

November 8, 2013

Mr. Doug Sample, Manager  
Technical Services (QA/QC)  
Newport News Industrial  
182 Enterprise Dr.  
Newport News, VA 23602

SUBJECT: NUCLEAR REGULATORY COMMISSION INSPECTION REPORT  
NO. 99901433/2013-201, NOTICE OF NONCONFORMANCE

Dear Mr. Sample:

From September 16–20, 2013, U.S. Nuclear Regulatory Commission (NRC) staff conducted an inspection at the Newport News Industrial Corporation (hereafter referred to as NNI) facility in Newport News, VA. The purpose of this limited-scope routine inspection was to assess NNI compliance with provisions of Title 10 of the *Code of Federal Regulations* (10 CFR) Part 21, “Reporting of Defects and Noncompliance,” and selected portions 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.”

This technically focused inspection specifically evaluated NNI implementation of quality activities associated with the fabrication and testing activities of shield building structural modules for Westinghouse Electric Company’s AP1000 reactor design. The enclosed report presents the results of the inspection. This NRC inspection report does not constitute NRC endorsement of NNI’s overall quality assurance (QA) program. During this inspection, the NRC staff reviewed inspection and manufacturing activities associated with inspections, tests, analyses, and acceptance criteria (ITAAC) from Revision 19 of the certified AP1000 Design Control Document (DCD), Tier 1. Specifically, these activities were associated with ITAAC 3.3.0.2.a.i.b. The NRC inspection team did not identify any findings associated with the ITAAC contained in Section (4) of the attachment to this report.

Based on the results of this inspection, the NRC inspection team found that the implementation of your QA program did not meet certain regulatory requirements imposed on you by your customers or NRC licensees. Specifically, the inspectors determined that NNI was not fully implementing its QA program in the areas of corrective action, procurement document control, and control of purchased equipment, materials, and services. The enclosed notice of nonconformance (NON) with this letter identifies the specific findings and references to the pertinent requirements, and the enclosed inspection report describes in detail the circumstances surrounding it.

Please provide a written explanation or statement within 30 days of this letter in accordance with the instructions specified in the enclosed NON. The agency will consider extending the response time if you show good cause for us to do so.

In accordance with 10 CFR 2.390, "Public Inspections, Exemptions, Requests for Withholding," of the NRC's "Rules of Practice," the NRC will make available electronically for public inspection a copy of this letter, its enclosure, and your response through the NRC Public Document Room or from the NRC's Agencywide Documents Access and Management System (ADAMS), which is accessible at <http://www.nrc.gov/reading-rm/adams.html>. To the extent possible (and if applicable), your response should not include any personal privacy, proprietary, or Safeguards Information so that it can be made available to the public without redaction. If personal privacy or proprietary information is necessary to provide an acceptable response, please provide a bracketed copy of your response that identifies the information that should be protected and a redacted copy of your response that deletes such information. If you request that such material be withheld from public disclosure, you must specifically identify the portions of your response that you seek to have withheld and provide in detail the bases for your claim (e.g., explain why the disclosure of information would create an unwarranted invasion of personal privacy or provide the information required by 10 CFR 2.390(b) to support a request for withholding confidential commercial or financial information). If Safeguards Information is necessary to provide an acceptable response, please provide the level of protection described in 10 CFR 73.21, "Protection of Safeguards Information: Performance Requirements."

Sincerely,

*/RA/*

Edward H. Roach, Chief  
Mechanical Vendor Inspection Branch  
Division of Construction Inspection  
and Operational Programs  
Office of New Reactors

Docket No.: 99901433

Enclosures:

1. Notice of Nonconformance
2. Inspection Report No. 99901433/2013-201  
and Attachment

In accordance with 10 CFR 2.390, "Public Inspections, Exemptions, Requests for Withholding," of the NRC's "Rules of Practice," the NRC will make available electronically for public inspection a copy of this letter, its enclosure, and your response through the NRC Public Document Room or from the NRC's Agencywide Documents Access and Management System (ADAMS), which is accessible at <http://www.nrc.gov/reading-rm/adams.html>. To the extent possible (and if applicable), your response should not include any personal privacy, proprietary, or Safeguards Information so that it can be made available to the public without redaction. If personal privacy or proprietary information is necessary to provide an acceptable response, please provide a bracketed copy of your response that identifies the information that should be protected and a redacted copy of your response that deletes such information. If you request that such material be withheld from public disclosure, you must specifically identify the portions of your response that you seek to have withheld and provide in detail the bases for your claim (e.g., explain why the disclosure of information would create an unwarranted invasion of personal privacy or provide the information required by 10 CFR 2.390(b) to support a request for withholding confidential commercial or financial information). If Safeguards Information is necessary to provide an acceptable response, please provide the level of protection described in 10 CFR 73.21, "Protection of Safeguards Information: Performance Requirements."

Sincerely,

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Edward H. Roach, Chief  
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## NOTICE OF NONCONFORMANCE

Newport News Industrial  
182 Enterprise Dr.  
Newport News, VA 23602

Docket No. 99901433  
Report No. 2013-201

Based on the results of a U.S. Nuclear Regulatory Commission (NRC) inspection conducted at the Newport News Industrial Corporation (hereafter referred to as NNI) facility in Newport News, VA, from September 16, 2013 through September 20, 2013, it appears that NNI did not conduct certain activities in accordance with NRC requirements that were contractually imposed on NNI by its customers or NRC licensees:

- A. Criterion XVI, "Corrective Action," of Appendix B, "Quality Assurance Program Criteria for Nuclear Power Plants and Fuel Reprocessing Plants," to Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, "Domestic Licensing of Production and Utilization Facilities," states, in part, that "Measures shall be established to assure that conditions adverse to quality, such as failures, malfunctions, deficiencies, deviations, defective material and equipment, and nonconformances are promptly identified and corrected."

Section 17, "Corrective Action," of NNI's quality-assurance manual (QAM)-100, "Commercial Nuclear Facility Applications Quality Assurance Manual," Revision C, dated April 16, 2013, states, that this section provides for the investigation of the cause and corrective actions necessary to preclude a recurrence, the analysis of processes, procedures, quality records, customer complaints, initiation of appropriate preventive actions, and the implementation and recording of changes in procedures resulting from corrective actions."

Contrary to the above, as of September 20, 2013, NNI failed to have adequate measures in place to assure that customer-identified conditions adverse to quality, such as failures, malfunctions, deficiencies, deviations, defective material and equipment, and nonconformances were promptly identified and corrected to preclude repetition.

Specifically, NNI failed to enter and evaluate in its corrective-action program the Chicago Bridge & Iron (CB&I) inspectors' notice of unsatisfactory conditions (NUCs) identified during fabrication of the AP1000 shield building structural modules for potential conditions adverse to quality.

This issue has been identified as Nonconformance 99901433/2013-201-01.

- B. Criterion IV, "Procurement Document Control," of Appendix B to 10 CFR Part 50, states, in part, that "Measures shall be established to assure that applicable [...] requirements which are necessary to assure adequate quality are suitably included or referenced in the documents for procurement of material, equipment, and services [...]."

Criterion VII, "Control of Purchased Material, Equipment, and Services," of Appendix B to 10 CFR 50, states, in part, that "The effectiveness of the control of quality by contractors and subcontractors shall be assessed by the applicant or designee at intervals consistent with the importance, complexity, and quantity of the product or services."

Procedure SI-QA-5, "Supplier Evaluation Program," Revision M, dated July 26, 2012, Section 7.1.4, states, in part, that "Following approval, the Lead Auditor shall complete an Approved Supplier Capabilities form. A copy of the Approved Supplier Capabilities form shall be kept with the ASL [Approved Suppliers List] and a copy shall be forwarded to Purchasing with the evaluation status."

Subsection 8.2700, "Supplier Performance Evaluation," of QAM-100, states, in part, that "Suppliers are reviewed every six months by QA through quality documentations, such as reports of results of receiving, inspection and documents reporting nonconforming conditions."

Contrary to the above, as of September 20, 2013, NNI failed to establish proper measures to include or cite requirements which are necessary to assure adequate quality in the documents for procurement of material, equipment, and services. NNI also failed to effectively control the quality of their contractors and subcontractors by assessing the designee at intervals consistent with the importance, complexity, and quantity of the product or services. Specifically,

1. NNI failed to document the restrictions and limitations on the scope of supply as dictated by the results of the audits/survey of DuBose National Energy Services Inc. and Tioga Pipe Supply Co. The results of the audits/survey were placed in NNI's supplier database, "Navision," which generates supplier restrictions and limitations for the ASL and procurement orders. For these two specific suppliers, NNI failed to have adequate controls in place to assure that the restrictions and limitations for the ASL and POs were included when these documents were generated using Navision.
2. NNI failed to perform a supplier performance evaluation of Nelson Stud Welding Inc., which has been an approved supplier since April 30, 2012. During this period, Nelson Stud Welding Inc. provided nonconforming material which was not documented in their performance evaluation to assess the effectiveness of the supplier quality controls.

This issue has been identified as Nonconformance 99901433/2013-201-02.

