June 30, 2016

Mr. Paul Russ, Director
AP1000 Licensing Programs
Westinghouse Electric Company
1000 WEC Drive
Cranberry Township, PA 16066

SUBJECT: NUCLEAR REGULATORY COMMISSION VENDOR INSPECTION REPORT NO. 99900404/2016-203

Dear Mr. Russ:

On May 19 and 20, 2016, the U.S. Nuclear Regulatory Commission (NRC) conducted an inspection at the Westinghouse Electric Company (WEC) facility in Cranberry Township, PA. The purpose of the inspection was to review the corrective actions taken by WEC in response to two issues (Nonconformance 99900404/2011-201-02 and Open Item 99900404/2011-201-05) identified during a previous NRC inspection associated with the design and qualification testing of systems and components being supplied as part of the AP1000 reactor design. As applicable, the inspection team reviewed aspects of your quality assurance program in accordance with Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants," and 10 CFR Part 21, "Reporting of Defects and Noncompliance." The enclosed report presents the results of this inspection. This NRC inspection report does not constitute NRC endorsement of your overall quality assurance (QA) and 10 CFR Part 21 programs.

During this inspection, the NRC inspection team determined that WEC took corrective actions to the two previously identified issues, but these corrective actions involved modifications to the design that are departures from the approved AP1000 Final Safety Analysis Report. Consequently, these modifications will require the licensees of the Vogtle and Summer plants to submit License Amendment Requests (LARs) to the NRC staff for review and approval. Since, at the time of this inspection, these LARs had not yet been submitted to the NRC staff, the findings will remain open.

These two issues are also related to certain Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC) contained in the AP1000 Design Control Document, and as such, without appropriate resolution, may impact the ability of licensees to demonstrate specific ITAAC have been met. A table identifying each inspection finding reviewed by the team, its status, and the applicable ITAAC is contained at the end of the enclosed inspection report.

In accordance with 10 CFR 2.390, “Public Inspections, Exemptions, Requests for Withholding,” of the NRC's "Rules of Practice," a copy of this letter, and its enclosures will be made available electronically for public inspection in the NRC Public Document Room or from the NRC’s Agencywide Document Access and Manager System document system, accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html.

Sincerely,

/RA/ (GGalletti for)

Terry W. Jackson, Chief
Quality Assurance Vendor Inspection Branch-1
Division of Construction Inspection
and Operational Programs
Office of New Reactors

Docket No.: 99900404

Enclosure:
Inspection Report No. 99900404/2016-203
and Attachment

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NAME	JJacobson	TScarbrough	TJackson (GGalletti for)
DATE	06/27/16	06/22/16	06/27/16

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

Docket No.:	99900404
Report No.:	99900404/2016-203
Vendor:	Westinghouse Electric Company 1000 WEC Drive Cranberry Township, PA 16066
Vendor Contact:	Mr. Ron Wessel, Principle Engineer 412-374-4023 wesselrp@WEC.com
Nuclear Industry Activity:	Westinghouse Electric Company (WEC) is responsible for the detailed design and testing of safety-related components to be used in AP1000 plants. These tests, including qualification and functional tests, are associated with and may directly impact 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:	May 19-20, 2016
Inspectors:	Jeffrey Jacobson NRO/DCIP/QVIB-1, Team Leader Thomas Scarbrough NRO/DEIA/MEB
Approved:	Terry W. Jackson, Chief Quality Assurance Vendor Inspection Branch-1 Division of Construction Inspection and Operational Programs Office of New Reactors

Enclosure

REPORT DETAILS

1. Background and General Scope

The purpose of the inspection was to review the corrective actions taken by WEC in response to two issues (Nonconformance 99900404/2011-201-02 and Open Item 99900404/2011-201-05) identified during a previous NRC Engineering Design Verification (EDV) inspection associated with the design of systems and components being supplied as part of the AP1000 reactor design. This inspection was performed during June and July of 2011, to assess the implementation of WEC's processes for completing the detailed design of the AP1000 reactor and for transferring the design requirements contained in the Design Control Document (DCD) into engineering, procurement, and construction documents.

