

November 14, 2016

Steve Hamilton, Senior Vice President
Quality, Environment, Health & Safety
Westinghouse Electric Company
1000 Westinghouse Drive
Cranberry Township, PA 16066

SUBJECT: NUCLEAR REGULATORY COMMISSION VENDOR INSPECTION OF
WESTINGHOUSE ELECTRIC COMPANY LLC, CRANBERRY TOWNSHIP,
REPORT NO. 99900404/2016-204 and NOTICE OF NONCONFORMANCE

Dear Mr. Hamilton:

On September 26 through 30, 2016, the U.S. Nuclear Regulatory Commission (NRC) staff conducted an inspection at the Westinghouse Electric Company (here-after referred to as WEC) facility in Cranberry Township, PA. The purpose of this limited-scope inspection was to assess WEC's compliance with the provisions of 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," and 10 CFR Part 21, "Reporting of Defects and Noncompliance."

This technically focused inspection specifically evaluated WEC's implementation of quality activities associated with corrective actions, oversight of suppliers, procurement document control, and design control. Specifically, the scope of the quality activities inspected included WEC's corrective actions to the January 2015 quality assurance (QA) vendor inspection (NRC Inspection Report No. 99900404/2015-202 dated April 24, 2015) and design control topics related to the AP1000 plant design. The enclosed report presents the results of the inspection. This NRC inspection report does not constitute NRC endorsement of WEC's overall QA or 10 CFR Part 21 programs.

Based on the results of this inspection, the NRC staff determined that the implementation of your QA program failed to meet certain NRC requirements imposed on you by your customers. Specifically, 1) WEC failed to promptly identify and correct a condition adverse to quality that could potentially affect regulatory compliance and/or nuclear safety when WEC determined that the design of safety-related valves for the AP1000 did not comply with ASME Section XI, and 2) WEC failed to apply adequate design control measures to ensure that accessibility for inservice inspection was provided for AP1000 safety-related valves.

The enclosed Notice of Nonconformance cites these nonconformances, and the enclosed report describes the circumstances surrounding them. In response to the enclosed Notice of Nonconformance, please provide a written statement or explanation within 30 days from the date of this letter in accordance with the instructions specified in the enclosed Notice of Nonconformance. The NRC will consider extending the response time if you show good cause to do so.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," 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, then please provide a bracketed copy of your response that identifies the information that should be protected and a redacted copy of your response that deletes such information. If you request that such material is 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).

Sincerely,

Kerri Kavanagh, Chief /RA Paul Prescott acting for/
Quality Assurance Vendor Inspection Branch-3
Division of Construction Inspection
& Operational Programs
Office of New Reactors

Docket No.: 99900404

Enclosures:

1. Notice of Nonconformance
2. Inspection Report No. 99900404/2016-204
and Attachment

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," 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, then please provide a bracketed copy of your response that identifies the information that should be protected and a redacted copy of your response that deletes such information. If you request that such material is 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).

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1. Notice of Nonconformance
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and Attachment

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NRO-002

OFC	NRO/DCIP/QVIB-3	NRO/DCIP/QVIB-2	NRO/DCIP/QVIB-1	NRO/DCIP/QVIB-3
NAME	JHeath	JOrtega*	JJimenez*	KKavanagh (PPrescott for)
DATE	11/4/2016	11/7/2016	11/10/2016	11/14/2016
OFC	NRO/DEIA/MEB	NRO/DEIA/MCB	NRO/DCIP/OIE	RII/DCI/CIB3
NAME	TLe*	SDowney*	ABelen*	TSteadham*
DATE	11/4/2016	11/7/2016	11/9/2016	11/7/2016

OFFICIAL RECORD COPY

NOTICE OF NONCONFORMANCE

Westinghouse Electric Company
Cranberry, PA
Docket No. 99900404

Based on the results of a Nuclear Regulatory Commission (NRC) inspection conducted at Westinghouse Electric Company (WEC) located in Cranberry Township, PA from September 26 through September 30, 2016, certain activities were not conducted in accordance with NRC requirements which were contractually imposed on WEC by NRC licensees.

- A. 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," states, in part, that "Measures shall be established to assure that conditions adverse to quality, such as failures, malfunctions, deficiencies, deviations, defective material and equipment, and nonconformances are promptly identified and corrected."

WEC procedure WEC 16.2, "Corrective Action Process," states, in part, that "Corrective Action Process (CAP) Issue Reports should be created promptly whenever a Westinghouse employee or contract employee becomes aware of an event or condition that could potentially affect regulatory compliance and/or nuclear safety."

Contrary to the above, as of February 18, 2016, WEC failed to ensure that a condition adverse to quality was promptly identified and corrected that could potentially affect regulatory compliance and/or nuclear safety. Specifically, WEC determined that the design of a population of safety-related AP1000 valves procured for Vogtle and V.C. Summer construction sites were not designed so that access is provided to perform the examinations required by American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components." The AP1000 valves impacted by this issue were procured between June 2009 and December 2010. However, despite identifying this inspectability issue as early as January 2011, WEC did not enter the issue into its corrective action program until February 2016.

These issues have been identified as Nonconformance 99900404/2016-204-01.

- B. Criterion III, "Design Control," of Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants," to 10 CFR Part 50, "Domestic Licensing of Production and Utilization Facilities," states, in part, that "Design control measures shall be applied to items such as the following (...) accessibility for inservice inspection, maintenance, and repair."

WEC design specifications APP-PV01-Z0-001, APP-PV03-Z0-001, APP-PV14-Z0-001, APP-PV20-Z0-001, and APP-PV63-Z0-001 require that safety-related valves supplied for service in the AP1000 plant be designed for inspection in accordance with the ASME Section XI.

Enclosure

Contrary to the above, as of September 30, 2016, WEC failed to apply adequate design control measures to ensure that accessibility for inservice inspection was provided for safety-related valves procured and shipped to the Vogtle and V.C. Summer construction sites. Specifically, WEC AP1000 design specifications permit the applicable safety-related valves to be designed and fabricated in a manner that does not provide access to perform the examinations as required by ASME Section XI. The AP1000 valve designs result in valve-to-pipe weld configurations in which the achievable ultrasonic examination volume is significantly less than the required examination volume as required by the ASME Code.

These issues have been identified as Nonconformance 99900404/2016-204-02.

Please provide a written statement or explanation to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001 with a copy to the Chief, Quality Assurance Vendor Inspection Branch 3, Division of Construction, Inspection and Operational Programs, Office of New Reactors, within 30 days of the date of the letter transmitting this Notice of Nonconformance. This reply should be clearly marked as a "Reply to a Notice of Nonconformance" and should include for each noncompliance: (1) the reason for the noncompliance, or if contested, the basis for disputing the noncompliance; (2) the corrective steps that have been taken and the results achieved; (3) the corrective steps that will be taken to avoid 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 and Management System (ADAMS), accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html>, to the extent possible, it should not include any personal privacy, proprietary, or safeguards information 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.

If you choose to respond, your response will be made available electronically for public inspection in the NRC Public Document Room or from ADAMS, accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html>. To the extent possible, it should not include any personal privacy, proprietary, or safeguards information 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 14th day of November 2016.

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

Docket No.: 99900404

Report No.: 99900404/2016-204

Vendor: Westinghouse Electric Company
Cranberry Township, PA

Vendor Contact: Mr. Ronald Wessel
wesselrp@westinghouse.com
412-374-4023

Nuclear Industry Activity: Westinghouse Electric Company (WEC) holds a design certificate for the AP1000 plant design and is responsible for detailed design and testing of safety-related components to be used in AP1000 plants. These qualification and functional tests are associated with and may directly affect closure of Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC) from Revision 19 of the certified AP1000 design. Currently, these ITAAC are incorporated into the combined licenses of Vogtle Units 3 and 4 and V.C. Summer Units 2 and 3.

