

October 2, 2013

Mr. Steven Smeal, Quality Assurance Manager  
Fabrication & Manufacturing  
Chicago Bridge & Iron  
366 Old Airport Road  
Laurens, SC 29360

SUBJECT: NUCLEAR REGULATORY COMMISSION INSPECTION REPORT  
NO. 99901432/2013-201, NOTICE OF VIOLATION AND NOTICE OF  
NONCONFORMANCE

Dear Mr. Smeal:

From August 19 to August 23, 2013, the U.S. Nuclear Regulatory Commission (NRC) staff conducted an inspection at the Chicago Bridge & Iron facility in Laurens, SC (hereafter referred to as CB&I Laurens). The purpose of this limited-scope routine inspection was to assess CB&I Laurens's 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 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 CB&I Laurens's implementation of quality activities associated with the fabrication and testing of piping and piping modules for the Westinghouse Electric Company AP1000 reactor design. The enclosed report presents the results of the inspection. This NRC inspection report does not constitute NRC endorsement of CB&I Laurens's overall quality assurance (QA) program.

Based on the results of this inspection, the NRC has determined that one Severity Level IV violation of NRC requirements occurred. The NRC evaluated the violation in accordance with the agency's Enforcement Policy, which is available on the NRC's Web site at <http://www.nrc.gov/about-nrc/regulatory/enforcement/enforce-pol.html>.

The enclosed notice of violation (NOV) cites the violation, and the subject inspection report details the circumstances surrounding it. The NOV cites CB&I Laurens for failing to prepare and submit to the Commission an interim report for an evaluation of an identified deviation or failure to comply potentially associated with a substantial safety hazard.

You are required to respond to this letter and to follow the instructions specified in the enclosed NOV when preparing your response. In your response to the enclosed NOV, CB&I Laurens should document the results of the extent of condition review for this finding and determine if there are any effects on other safety-related components. If you have additional information that you believe the NRC should consider, you may provide it in your response to the NOV. The NRC's review of your response to the NOV also will determine if further enforcement action is necessary to ensure compliance with regulatory requirements.

In addition, 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 NRC inspection team determined that CB&I Laurens was not fully implementing its QA program in the areas of control of special processes, design control, and control of purchased equipment, materials and services. The enclosed notice of nonconformance (NON) to this letter identifies the specific findings and references to the pertinent requirements, and the enclosed inspection report describes in detail the circumstances surrounding it. In response to the enclosed NON, CB&I Laurens should document the results of the extent of condition review for these findings and determine if there are any effects on other safety-related components.

Please provide a written explanation or statement within 30 days of this letter in accordance with the instructions specified in the enclosed NON. The NRC will consider extending the response time if you show good cause for doing 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, 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.: 99901432

Enclosures:

1. Notice of Violation
2. Notice of Nonconformance
3. Inspection Report No. 99901432/2013-201  
and Attachment

In addition, 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 NRC inspection team determined that CB&I Laurens was not fully implementing its QA program in the areas of control of special processes, design control, and control of purchased equipment, materials and services. The enclosed notice of nonconformance (NON) to this letter identifies the specific findings and references to the pertinent requirements, and the enclosed inspection report describes in detail the circumstances surrounding it. In response to the enclosed NON, CB&I Laurens should document the results of the extent of condition review for these findings and determine if there are any effects on other safety-related components.

Please provide a written explanation or statement within 30 days of this letter in accordance with the instructions specified in the enclosed NON. The NRC will consider extending the response time if you show good cause for doing 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, 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  
Mechanical Vendor Inspection Branch  
Division of Construction Inspection  
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Office of New Reactors

Docket No.: 99901432

Enclosures:

1. Notice of Violation
2. Notice of Nonconformance
3. Inspection Report No. 99901432/2013-201  
and Attachment

ADAMS Accession No.: ML13263A411

\*via email

NRO-002

OFFICE	NRO/DCIP/MVIB	NRO/DCIP/MVIB	NRO/DCIP/MVIB	NRO/DCIP/MVIB	NRR/DCIP/QVIB
NAME	YDiaz-Castillo	BClarke	RPatel	MAnderson	ABelen
DATE	09/24/2013	09/25/2013	09/25/2013	09/25/2013	09/25/2013
OFFICE	NRO/DE/CIB	NRO/DCIP	NRO/DCIP/MVIB		
NAME	RDavis	TFrye	ERoach		
DATE	09/24/2013	09/26/2013	10/02/2013		

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SUBJECT: NUCLEAR REGULATORY COMMISSION INSPECTION REPORT  
NO. 99901432/2013-201, NOTICE OF VIOLATION AND NOTICE OF  
NONCONFORMANCE

**DISTRIBUTION:**

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## NOTICE OF VIOLATION

Chicago Bridge & Iron  
366 Old Airport Road  
Laurens, SC 29360

Docket No. 99901432  
Report No. 2013-201

During a U.S. Nuclear Regulatory Commission (NRC) inspection conducted at the Chicago Bridge & Iron facility in Laurens, SC (hereafter referred to as CB&I Laurens), from August 19, 2013, through August 23, 2013, a violation of NRC requirements was identified. In accordance with the NRC Enforcement Policy, the violation is listed below:

Title 10 of the *Code of Federal Regulations* (10 CFR), Section 21.21, "Notification of failure to comply or existence of a defect and its evaluation," paragraph 21.21(a)(2) states, "Ensure that if an evaluation of an identified deviation or failure to comply potentially associated with a substantial safety hazard cannot be completed within 60 days from discovery of the deviation or failure to comply, an interim report is prepared and submitted to the Commission through a director or responsible officer or designated person as discussed in § 21.21(d)(5). The interim report should describe the deviation or failure to comply that is being evaluated and should also state when the evaluation will be completed. This interim report must be submitted in writing within 60 days of discovery of the deviation or failure to comply."

CB&I Laurens Procedure BFS-QC-10CFR21, "Procedure for Compliance with 10CFR21," Revision 3, dated April 2, 2012, section 2.5 states, in part, that "In the event the evaluation cannot be completed in 60 days of discovery of the defect or noncompliance, an interim report shall be prepared by the QA/QC Manager and submitted to the Commission. The interim report should describe the deviation or failure to comply that is being evaluated and should also state when the evaluation will be completed. This interim report must be submitted in writing within 60 days of discovery of the defect or noncompliance."

Contrary to the above, as of August 23, 2013, CB&I Laurens failed to prepare and submit to the Commission an interim report within 60 days of discovery for an evaluation of an identified deviation or failure to comply potentially associated with a substantial safety hazard. Specifically, CB&I Laurens identified on January 25, 2012 that it had shipped to its customer safety-related pipe sleeves to be used in the AP1000 modules without verifying the chemical and physical properties, resulting in material of indeterminate quality being shipped to the customer. CB&I Laurens initiated an evaluation of the deviation on January 25, 2012, following discovery of the potential substantial safety hazard. Subsequently, CB&I Laurens performed the commercial-grade dedication of the pipe sleeves and on May 21, 2012, determined that there was no substantial safety hazard. This evaluation was completed 120 days after discovery; however CB&I Laurens did not submit a 60-day interim report to the Commission as required.

This issue has been identified as Violation 99901432-2013-201-01.

This is a Severity Level IV violation (Section 6.9.d of the NRC Enforcement Policy).

Under the provisions of 10 CFR 2.201, "Notice of Violation," CB&I Laurens is hereby required to submit a written statement or explanation to the U.S. Nuclear Regulatory Commission, ATTN:

Enclosure 1

Document Control Desk, Washington, DC 20555-0001, with a copy to the Chief, Construction Mechanical Vendor 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 violation. This reply should be clearly marked as a "Reply to a Notice of Violation" and should include (1) the reason for the violation or, if contested, the basis for disputing the violation or severity level, (2) the corrective steps that have been taken and the results achieved, (3) the corrective steps that will be taken, and (4) the date when full compliance will be achieved. Your response may reference or include previous docketed correspondence if the correspondence adequately addresses the required response. Where good cause is shown, the NRC will consider extending the response time.

If you contest this enforcement action, provide a copy of your response, with the basis for your denial, to the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001.

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 agency can make it available to the public without redaction. If personal privacy or proprietary information is necessary to provide an acceptable response, then 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."

In accordance with 10 CFR 19.11, "Posting of Notices to Workers," you may be required to post this notice within 2 working days of receipt.

Dated this 2nd day of October 2013.