Contained within this report is a synopsis of each of the original inspection findings, a summary of the corrective actions taken, an assessment with regard to the adequacy of the corrective actions, and a conclusion with regard to whether the inspection findings are considered to be closed or will remain open pending additional corrective actions.

2. Nonconformance 99900404/2011-201-02 - Effect of Squib Injection Valve Transient on In-Containment Refueling Water Storage Tank Check Valves and Related Components

a. Inspection Scope

In Inspection Report No. 99900404/2011-201, Nonconformance 99900404/2011-201-02 identified that the hydrodynamic forces generated by the inadvertent opening of the In-containment Refueling Water Storage Tank (IRWST) squib valves, combined with a relatively small volume between the IRWST squib valves and check valves, could result in stresses significantly in excess of the design limits for the associated piping, pipe supports, check valves, and related components. Significant issues identified by the team in Inspection Report No. 99900404/2011-201 included:

- WEC had not accounted for the hydrodynamic loads in the purchase specifications for piping and components in the IRWST injection line.

- WEC Open Item DI-OI-028536 which was written to evaluate the subject hydrodynamic loads, did not specify whether the analysis should be performed at the reduced reactor coolant system pressure that might be expected during a normal accident mitigation sequence, or at the much higher reactor coolant system pressure that might exist during inadvertent operation of the squib valves. Potentially large hydrodynamic forces could occur due to a spurious actuation of the IRWST squib valves while the reactor is at operating pressure.

- A documented process or procedure had not been implemented by WEC to ensure that once completed, the results of the transient analysis would be appropriately incorporated into the specifications and requirements for the related components.

While unlikely, a spurious operation of the squib valves could be caused by failures, such as a software common-cause failure in the PMS system or by unintended manual actions.

In Inspection Report 99900404/2012-202 the NRC assessed interim corrective actions taken by WEC in response to this issue. These interim corrective actions primarily centered around additional analysis of what would be the impact of a spurious actuation of the squib valves at various reactor pressures. In that inspection report, the inspection team identified that the analysis performed by WEC was inconclusive as it had not sufficiently addressed the impacts of inadvertent operation at full reactor pressure.

During this inspection, the team reviewed additional corrective actions taken by WEC to respond to the issue. These corrective actions involved a modification to the design of the PMS system associated with the arming circuitry for the IRWST injection squib valves to add an additional diverse blocking contact that would essentially eliminate the possibility for inadvertent actuation of the valves due to a software common-cause failure/error.

b. Findings and Observations

The inspectors reviewed APP-GW-GEE-4291, "Changes to Address Spurious Actuation of the IRWST Squib Valves," Revision 0, dated June 7, 2013, which described the modifications made by WEC to the PMS system to add the blocking devices. WEC informed the inspectors that these changes had been implemented, both in design and in hardware, but that a License Amendment Request (LAR) describing the modification had not yet been submitted to the NRC. WEC indicated that they were currently in the process of preparing LARs for both the licensees of Vogtle and Summer, and they expected these LARs would be submitted to the NRC in the late summer/fall 2016 timeframe.

WEC indicated that the LARs would describe changes being made to the Updated Final Safety Analysis Reports (UFSARs) to remove the statement regarding the consequences of an inadvertent operation of the IRWST squib valves, as well as the modification to add the blocking device. The blocking device would prevent arming of the squib valve actuation circuitry until the level in the core make up tank is drained to a predetermined level that would be indicative of an actual LOCA event. The blocking devices being utilized would be fail-safe in the unblocked position and would fail in this position upon a loss of electrical power. Each blocker device would receive inputs from two different level transmitters and the logic would be set up so the device would be unblocked if an input from either one of the two inputs is received. The output of the blocking device is connected though optical isolators to the Z port of the Component Interface Module (CIM) used in the arming circuitry for the squib valves. The Z port is set up as a priority input for these modules.

