

November 21, 2014

Mr. Russell E. Stone, Quality Manager
Specialty Maintenance and Construction, Inc.
A Division of Metaltek International
4015 Drane Field Rd.
Lakeland, FL 33811

SUBJECT: NUCLEAR REGULATORY COMMISSION INSPECTION REPORT NO.
99901439/2014-202 AND NOTICE OF NONCONFORMANCE

Dear Mr. Stone:

On October 13-17, 2014, the U.S. Nuclear Regulatory Commission (NRC) staff conducted an inspection at the Specialty Maintenance and Construction, Inc. (SMCI) facility in Lakeland, FL. The purpose of this limited-scope reactive inspection was to assess SMCI's compliance with selected portions 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." This technically-focused inspection specifically evaluated SMCI's implementation of quality activities associated with the fabrication of the remain-in-place steel formwork modules for concrete, in-containment refueling water storage tank wall and reactor vessel cavity modules for the Westinghouse Electric Company's AP1000 reactor design. The enclosed report presents the results of the inspection. This NRC inspection report does not constitute an NRC endorsement of SMCI's overall quality assurance (QA) program.

During this inspection, the NRC inspection team found that the implementation of SMCI's QA program failed to meet certain NRC requirements imposed on you by your customers. Specifically, the NRC inspection team determined that SMCI was not fully implementing its QA program in the areas of corrective action, nonconforming materials, parts, or components, handling, storage, and shipping, and control of purchased material, equipment, and services. The specific findings and references to the pertinent requirements are identified in the enclosures to this letter. In response to the enclosed notice of nonconformance (NON), SMCI should document the results of the extent of condition review for these findings and determine whether there are any effects on other safety-related components.

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

In accordance with 10 CFR 2.390, "Agency Rules of Practice and Procedure," a copy of this letter, its enclosure(s), and 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), accessible at <http://www.nrc.gov/reading-rm/adams.html>. To the extent possible, your response (if applicable) 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 will 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.: 99901439

Enclosures:

1. Notice of Nonconformance
2. Inspection Report No. 99901439/2014-202 and Attachment

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 will 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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NRO-002

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DATE	11/5/2014	11/6/2014	11/21/2014

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NOTICE OF NONCONFORMANCE

Specialty Maintenance and Construction, Inc.
4015 Drane Field Road
Lakeland, FL 33811
Docket No. 99901439

Based on the results of a U.S. Nuclear Regulatory Commission (NRC) inspection conducted at the Specialty Maintenance and Construction, Inc. (SMCI) facility in Lakeland, FL, on October 13, 2014, through October 17, 2014, certain activities were not conducted in accordance with NRC requirements that were contractually imposed on SMCI by its customers or NRC licensees:

- A. Criterion XVI, "Corrective Action," in Appendix B, "Quality Assurance Program Criteria for Nuclear Power Plants and Fuel Reprocessing Plants," to Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, "Domestic Licensing of Production and Utilization Facilities," states that, "Measures shall be established to assure that conditions adverse to quality, such as failures, malfunctions, deficiencies, deviations, defective material and equipment, and nonconformances are promptly identified and corrected. In the case of significant conditions adverse to quality, the measures shall assure that the cause of the condition is determined and corrective action taken to preclude repetition. The identification of the significant condition adverse to quality, the cause of the condition, and the corrective action taken shall be documented and reported to appropriate levels of management."

Paragraph 16.3.3.3 of Section 16.0 of SMCI's Quality Assurance Manual, "Corrective Action," Revision 3 dated December 23, 2013, states, in part, that "The Quality Manager in conjunction with the affected department manager or supervisor shall recommend the appropriate corrective action to be taken... The individual responsible for implementing the corrective measures shall propose a completion date, subject to the Quality Manager's acceptance."

Contrary to the above, as of October 16, 2014, SMCI failed to ensure that significant conditions adverse to quality were promptly identified and corrected, and also failed to ensure that significant conditions adverse to quality were corrected to preclude repetition.

Specifically,

1. Corrective action taken in response to NRC finding, NON 99901439/2014-201-01, related to SMCI's failure to qualify a welding procedure in accordance with Westinghouse Electric Company document number APP-VW20-ZO-023, "Welding Specification for ASTM A240 UNS S32101 Duplex Stainless Steel," Revision 3, dated February 11, 2011, was inadequate. The NRC inspection team verified the corrective actions and determined that SMCI failed to effectively implement the corrective actions as documented in a letter from SMCI to the NRC dated June 6, 2014. Although SMCI did generate a welding procedure specification and procedure qualification record checklist, these checklists have not been incorporated in SMCI's quality assurance

program. In addition, the checklists failed to provide the necessary reference to meet the WEC specifications to address weld ferrite content in duplex stainless steel welds.

2. Corrective action taken in response to NRC finding, NON 99901439/2014-201-02, classified as a significant condition adverse to quality, related to SMCI's failure to adopt a Nonconformance Program that meets the requirements of Criterion XV in Appendix B to 10 CFR Part 50, was inadequate. The NRC inspection team verified the corrective actions and determined that SMCI failed to effectively implement the corrective actions as documented in a letter from SMCI to the NRC dated June 6, 2014. The NRC inspection team found several recurrent examples that indicate that the corrective actions taken to preclude repetition were inadequate. For example, the NRC inspection team identified four nonconformance (NCR) hold tags that did not contain the NCR number, and found seven items in the NCR holding area without proper identification and description of the cause of the nonconforming issue. Furthermore, the NRC inspection team determined that the SMCI training conducted for the new NCR procedure as part of the corrective action was ineffective.

This issue has been identified as Nonconformance 99901439/2014-202-01.