Please provide a written statement or explanation to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001, with a copy to the Chief, Mechanical Vendor Inspection Branch, Division of Construction Inspection and Operational Programs, Office of New Reactors, within 30 days of the date of the letter transmitting this Notice of Nonconformance. This reply should be clearly marked as a "Reply to a Notice of Nonconformance" and should include for each noncompliance: (1) the reason for the noncompliance or, if contested, the basis for disputing the noncompliance; (2) the corrective steps that have been and the results achieved; (3) the corrective steps that will be taken to avoid further noncompliance; and (4) the date when the corrective action will be completed. Where good cause is shown, the NRC will consider extending the response time.

Because your response will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's Agencywide Documents Access and Management

System (ADAMS), which is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html>, to the extent possible, it should not include any personal privacy, proprietary, or Safeguards Information (SGI) so that the NRC can make it available to the public without redaction. If personal privacy or proprietary information is necessary to provide an acceptable response, please provide a bracketed copy of your response that identifies the information that should be protected and a redacted copy of your response that deletes such information. If you request that such material be withheld, you must specifically identify the portions of your response that you seek to have withheld and provide in detail the bases for your claim of withholding (e.g., explain why the disclosure of information would create an unwarranted invasion of personal privacy or provide the information required by 10 CFR 2.390(b) to support a request for withholding confidential commercial or financial information). If SGI is necessary to provide an acceptable response, please provide the level of protection described in 10 CFR 73.21, "Protection of Safeguards Information: Performance Requirements."

Dated this 8th day of November 2013.

**U.S. NUCLEAR REGULATORY COMMISSION  
OFFICE OF NEW REACTORS  
DIVISION OF CONSTRUCTION INSPECTION AND OPERATIONAL PROGRAMS  
VENDOR INSPECTION REPORT**

Docket No.: 99901433

Report No.: 99901433/2013-201

Vendor: Newport News Industrial Corporation  
182 Enterprise Dr.  
Newport News, VA 23602

Vendor Contact: Doug Sample  
Manager Technical Services (QA/QC)  
doug.sample@hii-nns.com  
757-380-2725

Nuclear Industry Activity: Newport News Industrial Corporation (NNI), a subsidiary of Huntington Ingalls Industries, whose scope of supply includes, but is not limited to, design and construction of tanks, pressure vessels, structures, and piping assemblies. Chicago Bridge & Iron contracted NNI in Newport News, VA, to fabricate, assemble, inspect, transport, and deliver shield building structural modules to the Vogtle & V.C. Summer new construction sites.

Inspection Dates: September 16–20, 2013

Inspection Team: Jonathan Ortega NRO/DCIP/MVIB Team Leader  
Paul Coco NRO/DCIP/MVIB  
Raju Patel NRO/DCIP/MVIB  
Paul Prescott NRO/DCIP/QVIB  
John Honcharik NRO/DE/CIB  
Jason Christensen RII/DCI/CIB3  
Bradley Davis RII/DCI/CIB2

Approved by: Edward H. Roach, Chief  
Mechanical Vendor Inspection Branch  
Division of Construction Inspection  
and Operational Programs  
Office of New Reactors

## **EXECUTIVE SUMMARY**

Newport News Industrial Corporation  
99901433/2013-201

The U.S. Nuclear Regulatory Commission (NRC) staff conducted a vendor inspection at the Newport News Industrial Corporation (hereafter referred to as NNI) facility to verify that it had implemented an adequate quality-assurance (QA) program that complies with the requirements of Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants," to Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, "Domestic Licensing of Production and Utilization Facilities." In addition, the NRC inspection also verified that NNI had implemented a program under 10 CFR Part 21, "Reporting of Defects and Noncompliance," that met the NRC's regulatory requirements. The NRC inspection team conducted the inspection from September 16 through 20, 2013.

This technically focused inspection specifically evaluated NNI's implementation of quality activities associated with the fabrication and testing activities of shield building modules for the Westinghouse Electric Company (WEC) AP1000 reactor design.

Some of the specific activities observed by the NRC inspection team included:

- Setup and performance of Whitney machine for a plate worked for Work Instruction (WI) 7342-F-064-008
- Manual gas tungsten arc welding (GTAW) and automated submerged arc welding (SAW) on Shield Building inner panel, Weld Joint 02K-5000
- Fit-up inspection and visual inspection of Weld Joint 02K-5000 for the inner panel
- Visual inspection of outer panel to tie bar Weld Joint s 02H-3009, 02H-3109 and 02H-3209
- Magnetic-particle inspection of inner panel Weld Joint 02J-5000
- Observed inspection of filler metal process (filler metal control) for inner panel Weld Joint 02K-5000
- Visual testing (VT) inspections for full joint penetration welds on tie bars for WI # 7340-F-068-003, Fab Shield Building Modules–Vogtle 3, Module 02H (Group 41)
- Weld joint preparation for WI # 7340-F-069-003, Fab Shield Building Module–Vogtle 3, Module 02J (Group 41)
- Holes drilled and beveled for welding tie bars for WI # 7340-F-054-016, machining operations for elevations 100 feet through 103 feet 6 inches, Fabrication Shield Building Modules - Vogtle 3



- Quality-control (QC) inspections for WI # 7342-F-064-008, Fabrication Shield Building Modules–Vogtle 4 to verify hole diameter, hole spacing, and location. These holes are the intended location of the tie bars weld joints.
- QC inspection to verify radius or curvature for WI # 7341-F-073-012, Fabrication Shield Building Modules - Summer 2.

In addition to observing these activities, the NRC inspection team verified that measuring and test equipment (M&TE) was properly identified, marked, calibrated, and used within its calibrated range. The inspectors also walked down NNI's assembly floor and verified that nonconforming components were properly identified, marked, and segregated when practical, to ensure that they were not reintroduced into the manufacturing processes.

These regulations served as the bases for the NRC inspection:

- Appendix B to 10 CFR Part 50
- 10 CFR Part 21

During the course of this inspection, the NRC inspection team implemented Inspection Procedure (IP) 43002, "Routine Inspections of Nuclear Vendors," dated July 15, 2013; IP 43004, "Inspection of Commercial-Grade Dedication Programs," dated April 25, 2011; and IP 36100, "Inspection of 10 CFR Part 21 and Programs for Reporting Defects and Noncompliance," dated February 13, 2012.

This was the initial NRC inspection at the NNI Newport News facility. NNI is currently under contract with Chicago Bridge and Iron (CB&I) to produce ASTM A572 grade 50 panels for the Shield Building Structural Modules being fabricated for the Vogtle and V.C. Summer projects.

With the exception of the nonconformances described below, the NRC inspection team determined that, in general, the manufacturing activities that NNI performed in support of safety-related reactor Shield Building Structural Modules were performed in accordance with the Commission's rules and regulations and the technical and quality requirements passed down to NNI from NRC licensees or its contractors. The information below summarizes the results of this inspection.

#### Corrective-Action Programs

The NRC inspection team issued Nonconformance 99901433/2013-201-01 because of NNI's failure to implement the regulatory requirements of Criterion XVI, "Corrective Action," of Appendix B to 10 CFR Part 50. Nonconformance 99901433/2013-201-01 cites NNI for failing to have adequate measures in place to assure that customer-identified conditions adverse to quality, such as failures, malfunctions, deficiencies, deviations, defective material and equipment, and nonconformances were promptly identified and corrected to preclude repetition. Specifically, NNI failed to enter and evaluate in its corrective-action program the CB&I inspector-initiated notice of unsatisfactory conditions (NUCs) during fabrication of AP1000 shield building structural modules for potential conditions adverse to quality.

### Oversight of Contracted Activities and Internal Audits

The NRC inspection team determined that NNI is implementing its programs for Criterion XVIII, "Audits," in accordance with the applicable regulatory requirements of Appendix B to 10 CFR Part 50. Based on the limited sample of documents reviewed and activities observed, the NRC inspection team also determined that NNI is implementing its policies and procedures associated with this program.

The NRC inspection team issued Nonconformance 99901433/2013-201-02 in association with NNI's failure to implement Criterion IV, "Procurement Document Control" and Criterion VII, "Control of Purchased Material, Equipment, and Services" of Appendix B to 10 CFR Part 50. Nonconformance 99901433/2013-201-02 cites NNI for failing to document the restrictions and limitations on the scope of supply as dictated by the results of the audits/survey in their procurement documents and for failing to perform a supplier performance evaluation in accordance with NNI policies and procedures.

### Other Inspection Areas

The NRC inspection team determined that NNI is implementing its programs for 10 CFR Part 21; control of special processes; commercial-grade dedication; traceability; inspection control; control of measurements and testing equipment; nonconforming material, parts, or components; training; and indoctrination in accordance with the applicable regulatory requirements of Appendix B to 10 CFR Part 50. Based on the limited sample of documents reviewed and activities observed, the NRC inspection team also determined that NNI is implementing its policies and procedures associated with these programs. As a result of this inspection, NNI generated 16 quality-assurance condition reports (CRs) to address concerns of low significance identified by the NRC inspection team that did not meet the threshold of more than minor concerns as defined by Inspection Manual Chapter 0617, "Vendor and Quality Assurance Implementation Inspection Reports." No findings of significance were identified.