The inspectors reviewed design information associated with the blocking device being used, including information associated with the commercial grade dedication and testing of the Acromag Alarm module used in the Automatic Depressurization System (ADS) Blocking Device Assembly. The team assessed the methods used by WEC to identify and verify the critical characteristics of the alarm module (commercial grade survey and testing), reviewed data sheets, and reviewed the overall testing of the blocker assembly.

c. Conclusions

The inspectors concluded that while the corrective actions taken by WEC to address Nonconformance 99900404/2011-201-02 appeared reasonable, what is being proposed is an extensive Level One Modification involving changes to a multitude of associated documents and procedures, including drawings, logic diagrams, UFSAR, probabilistic risk assessment (PRA), surveillance procedures, Technical Specifications, etc. As such, the ultimate acceptability of the proposed modifications to the AP1000 design will require further review by the NRC staff as part of the licensing process once the associated LARs are submitted. Consequently, Nonconformance 99900404/2011-201-02 will remain open until the LAR is submitted and reviewed by the NRC staff.

The inspectors concluded that the addition of the blocking device for the 8" IRWST injection valves presents a somewhat unquantified tradeoff from a risk perspective, with a decrease in risk associated with the deceased likelihood (and possible unanalyzed consequences) of an inadvertent operation of the valves due to a common cause software failure/error, versus an increase in risk associated with the probability that the valves will not actuate when required due to the additional complexity being added to the actuation circuitry as a result of the modification. The risk consequences of the proposed modification will be assessed as part of the NRC staff's review of the license amendment request.

The inspectors also identified that the proposed modification does not address the likelihood of inadvertent operation of the valves from the Diverse Actuation System (DAS), but WEC stated they believed such an event could be ruled out since actuation from DAS requires two independent manual actuations and there is no single failure of component that could result in an inadvertent actuation. Electrical power to the DAS actuation circuity is not available until manual actuations are taken in the control room.

Likewise, the proposed modification does not address a failure of the CIM itself as an inadvertent firing of the squib valves would require the simultaneous failure two independent CIM, one which is used to arm the valves, and one which is used to fire them. The proposed blocking device is used only on the CIM associated with the arming circuitry.

The inspectors also raised a question as to whether or not failure of the blocking device would be detectable or alarmed but was unable to evaluate this aspect of the design before the conclusion of the inspection.

3. NRC Open Item 99900404/2011-201-05 - IRWST Injection Line Resistance

a. Inspection Scope

NRC Inspection Report No. 99900404/2011-201 (dated September 27, 2011) described an NRC EDV Inspection of the WEC AP1000 reactor design. During that inspection, the NRC inspectors questioned the design assumption that IRWST Injection Check Valves PXS-V122A/B and 124A/B in the Passive Core Cooling System (PXS) would be fully open during IRWST Injection flow following a design-basis event. In response to those questions, WEC indicated that it had previously initiated Correction Action Process (CAP) IR 11-076-C001 to track its resolution of this issue. The NRC inspectors identified this issue in the inspection report as NRC Open Item 99900404/2011-201-05.

NRC Inspection Report No. 99900404/2012-202 (dated November 9, 2012) documented the review by NRC inspectors of WEC corrective actions in response to NRC Open Item 99900404/2011-201-05. In that report, the NRC inspectors concluded that WEC had obtained information from the check valve vendor that was used to conservatively bound flow resistance for partially open check valves in the IRWST Injection line. The inspectors concluded that WEC had resolved an issue regarding use of incorrect check valve flow resistance in safety-related analyses. However, the inspectors concluded that the WEC design specifications did not meet ITAAC Table 2.2.3-4, Item 8.c, because the ITAAC states that the IRWST Injection check valves must be fully open during the ITAAC test, but these check valves will not be fully open during IRWST Injection flow. The inspectors also concluded that WEC had not provided evidence that acceptance criteria for extended operation of the IRWST and other PXS check valves in their partially open positions had been included in the design requirements. The inspectors determined that WEC needed to incorporate these low flow conditions into the specifications for the check valves, and that the qualification program needed to ensure that these valves can operate reliably under extended low flow conditions. In NRC Inspection Report No. 99900404/2012-202, the inspectors concluded that Open Item 99900404/2011-201-05 would remain open pending (1) submittal of a license amendment to resolve the ITAAC discrepancy, and (2) an update of the check valve qualification requirements.

