section to determine if this unsatisfactory component was properly tagged in the field per the implementing procedures. The inspectors reviewed associated documentation and interviewed Shaw warehouse personnel to determine if repairs or a replacement was initiated.

The inspectors reviewed a sample of inspection reports to determine whether the inspections were performed by qualified individuals other than those who performed or directly supervised the work.

The inspectors selected eight out of twelve inspection reports for the receipt of quality level (QL) -1 safety related reinforcing steel rebar to inspect for qualification of Shaw quality control inspectors. The inspectors requested a complete list of the Certified Shaw quality control inspectors on staff. The inspectors reviewed and compared the licensee's "QC Inspector Certification List" printed on November 15, 2011 with the QC inspectors identified as performing the inspection for the receipt of reinforcing steel rebar.

The inspectors reviewed quality assurance directive QAD 2.15 "Qualifications and Certification of Inspection and Test Personnel", Rev. F which identifies certification documentation to include standard resume, current eye test certificate, documents attesting to completion of quality assurance training and verification of education as qualification requirements. The inspectors reviewed the required certification documentation for three of eight QC inspectors to determine if records are sufficient to reasonably support that quality assurance inspectors are trained and qualified.

(4) Inspection Scope (IP 35007 – Appendix 12, "Inspection of Criterion XII – Control of Measuring and Test Equipment")

The inspectors reviewed Shaw's tracking system for calibrated Measurement and Test Equipment (M&TE) used for safety-related construction activities to determine whether this system was adequate to assure that calibrated M&TE was controlled and maintained. The inspectors observed the use of the "M&TE Inventory & Identification Number Log" and the "M&TE History Card" in the field. The inspectors reviewed these documents for conformance to Shaw procedure MS 1.2, " Calibration Identification Labels, M&TE Identification Numbers, and Inventory," Rev. E; procedure MS 1.5, " Preparation of Calibration Checklists and M&TE History Cards, Rev. C; and procedure Quality Site Instruction (QSI) 12-1-0, "Control of Measuring and Test Equipment," Rev. 0.

The inspectors reviewed the calibration records, associated inventory logs, and M&TE history cards, which were utilized during storage, for the following M&TE inspection and testing of the installation of Unit 3 nuclear island waterproofing membrane materials:

- M&TE ID # 0125, Adhesion Tester
- M&TE ID # 0126, Adhesion Tester
- M&TE ID # 0088, Temperature / Humidity Monitor
- M&TE ID # 0089, Temperature / Humidity Monitor
- M&TE ID # 0090, Temperature / Humidity Monitor

For the above M&TE, the inspectors reviewed the calibration records to determine whether the M&TE:

- was identified by a unique number and traceable to the supporting calibration records
- was appropriately tagged and labeled to indicate current calibration status
- was appropriately stored
- was calibrated within the specified calibration interval and had the appropriate accuracy for its intended use

The inspectors noted that the above test equipment had recently been removed from service; therefore, the inspectors reviewed the M&TE records and associated Nonconformance and Disposition reports (N&Ds) to determine whether Shaw had appropriately controlled the M&TE in accordance with procedure QSI 12-1-0, "Control of Measuring and Test Equipment," Rev. 0. The inspectors also reviewed Shaw's documented evaluation of the validity of previously conducted inspections and tests with the nonconforming M&TE to determine whether the evaluation provided adequate justification to support the data obtained by these instruments. Specifically, the inspectors reviewed the following N&Ds which included Shaw's engineering justifications:

- V-ND-11-0285
- V-ND-11-0288

The inspectors also reviewed Shaw CAR 2011-0395, which was related to the out-of-calibration condition of the above M&TE to determine whether Shaw had taken appropriate corrective action to correct the nonconforming conditions.

(5) Inspection Scope (IP35007 – Appendix 15, "Inspection of Criterion XV – Nonconforming Materials, Parts, or Components")

The inspectors reviewed a sample of Stone & Webster (S&W) N&Ds to determine whether the condition had been adequately reviewed and accepted, rejected, repaired, or reworked in accordance with documented procedures. The inspectors compared these N&Ds to Section 15, "Nonconforming Materials, Parts, or Components," of the S&W Nuclear Quality Assurance Program (SWSQAP 1-74A) and S&W procedure QS 15.1, "Nonconformance & Disposition Report, Rev. G."

Specifically, the inspectors reviewed the following N&Ds:

- V-ND-11-0240
- V-ND-11-0311
- V-ND-11-0399

The inspectors reviewed Shaw's procedure for creating N&Ds along with 13 N&Ds pertaining to M&TE. The reports were reviewed to determine if they were generated in accordance with the appropriate procedure and contained technically adequate explanations for the resulting dispositions of the nonconforming items. There were no instances of nonconforming items that were required to be reported per Title 10 of the *Code of Federal Regulations* (10 CFR) 21.21(d)(1) or 10 CFR 50.55(e) in the sample taken.

(6) Inspection Scope (IP 35007 - Appendix 16, "Inspection of Criterion XVI – Corrective Action")

On a routine basis, the inspectors reviewed a sample of issues entered into the SNC and Shaw corrective action programs to determine whether conditions adverse to quality were controlled in accordance with each company's quality assurance program (QAP) and whether potential adverse trends were appropriately identified and corrected

by SNC or their contractors. Specifically, the inspectors: (1) attended weekly issue review committee meetings at the site; (2) reviewed a sample of SNC and Shaw corrective action documents; (3) observed a Vogtle Corrective Action Review Board meeting and (4) held discussions with SNC and Shaw personnel responsible for the screening and correction of the issues.

The inspectors selected a sample of issues entered in the corrective action programs to determine whether the handling of these issues was consistent with the applicable QAP requirements; and 10 CFR Part 50, Appendix B, "Quality Assurance Program Criteria for Nuclear Power Plants and Fuel Reprocessing Plants." Specifically, the inspectors reviewed Shaw CAR 2011-0395 in detail to determine whether:

- the condition adverse to quality was 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: (1) the cause was determined, (2) corrective actions were taken to prevent recurrence, and (3) the cause and corrective actions taken were documented and reported to appropriate levels of management
- conditions were appropriately screened
- the organization properly evaluated and reported the condition (e.g., 10 CFR 50.55(e), 10 CFR Part 21)

(7) Inspection Scope (IP 35007 - Appendix 18, "Inspection of Criterion XVIII – Audits")

The inspectors' randomly selected Shaw auditors from the certified Shaw auditors list (for auditors performing work on the reinforcing steel rebar activities) to determine if the auditors were trained and to determine if the auditor's training was maintained in accordance with scheduled activities. The inspectors also reviewed documentation to determine, that the auditors did not have direct responsibility in the areas that were audited, nor did they perform the work being audited.

The inspectors randomly selected two auditors from the certified Shaw auditors list and requested the qualification records per quality assurance directive QAD 2.13 "Qualification and Certification of Personnel Performing Quality Assurance Audits", Rev. 4. The inspectors reviewed "Shaw Nuclear Services, Inc. Record of Auditor Qualifications" dated April 9, 2010, and December 2, 2004, and "Nuclear Procurement Issues Committee (NUPIC) Lead Auditor Annual Training/Qualification Records" to determine whether compliance with directive QAD 2.13 and if training was maintained in accordance with the submitted scheduled activities identified under "Shaw, Vogtle 3 & 4 Audit & Surveillance Schedule – 2011, 3rd & 4th Quarter".

The inspectors reviewed two audits performed by SNC on the contractors working on site. The first audit was of Westinghouse Electric Company's (WEC) QAP implemented on the construction site. The second was of the Limited Work Authorization work being performed by both Shaw and WEC. The inspectors reviewed the audit checklists associated with the audit reports to insure the work performed was sufficient to ascertain the general status of the contractor's implemented QA activities for the requirements in associated procurement documents. The inspectors reviewed the Audit Finding Reports (AFR) and the mechanisms used by SNC and the contractors to track the resolution of

the AFR's. The inspectors interviewed WEC personnel responsible for tracking the closure of the Inspection Reports (IR) created to address the AFR's to verify that the follow-up activity fully addressed expressed concerns and that previously identified concerns were appropriately resolved.

b. Findings

No findings were identified.

