

July 1, 2015

EA-13-196

Mr. Michael J. Annacone
Vice President Nuclear Safety
Chicago Bridge and Iron Company
128 South Tryon Street
Charlotte, NC 28202

SUBJECT: U.S. NUCLEAR REGULATORY COMMISSION INSPECTION REPORT
NO. 99901425/2015-201, IMPLEMENTATION OF CONFIRMATORY ORDER
EA-13-196 AT CHICAGO BRIDGE AND IRON COMPANY LAKE CHARLES,
LOUISIANA FABRICATION FACILITY

Dear Mr. Annacone:

From May 18 – 21, 2015, the U.S. Nuclear Regulatory Commission (NRC) staff conducted an inspection at the Chicago Bridge and Iron Lake Charles (CB&I LC) facility in Lake Charles, LA. The purpose of the inspection was to assess CB&I LC's implementation of Confirmatory Order (CO) EA-13-196, dated September 25, 2014, specifically to evaluate communications, training, work processes, nuclear safety culture, safety conscious work environment (SCWE), and other activities at CB&I LC. The staff previously performed inspections at CB&I LC in February and December 2014, and attended presentations by CB&I at the NRC's March 2014 Regulatory Information Conference and the June 2014 NRC Workshop on Vendor Oversight. The enclosed report presents the results of the inspections.

Based on the results of the inspections, the NRC inspection team found that CB&I is meeting the conditions specified in the CO at the Lake Charles facility. The safety culture, including the SCWE, continues to show improvement since the earlier NRC inspections. Most CB&I LC personnel said that they were willing and able to raise concerns through multiple avenues without fear of harassment, intimidation, retaliation or discrimination. The NRC inspection team has concluded that the actions taken in response to the CO, if continued to be effectively implemented, should result in a sustained SCWE. The NRC further acknowledges that some of the processes and procedures reviewed also apply to other CB&I facilities and construction projects that are involved with work associated with NRC-regulated activities (e.g., Vogtle Electric Generating Plant and Virgil C. Summer Nuclear Station); however, the effectiveness of the processes at CB&I facilities other than CB&I LC has not been established as of this date.

Within the scope of this inspection, no violations were identified.

In accordance with Title 10 of the *Code of Federal Regulations* 2.390, "Public inspections, exemptions, requests for withholding," of the NRC's "Agency Rules of Practice and Procedure," the NRC will make available electronically for public inspection a copy of this letter, its enclosure, and your response (if any) through the NRC Public Document Room or from the NRC's Agencywide Documents Access and Management System (ADAMS), which is accessible at <http://www.nrc.gov/reading-rm/adams.html>. To the extent possible, your response

(if provided) 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/

Kerri A. Kavanagh, Chief
Quality Assurance Vendor Inspection Branch
Division of Construction Inspection
and Operational Programs
Office of New Reactors

Docket No.: 99901425

Enclosure:
Inspection Report No. 99901425/2015-201
and Attachment

(if provided) 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."

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

Docket No.: 99901425

Report No.: 99901425/2015-201

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Lake Charles, LA 70605

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Nuclear Industry Activity: CB&I's fabrication facility located in Lake Charles, LA, is under contract to fabricate, assemble, inspect, transport, and deliver Westinghouse Electric Company's AP1000 reactor design structural sub-modules for the Vogtle Electric Generating Plant, and Virgil C. Summer Nuclear Station.

Inspection Dates: May 18 – 21, 2015

Inspection Team:

Russell Arrighi	OE/CRB	Team Leader
Diane Sieracki	OE/CRB	
Catherine Thompson	OE/CRB	
Robert Fretz	OE/EB	
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Molly Keefe	NRR	
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Approved by: Kerri A. Kavanagh, Chief
Quality Assurance Vendor Inspection Branch
Division of Construction Inspection
and Operational Programs
Office of New Reactors

Enclosure

EXECUTIVE SUMMARY

Chicago Bridge and Iron Company, Lake Charles
99901425/2015-201

The U.S. Nuclear Regulatory Commission (NRC) staff conducted an inspection at the Chicago Bridge and Iron Lake Charles (CB&I LC) facility in Lake Charles, LA to verify that it had implemented the requirements of NRC Confirmatory Order (CO) EA-13-196, dated September 25, 2014. Some of the processes and procedures reviewed also apply to other CB&I facilities and construction projects that are engaged in work associated with NRC-regulated activities (e.g., Vogtle Electric Generating Plant, and Virgil C. Summer Nuclear Station). The NRC inspection team conducted the inspection from May 18 through 21, 2015. The NRC staff previously performed inspections at CB&I LC in February and December 2014, and attended presentations by CB&I at the March 2014 Regulatory Information Conference (RIC) and the June 2014 NRC Workshop on Vendor Oversight.

Background

On September 16, 2013, the NRC issued an Order (EA-2012-189) to CB&I confirming commitments made as a result of an agreement reached during multiple alternative dispute resolution (ADR) mediation sessions. The CO outlined several actions that CB&I would take to improve its nuclear safety culture (NSC) and safety conscious work environment (SCWE) within business groups where nuclear related activities take place. The September 2013 CO was later revised and superseded by a September 25, 2014, CO (EA-2013-196) as a result of a second ADR mediation. The revised CO incorporated all the actions required by the first Order, and included additional actions that CB&I would take to address wrongdoing at its nuclear-related sites.

This inspection specifically evaluated CB&I LC's implementation of the September 2014 CO. Specific activities performed by the NRC inspection team included:

- Reviewed CB&I implementing policies and procedures;
- Reviewed training documents;
- Observed training classes. Specific examples include: Nuclear Safety Culture Leadership (Supervisory) Training (8-hour); Non-Supervisory Nuclear Safety Culture Training (2-hour) (also used for new employee orientation training);
- Held multiple focus group meetings with employees;
- Reviewed safety culture assessments and surveys and corresponding corrective actions;
- Observed the Safety Culture Monitoring Panel (1st Quarter 2015); and
- Interviewed management and other staff.