Inspection Dates: September 26 - 30, 2016

Inspectors: Jermaine Heath, Team Leader, NRO/DCIP/QVIB-3
Jonathan Ortega, NRO/DCIP/QVIB-2
Jose Jimenez, NRO/DCIP/QVIB-1
Steven Downey, NRO/DEIA/MCB
Tuan Le, NRO/DEIA/MEB
Timothy Steadham, R-II/DCI/CIB3

Approved by: Kerri Kavanagh, Branch Chief
Quality Assurance Vendor Inspection Branch-3
Division of Construction Inspection
& Operational Programs
Office of New Reactors

EXECUTIVE SUMMARY

Westinghouse Electric Company Inspection Report No. 99900404/2016-204

The U.S. Nuclear Regulatory Commission (NRC) staff conducted an announced, routine inspection at Westinghouse Electric Company (WEC), in Cranberry, Township, PA, from September 26 through 30, 2016. The purpose of the inspection was to review the implementation of the WEC Quality Assurance (QA) program pursuant to 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," and 10 CFR Part 21, "Reporting of Defects and Noncompliance."

This technically focused inspection evaluated WEC's implementation of quality activities associated with safety-related systems, structures, and components to determine if those activities were being effectively implemented. Specifically, the NRC inspection team evaluated WEC's implementation of its corrective action program, which included corrective actions taken in response to the NRC QA inspection conducted in January 2015 (Agencywide Documents Access and Management System (ADAMS) Accession Number ML15070A213). The NRC inspection team also evaluated the WEC QA program as it applies to selected AP1000-related design control topics which included American Society of Mechanical Engineers (ASME) Section III, "Rules for Construction of Nuclear Facility Components;" design compliance for the reactor vessel and pressurizer, design for inspectability for AP1000 valves; corrective actions taken in response to AP1000 embedment plates supplied by Cives Steel Co. and Joseph Oat Corp.; and corrective actions taken in response to a 2012 NRC QA inspection Finding associated with AP1000 Squib Valve equipment qualification (ADAMS Accession Number ML12128A072).

The following regulations serve as the bases for the NRC inspection:

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

During conduct of this inspection, the NRC inspection team implemented inspection procedure (IP) 43002, "Routine Inspections of Nuclear Vendors," supplemented by IP 36100, "Inspection of 10 CFR Part 21 and Programs for Reporting Defects and Noncompliance," and IP 43004, "Inspection of Commercial-Grade Dedication Programs."

The results of the inspection are summarized below.

10 CFR Part 21 Program

Based on the limited samples of documents reviewed, the NRC inspection team determined that WEC is implementing its 10 CFR Part 21 program for evaluating deviations and reporting defects that could create a substantial safety hazard in accordance with regulatory requirements. No findings of significance were identified.

Design Control

The NRC inspection team issued Notice of Nonconformance (NON) 99900404/2016-204-01 in association with WEC's failure to implement the regulatory requirements of Criterion XVI, "Corrective Actions," of Appendix B to 10 CFR Part 50. NON 99900404/2016-204-01 cites WEC for failure ensure that a condition adverse to quality was promptly identified and corrected that could potentially affect regulatory compliance and/or nuclear safety. Specifically, WEC determined, as late as January 2011, that the design of safety-related AP1000 valves procured for Vogtle and V.C. Summer construction sites did not comply with the accessibility requirements of ASME Section XI for the inservice inspectability of applicable safety-related valves, but did not enter the issue into its corrective action program until February 2016.

The NRC inspection team also issued NON 99900404/2016-204-02 in association with WEC's failure to implement the regulatory requirements of Criterion III, "Design Control," of Appendix B to 10 CFR Part 50. NON 99900404/2016-204-02 cites WEC for failure to apply adequate design control measures to ensure that accessibility for inservice inspection was provided for safety-related valves procured for and shipped to the Vogtle and V.C. Summer construction sites. Specifically, WEC's AP1000 design specifications permitted the applicable safety-related valves to be designed and fabricated in a manner that does not provide access to perform the examinations as required by ASME Section XI.

Corrective Action

The documentation reviewed by the NRC inspection team showed that corrective actions described by WEC in its response letter to NRC inspection report 99900404/2015-202, dated April 14, 2015 (ADAMS Accession Number ML15070A213) adequately addressed the issues described in the NONs. However, at the time of the inspection, corrective actions related to these NONs were still outstanding. Consequently, the NRC inspection team could not adequately evaluate and close the NONs until WEC completes all corrective actions relating to these issues. Therefore, NONs 99900404/2015-202-01, 99900404/2015-202-02, and 99900404/2015-202-03 will remain OPEN and may be reviewed for closure at a future NRC inspection.

The NRC inspectors reviewed corrective actions associated with NON 99900404/2012-201-01, issued for inadequate testing relating to AP1000 squib valves. The NRC inspection team determined that the corrective actions implemented were adequate to address the identified NON. Based on the inspectors' review, NON 99900404/2012-201-01 is CLOSED.

REPORT DETAILS

1. 10 CFR Part 21 Program

a. Inspection Scope

The NRC inspection team reviewed the policies and implementing procedures that govern Westinghouse Electric Company's (WEC's) implementation of 10 CFR Part 21, "Reporting of Defects and Noncompliance" program. The NRC inspection team reviewed a sample of WEC's 10 CFR Part 21 evaluations from the last two years to verify compliance with the requirements of 10 CFR 21.21, "Notification of Failure to Comply or Existence of a Defect and its Evaluation." Additionally, the team reviewed a sample of purchase orders (POs) issued by WEC for safety-related materials, services and equipment to verify compliance with the requirements of 10 CFR 21.31, "Procurement Documents." The NRC inspection team also reviewed WEC's procedures that govern corrective action and nonconforming conditions to verify adequate implementation of the regulatory requirements to identify and correct conditions adverse to quality.

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

b. Observations and Findings

No findings of significance were identified.

c. Conclusions

Based on the review of WEC's 10 CFR Part 21 program, implementing procedures, and a sample of 10 CFR Part 21 evaluations, the NRC inspection team determined that WEC's process met regulatory requirements. No findings of significance were identified.

2. Design Control

AP1000 ASME III Design Compliance for Reactor Vessel and Pressurizer

a. Inspection Scope

The NRC inspection team reviewed AP1000 generic design assessment (GDA) review GI-AP1000-S05. The GDA identified WEC calculation packages which contained a number of American Society of Mechanical Engineers (ASME) Section III code compliance issues related to the stress calculations for the AP1000 reactor vessel (RV) and pressurizer (PZR).

The NRC inspection team reviewed WEC's corrective actions documented in Apparent Cause Analysis Report (ACAR) Issue 100382797 which covered WEC's demonstration of ASME Section III compliance for the AP1000) for the AP1000 RV and PZR. The NRC inspection team sampled WEC's calculation packages and design reports for the components, and reviewed WEC's extent of condition relative to the issue.

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

b. Observations and Findings

The NRC inspection team found that WEC's ACAR evaluation and corrective actions were acceptable to address the plant-specific risk consequences, and concerns associated with the ASME code compliance issues relating to the stress calculations for the AP1000 RV and PZR.

For the RV, the NRC inspection team found that WEC's updated stress calculations for the RV and PZR resulted in a reduction in margin for some stress results and fatigue cumulative usage factors (CUFs); however, these results were still within the ASME code allowable stress and allowable CUFs limits. At the time of the inspection, stress calculations for the PZR, and other "extent-of-condition" major components (steam generator (SG), accumulator tank (ACC), core make-up Tank (CMT) and post residual heat removal exchanger (PRHR HX) were still in the update and verification process. The NRC inspection team also noted that WEC currently has corrective actions in process to develop an ASME code compliance checklist to aid in its design verification processes for the AP1000 plant design.

No findings of significance were identified regarding ASME III design compliance for the AP1000 RV and PZR.

c. Conclusions

The NRC inspection team determined that WEC is implementing its design control processes pertaining to ASME Section III design compliance for the AP1000 major components, in accordance with the requirements of Criterion III in Appendix B to 10 CFR Part 50. No findings of significance were identified.