During this inspection (Inspection Report No. 99900404/2016-203), the NRC inspectors reviewed the following documents associated with this issue:

- WEC Safety Analysis APP-SSAR-GSC-732 (Revisions 1 and 2), "AP1000 AFCAP Post-LOCA Long-Term Core Cooling Analysis," that describes the flow calculations using the Advanced First Core Analysis Program (AFCAP) AP1000 W COBRA/TRAC model for design-basis events, included IRWST Injection flow
- WEC Design Change Proposal APP-GW-GEE-4903 (Revision 0), "PXS Partially Open Check Valve Changes," that describes updates to performance curves and safety analyses based on the PXS check valve performance data
- WEC Root Cause Analysis CAP-RCA-11-076-C001 (Revision 1), "AP1000 Passive Core Cooling Test Issue," describing the WEC plans to address the partially open position of the PXS check valves when performing their safety function
- WEC Discrete Issue/Suggestion for Improvement Issue ID 100000061, "Passive Core Cooling Testing Issues," that addresses plans in response to the determination that the PXS check valves will not be fully open during a design-basis event
- WEC Calculation APP-PXS-M3C-195 (Revision 3), "Check Valve Functional Requirements for PXS IRWST Isolation Check Valves," that establishes parameters that define the PXS check valves
- WEC Calculation APP-PXS-M3C-019 (Revision 5), "IRWST/Containment Sump Injection Lines and ADS Line Resistances," that determines flow resistances and other characteristics of the IRWST injection lines, containment recirculation lines, and Automatic Depressurization System (ADS) lines
- WEC Calculation APP-PXS-M3C-220 (Revision 0), "IRWST DVI Injection Check Valve Environmental Qualification and Cycle Evaluation," that establishes environmental qualification requirements and the number of cycles for the PXS IRWST Injection check valves to perform their safety functions
- WEC Calculation APP-PV03-VPH-005 (Revision 0), "Supplemental Testing Specification for PV03 Swing Check Valves Built to Data Sheets APP-PV03-Z0D-184

and 195 for Long Term Operation," that verifies that the PXS check valves will perform their functions with varying flow rates for 1 year after a design-basis event.

- WEC Datasheet APP-PV03-Z0D-195 (Revision 2), "PV03 Datasheet 195," that specifies performance requirements for the PXS check valves
- WEC Specification APP-PV03-Z0-001 (Revision 9), "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," which provides the specification requirements for the PXS check valves and other AP1000 valves
- WEC report APP-PV03-VTR-184, which forwards Flowserve Cycle Life Test Report RAL-70125 (Revision 1, June 19, 2014), "Size 8 Class 1530 Swing Check Valve with Position Indication," that describes the cycle life testing to provide long-term wear information regarding the PXS check valves
- WEC Engineering & Design Coordination Report (dated May 13, 2015) that described plans to address the determination that PXS check valves operate at lower flows than sufficient to achieve a full open valve position
- WEC Discrete Issue/Suggestion for Improvement Issue ID 100015697, "Extent of Condition EQ Evaluation Completed – Potential Impacts," that re-evaluated the long-term environmental qualification for numerous AP1000 valves
- Flowserve Application Report CPP-PV03-VPR-195 (Revision 0), "QME-1 Application Report - Size 8 Class 1530 Swing Check Valve with Remote Position Indication for APP-PV03-Z0D-195," that addresses the Application Report provisions in ASME Standard QME-1-2007, "Qualification of Active Mechanical Equipment Used in Nuclear Power Plants," for the PXS check valves for Sanmen Unit 1 and Haiyang Unit 1 nuclear power plants.

The inspectors discussed the specifications, calculations, testing, and analyses related to the PXS check valves described in these documents with WEC personnel.

b. Findings and Observations

During this inspection, the NRC inspectors determined that the IRWST Injection flow analysis was obtained from the WEC Safety Analysis APP-SSAR-GSC-732 that provides flow calculations using AFCAP AP1000 W COBRA/TRAC model for design-basis events. The AP1000 COBRA/TRAC computer modeling calculated an initial flow rate for IRWST Injection using assumptions for the flow resistance of the PXS components. The inspectors found that the WEC calculations had been updated to support the flow rate determination for IRWST Injection that involves an iterative process to incorporate additional information regarding component performance characteristics. This includes evaluation of the flow resistance of the PXS check valves that varies with injection flow and valve open position during the IRWST Injection phase following a design-basis event. The inspectors did not identify any concerns with this iterative process to evaluate the IRWST Injection flow.