## NOTICE OF NONCONFORMANCE

Chicago Bridge & Iron  
366 Old Airport Road  
Laurens, SC 29360

Docket No. 99901432  
Report No. 2013-201

Based on the results of a U.S. Nuclear Regulatory Commission (NRC) inspection conducted at the Chicago Bridge & Iron facility in Laurens, SC (hereafter referred to as CB&I Laurens), from August 19, 2013 through August 23, 2013, it appears that CB&I Laurens did not conduct certain activities in accordance with NRC requirements that were contractually imposed upon CB&I Laurens by its customers or NRC licensees:

- A. Criterion IX, "Control of Special Processes," 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," states, in part, that "Measures shall be established to assure that special processes, including welding, heat treating, and nondestructive testing, are controlled and accomplished by qualified personnel using qualified procedures in accordance with applicable codes, standards, specifications, criteria, and other special requirements."

CB&I Laurens Welding Procedure Specification No. AP1000-803, Revision 2, dated February 12, 2011, states, in part, that "Voltage ranges shall be as required to maintain a maximum of 30,000 joules per inch heat input."

Contrary to the above, as of August 23, 2013, CB&I Laurens failed to perform welding activities in accordance with qualified procedures. Specifically, CB&I Laurens did not maintain weld heat input limits while welding pipe spool 890300-40-00647, serial number SV3-RNS-PLW-015-3, weld number 10 for Vogtle Electric Generating Plant Unit 3. The NRC inspection team measured the heat input of four weld beads and determined that the heat input of all four weld beads was greater than the maximum weld heat input limit of 30,000 joules per inch. The weld heat input limit was exceeded by 5,000, 27,000, 27,000, and 28,000 joules per inch, respectively.

This issue has been identified as Nonconformance 99901432/2013-201-02.

- B. Criterion III, "Design Control," of Appendix B to 10 CFR Part 50, states, in part, that "Measures shall be established for the selection and review for suitability of application of materials, parts, equipment, and processes that are essential to the safety-related functions of the structures, systems and components."

Contrary to the above, as of August 23, 2013, CB&I Laurens failed to ensure the selection and review for suitability of application of materials, parts, equipment, and processes that are essential to the safety-related functions of the structures, systems and components. Specifically, CB&I Laurens did not perform an engineering evaluation and consider qualitative factors (e.g., supplier performance, historical quality controls, complexity of item, safety significance of the item) for the selection of the sampling plan's sample size used for dedicating commercial-grade seamless pipes to be used in piping sleeves, to provide reasonable assurance that when used as basic components they will perform their intended safety function. The NRC inspection team identified four examples of seamless pipes that were procured as commercial-grade items and then

inadequately dedicated to be used as safety-related components by CB&I Laurens in job Nos. 230038, 230039, 230040, and 230041.

This issue has been identified as Nonconformance 99901432/2013-201-03.

- C. Criterion VII, "Control of Purchased Material, Equipment, and Services," of Appendix B to 10 CFR Part 50, states, in part, that "These measures shall include provisions, as appropriate, for source evaluation and selection, objective evidence of quality furnished by the contractor or subcontractor, inspection at the contractor or subcontractor source, and examination of products upon delivery. 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."

Criterion XVIII, "Audits," of Appendix B to 10 CFR Part 50 states, in part, that "a comprehensive system of planned and periodic audits shall be carried out to verify compliance with all aspects of the quality assurance program and to determine the effectiveness of the program."

Subsection 7.7.6 of CB&I Laurens' Quality Manual, states, in part, that "Material Organizations and Suppliers qualified by B.F. Shaw, Inc. in accordance with 7.7.3 (C) of this Manual shall be re-surveyed on a triennial basis to maintain their listing on the Nuclear Approved Vendors List (NAVL)."

Subsection 7.7.7 of CB&I Laurens' Quality Manual, in part, that "Material Organization and Suppliers qualified by B.F. Shaw, Inc [...] shall be evaluated annually utilizing audits or performance assessments to document the effectiveness of the Material Organization's/Supplier's Quality System Program."

Contrary to the above, as of August 23, 2013, CB&I Laurens failed to perform periodic audits and source evaluations to verify the effectiveness of the control of quality by contractors and subcontractors at intervals consistent with the importance, complexity, and quantity of the product or services.

Specifically,

1. For safety-related procurement, CB&I Laurens did not perform triennial audits and adequate annual evaluations of its safety-related suppliers. Specifically, CB&I Laurens did not perform triennial audits of 11 nuclear suppliers prior to purchasing and shipping safety-related materials to its customers. Additionally, CB&I Laurens did not perform adequate annual evaluations of these safety-related suppliers. By failing to perform supplier triennial audits and adequate annual evaluations, CB&I Laurens did not assure that safety-related suppliers were effectively implementing their quality assurance programs before issuing purchase orders.
2. For commercial procurement, CB&I Laurens did not conduct a commercial-grade survey or source surveillance to verify that DuBose National Energy's quality program included the requisite processes, such as material traceability, and lot and batch controls, for the control of critical characteristics necessary to provide reasonable assurance that commercial-grade materials to be used as basic



components will perform their intended safety function. CB&I Laurens relied on DuBose National Energy's issued certified material test reports as the sole method to verify critical characteristics of acceptance (e.g., tensile properties, yield, and elongation) during the commercial-grade dedication of pipe sleeves, plates, and beams for use in the construction of AP1000 R365 module assembly and CA20 module pipe sleeves.

3. CB&I Laurens did not verify that test controls used in the testing of the demineralized water for hydrostatic testing and final cleaning of safety-related pipe sub-assemblies were adequately controlled. CB&I Laurens only verified that ALS Environmental was certified to ISO/IEC 17025, "General Requirements for the Competence of Testing and Calibration Laboratories." ISO/IEC 17025 accreditation may not be used solely as the basis for qualifying safety-related testing services. Without verifying the adequacy of ALS Environmental's test controls, CB&I Laurens failed to assure that the validity of the test results will provide reasonable assurance that pH, conductivity, fluoride, and chlorides met the water quality specifications. If out of specification, these impurities could degrade the ability of stainless steel components to perform their safety-function during plant operations.

This issue has been identified as Nonconformance 99901432/2013-201-04.

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, Construction Mechanical Vendor 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 taken 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, 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, then 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 XXth day of September 2013.

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

Docket No.: 99901432

Report No.: 99901432/2013-201

Vendor: Chicago Bridge & Iron  
366 Old Airport Road  
Laurens, SC 29360

Vendor Contact: Mr. Steven Smeal  
Quality Assurance Manager  
E-mail: steven.smeal@cbi.com  
Phone: 864-683-3970

Nuclear Industry Activity: Chicago Bridge & Iron (hereafter referred to as CB&I Laurens), located in Laurens, SC, has been providing pipe bending and piping fabrication services for over 25 years. CB&I Laurens's scope of supply includes fabrication and assembly of pressure piping, American Society of Mechanical Engineers (ASME) Boiler & Pressure Vessel (B&PV) Code Class 1, 2 & 3 fabrication of supports, and ASME B&PV Class 1, 2 & 3 shop assemblies. CB&I's services include pipe bending, piping fitting and assembly of safety-related piping, and piping modules for the Westinghouse Electric Company AP1000 new reactor construction.

Inspection Dates: August 19 - 23, 2013

Inspectors: Yamir Diaz-Castillo NRO/DCIP/MVIB  
Brent Clarke NRO/DCIP/MVIB  
Raju Patel NRO/DCIP/MVIB  
Mary Anderson NRO/DCIP/MVIB  
Aixa Belén NRO/DCIP/QVIB  
Robert Davis NRO/DE/CIB

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

## **EXECUTIVE SUMMARY**

Chicago Bridge & Iron  
99901432/2013-201

The U.S. Nuclear Regulatory Commission (NRC) staff conducted a vendor inspection at the Chicago Bridge & Iron facility in Laurens, SC (hereafter referred to as CB&I Laurens), 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 CB&I Laurens 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 August 19 to August 23, 2013.

This technically-focused inspection specifically evaluated CB&I Laurens's implementation of quality activities associated with the fabrication and testing of piping and piping modules for the Westinghouse Electric Company (WEC) AP1000 reactor design.