2. IP 35007, "Quality Assurance Program Implementation and Pre-Construction Activities" (IMC 2502-07.02, "Pre-Construction Activity Inspections")

a. Inspection Scope

The inspectors performed an inspection of ongoing pre-construction activities that could affect the quality of the Units 3 and 4 containment vessel bottom heads (CVBH). The inspectors observed in-process activities, conducted interviews with responsible personnel, and reviewed construction records to determine whether the applicant, and its contractor WEC and subcontractor Chicago Bridge and Iron (CB&I) performed construction activities in accordance with the applicable requirements of 10 CFR Part 50, Appendix B.

Specifically, the inspectors evaluated whether CB&I performed safety-related welding activities associated with the Vogtle Units 3 and 4 CVBH in accordance with the Combined License Application (COLA) and the American Society of Mechanical Engineers (ASME), Boiler and Pressure Vessel Code, Section III, Division 1, 2001 Edition including the 2002 Addenda for Subsection NE, "Class MC Components."

The results of this inspection may be used to support future closure for the proposed ITAAC numbers shown below from the COLA for the Vogtle Units 3 and 4, as described in the AP1000 Design Control Document (DCD).

The inspectors used IP 35007, as informed by the procedures referenced below:

ITAAC 2.2.01.02a (Family 6F):

- IP-65001.F for design and fabrication using sections 02.03 for on-site fabrication activities and 02.04 for problem identification and resolution (PI&R).

ITAAC 2.2.01.03a (Family 6B):

- IP-65001.B for welding using sections 02.01 for program and procedures review, 02.02 for welding procedure qualification, 02.03 for welder qualification, 02.04 for production control, 02.05 for inspection, and 02.06 for records;

- IP-65001.6 for design and fabrication using sections 02.01 for general installation, 02.02 for component welding, and 02.05 for PI&R; and

- IP65001.11 for containment integrity using sections 02.01 for purchasing of materials, 02.02 for storage of materials, 02.05 for review of nondestructive examination (NDE) records, and 02.11 for PI&R.

ITAAC 2.2.01.04a.ii (Family 6F):

- IP-65001.F for Design and Fabrication using Sections 02.03 for On-Site Fabrication Activities and 02.04 for PI&R.

(1) IP 35007 – Appendix 1, "Inspection of Criterion I – Organization"

The inspectors reviewed the CB&I ASME Nuclear Quality Assurance Manual (NQAM) organizational chart and interviewed responsible management and QA personnel to determine whether QA had sufficient authority and organizational freedom for identification and resolution of quality problems with independence from production in accordance with regulatory requirements.

(2) IP 35007 – Appendix 2, "Inspection of Criterion II – QA Program"

The inspectors reviewed the CB&I ASME NQAM Rev. 10 to determine whether the NQAM was in accordance with 10 CFR Part 50, Appendix B and ASME Nuclear Quality Assurance (NQA) Standard NQA-1-1994, "Quality Assurance Requirements for Nuclear Facility Applications" for the CVBH fabrication and assembly.

The inspectors reviewed the CB&I training matrix for non-craft workers to determine whether supervisors and managers received training on the latest NQAM, contract procedures, and nuclear procedures in accordance with 10 CFR Part 50 Appendix B, Criterion II, "Quality Assurance Program."

The inspectors reviewed the CB&I written practice to determine whether the qualification and certification program for NDE personnel was in accordance with the requirements of ASME Section III, Subsection NE and SNT-TC-1A, "Personnel Qualification and Certification in Nondestructive Testing," 1992 edition. Specifically, the inspectors verified that the written practice contained provisions for education, training, experience, and examinations for personnel to perform visual testing (VT), radiographic testing (RT), liquid penetrant testing (PT), and magnetic particle testing (MT) methods.

This portion of the inspection may be used to support future closure of proposed ITAAC Number 2.2.01.03a from the COL for Units 3 & 4.

(3) IP 35007 – Appendix 3, "Inspection of Criterion III – Design Control"

The inspectors measured several Unit 3 BH-2 plates and reviewed Ishikawajima-Harima Heavy Industries (IHI) Industries Record of Dimension Measurements for Unit 3 BH-3 Part-No. C13-1 and C31-1 (includes eight perimeter and two central thickness readings for each plate) to determine whether the as-built thickness of the ellipsoidal head plate materials were in accordance the WEC Containment Vessel (CV) design specification.

The inspectors reviewed CB&I's purchase order (PO) for IHI Industries to determine if the CB&I referenced Material Specification MS-SA-738B-2888 for SA-738 Grade B Steel

Plate and Project Specification PS-604-5 for Fabricated Containment Vessel Parts (which provided the specification requirements for the plate material to be purchased and fabricated as containment vessel nuclear parts) was in accordance with the WEC CV design specification and ASME Section III, Subsection NE requirements. This portion of the inspection may be used to support future closure of proposed ITAAC Number 2.2.01.02a from COL for Units 3 & 4.

(4) IP 35007 – Appendix 4, "Inspection of Criterion IV – Procurement Document Control"

The inspectors reviewed the WEC and CB&I purchasing documents and contracts associated with the CVBH to determine whether the appropriate regulatory requirements were imposed on the fabricators in accordance with 10 CFR Part 50, Appendix B, Criterion IV, "Procurement Document Control"; NQA-1-1994, and 10 CFR 21.

The inspectors reviewed the SNC, WEC, and CB&I authorized suppliers list (ASL) to verify whether the companies involved with the fabrication of the CVBH were on the list. This included the SNC's contract with WEC; WEC's PO number 4500281180 dated August 14, 2008 with CB&I; and CB&I's PO number 49404 with IHI Industries. IHI purchased plates for the CVBH and performed some fabrication activities for CB&I under the IHI Corporation ASME Certificate of Authorization (N-1394) with expiration date of August 10, 2013, and performed ASME "NPT" code stamping on plates joined by welding.

The inspectors reviewed CB&I Procedure CMS-720-03-PR-03401, Preparation of Welding Material Procurement Specifications, to determine whether the contents of the procedure were in accordance with the requirement of the WEC CV design and material specifications, and ASME Section III, Subsection NE requirements.

(5) IP 35007 – Appendix 5, "Inspection of Criterion V – Instructions, Procedures, and Drawings"

The inspectors reviewed CB&I Drawing Number 13, Sheets 1 and 2 with Rev. 4 and 3, respectively, and titled "Field Edge Preps and Weld Details" to verify whether the butt joint weld groove configurations (e.g., root opening and groove angles) were in compliance with WEC CV design specification and ASME Section III, Subsection NE requirements to ensure complete penetration and fusion of welds.

The inspectors reviewed CB&I Drawing PTP, Sheet 1, titled "Production Test Plates" to determine whether the indicated impact testing temperatures and average and minimum absorbed energy acceptance criteria for Charpy V-notch testing specimens were in compliance with the WEC CV design specification and ASME Section III, Subsection NE requirements.

This portion of the inspection may be used to support future closure of proposed ITAAC Number 2.2.01.03a and 2.2.01.04a.ii from the COL for Units 3 & 4.

(6) IP 35007 – Appendix 6, "Inspection of Criterion VI – Document Control"

The inspectors reviewed selected CB&I drawings and procedures in the field office against the document distribution list to determine whether the latest revisions were

controlled and used by the craft supervision and welders/operators in accordance with 10 CFR 50 Appendix B, Criterion VI.

This portion of the inspection may be used to support future closure of proposed ITAAC Number 2.2.01.03a from the COL for Units 3 & 4.