- B. Criterion XV, "Nonconforming Materials, Parts, or Components," in Appendix B to 10 CFR Part 50, states, in part, that "Measures shall be established to control materials, parts, or components which do not conform to requirements in order to prevent their inadvertent use or installation. These measures shall include, as appropriate, procedures for identification, documentation, segregation, disposition, and notification to affected organizations. Nonconforming items shall be reviewed and accepted, rejected, repaired or reworked in accordance with documented procedures."

Paragraph 15.3.1 of Section 15.0 of SMCI's Quality Assurance Manual, "Control of Nonconforming Items," Revision 6 dated December 23, 2013, states, in part, that "Nonconforming conditions may be identified by an SMCI employee discovering a condition adverse to quality during processing activities affecting quality, or a supplier or subcontractor notifying SMCI of a nonconforming condition. Once a nonconformance is determined to exist, the SMCI employee shall document the nonconformance on a Nonconformance Report (NCR)."

Section 5.5.2.1 of SMCI procedure QP-5.3, "Manufacturing Travelers," Revision 2, dated September 4, 2014, states, in part, that "Manufacturing shall sign/initial and date all completed operations as they are completed." In addition, Section 5.5.2.2 states, in part, that "If Quality Inspection performs the inspection and determines the work performed by Manufacturing has not been completed in accordance with the operation description, the Traveler shall be returned to Manufacturing. Quality Assurance shall initiate a Nonconformance Report in accordance with QP-15.0 for all nonconforming conditions."

Contrary to the above as of October 16, 2014, SMCI failed to adequately identify, document, evaluate, segregate, disposition, and notify affected organizations of nonconforming products.

Specifically,

1. The NRC inspection team identified through interviews of manufacturing and quality inspection staff at SMCI that quality control (QC) inspectors do not always initiate an NCR for all nonconforming conditions found after a welder has completed a step in accordance with the operation description; instead, the QC inspectors extend the definition of "work in process" to justify rework of nonconforming conditions without proper documentation. Individuals described various administrative methods of classifying a weld as "in process" based on which signature blocks on a weld traveler had been signed and dated. This practice allowed unlimited iterations of grinding out and reworking of nonconforming conditions by a welder without documentation in an NCR.
2. SMCI failed to generate an NCR for an oxidized spool of AWS E71T-1M/12M-JH4 flux core arc welding wire intended for use on the AP1000 CA-20 subassemblies 3 and 4 for Vogtle Electric Generating Plant Unit 3. The spool of wire was checked into the controlled storage area by a member of the SMCI staff in a known wetted condition, but rather than documenting the condition in an NCR, the employee attached a handwritten note stating that the spool should not be used.

This issue has been identified as Nonconformance 99901439/2014-202-02.

- C. Criterion XIII, "Handling, Storage, and Shipping," in Appendix B to 10 CFR Part 50, states, in part, that "Measures shall be established to control the handling, storage, shipping, cleaning and preservation of material and equipment in accordance with work and inspection instructions to prevent damage or deterioration."

Subsection 6.1.2.d of Section 6, "Storage," of Subpart 2.2, "Quality Assurance Requirements for Packaging, Shipping, Receiving, Storage, and Handling of Items for Nuclear Power Plants," of the American Society of Mechanical Engineers Nuclear Quality Assurance (NQA)-1, "Quality Assurance Requirements for Nuclear Facility Applications," 1994 Edition, states, in part, that "Level D items may be stored outdoors in an area marked and designated for storage that is well drained. Items shall be stored on cribbing or equivalent to allow for air circulation and to avoid trapping water."

Subsection 5.a, "Storage Level D," of Section 1.2, "Storage Area Requirements," of Appendix 1, "Storage Levels and Cleanliness Classes," to SMCI's QP-13.0, "Material, Handling, Storage, and Shipping," Revision 4, dated September 8, 2014, states, in part, "Outdoor storage - well drained. Items shall be stored on cribbing, or equivalent, to allow for air circulation and to avoid trapping water."

Contrary to the above, as of October 16, 2014, SMCI failed to establish adequate measures for the storage of Level D items to prevent damage or deterioration. Specifically, the NRC inspection team identified several locations where Level D material was being stored that did not have proper drainage. For example, several of the materials being stored were retaining water, had standing water directly beneath the material, and in some cases the pallets holding the material were sinking into the mud created by the water.

This issue has been identified as Nonconformance 99901439/2014-202-03.

- D. Criterion VII, "Control of Purchased Material, Equipment, and Services," in Appendix B to 10 CFR Part 50, states, in part, that "Measures shall be established to assure that purchased material, equipment, and services, whether purchased directly or through contractors and subcontractors, conform to the procurement documents. 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."

Appendix E, "Detrimental and Prohibited Material Control," to WEC document number, APP-GW-ZO-602 "AP1000 Cleaning and Cleanliness Requirements of Equipment for Use in Nuclear Supply and Associated Systems," Revision 3, dated February 8, 2013, states, in part, that "marking materials to be used on the surface of items during manufacture and installation shall be evaluated prior to use to determine if contaminants are present." The document further states, in part, that "possible sources of contaminants include temperature indicating crayons." Table IV, "Detrimental Material Limits for Non-Product Material," in Appendix E lists the contaminants that may be detrimental to various component materials.

Contrary to the above, as of October 16, 2014, SMCI failed to assure that purchased material conforms to the procurement documents. Specifically, SMCI failed to verify that temperature indicating crayons, used in the fabrication of AP1000 safety-related components, were free of contaminants in accordance with the requirements of Appendix E to WEC document number APP-GW-ZO-602. Contaminants present on stainless steel surfaces can increase the material's susceptibility to stress corrosion cracking.