Design for Inspectability (AP1000 Valves)

a. Inspection Scope

The NRC inspection team reviewed WEC engineering design documents, evaluations, and implementing procedures that govern design for inspectability for AP1000 valves in order to verify compliance with ASME Section XI, and the requirements of Appendix B to 10 CFR Part 50.

The attachment to the inspection report lists the individuals interviewed and documents reviewed.

b. Observations and Findings

b.1 Corrective Action

The NRC inspection team reviewed WEC Corrective Action Prevention and Learning (CAPAL) 100361717, "Preservice Inspection/Inservice Inspection Inspectability for AP1000 Component to Pipe Welds." While reviewing the CAPAL and timeline of events, the NRC inspection team made two observations. First, the NRC inspection team observed that the timeline of events indicated that the valve inspectability issue was identified as early as January 2011. Second, CAPAL 100361717 was issued in February 2016. During subsequent discussions with WEC staff relating to the documents provided, the NRC inspection team verified that the valve inspectability issue was identified as early as January 2011. However, the NRC inspection team identified that the issue was not entered into WEC's corrective action program until CAPAL 100361717 was issued in February 2016.

The NRC inspection team reviewed the revisions of WEC 16.2, "Westinghouse Corrective Action Process," that were in effect between 2008 and 2011 to determine the requirements for entering issues into WEC's corrective action program. The NRC inspection team found that, in all cases, WEC 16.2 states, in part, that, "Corrective Action Process (CAPs) Issue Reports should be created promptly (generally within one business day) whenever a Westinghouse employee or contract employee becomes aware of an event or condition that that could potentially affect regulatory compliance and/or nuclear safety." As a result, the NRC inspection team determined that WEC's failure to promptly enter the valve inspectability issue into its corrective action program was not in accordance with WEC 16.2.

The NRC inspection team identified this corrective action issue as NON 99900404/2016-204-01 for failure to ensure that a condition adverse to quality was promptly identified and corrected that could potentially affect regulatory compliance and/or nuclear safety.

b.2. Design Control

The NRC inspection team reviewed the POs for the AP1000 valve types impacted by the inspectability issue. The NRC inspection team found that the impacted valves were procured for the Vogtle and V.C. Summer construction sites in accordance with WEC design specifications between June 2009 and December 2010.

The NRC inspection team reviewed the WEC AP1000 design specification for each valve type impacted by the inspectability issue. These WEC AP1000 valve design specifications established and imposed the requirements for safety-related, ASME Boiler and Pressure Vessel Code Section III, Subsection NB, NC and ND, Class 1, 2 and 3 valves. Per the design specifications, the valves shall be designed for inspection in accordance with the 1998 Edition through 2000 Addenda, of the ASME Boiler and

Pressure Vessel Code, Section XI, Rules for Inservice Inspection of Nuclear Power Plant Components.

Contrary to these requirements, the NRC inspection team observed two instances in which the AP1000 design specifications permit the applicable safety-related valves to be designed and fabricated in a manner that does not provide access to perform the examinations required by ASME Section XI.

The NRC inspection team observed that these design specifications allow the valve supplier the option to provide the austenitic stainless steel valve body as a casting. The 1998 Edition, 2000 Addenda, of ASME Section XI requires that the resulting valve-to-pipe weld be ultrasonically examined using procedures, equipment and personnel qualified by performance demonstration in accordance with Appendix VIII of the Code. However, there are currently no performance demonstration qualified methods to ultrasonically examine cast austenitic stainless steel (CASS). ASME Section XI requirements for performance demonstration for ultrasonic examination procedures, equipment, and personnel used to detect and size flaws in CASS piping (Appendix VIII, Supplement 9) have not been developed and are listed as "in the course of preparation." Considering the limitations associated with the ultrasonic examination of CASS, the NRC inspection team determined that the allowance of CASS valve bodies in the design specifications does not comply with ASME Section XI because the use of CASS valve bodies results in valve-to-pipe weld configurations that cannot be ultrasonically examined in accordance with ASME Section XI. Specifically, the achievable ultrasonic examination volume is significantly less than the required examination volume.

The NRC inspection team discussed with WEC staff why the design specifications permitted the use of CASS valve bodies given the known lack of qualified methods and qualification requirements. During the discussion, WEC staff indicated that CASS valve bodies were allowed in design specifications because it was anticipated that the qualification requirements for CASS components would soon be provided in the ASME Code. However, the NRC inspection team determined that, as of September 29, 2016, ASME Section XI still identifies Appendix VIII, Supplement 9 as "in the course of preparation." WEC staff stated their plans to continue to work with ASME to resolve this issue.

During the review of the design specifications for the affected AP1000 valves, the NRC inspection team also observed that all design specifications require that butt weld connections be in accordance with WEC AP1000 weld end configuration drawing, APP-GW-VFY-001, Revision 0 through 2, "AP1000 Weld End Configuration for Stainless Steel, Carbon Steel, and Alloy Steel Auxiliary Piping Components." The NRC inspection team reviewed the drawing and determined that it does not comply with ASME Section XI because the allowable contour angles result in a valve body geometry that provides only single sided access to perform ultrasonic testing.

The NRC inspection team also met with WEC staff to discuss the implementation of the weld end configuration requirements by valve suppliers. During this meeting, the NRC inspection team reviewed design drawings showing the resulting weld end preparation

for various procured valves. After reviewing the drawings, the NRC inspection team observed that some valves were provided with a minimum (0-2 degrees) weld contour while others were provided with a valve body contour closer to the allowable maximum (18 degrees). The NRC inspection team verified that the forged valves impacted by the inspectability issue are those in which the valve body and associated weld contour is maximized. For the cast valves impacted by this issue, the NRC inspection team verified that a CASS valve body with no contour would still be impacted by the inspectability issue, but to a lesser degree than valves in which the valve body and associated weld contour is maximized.

These deficiencies represent a condition adverse to quality that, if left uncorrected, could become a more significant safety concern. As described above, the impacted valves were designed and fabricated such that access will not be provided to ultrasonically examine the resulting valve-to-pipe welds in accordance with ASME Section XI. Specifically, the volume of the valve-to-pipe welds that can be ultrasonically examined is significantly less than the required examination volume. Consequently, any flaws that develop in the portion of the welds that cannot be examined may go undetected and could render the quality of the systems, structures, and components unacceptable, or indeterminate.

The NRC inspection team identified these design control issues as NON 99900404/2016-204-02 failure to apply adequate design control measures to ensure that accessibility for inservice inspection was provided for safety-related ASME Class 1, 2, and 3 valves.

c. Conclusions

The NRC inspection team issued NON 99900404/2016-204-01 in association with WEC's failure to implement the regulatory requirements of Criterion XVI, "Corrective Actions," of Appendix B to 10 CFR Part 50. NON 99900404/2016-204-01 cites WEC for failure ensure that a condition adverse to quality was promptly identified and corrected that could potentially affect regulatory compliance and/or nuclear safety. Specifically, WEC determined, as early as January 2011, that the design of safety-related valves procured for Vogtle and V.C. Summer construction sites for the AP1000 did not comply with the accessibility requirements of ASME Section XI for the inservice inspectability of applicable safety-related valves, but did not enter the issue into its corrective action program until February 2016.

The NRC inspection team also issued NON 99900404/2016-204-02 in association with WEC's failure to implement the regulatory requirements of Criterion III, "Design Control," of Appendix B to 10 CFR Part 50. NON 99900404/2016-204-02 cites WEC for failure to apply adequate design control measures to accessibility for inservice inspection of AP1000 safety-related valves. Specifically, WEC AP1000 design specifications permitted the applicable valves to be designed and fabricated in a manner that does not provide access to perform the examinations required by ASME Section XI.