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

- commercial-grade dedication of carbon steel pipes for use in the construction of the AP1000 C20 module for the Vogtle Electric Generating Plant (VEGP), Units 3 and 4, and Virgil C. Summer (VCS) Generating Station, Units 2 and 3
- set-up and performance of hydrostatic testing of ASME Section III Class 3 pipe sub-assemblies for the VEGP Unit 3 Waste Water System, VEGP Unit 4 Liquid Radwaste System; and VCS Unit 2 Liquid Radwaste and Waste Water System
- set-up and performance of in-process inspection after cold bending operation of pipe sub-assembly for VEGP Unit 4 Passive Core Cooling System
- manual Gas Tungsten Arc Welding (GTAW) on pipe spool 890300-40-00647, serial number SV3-RNS-PLW-015-3, weld number 10, for VEGP Unit 3, Residual Heat Removal System, ASME Code Section III, Code Class 2 piping
- manual GTAW Welding on pipe spool 891300-40-00647, serial number SV4-RNS-PLW-015-3, weld number 11, for VEGP Unit 4, Residual Heat Removal System, ASME Code Section III, Code Class 2 piping
- manual GTAW on pipe spool 892300-40-00069, serial number VS2-RNS-PLW-162-2, weld number 5, for VCS Unit 2, Residual Heat Removal System, ASME Code Section III, Code Class 3 piping
- liquid penetrant examination of pipe spool 892300-40-00069, serial number VS2-RNS-PLW-162-2, weld number 5 for VCS Unit 2, Residual Heat Removal System, ASME Code Section III, Code Class 3 piping
- tool room attendant activities associated with the storage of welding rods, issuance of welding rods, and return of unused welding rods

In addition to observing these activities, the NRC inspection team verified that measuring and test equipment was properly identified, marked, calibrated, and used within its calibrated range. The NRC inspection team also walked down CB&I Laurens'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 April 25, 2011, 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 first NRC inspection at the CB&I Laurens facility. The NRC started an inspection in May 2012, but the agency terminated it early because the amount of safety-related activities being performed during the week of the inspection was insufficient to make a determination on the effectiveness of CB&I Laurens's implementation of its Appendix B to 10 CFR Part 50 and 10 CFR Part 21 programs. This inspection focused on the fabrication of safety-related piping and piping modules for the VEGP, Units 3 and 4, and VCS, Units 2 and 3.

With the exception of the notice of violation and nonconformances described below, the NRC inspection team concluded that CB&I Laurens's QA policies and procedures comply with the applicable requirements of Appendix B to 10 CFR Part 50 and 10 CFR Part 21, and that CB&I Laurens's personnel are implementing these policies and procedures effectively. The results of this inspection are summarized below.

#### 10 CFR Part 21 Program

The NRC inspection team issued Violation 99901432/2013-201-01 for CB&I Laurens's failure to implement the regulatory requirements of 10 CFR Part 21.21(a)(2). Violation 99901432/2013-201-01 cites CB&I Laurens for failing to submit to the Commission an interim report for the evaluation of shipped safety-related pipe sleeves without the verification of the chemical and physical properties. This resulted in material of indeterminate quality being shipped to the customer.

#### Manufacturing Control

The NRC inspection team issued Nonconformance 99901432/2013-201-02 in association with CB&I Laurens's failure to implement the regulatory requirements of Criterion IX, "Control of Special Processes," of Appendix B to 10 CFR Part 50. Nonconformance 99901432/2013-201-02 cites CB&I Laurens for failing to perform welding activities in accordance with qualified procedures. Specifically, CB&I Laurens did not maintain weld heat input limits while welding pipe spool 890300-40-00647, serial number SV3-RNS-PLW-015-3, weld number 10 for VEGP Unit 3. The NRC inspection team measured the heat input of four weld beads and determined that the heat input of all four weld beads was greater than the maximum weld heat input limit of 30,000 joules per inch. The weld heat input limit was exceeded by 5,000, 27,000, 27,000, and 28,000 joules per inch, respectively.

### Commercial-Grade Dedication

The NRC inspection team issued Nonconformance 99901432/2013-201-03 in association with CB&I Laurens's failure to implement the regulatory requirements of Criterion III, "Design Control," of Appendix B to 10 CFR Part 50. Nonconformance 99901432/2013-201-03 cites CB&I Laurens for failing to establish an adequate commercial-grade dedication program for the materials used in the construction of the AP1000 R365 module assembly. Specifically, CB&I Laurens did not perform an engineering evaluation and consider qualitative factors (e.g., supplier performance, historical quality controls, complexity of item, and safety significance of the item) for the selection of the sampling plan's sample size used for dedicating commercial-grade seamless pipes to provide reasonable assurance that when used as basic components they will perform their intended safety function. The NRC inspection team identified four examples of seamless pipes to be used as piping sleeves that were procured as commercial-grade items and then inadequately dedicated to be used as safety-related components by CB&I Laurens in job Nos. 230038, 230039, 230040, and 230041.

### Oversight of Contracted Activities and Internal Audits

The NRC inspection team issued Nonconformance 99901432/2013-201-04 in association with CB&I Laurens's failure to implement the regulatory requirements of Criterion VII, "Control of Purchased Material, Equipment, and Services," and Criterion XVIII, "Audits," of Appendix B to 10 CFR Part 50. Nonconformance 99901432/2013-201-04 cites CB&I Laurens for failing to perform periodic audits and source evaluations to verify the effectiveness of the control of quality by contractors and subcontractors at intervals consistent with the importance, complexity, and quantity of the product or services. Specifically, CB&I Laurens (1) did not perform triennial audits and adequate annual evaluations of its safety-related suppliers, (2) did not conduct a commercial-grade survey or source surveillance to verify that DuBose National Energy's quality program included the requisite processes, such as material traceability and lot/batch controls, for the control of critical characteristics necessary to provide reasonable assurance that commercial-grade materials to be used as basic components will perform their intended safety function, and (3) did not verify that the test controls used in the testing of the demineralized water for the hydrostatic testing and final cleaning of safety-related pipe sub-assemblies were adequately controlled. CB&I Laurens only verified that ALS Environmental was certified to ISO/IEC 17025, "General Requirements for the Competence of Testing and Calibration Laboratories."

### Other Inspection Areas

The NRC inspection team determined that CB&I Laurens is implementing its programs for material traceability, inspection, test control, control of measuring and test equipment, nonconforming material, parts, or components, and corrective action programs 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 CB&I Laurens is implementing its policies and procedures associated with these programs. No findings of significance were identified.

## **REPORT DETAILS**

### **1. 10 CFR Part 21 Program**

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

The U.S. Nuclear Regulatory Commission (NRC) inspection team reviewed the policies and implementing procedures of Chicago Bridge & Iron in Laurens, SC (hereafter referred to as CB&I Laurens) that govern the facility's compliance with the requirements under Title 10 of the *Code of Federal Regulations* (10 CFR) Part 21, "Reporting of Defects and Noncompliance." In addition, the NRC inspection team evaluated the 10 CFR Part 21 postings and a sample of CB&I Laurens's purchase orders (PO) for compliance with the requirements of 10 CFR 21.21, "Notification of Failure to Comply or Existence of a Defect and its Evaluation," and 10 CFR 21.31, "Procurement Documents." The NRC inspection team also verified that CB&I Laurens's nonconformance and corrective action procedures provide a link to the 10 CFR Part 21 program. Furthermore, the NRC inspection team reviewed a sample of nonconformance reports (NCR), corrective and preventive action reports (C/PAR), and 10 CFR Part 21 evaluations to verify the implementation of CB&I Laurens's 10 CFR Part 21 program. The attachment to this inspection report lists the documents reviewed by the NRC inspection team.

#### **b. Observations and Findings**

During the review of a sample of 10 CFR Part 21 evaluations, the NRC inspection team noted that the evaluation for C/PAR No. 272 stated that CB&I Laurens shipped to its customer safety-related pipe sleeves to be used in the AP1000 modules. These pipe sleeves are made of seamless carbon steel and are used to protect the piping from its surroundings. CB&I Laurens subsequently concluded that the chemical and physical properties were not verified resulting in material of indeterminate quality being shipped to the customer. CB&I Laurens initiated an evaluation of the deviation in January 25, 2012 and opened several NCRs (e.g. V3/V1024, V4/V1008, S2/V1028, and S3/V1008). As part of the evaluation, CB&I Laurens decided to perform commercial-grade dedication of the pipe sleeves using a sample of the material with the same lot/batch as the one shipped. After completing the commercial-grade dedication of the pipe sleeves, CB&I Laurens determined that there was no substantial safety hazard in May 21, 2012; 120 days after discovery without submitting an interim report to the Commission. The NRC inspection team identified this issue as an example of Violation 99901432/2013-201-01 for CB&I Laurens's failure to prepare and submit to the Commission an interim report for an evaluation of an identified deviation or failure to comply potentially associated with a substantial safety hazard. CB&I Laurens initiated C/PAR No. 355 to address this issue.