Associated documents reviewed by the NRC inspectors are included in an attachment to this inspection report.

During the course of this inspection, the NRC inspection team implemented Inspection Procedure (IP) 43002, "Routine Inspection of Nuclear Vendors"; supplemented by IP 40100, "Independent Safety Culture Assessment Follow-up," dated April 5, 2011; and IP 95003.02, "Guidance for Conducting an Independent Safety Culture Assessments," dated January 15, 2009.

Communications

The NRC inspection team determined that CB&I LC is properly implementing the conditions specified in Section A, "Communications," of Confirmatory Order EA-13-196 at its Lake Charles, LA fabrication facility. This included: communicating CB&I's strategy to improve its NSC; ensuring that its NSC and SCWE policies, guidance, and related materials are in place, updated and consistent with applicable NRC and industry guidance; and that managers and supervisors at CB&I LC periodically reinforce expectations regarding SCWE and wrongdoing to their respective work units such that employees receive a relevant message on one or more of these topics at least once per quarter. No findings of significance were identified.

Training

The NRC inspection team determined that CB&I LC is properly implementing the conditions specified in Section B, "Training," of Confirmatory Order EA-13-196 at its Lake Charles, LA fabrication facility. This included: training supervisory and non-supervisory staff on the NRC's employee protection and wrongdoing regulations; NRC's nuclear safety culture and safety conscious work environment policy statements; CB&I's corrective action program; and CB&I's Code of Conduct Policy relating to employees right to raise concerns. No findings of significance were identified.

Work Processes

The NRC inspection team determined that CB&I LC is properly implementing the conditions specified in Section C, "Work Processes," of Confirmatory Order EA-13-196 at its Lake Charles, LA fabrication facility. This included: developing and maintaining a uniform Executive Review Board process, a single Employee Concerns Program for all CB&I employees, and a NSC oversight program; establishing, where applicable, an active corrective action program (CAP) trending process to include the ability to trend root and contributing causes related to CB&I's NSC; entering the conditions associated with the wrongdoing event described in the NRC's February 20, 2014, letter into its CAP and characterizing it as a significant condition adverse to quality; and revising applicable procedures on procedure use and adherence to reinforce the requirements of Title 10 of the *Code of Federal Regulations* (10 CFR) 52.6, "Completeness and accuracy of information." No findings of significance were identified. The effectiveness of the processes at CB&I facilities other than CB&I LC has not been established as of this date.

Nuclear Safety Culture and Safety Conscious Work Environment

The NRC inspection team determined that CB&I LC is properly implementing the conditions specified in Section D, "Nuclear Safety Culture and Safety Conscious Work Environment," of Confirmatory Order EA-13-196 at its Lake Charles, LA fabrication facility. This included: establishing a Nuclear Safety Officer function; hiring a third-party, independent consultant to perform tailored comprehensive NSC assessments to ensure effectiveness of the NSC and

SCWE programs; and to address concerns raised in the NRC's April 18, 2013, Chilling Effect Letter. No findings of significance were identified. The effectiveness of the processes at CB&I facilities other than CB&I LC has not been established as of this date.

Other Order Requirements

The NRC inspection team determined that CB&I LC is properly implementing the conditions specified in Section E, "Other Order Requirements," of Confirmatory Order EA-13-196 at its Lake Charles, LA fabrication facility. This included: entering the conditions associated with the April 18, 2013, Chilling Effect Letter into its CAP; and revising and maintaining its Code of Corporate Conduct to incorporate the NRC's deliberate misconduct rule and include a provision stating that all employees have the right to raise nuclear safety and quality concerns to CB&I, the NRC, and Congress, or engage in any other type of protected activity without being subject to disciplinary action. No findings of significance were identified.

REPORT DETAILS

1. Communications

a. Inspection Scope

Section A, "Communications," of the CO includes requirements that CB&I communicate its strategy to improve its NSC to its employees and contractors; share the company's experience and insights with respect to NSC in a presentation at an NRC and vendor conferences; ensuring that its NSC and SCWE policies, guidance, and related materials are in place, updated and consistent with applicable NRC and industry guidance; and that managers and supervisors at CB&I LC periodically reinforce expectations regarding SCWE and wrongdoing to their respective work units such that employees receive a relevant message on one or more of these topics at least once per quarter.

The NRC inspection team (hereafter referred to as the inspectors) reviewed NSC site communications, documentation, policies, guidance and related materials; attended presentations by CB&I at the March 2014 RIC and the June 2014 NRC Workshop on Vendor Oversight; and participated at pre-job and post job briefings at CB&I LC to verify compliance with the requirements of Section A of the CO.

The attachment to this inspection report lists the documents reviewed by the NRC inspection team.

b. Observations and Findings

The inspectors reviewed written communication, dated November 14, 2013, provided by the CB&I Chief Executive Officer (CEO) to CB&I employees and contractors engaged in work associated with NRC-regulated activities, including handouts associated with the all-hands meetings held at CB&I LC. The inspectors verified that the CEO communicated CB&I's strategy to improve its NSC; held all-hands meeting with employees associated with NRC-regulated activities; posted the document in prominent locations where employees congregate; and interviewed a sample of site personnel to verify communications effectiveness as required by Section A.1 of the CO.