This issue has been identified as Nonconformance 99901439/2014-202-04.

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, Mechanical Vendor Inspection Branch, Division of Construction 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 future noncompliances; and (4) the date when your corrective action will be completed. Where good cause is shown, consideration will be given to 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 Management System (ADAMS), accessible through 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 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, 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 withholding of such material, 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 will 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."

Dated this the 21st day of November 2014.

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

Docket No.: 99901439

Report No.: 99901439/2014-202

Vendor: Specialty Maintenance and Construction, Inc.
A Division of Metaltek International
4015 Drane Field Rd.
Lakeland, FL 33811

Vendor Contact: Mr. Russell Stone
Quality Assurance Manager
E-mail: Russel.Stone@metaltek.com
Phone: 863-644-8432

Nuclear Industry Activity: Specialty Maintenance and Construction, Inc. is under contract to Chicago Bridge & Iron to fabricate, assemble, inspect, transport, and deliver the reactor vessel cavity, remain-in-place steel form work modules for concrete, and in-containment refueling water storage tank wall modules for the Westinghouse Electric Company's AP1000 reactor design.

Inspection Dates: October 13-17, 2014

Inspectors: Yamir Diaz-Castillo NRO/DCIP/MVIB Team Leader
Jonathan Ortega-Luciano NRO/DCIP/MVIB
Laura Miceswki NRO/DCIP/MVIB
Robert Davis NRO/DE/MCB

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

EXECUTIVE SUMMARY

Specialty Maintenance and Construction, Inc.
99901439/2014-202

The U.S. Nuclear Regulatory Commission (NRC) staff conducted a vendor inspection at the Specialty Maintenance and Construction, Inc. (SMCI) facility to verify that it had implemented an adequate quality assurance (QA) program that complies with the requirements of Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants," to Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, "Domestic Licensing of Production and Utilization Facilities." The NRC inspection team conducted the inspection from October 13-17, 2014. This was the second NRC inspection at the SMCI facility.

This technically-focused inspection specifically evaluated SMCI's implementation of quality activities associated with the fabrication of the remain-in-place steel formwork modules for concrete, in-containment refueling water storage tank wall and reactor vessel cavity modules for the Westinghouse Electric Company (WEC) AP1000 reactor design. These modules and sub-modules are being fabricated for the Vogtle Electric Generating Plant (VEGP), Units 3 and 4 and Virgil C. Summer Generating Station, Units 2 and 3.

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

- Corrective Action Review board meeting
- Semi-automatic flux core arc welding on the reactor vessel cavity CA04 module for Virgil C. Summer Generating Station, Unit 3

The following regulation served as the basis for the NRC inspection:

- Appendix B to 10 CFR Part 50

During the course of this inspection, the NRC inspection team implemented Inspection Procedure (IP) 43003, "Reactive Inspections of Nuclear Vendors."

The information below summarizes the results of this inspection.

Corrective Action

The NRC inspection team issued Nonconformance 99901439/2014-202-01 in association with SMCI's failure to implement the regulatory requirements of Criterion XVI, "Corrective Action," in Appendix B to 10 CFR Part 50. Nonconformance 99901439/2014-202-01 cites SMCI for failing to ensure that significant conditions adverse to quality and conditions adverse to quality are promptly identified and corrected, and for failing to ensure that significant conditions adverse to quality were corrected to preclude repetition. Specifically, SMCI did not take adequate corrective actions in response to the findings from the last NRC inspection as documented in inspection report No. 99901439/2014-201.

Nonconforming Materials, Parts, or Components

The NRC inspection team issued Nonconformance 99901439/2014-202-02 in association with SMCI's failure to implement the regulatory requirements of Criterion XV, "Nonconforming Materials, Parts, or Components," in Appendix B to 10 CFR Part 50. Nonconformance 99901439/2014-202-02 cites SMCI for failing to adequately identify, document, evaluate, segregate, disposition, and notify affected organizations of a nonconforming product. Specifically, SMCI avoided generating nonconformance reports (NCRs) for all nonconforming conditions by extending the definition of "work in process" to justify rework of nonconforming conditions without proper documentation and did not generate an NCR for spool of wire that was checked into the controlled storage area by a member of SMCI staff in a known wetted condition.

Handling, Storage, and Shipping

The NRC inspection team issued Nonconformance 99901439/2014-202-03 in association with SMCI's failure to implement the regulatory requirements of Criterion XIII, "Handling, Storage, and Shipping," in Appendix B to 10 CFR Part 50. Nonconformance 99901439/2014-202-03 cites SMCI for failing to establish adequate measures for the storage of Level D items. Specifically, the NRC inspection team identified several locations where Level D material was being stored that did not have proper drainage.

Control of Purchased Material, Equipment, and Services

The NRC inspection team issued Nonconformance 99901439/2014-202-04 in association with SMCI's failure to implement the regulatory requirements of Criterion VII, "Control of Purchased Material, Equipment, and Services," in Appendix B to 10 CFR Part 50. Nonconformance 99901439/2014-202-04 cites SMCI for failing to assure that purchased material conformed to the procurement documents. Specifically, SMCI failed to verify that temperature indicating crayons, used in the fabrication of AP1000 safety-related components, were free of contaminants in accordance with the requirements of Appendix E, "Detrimental and Prohibited Material Control," of Westinghouse Electric Company (WEC) document number, APP-GW-ZO-602 "AP1000 Cleaning and Cleanliness Requirements of Equipment for Use in Nuclear Supply and Associated Systems," Revision 3, dated February 8, 2013.