## REPORT DETAILS

### 1. 10 CFR Part 21 Program

#### a. Inspection Scope

The NRC inspection team reviewed the policies and implementing procedures that govern the Newport News Industries (NNI) quality-assurance program under Title 10 of the *Code of Federal Regulations* (10 CFR) Part 21, "Reporting of Defects and Noncompliance." The inspectors verified that NNI's procedure, standard instruction (SI)-EN-8, "Procedure for Reporting of Defects and Noncompliance (Reference to 10 CFR Part 21)," effectively implemented the requirements of 10 CFR 21.21(a)(1) for evaluating deviations and failures to comply. SI-EN-8 also implemented the requirements of 10 CFR 21.21(d) regarding directors or responsible officers notifying NRC or informing affected customers (when applicable) of identified defects or failures to comply associated with a substantial safety hazard. Additionally, the inspectors reviewed and evaluated postings for compliance with 10 CFR 21.6, "Posting Requirements." To verify an adequate link to the 10 CFR Part 21 process, the inspectors also reviewed NNI's procedures that govern corrective action and nonconforming conditions to verify adequate implementation of the regulatory requirements identifying items that cause conditions adverse to quality.

The NRC inspection team verified that the condition report (CR), corrective-action report (CAR) form, and the nonconformance report (NCR) form included in SI-QA-23, "Corrective Actions Procedure," and SI-QA-22, "Requirements for Issuance and Processing of Nonconformity Reports" respectively, provided a link to the 10 CFR Part 21 program. At the time of the inspection, NNI had not performed any 10 CFR Part 21 evaluations. The inspectors reviewed a sample of 10 CARs, two root-cause evaluation reports, and 10 NCRs to verify that NNI correctly determined that they did not need to perform an evaluation in accordance with 10 CFR Part 21 requirements.

The NRC inspection team interviewed NNI individuals involved in the evaluation of deficiency identified during receipt of Nelson Stud Welding S3L shear studs and discussed the evaluation with NNI management related to implementation of 10 CFR Part 21. The attachment to this inspection report lists the documents reviewed by the NRC inspection team.

#### b. Observations and Findings

The NRC inspection team verified that NNI's procedure, standard instruction (SI)-EN-8, "Procedure for Reporting of Defects and Noncompliance (Reference to 10 CFR Part 21)," effectively implemented the requirements of 10 CFR 21.21(a)(1) for evaluating deviations and failures to comply. SI-EN-8 also implemented the requirements of 10 CFR 21.21(d) regarding directors or responsible officers notifying NRC or informing affected customers (when applicable) of identified defects or failures to comply associated with a substantial safety hazard.

The NRC inspection team verified that the condition report (CR), corrective-action report (CAR) form, and the nonconformance report (NCR) form included in SI-QA-23, "Corrective Actions Procedure," and SI-QA-22, "Requirements for Issuance and Processing of Nonconformity Reports (NCR)," respectively, provided a link to the 10 CFR Part 21 program. At the time of the inspection, NNI had not performed any 10 CFR Part 21 evaluations. The inspectors reviewed a sample of 10 CARs, two root-cause evaluation reports, and 10 NCRs to verify that NNI correctly determined that they did not need to perform an evaluation in accordance with 10 CFR Part 21 requirements.

The NRC inspection team reviewed NNI's File No. Q-GE-13-012, "Nelson Stud Welding S3L Shear Studs," dated April 23, 2013, that provides NNI's independent evaluation of the deviation identified in the Nelson Stud Welding S3L shear studs during receipt inspection to determine whether a defect exists in accordance with 10 CFR Part 21. The NNI File No. Q-GE-13-012, concluded that the deficiency in the Nelson Stud Welding S3L shear studs was within American Welding Society (AWS) D1.1, "Structural Welding Code - Steel," Edition 2000, visual acceptance criteria and did not meet the regulatory requirements to be reportable under 10 CFR Part 21.

NNI identified the nonconforming material and it was segregated in accordance with NNI policies and procedures to avoid installation of any of the deficient Nelson Stud Welding material. As a result of this independent evaluation, NNI initiated preventive measures by imposing additional acceptance criteria during receipt inspection. The NRC inspection team found this NNI report acceptable.

The NRC inspection team observed that NNI satisfied the posting requirements in 10 CFR 21.6. The postings included a copy of Section 206 of the Energy Reorganization Act of 1974, as amended; a copy of 10 CFR Part 21; and a copy of SI-EN-8.

The NRC inspection team verified a sample of NNI's purchase orders (PO) and determined that NNI had implemented a program consistent with the requirements in 10 CFR 21.31, "Procurement Documents," for specifying the applicability of 10 CFR Part 21 in its POs for basic components. In addition, the inspectors verified NNI's corrective-action screening committee members' training records to ensure that they were adequately trained on NNI's 10 CFR Part 21 procedure.

c. Conclusion

The NRC inspection team determined that NNI appropriately translated the requirements of 10 CFR Part 21 into implementing procedures and, for those activities that the NRC inspection team reviewed, implemented them in accordance with NNI's procedures. No findings of significance were identified.

## 2. Control of Special Processes

### a. Inspection Scope

The NRC inspection team reviewed NNI policies and implementing procedures that govern the control of special processes to verify compliance with the regulatory requirements of Criterion IX, "Control of Special Processes," of Appendix B to 10 CFR Part 50 as well as with the requirements of the American Welding Society (AWS) D1.1, "Structural Welding Code-Steel," 2000 Edition, AWS D1.4, "Structural Welding Code – Reinforcing Steel," 1998 Edition, and American Society for Nondestructive Testing (ASNT) SNT-Tc-1A, "Personnel Qualification and Certification in Nondestructive Testing," 1992 Edition.

The NRC inspection team reviewed a sample of welding and nondestructive examination (NDE) documents and observed welding and NDE activities associated with the fabrication and inspection of the AP1000 reactor shield building design. The inspectors also reviewed a sample of qualification records for those operators associated with manufacturing equipment used during fabrication of the AP1000 reactor shield building structural modules. The attachment to this inspection report lists the documents reviewed by the inspectors.

### b. Observations and Findings

#### b.1 Welding Process

At the time of the inspection, NNI was fabricating AP1000 shield building high stress panel modules under Work Packages 7341-F-070-002 for , Work Package 7341-F-068-003 for outer panel to tie bar, and Work Package 7341-F-069-002 for inner panel for Vogtle Generating Electric Plant Units 3 and 4 as well as for the Virgil C. Summer Unit 2. The NRC inspection team witnessed manual gas tungsten arc welding (GTAW) welding and automated submerged arc welding (SAW) for weld joint number 02K-5000 on the inner panel under Work Package 7341-F-070-002. The inspectors verified that the welding procedure specifications (WPS) 1016 and 1017 were qualified in accordance with the requirements of AWS D1.1 using the supporting NNI procedure qualification records (PQRs) 1033, 1035, 1036 and 1037. The PQRs were verified to meet the requirements of AWS D1.1 and the applicable NNI procedures. The inspectors reviewed a sample of WPSs and PQRs to verify that the sample documents were in accordance with the requirements of AWS D1.1, AWS D1.4 and the applicable NNI procedures.

The NRC inspection team verified that the applicable welding data; such as weld material and heat/lot number, WPS, inspection procedures used, and that the final inspection results were recorded in accordance with the applicable NNI procedures and instructions. The welding data was recorded on the associated weld history log for each weld joint along with the applicable NDE results.

b.2 Control of Weld Material

The NRC inspection team observed the weld material storage and issue station and verified that weld material was adequately controlled, including that flux covered weld electrodes were either in hermetically sealed containers or were kept in baking ovens to control the moisture content within the requirements of AWS D1.1. The inspectors also verified that the corrective actions for CRs 104 and 106 concerning filler metal control were implemented related to filler metal storage and use of calibrated thermometers in the baking ovens. Calibrated thermometers were verified to be in the ovens and had valid calibration documentation in accordance with applicable NNI procedures. The inspectors verified that weld material was controlled at all times until its consumption.

b.3 Nondestructive Examination

The NRC inspection team witnessed visual inspections of outer panel to tie bar welds, fit-up inspections visual inspection of welds for the inner panel, and magnetic-particle (MT) inspections of inner panel welds in accordance with the applicable NNI procedures. The inspector verified that the examinations were performed by qualified personnel and qualified procedures in accordance with the requirements of AWS D1.1, AWS D1.4 and ASNT SNT-Tc-1A.

During the visual inspections, the NRC inspection team witnessed and verified that the Level II inspector performed the examination in accordance with the NNI procedure and the appropriate acceptance criteria. For the performance of the MT, the inspectors verified through observation and discussion with the Level II inspector that the parameters specified in the associated NNI procedure (including MT yoke model, calibration, and MT yoke orientation) were in accordance with the NNI procedure.

b.4 Qualification and Training of Welding and Nondestructive Testing Personnel

The NRC inspection team reviewed the welder qualification list (SI-QA-18 QWL) and associated welder qualification records and confirmed that the welders had completed the required training and had maintained their qualifications in accordance with NNI procedures. The inspectors also verified that the applicable procedure for welder qualification meets the requirements of AWS D1.1 and AWS D1.4.

The NRC inspection team reviewed the NNI procedures for visual and MT inspections, and verified that they were consistent with the applicable code requirements. The inspectors also reviewed the Level III non-destructive examiner and Level II non-destructive inspector qualification records and confirmed they were qualified in accordance with the requirements in ASNT SNT-Tc-1A and had sufficient training and previous inspection experience.

b.5 Water Jet, Whitney Punch/Drill, and Rolling Machining Processes

The NRC inspection team reviewed the controls that NNI has in place for the water jet, the Whitney punch/drill, and the rolling machines. Specifically, the inspectors interviewed the operators of the water jet machine to verify their qualifications for operating the machine. The inspectors noted that operation of the water jet is performed using a 3D model that is created on computer software using CB&I design documents. This 3D model is used by the water jet machine and contains the locations and tolerances of all cuts for the specific plate. The inspection also verified that the spot checks being performed on the plate were completed using calibrated tools and equipment.

