CB&I
PO. Box 1199
366 Old Airport Road
Laurens, SC 29360
US
Tel: + 1 864 682 4000
Fax: + 1 864 683 5767
www.CBI.com

October 31, 2013

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555-0001

Subject: Response to a Notice of Violation and Nonconformances
NRC Inspection report No. 99901432/2013-201

Attached is the CB&I Laurens response to the Notice of Violation and Nonconformances that were identified in NRC Inspection Report No. 99901432/2013-201, dated October 2, 2013.

If you have any questions, please contact Mr. Joe Harrison, General Manager.

Sincerely,

Steven W. Smeal
QA Manager
CB&I Laurens, SC

cc: Chief
Construction Mechanical Vendor Branch
Division of Construction Inspection and Operational Programs
Office of New Reactors

Joe Harrison, General Manager
Kamlesh Panwala, Director, Quality

Attachments:
1. Response to Notice of Violation 99901432-2013-201-01
2. Response to Notice of Nonconformance 99901432/2013-201-02
3. Response to Notice of Nonconformance 99901432/2013-201-03
4. Response to Notice of Nonconformance 99901432/2013-201-04

IE09
NRO

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

This is the CB&I Laurens response to the Notice of Violation identified in NRC Inspection Report No. 99901432/2013-201 dated October 2, 2013.

VIOLATION

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 AP1 000 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

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

REASON FOR THE VIOLATION

Procedure BFS-QC-10CFR21, which is the procedure for compliance with 10CFR21, did not include a requirement for tracking potential 10CFR21 deviations or failures to comply. Therefore, an interim report was not filed due to the lack of a tracking method for potential 10CFR21 reportable defects or failures to comply.

The formal 10CFR21 evaluation was not completed until May 21, 2012, which was 50 days beyond the 60-day evaluation time limit. An interim report was not submitted prior to the 60-day limit because during the period in question, the duties of the QA/QC Manager were split and a new QA Manager was hired in March 2012, and without an established tracking method for potentially reportable deviations or failures to comply, the need to submit an interim report was inadvertently overlooked.

CORRECTIVE STEPS THAT HAVE BEEN TAKEN AND THE RESULTS ACHIEVED

Corrective/Preventive Action Request 355 was initiated for this violation to determine and document the causes and corrective actions for this condition.

Procedure BFS-QC-10CFR21 has been revised to incorporate more detailed instructions for identifying, evaluating, tracking, and reporting potentially reportable 10CFR21 deviations or failures to comply that may constitute a substantial safety hazard.

CORRECTIVE STEPS THAT WILL BE TAKEN

Training in the implementation of the revised procedure BFS-QC-10CFR21 will be provided for all CB&I Laurens employees. Additionally, the indoctrination training for new CB&I Laurens employees will be updated to include the revised 10CFR21 procedure information.

DATE WHEN FULL COMPLIANCE WILL BE ACHEIVED

Full compliance will be achieved by December 1, 2013.

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

This is the CB&I Laurens response to the Notice of Nonconformance 99901432/2013-201-02 identified in NRC Inspection Report No. 99901432/2013-201 dated October 2, 2013.

NONCONFORMANCE

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* (1 0 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.

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

REASON FOR THE NONCOMPLIANCE

The welders did not adhere to the welding instructions and were not adequately trained in the control of the heat input requirements when using the GTAW welding process for welding the stainless steel materials.

CORRECTIVE STEPS THAT HAVE BEEN TAKEN AND THE RESULTS ACHIEVED

Based on Regulatory Guide 1.44, May 1973, it has been determined that heat input control is not required except when welding type 304 and 316 materials that have a carbon level greater than 0.03 percent. The following paragraph is an excerpt from Regulatory Guide 1.44:

- "In addition, welding procedures should be qualified by passing a suitable intergranular corrosion test in all cases where the procedure is used for welding stainless steel having a carbon level greater than 0.03 percent. The qualification test should be performed using base material having the maximum carbon content anticipated and the minimum and maximum thicknesses anticipated. As a minimum, the variables that should be controlled in the qualification test are heat input, interpass temperature, and welding techniques for specific section thicknesses."

A review was conducted of the Mill Test Reports for the stainless steel materials for pipe spool 890300-40-00647 (serial number SV3-RNS-PLW-015-3), the other Section III pipe spools in process at the time, and the Section III pipe spools that had been shipped to determine the actual carbon content of the material. As a result of this review no material was found that exceeded 0.030% carbon content.

Additionally, the actual welding procedure qualification test data was reviewed by the Welding Engineer and the actual heat input during the welding of the test coupon was 65,200 joules for the GTAW Manual process and 63,692 joules for the GTAW Machine process. The welding procedure specification has been revised to the 65,200 joules limit and submitted to the customer for review and approval.

Corrective/Preventive Action Request 348 was initiated for this nonconformance to determine and document the causes and corrective actions.

CORRECTIVE STEPS THAT WILL BE TAKEN

Additional training will be provided to the welders qualified to weld stainless steel materials and their supervisors for identifying when the requirement for heat input control applies and how to control the heat input within the limits provided in the applicable welding procedure specification. Additionally, welder training will be revised to include this information.

DATE WHEN CORRECTIVE ACTION WILL BE COMPLETED

The corrective action will be completed by December 31, 2013.

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

This is the CB&I Laurens response to the Notice of Nonconformance 99901432/2013-201-03 identified in NRC Inspection Report No. 99901432/2013-201 dated October 2, 2013.

NONCONFORMANCE

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.