Other Inspection Areas

The NRC inspection team determined that SMCI is implementing its programs for training and qualification of personnel and control of special processes 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 SMCI is implementing its policies and procedures associated with these programs. No findings of significance were identified.

REPORT DETAILS

1. Corrective Action

a. Inspection Scope

The U.S Nuclear Regulatory Commission (NRC) inspection team reviewed SMCI's policies and implementing procedures that govern the corrective action program to verify compliance with the requirements of Criterion XVI, "Corrective Action," 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."

The NRC inspection team observed a Corrective Action Report (CAR) review board meeting to determine whether SMCI's staff demonstrated sufficient knowledge of the Corrective Action Program and whether the meeting provided an adequate review of the CARs, including proposed categorization (significant condition adverse to quality, condition adverse to quality, or other, as applicable) and appropriate screening for applicability 10 CFR Part 21, "Reporting Defects and Noncompliance." The NRC inspection team also evaluated the adequacy of SMCI's implementation of the corrective actions taken in response to the findings identified in the previous NRC inspection.

The NRC inspection team discussed the CAP with SMCI's management and technical staff. The attachment to this inspection report lists the documents reviewed by the NRC inspection team.

b. Observations and Findings

b.1 Corrective Action Associated with Nonconformance 99901439/2014-201-01

Following an April 2014 inspection, the NRC issued Nonconformance 999901439/2014-201-01 for SMCI's failure to qualify a welding procedure in accordance with Westinghouse Electric Company (WEC) specification APP-VW20-ZO-023, "Welding Specification for ASTM A240 UNS S32101 Duplex Stainless Steel," Revision 3, dated February 11, 2011. Specifically, SMCI welding procedure qualification record (PQR) 1015-Partial Joint Penetration (PJP), listed the results of the ferrite testing of the test weld root as 73 percent, which is outside of the 35-65 percent ferrite range acceptance criterion specified by WEC specification APP-VW20-ZO-023. PQR 1015-PJP is a supporting PQR for welding procedure specification (WPS) number 1015. SMCI subsequently identified similar issues with WPS 1019, and its supporting PQRs 1019 and 1019-PJP. WPS 1015 and WPS 1019 are being used to perform welding on the in-containment refueling water storage tank modules for the AP1000 reactor.

In its response to the NRC, SMCI stated that PQRs 1015-PJP, 1019 and 1019-PJP were retested in accordance with WEC specification APP-VW20-ZO-023. SMCI further stated that the testing was done to the same parameters as the original PQRs 1015-PJP, 1019 and 1019-PJP, and that the results of the delta ferrite testing were found to be within the

required range of 35 to 65 percent ferrite. SMCI's response also stated that to avoid future noncompliance, SMCI WPS generation procedure would be revised to require a technical peer check of the WPS before approval at SMCI and submission to the purchaser. In addition, as part of the proposed corrective action, SMCI stated that a technical checklist would be developed for use during these reviews to prevent recurrence.

During the review of the documentation that provided the objective evidence for the completion of the corrective action, the NRC inspection team was unable to locate any new or revised SMCI procedures to verify implementation of SMCI's corrective action to Nonconformance 99901439/2014-201-01. SMCI did provide a WPS and PQR checklist, however, these checklists were not part of any formalized procedure and they failed to contain the necessary guidance to verify acceptable ferrite content for duplex stainless steel welds in accordance with WEC specification APP-VW20-ZO-023. The NRC inspection team identified this issue as an example of Nonconformance 99901439/2014-202-01 for SMCI's failure to ensure that conditions adverse to quality are promptly identified and corrected to preclude repetition.

b.2 Corrective Action Associated with Nonconformance 99901439/2014-201-02

The NRC also issued Nonconformance 99901439/2014-201-02 for SMCI's failure to adequately identify, document, evaluate, segregate, disposition, and notify affected organizations of nonconforming products. Specifically, in 10 out of the 21 nonconformance reports reviewed by the NRC inspection team, SMCI failed to provide objective evidence of the following: (1) proper identification and description of the cause of the nonconforming product or activity, (2) indication of whether the nonconformance was evaluated for 10 CFR Part 21 reportability, (3) disposition and justification of the acceptability of the nonconforming product or activity, and (4) indication that the disposition was adequately completed to close the nonconformance report. In addition, SMCI failed to initiate and disposition nonconformance reports for six different pieces of measuring and testing equipment that were received out of calibration from the calibration vendor.

In its response to the NRC, SMCI stated that: (1) two additional staff with experience in Criterion XV in Appendix B to 10 CFR Part 50 would be hired, (2) the nonconformance reports (NCR) procedure and form were revised to establish a more robust and consistent nonconformance reporting process, (3) training was conducted on the new NCR procedure, and (4) a computer based program for handling NCRs would be developed and implemented. The NRC inspection team noted that the CAR opened in response to this finding was classified as a significant condition adverse to quality.