The NRC inspection team observed the operation of the Whitney drill on a plate for work package 7342-F-064-008 to be used on Vogtle Unit 4. The inspectors observed the input of hole coordinates, obtained from the computer model, into the machine. The operator spot-checked the holes on the plate for hole diameter, center line distance, and distance to the edge using a calibrated caliper. These spot checks were not required to be documented and were only used to confirm proper machine operation.

The NRC inspection team interviewed one operator of the rolling machine to verify that he was qualified. No observable work was being performed at the time of the interview. No procedures were in use for operations of these machines.

The NRC inspection team verified the qualification records of all interviewed personnel for their specific machines. The qualifications were performed in three separate phases: formal training, on-the-job training, and a job safety analysis. The formal training was given by the machine manufacturers for the water jet and Whitney machine. All other training was given by staff and experienced personnel. NNI is in the process of documenting these training requirements in a formal procedure for each job function. The inspectors reviewed CR 100, written July 25, 2013, to cover this inadequate process for determining training requirements. NNI is in the process of developing the procedure (SI-TR-18) as part of the corrective action taken for CR 100.

c. Conclusion

The NRC inspection team concluded that NNI is implementing its process to control the use of special processes program in accordance with the regulatory requirements of Criterion IX of Appendix B to 10 CFR Part 50. Based on the limited sample of documents reviewed and interviews conducted, the NRC inspection team also determined that NNI is adequately implementing a special process control program. No findings of significance were identified.

### 3. Commercial-Grade Dedication

#### a. Inspection Scope

The NRC inspection team reviewed NNI's policies and implementing procedures that govern the commercial-grade dedication (CGD) program to verify compliance with the regulatory requirements of Criterion III, "Design Control," and Criterion VII, "Control of Purchased Material, Equipment, and Services," of Appendix B to 10 CFR Part 50.

The NRC inspection team reviewed NNI's program for the dedication of commercial-grade items and services for use in safety-related applications to verify its compliance with the applicable regulatory requirements. The inspectors also reviewed the commercial-grade dedication plans, checklists, reports and associated purchase orders for surveys of all commercial vendors on NNI's Approved Supplier's List (ASL). The inspectors evaluated the criteria for the selection of critical characteristics, the basis for sampling plan selection, and the selection of verification methods to verify effective implementation of NNI's dedication process. The inspectors also discussed the conduct of CGD activities with NNI personnel involved with the surveys and assessing the results.

The NRC inspection team also reviewed a NNI root-cause analysis report, findings, and implementation of corrective actions associated with inadequate implementation of critical processes to support CGD surveys. The attachment to this inspection report lists the documents reviewed by the inspectors.

#### b. Observations and Findings

NNI performed surveys of suppliers of items and services which included: 1) personnel and equipment for conducting measurements of sub-modules with lasers, 2) dedication of weld wire material, 3) personnel conducting welding and fabrication activities, 4) personnel and services for mechanical and physical testing of material properties, and 5) personnel conducting nondestructive examination services in accordance with applicable codes and standards.

The technical evaluations in the dedication plans appropriately considered those technical attributes to verify that they were necessary to provide reasonable assurance that the items or services would perform their safety function. The survey checklists and reports adequately documented the verified technical attributes of the items or services. The NRC inspection team noted that some of the initial survey results were amended to correct for deficiencies noted from NNI's root-cause analysis.

#### c. Conclusion

The inspectors determined, based on the commercial-grade dedication packages reviewed and discussions with the vendor's personnel, that NNI's commercial-grade dedication process met the requirements of Criterion III and Criterion VII of Appendix B to 10 CFR Part 50. No findings of significance were identified.



#### 4. Oversight of Contracted Activities and Internal Audits

##### a. Inspection Scope

The NRC inspection team reviewed NNI policies and implementing procedures that govern the implementation of its oversight of contracted activities and internal audits program to verify compliance with the requirements of Criterion IV, "Procurement Document Control," Criterion VII, "Control of Purchased Material, Equipment, and Services," and Criterion XVIII, "Audits," of Appendix B to 10 CFR Part 50.

The NRC inspection team reviewed a sample of POs to verify that specific procurement requirements were met and documented correctly. The inspectors also verified that the POs included, as applicable, scope of work, right of access to facilities and records for source inspections and audits, reporting and approving disposition of nonconformances, and references to specific drawings, codes, and specifications. In addition, the inspectors confirmed that all of the safety related POs reviewed included clauses that invoke the provisions of 10 CFR Part 21 and that require the vendor or supplier to conduct safety related work under its approved QA program. The NRC inspection team also reviewed NNI's processes and management of their supplier database, "Navision," and its interfaces with generating supplier limitations and capabilities on their Approved Suppliers List (ASL) and POs. A list of POs sampled is included at the end of this report.

The NRC inspection team reviewed a sample of external and internal audits, and receipt inspection records to evaluate compliance with NNI program and technical requirements. The inspectors also reviewed the disposition of audit findings to resolve for adequacy and timeliness. The attachment to this inspection report lists the documents reviewed by the inspectors.

##### b. Observations and Findings

###### b.1 Procurement Document Control

The NRC inspection team verified that the capabilities and limitations recommended by NNI's external audits/surveys were documented in NNI's supplier database, "Navision." NNI's supplier database generates the requirements and limitations that are included in NNI's ASL and POs. The inspectors noted that there were two supplier external audits, DuBose National Energy Services, Inc., and Tioga Pipe Supply Co., in which the ASL and POs did not appropriately document the restrictions and limitations on the scope of supply as dictated by the results of the audit/survey. The inspector verified that the results of the audits/survey were placed in Navision. For these two specific suppliers, NNI failed to have adequate controls in place to assure that the restrictions and limitations for the ASL and POs were included when these documents were generated using Navision. This issue has been identified as an example of Nonconformance 99901433-2013-201-02.

b.2 Oversight of Suppliers

The NRC inspection team verified that NNI had prepared and approved plans that identify the audit scope, focus, and applicable checklist criteria before the initiation of the audit activity. The NRC inspection team confirmed that the audit reports contained a review of the relevant QA criteria in Appendix B to 10 CFR Part 50 for the activities that individual suppliers performed and documentation of pertinent supplier guidance associated with each criterion. For audits that resulted in findings, the inspectors verified that the supplier had established a plan for corrective action and that NNI had reviewed and approved the corrective action and verified its satisfactory completion and proper documentation. NNI's audit program also includes the performance of semi-annual evaluations of suppliers to ensure that they are effectively implementing their approved QA programs.

In sampling NNI's semi-annual performance evaluations of their approved suppliers, the NRC inspection team found that NNI failed to perform a supplier performance evaluation of Nelson Stud Welding, Inc., at an interval consistent with the importance, complexity, and quantity of the product and their procedures. NNI performed an audit of this vendor and they were added to the ASL on April 30, 2012, with no restrictions or limitation in the scope of work. During this period the supplier in question provided nonconforming material which was not documented in their performance evaluation to assess the effectiveness of their supplier's quality controls. This issue has been identified as another example of Nonconformance 99901433-2013-201-02.

b.3 Internal Audit

The NRC inspection team reviewed implementation of NNI's internal audit program to verify that the audits were completed annually, that the program covers all 18 criteria of Appendix B to 10 CFR Part 50, that each audit was conducted following an audit checklist approved by QA, that the audits are performed by a qualified lead auditor, that all discrepancies were noted and tracked, and that associated documentation justified audit closure. No issues of significance were identified.

b.4 Receipt Inspection

The NRC inspection team observed the receipt inspection of a safety-related component used in the fabrication of the AP1000 shield building. The inspectors reviewed documentation, confirmed the PO information, conducted a review for any obvious damage, verified the quantity received, verified dimensional aspects of material, and compared measurements to the drawing. No issues of significance were identified.

b.5 Qualification and Training of Auditors, Lead Auditors, and Inspection Personnel

The NRC inspection team reviewed a sample of the training and qualification records of NNI's lead auditors, auditors, and inspection personnel and confirmed that auditing and inspection personnel had completed all required training and had maintained qualification and certification in accordance with NNI's policies and procedures. No issues of significance were identified.

c. Conclusion

The NRC inspection team determined that NNI is implementing its programs for Criterion XVIII in accordance with the applicable regulatory requirements of Appendix B to 10 CFR Part 50. Based on the limited sample of documents reviewed and activities observed, the NRC inspection team also determined that NNI is implementing its policies and procedures associated with these programs.

The NRC inspection team issued Nonconformance 99901433/2013-201-02 in association with NNI's failure to implement Criterion IV and Criterion VII of Appendix B to 10 CFR Part 50. Nonconformance 99901433/2013-201-02 cites NNI for failing to document the restrictions and limitations on the scope of supply as dictated by the results of the audits/survey. Also, NNI failed to perform a supplier performance evaluation.