The NRC inspectors verified CB&I policies and procedures CMS-805-00-PL-00001, "Nuclear Safety Culture Policy," CMS-805-00-PL-00002, "SCWE Policy," CMS-805-00-PR-00001, "Maintaining a Positive Nuclear Safety Culture & a Safety Conscious Work Environment," and CMS-805-01-PR-00001, "Employee Concerns Program," were up to date and consistent with: (1) the NRC's March 2011 Safety Culture Policy Statement and associated traits; and (2) the NRC's May 1996 Safety Conscious Work Environment Policy Statement; and is informed by: (1) the NRC's Regulatory Issue Summary 2005-18, "Guidance for Establishing and Maintaining a Safety Conscious Work Environment;" and (2) the industry's common language initiative (INPO 12-012, Revision 1, April 2013). The inspectors verified that that CB&I maintained and implemented these materials and distributed copies of these updated policies and brochures to both current and new employees during initial orientation. The NRC inspectors also interviewed a sample of site personnel to verify communications effectiveness as required in Section A.2 of the CO.

The inspectors previously attended the March 2014 RIC and the June 2014 NRC Workshop in Portland, Oregon and verified a senior CB&I manager shared the company's experience and insights with respect to improving its NSC, including lessons learned and actions taken in a presentation. As such, the actions required by Section A.3 of the CO are considered complete.

The NRC inspectors reviewed communications efforts, including posters, handouts associated with site-wide all-hands meetings held in October 2014, November 2014 and February 2015 and attended a pre-job brief and post-job brief on May 20, 2015. The safety topic handouts reviewed showed that relevant NSC trait behavior examples have been incorporated into discussions on other safety topics, such as personnel safety, and are being discussed on a weekly basis. The NRC inspectors also interviewed a sample of site personnel to verify communications effectiveness. Interviews with company personnel on the shop floor confirmed that wrongdoing and NSC topics are frequently discussed during routine meetings, including daily pre-job briefs. The personnel interviewed appeared to understand the intent of these messages, and indicated to the inspectors that "things are changing at Lake Charles" and that these changes are being viewed in a positive manner. The inspectors consider Section A.4 of the CO as being effectively implemented.

c. Conclusions

The inspectors concluded that CB&I is effectively implementing the requirements of Section A, "Communications," of the CO. No findings of significance were identified.

2. Training

a. Inspection Scope

Section B, "Training," of the CO includes requirements that CB&I: train supervisory and non-supervisory staff on the NRC's employee protection and wrongdoing regulations; NRC's NSC and SCWE policy statements; CB&I's CAP; and CB&I's Code of Conduct Policy relating to employees right and avenues to raise concerns.

The inspectors reviewed a variety of training materials including student slides, instructor guides and training records; observed employee and supervisor training being performed; and interviewed a sample of employees at CB&I LC to establish a sense of the effectiveness of the training. These actions were taken to verify compliance with the requirements of Section B of the CO.

b. Observations and Findings

1. Training Materials

A review of the training materials revealed they were developed by Beckman and Associates, Inc. (B&A), under a contract with CB&I/Stone and Webster, Inc. An evaluation of contract documents, including resumes of the referenced B&A personnel named on the contract, revealed that B&A has sufficient experience with NSC, SCWE, and NRC employee protection regulations. The inspectors verified that the training materials included the following:

- Case studies of discriminatory practices (B.1.a);
- Defined key terms included in employee protection regulation, NSC and SCWE policy statements (B.1.b);
- Behavioral expectations associated with various NSC traits (B.1.c);
- CB&I's CAP as it relates to NSC trait #8. The CAP discussion also emphasized and discussed the reasoning behind the low threshold for initiating a corrective action report (CAR) (B.1.d);
- Discussion on the NRC's deliberate misconduct rules and the concept of willfulness, including the possibility for the NRC to take enforcement action against individuals for violating NRC deliberate misconduct rules. The discussion also included a case study on willful violations and deliberate misconduct (B.1.e);
- An overview on how NRC regulations (e.g., Appendix B to Title 10 of the *Code of Federal Regulations* (10 CFR), Part 50) apply to work being performed by CB&I, and how NRC regulations are incorporated into work practices (B.1.f); and
- A discussion of CB&I's revised Corporate Code of Conduct that incorporated deliberate misconduct requirements and their applicability to employees engaged in NRC-regulated activities (E.2.b).

The training materials fully meet the requirements of Section B.1 of the CO.

2. Supervisor Training

Training class NU-NSC-1000, "Nuclear Safety Culture Leadership Training," was developed to meet the requirements of Sections B.2 and B.3 of the CO. It is designed specifically for first-line supervisors and above. The class addressed change management issues associated with improving the NSC at CB&I and preventing a chilled work environment. The inspectors verified that NU-NSC-1000 included each of the 10 NSC traits described in the NRC's Nuclear Safety Culture Policy Statement and other topics specified in the CO sections B.2 and E.2. The training was instructor-led as required by Section B.3 of the CO, and the class duration was approximately 8 hours.

NU-NSC-1000 also included information on the four elements of retaliation or employee discrimination (i.e., protected activity, adverse action, knowledge of the protected activity, and nexus between the protected activity and the adverse action). The employee protection discussion included several case studies or short questions and asked the supervisors to determine if the case study constituted retaliation. The course also integrated a number of interactive group sessions designed to engage the students and address particular NSC traits as they apply to CB&I's organization. The inspectors considered the training methods used as a strength and concluded that NU-NSC-1000 fully meets the requirements of Section B.2 and B.3 of the CO.

3. Employee (non-Supervisory) Training

Training class NU-NSC-3000, "Non-Supervisory NSC Training," was developed to meet the requirements of Section B.4 of the CO. The course emphasized those NSC traits where the non-supervisory employee has the most impact, such as personal accountability, the value of one's signature, and use of the CAP.