3. Corrective Action

a. Inspection Scope

The NRC inspection team reviewed WEC'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 to 10 CFR Part 50. Specifically, the NRC inspection team evaluated the following items:

- WEC's corrective actions for three nonconformances associated with NRC inspection report number 99900404/2015-202, dated April 14, 2015 (ADAMS Accession Number ML15070A213), to verify that actions described in WEC's response to the NONs (ADAMS Accession Number ML15146A097 and ML15201A128) adequately addressed the findings.
- WEC's implementation of corrective actions associated with NON 99900404/2012-201-01, issued for inadequate testing relating to AP1000 squib valves, documented in inspection report 99900404/2012-201 (ADAMS Accession Number ML12313A461), dated November 9, 2012.
- WEC's implementation of AP1000-related corrective actions issued since January 2015 to verify that conditions adverse to quality were promptly identified and corrected, and for significant conditions adverse to quality, the CAPALs specified the cause of these conditions and corrective actions to prevent recurrence.

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

b. Observations and Findings

b.1 Corrective Action Associated with NON 99900404/2015-202-01

NON 99900404/2015-202-01 (NON-1) was issued for WEC's failure to verify, by auditing, that activities affecting safety-related functions had been correctly performed. The NRC inspection team verified that WEC adequately addressed the two examples cited for NON-1.

Example 1 of NON-1 identified WEC's failure to take timely and effective corrective actions to address significant conditions adverse to quality relating to the oversight of suppliers and the inadequate use of the qualified supplier list. The NRC inspection team reviewed numerous CAPALs that were opened to address the two examples cited in the NON.

The NRC inspection team verified that WEC had effectively completed the actions described in the CAPALs. The documents reviewed included a self-assessment of WEC's organization, effectiveness evaluation of the corrective action program, re-

qualification of personnel, revision and consolidation of procedures, and the institution of the Westinghouse Executive Corrective Action Review Board. The NRC inspection team reviewed the current approved procedures affected by this NON to verify that these procedures contained the changes described by the corrective actions and that any required training was properly completed.

Example two of NON-1 identified WEC's failure to verify that its suppliers had measures in place to assure that purchased material, equipment, and services conformed to the procurement documents. WEC decided to address corrective actions for this example under the corrective actions for NON 99900404/2015-202-03 because these issues have overlapping aspects.

The NRC inspection team did not identify any issues of significance associated with WEC's corrective actions to NON-1; however, many of the corrective actions that addressed the weaknesses pertaining to supplier oversight were addressed by WEC under its response to Nonconformance 99900404/2015-202-03 (NON-3) cited against Criterion VII, "Control of Purchased Materials." Therefore, NON-1 will remain OPEN pending the adequate closure of NON-3.

b.2 Corrective Action Associated with NON 99900404/2015-202-02

NON 99900404/2015-202-02 (NON-2) was issued for WEC's failure to establish measures to assure that conditions adverse to quality were promptly corrected, and for significant conditions adverse to quality, corrective actions were taken to preclude repetition. The NRC inspection team verified that WEC adequately addressed three of the four examples cited for NON-2. Specifically, the NRC inspection team assessed the CAPALs opened to address the nonconformance examples associated with the inadequate management oversight for the control of suppliers (Example one), inadequate audit of suppliers (Example two), and inadequate characterization of corrective actions for the condensate return system (Example four). Due the extent of the document review and limitations on time, the NRC inspection team was unable to evaluate the CAPALs issued to address Example three of NON-2 for deficiencies associated with WEC's internal audit program.

Based on the documents reviewed, the NRC inspection team did not identify any issues of significance associated with WEC's corrective actions to NON-2. As noted above, the NRC inspection team was unable to evaluate corrective actions associated with Example three of the nonconformance, which was issued to address weaknesses in WEC's internal audit program, NON-2 will remain OPEN until corrective actions associated with Example three can be verified.

b.3 Corrective Action Associated with NON 99900404/2015-202-03

The NRC inspection team verified that WEC adequately resolved NON 99900404/2015-202-03 (NON-3) for failure to verify that its suppliers had measures

in place to assure that purchased material, equipment, and services conform to the procurement documents. The NRC inspection team reviewed several CAPALs that were opened to address both this and NON-1 since there were overlapping aspects relating to selection of suppliers for both NONs. NON-3 specifically addressed deficiencies identified with the procurement of services from L&S Machine Company LLC (L&S) and Peerless Manufacturing Company. The NRC inspection team verified that WEC had effectively completed the actions described in the CAPALs. The documents reviewed included a self-assessment of the procurement process, re-qualification of personnel, verification of current status as approved suppliers for both L&S and Peerless, extent of condition for previously procured services, and revision to procedures and external audits used to qualify or dedicate suppliers' services. The NRC inspection team also reviewed the current approved supplier list, sampled audits performed on some of these vendors, and interviewed procurement personnel regarding the plan to streamline all of WECs procurement activities.

The NRC inspection team did not identify any issues of significance associated with WEC's corrective actions to NON-3. At the time of this inspection, WEC was still in the progress of performing an effectiveness review for NON-3 corrective actions. Therefore, NON-3 will remain OPEN pending successful completion and verification of WEC's effectiveness review.

b.4 Corrective Action Associated with NON 99900404/2012-201-01

The NRC inspection team verified that WEC adequately resolved Nonconformance 99900404/2012-201-01 for failure to verify the adequacy of certain design features and include the most adverse design conditions in the test program for performing functional testing of the AP1000 squib valve actuators.

The inspectors reviewed WEC corrective actions which included revisions to functional qualification reports and test plans for the affected squib valves and determined that the "no fire" testing was performed for the squib valve actuators. In addition, as documented in NRC Inspection Report 99900905/2012-201 (ML12242A459), the NRC previously observed squib valve actuator testing including performance of the "no fire" testing. The NRC inspection team also verified that the valve testing included the temperature of the most adverse design condition with respect to operation of the valve. Specifically, the original concern was that the valve shear caps were not tested at room temperature where this would require more force to operate the valves. To address this concern, WEC included shear cap lot acceptance testing into the squib valve qualification documentation where a sample of shear caps from each lot were tested at room temperature. Based on the review, the NRC inspection team determined that the corrective actions implemented were adequate to address the identified nonconformance. Therefore, NON 99900404/2012-201-01 is CLOSED.

c. Conclusions

The documentation reviewed by the NRC inspection team showed that corrective actions described by WEC in its response letter to NRC inspection report 99900404/2015-202, dated April 14, 2015 (ADAMS ML15070A213) adequately addressed the issues described in the nonconformances. However, at the time of the inspection, corrective actions related to these nonconformances were still outstanding. Consequentially, the inspectors could not satisfactorily close the Nonconformances until WEC completes all corrective actions relating to these issues. Therefore, NONs 99900404/2015-202-01, 99900404/2015-202-02, and 99900404/2015-202-03 will remain OPEN and may be reviewed for closure at a future NRC inspection.

The NRC inspection team reviewed corrective actions associated with NON 99900404/2012-201-01 issued for inadequate testing relating to AP1000 squib valves. The NRC inspection team determined that the corrective actions implemented were adequate to address the identified NON. Therefore, NON 99900404/2012-201-01 is CLOSED.

4. Entrance and Exit Meeting

On September 26, 2016, the NRC inspection team presented the inspection scope during an entrance meeting with Mr. Steve Hamilton, Senior Vice President of Quality, Environment, Health & Safety and WEC staff. On September 30, 2016, the NRC inspection team presented the inspection findings during an exit meeting with Mr. Ronnie Gardner, Vice President of Global Quality Programs, and WEC staff. The attachment to this report lists the participants of the entrance and exit meeting attendees, and those personnel interviewed by the NRC inspection team.