5. Material Traceability

a. Inspection Scope

The NRC inspection team reviewed NNI's policies and implementing procedures for identification and control of items. Also, that identification markings were applied using materials and methods that provided a clear and legible identification and did not adversely affect the function or service life of the shield building structural modules and their associated components to verify compliance with the regulatory requirements of Criterion VIII, "Identification and Control of Material, Parts, and Components," of Appendix B to 10 CFR Part 50. The inspectors observed the production process for the manufacture, inspection, and testing of safety-related panels and shield building structural modules to verify that all materials were marked with unique identifiers traceable to procurement records. The attachment to this inspection report lists the documents reviewed by the inspectors.

The NRC inspection team conducted interviews of NNI personnel to ensure that the marking procedures and processes were being followed in the shop and to ensure proper use of a shop manufacturing traveler system for each manufactured plate and shield building structural module.

b. Observations and Findings

The NRC inspection team verified that the permanently stamped shield building sections were traceable to design, shop, and erecting drawings. These permanent markings were created by the water-jet machine. The markings were created using computer software by the machine operators and a test sample was run to ensure compliance with NNI procedure SI-QA-24, "Material Storage, Segregation, and Identification," before marking the final product. In addition, the inspectors verified that markings on individual shield building sections were carried through and remained legible as the individual components were in the manufacturing process and through to completion of the structural modules. Furthermore, the inspectors reviewed shop manufacturing travelers for work package 7340-F-068-003 (Vogtle 3 MF6 module 02H, Group 41), currently in production, from receipt of the individual components through final inspection to verify that material was being tracked in accordance with NNI Procedure SI-QA-24.

The NRC inspection team verified that the process, hold, and storage tags for material movement and production were being used in accordance with the applicable NNI procedures for material control and movement. In addition, the inspectors reviewed the NNI material storage procedures to ensure that material was being stored as described in NNI Procedure SI-QA-24.

c. Conclusions

The NRC inspection team concluded that NNI is implementing its material traceability program in accordance with the regulatory requirements of Criterion VIII of Appendix B to 10 CFR Part 50. Based on the limited sample of documents reviewed, the NRC inspection team also determined that NNI is implementing its policies and procedures associated with the material traceability program. No findings of significance were identified.

6. Inspection

a. Inspection Scope

The NRC inspection team reviewed NNI policies and implementing procedures that govern the inspection program to verify compliance with the regulatory requirements of Criterion X, "Inspection," of Appendix B to 10 CFR Part 50. The inspectors observed in process quality-control inspections of the shield building panels being fabricated and receipt inspection of Nelson deformed bars. In addition, the inspectors observed NNI perform inspections of in-process work to ensure that the AP1000 shield building panels were being fabricated in accordance with the design and that any deviations identified were reconciled in accordance with ITAAC 3.3.0.2.a.i.b from the AP1000 Design Control Document (DCD), Tier 1, Revision 19. The attachment to this inspection report lists the documents reviewed by the inspectors.

b. Observations and Findings

b.1 Inspection Control

The NRC inspection team performed direct observations of in-process quality-control inspections to verify that the actual inspections being performed were in accordance with NNI's controlling procedure NNI-7340-F-Q003, "Inspection and Test Plan." The inspectors also verified that the personnel conducting the inspections were qualified to perform the work.

The NRC inspection team observed quality-control (QC) inspectors verify holes dimensions, holes locations, and curvature for the steel plates that formed the panels for the AP1000 shield building. These quality-control inspections were completed in support of NNI Work Instructions 7341-F-073-012, "Fab Shield Building Modules - Summer 2," and 7342-F-064-008, "Fab Shield Building Modules - Vogtle 4." The inspectors verified that the inspections were documented within the Work Instructions and the Inspection Data Reports.

The NRC inspection team also observed NNI perform receipt inspections of Nelson deformed bars that were to be used as tie bars and shear reinforcement in the AP1000 shield building panels. The inspectors verified that NNI performed the inspections in accordance with the applicable procedures, sampled the correct number of parts, and verified the appropriate characteristics of the deformed bars to ensure that the components received meet the requirements stated in the PO. The inspectors also verified that the results of the receipt inspection were adequately documented and approved by authorized staff.

b.2 Inspections, Testing, Analyses, and Acceptance Criteria

The NRC inspection team evaluated NNI policies, procedures and processes and inspection activities associated with AP1000 ITAAC for the shield building. The inspectors observed the implementation of visual testing in weld inspections, magnetic testing in particle inspections for welds, weld joint prep and fit-up inspections, dimensional inspections of the fabricated panels, and material property inspections.

The NRC inspection team verified that the panels were being fabricated in accordance with the design requirements and that deviations identified by NNI QC inspectors were documented as nonconformances and reconciled through the design authority, Westinghouse.

Based on the limited sample of documents reviewed and shield building panels observed, the inspectors concluded that NNI had adequate processes to ensure that the design deviations identified by NNI were adequately reconciled through Westinghouse in accordance with the acceptance criteria of the ITAAC.

c. Conclusions

The NRC inspection team concluded that NNI is implementing its inspection program in accordance with the regulatory requirements of Criterion X of Appendix B to 10 CFR Part 50. Based on the limited sample of documents reviewed, the NRC inspection team also determined that NNI is implementing its policies and procedures associated with the inspection program. No findings of significance were identified.

7. Control of Measuring and Test Equipment

a. Inspection Scope

The NRC inspection team reviewed NNI policies and implementing procedures that govern the Measuring and Test Equipment (M&TE) program to verify compliance with the requirements of Criterion XII, "Control of Measuring and Test Equipment," of Appendix B to 10 CFR Part 50. The inspectors reviewed a sample of calibration records for various M&TE and the audits used to accept their calibration service supplier for performing the duties of calibrating and testing equipment. The inspectors additionally verified that the M&TE program ensured that devices used in activities affecting quality were of the proper range, type, and accuracy to verify conformance to established requirements.

The inspectors also verified that when M&TE equipment is found to be out of calibration, NNI generates a nonconformance report (NCR) to identify items that have been accepted using this equipment since the last valid calibration date and to perform an extent-of-condition review. The attachment to this inspection report lists the documents reviewed by the inspectors.

b. Observations and Findings

The NRC inspection team performed a visual inspection of M&TE used during the fabrication of the AP1000 shield building panels and found that the sampled M&TE had the appropriate identification markings indicating the current calibration, due date of next calibration, M&TE identification number, and name of company that performed the last calibration. The inspectors also compared the M&TE identification markings on the actual equipment to the tracking database used by NNI to monitor all M&TE. The inspectors found no discrepancies between the tracking database and equipment in service. The NRC inspection team also verified that the selected M&TE was calibrated using procedures traceable to known industry standards. In addition, for a sample of calibration records reviewed, the inspectors verified that the records included the as-found or as-left conditions, accuracy required, calibration results, calibration dates, and the due date for recalibration.

c. Conclusion

The NRC inspection team concluded that NNI is implementing its M&TE program in accordance with the regulatory requirements of Criterion XII of Appendix B to 10 CFR Part 50. Based on the limited sample of documents

reviewed, the NRC inspection team also determined that NNI is implementing its policies and procedures associated with the M&TE program. No findings of significance were identified.

## 8. Nonconforming Materials, Parts, or Components

### a. Inspection Scope

The NRC inspection team reviewed policies and implementing procedures that govern the control of nonconforming materials, parts, and components to verify compliance with Criterion XV, "Nonconforming Materials, Parts, or Components," of Appendix B to 10 CFR Part 50. The inspectors verified that NNI's processes and procedures include the identification, documentation, segregation, evaluation, and disposition of nonconforming items. These processes also apply the categories of "accepted," "rework," "scrap," "on hold," or "use as is" and list the applicable justifications that will be adequately supported and properly documented.

The NRC inspection team verified that NNI's nonconformance process provides a link to the 10 CFR Part 21 program. In addition, the inspectors reviewed a sample of NCRs and nonconforming items on the shop floor to verify implementation of NNI's nonconformance program.

### b. Observations and Findings

The NRC inspection team verified that NNI's processes and procedures include the identification, documentation, segregation, evaluation, and disposition of nonconforming items. These processes also apply the categories of "accepted," "rework," "scrap," "on hold," or "use as is" and list the applicable justifications that will be adequately supported and properly documented. The inspectors verified that NNI's nonconformance process provides a link to the 10 CFR Part 21 program.

The NRC inspection team performed walkdowns of material storage areas and fabrication and assembly areas to inspect the segregation of nonconforming materials, the control of NCRs on ongoing work, and material conditions that could contribute to quality issues. The NRC inspection team observed ongoing craft work and inspection activities for the identification and control of NCRs. The NRC inspection team also verified that nonconforming materials were properly identified, marked, and segregated, when practical, to ensure that they were not reintroduced into the production processes.

The NRC inspection team verified implementation of NNI's nonconformance process while observing in-process dimensional inspection of a liner plate for the AP1000 shield building structural module during which the NNI inspector identified dimensional discrepancies. The NNI inspector immediately initiated a hold, attached a hold tag to the component, and initiated a NCR for disposition.

The NRC inspection team verified that, for the sample of 10 NCRs reviewed, NNI had: (1) dispositioned the nonconformances it identified in accordance with

NNI's approved procedures, (2) documented an appropriate technical justification for various dispositions, (3) taken adequate action with regard to the nonconforming material or item, and (4) subjected all identified nonconformances, as appropriate, to a 10 CFR Part 21 assessment for evaluation. For those NCRs that were dispositioned as "repair" or "use as is," the inspectors confirmed that the technical justifications were documented to verify the acceptability of nonconforming items and had been reviewed and approved by NNI's customer.

c. Conclusion

The NRC inspection team concluded that NNI is implementing its nonconforming material, parts, or components program in accordance with Criterion XV of Appendix B to 10 CFR Part 50. Based on the limited sample of documents reviewed, the NRC inspection team also determined that NNI is implementing its policies and procedures associated with its nonconforming material, parts, and components. No findings of significance were identified.