Short-term employees, those employed by CB&I for less than 90 days, receive a copy of a "one-pager" that captures the key elements of the training required by Section B.1 of the CO. Topics or concepts covered on the "one-pager" include:

- Safety and quality is the worker's first priority;
- Workers must be honest and trustworthy;
- Employees must follow procedures and promptly raise nuclear safety and quality issues;
- Do the right thing every time and "my signature is my word";
- NRC prohibits deliberate misconduct;
- Traits of a healthy nuclear safety culture; and
- Employees are free to raise concerns without fear of retaliation.

The reverse side of the "one-pager" provides a copy of the letter to CB&I employees from Philip Asherman, President and CEO, dated November 14, 2013, discussing CB&I's nuclear safety culture and the steps that CB&I is taking to address the chilled environment at the company. The revised version of the "one-pager" document covered the same topics and a summary message from Philip Asherman. These documents fully meet the requirements of Section B.5 of the CO when provided to short-term employees.

4. Training Records

Sections B.2.d and B.4.e of the CO state that training records shall be retained consistent with applicable CB&I record retention policies. The inspectors reviewed training records provided by CB&I and determined that over 10,000 employees have taken the non-supervisory training and that several hundred supervisors have taken the supervisory training at various CB&I facilities where nuclear-related activities are taking place. This includes the Vogtle and Summer new construction sites in addition to CB&I LC and CB&I Power's Charlotte, NC, office. CB&I representatives interviewed by the inspectors noted that improvements to its training records system are needed to ensure that currently trained employees and supervisors receive refresher training at the 2-year point as required by the CO.

c. Conclusions

The inspectors concluded that CB&I is effectively implementing the requirements of Section B, "Training," of the CO. No findings of significance were identified.

3. Work Processes

a. Inspection Scope

Section C, "Work Processes," of the CO includes requirements that CB&I: develop and maintain a uniform Executive Review Board (ERB) process, a single Employee Concerns Program (ECP) for all CB&I employees, and a NSC oversight program; establish, where applicable, an active CAP trending process to include the ability to trend root and contributing causes related to CB&I's NSC; enter the conditions associated with the wrongdoing event described in the NRC's February 20, 2014, letter into its CAP and characterizing it as a significant condition adverse to quality (SCAQ); and revise applicable procedures on procedure use and adherence to reinforce the requirements of 10 CFR 52.6, "Completeness and accuracy of information."

The inspectors reviewed CB&I LC's processes, procedures and documentation related to ERB, ECP, NSC oversight program, CAP and safety culture and deliberate misconduct work processes. In addition, interviews were conducted with the owner of the ERB process as well as the Human Resources (HR) Manager. These actions were taken to verify compliance with the requirements of Section C of the CO.

b. Observations and Findings

The inspectors verified that CB&I benchmarked the reactor industry and modeled the CB&I ERB process on that benchmarking effort. The ERB includes management personnel, legal counsel and human resources participation. ERB files are kept in the HR Department. Tracking and trending of ERB case types, including deliberate misconduct, is incorporated as a part of the ERB process and was evidenced by the ERB status report at the Safety Culture Monitoring Panel. It appears that the ERB process is being utilized and is effective in screening disciplinary actions for potential chilling effects. The inspectors considered that all requirements of Section C.1 of the CO are properly being implemented at CB&I LC.

The inspectors verified that industry ECP programs were benchmarked as the basis for the CB&I corporate ECP. The ECP Manager position for CB&I LC has recently been filled with an individual who will be beginning work at CB&I LC within the next few months. This ECP Manager position for CB&I LC reports to the ECP Functional Manager for LC who reports directly to the Corporate ECP Manager. The ECP Manager position for CB&I LC matrixes to the General Manager at CB&I LC. The Corporate ECP manager reports to the Vice-President, Nuclear Safety. This reporting relationship is part of the new ECP organization. A review of the ECP Qualification Card indicates a robust training program. The two ECP Specialists currently in the CB&I LC ECP are not yet qualified to all training requirements and consequently, function under the guidance of a qualified ECP Manager as confirmed by the Corporate ECP Manager. The Corporate ECP procedure includes a requirement for all quarterly and annual reports to include a summary of deliberate misconducts and willful violations identified through ECP. A review of the Employee Concerns Program Fourth Quarter Report, Calendar Year 2014, includes deliberate misconducts and willful violations tracking and trending. All requirements of Section C.2 of the CO are properly being implemented at CB&I LC.

The inspectors verified that CB&I's "Manager Review Form - Performance Management," contains guidance for evaluating supervisory staff with regards to CB&I's expectations with regards to employee protection, NSC and SCWE as required by Section C.3 the CO.

The inspectors reviewed the adequacy and implementation of CB&I LC's corrective action program trending process to verify the compliance of Section C.4 and C.9 of the CO. The inspectors discussed the trending process with CB&I LC personnel. The inspectors observed the CAP Screening Committee and verified that the meeting provided an adequate review of the CAR which including proposed categorization for safety culture, wrongdoing and other trending codes (e.g., procedure adherence). In addition, the NRC inspection team noted that CB&I LC established a Corrective Action Review Board (CARB) and performed a CAR and non-conformance reports quarterly trend analysis for conditions adverse to quality (CAQs).

The inspectors verified that condition reports related to NSC and wrongdoing are referred to ECP for investigation and vice versa. The CAP has a screening code for potential wrongdoing and has the capability of trending potential wrongdoing. Condition reports associated with potential wrongdoing are also characterized as a SCAQ and include a root cause analysis. The inspectors noted that CAP department performs the root cause analysis for all the technical aspects of the potential wrongdoing condition report. However, ECP performed the trending of substantiated and unsubstantiated safety culture and wrongdoing cases. All requirements of Section C.4 and C.9 of the CO are properly being implemented at CB&I LC.

The inspectors verified that the ECP requires that Exit Interviews/Surveys are provided to departing employees. The ECP database reflects several ECP case files which have been opened as a result of issues raised on Exit Interview/Surveys. This process, as required in C.5 appears to be effective and is properly being implemented.