In addition, the NRC inspection team identified that CB&I Laurens's commercial-grade dedication of the pipe sleeves was inadequate. Section 3.b.1 of this report provides more details on CB&I Laurens's commercial-grade dedication activities associated with the pipe sleeves.

#### **c. Conclusion**

The NRC inspection team issued Violation 99901432/2013-201-01 for CB&I Laurens's failure to implement the regulatory requirements of 10 CFR Part 21.21(a)(2). Violation

99901432/2013-201-01 cites CB&I Laurens for failing to submit to the Commission an interim report for the evaluation of shipped safety-related pipe sleeves without the verification of the chemical and physical properties. This resulted in material of indeterminate quality being shipped to the customer.

## 2. Manufacturing Control

### a. Inspection Scope

The NRC inspection team reviewed CB&I Laurens's policies and implementing procedures that govern the implementation of its control of special processes program to verify compliance with the regulatory requirements of Criterion IX, "Control of Special Processes," in Appendix B to 10 CFR Part 50 as well as with the requirements in Subsection NCA, "General Requirements for Division 1 and Division 2," Subsection NC, "Class 2 Components," Subsection ND, "Class 3 Components," of Section III, "Rules for Construction of Nuclear Facility Components," Section V, "Nondestructive Examination," and Section IX, "Welding and Brazing Qualification," of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel (B&PV) Code, 1998 Edition, 2000 Addenda. The NRC inspection team also reviewed a sample of welding and nondestructive examination (NDE) documents and observed welding and NDE activities associated with the fabrication and testing of the AP1000 reactor design piping. The attachment to this inspection report lists the documents reviewed by the NRC inspection team.

### b.1 Welding Process

During the inspection, CB&I Laurens was fabricating pipe spool pieces for Vogtle Electric Generating Electric Plant (VEGP) Units 3 and 4 as well as for the Virgil C. Summer (VCS) Unit 2. The NRC inspection team witnessed manual gas tungsten arc welding on the following pipe spool pieces:

- 890300-40-00647, serial number SV3-RNS-PLW-015-3, for VEGP Unit 3, Residual Heat Removal System, ASME B&PV Code Section III, Code Class 2
- 8913000-40-00647, serial number SV4-RNS-PLW-015-3, for VEGP Unit 4, Residual Heat Removal System, ASME B&PV Code Section III, Code Class 2
- 892300-40-00069, serial number VS2-RNS-PLW-162-2, VCS Unit 2, Residual Heat Removal System, ASME Code Section B&PV III, Code Class 3.

The NRC inspection team verified that the welding procedure specification (WPS) AP1000-803, Revision 2, dated February 12, 2011, used to perform the welding, and supporting procedure qualification record (PQRs), met the requirements in Section IX of the ASME B&PV Code, 1998 Edition, 2000 Addenda. However, during the review of WPS AP1000-803, the NRC inspection team noted that the WPS specifies a maximum weld heat input of 30,000 joules per inch. During the welding of pipe spool 890300-40-00647, serial number SV3-RNS-PLW-015-3, weld number 10 for VEGP Unit 3, the NRC inspection team measured the heat input of four weld beads and determined that the heat input of all four weld beads was greater than the maximum weld heat input limit of 30,000 joules per inch. The weld heat input limit was exceeded by 5,000, 27,000, 27,000, and 28,000 joules per inch, respectively. The NRC inspection

team identified this issue as an example of Nonconformance 99901432/2013-201-02 for CB&I Laurens's failure to perform welding activities in accordance with qualified procedures. CB&I Laurens initiated C/PAR No. 348 to address this issue.

#### b.2 Control of Weld Material

The NRC inspection team observed the tool room attendant activities associated with the storage of welding rods, issuance of welding rods and return of unused welding rods. The NRC inspection team verified that the control, issuance, and return of unused welding rods was in accordance with CB&I Laurens's procedure number BFS-NWC-1, "Nuclear Welding Material Control," Revision 1, dated August 28, 2010.

#### b.3 Nondestructive Examination

The NRC inspection team witnessed the final dye penetrant test (PT) performed on pipe spool 892300-40-00069, weld number 5 for VCS Unit 2. The NRC inspection team verified that the PT was performed in accordance with the Westinghouse Electric Company requirements, CB&I Laurens's procedure SP-PT-1 "Liquid Penetrant Examination Procedure Addendum," AP1000 Addendum Revision. 2," dated March 15, 2012 and the applicable requirements of Article ND-5000, "Examination," of Section III of the ASME B&PV Code, 1998 Edition, 2000 Addenda.

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

The NRC inspection team reviewed a sample of training and qualification records for CB&I Laurens's welding personnel and confirmed that they had completed all the required training and had maintained qualification and certification in accordance with CB&I Laurens's policies and procedures. The NRC inspection team also confirmed that the welding operators were qualified in accordance with the applicable requirements in Sections III and IX of the ASME B&PV Code, 1998 Edition, 2000 Addenda.

The NRC inspection team reviewed the qualification and training records for the NDE technician who performed the PT examination of pipe spool 892300-40-00069. The NRC inspection team verified that the NDE technician was qualified in accordance with American Society of Nondestructive Testing "Recommended Practice for Nondestructive Testing Personnel Qualification and Certification SNT-TC-1A," 1992 Edition, and the applicable requirements of Subsection ND-5520, "Personnel Qualification, Certification, and Verification," of Section III of the ASME B&PV Code, 1998 Edition, 2000 Addenda.

#### c. Conclusion

The NRC inspection team issued Nonconformance 99901432/2013-201-02 in association with CB&I Laurens's failure to implement the regulatory requirements of Criterion IX of Appendix B to 10 CFR Part 50. Nonconformance 99901432/2013-201-02 cites CB&I Laurens for failing to perform welding activities in accordance with qualified procedures. Specifically, CB&I Laurens did not maintain weld heat input limits while welding pipe spool 890300-40-00647, serial number SV3-RNS-PLW-015-3, weld number 10 for VEGP Unit 3. The NRC inspection team measured the heat input of four weld beads and determined that the heat input of all four weld beads was greater than the maximum weld heat input limit of 30,000 joules per inch. The weld heat input limit was exceeded by 5,000, 27,000, 27,000, and 28,000 joules per inch, respectively.



### 3. Commercial-Grade Dedication

#### a. Inspection Scope

The NRC inspection team reviewed CB&I Laurens's policies and implementing procedures that govern the implementation of its commercial-grade dedication program to verify compliance with the regulatory requirements of Criterion III, "Design Control," of Appendix B to 10 CFR Part 50. The NRC inspection team also reviewed a sample of engineering drawings, purchase and job instructions, and shop sketches associated with the AP1000 R365 and CA20 module assemblies.

The NRC inspection also reviewed several dedication packages, including dedication plans, 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 the CB&I Laurens's dedication process. The NRC inspection team observed the dedication of carbon steel pipes on CB&I Laurens for job Nos. 230038, 230039, 230040, and 230041 for use in the construction of AP1000 CA20 module pipe sleeves. The attachment to this inspection report lists the documents reviewed by the NRC inspection team.

#### b. Observations and Findings

CB&I Laurens's procedure BFS-AP1000-CGD-1, "Commercial Grade Dedication Procedure," Revision 2, dated March 22, 2012, describes the authority, responsibilities, and methods to be implemented by CB&I Laurens for the commercial-grade dedication of pipe sleeves and plate material. CB&I Laurens develops a commercial-grade dedication plan (CGDP) that documents the specific item's safety function, application, critical characteristics, verification methods to be used, and the sampling plan used for the verification of the critical characteristics.

During the review of a sample of CGDPs for carbon steel seamless pipes, the NRC inspection team noted that the CGDPs provide a table used as guidance for the selection of the sampling plan's sample size that's based on the Military Standard MIL-STD-105E, "Sampling Procedures and Tables for Inspection By Attributes," dated May 10, 1989. The NRC inspection team determined that the use of this table by itself was not adequate and needed to be supplemented with other qualitative factors to ensure adequate selection and implementation of the sampling plan's sample size. Specifically, the NRC inspection team noted the following:

- The selection of a specific sampling plan's sample size did not consider qualitative factors such as supplier performance, performance history of the item, complexity of the item, and safety significance of the item.
- There is no documented guidance to provide an engineering justification in cases where a lot/batch is rejected or there is a documented lot/batch control and the CGDPs need to be revised to change the sampling plan's sample size. This is important to ensure that the basis for the selection of a sampling plan's sample size remains valid after rejection of a lot/batch has occurred.