(7) IP 35007 – Appendix 7, "Inspection of Criterion VII – Control of Purchased Material, Equipment, and Services"

The inspectors reviewed receipt inspection per 10 CFR Part 50, Appendix B, Criterion VII; NQA-1-1994; CB&I NQAM section 5.0; and CB&I Procedure CMS-720-03-PR-09051, Receipt, Inspection and Release of Site Welding Material, to determine whether materials (including CVBH fabricated plates) for Units 3 and 4 were treated as described in the CB&I procedure. In particular, the inspectors verified that plates with incomplete receipt inspection were tagged with hold tags and segregated from other acceptable material; and material that had a nonconformance identified during the receipt inspection had an additional nonconformance report (NCR) tag in accordance with CB&I Procedure CMS-720-03-PR-11001, Control of Nonconforming Items.

This portion of the inspection may be used to support future closure of proposed ITAAC Number 2.2.01.02a and 2.2.01.03a from the COL for Units 3 & 4.

(8) IP 35007 – Appendix 8, "Inspection of Criterion VIII – Identification and Control of Materials, Parts, and Components"

The inspectors reviewed identification and control for a sample of CVBH plate materials on weld map drawing number PCD3 (Sheet 6, Rev. 1) and physical markings on the upper-course BH3 and mid-course BH2 for the CVBH plates, and selected temporary attachments and column stub plate support C-53, and Nelson S3L headed shear connector studs of 3/4" diameter welded to the pressure boundary to determine whether material traceability to certified material test reports (CMTRs) and ID markings were in accordance with CB&I's NQAM, Procedure CMS-720-03-PR-07001, Assignment, Cutting and Marking of Materials, and Procedure CMS-720-03-PR-07101, Preparation and Use of the Traveler, and the ASME Section III, Subsection NE requirements.

The inspectors reviewed a CMTR RINJQ-225-3-1 from the Nippon Steel & Sumikin Welding Co. Ltd. for weld filler metal of heat number 8U7724 used by IHI Industries for joining plate-halves that were ASME "NPT" code stamped after welding assembly of the CVBH to verify the actual chemical composition and mechanical properties (including impact testing) were in accordance with the ASME Section II, Part C for weld filler material specification and ASME Section III, Subsection NE requirements.
The inspectors observed the storage of temporary attachments to verify landing angles and finger bars were uniquely marked for identification, and controlled in accordance with CB&I Procedure CMS-720-03-PR-07351, Control of Temporary Attachments, and ASME Section III, Subsection NE requirements.

The inspectors observed the welding material storage area to determine whether electrodes, cored and solid wire spools, Submerged Arc Welding (SAW) flux, and welding studs and ferrules were stored with legible identification labels in accordance with CB&I Procedure CMS-720-03-PR-09301, Care, Storage and Conditioning of Welding Materials, and the ASME Section III, Subsection NE requirements.

The inspectors reviewed JFE Steel Corporation CMTRs 5914-1 and 5915-1 for plate ID mark C-1, and CMTRs 5917-11 and 5911-8 for plate ID mark C-27 joined together by welding in the vertical position during assembly of the BH-3 course to determine whether the fully-killed plate chemical composition (using basic oxygen degassing) and mechanical properties (including impact testing) were in accordance with the WEC CV material specification and ASME Section III, Subsection NE requirements.

The inspectors reviewed Lincoln Electric CMTR 1462 of lot number 958E for flux-cored wire to determine whether the actual chemical composition and mechanical properties (including impact testing) were in accordance with the ASME Section II – Part C, SFA-5.29 weld material specification for American Welding Society (AWS) Classification E91TG-H4 and ASME Section III, Subsection NE requirements.

The inspectors reviewed JFE Steel Corporation CMTR 5948-1 for column stub plate support C-53 that was temporarily welded to the BH-3 course plate with ID mark C-27 to determine whether the chemical composition and mechanical properties (including impact testing) were in accordance with the ASME Section II – Part A material specifications and ASME Section III, Subsection NE requirements.

This portion of the inspection may be used to support future closure of proposed ITAAC Number 2.2.01.02a, 2.2.01.03a, and 2.2.01.04a.ii from the COL for Units 3 & 4.

(9) IP 35007 – Appendix 9, "Inspection of Criterion IX – Control of Special Processes"

The inspectors reviewed CB&I welding procedure specifications (WPS) and supporting procedure qualification records (PQR) to determine whether the SAW, Flux-Cored Arc Welding (FCAW), Shielded Metal Arc Welding (SMAW), and Stud Welding (SW) processes were qualified in accordance with CB&I Procedure CMS-720-03-PR-09351, Qualification of Welding Procedures, and the ASME Section IX Code requirements. The inspectors reviewed the following welding program attributes to determine whether manual, semi-automatic, and machine welding was acceptable:

- WPSs were qualified in accordance with the ASME Section III, Subsection NE requirements for impact testing;
- Welders/operators were aware that WPSs and other process supporting documents were available in the field office for review;
- Welding position qualified for the applicable WPS supplementary essential variables and welder/operator essential variables;
- Type and number of qualification test specimens required to qualify a WPS and welder/operator for a given thickness, diameter, or both were specified and conformed to the requirements; and
- WPSs in combination with the use of other documents adequately specified all the applicable essential, nonessential, and supplementary essential variables for each welding process.

The inspectors reviewed CB&I General Welding Procedure Specification for SAW, FCAW, SMAW, and stud welding processes that are listed in the Attachment to verify that these other WPS supporting documents adequately addressed nonessential variables such as base metal preparation, use of non-metallic retainers, gas nozzle size, tacking, cleaning, oscillation, spacing of multiple electrodes for machine welding, peening, and treatment of the backside of double-welded grooves in accordance with the WEC CV design specification and ASME Section III-NE and IX Code requirements.

The inspectors reviewed "CB&I Welder Qualification Log" (updated on October 8, 2011) and "Vogtle Unit 3 and 4 Qualified Welders List" (updated on October 21, 2011) to verify CB&I had established a program for ensuring that all personnel associated with the installation of safety-related systems were qualified to the applicable welding procedures and controlled in accordance with CB&I Procedures CMS-720-03-PR-09401, Qualification of Welders and Welding Operators, and CMS-720-03-PR-09701, Welder ID Requirements. The inspectors reviewed CB&I's Welding Operator Performance Qualifications (WPQ) of welder/operator unique identification numbers 878, 142, 725, and 689 to verify that welding activities were performed by qualified personnel in accordance with ASME Section IX, Article III. The following attributes were verified:

- Welding personnel demonstrated their skills by successfully performing specific performance qualification tests required by the code.

- Performance qualification tests were documented, and records were certified.

- Instructions required monitoring of welder/operator performance qualifications to control six months continuity and ensure the welders/operators used each process during that time period.

- Welders/operators who were qualified for a given process were required to requalify, if an essential variable for the process was changed beyond the limits specified on qualification records.

The inspectors observed BH-3 course joint fit-ups, tack welds, in-process FCAW between plates C-15 to C-28, and SAW on a BH-2 sectional assemblies for the Unit 3 CVBH, to determine whether the control of formed plates, attachment materials, welding consumables, weld joint cleanliness, fit-up and tack with approximately 3/16" root opening, 75% Argon + 25% CO_2 mixture shielding gas with flow rate of 60 cfh, welding arc protection from wind, in-process repair of SAW weld metal with FCAW, completion of inspection hold points, and final visual inspections were in accordance with applicable WEC specifications, CB&I procedures, and ASME Section III, Subsection NE requirements for metal containment.