The inspectors verified that CB&I established and maintains a "CB&I Ethics Line" as an anonymous toll-free number where employees are able to raise safety concerns. The toll-free number is one of multiple ways where employees may raise concerns (CB&I employees may also raise concerns to the ECP via email in addition to the toll-free number). The inspectors consider Section C.6 as being effectively implemented.

The inspectors noted that members of the Nuclear Safety Culture Monitoring Panel (NSCMP) participated in healthy dialogue regarding safety culture issues at the site. The meeting was significantly extended beyond the time anticipated in the agenda and included problem solving discussions which allowed for a robust discussion centered on safety culture activities. The inspectors determined that the NSCMP is a good mechanism for the management team to understand their issues and develop appropriate corrective actions. Per CMS-805-00-PR-0500, "Nuclear Safety Culture Monitoring Panel," the NSCMP meets quarterly to discuss safety culture trends and develop corrective actions to ensure that early indications of safety culture weaknesses are identified and addressed. The results of the NSCMP are communicated to the Executive Nuclear Safety Council (ENSC), which includes two external consultants, and which meets twice a year to review the site NSCMP reports. The ENSC provides oversight and feedback to the monitoring panel. In addition, the inspectors noted that the NSCMP procedure follows the guidance found in NEI 09-07, "Fostering a Healthy

Nuclear Safety Culture,” which describes the process for implementing the monitoring panel. The panel was chaired by the Nuclear Safety Manager, and was monitored by the site Vice President. Before implementing the process, CB&I LC benchmarked the process against two other sites; Diablo Canyon Power Plant and Wolf Creek Generating Station. In September of 2014, the NSCMP procedure was revised to include discussion on deliberate misconduct per CAR 2011-0884. This revision includes a definition for deliberate misconduct, as well as instruction for the Panel Chair to ensure wrongdoing related SCAQ are communicated to other CB&I nuclear-related facilities. The inspectors determined that the NSCMP is a good mechanism for the management team to understand their issues and develop appropriate corrective actions. As a result, it appears that the NSCMP process, as required by Section C.7 in the CO, is being implemented effectively.

The inspector’s review of various documents associated with CAR 2011-091 revealed that it was initially classified as a CAQ; however, the CAR also acknowledged that further investigation might result in the CAR being re-classified as a SCAQ. A further review of Revision 1 to CAR 2011-091, dated June 23, 2011, confirmed that the corrective action document was “upgraded” to a SCAQ and a root cause analysis was performed. In conjunction with the root cause analysis, CB&I LC contracted with Global QA, Inc., to perform an internal audit and extent of condition review. Corrective actions included: (1) changes to the Quality Assurance Manual regarding the use of welder identification markings, (2) associated procedure changes, including a revised signature verification form, and (3) training to implement the procedure changes, and organizational meetings to discuss the purpose and value of one’s signature on quality assurance documents. The inspectors determined that CB&I LC met the requirements of Section C.8 of the CO.

The inspectors determined that procedure QP-AD-205, “Procedure Hierarchy, Use, and Adherence,” adequately captures the requirements of 10 CFR 52.6 as required by Section C.10 of the CO.

c. Conclusions

The inspectors concluded that CB&I LC is implementing its work processes in accordance with the requirements of Section C, “Work Processes,” of the CO. Although these procedures and processes are in place at a CB&I corporate level, the effectiveness of the processes at CB&I facilities other than LC has not yet been established. No findings of significance were identified.

4. Nuclear Safety Culture and Safety Conscious Work Environment

a. Inspection Scope

Section D, “Nuclear Safety Culture and Safety Conscious Work Environment,” of the CO includes requirements that CB&I: establishing a Nuclear Safety Officer function; hire a third-party, independent consultant to perform tailored comprehensive nuclear safety culture assessments to ensure effectiveness of the NSC and SCWE programs; and to address concerns raised in the NRC’s April 18, 2013, Chilling Effect Letter (these items included: performing an independent focused assessment to determine if effective programmatic controls are in place at CB&I LC (e.g., control of special process,

inspections, procedures, training, etc.), evaluating the results of the assessment and taking corrective actions, and reviewing the independent contractor's 2012 nuclear safety culture assessment report and initiated corrective actions, as necessary).

The inspectors reviewed CB&I LC's processes, procedures and documentation related to assess and monitor NSC and SCWE. In addition, the inspectors evaluated CB&I LC's progress to date in completing the requirements relating to improving the NSC at the CB&I LC facility. Specifically, the inspectors reviewed CB&I LC's actions related to: (1) addressing existing SCWE issues, (2) improving the environment for raising concerns, (3) ensuring that individuals are permitted to pursue resolution of issues without fear of retaliation, and (4) improvements in the process for raising safety and quality concerns.

The inspectors interviewed over 12 individuals and held focus group meetings with a total of 49 individuals to assess the SCWE at CB&I LC and: (1) their willingness and ability to raise concerns, (2) whether they had received training on deliberate misconduct and willful violations, and (3) their use of the CAP. The employees interviewed included: floor supervisor, foreman, rigger, quality control inspectors, document control staff, welder, nondestructive examination technician, and field engineering. The employee's interviewed have been working at CB&I LC between 1 year and 4 years.

During an NRC inspection conducted from February 3–7, 2014, at the CB&I LC facility the inspectors reviewed CAR 2013-438, which was initiated in response to the Chilling Effect Letter (CEL) issued by the NRC to CB&I LC. The inspectors also reviewed the actions associated with CAR 2013-594 to determine if the corrective actions were adequate and sufficient to correct the issues identified in the CEL.