9. Corrective Actions

a. Inspection Scope

The NRC inspection team reviewed the NNI policies and procedures that govern the programs for the control of corrective actions to verify compliance with Criterion XVI, "Corrective Action," of Appendix B, to 10 CFR Part 50. The inspectors reviewed a sample of 18 CRs/CARs associated with the fabrication of safety-related AP1000 shield building structural modules to verify the adequacy of NNI's implementation and control over corrective action.

The NRC inspection team reviewed a sample of 13 conditions identified by CB&I inspectors as conditions adverse to quality, documented by CB&I in notices of unsatisfactory conditions (NUCs), and discussed the corrective-action program with NNI's management and technical staff. In addition, the inspectors observed a corrective-action screening meeting and interviewed NNI's root-cause evaluation committee members. The attachment to this inspection report lists the documents reviewed by the inspectors.

b. Observations and Findings

Prior to the week of the NRC inspection, NNI had performed a root-cause evaluation to identify the root causes and contributing causes for an ineffective corrective-action program as identified in repetitive CB&I V2012-09 and V2013-30 audits. NNI's RCA-27, "Root Cause Evaluation Report," Revision 0, dated September 12, 2013, documents the results, which indicate that there was one root cause and three contributing causes. RCA-97 recommended thirteen corrective actions to be taken or planned to be taken to correct the problem and verify effective implementation by June 19, 2014. On September 12, 2013, NNI revised its corrective-action procedure SI-QA-23 and developed new procedure SI-QA-27, "Cause Evaluation Process," Revision A, as a standalone cause-evaluation procedure.



The NRC inspection team verified that NNI had programs in place to address corrective actions and verified there was a procedural connection between the corrective action and the 10 CFR Part 21 programs.

CB&I's contract Nos. 132175 and 132177 with NNI require CB&I to have two full-time inspectors, known as "Purchaser's Quality Representatives" (PQRs), at NNI's facility to perform oversight of NNI quality-assurance activities associated with the fabrication of AP1000 shield building structural modules for Vogtle and V.C. Summer.

When a PQR identifies any condition adverse to quality such as a failure, malfunction, deficiency, deviation, defective material and equipment, or nonconformance, the PQR initiates a NUC under CB&I's QA program that requires NNI to provide a corrective action under CB&I's corrective-action program.

The NRC inspection team verified a sample of 13 of the 28 CB&I NUCs that had been generated as of August 8, 2013, that were associated with the fabrication of AP1000 shield building structural modules for Vogtle Units 3 and 4 and V.C. Summer Units 2 and 3. The inspectors reviewed those NUCs to confirm that they identified root causes, established corrective actions, and verified the effective implementation of those actions through followup.

The NRC inspection team noted that NNI provided a response to these NUCs; however, NNI failed to enter and evaluate in its corrective-action program the NUCs for conditions adverse to quality. NNI circumvented its corrective-action program by processing the NUCs outside NNI's corrective-action program and, as a result, these NUCs did not go through the NNI's corrective-action screening committee to determine the significant level of deficiency for potential conditions adverse to quality. Further, the inspectors noted that several of these NUCs had been initiated because of recurring problems identified by the CB&I PQR.

In addition, the NRC inspection team reviewed the NNI root-cause evaluation report, RCA-97 that was developed on the basis of repetitive audit findings by CB&I (and previous owner Shaw) in NNI's ineffective implementation of its corrective-action program. The inspectors noted that RCA-97 did not consider factors such as customer-identified conditions adverse to quality such as CB&I NUCs. The inspectors interviewed the NNI root-cause evaluation team to understand the methodology for the selection of certain factors and the failure to consider others when conducting the root-cause evaluation.

Based on the review of RCA-97 and interviews performed to members of NNI's root cause evaluation team, the NRC inspection team determined that NNI had failed to establish measures to assure that customer-identified conditions adverse to quality, such as failures, malfunctions, deficiencies, deviations, defective material and equipment, and nonconformances are promptly identified, and corrective action taken to preclude repetition. Specifically, NNI did not enter and evaluate in its corrective-action program the conditions adverse to quality identified by CB&I PQRs and documented in the NUCs for potential conditions

adverse to quality in order to preclude repetition. The NRC inspection team identified this failure as Nonconformance 99901433/2013-201-01.

c. Conclusions

The NRC inspection team issued Nonconformance 99901433/2013-201-01 in association with NNI's failure to implement the regulatory requirements of Criterion XVI of Appendix B to 10 CFR Part 50.

Nonconformance 99901433/2013-201-01 cites NNI for failure to establish measures to assure that customer-identified conditions adverse to quality, such as failures, malfunctions, deficiencies, deviations, defective material and equipment, and nonconformances are promptly identified, and to assure that corrective action is taken to preclude repetition.

10. Entrance and Exit Meetings

On September 16, 2013, the NRC inspection team discussed the scope of the inspection with Mr. Diakun, President, and other members of NNI management and technical staff. On September 20, 2013, the NRC inspection team presented the inspection results and observations during an exit meeting with Mr. Diakun and other members of NNI management and technical staff. The attachment to this report lists the attendees of the entrance and exit meetings, as well as those individuals whom the NRC inspection team interviewed.

## ATTACHMENT

### 1. ENTRANCE/EXIT MEETING ATTENDEES

Name	Title	Affiliation	Entrance	Exit	Interviewed
Peter Diakun	President	Newport News Industrial (NNI)	X	X	
Doug Sample	Manager Technical Services	NNI	X	X	X
Paul Vinyard	Quality Manager	NNI	X	X	X
Albert Kalaskas	Quality Engineer	NNI			X
Bernard Wigginton	Nuclear Source Inspector Procurement Power	Chicago Bridge and Iron (CB&I)			X
Laura Burger	Records Center	NNI			X
Mike Walsh	Contract & Purchasing	NNI			X
Tim Laursen	Performance Consultant	WDI			X
James Whitley	Planning Manager	NNI			X
Derrick Coates	Program Manager	NNI			X
Jeff Gowers	Quality Analyst II	NNI			X
Peter Smagula IV	Project Engineer	NNI			X
Richard Blount	Operations & Support Manager	NNI			X
Mathew Hubbard	Quality Analyst II	NNI			X
Scott Jones	Construction Superintendent	NNI			X
Keith Meadows	CAP Coordinator	NNI			X
Lisa Lindsey	Structural Mechanical Inspector Level II	NNI			X
Jesse Ricks	Welder	NNI			X
Anthony Woodard	Quality Control / Nondestructive Examiner (NDE) Inspector Level II	NNI			X
Gary Michaelis	NDE Level III Inspector	NNI			X
Steve Bocrie	Supervisor Testing and Inspection, Quality Control	NNI			X
Kyle Jaffeux	QC Administrative Assistant	NNI			X
Walt Greene	Warehouse Supervisor	NNI			X
Jason Mintz	QC Inspector	NNI			X
Kevin Angle	Welding Foreman	NNI			X
Ed Derlin	Level II Inspector	NNI			X
Nelson Farrar	Welder	NNI			X
Eric White	Level II Inspector	NNI			X
Keith Long	Quality Inspector	NNI			X
Joseph Ernst	Project Manager	CB&I	X	X	
Steve Napiecek	Manager, Technical Services	NNI	X	X	
Robert Schatzel	Program Director	NNI	X	X	
Randy Musser	Chief of Inspection Branch 3, Atlanta Regional Office	NRC		X	
James Beardsley	Chief of the Construction Inspection Program Branch	NRC		X*	
Marilyn Kavchak	Quality Assurance	CB&I		X*	

<b>Name</b>	<b>Title</b>	<b>Affiliation</b>	<b>Entrance</b>	<b>Exit</b>	<b>Interviewed</b>
Keyes Niemer	Program Manager	CB&I		X*	
Earl Duda	Program Manager for Inspections	CB&I		X*	

\*Participated by teleconference

## 2. INSPECTION PROCEDURES USED

Inspection Procedure (IP) 36100, "Inspection of 10 CFR Part 21 and Programs for Reporting Defects and Noncompliance," dated February 13, 2012.

IP 43002, "Routine Inspections of Nuclear Vendors," dated July 15, 2013.

IP 43004, "Inspection of Commercial-Grade Dedication Programs," dated April 25, 2011.

## 3. LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

<b>Item Number</b>	<b>Status</b>	<b>Type</b>	<b>Description</b>
99901433/2013-201-01	Opened	NON	Criterion 16
99901433/2013-201-02	Opened	NON	Criterion 4 and 7

## 4. INSPECTIONS, TESTS, ANALYSES, AND ACCEPTANCE CRITERIA

The U.S. Nuclear Regulatory Commission (NRC) inspection team identified the following inspections, tests, analyses, and acceptance criteria (ITAAC) related to components being fabricated, manufactured, and tested at Newport News Industrial (NNI). At the time of the inspection, NNI was involved in fabrication of the panels being used to manufacture the shield building structural modules for the AP1000 reactor design. For the ITAAC listed below, the NRC inspection team reviewed NNI's quality-assurance controls in the areas of inspection and manufacturing control, commercial-grade dedication, special processes, oversight of contracted activities, control of measuring and test equipment, nonconforming materials parts and components, and corrective actions. The ITAAC design commitments cited below are for future use by the NRC staff during the ITAAC closure process; the listing of these ITAAC design commitments does not signify that they have been met and/or closed. The NRC inspection team did not identify any findings associated with the ITAAC listed below.