During the review of the documentation that provided the objective evidence for the completion of the corrective action, the NRC inspection team was not able to find objective evidence that all of the corrective actions documented in SMCI's response to the NRC were completed as described. The NRC inspection team verified the implementation of the corrective actions as documented in SMCI's response and found recurrent examples that indicate that the corrective actions taken to preclude repetition

were inadequate. For example, during a walkdown of the SMCI facilities, the NRC inspection team identified four examples in which SMCI placed an NCR hold tag on CA04 modules that did not include an NCR number on the hold tag as required by SMCI procedure QP 15.0, "Nonconformances." In addition, the NRC inspection team also found seven examples of items in the NCR holding area without proper identification and description of the cause of the nonconforming issue. Furthermore, based on several interviews of SMCI staff regarding the new NCR procedure, the NRC inspection team determined that the training provided to all SMCI staff on the new NCR process was ineffective. The NRC inspection team identified this issue as another example of Nonconformance 99901439/2014-202-02 for SMCI's failure to ensure that significant conditions adverse to quality are promptly identified and corrected to preclude repetition.

c. Conclusion

The NRC inspection team issued Nonconformance 99901439/2014-202-01 in association with SMCI's failure to implement the regulatory requirements of Criterion XVI, "Corrective Action," in Appendix B to 10 CFR Part 50. Nonconformance 99901439/2014-202-01 cites SMCI for failing to ensure that significant conditions adverse to quality and conditions adverse to quality are promptly identified and corrected, and for failing to ensure that significant conditions adverse to quality were corrected to preclude repetition. Specifically, SMCI did not take adequate corrective actions in response to the findings from the last NRC inspection as documented in inspection report No. 99901439/2014-201.

2. Nonconforming Materials, Parts, or Components

a. Inspection Scope

The NRC inspection team reviewed SMCI's policies and implementing procedures that govern the control of nonconformances to verify compliance with the requirements of Criterion XV, "Nonconforming Materials, Parts, or Components," of Appendix B to 10 CFR Part 50.

The NRC inspection team also reviewed a sample of NCRs and nonconforming items on the shop floor to verify implementation of the corrective actions taken by SMCI to improve the nonconformance program. The NRC inspection team discussed the nonconformance program with SMCI's management and technical staff. The attachment to this inspection report lists the documents reviewed by the NRC inspection team.

b. Observations and Findings

During several interviews with manufacturing and quality inspection staff at SMCI, the NRC inspection team identified that quality control (QC) inspectors do not always initiate a NCR for all nonconforming conditions; instead, the QC inspectors extend the definition of "work in process" to justify rework of nonconforming conditions, despite being found after welding work completion, without proper documentation. Some individuals stated that welders have been instructed to initial, but not date, line items on a traveler so that

the step can be considered “in-process” and therefore if QC finds a problem it can be corrected without writing an NCR and a rework traveler. Additionally, other individuals stated that a weld would be considered “in-process” until the QC inspector actually initialed and dated the traveler, even though the welder had already signed off the work as complete. This effectively allows unlimited iterations of grinding out and reworking by the welder for re-inspection by QC staff, with no supporting documentation, until an acceptable weld is achieved. The NRC inspection team identified this issue as an example of Nonconformance 99901439/2014-202-02 for SMCI’s failure to adequately identify, document, evaluate, segregate, disposition, and notify affected organizations of a nonconforming product.

The NRC inspection team inspected SMCI’s material storage areas to verify the storage condition of the weld wire used for nuclear safety-related applications. While performing a walkdown of the storage area, the NRC inspection team noted a spool of E71-T1 flux cored weld wire with a note carrying the handwritten instruction “DO NOT USE SPOOL” taped to the side. Upon further questioning, SMCI staff showed the NRC inspection team that the wire had several visible rust spots. This issue had not been entered into either the nonconformance or corrective action programs. Because the issue had not been documented, the spool was not segregated from the spools ready for issue, the cause of the rust had not been determined, and an extent of condition investigation had not been performed to determine whether any nonconforming wire had actually been used in a safety-related welding application. The material identification and lot numbers printed on the spool, as well as the job number, indicated that the wire was intended for use on nuclear safety-related welds for the AP1000 CA20 module subassemblies that SMCI is currently fabricating for Vogtle Electric Generating Plant.

In response, SMCI initiated NCR 2014-531, tagged and segregated the spool, and opened an investigation. SMCI management subsequently interviewed the personnel who had logged the spool of wire into the controlled wire box, who stated that the spool had been dropped in a puddle by a welder when returning the wire at the end of their shift. The personnel believed that the spool would dry out, and the handwritten note would prevent issuance while it was still wet. SMCI staff reviewed the weld wire issuance log and determined that the spool was logged into the storage area on September 20, 2014. SMCI ultimately concluded that the spool of wire had not been used for subsequent production work after it was wetted. E71T-1 flux cored welding wire is a tubular weld wire filled with welding flux. When the weld wire is exposed to water, the flux inside absorbs moisture. Once the welding wire is wetted or absorbs an excessive amount of moisture, there is no process that can “dry out” the welding wire. Dropping a spool of weld wire in a puddle would make the spool of wire unacceptable for use in welding safety-related components. Wetted weld wire can potentially produce welding defects such as porosity. Wetted weld wire can also contribute to hydrogen cracking which might not be detected unless the inspection of the welds is conducted at least 48 hours after the weld is completed. The NRC inspection team identified this issue as another example of Nonconformance 99901439/2014-202-02 for SMCI’s failure to adequately identify, document, evaluate, segregate, disposition, and notify affected organizations of a nonconforming product. SMCI initiated CAR No. 2014-277 to address this issue.

c. Conclusion

The NRC inspection team issued Nonconformance 99901439/2014-202-02 in association with SMCI's failure to implement the regulatory requirements of Criterion XV, in Appendix B to 10 CFR Part 50. Nonconformance 99901439/2014-202-02 cites SMCI for failing to adequately identify, document, evaluate, segregate, disposition, and notify affected organizations of a nonconforming product. Specifically, SMCI avoided generating NCRs for all nonconforming conditions by extending the definition of "work in process" to justify rework of nonconforming conditions without proper documentation and did not generate an NCR for a spool of wire that was checked into the controlled storage area by a member of SMCI staff in a known wetted condition.