These actions were taken to verify compliance with the requirements of Section D of the CO.

b. Observations and Findings

The inspectors verified that correspondence (dated February 10, 2014) was sent to all CB&I employees stating that the Vice President of Nuclear Safety had been assigned the duties of the Nuclear Safety Officer as required in Section D.1 of the CO.

The inspectors verified that CB&I LC hired a third-party consultant, Utilities Service Alliance (USA), to perform an independent comprehensive NSC assessment. A review of the assessment identified one positive observation, seven weaknesses, four negative observations and six general observations. CB&I initiated CAR 2014-1244 to address identified weaknesses and negative observations in response to the Nuclear Safety Culture Assessment report. The inspectors determined that the corrective actions identified in CAR 2014-1244 were adequate to correct the issues identified in the CEL and should be effective if implemented as described in the CAR. The inspectors verified that CB&I communicated the results of the assessment and CB&I's plan to address the results to its employees through All Hands meetings. CB&I LC had effectively and adequately communicated the strategy for improving the NSC weaknesses identified in the survey.

Inspector interviews of employees revealed that CB&I LC workers were not afraid of raising safety concerns to their supervisors. The employees also indicated that the current work environment is much better than before the NRC issued the CO. In addition, employees stated that they had received training in deliberate misconduct and willful violations. Furthermore, all of the employees stated that they knew how to use the CAP.

All personnel interviewed indicated that they would stop work if needed. They stated that CB&I LC management's expectations are to treat each other professionally and with respect and bad behavior is not tolerated. When asked if they believed that managements' actions were consistent with this philosophy, they all indicated that they did. The inspectors also heard from those interviewed that they trust their immediate supervision and their management team.

The focus group meeting participants indicated that they would raise safety concerns through multiple avenues. The majority of the non-supervisory personnel preferred to raise concerns to their immediate supervisors, but would not be hesitant to use the CAP if necessary. They all indicated they had been trained on how to use the CAP and knew where the drop boxes were located; that they were aware of CB&I LC's SCWE and safety culture policies; and that safety was continually reinforced during morning meetings, weekly Monday meetings, and all hands meetings.

Based on the outcome of interviews and focus groups, the inspectors concluded that CB&I LC personnel were not hesitant to raise safety issues to their management and understood CB&I LC's safety mission.

In addition, the NRC inspection team reviewed CB&I procedure CMS-805-00-PR-15000, "Nuclear Safety Culture Surveys and Assessments," Revision 0, dated April 7, 2015. The purpose of this procedure is to provide a process for conducting NSC surveys and assessments, including pulse surveys. The procedure also describes the process for coordinating NSC surveys and assessments performed by external organizations on behalf of CB&I. Pulse surveys are used to determine the health of the NSC for a particular work group or location and focus on fewer safety culture traits as a subset of the full NSC survey.

CB&I conducted a pulse survey from April 13, 2014, through April 22, 2015. The purpose of the pulse survey was to evaluate the status of the health of the NSC at the CB&I LC facility. The pulse survey's goal was to determine what areas CB&I LC had improved, as well as areas which require further improvement regarding safety culture. The inspectors reviewed the report and the results of the pulse survey. Of the ten NSC traits surveyed by CB&I LC, five traits received positive results and 5 traits received results which indicated that portions of the trait require further improvement. In response to the results of the pulse survey, CB&I initiated CAR 15-549 to address the traits that require improvement. All requirements of Section D.2 of the CO are properly being implemented at CB&I LC.

The inspectors reviewed the adequacy and implementation of CB&I LC's Assessment Team Interim Report entitled "NRC Chilled Environment Letter EA-13-066, Assessment Team Interim Report (procedure review)," dated August 22, 2013. This report provided the assessment results from procedure reviews and focused on the following five areas:

control of special processes; inspections; personnel training and qualification; instructions, procedures, and drawings; and corrective action. The assessment team included representatives from Southern Nuclear Operating Company, South Carolina Electric and Gas Company, and CB&I Power. The inspector's review of the implementation of the CB&I LC corrective actions determined that CB&I LC is taking adequate corrective actions. These actions meet the intent of Sections D.3 of the CO.

As found in the February 2014 inspection, CB&I initiated CAR 2013-438 in response to the CEL issued by the NRC to CB&I LC. The inspectors determined that the root cause analysis (RCA) 2013-438 was adequate in identifying the root causes that lead to the issuance of the CEL. The inspectors found the corrective actions identified in CAR 2013-438 were adequate to correct the issues identified in the CEL. CB&I also initiated CAR 2013-594 to track the actions identified in the CB&I LC response to the CEL. The inspectors determined that the actions identified in CAR 2013-594 were adequate and sufficient to track and correct issues identified in the CEL. These actions meet the intent of Sections D.4 of the CO.

c. Conclusions

The inspectors concluded that CB&I is effectively implementing the requirements of Section D of the CO. CB&I LC's NSC and SCWE programs were determined to be consistent with: (1) the NRC's March 2011 Safety Culture Policy Statement and associated traits; and (2) the NRC's May 1996 Safety Conscious Work Environment Policy Statement; and is informed by: (1) the NRC's Regulatory Issue Summary 2005-18, "Guidance for Establishing and Maintaining a Safety Conscious Work Environment;" and (2) the industry's common language initiative (INPO 12-012, Revision 1, April 2013). No findings of significance were identified.

5. Other Order Requirements

a. Inspection Scope

Section E, "Other Order Requirements," of the CO includes requirements that CB&I: entered the conditions associated with the April 18, 2013, Chilling Effect Letter into its CAP and completed a RCA; revise its Code of Corporate Conduct to include a provision stating that all employees have the right to raise nuclear safety and quality concerns; and to incorporate "Deliberate Misconduct" requirements and its applicability to employees engaged in NRC-regulated activities.