CB&I Laurens's sampling practice for dedicating commercial-grade items needs to include appropriate engineering involvement and provide adequate qualitative factors to

ensure that all parts supplied as basic components for use in nuclear safety-related applications conform to the applicable procurement specification requirements. The use of sampling plans for the verification of critical characteristics should have an adequate documented technical basis to support the sampling strategy. The NRC inspection team identified this issue as an example of Nonconformance 99901432/2013-201-03 for CB&I Laurens's failure to establish an adequate commercial-grade dedication program. CB&I Laurens initiated C/PAR No. 344 to address this issue.

c. Conclusion

The NRC inspection team issued Nonconformance 99901432/2013-201-03 in association with CB&I Laurens's failure to implement the regulatory requirements of Criterion III of Appendix B to 10 CFR Part 50. Nonconformance 99901432/2013-201-03 cites CB&I Laurens for failing to establish an adequate commercial-grade dedication program for the materials used in the construction of the AP1000 R365 module assembly. Specifically, CB&I Laurens did not perform an engineering evaluation and consider qualitative factors (e.g., supplier performance, historical quality controls, complexity of item, and safety significance of the item) for the selection of the sampling plan's sample size used for dedicating commercial-grade seamless pipes to provide reasonable assurance that when used as basic components they will perform their intended safety function. The NRC inspection team identified four examples of seamless pipes to be used as piping sleeves that were procured as commercial-grade items and then inadequately dedicated to be used as safety-related components by CB&I Laurens in job Nos. 230038, 230039, 230040, and 230041.

4. Oversight of Contracted Activities and Internal Audits

a. Inspection Scope

The NRC inspection team reviewed CB&I Laurens's 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, external and internal audits, and receipt inspection records to evaluate compliance with CB&I Laurens's program and technical requirements. In addition, the NRC inspection team reviewed the disposition of audit findings to resolve for adequacy and timeliness. The attachment to this inspection report lists the documents reviewed by the NRC inspection team.

b. Observations and Findings

b.1 Procurement Document Control

The NRC inspection team found that the POs adequately documented the procurement requirements as established by the governing CB&I Laurens's policies and procedures which include (1) task definitions and responsibilities; (2) imposition of appropriate quality, technical, and regulatory requirements; and (3) identification of applicable codes and standards. The NRC inspection team also found that these POs adequately defined

contract deliverables, disposition of nonconformances, access rights to subtier suppliers, and extension of contractual requirements to subcontractors.

## b.2 Oversight of Suppliers

CB&I Laurens's audit program includes the performance of triennial audits and annual evaluations of its suppliers to ensure that they are effectively implementing their approved quality programs. However, during the review of the Nuclear Approved Vendor's List (NAVL), the NRC inspection team noted that CB&I Laurens had not performed triennial audits of 11 nuclear suppliers currently listed on the NAVL before purchasing and shipping safety-related materials to its customers. During further discussions with CB&I Laurens's staff, the NRC inspection team learned that CB&I Laurens was not performing the triennial audits because the suppliers listed in the NAVL had certificates of authorization from the ASME Accreditation Program. As described in Information Notice 86-21, "Recognition of American Society of Mechanical Engineers Accreditation Program for N Stamp Holders," dated March 31, 1986 (and its supplements), the NRC recognized the ASME Accreditation Program and associated certificates of authorization as evidence that the holder of the certificate of authorization has a documented QA program that meets the requirements of Appendix B to 10 CFR Part 50. However, recognition of the ASME Accreditation Program applies only to the programmatic aspects of the QA programs. Licensees, construction permit holders, and their subcontractors are still responsible for ensuring that the supplier is effectively implementing its approved QA program.

Additionally, during the review of a sample of CB&I Laurens's annual evaluations of its suppliers, the NRC inspection team noted that the annual evaluations, though documented and performed, were insufficient in that they relied solely on the suppliers NCRs and did not evaluate the suppliers in accordance with Section C.3.2.2 of Regulatory Guide 1.28, "Quality Assurance Program Requirements (Design and Construction)," Revision 3, dated August 1985, that states, in part, that "the applicant or licensee should perform or arrange for annual evaluations of suppliers. This evaluation should be documented and should take into account, where applicable, (1) review of supplier furnished documents, and records such as certificates of conformance, nonconformance notices, and corrective actions, (2) results of previous source verifications, audits, and receiving inspections, (3) operating experience of identical or similar products furnished by the same supplier, and (4) results of audits from other sources, e.g., customer, ASME, or NRC audits."

By failing to perform supplier triennial audits and adequate annual evaluations, CB&I Laurens did not assure that safety-related suppliers were effectively implementing their quality programs before issuing purchase orders. The NRC inspection team identified these issues as an example of Nonconformance 99901432/2013-201-04 for CB&I Laurens's failure to verify the effectiveness of the control of quality by contractors and subcontractors. CB&I Laurens initiated C/PAR Nos. 346 and 352 to address these issues.

During the review of a sample of CGDPs for pipe sleeves, plates, and beams to be used in the construction of the AP1000 R365 module assembly and CA20 module pipe sleeves, the NRC inspection team noted that CB&I Laurens had procured these items from DuBose National Energy under its commercial quality program. CB&I Laurens relied on DuBose National Energy's issued certified material test reports (CMTR) as the

sole method to verify critical characteristics of acceptance (e.g., tensile properties, yield, and elongation). The NRC inspection team also noted that CB&I Laurens had not performed a commercial-grade survey or source surveillance of DuBose National Energy to verify if its quality program included the requisite processes, such as material traceability and lot/batch controls, for the control of critical characteristics. The NRC inspection team determined that complete reliance on a commercial supplier's CMTRs without verification of appropriate quality controls of the required critical characteristics is inadequate. The NRC inspection team identified this issue as another example of Nonconformance 99901432/2013-201-04 for CB&I Laurens's failure to verify the effectiveness of the control of quality by contractors and subcontractors. CB&I Laurens initiated C/PAR No. 353 to address this issue.

During the review of the results from the safety-related hydrostatic testing performed on four piping sub-assemblies, the NRC inspection team noted that the quality specification testing of the demineralized water was performed by ALS Environmental, a commercial testing laboratory. The NRC inspection team also noted that ALS Environmental was not on CB&I Laurens's NAVL and was not qualified to supply safety-related testing services. During further discussion with CB&I Laurens's staff, the NRC inspection team learned that CB&I Laurens only verified that ALS Environmental was certified to ISO/IEC 17025, "General Requirements for the Competence of Testing and Calibration Laboratories." ISO/IEC 17025 accreditation may not be used solely as the basis for qualifying safety-related testing services. CB&I Laurens did not verify that the test controls used in the testing of the demineralized water for the hydrostatic testing and final cleaning of safety-related pipe sub-assemblies were adequately controlled. Without verifying the adequacy of ALS Environmental's test controls, CB&I Laurens failed to assure that the validity of the test results will provide reasonable assurance that pH, conductivity, fluoride, and chlorides met the water quality specifications. If out of specification, these impurities could degrade the ability of stainless steel components to perform their safety-function during plant operations. The NRC inspection team identified this issue as another example of Nonconformance 99901432/2013-201-04 for CB&I Laurens' failure to verify the effectiveness of the control of quality by contractors and subcontractors. CB&I Laurens initiated C/PAR No. 352 to address this issue.

### b.3 Qualification and Training of Auditors, Lead Auditors and Inspection Personnel

The NRC inspection team reviewed a sample of the training and qualification records of CB&I Laurens's lead auditors, auditors and inspection personnel and confirmed that auditing and inspection personnel had completed all the required training and had maintained qualification and certification in accordance with CB&I Laurens's policies and procedures.