ATTACHMENT

1. ENTRANCE/EXIT MEETING ATTENDEES AND KEY POINTS OF CONTACT

Name	Title	Affiliation	Entrance	Exit	Interviewed
Jermaine Heath	Inspection Team Leader	NRC	X	X	
Jonathan Ortega-Luciano	Inspector	NRC	X	X	
Jose Jiminez	Inspector	NRC	X	X	
Tuan Le	Inspector	NRC	X	X	
Steven Downey	Inspector	NRC	X	X	
Tim Steadham	Inspector	NRC	X	X	
Kerri Kavanagh	Chief	NRC		X	
Brian Smith	Deputy Director, DCIP	NRC		X	
Alan Edwards	Inspector	ONR	X	X	
Jim Caul	Inspector	ONR	X	X	
Steve Hamilton	Senior Vice President Quality, Environment, Health & Safety (QEHS)	WEC	X		
Sara DiTamaso	Manager, ITAAC & Inspection	WEC	X	X	
Ron Wessel	Principal Engineer	WEC		X	
Paul Russ	Director, US Licensing & Regulatory Support	WEC	X		
Mark Urso	Manager ASME Engineering	WEC	X	X	
Ronnie Gardner	VP, Global Quality Programming	WEC	X	X	
Shayan Sinhn	Licensing Engineer	WEC	X	X	
Angela Zubroski	Principal Quality Engineer, Quality Programs	WEC	X		
Michael Stefanchik	Manager, Supplier Quality Assessment	WEC	X	X	X
Kevin Accornerd	Principal Engineer	WEC			
Bernie Copsey	Director, Energy Center Of Excellence Quality & Process Improvement	WEC	X	X	
David Arrigo	Program Manager, Codes & Stds	WEC	X	X	
Bradley Mustio	Principa QA Engineer, UK Moorside	WEC	X	X	
Donna Burns	Manager, NP & MP	WEC	X	X	
Lori Lubic	Manager, Quality Programs	WEC	X	X	
Tara Werner	Director, Quality Program & Programs & Assessment	WEC	X	X	
Luca Oriani	VP, New Plants Engineering	WEC	X	X	

ENTRANCE/EXIT MEETING ATTENDEES AND KEY POINTS OF CONTACT (CONT.)

Name	Title	Affiliation	Entrance	Exit	Interviewed
Doug Ezar	Operations Lead	WEC	X	X	
Elise Hamilton	Operations Manager	WEC	X		
Mark Marsuter	Director Procurement Engineering	WEC	X		
Mike Wilkie	Director, Mechanical Engineering	WEC	X		X
Zak Kupec	QEHS Lead Screener	WEC	X		
Amanda Hurley	Manager, HU/Trend (V.C. Summer)	WEC	X		
Michal McCullogh	Engineering Manager, Vogtle Site	WEC	X		
Kevin Kilmer	Director, Global Inventory Management	WEC	X	X	
Mathew Welborn	Program Manager, OE/LL	WEC	X		
Eric Rossi	Manager, Product and Plant Licensing		X		
Donna Aiken-Colflesh	CAP Action Program Strategic Lead	WEC	X		
Lidia Haddock		WEC		X	
Heath Susini	Project Manager, UK Licensing	WEC		X	
Brian McIntyre	Director, VC Summer Licensing	WEC		X	
Adam Tamilia	Procurement Engineer	WEC		X	
Mike Klinvex	Licensing Engineer	WEC	X	X	
Rick Rishel	Fellow Engineer		X	X	X
Remington Iddings	Licensing Engineer	WEC		X	
Dave Varner	VP/Chief Procurement Officer	WEC	X		
Nancy Closky	Manager, Component Technical Issues	WEC	X	X	
Ted Anderen	Director, Component Replacement and Engineering	WEC	X	X	
Sean Halfhill	Manager, MRCDA-II	WEC		X	
Angela Zubroski	Principal Quality Engineer	WEC		X	
Mathew Welborn	Program Manager, OE/LL	WEC	X		
Zach Harper	Licensing Manager	WEC	X		X
Jim Gresham	Manager, Regulator Compliance	WEC	X	X	
Anthony Schoedel	Licensing Engineer	WEC	X	X	
Jennifer McNeely	Licensing Engineer	WEC	X	X	X
Timothy Northcott	Manager, Global CAP	WEC	X	X	

ENTRANCE/EXIT MEETING ATTENDEES AND KEY POINTS OF CONTACT (CONT.)

Name	Title	Affiliation	Entrance	Exit	Interviewed
Ed Renaud	Engineering manager, CGD, Codes and Stds	WEC	X	X	
Zachary Kupec	Lead Screener, Global CAP	WEC		X	
Mike Corlettie	Director, UK Ap1000 Project, Engineer, & Licensing	WEC		X	
Greg Glenn	Ap1000 ITAAC & Inspection Report	WEC	X		
Jason Eisenhower	Manager, UK Licensing	WEC		X	
Preston Vock	Fellow Engineer	WEC			X
Ed Pleins	Principal Engineer	WEC			X
Warren Banford	Consulting Engineer	WEC			X
Andy Breneman	Product/Resource Manager	WEC			X
Mark Urso	Manager, AP1000 Engineering Integration	WEC			X

2. LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

<u>Item Number</u>	<u>Status</u>	<u>Type</u>	<u>Description</u>
99900404/2012-201-01	Closed	NON	Criterion III
99900404/2015-202-01	Remain Open	NON	Criterion I
99900404/2015-202-02	Remain Open	NON	Criterion XVI
99900404/2015-202-03	Remain Open	NON	Criterion VII
99900404/2016-204-01	Open	NON	Criterion XVI
99900404/2016-204-02	Open	NON	Criterion III

3. NRC INSPECTION PROCEDURES USED

- Inspection Procedure (IP) 36100, "Inspection of 10 CFR Part 21 Programs for Reporting Defects and Noncompliance"
- IP 43002, "Routine Inspections of Nuclear Vendors"
- IP 43004, "Inspections of Commercial Grade Dedication Programs"

4. LIST OF DOCUMENTS REVIEWED

Corrective Actions and Extent of Condition

- CAPAL 100078778, NDE Requirement Not Performed on V6-409 Support Pins for Vogtle 3, dated February 10, 2015
- CAPAL100383544, Nonconforming Materials Supplied by Supplier Discovered After Delivery, dated May 17, 2015
- CAPAL 100331507, KB25 and KB36 calculation deficiencies, dated September 30, 2015
- CAPAL 100170827, Discrepancies between design and licensing basis, dated March 26, 2015
- CAPAL 100393510, Incorrect material Used on Embed. Plates, dated June 28, 2016
- CAPAL Issue ID 100361717, PSI/ISI Inspectability for AP1000 Component to Pipe Welds, dated February 18, 2016
- CAPAL Issue ID 100376365, Domestic PSI Program Plans, dated April 19, 2016
- CAPAL Issue ID 100412765, PSI/ISI Inspectability – CAPAL Significance, dated September 14, 2016
- CAPAL Issue ID 100417162, ASME Section III Valve Design/Licensing Inspectability Requirements Discrepancy, 09/29/2016 (Opened in response to findings)
- CAPAL Issue ID 100341382, “Possible Counterfeit Components Used in the PC Node Box,” dated November 4, 2015 (L2)
- CAPAL Issue ID 100345705, “Falsification of UT Calibration Block Heat Treatment,” dated December 11, 2015 (L1)
- CAPAL Issue ID 100078299, “Loss of Status Control for PV44 Valves at V.C. Summer,” dated February 6, 2015 (L2)
- CAPAL Issue ID 100199478, “VC Summer 3 Closure Head Rod Travel Housing PT Indications,” dated April 8, 2015 (L2)
- CAPAL Issue ID 100078778, “NDE Requirement Not Performed on V6-409 Support Pins for Vogtle 3,” dated February 10, 2015 (L2)
- CAPAL Issue ID 100299217, “Discrepancy Between Calc and Drawing,” dated May 8, 2015 (L2)
- CAPAL Issue ID 100173014, “Vogtle WEC SEG Performing ASME Section III Design Work Without ASME Accreditation,” dated March 31, 2015 (L3)
- CAPAL Issue ID 100214742, “Squib Valve IEEE Testing 1 Amp No Fire Testing,” dated March 29, 2012 (L4)
- CAPAL Issue ID 100214842, “Squib Valve Operational Parameters,” dated March 30, 2012 (L2)
- CAPAL Issue ID 100000085, “Negative NRC Results at Obayashi,” dated September 16, 2011
- CAPAL Issue ID 100000447, “Discrepancy between Pressurizer Column Embedment Design Loads and Actual Loads,” dated May 10, 2013 (L1)
- CAPAL 100077431 – NRC Potential Issue – Inadequate Corrective Action
- CAPAL 100326623 – Inconsistent compliance with CAP requirements
- CAPAL 100073951 – Condensate Return – IRWST steaming rate discrepancy