3. Handling, Storage, and Shipping

a. Inspection Scope

The NRC inspection team reviewed SMCI's policies and implementing procedures that govern the handling, storage, and shipping program to verify compliance with the requirements of Criterion XIII, "Handling, Storage, and Shipping," in Appendix B to 10 CFR Part 50.

The NRC inspection team also reviewed the classification and use of the storage level B, C, and D areas in accordance with the requirements of Subsection 6.1.2.d of Section 6, "Storage," of Subpart 2.2, "Quality Assurance Requirements for Packaging, Shipping, Receiving, Storage, and Handling of Items for Nuclear Power Plants," of the American Society of Mechanical Engineers Nuclear Quality Assurance (NQA) -1, "Quality Assurance Requirements for Nuclear Facility Applications," 1994 Edition. In addition, the NRC inspection team performed a walkdown of levels B, C, and D of SMCI's storage areas.

The NRC inspection team discussed the handling, storage, and shipping program with SMCI's management and technical staff. The attachment to this inspection report lists the documents reviewed by the NRC inspection team.

b. Observations and Findings

While performing a walkdown of the level B, C, and S storage areas, the NRC inspection team identified several locations where Level D material was being stored that did not have proper drainage. For example, several of the materials being stored were retaining water, had standing water directly beneath the material, and in some cases the pallets holding the material were sinking into the mud created by the water. The NRC inspection team identified this issue as an example of Nonconformance 99901439/2014-202-03 for SMCI's failure to establish adequate measures for the storage of Level D items to prevent damage or deterioration. SMCI initiated CAR No. 2014-281 to address this issue.

c. Conclusion

The NRC inspection team issued Nonconformance 99901439/2014-202-03 in association with SMCI's failure to implement the regulatory requirements of Criterion XIII in Appendix B to 10 CFR Part 50. Nonconformance 99901439/2014-202-03 cites SMCI for failing to establish adequate measures for the storage of Level D items. Specifically, the NRC inspection team identified several locations where Level D material was being stored that did not have proper drainage.

4. Control of Purchased Material, Equipment, and Services

a. Inspection Scope

The NRC inspection team reviewed SMCI'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 VII, "Control of Purchased Material, Equipment, and Services," in Appendix B to 10 CFR Part 50.

The NRC inspection team discussed the control of purchase material, equipment, and services program with SMCI's management and technical staff. The attachment to this inspection report lists the documents reviewed by the NRC inspection team.

b. Observations and Findings

During an observation of the fabrication of carbon steel reactor vessel cavity CA04 modules, the NRC inspection team inquired as to the method used by SMCI to monitor the interpass temperature during welding operations. SMCI QC personnel stated that they use temperature indicating crayons to ensure that WPS interpass temperature limits are not exceeded. SMCI personnel further stated that the same method of interpass temperature monitoring is used on duplex stainless steel for the in-containment refueling water storage tank CA03 modules.

In accordance with WEC APP-GW-ZO-602, "AP1000 Cleaning and Cleanliness Requirements of Equipment for Use in Nuclear Supply and Associated Systems," Revision 3, dated February 18, 2013, materials used on the surface of items during their manufacture and installation shall be evaluated before their use to determine whether contaminants are present. Appendix E of WEC APP-GW-ZO-602 provides a list of contaminants. WEC APP-GW-ZO-602 lists temperature indicating crayons as a possible source of contaminants.

The NRC inspection team requested that SMCI provide documentation to show that it had verified that the temperature indicating crayons, used during the fabrication of AP1000 components, met the requirements of the WEC APP-GW-ZO-602 specifications regarding potential contaminants. SMCI could not provide the requested documentation. SMCI also could not provide any objective evidence that it had verified the absence of contaminants in the temperature indicating crayons in accordance with WEC APP-GW-ZO-602. The NRC inspection team was also unable to obtain any objective evidence

that the accuracy of the temperature indicating crayons had been verified. Contaminants in contact with stainless steel material can contribute to an increased susceptibility to stress corrosion cracking. The NRC inspection team identified this issue as an example of Nonconformance 99901439/2014-202-204 for SMCI's failure to assure that purchased material conforms to the procurement documents. SMCI initiated CAR No. 2014-281 to address this issue.

c. Conclusion

The NRC inspection team issued Nonconformance 99901439/2014-202-04 in association with SMCI's failure to implement the regulatory requirements of Criterion VII, in Appendix B to 10 CFR Part 50. Nonconformance 99901439/2014-202-04 cites SMCI for failing to assure that purchased material conforms to the procurement documents. Specifically, SMCI failed to verify that temperature indicating crayons, used in the fabrication of AP1000 safety-related components, were free of contaminants in accordance with the requirements of Appendix E of WEC document number APP-GW-ZO-602.

5. Manufacturing Control

a. Inspection Scope

The NRC inspection team reviewed SMCI policies and implementing procedures that govern the control of special processes to verify compliance with the regulatory requirements of the following:

- Criterion IX, "Control of Special Processes," in Appendix B to 10 CFR Part 50
- American Welding Society (AWS) D1.1 Structural Welding Code - Steel, 2000 Edition,

The NRC inspection team reviewed a sample of welding documents associated with the fabrication of the reactor vessel cavity CA04 modules. The NRC inspection team also verified that the applicable welding data, such as weld material identification number, welding procedure specification (WPS), and in process inspection results were recorded on weld travelers.

The NRC inspection team witnessed semi-automatic flux cored arc welding on the CA04 module 4 for Virgil C. Summer Generating Station Unit 3. In addition, the NRC inspection team verified that the welding was performed using appropriately qualified welding procedures by qualified welders in accordance with AWS D1.1.