REASON FOR THE NONCOMPLIANCE

The Commercial Grade Dedication Plan, including the critical characteristics and sampling plan, was submitted to the customer for review and approval. The Commercial Grade Dedication Plan, critical characteristics and sampling plan were approved by the customer prior to implementing their use; therefore it was believed that the Commercial Grade Dedication, as approved, would be sufficient. After review of additional commercial grade dedication guidance information, it has been concluded that further details should be included in the applicable Commercial Grade Dedication Plans.

CORRECTIVE STEPS THAT HAVE BEEN TAKEN AND THE RESULTS ACHIEVED

A Survey of the primary supplier of commercial materials that have been dedicated by CB&I Laurens has been completed with no findings or observations.

The Commercial Grade Dedication procedure and Commercial Grade Dedication Plan associated with the identified example have been revised to include additional controls and to also include the sampling plans consistent with the industry guidance document for commercial grade dedication, EPRI TR-017218-R1.

Evaluation of this condition in accordance with 10CFR21 is in progress. An interim report dated October 18, 2013, and revised on October 25, 2013, has been submitted. The evaluation is expected to be completed by January 31, 2014.

Corrective/Preventive Action Request 344 was initiated for this nonconformance to determine and document the causes and corrective actions.

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

CORRECTIVE STEPS THAT WILL BE TAKEN

Surveys of the suppliers of safety related materials that have been dedicated by CB&I Laurens provided for the AP1000 Projects have been scheduled. The results of these surveys will be used to assist in determining the status of the materials shipped to the applicable customers.

The documentation for the commercial grade dedication packages which utilized the subject sampling plan will be reviewed to determine any actions that may be required to comply with the revised Commercial Grade Dedication procedure and applicable Commercial Grade Dedication Plan for each condition identified during the review.

Samples of the materials will be sent to an approved testing lab for further testing, if required.

Training in the implementation of the revised procedure BFS-AP1000-CGD-1 and Commercial Grade Dedication Plan will be provided for all CB&I Laurens employees involved in the activities related to Commercial Grade Dedication. Training in the procedure and plan will be provided for all CB&I Laurens employees newly assigned to activities related to Commercial Grade Dedication.

DATE WHEN CORRECTIVE ACTION WILL BE COMPLETED

The corrective actions will be completed by January 31, 2014.

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

This is the CB&I Laurens response to the Notice of Nonconformance 99901432/2013-201-04 identified in NRC Inspection Report No. 99901432/2013-201 dated October 2, 2013.

NONCONFORMANCE

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. (CB&I Laurens) 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. A. 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.

   B. 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.

REASON FOR THE NONCOMPLIANCE

Based on a review of the circumstances described in this nonconformance, it has been concluded that the B.F. Shaw, Inc. (CB&I Laurens) Quality Manual did not include sufficient detail to ensure that these activities would be accomplished in accordance with the applicable guidelines and requirements.

CORRECTIVE STEPS THAT HAVE BEEN TAKEN AND THE RESULTS ACHIEVED

The CB&I Laurens Quality Manual has been amended to include a requirement for a triennial audit in accordance with NQA-1 and NCA-3800 of all active suppliers of ASME Section III materials. The addendum will be distributed internally and externally to controlled manual holders within two weeks of acceptance by the Authorized Nuclear Inspector Supervisor. Training in the revised addendum will be conducted for all B.F. Shaw, Inc. (CB&I Laurens) personnel affected by the revised addendum within two weeks of distribution.

Corrective/Preventive Action Request 346 was initiated for this condition to determine and document the causes and corrective actions.

The CB&I Laurens Quality Manual has been amended to include a requirement for annual evaluations in accordance with Regulatory Guide 1.28, Rev. 3 of all active suppliers of ASME Section III and Safety Related materials.

Corrective/Preventive Action Request 351 was initiated for this condition to determine and document the causes and corrective actions.

The CB&I Laurens Quality Manual has been amended to include a requirement for a triennial commercial grade survey in accordance with EPRI NP-5652 of all active suppliers of safety related materials.

Corrective/Preventive Action Request 353 was initiated for this condition to determine and document the causes and corrective actions.

The CB&I Laurens Quality Manual has been amended to include a requirement for a triennial commercial grade survey in accordance with EPRI NP-5652 and an annual evaluation in accordance with Regulatory Guide 1.28, Rev. 3 of all active suppliers of safety related services such as water analysis, heat treatment, machining, etc.

Corrective/Preventive Action Request 352 was initiated for this condition to determine and document the causes and corrective actions.

A Commercial Grade Survey and NQA-1 Audit of DuBose National Energy's quality program was completed on September 24, 2013. There were no findings or observations noted during the survey/audit.

Corrective/Preventive Action Request 353 was initiated for this condition to determine and document the causes and corrective actions.

CORRECTIVE STEPS THAT WILL BE TAKEN

The suppliers listed on the CB&I Laurens NAVL that possessed an ASME QSC Certificate have been scheduled for an audit by CB&I Laurens in accordance with NQA-1 and NCA-3800.

Corrective/Preventive Action Request 346 was initiated for this condition to determine and document the causes and corrective actions.

The annual evaluations of suppliers are being supplemented with the additional criteria outlined in Regulatory Guide 1.28, Rev. 3.

Corrective/Preventive Action Request 351 was initiated for this condition to determine and document the causes and corrective actions.

A Commercial Grade Survey of ALS Environmental's quality program has been scheduled.

Corrective/Preventive Action Request 352 was initiated for this condition to determine and document the causes and corrective actions.

DATE WHEN CORRECTIVE ACTIONS WILL BE COMPLETED

The corrective actions will be completed by January 31, 2014.