The design specifications for the PXS check valves in WEC Specification APP-PV03-Z0-001 require the qualification of these valves in accordance with ASME Standard QME-1-2007, which is accepted in NRC Regulatory Guide 1.100 (Revision 3), "Seismic Qualification of Electrical and Active Mechanical Equipment and Functional Qualification of Active Mechanical Equipment for Nuclear Power Plants." The inspectors found that APP-PV03-Z0-001 had been updated to specify requirements for the valve supplier to include performance data for the PXS check valve flow coefficient (C_v) versus valve open position, and check valve performance capability for long-term operation. In addition, the inspectors found that WEC Datasheet APP-PV03-Z0D-195 had been updated to specify that the valve vendor shall provide the C_v flow coefficient versus disc position, perform 1-year supplemental testing, and meet loading requirements resulting from nearby squib valve actuation for the PXS check valves. Based on their review, the inspectors found that the design specifications and datasheets for the PXS check valves had been revised to reflect the C_v flow coefficient and long-term performance requirements to address previous inspection findings.

WEC Calculation APP-PXS-M3C-019 determines the flow resistances and other characteristics of the IRWST Injection lines, containment recirculation lines, and ADS lines using flow resistance assumptions for components in those lines. Appendix H, "Flow Dependent Resistance Summary (Partial Open Check Valves Included)," to APP-PXS-M3C-019 provides the PXS check valve C_v flow coefficient values based on flow velocity and valve open position. The inspectors found that APP-PXS-M3C-019 specifies that the specific flow-dependent resistance characteristics of the PXS check valves are used to determine line resistance for the IRWST Injection line and other lines in accordance with APP-PXS-M3C-019.

The inspectors found that WEC Calculation APP-PV03-VPH-005 specified supplemental testing to verify that the PXS check valves will perform their functions with varying flow rates over a 1-year time period following a design-basis event. Flowserve report RAL-70125 documented this cycle life testing of the PXS check valves. The Flowserve report described the minimal wear of the PXS check valve internals, and concluded that the check valve wear would not affect the performance or integrity of the check valves. The inspectors agreed that the descriptions and photographs of the minimal check valve wear would not significantly impact the integrity of the PXS check valves. However, the inspectors observed that the documentation did not describe the justification for the absence of a need to verify that the C_v flow coefficient had not been adversely affected by the check valve wear. The inspectors discussed this observation with WEC personnel during the inspection.

The inspectors found that WEC Design Change Proposal APP-GW-GEE-4903 describes several actions in response to the determination of the partially open PXS check valves during their operation in response to a design-basis event. For example, APP-GW-GEE-4903 specifies that the performance curves are to be updated to reflect the valve supplier's analysis and to incorporate new data in the PXS line resistance calculation APP-PXS-M3C-019. APP-GW-GEE-4903 specifies that the safety analyses will be updated to reflect the PXS check valve performance during design-basis events. In addition, APP-GW-GEE-4903 specifies that the licensing basis will be updated to reflect that the PXS check valves will not be fully open with variable flow resistance of the check valves. The inspectors found these specified actions to be acceptable in response to the PXS check valve performance characteristics.

WEC Root Cause Analysis CAP-RCA-11-076-C001 includes specific corrective actions in response to the determination that the PXS check valves would not fully open during a design-basis event, including revision of the ITAAC related to PXS line resistance. In particular, AP1000 ITAAC 2.2.3-4, Item 8.c, states, in part, that a low-pressure injection test and analysis for each core makeup tank (CMT), each accumulator, each IRWST injection line, and each containment recirculation line will be conducted. For IRWST Injection, ITAAC 2.2.3-4, Item 8.c, states that the IRWST will be partially filled with water, and that sufficient flow will be provided to fully open the check valves. However, the IRWST Injection flow will not be sufficient to fully open the PXS check valves. The inspectors found that the root cause analysis identified actions that need to be addressed to resolve the PXS check valve performance issue.