The NRC inspection team discussed the special processes program with SMCI's management and technical staff. The attachment to this inspection report lists the documents reviewed by the NRC inspection team.

b. Observations and Findings

No findings of significance were identified.

c. Conclusion

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

6. Personnel Training and Qualification

a. Inspection Scope

The NRC inspection team reviewed SMCI's policies and implementing procedures that govern the training and qualification program to verify compliance with the requirements of Criterion II, "Quality Assurance Program," in Appendix B to 10 CFR Part 50.

The NRC inspection team reviewed the indoctrination, training and qualification of lead auditors and auditors, nondestructive examination personnel, QC personnel, and welding personnel to ensure that proficiency is achieved and maintained. The NRC inspection team verified that all personnel performing activities affecting quality had completed the required training and met all the specified requirements in accordance with SMCI's policies and procedures.

The NRC inspection team discussed the training and qualification program with SMCI's management and technical staff. The attachment to this inspection report lists the documents reviewed by the NRC inspection team.

b. Observations and Findings

No findings of significance were identified.

c. Conclusion

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

7. Entrance and Exit Meetings

On October 13, 2014, the NRC inspection team discussed the scope of the inspection with Mr. Dave Masterson, SMCI's General Manager, and other members of SMCI's management and technical staff. On October 17, 2014, the NRC inspection team presented the inspection results and observations during an exit meeting with Mr. Masterson, and other members of SMCI'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 AND EXIT MEETING ATTENDEES

Name	Title	Affiliation	Entrance	Exit	Interviewed
Bob Marshall	Executive Vice President, Energy Solutions	Specialty Maintenance & Construction, Inc. (SMCI)		X	
Dave Masterson	General Manager	SMCI	X	X	
Tim Ennis	Director of Nuclear Operations	SMCI	X	X	
Mike Anderson	Controller	SMCI	X		
Cameron Ott	Operations Manager	SMCI		X	X
Russell Stone	Quality Assurance Manager	SMCI	X	X	X
Gamal Handal	Engineering Manager	SMCI	X	X	X
Maricelli Rodríguez	Corrective Action Program Manager	SMCI	X	X	X
Lance Penn	Document Control Manager	SMCI	X	X	X
Aubrey Greene	Project Quality Manager	SMCI			X
Shawn Beck	Project Quality Manager	SMCI	X		
John Bard	Project Quality Manager	SMCI			X
John L. Simon	Project Manager	SMCI	X		X
Joe Shinn	Project Manager	SMCI	X		
Dan Grannan	Project Manager	SMCI			X
Anthony Saputo	Quality Control (QC) Inspector	SMCI			X
Jeff Blanton	QC Inspector	SMCI			X
Bradley Brown	QC Inspector	SMCI			X
Scott Canup	QC Inspector	SMCI			X

Name	Title	Affiliation	Entrance	Exit	Interviewed
Peter Furman	Welding Engineer	SMCI	X	X	X
Jack Pastorik	Welding Engineer	SMCI			X
Ron Riley	Welding Foreman	SMCI			X
Telly Davis	Foreman	SMCI			X
Phillip Johnson	Welder	SMCI			X
Troy Weathers	Welder	SMCI			X
Roger Johnson	Welder	SMCI			X
John Henson	Welder	SMCI			X
Virgil Barton*	Senior Vice President of Operations	Chicago Bridge & Iron (CB&I)	X		
Dave Jantosik*	Senior Director Nuclear Quality	CB&I	X	X	
Josh Skudlarick	Director Modules	CB&I		X	
Thomas Collins	Senior Inspection Specialist	CB&I			X
Daniel P. Grannan	Quality Director	CB&I	X	X	
Gary Cook*	Project Manager	CB&I		X	
Mike Yox*	Licensing Manager	Southern Nuclear Operating Company (SNOC)		X	
Josh Olson*	Quality Assurance	SNOC		X	
Adam Wilshire*	Supplier Oversight	SNOC		X	
Thomas Saunders*	Supplier Compliance	SNOC		X	
Yamir Diaz-Castillo	Inspection Team Leader	NRC	X	X	
Jonathan Ortega-Luciano	Inspector	NRC	X	X	
Laura Micewski	Inspector	NRC	X	X	
Robert Davis	Inspector	NRC	X	X	

2. INSPECTION PROCEDURE USED

IP 43003, "Reactive Inspections of Nuclear Vendors," dated October 3, 2013

3. LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Item Number	Status	Type	Description	Applicable ITAAC
99901439/2014-201-01	DISCUSSED	NON	Criterion IX	N/A
99901439/2014-201-02	DISCUSSED	NON	Criterion XV	N/A
99901439/2014-202-01	OPENED	NON	Criterion XVI	N/A
99901439/2014-202-02	OPENED	NON	Criterion XIII	N/A
99901439/2014-202-03	OPENED	NON	Criterion XV	N/A
99901439/2014-202-04	OPENED	NON	Criterion XVI	N/A

4. DOCUMENTS REVIEWED

Policies and Procedures

- SMCI's Quality Assurance Manual, Revision 6, dated December 23, 2013
- Quality Procedure (QP) 1.1, "Employee Concerns Program," Revision 0, dated April 18, 2014
- QP-2.0, "Indoctrination, Training, and Qualification of Personnel," Revision 2, dated May 20, 2014
- QP-3.2, "Engineering Change Notice," Revision 1, dated April 14, 2014
- QP-5.3, "Manufacturing Travelers," Revision 2, dated September 4, 2014
- QP-7.1, "Receiving Inspections," Revision 3, dated September 8, 2014
- QP-9.0, "Weld Filler Metal and Consumables Control," Revision 5, dated September 19, 2014