- CAPAL 100000472 – Purchase Requisition/Purchase Order Processing Violates Numerous WEC-7.5 Requirements, reference IR
- CAPAL 100312448 – Peerless Manufacturing Company Additional SR POs
- CAPAL 100077746 – Inadequate oversight of suppliers CRA-2014-111
- CAPAL 100377138 dated 4/21/16
- CAPAL 100382797 dated 5/13/16
- RCA “Failure to Address ONR Regulatory Issues on ASME Section III Calculations for Structural Integrity” Issue 100377138 Rev.2 dated 7/6/2016
- ACAR Issue 100382797 “Deficiency in ASME Calculation for AP1000” investigator Kevin E. Spencer (2016)
- CAPs 12-264-M017, “ASME Section III Criteria on WEC Quality Release,” dated September 20, 2012
- CAPs 13-001-C004, “Improper Closure of Corrective Actions,” dated January 1, 2013
- CAPs 13-122-M034, “Errors Within Data package SV4-PV31-VQQ-001, Rev. 0,” dated May 2, 2013
- CAPs 13-212-M042, “CAP 13-001-C004.01 Closure Lacks Reference to Open IR and Commitments,” dated July 31, 2013
- CAPs 13-218-C011, “Audit Team Lead Removed as QA Lead for CAPs 13-001-C004,” dated August 6, 2013
- CAPs 11-259-M039, “Negative NRC Results at Obayashi,” dated September 16, 2011
- CAPs 13-015-M043, “Making Revisions to Contingent Quality Release not Addressed in APP-GW-GAP-137, Rev. 0,” dated January 15, 2013
- WSA-QEHS-15-1, “Self-Assessment of Corrective Action Program Implementation”, dated July 31, 2015
- Apparent Cause Analysis (ACA) 100077431 [including CAPAL 100075345] CRA-2014-111, “NRC Inspection Potential Issue – Inadequate Corrective Action and Extent of Condition Shortfalls”
- Root Cause Analysis (RCA) 100073951, “Condensate Return” March 7, 2015
- RCA 100326623, “Inconsistent compliance with CAP requirements” dated December 7, 2015
- Root Cause Analysis, “Implementation of Purchase Requisition/Purchase Order Process frequently results in violation of Numerous WEC 7.5 Requirements, reference IR 10-014-W012, dated May 29, 2014
- Interim Effectiveness Review Report CAPAL 10000472, dated n/a
- Effectiveness Review Report CAPAL 100073951, dated March 7, 201
- Review of Safety Analyses Inputs for Inclusion in SAIK Database, dated December 3, 2015
- APP-SSAR-GS-001, “AP1000 Plant Safety Analysis Input Knowledgebase (SAIK) Methodology”, dated October 14, 2015
- DCP_DCP_007060, “Design Experience/Lessons Learned from WEC RCA on Condensate Return”, dated April 16, 2015
- DCP_DCP_007732, “Review of Safety Related Design Criteria in System Specification Documents”, dated December 18, 2015 Engineering & Design Coordination Report (E&DCR) – Revision of APP-SSAR-GS-001, dated October 13, 2015

- DCP_DCP_007271, "Review of CAPAL Commitment 800000015117", dated June 30, 2015
- CDI-BWR-ENG-16-001 (CDI) Commercial Dedication Instructor for computational fluid dynamics analysis work performed by peerless manufacturing company, revision 0, dated September 27, 2016
- LTR-TA-15-62, Revision 0 – "LOFTRAN Applicability for Extended Closed Loop PRHR HX Operation", dated June 26, 2015
- LTR-EMPE-10-88, "Quality Assurance, Marking and Documentation Requirements for the Supply of Replacement Parts for Westinghouse Nuclear Parts Operations" revision 0, dated April 2010
- Letter NPP_NPP_000280, "Assess AP1000 plant licensing plans (domestic and international) content for guidance for addressing a compliance matrix and regulatory questions", dated June 30, 2015
- Assessment of Fluid Systems' Excel Based Calculations, dated December 21, 2015
- AP1000 Design Change Proposal of APP-GW-GEE-5007, dated April 21, 2015
- DCP_DCP_007847, "Corrective Action Review Board (CARB) Meeting Minutes – Effectiveness Review Approval", dated November 9, 2015
- DCP_DCP_006939, "Corrective Action Review Board (CARB) Meeting Minutes – Effectiveness Review Approval", dated March 9, 2015
- CAR 2012-0874, Evaluation of vendor's failure to provide quality products
- Root Cause Analysis Report CAR NO. 2012-0874 Revision 2, dated February 21, 2013
- CAR 2014-1961, "Southern Nuclear Company Letter ND_14-1513, "Ineffective and Untimely Corrective Actions Related to Quality & Compliance Deficiencies for 10 CFR part 50 App M Modules and Submodules," dated October 1, 2014
- CAR 2015-3384, "Lack of N690 Mag Particle Testing of Cives SR Welded Couplers Embeds," dated September 10, 2015
- 2015-3384, "Vogtle 3 & 4 Apparent Cause Analysis – Cives Steel Company Missed NDE of PJP Coupler Welds," dated January 15, 2015
- CAR 2015-4746, "Programmatic Discrepancy of Visual Acceptance Criteria," dated December 22, 2015
- CAR 2015-4484, "Duplicate Tag Numbers in Inventory," dated December 2, 2015
- Issue ID: 100382034, "Embedment plates that were needed to disposition non-conforming condition were scraped at the Vog," dated May 10, 2016
- Issue ID: 100361145, "SNC CRs 10180672 & 10181738 – NRC IOC 16-002: Green NCV debrief by NRC at interim exit," dated February 15, 2016
- Issue ID: 100390225, "Green NCV for SS Couplers," dated June 14, 2016
- Issue ID: 100409799, "Non-Conforming for Cives Carbon Steel Plates at VC Summer Site," dated August 31, 2016
- Issue ID: 100413241, "Missing correspondence CAPAL for CAR 2015-3384 Corrective Action," dated September 16, 2016
- Issue ID: 100414651, "Review of the processes for holding material at site (Related to CAPAL 100382034)," dated September 23, 2016
- Issue ID: 100237332, "Inadequate Implementation Criterion I," dated April 25, 2015
- Issue ID: 100312448, "Peerless Manufacturing Company – Additional SR POs," dated July 9, 2015

- Issue ID: 100000472, "Purchase Requisition/Purchase Order Processing Violates Numerous WEC-7.5 Requirements, reference IR," dated May 31, 2013
- CAPs-RCA-13-151-M013, "Root Cause Analysis – Implementation of Purchase Requisition/Purchase Order Process frequently results in violation of Number WEC-7.5 Requirements, reference IR 10-014-W012, Revision 1 dated May 29, 2014
- CDI-BWR-ENG-15-001, "Commercial Dedication Instruction for Computational Fluid Dynamics Analysis Work Performed by Peerless Manufacturing Company," Revision 1 dated July 31, 2015
- CDI-BWR-ENG-15-001 – Results, "Commercial Dedication Instruction for Computational Fluid Dynamics Analysis Work Performed by Peerless Manufacturing Company," Revision 1 dated July 31, 2015
- Issue Number: 100312448 Limited Cause Analysis Report for Peerless Manufacturing Company – Additional Safety Related Purchase Orders."
- Issue ID: 100414592 "Potential Gap in Peerless Manufacturing CGS WES-2014-117," dated September 23, 2016
- CAR 2015-2745, "Cives Commercial Grade Dedication Plans and Procedures not reviewed and approved by CB&I," dated July 22, 2015