The inspectors interviewed welding operators performing FCAW and SAW to determine whether they were provided with adequate direction on welding procedure limitations for heat input control (maximum amperage and voltage, and minimum travel speed) and minimum preheat and maximum interpass temperatures to make production welds in accordance with the applicable WPS. The digital meters of welding machines and wire feeders were observed to determine whether the voltage and wire feed speed were controlled in accordance with the applicable WPS, CB&I Procedure CMS-720-03-PR-09601, Monitoring Welding Parameters, CB&I Procedure CMS-720-03-PR-09651,

Preheat/Interpass Temperature Control, and the ASME Section III, Subsection NE requirements.

The inspectors observed welding operators and helpers to determine if they were adequately using calibrated infrared thermometers to verify that the minimum preheat of 200°F was achieved before the start of welding and monitored during welding along with the 500°F maximum interpass temperature in accordance with WPS No. E91TG-H4 for mechanized FCAW and the ASME Section III, Subsection NE requirements.

The inspectors observed in-process control of weld metal distortion to counteract overdishing transverse to the longitudinal axis of a BH-2 plate weld to determine whether the removal of previously deposited weld metal using preheat and mechanized air carbon arc gouging was in accordance with CB&I Procedure GS603-5-2, General Specification for Fabrication of Elliptical Steel Head Plates With and Without Nozzles, and ASME Section III, Subsection NE requirements.

This portion of the inspection may be used to support future closure of proposed ITAAC Number 2.2.01.02a, 2.2.01.03a, and 2.2.01.04a.ii from the COL for Units 3 & 4.

(10) IP 35007 – Appendix 10, "Inspection of Criterion X – Inspection"

The inspectors reviewed CB&I's NDE procedures CMS-830-15-PR-45158 for VT, CMS-830-15-PR-45160 for MT, and CMS-830-15-PR-45154 for RT to verify the contents of these NDE procedures were in accordance with the Code requirements of ASME Section V, Articles 9, 7 and 2, respectively.

The inspectors reviewed CB&I NDE personnel qualifications and current visual acuity for two Level III, three Level II, and one Level I certifications to determine whether these records were in accordance with the CB&I Written Practice for NDE Personnel Training Qualification and Certification Program (includes 1992 thru 2006 Edition of SNT-TC-1A), signed by the Principal NDE Level III and reviewed by the HSB-ANIS, and ASME Section III, Subsection NE requirements.

The inspectors reviewed weld travelers with completed QC hold points for material verification inspections, fit-up and tack inspections, final visual inspections, and traceability to CMTRs and welders/operators for the following pressure boundary welds to verify field welding inspection activities were performed in accordance with the CB&I NQAM, and ASME Section III, Subsection NE requirements:

- BH-3 course plates C-1 to C-27 full penetration butt joint using a double-V groove for machine FCAW;

- Temporary attachment weld of the column stub plate support C-53 to the BH-3 plate C-27 using drawing 165766 with a weld symbol and inscribed detail sketch of the partial penetration corner joint groove weld and 3/8" fillet weld reinforcement; and

- Automatic stud welding of 3/4" diameter Nelson studs with heat no. 10075840 to the BH3 course plate C-12 (fit-up and tack not applicable) with two acceptable stud welds on a test piece (prior to each shift) and bent 30° to verify proper settings and conditions prior to stud welding on the pressure boundary.

The inspectors observed the application of NDE-VT and MT activities in the field related to NCR No. U3-059 (subsequent to the removal of five welded studs from a BH-3 plate) to verify these NDE methods were accomplished in accordance with the respective CB&I Procedures CMS-830-15-PR-45158 for VT and CMS-830-15-PR-45160 for MT, and ASME Section V, Articles 9 and 7. The inspectors observed the use of a calibrated light meter to determine if the CB&I inspector measured the natural light intensity at the examination surface (located in the shade) in accordance with CB&I's procedures for VT and MT, and the ASME Section V Code requirements. The inspectors observed the use of a 40 lbs. test plate to determine if the CB&I inspector verified that the magnetizing lifting power of the DC yoke was in accordance the CB&I procedure for MT and the ASME Section V Code requirements.

The inspectors reviewed CB&I NDE-PT Report No. U3-010 and MT Report No. U3-007 for the temporary column stub plate support C-53 welded to the BH-3 plate C-27 to determine whether the NDE reports were signed and accepted by a Level II inspector in accordance with the respective CB&I Procedures CMS-830-15-PR-45162 for PT and CMS-830-15-PR-45160 for MT, and ASME Section V Articles 6 and 7 Code requirements and both NDE reports were signed by the HSB-ANI.

The inspectors reviewed CB&I NDE RT Report No. U3-002 and a sample of associated X-ray films for a BH-3 course full penetration weld between plates C-1 and C-27 to determine whether the quality of the film, final weld acceptance criteria, and the NDE report were compliant with CB&I Procedure CMS-830-15-PR-45154, Radiographic Examination ASME Section III, Subsection NE, and ASME Section V Article 2 Code requirements.

This portion of the inspection may be used to support future closure of proposed ITAAC Number 2.2.01.02a and 2.2.01.03a from the COL for Units 3 & 4.

(11) IP 35007 – Appendix 11, "Inspection of Criterion XI – Test Control"

The inspectors reviewed a sample of CMTRs for material toughness properties of plate and weld materials (including attachments) used for the CVBH to determine whether the Charpy V-notch impact testing temperatures and absorbed energy values were in accordance with the WEC CV design specification and ASME Section III, Subsection NE requirements.

This portion of the inspection may be used to support future closure of proposed ITAAC Number 2.2.01.04a.ii from the COL for Units 3 & 4.

(12) IP 35007 – Appendix 12, "Inspection of Criterion XII – Control of Measuring and Test Equipment"

Calibration records of equipment with identification numbers Z169313, 16600563, 16321856, 16460342, and LN25V-11 were selected in the field, and reviewed to determine whether the measuring instruments and equipment used for welding process monitoring were calibrated and maintained in accordance with CB&I Procedure CMS-830-15-WI-81001, Calibration Program Work Instruction.

This portion of the inspection may be used to support future closure of proposed ITAAC Number 2.2.01.03a from the COL for Units 3 & 4.

(13) IP 35007 – Appendix 13, "Inspection of Criterion XIII – Handling, Storage and Shipping"

The inspectors observed the storage of temporary welded attachments to determine whether landing angles and finger bars used for weld fit-up purposes were stored in labeled bins in accordance with CB&I Procedure CMS-720-03-PR-07351, Control of Temporary Attachments, and ASME Section III, Subsection NE requirements.

After the CB&I Storage Attendant unlocked the rod room, the inspectors observed the storage area of welding material to determine whether electrodes, cored and solid wire spools, SAW flux, and welding studs and ferrules were stored in a clean environment using a calibrated digital climate control instrument with a retrievable electronic data logger in accordance with CB&I Procedure CMS-720-03-PR-09301, Care, Storage and Conditioning of Welding Materials, and the ASME Section III, Subsection NE requirements.

This portion of the inspection may be used to support future closure of proposed ITAAC Number 2.2.01.02a and 2.2.01.03a from the COL for Units 3 & 4.

(14) IP 35007 – Appendix 15, "Inspection of Criterion XV – Nonconforming Materials, Parts, or Components"

The inspectors reviewed the CB&I NQAM-Section 11.0 and CB&I Procedure CMS-720-03-PR-11001, Control of Nonconforming Items, to determine whether the nonconformances program was in accordance with 10 CFR Part 50, Appendix B, Criterion XV. The inspectors reviewed the list of active NCR and selected several to evaluate for proper tagging and segregation in accordance with Section 4.3.2 of the procedure.

The inspectors observed activities in the field related to NCR No. U3-059 to determine whether the removal of five welded studs from the CVBH pressure boundary plate was accomplished in accordance with CB&I Procedure CMS-830-15-PR-18010, General Repair Procedure for Materials and Welds Class 2 and MC Products, and ASME Section III, Subsection NE requirements. The inspectors observed an additional dozen stud welds in the vicinity of the stud removal area to determine whether they were free of discontinuities and consistently had a 360° flash at the base of each stud in accordance with CB&I Procedure CMS-830-15-PR-45180, Visual Inspection Shear Stud Welds.