Appendix C to the Combined License for Vogtle Electric Generating Plant Unit 3	No. 761	ITAAC 3.3.00.02.a.i.b
Appendix C to the Combined License for Vogtle Electric Generating Plant Unit 4	No. 761	ITAAC 3.3.00.02.a.i.b
Appendix C to the Combined License for Virgil C. Summer Nuclear Station Unit 2	No. 761	ITAAC 3.3.00.02.a.i.b
Appendix C to the Combined License for Virgil C. Summer Nuclear Station Unit 3	No. 761	ITAAC 3.3.00.02.a.i.b

## 5. DOCUMENTS REVIEWED

### Policies and Procedures

- Newport News Industrial (NNI) quality-assurance manual (QAM)-100, "Commercial Nuclear Facility Applications Quality Assurance Manual," Revision C, dated April 26, 2013
- Standard instruction (SI)-QA-10, "Qualification and Certification of Inspection and Test Personnel," Revision I, dated April 13, 2012
- SI-QA-4, "Control of Suppliers for Commercial and Commercial Nuclear Work," Revision H, dated October 22, 2012
- SI-QA-5, "Supplier Evaluation Program," Revision M, dated July 26, 2012
- SI-QA-8, Weld Metal Issue, Revision N-1, dated August 7, 2013
- SI-QA-18, Welding Performance Qualification Requirements, Revision O, Dated July 16, 2013
- SI-QA-18 QWL, Qualified Welders List, Effective September 16, 2013
- SI-QA-19, "Quality Assurance Requirements for Commercial-Grade Items and Services," Revision D, dated October 15, 2012
- SI-QA-20, "Sampling for Inspection," Revision B, dated November 10, 2011
- SI-QA-21, "Counterfeit, Fraudulent and Suspect Items," Revision B, dated October 10, 2011
- SI-QA-22, "Requirements for Issuance and Processing of Nonconformity Reports (NCR)," Revision D, dated September 22, 2013
- SI-QA-23, "Corrective Action Program," Revision C, dated September 12, 2013
- SI-QA-24, "Material Storage, Segregation, and Identification," Revision A-1, dated January 24, 2013
- SI-QA-27, "Cause Evaluation Process," Revision A, dated September 12, 2013
- SI-QA-52, "Part Numbering and Material List," Revision F, dated October 15, 2012
- NNI Instruction 7340-F-W001, Shaw AP 1000 Shield Building Modules-Welding Of Modules Plate to Plate, Nelson D2L (D2S Modified D2L), and Lenton Weldable Couplers, Revision E, dated June 28, 2013
- NNI Instruction 7340-F-W002, CB&I AP 1000 Shield Building Modules-Shot Studs (Nelson S3L), Revision A, dated September 7, 2013
- NNI Instruction 7340-F-W003, Shaw AP 1000 Shield Building Modules-Welding Procedure Qualification Records, Revision F, dated September 7, 2013
- NNI Instruction 7340-F-W004, Shaw AP 1000 Shield Building Modules-Welding Procedure Specifications, Revision F, dated September 7, 2013
- NNI Instruction 7340-F-W005, Shaw AP 1000 Shield Building Modules-Welding of Rebar, Revision B, dated October 10, 2012
- NNI Instruction 7340-F-Q001, Shaw AP 1000 Shield Building Modules-QA/QC Plan, Revision C-1, dated November 26, 2012
- NNI Instruction 7340-F-Q002, Shaw AP 1000 Shield Building Modules-Cleaning Instructions, Revision B, dated December 4, 2012
- NNI Instruction 7340-F-Q003, Shaw AP 1000 Shield Building Modules-Inspection and Test Plan, Revision D, dated January 22, 2013
- NNI Instruction 7340-F-Q005, Shaw AP 1000 Shield Building Modules-Shaw AP1000 Shield Building Modules-Radiographic Examination of Structural Elements, Revision C, dated April 2, 2013

- NNI Instruction 7340-F-Q006, Shaw AP 1000 Shield Building Modules-Shaw AP1000 Shield Building Modules-Ultrasonic Examination of Structural Elements Revision C, dated May 13, 2013
- NNI-7340-F-WH003, "Shaw AP1000 Shield Building Modules - Receipt Inspection and Storage of NNI Controlled Material," Revision C, dated February 1, 2013
- NNI-7340-F-A001, "Product Model Development and Approval Instructions," Revision B-1, February, 18, 2013
- NNI-7340-F-A002, Design Lofting and Data Files Instruction, Revision B, February 13, 2013
- NNI-7340-F-A003, Structural Drawing Instruction, Revision B, February 13, 2013
- SI-DE-1, Records Center Controlled Distribution of Documents, Revision J, June 3, 2013
- SI-DE-2, Drawing and Fabrication Specification Control, Revision G, February 11, 2013
- SI-DE-3, Records Management Program, Revision A, June 3, 2013
- SI-FP-7, Control of Measuring and Test Equipment, Revision L, October 31, 2012
- SI-FP-2, Accountability and Controls of Tools, Revision G, August 31, 2013
- SI-EN-1, Magnetic Particle Inspection in Accordance with ASME Section V using Prod's Yoke or Longitudinal Magnetization Technique with Dry Powder Particles, Revision U, dated May 16, 2013
- SI-EN-9 Processing of Welding Procedure Qualification Records (WPS), Procedure Qualification Records (PQRs) and Welder Performance Qualification Records (WPQRs), Revision H, dated September 15, 2008
- SI-EN-2, Qualification of Nondestructive Examination Personnel, Revision R, dated September 30, 2011
- SI-EN-14, Visual Inspection of Welds and Material Surfaces in Accordance with ASME Section III, Division 1, Revision S, dated June 19, 2013
- SI-EN-18, NDE Acceptance Criteria, ASME Section VIII Division 1 and 3, American National Standard Structural Welding Codes-AWS, B31.3-Process Piping, Revision P, Dated June 20, 2013

#### Purchase Orders (POs)

- PO 012350, dated February 14, 2013, MOD 5, Tioga Pipe Supply Co., for steel plate.
- PO 013335, dated March 26, 2012, MOD 2, Advex Corp. Services, for RT blanket on welding.
- PO 014157, dated June 5, 2012, MOD 6, Advex Corp. Services, for machining holes for countersinks and weld preps.
- PO 018290, dated June 27, 2013, MOD 0, Advex Corp. Services, for machine connection plate.
- PO 018289, dated June 27, 2013, MOD 0, Advex Corp. Services, for machined linear plate.
- PO 013651, dated April 20, 2012, MOD 0, Nelson Stud Welding Inc., for Nelson® studs.
- PO 014717, dated July 20, 2012, MOD 2, ESAB Welding and Cutting Products, for welding material.
- PO 015724, dated October 18, 2012, MOD 1, ESAB Welding and Cutting Products, for welding material.
- PO 016552, dated January 11, 2013, MOD 2, ESAB Welding and Cutting Products, for welding material.
- PO 013068, dated March 5, 2012, MOD 1, Tioga Pipe Supply Co., for Lenton® couplers.

- PO 012642, dated February 1, 2012, MOD 1, Tioga Pipe Supply Co., for rebar and D45 deformed steel wire.
- PO 014205, dated June 8, 2012, MOD 10, ATI Fabricated Components, for work on the water jets.

#### Drawings and Specifications

- NNI-1208-S4-411, Ap1000 Shield Building Panel Group 41 Assembly, Sheet 1, Revision 1
- NNI-1208-S4-411, Ap1000 Shield Building Panel Group 41 Assembly, Sheet 2, Revision 1
- NNI-1208-S4-411, Ap1000 Shield Building Panel Group 41 Assembly, Sheet 3, Revision 1
- NNI-1208-T7-411, AP1000 Shield Building Group 41 Weld Joint Index Map, Sheet 1, Revision 0
- NNI-1208-T7-411, AP1000 Shield Building Group 41 Weld Joint Index Map, Sheet 2, Revision 0
- NNI-1208-S4-251, AP1000 Shield Building Group 25 Assembly, Sheet 1, Revision 1
- NNI-1208-S4-251, AP1000 Shield Building Group 25 Assembly, Sheet 2, Revision 1
- NNI-1208-S4-251, AP1000 Shield Building Group 25 Assembly, Sheet 3, Revision 1
- NNI-1208-T7-251, AP1000 Shield Building Group 25 Weld Joint Index Map, Sheet 1, Revision 1
- NNI-1208-T7-251, AP1000 Shield Building Group 25 Weld Joint Index Map, Sheet 2, Revision 1
- NNI-1208-T7-251, AP1000 Shield Building Group 25 Weld Joint Index Map, Sheet 3, Revision 1
- NNI-1208-S4-261, AP1000 Shield Building Group 26 Assembly, Sheet 1, Revision 7
- NNI-1208-S4-261, AP1000 Shield Building Group 26 Assembly, Sheet 2, Revision 7
- NNI-1208-S4-261, AP1000 Shield Building Group 26 Assembly, Sheet 3, Revision 7
- NNI-1208-S9-100, "AP1000 Shield Building General Notes, Tolerances and NDE Requirements", Revision 2