Correspondence

- LTR-SRC-15-26, Closing Request for PI-15-004,"AP1000 Containment Basemat Analysis Model Applied Incorrect Thermal Boundary Conditions," dated March 3, 2015
- LTR-SRC-15-55, Closing Request for PI-15-016,"Lost Traceability for Safet-Related Parts," dated May 19, 2015
- Po6-68, Closing Request for PI-16-21, "Mangiarotti Delivered Components found to have indeterminate Quality," dated June 22, 2016
- LTR-SRC-15-29, Closing Request for PI-15-13,"Incorrect Vendor Potentiometers Installed in SSPS Power Supplies," dated March 9, 2015
- LTR-SRC-15-53, Closing Request for PI-15-015, "Problems with Implementation of Design Release Process," dated May 15, 2015
- LTR-SRC-15-54, Closing Request for PI-15-019, "Mirion Potential Defect Notification for WL-24076 N16 Gamma Chambers," dated May 18, 2015
- LTR-SRC-15-68, Closing Request for PI-15-018, "FHE&CM Discovery of Additional Commercial Grade Dedication Deviations," dated June 23, 2015
- LTR-SRC-15-65, Closing Request for PI-15-020,"Violation of Design
- LTR NCE-16-217 'Impact Assessment of UKDGA ONR Comments on Westinghouse Operating Plants (Extent Condition Assessments) dated 9/26/20
- LTR-SRC-16-82 "Closeout Request for PI-16-20 "ASME Code Section III Analysis for AP1000 Plant Components'
- Requirements for Weldable Connectors," dated June 11, 2015
- LTR-SRC-16-24, Closing Request for PI-16-003, "AP1000 MOV Lubrication Issue," dated February 26, 2016
- LTR-SRC-16-71, Closing Request for PI-16-014,"2B10254H02 Electros witch Improper Assembly and Non-Functioning After Torqueing," dated May 19, 2016
- LTR-SRC-16-82, Closing Request for PI-16-20, "ASME Code Section III Analysis of AP1000 Components," dated June 16, 2016

- LTR-SRC-13-207, Opening Request for PI-13-55,"Processing of Purchase Requisitions / Purchase Order in Accordance with WEC-7.5, Control of Purchases Items and Services," dated September 27, 2013
- LTR-SRC-15-78,"PD-1312 Closeout, "Peerless Manufacturing Company-Additional Safety 9Related Purchase Orders, dated July 27, 2015

Procedures

- QMS-A, Quality Management System-A revision 7, dated October 01, 2013
- W2-5.1-100, "Westinghouse Corrective Action Program" revision 0.0, dated January 08, 2016
- W2-5.1-101, "Westinghouse Corrective Action Program Procedure" revision 1.0, dated April 15, 2016
- W2-5.1-103, "Root Cause Analysis" revision 0.0, dated January 08, 2016
- W2-9.5-101, "Supplier QA Program Qualification and Assessment" revision 0.1, dated January 15, 2016
- W2-9.6-101, "Control of Supplier-Generated Documents" revision 0.1, dated January 13, 2016
- W2-9.5-105, "Control of Suppliers on the ASL and QSL" revision 0.0, dated April 15, 2016
- W2-9.4-101, "Control of Purchase Items and Services" revision 3.0, dated June 1, 2016
- W2-5.1-104, "Apparent Cause Analysis" revision 0.0, dated January 08, 2016
- W2-5.1-102, "Issue Review Committee" revision 1.0, dated May 01, 2016
- W2-5.1-201, "Identification and Reporting of Conditions Adverse to Nuclear Safety", dated January 08, 2016
- W2-7.2-101, "External Audits and Regulatory Inspections," Revision 0.1 dated July 29, 2016
- W2-8.4-100, Verification and Validation Process, Revision 1, dated September 6, 2015
- W2-8.4-105, Signing and Sealing by Professional Engineers, Revision 0, dated January 8, 2015
- PP-09-01, "Production Order," Revision 16, dated October 8, 2013
- PP-08-01, "Goods Receipt Slip," Revision 8, dated April 11, 2014
- WEC 3.4.1, "Change Control For The AP1000 Plant Program, " Revision 3.0, dated October 31, 2013
- APP-GW-GAP-150, "Process and Guidelines for Preparing the Technical Content of AP1000 Certified Construction Civil/Structural Drawings," Revision 1, dated December 6, 2013
- APP-GW-GAH-004, "AP1000 Program Project Quality Plan," Revision 5, dated September 12, 2016
- WEC Procedure QA-7.5, "Quality Releases," Revision 4, dated November 1, 2013
- WEC Procedure WEC 7.1, "Supplier Qualification and Assessment," Revision 3.1, dated April 5, 2012
- WEC Procedure QA-7.11, "Supplier Quality Development," Revision 1, dated May 11, 2012
- Westinghouse Form F-2.8-4, "Lead Auditor Body of Knowledge," Revision 1

- Form F-7.10-3, "Quality Release and Certificates of Conformance," Revision 3, dated August 15, 2013
- WEC Procedure GNSC-P-3202, "Supplier Dashboard," Revision 0.1, dated January 31, 2016

Engineering Documents

- APP-PV70-VPR-014, "ASME QME-1 Functional Qualification Report for 8" Squib Valves Installed in AP1000 Plants," Revision 0, dated February 23, 2016
- APP-PV70-VPR-013, "ASME QME-1 Functional Qualification Report for 14" Squib Valves Installed in AP1000 Plants," Revision 0, dated February 14, 2016
- APP-PV70-VPH-004, "AP1000 Squib Valve Qualification Plan," Revision 0, dated September 9, 2015
- APP-PV70-VPH-001, "AP1000 Squib Valve Equipment Qualification Test Plan," Revision 5, dated January 28, 2016
- Drawing APP-1238-CR-903, "Reinforcement Locations Interface Drawing Basemat and Shield Building Elevation 100'-0" Sections and Details," Revision 3
- APP-GW-VW-001, Revision 0, AP1000 Design for Inspectability Program: ISI Requirements and Design Guidance for Class 1 Components, 08/18/2006
- APP-GW-VW-001, Revision 1, AP1000 Design for Inspectability Program: ISI Requirements and Design Guidance for Class 1 Components, 06/06/2014
- APP-GW-GLY-105, Revision 0, ASME Section XI Preservice and Inservice Inspection Limitations, 05/19/2016
- APP-GW-VFY-001, Revision 0, AP1000 Weld End Configuration for Stainless Steel, Carbon Steel, and Alloy Steel Auxiliary Piping Components, 2006
- APP-GW-VFY-001, Revision 1, AP1000 Weld End Configuration for Stainless Steel, Carbon Steel, and Alloy Steel Auxiliary Piping Components, January 28, 2009
- APP-GW-VFY-001, Revision 2, AP1000 Weld End Configuration for Stainless Steel, Carbon Steel, and Alloy Steel Auxiliary Piping Components, April 6, 2015
- APP-PV01-Z0-001, Revision 0, 3" and Larger Motor Operated Gate Valve and Globe Valves, ASME Boiler and Pressure Vessel Code Section III, Class 1, 2, and 3, May 1, 2008
- APP-PV03-Z0-001, Revision 0, Design Specification for 3" and Larger Manually Operated Gate, Stop Check, and Check Valves, ASME Boiler and Pressure Vessel Code Section III Class 1, 2, and 3 for Various Systems, 2007
- APP-PV14-Z0-001, Revision 0, Air Operated Globe and Stop Check Valves, ASME Boiler and Pressure Vessel Code, Section III, Class 1, 2, and 3, 2008
- APP-PV20-Z0-001, Revision 0, Passive Residual Heat Removal Discharge Valve, ASME Boiler and Pressure Vessel Code, Section III, Class, 2009
- APP-PV63-Z0-001, Revision 0, Pressurizer Safety Valve, ASME B&PV Code, Section III, Class 1, 2008
- APP-PV01-Z5-003, Revision 3, Appendix 3: Technical and Quality Requirements for the Procurement of PV01 Motor Operated Gate and Globe Valves for Domestic Projects, May 20, 2013.