This portion of the inspection may be used to support future closure of proposed ITAAC Number 2.2.01.02a and 2.2.01.03a from the COL for Units 3 & 4.

(15) IP 35007 – Appendix 16, "Inspection of Criterion XVI – Corrective Action"

The inspectors reviewed CB&I Procedure CMS-720-03-PR-11051, Handling of Conditions Adverse to Quality and Corrective Actions; and CB&I's Root Cause Analysis 001, Rev. 3, Vogtle Containment Vessel Stop Work Order and the associated corrective actions described for compliance with 10 CFR Part 50 Appendix B, Criterion XVI. The inspectors reviewed applicant and contractor surveillance inspection reports to verify additional findings revealed by the reviews were corrected in accordance with the corrective action program. The inspectors also interviewed managers and workers and

observed CB&I field work practices to confirm that these corrective actions had been effective.

This portion of the inspection may be used to support future closure of proposed ITAAC Number 2.2.01.02a, 2.2.01.03a, and 2.2.01.04a.ii from the COL for Units 3 & 4.

(16) IP 35007 – Appendix 18, "Inspection of Criterion XVIII – Audits"

The inspectors reviewed the QA audits and surveillance activities associated with fabrication of the bottom heads to determine whether SNC was adequately implementing 10 CFR Part 50, Appendix B, Criterion XVIII and ASME NQA-1-1994. These inspection activities included SNC activities for the CVBH fabrication which are listed in the attachment. It included SNC's Welding Procedure Surveillance Report NDQA-2010-S21 dated December 13, 2010 for Welding Procedure Surveillance, and WEC's Quality Program Audit Report WES-2011-390 and surveillance activities of CB&I which are listed in the Attachment. It also included the CB&I audit activities performed on June 30, 2011 at the IHI Corporation (Audit number A-2011-3) facility. The inspectors reviewed the qualifications of the SNC inspectors and WEC inspectors to determine whether they were qualified to perform audits. The inspectors also reviewed NRC Inspection Report 99901395/2010201 which was a review of procurement and QA program implementation at IHI Industries, including activities associated with the CVBH of Vogtle Units 3 & 4.

b. Findings

No findings were identified.

C. OTHER INSPECTION RESULTS

1. VIO 05200025/2010002-01, "Failure to assure that purchased services conform to procurement documents"

The inspectors performed a review of the licensee's actions to correct the issues identified in VIO 05200025/2010002-01, "Failure to assure that purchased services conform to procurement documents" (ML110460304), to determine the following: (1) whether the causes of this violation were identified, (2) any generic implications were addressed, and (3) that the licensee's programs and practices were appropriately enhanced to prevent recurrence. The inspectors reviewed the licensee's actions associated with the commitments made by the licensee in their response to the Notice of Violation (NOV) dated March 15, 2011 (ML110760146), to determine whether these commitments were met by the licensee and sufficient to adequately correct the issues identified by the NOV. As documented in section B.2.a.15 of this report, the inspectors reviewed CB&I's Root Cause Analysis 001, Rev. 3, Vogtle Containment Vessel Stop Work Order and the associated corrective actions described for compliance with 10 CFR 50 Appendix B, Criterion XVI.

Conclusion

The inspectors determined that further review of this open violation is required before it can be closed.

2. VIO 05200025/2011009-01, "Failure to Assure That material Qualification Testing Associated With The Waterproof System Simulated Field Conditions"

The inspectors performed a review of the licensee's actions to correct the issues identified in VIO 05200025/2011009-01, "Failure to Assure That Material Qualification Testing Associated With The Waterproof System Simulated Field Conditions" (ML11259A159), to determine the following: (1) whether the causes of this violation were identified, (2) any generic implications were addressed, and (3) that the licensee's programs and practices were appropriately enhanced to prevent recurrence. The inspectors reviewed the licensee's actions associated with the commitments made in their response to the NOV dated October 12, 2011 (ML11290A219), to determine whether these commitments were met by the licensee and sufficient to adequately correct the issues identified by the NOV.

Work package review:
Prior to the coefficient of friction testing, the inspectors reviewed work package SV0-G100-XEW-CV0378, "Nuclear Island In-Situ Horizontal Waterproofing Membrane Testing," Rev. 3, to determine whether the planned supplemental testing was consistent with the approved engineering services scope of work (ESSOW) for Onsite Nuclear Island Waterproofing Membrane Testing No. 132175-E-C-00012 and installation specification SV0-AT01-Z0-800001, "Nuclear Island Waterproofing Membrane Installation," Rev. 2. Through documentation review, the inspectors evaluated whether the tier 1 test samples of the waterproof membrane on the top of the 1st layer of the mud mat in unit 4, were installed in accordance with the installation specification and ESSOW. Specifically, the inspectors evaluated whether the work steps specified in the work package, had appropriately included the quality control (QC) hold points which were established by QC inspection plan number F-S530-01, "Nuclear Island Membrane for Mud Mat," Rev. 3. The inspectors reviewed the work package to determine whether the hold points were signed by qualified personnel that were independent from those who performed the activity. The inspectors also reviewed a sample of installation release cards from the work package to determine whether work was documented consistently with applicable quality and technical requirements.

The inspectors sampled completed QC inspection reports to determine whether the inspection of waterproofing membrane application was performed in accordance with applicable procedures and was adequate to identify potential conditions adverse to quality.

Onsite Tier 1 Testing:
During the week of November 7-11, 2011, as well as on December 13, 2011, the inspectors directly observed National Technical Systems (NTS) and their subcontractor Simpson Gumpertz & Heger (SGH) perform coefficient of friction testing on 10 of 24 samples. Prior to performing safety related testing, the inspectors reviewed records to determine whether both NTS and SGH completed the appropriate indoctrination and training required by Shaw. Given that all activities performed by SGH were performed under the supervision of NTS and their Shaw approved QA program (Corporate Quality Policy Manual, Rev. 5, dated June 13, 2008), the inspectors reviewed records to determine whether SGH had reviewed the manual prior to performing safety-related testing. The inspectors also reviewed NTS calibration records for a sample of testing equipment, to determine whether equipment was appropriately calibrated prior to use.

The inspectors reviewed Test Procedure TP63642-12N "Acceptance Verification Program for On-site and Laboratory Testing of Integritank Waterproofing Membrane System," Rev. 3, and observed in-process testing to determine whether the testing was performed in accordance with TP63642-12N. The inspectors directly observed the testing to determine whether the testing was performed in accordance with Section 4.0 "On site Acceptance Verification Tier 1 Testing," Subsection 4.3, "Coefficient of Friction Testing," of the test procedure. The inspectors observed the test to determine whether the testing adequately simulated field conditions to demonstrate that a minimum 0.7 coefficient of friction was achieved by the mudmat waterproof membrane structural interface. The inspectors also evaluated whether the test layout was consistent with the proposed layout in the test procedure, in that, at a minimum, the proposed joint configurations detailed in the test procedure were tested in unit 4, and that the actual test layout was consistent with drawing SV0-G100-XEK-CV0456, "Membrane Test Panel Layout," Rev.1.

During the testing, the inspectors observed Shaw oversight and reviewed surveillance report number S-132175-2011-0093, which documented Shaw's QA oversight of tier 1 testing to determine whether Shaw's oversight of NTS and SGH was adequate.