The inspectors reviewed the CAP associated with the NRC's Chilling Effects Letter and reviewed CMS-300-05-PL-00004, "Code of Conduct," Revision 6, dated January 6, 2015, to verify compliance with the requirements of Section E of the CO.

b. Observations and Findings

As previously noted in Section 4.b of this report, CB&I initiated CAR 2013-438 in response to the CEL issued by the NRC to CB&I LC. The inspectors verified that the CAR was treated as a SCAQ and that RCA 2013-438 was adequate in identifying the root causes that led to the issuance of the CEL. The inspectors found the corrective actions identified in CAR 2013-438 were adequate to correct the issues identified in the

CEL. CB&I also initiated CAR 2013-594 to track the actions identified in the CB&I LC response to the CEL. The inspectors determined that the actions identified in CAR 2013-594 were adequate and sufficient to track and correct issues identified in the CEL. These actions meet the intent of Sections E.1 of the CO.

A review of CB&I's Code of Corporate Conduct Policy revealed that it adequately captured the NRC's deliberate misconduct requirements and its applicability to employees engaged in NRC-regulated activities and contains a provision regarding employees' rights to raise nuclear safety and quality concerns as required by Section E.2 of the CO.

c. Conclusions

The inspectors concluded that CB&I LC is effectively implementing the requirements of Section E of the CO. No findings of significance were identified.

6. Entrance and Exit Meetings

On May 18, 2015, the NRC inspection team discussed the scope of the inspection with Mr. Michael J. Annacone, Vice President Nuclear Safety, and other CB&I LC management and technical staff. On May 21, 2015, the NRC inspection team presented the inspection results and observations during an exit meeting with Mr. Annacone and other CB&I LC management and technical staff. The attachment to this report lists the attendees of the entrance and exit meetings.

ATTACHMENT

A. Entrance and Exit Meeting Attendees

Name	Title / Organization	Affiliation	Entrance	Exit
Patricia Holahan	Director, Office of Enforcement (OE)	NRC		X
Kerri Kavanagh	Chief, Quality Assurance Vendor Inspection Branch, Office of New Reactors (NRO)	NRC		X
Russell Arrighi	Sr. Enforcement Specialist (OE)	NRC	X	X
Robert Fretz	Sr. Enforcement Specialist (OE)	NRC	X	X
Diane Sieracki	Sr. Safety Culture Program Manager (OE)	NRC		X
Catherine Thompson	Safety Culture Specialist (OE)	NRC		X
Dori Willis	Team Leader, Allegations and Enforcement Team, Office of Nuclear Reactor Regulation (NRR)	NRC	X	X
Molly Keefe	Human Factors Specialist (NRR)	NRC	X	X
Aixa Belen	Reactor Operations Engineer (NRO)	NRC	X	
Yamir Diaz	Reactor Operations Engineer (NRO)	NRC	X	X
Mike Annacone	VP, Nuclear Safety	CB&I	X	X
Ronald Stevens	Sr. Director, Regulatory Compliance	CB&I	X	X
Nicole Lachance	Manager, Nuclear Maintenance	CB&I	X	
Ryan Zurkuken	Director, Operations	CB&I	X	X
Chris Fordham	Plant Manager	CB&I	X	X
Secilia Gayle	Nuclear Safety Customer & Regulatory Affairs	CB&I	X	X
Scott Ortego	Manager, Projects	CB&I	X	
Jack Gallagher	ECP Program Development	CB&I	X	X
Brian Gibson	Director, Quality	CB&I	X	X
Robyn Breaux	Manager, HR	CB&I		X
Cheryl Peed	Employee Concerns Program	CB&I		X
Patrick Wagner	Employee Concerns Program	CB&I		X
Curt Castell	Licensing	CB&I		X
Bruce Campbell	Corrective Action Program	CB&I		X
David Portus	Manager, Engineering	CB&I		X
*Luke Scorsone	Executive VP	CB&I		X

*Participated by teleconference

B. Inspection Procedures Used

1. IP 40100, "Independent Safety Culture Assessment Follow-up," dated April 5, 2011
2. IP 43002, "Routine Inspections of Nuclear Vendors," dated July 15, 2013.
3. IP 95003.02, "Guidance for Conducting an Independent Safety Culture Assessments," dated January 15, 2009

C. Documents Reviewed

Policies (PL), Procedures (PR), Work Instructions (WI), Forms (FM)

1. CMS-300-05-PL-00004, "Code of Conduct," Revision 6, dated January 6, 2015
2. CMS-500-03-PR-00003: "Performance Management," Revision 1, dated March 20, 2013
3. CMS-805-00-CK-10000, Executive Review Board Document Checklist, dated March 9, 2015
4. CMS-805-00-FM-10004, Executive Review Board, Chilling Effective Mitigation Plan, dated December 15, 2014
5. CMS-805-00-FM-10005, Executive Review Board Record of Action, dated December 15, 2014
6. CMS-805-00-FM-15001, "Nuclear Safety Culture Survey Questions," dated April 16, 2015
7. CMS-805-00-PL-00001, "Nuclear Safety Culture Policy"
8. CMS-805-00-PL-00002, "Safety Conscious Work Environment Policy"
9. CMS-805-00-PR-00001, "Maintaining a Positive Nuclear Safety Culture & a Safety Conscious Work Environment"
10. CMS-805-00-PR-0500, "Nuclear Safety Culture Monitoring Panel" (NSCMP)"
11. CMS-805-00-PR-10000, "Executive Review Board," dated December 15, 2014
12. CMS-805-00-PR-05000, "Nuclear Safety Culture Monitoring," Revision 1, dated September 25, 2014
13. CMS-805-00-PR-15000, "Nuclear Safety Culture Surveys and Assessments," dated April 7, 2015
14. CMS-805-01-PR-00001, "Employee Concerns Program," dated May 12, 2015
15. CMS-805-01-WI-00001, "Employee Concerns Program (ECP) Qualification Card," dated June 25, 2014
16. CMS-805-01-WI-00002, "Employee Concerns Program (ECP) Work Instruction," dated March 25, 2015
17. CMS-805-00-WI-10001, "Executive Review Board Record Process," dated March 9, 2015
18. NQ-SCWE-01: "Executive Review Board," Revision 0, July, 22, 2013
19. NU-NSC-1000, "Nuclear Safety Culture Leadership Training"
20. NU-NSC-3000, "Our Nuclear Safety Culture" (Non-Supervisory NSC Training)
21. QP-AD-205, "Procedure Hierarchy, Use, and Adherence," Revision 3, dated January 12, 2015
22. QP-CA-216, "Corrective Action Program," Revision 2, dated February 18, 2013
23. QP-CA-303, "Trending Manual," Revision 1, dated February 5, 2015
24. QP-CA-305, "Condition Report Processing," Revision 4, dated May 1, 2015
25. QS-16.05, "Corrective Action Program," Revision 6, dated January 23, 2015
26. Manager Review Form - Performance Management