- APP-PV01-Z5-004, Revision 0, Appendix 4: Flowserve Compliance Matrix for Design Specification APP-PV01-Z0-001 in Support of AP1000 Projects, June 28, 2009.
- APP-PV03-Z5-003, Revision 2, Appendix 3: Technical and Quality Requirements for the Procurement of Manually Operated Gate, Stop Check, and Check Valves for AP1000 Projects, May 22, 2013.
- APP-PV03-Z5-004, Revision 0, Appendix 4: Compliance Matrix for Design Specification APP-PV03-Z0-001 in Support of AP1000 Projects, June 26, 2009.
- APP-PV14-Z5-001, Revision 1, Appendix 3: Technical and Quality Requirements for the Procurement of PV14 Air Operated Globe and Stop Check Valves for AP1000 Projects, May 21, 2013
- CPP-PV14-V2-103022, PV14 Datasheet 103 Assembly Drawing
- APP-PV03-Z5-003, Revision 2, Appendix 3: Technical and Quality Requirements for the Procurement of Manually Operated Gate, Stop, and Check Valves in AP1000 Projects, May 21, 2013
- APP-PV14-Z5-001, Revision 1, Appendix 3: Technical and Quality Requirements for the Procurement of PV14 Air Operated Globe and Stop Check Valves for Ap1000 Projects, May 21, 2013.
- APP-GW-GAP-100 "Westinghouse Corrective Actions process" Rev. 20 dated 11/03/2008
- APP-MV20-VOR-002 "AP1000 Pressurizer Upper Head Nozzles Interaction Technical Report" Rev. 0 dated 09/08/2016
- APP-MV20-ZOR-008 "AP1000 Pressurizer safety Relief Nozzle Analysis" Rev. 1, dated 9/28/2016
- APP-MV20-ZOC-107 "AP1000 Pressurizer Sizing Calculation" Rev. 2 dated 09/20/2016
- APP-MV01-ZOC-004 "AP1000 Reactor Vessel Sizing Calculation" Rev. 7 dated 08/25/2016
- APP-MV01-ZOC-0101 "AP1000 Reactor Vessel Design Report" Rev. 7 dated 08/25/2016
- RQ-AP1000-1620 dated 6/30/2016
- RQ-AP1000-1621 dated 6/30/2016
- GI-AP1-000-SI-05: Demonstration of Compliance with ASME III Design Criteria
- GI-AP1000-SI-05-RCA-ACA, AP1000 Plant Main Structural Components ASME III Code Compliance Recovery Plan Report, dated August 2016 (TRIM 2016/310521)
- WEC-REG-1185 N "Transmittal of Full Response to RQ-AP1000-1620 and RQ-AP1000-1621" dated 08/11/2016
- WEC 16.2, Revision 0, Westinghouse Corrective Action Process, 11/03/08
- WEC 16.2, Revision 1, Westinghouse Corrective Action Process, 08/03/09
- WEC 16.2, Revision 2, Westinghouse Corrective Action Process, 02/08/10
- WEC 16.2, Revision 3, Westinghouse Corrective Action Process, 08/01/11

Purchase Orders

- Requisition 1000543214 "Peerless Manufacturing Co", dated September 29, 2016
- Purchase Order (PO) 4500690088 "Tioga Pipe Supply Co.", dated March 29, 2016
- PO 4500691963 "NOVA Machine Products", dated April 22, 2016
- PO 4500694448 "Laboratory Testing Inc.", dated May 05, 2016
- PO 4500687410 "Flowserve Corp.", dated February 22, 2016
- PO 4500699883 "Curtiss-Wright EMCORP", dated August 10, 2016
- PO No. 4500703751, "Change to Purchase Order for Peerless Manufacturing Company," dated September 29, 2016
- PO 4500327852, Westinghouse Electric to Fisher Controls dated December, 16, 2009 (*66 Air-operated Globe and Stop Check Valves (PV14) – V.C. Summer*)
- PO 4500327665, Westinghouse Electric to Fisher Controls dated December, 15, 2009 (*66 Air-operated Globe and Stop Check Valves (PV14) – Vogtle*)
- PO 4500315849, Westinghouse Electric to Flowserve dated August 28, 2009 (*98 AP1000 motor operated valves (PV01) – V.C. Summer*)
- PO 4500319052, Westinghouse Electric to Flowserve dated September 28, 2009 (*98 AP1000 motor operated valves (PV01) – Vogtle*)
- PO 4500328866, Westinghouse Electric to Enertech dated December, 30, 2009 (*Inline check valves (PV03) – V.C. Summer*)
- PO 4500328840, Westinghouse Electric to Enertech dated December, 30, 2009 (*Inline check valves (PV03) – Vogtle*)
- PO 4500419083, Westinghouse Electric to Weir Valve & Controls dated December, 30, 2011 (*Air-operated Stop Check Valves, Class 1 (PV 14 DS90) – V.C. Summer*)
- PO 4500419078, Westinghouse Electric to Weir Valve & Controls dated December, 30, 2011 (*Air-operated Stop Check Valves, Class 1 (PV 14 DS90) – Vogtle*)
- PO 4500316051, Westinghouse Electric to Flowserve dated August 31, 2009 (*106 AP1000 manually operated valves (PV03) – Vogtle*)
- PO 4500309542, Westinghouse Electric to Fisher Controls dated June 30, 2009.
- PO 4500371190, Westinghouse Electric to Fisher Controls dated December 16, 2010.

Miscellaneous

- ASME Boiler and Pressure Vessel Code, Section XI, Rules for Inservice Inspection of Nuclear Power Plant Components, 1998 Edition through 2000 Addenda.
- Audit No. V2016-18, "Implementation Audit of Cives Steel Company, dated April 5, 2016
- WES-2014-117, "Commercial Grade Survey of Peerless Manufacturing Company," dated June 2, 2014
- VS-2015-53, "Surveillance Report for Cives Steel Company," dated November 23, 2015
- Audit No. WES-2016-043-R, "Audit of Scot Forge," dated August 3, 2016
- Audit Package WES-2007-017, "Obayashi Corporation," dated March 21, 2007 (audit dates March 18-19, 2007)
- Audit Package WES-2010-039, "Obayashi Corporation," dated April 14, 2010 (audit

dates March 15-16, 2010)

- APP-GW-GBH-602, "NPE Structural Review Board Charter," Revision 1, dated September 24, 2013
- Westinghouse Supplier Annual Evaluation Questionnaire, no date or revision, current revision
- Westinghouse Letter SQA-11-0268, "Quality Program Compliance to 10CFR50 Appendix B, 10CFR21, and/or ASME NQA-1," (Quality Alert) dated December 21, 2011
- Westinghouse White Paper/Memo from Ivan Bosnjak, SQA Principal Engineer, to Jamie Vasquez, Director – Supplier Quality Oversight and Assessment, "CAP Commitment 12-010-M010.12 Document Risk Ranking Criteria Used [for supplier re-evaluation]," dated August 29, 2012
- Excel Spreadsheet – Results of Quality Alert Memo to Suppliers
- Current Westinghouse Supplier Dashboard Executive Summary, dated August 2016

Corrective Action Reports Generated during the NRC Inspection

- CAPAL 100414592, dated September 29, 2016
- CAPAL 100417178, dated September 29, 2016