Tier 2 membrane application:
On November 19, 2011, the inspectors directly observed the application of the waterproofing membrane material to the Tier 2 test samples, to determine whether membrane application work steps, were documented and performed in accordance with work package SV0-G100-XEW-CV0404, "Nuclear Island Waterproofing Membrane Tier 2 & 3 Testing," Rev. 0. The inspectors directly observed Shaw's waterproofing membrane contractor – Thomarios, prepare the test samples in accordance with installation specification SV0-AT01-Z0-800001, "Nuclear Island Waterproofing Membrane Installation," Rev. 2. During membrane application, the inspectors observed the Shaw QC inspector perform an inspection on the application of the waterproofing membrane, to determine whether the application was performed in accordance with the documents referenced above as well as Test Procedure TP63642-12N "Acceptance Verification Program for On-site and Laboratory Testing of Integritank Waterproofing Membrane System," Rev. 3; and drawing SV0-G100-XEK-CV0483, "Waterproofing Membrane Tier 2 Testing Layout," Rev. 3. The inspectors reviewed the following completed Shaw QC IRs, which documents the application of the waterproofing membrane activities to the tier 2 test samples, to determine whether the Shaw QC inspector performed their inspection in accordance with inspection plan F-S530-01 "Protective Coatings: Nuclear Island Membrane for Mud Mat," Rev. 3:

- S530-01-11-0062
- S530-01-11-0063

Onsite Tier 2 Testing:
During the week of December 12-16, 2011, the inspectors directly observed NTS and SGH perform coefficient of friction testing on 4 of 10 Tier 2 test samples. Prior to performing safety related testing, the inspectors reviewed NTS calibration records of a sample of testing equipment, to determine whether equipment was appropriately calibrated prior to use.

The inspectors reviewed Test Procedure TP63642-12N "Acceptance Verification Program for On-site and Laboratory Testing of Integritank Waterproofing Membrane

System," Rev. 3; and drawing SV0-G100-XEK-CV0483, "Waterproofing Membrane Tier 2 Testing Layout," Rev. 3, to determine whether testing was performed and documented in accordance with the established procedure and drawing. The inspectors also directly observed the testing, to determine whether the testing was performed in accordance with Section 5.0 "On site Acceptance Verification Tier 2 Testing," to demonstrate that a minimum 0.7 coefficient of friction was achieved by the mudmat waterproof membrane structural interface.

Conclusion:

In order to determine whether the commitments made by the licensee in their response to the NOV dated October 12, 2011 (ML11290A219) were met and sufficient to adequately correct the issues identified, the inspectors determined that further review of this open violation is required before it can be closed.

D. EXIT MEETING SUMMARY

On January 5, 2012, the NRC resident inspectors discussed the inspection results with Mr. Mark Raukhort, Vogtle 3 & 4 Construction Vice President, and other management representatives for SNC and the consortium. The inspectors stated that no proprietary information would be included in the inspection report.

KEY POINTS OF CONTACT

SNC and Contractor Personnel

D. Jones	SNC Site Vice President VEGP Units 3 & 4
S. Shaler	SNC COO
J.R. Johnson	SNC Quality and Compliance Vice President
H. Mahan	SNC Licensing Manager
J. Davis	SNC Licensing Supervisor
R. Pate	SNC Licensing Engineer
E. Mickinac	SNC Licensing
M. Dove	SNC Engineering Supervisor Procurement
M. Edmondson	SNC Vendor Oversight
T. O'Brien	SNC NDQA Supervisor
J. B. Lowery	SNC NDQA
B. Sullivan	SNC NDQA
M. Sawyers	SNC QC
W. Crisler	Consortium Project Quality Assurance Director
J. Beasley	Shaw QA Engineering Manager
W. Poppell	Shaw Field Engineering Manager
C. Davis	Shaw Project Security/Facilities Manager
D. Oliver	Shaw Project Field Procurement Manager
W. Robinson	Shaw Warehouse Procurement Manager
D. Johnson	Shaw Warehouse Procurement Supervisor
E. Medlin	Shaw M&TE QC
M. Bezanson	Shaw Quality Engineering
D. Shepherd	Shaw Engineering
J. Lackey	Shaw QC
A. Reynolds	Shaw Project Quality Control Manager
R. Crews	Shaw Quality Assurance Manager
T. Dent	WEC Management
J. Pierpoint	WEC Vogtle 3 & 4 Containment Vessel Lead
D. Lipscomb	WEC CV Installation
D. Walters	WEC Engineering
S. Bradley	WEC Licensing
M. Merwin	WEC QA Manager
T. DiGoria	WEC QA Supervisor
J. Goans	WEC QA Inspector
L. Presley	CB&I Vice President of Nuclear Operations
J. Baer	CB&I Project Manager
L. Rumsey	CB&I Superintendent
M. Cusick	CB&I Director Quality Assurance Nuclear
S. Hand	CB&I QA Manager
P. W. Terrell	CB&I Welding QA
J. Madden	CB&I SNT-TC-1A Level III
V. Burchette	CB&I Process Control Coordinator

J. Taylor	CB&I Storage Attendant
S. Black	CB&I Temporary Attachments Distributor
C. Jenkins	ANI, Hartford Steam Boiler Global Standards

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Item Number	Status	Description
VIO 05200025/2010002-01	Discussed	Failure to assure that purchased services conform to procurement documents
VIO 05200025/2011009-01	Discussed	Failure to Assure That material Qualification Testing Associated With The Waterproof System Simulated Field Conditions

LIST OF DOCUMENTS REVIEWED

Procedures

SNC:

Nuclear Development Quality Assurance Manual, Rev. 9.3

WEC:

APP-GW-GAH-010, Project Quality Assurance Program Interface Plan for Domestic AP1000 Projects

APP-GW-GAH-020, AP1000 Systems, Structures, and Components Quality Requirements

APP-GW-GAH-030, Quality Assurance Requirements for Safety Related Components/Services of Standard AP1000 Plants

SV0-AT01-Z0-800001, "Nuclear Island Waterproofing Membrane Installation," Rev. 2

SV0-G100-XEK-CV0456, "Membrane Test Panel Layout," Rev.1

SV0-G100-XEK-CV0483, "Waterproofing Membrane Tier 2 Testing Layout," Rev. 3

SV0-G100-XEW-CV0378, "Nuclear Island In-Situ Horizontal Waterproofing Membrane Testing," Rev. 3

SV0-G100-XEW-CV0404, "Nuclear Island Waterproofing Membrane Tier 2 & 3 Testing," Rev. 0

SVO-MV50-Z5-004, Appendix 3: Technical Requirements for the AP1000 Containment vessel Purchase Agreement for the Vogtle 3 & 4 Project

CB&I:

Nuclear Quality Assurance Manual (NQAM), Rev. 10

CMS-720-03-PR-03401, Preparation of Welding Material Procurement Specifications, Rev. 2

CMS-720-03-PR-07001, Assignment, Cutting and Marking of Materials, Rev. 2

CMS-720-03-PR-07101, Preparation and Use of the Traveler, Rev. 1

CMS-720-03-PR-07351, Control of Temporary Attachments, Rev. 3

CMS-720-03-PR-09051, Receipt, Inspection and Release of Site Welding Material

CMS-720-03-PR-09301, Care, Storage and Conditioning of Welding Materials, Rev. 5

CMS-720-02-PR-09351, Qualification of Welding Procedures, Rev. 4

CMS-720-03-PR-09401, Qualification of Welders and Welding Operators, Rev. 4

CMS-720-03-PR-09601, Monitoring Welding Parameters, Rev. 1

CMS-720-03-PR-09651, Preheat / Interpass Temperature Control, Rev. 3

CMS-720-03-PR-09701, Welder ID Requirements, Rev. 2

CMS-720-03-PR-11001, Control of Nonconforming Items

CMS-720-03-PR-11051, Handling of Conditions Adverse to Quality and Corrective Actions

CMS-830-15-PR-18010, General Repair Procedure for Materials and Welds Class 2 and MC Products, Rev. 2

CMS-830-15-PR-45154, Radiographic Examination ASME Section III, Subsection NE,

CMS-830-15-PR-45158, Visual Inspection – Welds ASME Section III, Division 1 – Subsection NE, Rev. 0