### c. Conclusion

The NRC inspection team issued Nonconformance 99901432/2013-201-04 in association with CB&I Laurens's failure to implement the regulatory requirements of Criterion VII and Criterion XVIII of Appendix B to 10 CFR Part 50. Nonconformance 99901432/2013-201-04 cites CB&I Laurens for failing to perform periodic audits and source evaluations to verify the effectiveness of the control of quality by contractors and subcontractors at intervals consistent with the importance, complexity, and quantity of the product or services. Specifically, CB&I Laurens (1) did not perform triennial audits and adequate annual evaluations of its safety-related suppliers; (2) did not conduct a

commercial-grade survey or source surveillance to verify that DuBose National Energy's quality program included the requisite processes, such as material traceability and lot/batch controls, for the control of critical characteristics necessary to provide reasonable assurance that commercial-grade materials to be used as basic components will perform their intended safety function, and (3) did not verify that the test controls used in the testing of the demineralized water for the hydrostatic testing and final cleaning of safety-related pipe sub-assemblies were adequately controlled. CB&I Laurens only verified that ALS Environmental was certified to ISO/IEC 17025.

## 5. Material Traceability

### a. Inspection Scope

The NRC inspection team reviewed CB&I Laurens's policies and implementing procedures that govern the implementation of its material traceability program 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 NRC inspection team observed the production process for the manufacture, inspection, testing, and shipping of safety-related piping 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 NRC inspection team.

### b. Observations and Findings

The NRC inspection team verified that CB&I Laurens established and implemented policies and procedures for identifying and controlling items and 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 piping or components. The NRC inspection team also verified that the permanently stamped pipe sections were traceable to design, shop, and erecting drawings.

### c. Conclusions

The NRC inspection team concluded that CB&I Laurens 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 CB&I Laurens's 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 CB&I Laurens's policies and implementing procedures that govern the implementation of its inspection program to verify compliance with the regulatory requirements of Criterion X, "Inspection," of Appendix B to 10 CFR Part 50. The NRC inspection team observed an inspection performed after cold bending operation of a safety-related pipe sub-assembly and a receipt inspection of carbon steel seamless pipes to verify that both inspections were performed using calibrated M&TE and that inspection results were properly documented and met the

acceptance criteria specified in the shop sketch. The attachment to this inspection report lists the documents reviewed by the NRC inspection team.

b. Observations and Findings

The NRC inspection team witnessed an inspection performed after cold bending operation of an ASME Section III Class 3 piping sub-assembly spool piece for use in the construction of the AP1000 R365 module assembly. The inspection consisted of performing a visual inspection and verification of dimensional, ovality and wall thickness measurements in accordance with procedure SP-BD-3, "Cold Bending of Pipe Addendum," Revision 6, Addendum 5, dated July 3, 2012, using calibrated thickness gauge.

c. Conclusions

The NRC inspection team concluded that CB&I Laurens 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 CB&I Laurens's is implementing its policies and procedures associated with the inspection program. No findings of significance were identified.

7. Test Control

a. Inspection Scope

The NRC inspection team reviewed CB&I Laurens' policies and implementing procedures that govern the implementation of its test control program to verify compliance with the requirements of Criterion XI, "Test Control," of Appendix B to 10 CFR Part 50. The NRC inspection team also reviewed a sample of test procedures, records of completed tests, and witnessed hydrostatic testing of four ASME Section III Class 3 pipe sub-assemblies for use in the construction of the AP1000 R365 module assembly for the VGEP Units 3 and 4 and for VCS Units 2 and 3. The NRC inspection team reviewed the qualification records for a sample test engineers and confirmed that they had met all the required training and had maintained qualification and certification in accordance with CB&I Laurens's procedure BFS-PQ-3, "Training and Qualification Procedure for Special Process Personnel," Revision 0, dated May 14, 2012. The attachment to this inspection report lists the documents reviewed by the NRC inspection team.

b. Observations and Findings

CB&I Laurens procedure BFS-AP1000-WT-1, "Hydrostatic Testing Procedure," Revision 2, dated October 15, 2012, describes the requirements for hydrostatic testing of safety-related piping sub-assemblies for the Westinghouse AP1000 nuclear projects for ASME Section III applications. The NRC inspection team verified that BFS-AP1000-WT-1 adequately includes the technical, quality, and regulatory requirements identified in the associated AP1000 specifications. In addition, the test procedure provided an adequate description of the test responsibilities, objectives, sequences, instructions, parameters, M&TE usage, acceptance criteria, post-test activities, and water quality specifications for the demineralized water used in the

hydrostatic testing. The NRC inspection team also verified that BFS-AP1000-WT-1 met the applicable requirements of Section III of the ASME B&PV Code.

c. Conclusion

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

6. Control of Measuring and Test Equipment

a. Inspection Scope

The NRC inspection team reviewed CB&I Laurens's policies and implementing procedures that govern the implementation of its 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 NRC inspection team also reviewed a sample of calibration records for various M&TE and the training records of personnel conducting calibration and testing. The NRC inspection team also verified that when M&TE equipment is received from the calibration service supplier and the calibration certificate states that it was found to be out of calibration, CB&I Laurens generates a 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 NRC inspection team.

b. Observations and Findings

The NRC inspection team verified that the M&TE requirements in CB&I Laurens's procedures provide a system for the control of M&TE. The M&TE program ensured that devices used in activities that affect quality were of the proper range, type, and accuracy to verify conformance with established requirements.

c. Conclusion

The NRC inspection team concluded that CB&I Laurens 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 CB&I Laurens is implementing its policies and procedures associated with the M&TE program. No findings of significance were identified.

7. Nonconforming Materials, Parts, or Components and Corrective Action

a. Inspection Scope

The NRC inspection team reviewed CB&I Laurens's policies and implementing procedures that govern the implementation of its control of nonconformances and corrective action programs to verify compliance with the requirements of Criterion XV,

“Nonconforming Materials, Parts, or Components,” and Criterion XVI, “Corrective Action,” of Appendix B to 10 CFR Part 50. The NRC inspection team reviewed a sample of NCRs and verified that the disposition and control of nonconformances was in accordance with CB&I Laurens procedural guidelines. The NRC inspection team also reviewed a sample of C/PARs and verified that the C/PARs’ disposition and control provide adequate documentation and description of conditions adverse to quality, and the C/PARs specify the cause of these conditions and the corrective actions to prevent recurrence. 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 CB&I Laurens implemented an adequate program to assess and control nonconforming items, including appropriate identification, documentation, segregation, evaluation, and disposition of these items and that technical justifications were properly documented. The NRC inspection team also verified that the C/PARs provide (1) adequate documentation and description of conditions adverse to quality, (2) an appropriate analysis of the cause of these conditions and the corrective actions taken to prevent recurrence, (3) direction for review and approval by the responsible authority, (4) a description of the current status of the corrective actions, and (5) the follow-up actions taken to verify timely and effective implementation of the corrective actions. In addition, the NRC inspection team verified that CB&I Laurens’s NCRs and C/PARs provide a connection to the 10 CFR Part 21 program and that CB&I Laurens had established a system for the review of CARs and identification of trends.

c. Conclusion

The NRC inspection team concluded that CB&I Laurens is implementing its nonconforming materials, parts, or components and corrective action programs in accordance with the regulatory requirements of Criterion XV and Criterion XVI of Appendix B to 10 CFR Part 50. Based on the limited sample of documents reviewed, the NRC inspection team also determined that CB&I Laurens is implementing its policies and procedures associated with the control of nonconforming materials, parts, or components and its corrective action program. No findings of significance were identified.

9. Entrance and Exit Meetings

On August 19, 2013, the NRC inspection team discussed the scope of the inspection with Mr. Joe Harrison, CB&I Laurens’s General Manager, and other members of CB&I Laurens’s management and technical staff. On August 23, 2013, the NRC inspection team presented the inspection results and observations during an exit meeting with Mr. Harrison, and other members of CB&I Laurens’s 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
Joe Harrison	General Manager (GM) Fabrication & Manufacturing (F&M)	Chicago Bridge & Iron (CB&I) Laurens	X	X	
Wilson H. Bazen	Assistant GM F&M	CB&I Laurens	X	X	X
Kamlesh Panwala	Director Quality F&M	CB&I Baton Rouge	X	X	X
L. Keith Batson	Production Manager Fabrication & Manufacturing	CB&I Laurens	X	X	
W. Paul Freeman	Assistant Production Manager F&M	CB&I Laurens	X		
Steven Smeal	Quality Assurance (QA) Manager F&M	CB&I Laurens	X	X	X
Sallie Wald	QA Supervisor F&M	CB&I Laurens	X	X	X
Leonard P. Smeal	Quality Control (QC) Manager F&M	CB&I Laurens	X	X	X
Clyde Livingston	QC Supervisor F&M	CB&I Laurens	X	X	
Grace Hyatt	Materials Manager F&M	CB&I Laurens	X	X	X
Crystal Casey	Receiving Manager	CB&I Laurens			X
Anthony Samples	Environmental Health & Safety Manager F&M	CB&I Laurens	X	X	
Laurie Irby	QA Technician	CB&I Laurens			X
Ray Tumblin	QA Technician	CB&I Laurens			X
Rusty Smeal	QC Inspector	CB&I Laurens			X
Austin Cogdill	QC Inspector	CB&I Laurens			X
Corey Graydon	QC Inspector	CB&I Laurens			X
Joyce Lynne Duncan	Level II QC Inspector	CB&I Laurens			X
Glen Starek	Level II QC Inspector	CB&I Laurens			X
Rick Pottmeyer	Project Engineer F&M	CB&I Laurens	X	X	X
Susan Sherbert	Project Engineer F&M	CB&I Laurens			X
Richard S. Crow, Jr.	Project Manager F&M	CB&I Laurens	X	X	