The inspectors were informed that WEC will be assisting the AP1000 licensees in preparing an LAR to modify the ITAAC to reflect the fact that the PXS check valves will not be fully open. WEC indicated that they expect the LAR to be submitted to the NRC staff sometime during the summer of 2016. WEC described to the inspectors its current plan to retain the ITAAC provision to perform the IRWST injection testing with only one initial IRWST water level, even though the flow coefficient of the PXS check valves will vary as the IRWST level drops and flow rate is reduced during the IRWST injection phase.

As per standard NRC practice, the adequacy of the modified ITAAC will be reviewed by the NRC staff upon submittal of the LAR, including the adequacy of the ITAAC to verify adequate IRWST Injection based on gravity-driven flow, as necessary to provide sufficient core cooling in response to a design-basis event. As part of its review, the NRC staff would consider any previous testing that had been performed in support of the IRWST injection flow rate for the AP1000 reactor. WEC indicated that it would consider these factors in supporting preparation of the LAR to revise ITAAC 2.2.3-4, Item 8.c, with the AP1000 licensees.

Flowserve Application Report CPP-PV03-VPR-195 for the PXS check valves for the Sanmen Unit 1 and Haiyang Unit 1 nuclear power plants provides a summary of the Application Report provisions specified in ASME Standard QME-1-2007. The inspectors found that the Flowserve Application Report for the PXS check valves provided a reasonable summary of the completion of the qualification provisions specified in ASME Standard QME-1-2007 for the PXS check valves. However, the inspectors observed that CPP-PV03-VPR-195 described parent and candidate valve qualification from earlier versions of the ASME QME-1 Standard. In response to the inspectors' observations, WEC indicated that the application reports for the AP1000 licensees in the U.S. would be prepared to apply the qualification terminology from ASME QME-1-2007.

c. Conclusions

The AP1000 COBRA/TRAC computer modeling provided an initial flow rate for the IRWST injection using assumptions for the flow resistance of the PXS components. The WEC calculations had been updated to support the flow rate determination for the IRWST injection that involves an iterative process to incorporate additional information regarding system and component characteristics. This includes consideration of the flow resistance of the PXS check valves that varies during the IRWST injection phase. The inspectors concluded that the process for determining the AP1000 IRWST injection flow rate was acceptable.

In response to Open Item 99900404/2011-201-05, WEC updated the PXS check valve qualification requirements to address the partial open operating position of the PXS check valves following a design-basis event. In particular, WEC revised the design specifications to include requirements for the valve supplier to provide the C_v flow coefficient versus valve open position for the PXS check valves and to address long-term operation of these check valves. In addition, WEC obtained test information demonstrating the minimal wear of the PXS check valves over a 1-year time period. The inspectors discussed with WEC that the Flowserve documentation did not provide specific justification for the absence of the need for verification of the C_v flow coefficient performance of the PXS check valves following the long-term wear testing. WEC indicated that this justification would be provided in a more specific manner in follow-up documentation. The inspectors concluded that WEC had addressed the long-term performance of the PXS check valves in an acceptable manner.

As noted in Open Item 99900404/2011-201-05, WEC is planning to support the AP1000 licensees in preparing an LAR to correct ITAAC 2.2.3-4, Item 8.c, to reflect the partially open position of the PXS check valves during the IRWST Injection phase following a design-basis event. The adequacy of the modified ITAAC will be reviewed by the NRC staff upon submittal of the LAR, including the adequacy of the ITAAC to verify adequate IRWST Injection based on gravity-driven flow, as necessary to provide sufficient core cooling in response to a design-basis event.

Based on this inspection, the portion of Open Item 99900404/2011-201-05 related to the PXS check valve qualification requirements is closed. The portion of Open Item 99900404/2011-201-05 related to the planned LAR to correct ITAAC 2.2.3-4, Item 8.c, will remain open until the LAR is submitted to the NRC staff.