CMS-830-15-PR-45160, Magnetic Particle Examination, Color Contrast, Dry Yoke, ASME Section III, Division 1 – Subsection NE, Rev. 1

CMS-830-15-PR-45162, Liquid Penetrant Examination Color Contrast, Solvent Removable, ASME Section III, Division 1 – Subsection NE, Rev. 1

CMS-830-15-PR-45180, Visual Inspection Shear Stud Weld, Rev. 0

CMS-830-15-WI-81001, Calibration Program Work Instruction, Rev. 2

Written Practice to the 1980, 1992, 1996 including 1998 addenda, 2001, and 2006 edition of ASNT-TC-1A for NDE Personnel Training Qualification and Certification Program, Issue 5, Rev. 2

GS603-5-2, General Specification for Fabrication of Elliptical Steel Head Plates With and Without Nozzles,

Shaw:

MS 1.2, " Calibration Identification Labels, M&TE Identification Numbers, and Inventory," Rev. E

MS 1.5, " Preparation of Calibration Checklists and M&TE History Cards, Rev. C

NCSP 3-6-2 Personnel Qualification and Training, (February 3, 2010)

ND-QA-003 Quality Assurance Surveillances, R3.0

ND-QA-006 Supplier Quality Surveillance, R4.0

NEPP 4.58-1 Indoctrination, Continuing Education, and Certification Requirements, (November 3, 2011)

NMP-FO-103 Training and Qualification of Personnel, Version 8,

QAD 2.13 Qualifications and Certification of Personnel Performing Quality Assurance Audits, Rev. 4

QAD 2.14, Qualification and Certification of Nondestructive Examination Personnel, Rev. H

QAD 2.15 Qualifications and Certification of Inspection and Test Personnel, Rev. F

QAD 7.14, Receiving Inspection

QAD 10.68 Rev. A – Inspection Planning

QAD 14.1 Inspection Report System Type “A” Inspection Report, Rev. B

QAD 14.1, “Inspection Report System Type “A” Inspection Report,” Rev. B

QAD 18.2, Quality Audit Plans, Rev. H

QAD 18.12, QA Surveillances, Rev. C

QS 2.12, Qualification, Indoctrination and Continuing Education, Rev. J

QS 5.1 Quality Standard Procedural System, Rev. K

QS 7.1, Receiving Process, Rev. G

QS 8.13, Suspect Items and Counterfeit or Fraudulent Material, Items or Components

QS 10.67 Rev. 0 – Inspection Planning System

QS 14.2 Rev. J – Inspection Report System

QS 15.1, Rev G, April 11, 2011, “Nonconformance and Disposition Report”

QS 16.5 Corrective Action System, Rev. EW

QSI 10-1-0, Inspection Planning and Reporting

QSI 12-1-0, “Control of Measuring and Test Equipment,” Rev. 0

SWSQAP 1-74A, Rev. B

TP63642-12N “Acceptance Verification Program for On-site and Laboratory Testing of Integritank Waterproofing Membrane System,” Rev. 3

WPP 1.5 Development and Training of Procurement Personnel, Rev. 4

Specifications:

CB&I:

General Welding Specification for the Shielded Metal Arc Welding Processes, Specification Number 165766-000-15-SP-015001, Rev. 0, dated May 26, 2009

General Welding Specification for the Submerged Arc Welding Processes, Specification Number 165766-000-15-SP-015002, Rev. 0, dated May 26, 2009

General Welding Specification for the Flux Cored Arc Welding Processes, Specification Number 165766-000-15-SP-015003, Rev. 0, dated May 15, 2009

General Welding Specification for the Stud Welding Processes, Specification Number 165766-000-15-SP-015006, Rev. 3, dated July 7, 2010

Procedure Qualification Record No. 12674, dated November 10, 2009

Procedure Qualification Record No. 12676, dated November 18, 2009

Procedure Qualification Record No. 12690, dated December 17, 2009

Procedure Qualification Record No. 12707S, dated April 6, 2010

Procedure Qualification Record No. 12718F, dated February 9, 2010

Welding Procedure Specification ENi4 / OK 10.72, Rev. 3

Welding Procedure Specification E9018M H4 R, Rev. 2

Welding Procedure Specification E91TG-H4, Rev. 2

Welding Procedure Specification STUD - Machine, Rev. 2

Welding Procedure Specification STUD - Manual, Rev. 2

WEC:

APP-MV50-Z0-001, Containment Vessel Design Specification, Rev. 7

APP-MV50-Z0-037, AP1000 CV Material Specification: SA-738 Grade B Plates, Rev. 2

CB&I Welder and Welding Operator Qualifications:

CB&I Welder Qualification Log, updated October 8, 2011

Vogtle Unit 3 & 4 Qualified Welders List, updated October 12, 2011

Welding Operator Performance Qualification Record (WPQR) for Welder/Operator ID 878, 142, 725, and 689

Drawings:

CB&I Process Control Drawing PCD3, Unit 3 Bottom Head, Sheet 6, Rev. 1, (Weld Map)

CB&I Drawing Number 13, Field Edge Preps and Weld Details, Sheets 1-Rev. 4 and Sheet 2-Rev. 3

CB&I Drawing PTP, Sheet 1, titled “Production Test Plates”, Rev. 5

CB&I Drawing 165766, Sheet 1, Rev. 3 for temporary column stub plate support C-53

Calibration Records:

Calibration and Verification Check Record for Clamp Meter ID Z169313, updated June 22, 2011

Calibration and Verification Check Record for Fluke 62 Mini Infrared Thermometer ID 16600563, updated July 12, 2011

Calibration and Verification Check Record for Fluke 62 Mini Infrared Thermometer ID 16321856, updated October 4, 2011

Calibration and Verification Check Record for Fluke 62 Mini Infrared Thermometer ID 16460342, updated October 4, 2011

Calibration and Verification Check Record for Lincoln LN-25 Wire Feeder Voltmeter ID LN25V-11, updated August 11, 2011

Dynamic Technology Inc. Certificate of Calibration for Serial Number 16321856, Cal. Date October 4, 2011

Dynamic Technology Inc. Certificate of Calibration for Serial Number 16460342, Cal. Date October 4, 2011

Transcat Calibration Services Certificate of Calibration for Serial Number 16600563, Cal. Date July 12, 2011

Certified Material Test Reports (CMTRs):

JFE Steel Corporation CMTRs 5914-1 and 5915-1 for plate ID mark C-1

JFE Steel Corporation CMTRs 5917-11 and 5911-8 for plate ID mark C-27

JFE Steel Corporation CMTR 5948-1 for column stub plate support C-53

Lincoln Electric CMTR 1462 of lot number 958E for Lincoln Outershield 91K2-HSR of ASME Section II, Part C, SFA-5.29 and AWS Classification E91TG-H4 FCAW weld filler material

ESAB Welding and Cutting Products CMTR for Order No. 653283 Rev. 2 for ESAB OK 10.72 Flux in 55 lbs. bags, Lot No. ME02212, dated January 21, 2011

Nippon Steel & Sumikin Welding Co. Ltd. CMTR RINJQ-225-3-1 for weld filler metal with heat number 8U7724

Nelson Stud Welding CMTR of heat number 10075890 for 3/4" diameter S3L headed shear connector studs

CB&I NDE Reports:

PT Report No. U3-010

MT Report No. U3-007

RT Report No. U3-002

Audit and Surveillance Records:

SNC QA Surveillances: NDQA-2010-S21, ND-QA-2011-S13, ND-QA-2011-S18, ND-QA-2011-S12, and NQA-2010-S21/ December 13, 2010

WEC QA Surveillances: SV3-CBI-CV-002, 005, 008, 009, 013, 014, 015, 018, 019, 021, and 022; AP1000-VOG3-CBI-083, 084, 084A, 126, 129, 139, and 149; and AP1000-1063-CBI-084

WEC Supplier Quality Program Audit Report (WES-2011-390) at the CB&I facility on the SNC Vogtle Nuclear Plant Site. (July 18-22, 2011)

IHI Industries Job No. 5901003 Record of Dimension Measurements/CV Elliptical Heat Plate (BH3) for Vogtle Unit 3 Part Numbers C13-1 and C31-1 with inspection dates of January 11-12, 2010, respectively

CB&I Audit Report A-2011-3 of June 30, 2011 at the IHI Corporation facility.