<b>Name</b>	<b>Title</b>	<b>Affiliation</b>	<b>Entrance</b>	<b>Exit</b>	<b>Interviewed</b>
Reggie Martin	Welding Engineer/ Lead Auditor F&M	CB&I Laurens		X	X
Tim Duncan	Bay 4 Foreman	CB&I Laurens			X
Eddie Singer	Bay 7 Foreman & Tool Room Attendant	CB&I Laurens			X
T.J. Jennings	Shipping Foreman	CB&I Laurens			X
Gerald Moss	Maintenance Technician	CB&I Laurens			X
David McGlohon	Maintenance Technician	CB&I Laurens			X
Daniel Burnside	Nondestructive Examination (NDE) Inspector	CB&I Laurens			X
Danny Burnside	NDE Level II Technician	CB&I Laurens			X
David Brown	Furnace Operator	CB&I Laurens			X
Billy Wilson	Welder	CB&I Laurens			X
Rigoberto Morales	Welder	CB&I Laurens			X
Mathew Wilson	Pipe Fitter & Welder	CB&I Laurens			X
Johnny Hyatt	Pipe Fitter	CB&I Laurens			X
Edward A. Zawosky	Senior Quality Engineer	Westinghouse Electric Company (WEC)			X
Patrick L. Walsh	Material Management Quality Engineer	WEC			X
Paul D. Seals	Authorized Nuclear Inspector	Hartford Steam Boiler Inspection and Insurance Company			X
Yamir Diaz- Castillo	Inspection Team Leader	Nuclear Regulatory Commission (NRC)	X	X	
Brent Clarke	Inspector	NRC	X	X	
Raju Patel	Inspector	NRC	X	X	
Mary Anderson	Inspector	NRC	X	X	
Aixa Belén	Inspector	NRC	X	X	
Robert Davis	Inspector	NRC	X	X	

## 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 April 25, 2011.

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

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

Item Number	Status	Type	Description
99901432/2013-201-01	Opened	NOV	10 CFR Part 21
99901432/2013-201-02	Opened	NON	Criterion IX
99901432/2013-201-03	Opened	NON	Criterion III
99901432/2013-201-04	Opened	NON	Criterion VII

## 4. DOCUMENTS REVIEWED

### Policies and Procedures

- CB&I Laurens's Quality Assurance Manual, Revision 20, dated March 21, 2013
- CB&I Laurens's Nuclear Approved Vendor List, Revision 5, dated August 15, 2013
- BFS-AP1000-CGD-1, "Commercial Grade Dedication Procedure," Revision 2, dated March 22, 2012
- BFS-AP1000-WT-1, "Hydrostatic Testing Procedure," Revision 2, dated October 15, 2012
- BFS-CODE-PL-1, "Code Nameplates and Code Stamping," Revision 7, dated July 9, 2013
- BFS-NWC-1, "Nuclear Welding Material Control," Revision 1, dated August 28, 2012
- BFS-PQ-2, "Training and Qualification Procedure for QC Inspection Personnel," Revision 2, dated May 4, 2012
- BFS-PQ-3, "Training and Qualification Procedure for Special Process Personnel," Revision 0, dated May 14, 2012
- BFS-PQ-2, "Training and Qualification Procedure for QC Inspection Personnel," Revision 2, dated May 05, 2012

- BFS-PS-1, "Piping Sub-assembly Preparation for Shipment & Jobsite Storage," Revision 0, dated July 2, 2004
- BFS-QA-1, "QA Work Instruction NCR's," Revision 1, dated May 22, 2012
- BFS-QC-1, "Receiving Inspection," Revision 6, dated December 22, 2010
- BFS-QC-4, "Document Correction Procedure," Revision 1, dated July 9, 2013
- BFS-QC-10CFR21, "Procedure for Compliance with 10CFR21," Revision 3, dated April 2, 2012
- SP-BD-2, "Standard Procedure for Manufacturing Induction Bends, Revision 3, dated June 5, 2012
- SP-BD-3, "Cold Bending of Pipe Addendum," Revision 6, Addendum 5, dated July 3, 2012
- SP-CL-1, "Special Cleaning Procedure," Revision 3, dated July 8, 2011
- SP-CT-1, "Standard Coating Procedure," Revision 7, dated October 19, 2010
- SP-DF-1, "Delta-Ferrite Control Stainless Steel," Revision 9, dated September 8, 2011
- SP-HT-1, "Hardness Testing Procedure," Revision 4, dated March 6, 2013
- SP-MTE-1, "Measuring and Test Equipment Calibration," Revision 5, dated July 8, 2011, with Addendum 4, dated December 27, 2012
- SP-PMI-1, "Positive Material Identification," Revision 4, dated August 3, 2011
- SP-PQ-1, "NDT Personnel Certification Practice," Revision 16, dated March 6, 2013
- SP-PQ-1, "NDT Personnel Certification Practice AP1000 Addendum," AP1000 Addendum Revision 1, dated May 2, 2013
- SP-PT-1 "Liquid Penetrant Examination Procedure," Revision 14, dated September 16, 2010
- SP-PT-1 "Liquid Penetrant Examination Procedure Addendum," AP1000 Addendum Revision. 2," dated March 15, 2012
- SP-SCI-1, "Suspect/Counterfeit Items Control Procedure," Revision 1, dated August 01, 2011
- SP-SP-1, "Supplier Performance," Revision 3, dated July 26, 2011
- SP-UT, "Ultrasonic Thickness Gauging of Tubular Products & Plate Addendum," Revision 6, Addendum 0, dated December 10, 2010

### Drawings and Specifications

- American National Standard/American Institute of Steel Construction (ANS/AISC) N690-1994, " American National Standard Specification for the Design, Fabrication, and Erection of Steel Safety-Related Structures for Nuclear Facilities," published date May 1994
- Drawing VS-894900-1002 for Wide Flange W4 x 13 x 4'7¼" Long Beam to ASTM A36 Specification Revision 0, dated September 8, 2011
- Bill of Material PREBUY No. 8949-R365-Module Steel-1, for safety-related Assembly No. 2 for Vogtle Unit 3 Revision 2, dated October 5, 2011
- Shop sketch for spool No. 891400-40-00281, ASME Section III, Class 3 serial No. SV4-PXS-PLW-295-2, Revision 0, dated May 14, 2012
- WEC Document APP-GW-VLR-010, "AP1000 Supplemental Fabrication and Inspection Requirements," Revision 1, dated May 11, 2010
- WEC Specification APP-GW-PO-007, "AP1000 Specification for Shop Fabricated Piping" Revision 6, dated December 20, 2011

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

- Service Request No: J1304100, "Laboratory Results for Demineralizer Analysis from ALS Group USA, Corp, dba ALS Environmental," dated July 24, 2013
- Calibration Record and Label, Pressure Gauges, Serial # 60-1 and 60-2, dated August 9, 2013
- Calibration Record and Label, Welding Machine, Serial # U1130401759, dated February 6, 2013
- Calibration Record and Label, Welding Machine, Serial # AC766288, dated February 6, 2013
- Calibration Record and Label, Welding Machine, Serial # U1080503357, dated February 6, 2013
- Calibration Record and Label, Welding Machine, Serial # U1080707122, dated February 6, 2013
- Calibration Record and Label, Welding Machine, Serial # U1130401894, dated April 22, 2013
- Calibration Record and Label, Contact Pyrometer, Serial # 227273, dated January 3, 2013
- Calibration Report and Label, Relief Valve, Serial # BFS-PR-6, dated August 9, 2013
- Calibration Report and Label, 6-inch Vernier Caliper, Serial # A13, dated May 16, 2013