#### Calibration, Heat Treatment, NDE, and Inspection Reports

- Inspection Data Report 086, Dimensional Inspection of Gussets, January 17, 2013
- Inspection Data Report 083, Dimensional Inspection of Gussets, January 11, 2013
- Inspection Data Report 371, Dimensional Inspection of Hole Size and Locations of Liner Plate 4003A, August 17, 2013
- Inspection Data Report 398, Dimensional Inspection of Outer Liner Plate 2604B, October 11, 2012
- Certificate of Calibration 5875789, Digital Temp Meter, November 13, 2012
- Certificate of Calibration 6188103, No Go Thread Ring, August 26, 2013
- Inspection Data Reports for ATI Corporation:
  - 004, 005, 006, 007, 364, 086, 087, 089, 092, 093, 094, 095, 097, 098, 105, 114, 117, 121, 130, 058, 062, 072, 080, 043, 048, 050, 053, 056, 057, 007, 004, 020, 021, 030, 011, 012, 013, 014, 015, 016, 017, 018, 019
- Weld Procedure Specifications (WPS) Numbers 1006, 1016, 1017, and 1019
- Procedure Qualification Record (PQR) Numbers 1010, 1011, 1015, 1033, 1035, 1036, 1037, 1040, 1046, and 1047

### Audit/Surveys Reports

- NNI Quality System Audit Report File No. 960-080-01-2012, dated February 08, 2013
- Laboratory Testing, Inc. Commercial-Grade Survey (Plan LTS-SS-01-11)
- Laboratory Testing, Inc. Commercial-Grade Checklist (Plan LTS-SS-01-11)
- Laboratory Testing, Inc. Commercial-Grade Report (Plan LTS-SS-01-11)
- Simco Electronics Commercial-Grade Survey (Plan SIM-CGS-SS-01-10)
- Simco Electronics Commercial-Grade Checklist (Plan SIM-CGS-SS-01-10)
- Simco Electronics Commercial-Grade Report (Plan SIM-CGS-SS-01-10)
- Advex Corporation Commercial-Grade Survey (Plan AVX-CGS-SS-01-11)
- Advex Corporation Commercial-Grade Checklist (Plan AVX-CGS-SS-01-11)
- Advex Corporation Commercial-Grade Report (Plan AVX-CGS-SS-01-11)
- ESAB Welding & Cutting Systems Commercial-Grade Survey (Plan ESAB(M)-CGS-MO-01-12)
- ESAB Welding & Cutting Systems Commercial-Grade Checklist (Plan ESAB(M)-CGS-MO-01-12)
- ESAB Welding & Cutting Systems Commercial-Grade Report (Plan ESAB(M)-CGS-MO-01-12)
- Automated Precision, Inc. Services Commercial-Grade Survey (Plan APIS-CGS-SS-01-13)
- Automated Precision, Inc. Services Commercial-Grade Checklist (Plan APIS-CGS-SS-01-13)
- Automated Precision, Inc. Services Commercial-Grade Report (Plan APIS-CGS-SS-01-13)
- Lincoln Electric Company, Inc. Report LECO-MO-1-13 dated May 7, 2013
- DuBose National Energy Services, Inc. Report DB-MO-01-13 dated June 3, 2013
- Tioga Pipe Supply Company Report TP-MO-01-11 July 29,2011
- Burns and Roe Enterprises, Inc. Report BR-SS-01-12 dated December 8, 2012
- Lincoln Structural Solutions Report LSS-MO-01-11 dated September 23, 2012
- Semi-Annual Supplier Performance Reports
  - July 2012–December 2012
  - Jan 2012–June 2012
  - Jan 2011–June 2011
  - July 2011–December 2011
  - 1st and 2nd quarter review

### Nonconformance Reports

11, 77, 79, 90, 92, 94, 95, 99, 108, 110, 111, 113, 115, 116, 125, 144, 145, 166, 205, 225, 300, 317, 349, 359, 369, 371, 372, 382

### Condition Reports

96, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 110, 224, RCA-CR-96, RCA-CR-97

### Corrective Reports Generated During the NRC Inspection

233, 234, 238, 240, 241, 242, 244, 245, 248, 249, 251, 256, 268, 269, 270, 271



## Customer Specifications and Reports

- CB&I's Document No. 132175-D100.SB003-SOW, "Scope of Work/QA Requirements For Fabrication of the AP1000 Shield Building Structural Modules," Revision 3, dated May 23, 2013

## Miscellaneous

- Chicago Bridge & Iron (CB&I) notice of unsatisfactory condition (NUC) No. 132175-002, dated August 16, 2012, for failure to apply NNI traceability to materials in warehouse;
- CB&I NUC No. 132175-002a, dated September 7, 2012, for incorrect documentation of a welding record;
- CB&I NUC No. 132175-003, dated September 7, 2012, for NNI not being aware of AWS D1.1 welder-qualification requirements;
- CB&I NUC No. 132175-004, dated September 7, 2012, for NNI not being aware of AWS D1.1 welder-qualification requirements;
- CB&I NUC No. 132175-005, dated September 7, 2012, for incorrect tagging and material accountability and documentation needing revision to reflect actual line number inspected;
- CB&I NUC No. 132175-006, dated September 7, 2012, for NCR # 52 being insufficient as issued and not adequately identifying the discrepant part;
- CB&I NUC No. 132175-008, dated September 07, 2012, for failure to identify unacceptable surface condition on gussets;
- CB&I NUC No. 132175-009, dated January 9, 2013, for failure to include tolerances in the drawing/sketch;
- CB&I NUC No. 132175-015, dated January 30, 2013, for failure to meet American Welding Society (AWS) D1.1-2000 code requirements with regards to a radiographic examination procedure (NNI radiographic testing (RT) procedure No. 7340-F-Q005, Revision 1, has technical errors and does not meet AWS D1.1-2000 Code);
- CB&I NUC No. 132175-016, dated January 31, 2013, for NNI 7340-F-Q006, Revision A, Ultrasonic Examination of Structural Elements (with Attachment I ADVEX procedure NDT-UT-601) having technical errors according to the AWS D1.1-2000 Code.
- CB&I NUC No. 132175-017, dated March 5, 2013, for failure to meet identification and marking requirements (fabrication components do not meet the Westinghouse specification APP-1200-Z0-001, Revision 0, section 26, paragraph 26.1, "Identification and Marking").
- CB&I NUC No. 132175-018, dated February 26, 2013, for failure to verify the accuracy and readability of documentation on receipt from suppliers before acceptance (Tioga certified material test reports (CMTRs) accepted with illegible QA acceptance stamps);
- CB&I NUC No. 132175-025, dated July 29, 2013, for failure to maintain adequate quality records to assure reproducibility (NNI lost evidence of NCR 335A in the NCR database because the NCR database crashed).
- CB&I NUC NO.132177-D-100-58300-405-004-08, dated August 02, 2012, for failure to maintain identification and traceability (wrong heat number marked on materials at ADVEX);
- CB&I NUC No. 132177-001a, dated September 14, 2012, for loss of material control in warehouse;
- CB&I NUC No. 132177-002, dated September 18, 2012 for work performed without instructions;

- CB&I NUC No. 132177-003, dated October 3, 2012, for QC inspection performed using wrong (conflicting) MOD revisions to purchase order; CB&I NUC No. 132177-004, dated December 19, 2012, for failure to include tolerances in drawing/ sketch for backing bar;
- CB&I NUC No. 132177-005, dated December 19, 2012, for failure to maintain identification (liner plate marked incorrectly);
- NUC No. 132177-006, dated January 8, 2013, for lack of any provision for tracking multiple NCRs related to an individual component (NCR database does not account for revision control of the NCRs and maintenance of previous revisions);
- CB&I NUC No. 132177-007, dated January 16, 2013, for a lack of requirements in NNI QAM-100 that permits revisions to CARs and for the NNI CAR failing to address the issue related to drawings/sketches noted in NUC No. 132175-009;
- CB&I NUC No. 132177-011, dated January 25, 2013, for insufficient corrective action (corrective action failed to address issue related to lack of tolerances in the drawings/sketches as noted in NUC No. 131275-009).
- NNI Vision Test Technician Certification for Mark Bailey dated September 5, 2012;
- NNI Corrective Action Report (CAR) screening committee review report dated September 18, 2013;
- NNI File No. Q-GE-13-012, "Nelson Stud Welding S3L Shear Studs History/Interpretation of Allowance in AWS D1.1-2000 Code for Radial Cracks/Bursts in Shear Stud Heads," dated April 23, 2013;
- NNI 10 CFR Part 21 training dated March 8, 2013;
- Work Package 7340-F-068-003;
- 7340-F-068-003, Fab Shield Building Modules - Vogtle 3, MFG Module 02H (Group 41);
- 7340-F-069-003, Fab Shield Building Module - Vogtle 3, MFG Module 02J (Group 41);
- 7340-F-041-001, Design Change for Groups 25 & 27, Fab Shield Building Modules - Vogtle 3;
- 7340-F-054-016, Machining Operations for EL 100'–103'6", Fab Shield Building Modules - Vogtle 3;
- 7342-F-064-008, Fab Shield Building Modules - Vogtle 4; and 7341-F-073-012, Fab Shield Building Modules - Summer 2