Correspondence

1. Letter dated October 19, 2012, from R.P. Zimmerman, USNRC to E. Smith, President, Shaw Power Group, "Apparent Violation of Employee Protection Requirements (Office of Investigations Report No. 2-2011-047) (ADAMS Accession No. ML12270A171)
2. Letter dated April 18, 2013, from R.P. Zimmerman, USNRC to D. Barry, President, CB&I, "Notice of Violation and Imposition of Civil Penalties - \$36,400 (Office of Investigations Report No. 2-2011-047) (ADAMS Accession No. ML13050A597)
3. Letter dated April 18, 2013, from G. M. Tracy, USNRC to P. K. Asherman, President and CEO, CB&I, "Chilled Work Environment for Raising and Addressing Safety Concerns at Chicago Bridge & Iron Fabrication Lake Charles Facility (Formerly Known as Shaw Modular Solutions)," (ADAMS Accession No. ML13092A077)
4. Letter dated May 17, 2013, from P. K. Asherman, President and CEO, CB&I, to G. M. Tracy, USNRC, "Response to April 18, 2013, NRC Letter Regarding Chilled Work Environment at Chicago Bridge & Iron Fabrication Lake Charles Facility," (ADAMS Accession No. ML13149A351)
5. Letter dated December 20, 2013, from L. W. Scorsone, Executive VP, Fabrication Services, CB&I, to M. C. Cheok, USNRC, "Update to CB&I Response Letter Dated May 17, 2013, to April 18, 2013, NRC Letter Regarding Chilled Work Environment at Chicago Bridge & Iron Fabrication Lake Charles Facility," (ADAMS Accession No. ML13357A509)
6. Confirmatory Order for Chicago Bridge and Iron (CB&I) – EA-12-189 (ADAMS Accession No. ML13233A432)
7. Revised Confirmatory Order for Chicago Bridge and Iron (CB&I) – EA-13-196 (ADAMS Accession No. ML14248A445)
8. Letter dated June 16, 2014, from Mike Annacone, Vice President Nuclear Safety, CB&I, to USNRC, "Chicago Bridge & Iron Corrective Actions Regarding EA-13-196," (ADAMS Accession No. ML14170A034)

Previous Inspection Reports

1. Inspection Report No. 99901425/2014-201 dated March 21, 2014 (ML14072A315)
2. Inspection Report No. 99901425/2014-202 dated January 15, 2015 (ML14352A127)

Internal and External Audit Reports

1. Letter dated October 21, 2013, from Michael B. Cusick, Director QA Nuclear, CB&I to Kevin Walsh, Vice President Fabrication and Manufacturing, "NRC Chilled Environment Letter EA-13-066, NRC Action Item 4 Assessment Team Final Report."
2. Employee Concerns Program (ECP) External Assessment, April 20 - 23, 2015
3. Utilities Service Alliance's "Nuclear Safety Culture Assessment Report," Revision 1, dated May 30, 2014
4. CB&I Pulse Survey Results
5. Nuclear Safety Culture Pulse Survey Results & Report," dated February 17, 2015
6. Nuclear Safety Culture Pulse Survey Results & Report, Revision 1, dated April 13-22, 2015

Corrective Action Reports

1. CAR 2011-091
2. CAR 2011-884
3. CAR 2013-438
4. CAR 2013-594
5. CAR 2013-1338
6. CAR 2013-1340
7. CAR 2013-1341
8. CAR 2013-1344
9. CAR 2013-1351
10. CAR 2013-1352
11. CAR 2013-1353
12. CAR 2013-1354
13. CAR 2013-1355
14. CAR 2013-1356
15. CAR 2013-1358
16. CAR 2013-1359
17. CAR 2013-1360
18. CAR 2014-1244

Other Related Documents

1. Slides: Inspiration for Kaizen Blitz
2. Employee Concerns Program- Lake Charles Metrics, 2014
3. Nuclear Safety Advisory Board (NSAB) Quarterly Meeting minutes, dated June 19; August 20; and October 8, 2013.
4. CMS-805-00-FM-10004: "Executive Review Board Chilling Effect Mitigation Plan," DRAFT
5. CMS-805-00-FM-10005: "Executive Review Board Record of Action," DRAFT
6. Nuclear Safety Advisory Board Charter - DRAFT
7. CB&I Lake Charles Nuclear Safety Advisory Board: DRAFT
8. Nuclear Safety Advisory Board presentation slides: August 20, 2013
9. Gap Analysis for Prior CB&I Safety Culture/SCWE Training - DRAFT
10. January 15, 2014, All Hands Meeting slides
11. Employee Concerns Program Fourth Quarter Report, Calendar Year 2014, dated April 20, 2015