SNC Audit Reports: SNC-ND-2011.04-WEC-SITE-QA, May 26, 2011; SNC-ND-2011.05-SITE-LWA, June 15, 2011

Shaw Surveillance Reports: S-132175-2011-0024, S-132175-2011-0035, S-132175-2011-0039, S-132175-2011-0043, S-132175-2011-0053, S-132175-2011-0055, S-132175-2011-0093

Corrective Action / Nonconformance Records:

Shaw Condition Reports: CAR 2011-0013,CAR 2011-0098,CAR 2011-0099,CAR 2011-0138,CAR 2011-0143,CAR 2011-0145,CAR 2011-0155,CAR 2011-0201,CAR 2011-0208,CAR 2011-0265,CAR 2011-0388,CAR 2011-0395,CAR 2011-0477,CAR 2011-0482,CAR 2011-0659,CR 2011100395,CR 2011100396

NCR U4-007, U4 plate deficiency

NCR U3-039, plates BH1 plates

NCR U3-040 R1, BH2 plates

NCR U3-059, Removal of anchor studs on plate C15

Shaw N&Ds: V-ND-11-0011,V-ND-11-0014,V-ND-11-0026,V-ND-11-0038,V-ND-11-0039,V-ND-11-0057,V-ND-11-0060,V-ND-11-0099,V-ND-11-0111,V-ND-11-0126,V-ND-11-0129,V-ND-11-0141,V-ND-11-0152,V-ND-11-0175,V-ND-11-0187,V-ND-11-0201,V-ND-11-0202,V-ND-11-0204,V-ND-11-0237 ,V-ND-11-0240,V-ND-11-0264,V-ND-11-0285,V-ND-11-0288, V-ND-11-0311, V-ND-11-0312,V-ND-11-0343,V-ND-11-0354, V-ND-11-0399

Corrective Action Documents generated from this inspection:

CB&I OB-VES-2011-155

CB&I OB-VES-2011-157/PN-VES-2011-040

SNC CR 365607, related to CB&I OB-VES-2011-155

SNC CR 365131, related to CB&I OB-VES-2011-157/PN-VES-2011-040

Inspection Plans/Reports

WEC Inspection Reports: IR 11-017-M018, IR 11-060-M003, IR 11-104-M020

Shaw Inspection Reports: Q445-11-0020,Q445-11-0028,Q445-11-0053,Q445-11-0149,Q445-11-0154,Q445-11-0157,Q445-11-0177,Q445-11-0178,Q445-11-0225,Q445-11-0237,Q445-11-0246,Q445-11-0252,Q445-11-0260,Q455-11-0155,Q455-11-0158,Q455-11-0169,Q455-11-0171,Q455-11-0174,Q455-11-0190,Q455-11-0198,Q455-11-0217,Q455-11-0221,Q455-11-0223,Q455-11-0225,Q455-11-0270,C173-11-0087,C173-11-0121,C173-11-0298,C173-11-0316,C173-11-0336,C173-11-0466,C173-11-0492,C173-11-0520,C173-11-0622,C173-11-0687,C173-11-0748,C131-11-0001,C131-11-0304,C131-11-0543,C131-11-0880,C131-11-0960

Material Safety Data Sheets

None

Work Plans

F-C173, Soil Testing – QC Monitoring

F-Q445-1 – Receipt Inspection CWS piping

F-Q445-06 Shaw Nuclear Services Quality Inspection Plan, “Receipt Inspection – Reinforcing Steel, Rev. 0

F-Q445-06 Shaw Nuclear Services Quality Inspection Plan, “Receipt Inspection – Reinforcing Steel, CHG. 1

F-Q445-06 Shaw Nuclear Services Quality Inspection Plan, “Receipt Inspection – Reinforcing Steel, Rev. 1

F-S530-01, “Nuclear Island Membrane for Mud Mat,” Rev. 3

Miscellaneous:

SNC Approved Supplier List

WEC Approved Supplier List

CB&I Approved Supplier List, Nuclear Products and Services, updated, October 6, 2011

CB&I Root Cause Analysis 001, Rev. 3

NUPIC Lead Auditor Annual Training/Qualification Records

NRC Inspection Report 99901395/2010201

Shaw Nuclear Services, Inc Record of Auditor Qualifications March 9, 2010 and December 2, 2004

Shaw Certificate of Qualification Records and Eye Exams

Shaw, Vogtle 3 & 4 Audit & Surveillance Schedule – 2011, 3rd & 4th Quarter

Shaw Nuclear, Surveillance Log, dated November 14, 2011

SNC Surveillance Qualification Summary Records

Vogtle Units 3 & 4, QC Inspector Certification Log, printed November 14, 2011

ESSOW for Onsite Nuclear Island Waterproofing Membrane Testing No. 132175-E-C-00012

LIST OF ACRONYMS

ADAMS	Agency-wide Documents Access & Management System
AFR	Audit Finding Report
AP1000	Westinghouse Advanced Passive Pressurized Water Reactor
ASL	Approved Suppliers List
ASME	American Society of Mechanical Engineers
CAR	Corrective Action Report
CB&I	Chicago Bridge & Iron
COL	Combined License
COLA	Combined License Application
CMTR	Certified Material Test Report
CV	Containment Vessel
CVBH	Containment Vessel Bottom Head
DCD	Design Control Document
ESP	Early Site Permit
ESSOW	Engineering Services Scope of Work
FCAW	Flux-Cored Arc Welding
IHI	Ishikawajima-Harima Heavy Industries
IMC	Inspection Manual Chapter
IP	Inspection Procedure
IR	Inspection Report
ITAAC	Inspection, Test, Analysis and Acceptance Criteria
LWA	Limited Work Authorization
M&TE	Measurement and Test Equipment
MT	Magnetic Particle Testing
NCR	Nonconformance Report
ND	Nuclear Development
N&D	Nonconformance and Disposition Report
NDE	Nondestructive Examination
NDQAM	Nuclear Development Quality Assurance Manual
NOV	Notice of Violation
NQA	Nuclear Quality Assurance
NQAM	Nuclear Quality Assurance Manual
NRC	Nuclear Regulatory Commission
NTS	National Technical Systems
NUPIC	Nuclear Procurement Issues Committee
PI&R	Problem Identification and Resolution
PO	Purchase Order
PQR	Procedure Qualification Records
PT	Liquid Penetrant Testing
QA	Quality Assurance
QAD	Quality Assurance Directive
QAP	Quality Assurance Program
QC	Quality Control
QL	Quality Level
QS	Quality Standard
QSI	Quality Site Instructions
Rev.	Revision
RT	Radiograph Testing
SAW	Submerged Arc Welding

SGH	Simpson Gumpertz & Heger
SMAW	Shielded Metal Arc Welding
SNC	Southern Nuclear Operating Company, Inc (Licensee)
SW	Stud Welding
SWSQAP 1-74A	Shaw Standard Nuclear Quality Assurance Program
S&W	Stone & Webster
VEGP	Vogtle Electric Generating Plant
VT	Visual Testing
WEC	Westinghouse Electric Company LLC
WPM	Waterproofing Membrane
WPQ	Welding Operator Performance Qualification
WPS	Welding Procedure Specifications
10 CFR	Title 10 of the *Code of Federal Regulations*