- Certificate of Calibration and Labels, Conrad Kaczik Instrumentation Systems, Temperature Controller, dated June 4, 2013
- Certificate of Calibration and Label, Conrad Kacsik Instrument Systems, Digital Steam Trap Tester, Serial # 080467, dated December 6, 2012
- Certificate of Calibration, J. A. King & Co., 20,000# Capacity Crane Scale, dated November 21, 2013
- Certificate of Calibration, CMI Metrology Service, Radiometer, Serial # 071081A,B,C, dated September 4, 2012
- Certificate of Calibration, Conrad Kacsik Instrumentation Systems, Contact Pyrometers, multiple serial numbers, dated December 6, 2012
- Calibration Record, 4 to 40 Inch ID Micrometer, Serial # BFS 123, dated October 8, 2013
- Calibration Record, 1 Inch OD Micrometer, Serial # 02A, dated April 8, 2013
- Calibration Record, 6 Inch Dial Caliper, Serial # 012, dated May 3, 2013
- Notice of Unsatisfactory Measuring & Test Equipment, 4 to 40 Inch ID Micrometer, Serial # 133, dated June 20, 2013
- Calibration Log for Welding Machines from SP-MTE-1, Revision 5, dated July 8, 2011
- Relief Valve Calibration Log (For AP1000 Projects)
- Shop Traveler 890300-40-00647, Piping Spool Piece, Vogtle Unit 3
- Receipt report No. 77157 for 197.67' of 8" Ø standard seamless pipe of ASTM A106 Grade C specification to PO No. 858624-001-OI for Job No. 230038, dated August 21, 2013
- Receipt report No. 77158 for 197.67' of 8" Ø standard thickness seamless pipe of ASTM A106 Grade C specification to PO No. 858628-001-OI for Job No. 230039, dated August 21, 2013
- Receipt report No. 77157 for 197.67' of 8" Ø standard seamless pipe ASTM A106 Grade C received on PO No. 858624-001-OI for Job No. 230038, dated August 21, 2013
- Bending inspection report for spool piece No. 891400-40-00281, ASME Section III Class 3 piping sub-assembly serial No. SV4-PXS-PLW-295-2, for Vogtle Unit 4 passive core cooling system, dated August 22, 2013
- Hydrostatic test report for spool piece No. 890300-40-00171, ASME Section III Class 3 piping sub-assembly serial No. SV3-WWS-PLW-332-4 for Vogtle Unit 3 Liquid Radwaste System

- Hydrostatic test report for spool piece No. 891300-40-00585, ASME Section III Class 3 piping sub-assembly serial No. SLV-WLS-PLW-751-2 for Vogtle Unit 4 Liquid Radwaste System
- Hydrostatic test report for spool piece No. 892300-40-00152, ASME Section III Class 3 piping sub-assembly serial No. VS3-WLS-PLW-740-1 for V.C. Summer Unit 2 Liquid Radwaste System
- Hydrostatic test report for spool piece No. 892300-40-00171, ASME Section III Class 3 piping sub-assembly serial No. VS2-WWS-PLW-332-4 for V.C. Summer Unit 2 Waste Water System
- Certificate of Certification for Spotcheck Penetrant, SKL-SP2, Batch 11L16K
- Certificate of Certification for Spotcheck Developer, SKD-S2, Batch 12L15K
- Certificate of Certification for Spotcheck, SKC-S, Batch 13A047
- Certificate of Conformance and Certified Material Test Report for ER308/309L, Heat No. 743009, Lot No. CT9686, for PO No. 789585 OI, dated July 13, 2012
- CB&I Laurens Welding Procedure Specification Number AP1000-804, Revision 2, dated February 12, 2011
- CB&I Laurens Welding Procedure Specification Number AP1000-803, Revision 2, dated February 12, 2011
- Liquid Penetrant Testing (PT) Report for Spool Serial Number VS2-RNS-PLW-162-2, VC Summer Unit 2 Residual Heat Removal System, Weld No. 5, dated August 22, 2013.

#### Purchase Orders and Audit Reports

- CB&I Laurens's AP1000 Projects Vendor Audit Schedule, Revision 0, dated August 22, 2013
- PI-1, "Purchase Instruction for Job No. 230038\_230039 for Westinghouse AP1000 Vogtle Nuclear EPC Power Plant Units 3 & 4, CA20, CA01, Structural Sleeves & CA04 Ex-Core Detector Wells Safety-Related Structural Pipe and Plates," Revision 3, dated May 20, 2013
- PI-1, "Purchase Instruction for Job No. 230040\_230041 for Westinghouse AP1000 V.C. Summer Nuclear EPC Power Plant Units 2 & 3, CA20, CA01, Structural Sleeves & CA04 Ex-Core Detector Wells Safety-Related Structural Pipe and Plates," Revision 3, dated May 20, 2013
- PO No. 732997-OI, to Dubose National Energy Services Inc. for procurement of 197.67' of 8" Ø standard seamless pipe of ASTM A106 Grade C specification to be used for pipe sleeves embedded in concrete to purchase instructions PI230038-230039 PI-1, Revision 0 for CB&I Job No. 230038 for Vogtle Unit 3, dated October 14, 2011

- PO 730159-001-OI, to Dubose National Energy Services Inc., for procurement of safety related items for 8950 R365 Module to ANSI/AISC N690 standard and purchase instructions 8950-PI-2, Revision 2 for CB&I Job No. 8950 for Vogtle Unit 3, dated October 5, 2011
- PO No. 858628-001-OI for procurement 8" standard outside diameter pipe ASTM A106 Grade C in accordance with purchase instruction PI-1 Revision 3 for Job No. 230039 Vogtle Unit 4, dated June 17, 2013
- PO No. 758587 to Edgen Murray Corporation, dated February 4, 2012
- PO No. 792590-0002 to WFI International, dated June 26, 2012
- PO No. 856213 to Consolidated Power Supply, dated June 3, 2013
- PO No. 865514 to IBF S.p.A, dated July 31, 2013
- PO No. 864106 to ALS Group USA Corp, dated July 23, 2013
- PO No. 827060 to Dubose National Energy, dated December 11, 2012
- PO No. 805076 to Certified Measurements, dated August 23, 2012
- PO No. 758496 to M.E.G.A., dated February 3, 2012
- PO No. 775783 to Taylor Forge Stainless, dated April 17, 2012
- PO No. 855913 to Conrad Kacsik Instrument, dated May 31, 2013
- PO No. 858295 to J.A. King and Company LLC, dated June 13, 2013
- PO No. 805076 to Certified Measurements, dated August 23, 2012
- PO No. 700025 to Nippon & Sumitomo Metal Corporation, dated June 10, 2011
- PO No. 728898 to Productos Tubulares, S.A.U., dated September 29, 2011
- PO No. 746147, Tectubui Raccordi S.p.A., dated December 8, 2011
- PO No. 699827-004 to Tioga Pipe Supply Company, dated June 9, 2011
- PO No. 734245-003 to Wyman-Gordan Pipe & Fittings, dated October 19, 2011
- CB&I Vendor Evaluation Checklist for Bonney Forge, Revision 0, dated May 30, 2013
- Audit Plan/Checklist/Report for Section 11, Control of Measuring & Test Equipment, Revision 0, dated October 25, 2012
- Audit Plan/Checklist/Report for Section 17, Audits, Revision 0, dated February 20, 2013



- Audit Plan/Checklist/Report for Section 9, NDE, Inspections, Tests, and Inspection & Test Status, Revision 0, dated May 18, 2012
- External Audit of Wyman-Gordan Pipe & Fitting, dated May 22-24, 2013
- External Audit of WFI Nuclear Products, dated July 16-17, 2013
- External Audit of Edgen Murray Corporation, dated July 31 - August 3, 2013
- External Audit of Certified Measurements, dated July 20, 2006
- External Audit of Consolidated Power Supply, dated December 2-3, 2002
- External Audit of DuBose National Energy, dated September 11-12, 2006

#### Nonconformance Reports

- S2/V1020, S2/V1028, S2/V1029, S2/1189, S2/V1116, S2/V1117, S3/V1012, V3/1183, V3/1235, V3/V1024, V3/V1036, V3/1183, V3/V1089, V4/V1011, V4/1121

#### Corrective/Preventive Action Reports

- 251, 252, 253, 257, 258, 259, 272, 274, 275, 276, 280, 284, 287, 291, 295, 298, 304, 343, 346, 347R1, 349, 351, 352, 354, and 355