- QP-12.0, "Control of Measuring and Test Equipment," Revision 3, dated May 12, 2014
- QP-12.0, "Control of Measuring and Test Equipment," Revision 4, dated June 19, 2014
- QP-WI-12.1, "Tracking Measuring and Test Equipment," Revision 0, dated May 12, 2014
- QP-13.0, "Material Handling, Storage, and Shipping," Revision 4, dated September 8, 2014
- QP-15.0, "Nonconformances," Revision 2, dated May 7, 2014
- QP-16.0, "Corrective Action," Revision 2, dated April 24, 2014
- QP-17.0, "QA Records," Revision 1, dated October 19, 2012
- Form NCR-001, "Nonconformance Report," Revision 2

Design Documents

- WEC APP-GW-ZO-602, "AP1000 Cleaning and Cleanliness Requirements of Equipment for Use in Nuclear Supply and Associated Systems," Revision 3, dated February 18, 2013

Purchase Orders

- Purchase Order (PO) No. 132175-D100.CA007, from Stone & Webster, Inc., to SMCI for fabrication of CA20 subassemblies for Vogtle Unit 3, dated August 6, 2013
- P.O. No. 33420, from SMCI to Weldstar Company for E-71T flux-cored well filler, dated January 28, 2014

Calibration, Inspection, Material, and Welding Records

- Material Receiving Inspection Report for PO No. 33430, ESAB spooled wire E71T-1M/12MJH4
- Certificate of Compliance from Weldstar for spooled wire, 0.045" x 33 lb. spools, ESAB, E71T-1M/12MJH4 Lot #100285, dated January 28, 2014
- Magnetic Equipment Certification of Calibration #2011314 for Parker Yoke Model DA-400, Serial 10946, dated October 10, 2014
- Magnetic Equipment Certification of Calibration #2010244 for Parker Yoke Model DA-400, Serial 10946, dated October 15, 2014
- Welding Procedure Specification (WPS) 1036, Revision 2, dated February 25, 2014
- WPS 1015, Revision 3, July 15, 2014

- Welding Procedure Qualification Record (PQR) 1015-Partial Joint Penetration (PJP), Revision 2, dated July 15, 2014
- WPS 1019, Revision 3, dated July 15, 2014
- PQR 1019, Revision 2, dated April 16, 2014
- Welding Performance Qualification (WPQ) for Jason Stealy, AWS D1.1, WPS 1046, Flux Cored Arc Welding, 3G, dated June 21, 2014
- WPQ for Phillip Johnson, AWS D1.1, WPS 1046, Flux Cored Arc Welding, 3G, dated July 1, 2014
- WPQ for Phillip Johnson, AWS D1.1, WPS 1046, Flux Cored Arc Welding, 4G, dated September 10, 2014
- WPQ for Troy Weathers, AWS D1.1, WPS 1046, Flux Cored Arc Welding, 3G, dated July 1, 2014
- WPQ for Troy Weathers, AWS D1.1, WPS 1046, Flux Cored Arc Welding, 4G, dated September 10, 2014
- WPQ for John Henson, AWS D1.1, WPS 1046, Flux Cored Arc Welding, 3G, dated July 1, 2014
- WPQ for Roger Johnson, AWS D1.1, WPS 1046, Flux Cored Arc Welding, 3G, dated June 27, 2014

Nonconformance Reports

- 067, 068, 069, 078, 105, 119, 136, 147, 153, 165, 166, 171, 175, 227, 230, 231, 244, 246, 259, 266, 267, 278, 290, 294, 316, 332, 326, 372, 375, 376, 389, 390, 411, 419, 426, 432, 440, 461, 466, 531, and 532

Corrective-Action Reports

- 199, 200, 262, 277, 279, 116, 239, and 277

Corrective-Action Reports Generated during the NRC Inspection

- 275, 276, 277, 278, 279, 281, and 282

Training and Qualification Records

- Training and qualification records for the following personnel: Matthew T. Corsi, Jack R. Dighera, Timothy W. Ennis, David W. Johnson, David L. Masterson, Susan M. Pierce,

Maricelli Santiago-Rodríguez, William I. Seals, Jorge L. Vargas, Earl N. Welch, Phillip Johnson, Bradley Brown, Aubrey Greene, Mark Robertson, and Troy Weathers

Miscellaneous

- Memorandum from Quality Manager to all SMCI Employees, "Filling out SMCI Travelers," dated April 25, 2014
- Letter from Dave Masterson, SMCI's General Manager, to Fenley Hall, CB&I's Procurement Module Program, dated June 13, 2014
- Letter from Russell Stone, SMCI's Quality Assurance Manager, to Fenley Hall, CB&I's Procurement Module Program, "MetalTek International, SMCI Division Stop Shipment," dated September 30, 2014
- Letter from Tim Ennis, SMCI's Director of Nuclear Operations, to Fenley Hall, CB&I's Procurement Module Program, "SMCI Weld Nonconformances Potential Part 21," dated October 13, 2014
- Root Cause Analysis 2014-205 Responsive to: CAR 2014-205, CAR 2014-176, CAR 2014-110, and CAR 2014-109, "Ineffective NCR and CAR Disposition Process," dated July 28, 2014
- Notice of Unsatisfactory Conditions Nos. 132175-D100.CA006-30-1, 132175-D100.CA007-41-512, 132175-D100.CA006-24-1, 132175-D100.CA007-34-1, 132175-D100.CA007-36-1, 132177-D100.CA007-46-614, 132177-D100.CA007-46-673, 132175-D100.CA006-26-5, 132175-D100.CA007-708, and 132175-D100.CA007-709