4. Table of Items Opened/Closed and associated ITAAC

Nonconformance/Open Item Number	Open/Closed	Related ITAAC
99900404/2011-201-02	Remains Open	Table 2-2-3-4, Items 2.a) and 2.b) of AP1000 DCD
99900404/2011-201-05	Remains Open	Table 2-2-3-4, Item 8c of AP1000 DCD

ATTACHMENT

1. EXIT MEETING

On May 20, 2016, the NRC inspection team conducted an exit meeting with WEC management and staff and discussed the results of the inspection. The following people were contacted during the inspection.

NAME	ORGANIZATION	Attended Entrance Meeting	Attended Exit Meeting
Sue Mullen	WEC	X	
David Malarik	WEC	X	
Preston Vock	WEC	X	X
Andrew Pfbter	WEC	X	
Richard Paese	WEC	X	
Paul Russ	WEC	X	X
Jared Nichente	WEC	X	
Phil Kotwicki	WEC	X	
Sarah DiTommaso	WEC	X	X
Ron Wessel	WEC	X	
Ryan Borda	WEC	X	
Terry Matty	WEC	X	
Jonathan Guthrie	WEC	X	X
Jeffrey Jacobson	NRC	X	
Thomas Scarbrough	NRC	X	
Angela Zubroski	WEC		X
Robert Phillips	WEC		X

2. INSPECTION PROCEDURES USED

IP 43002, “Routine Vendor Inspection”

3. DOCUMENTS REVIEWED

WNA-TP-03641, “Test Specification and Procedure for Standard Safety Safety System Automatic Depressurization System (ADS) Blocking Device Assembly,” Revision 6, dated May 2016

CDI-4288, Commercial Grade Dedication Instruction for Acromag DC Powered Voltage/Current Input Alarm, Revision 9

CDI-4288, Dedication Data Sheets for Acromag DC Alarm module

APP-GW-GEE-4291, “Changes to Address Spurious Actuation of the IRWST Squib Valves,” Revision 0, dated June 7, 2013.

APP-PMS-J3-538, “AP1000 Detailed Functional Diagram Squib Valve (Squib),” Revision 7, dated May 15, 2014

APP-PMS-J4-105, “AP1000 Protection and Safety Monitoring System Component Functional Logic Specification,” Revision 11, dated September 18, 2015.

WEC Calculation APP-PXS-M3C-195 (Revision 3), “Check Valve Functional Requirements for PXS IRWST Isolation Check Valves.”

WEC Calculation APP-PXS-M3C-019 (Revision 5), “IRWST/Containment Sump Injection Lines and ADS Line Resistances.”

WEC Calculation APP-PXS-M3C-220 (Revision 0), “IRWST DVI Injection Check Valve Environmental Qualification and Cycle Evaluation.”

WEC Calculation APP-PV03-VPH-005 (Revision 0), “Supplemental Testing Specification for PV03 Swing Check Valves Built to Data Sheets APP-PV03-Z0D-184 and 195 for Long Term Operation.”

WEC Datasheet APP-PV03-Z0D-195 (Revision 2), “PV03 Datasheet 195.”

WEC Design Change Proposal APP-GW-GEE-4903 (Revision 0), “PXS Partially Open Check Valve Changes.”

WEC Discrete Issue/Suggestion for Improvement Issue ID 100000061, “Passive Core Cooling Testing Issues.”

WEC Discrete Issue/Suggestion for Improvement Issue ID 100015697, “Extent of Condition EQ Evaluation Completed – Potential Impacts.”

WEC Engineering & Design Coordination Report (dated May 13, 2015).

WEC Root Cause Analysis CAP-RCA-11-076-C001 (Revision 1), “AP1000 Passive Core Cooling Test Issue.”

WEC Safety Analysis APP-SSAR-GSC-732 (Revisions 1 and 2), “AP1000 AFCAP Post-LOCA Long-Term Core Cooling Analysis.”

WEC Specification APP-PV03-Z0-001 (Revision 9), “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.”

Flowserve Application Report CPP-PV03-VPR-195 (Revision 0), “QME-1 Application Report - Size 8 Class 1530 Swing Check Valve with Remote Position Indication for APP-PV03-Z0D-195.”

Flowserve Cycle Life Test Report RAL-70125 (Revision 1, June 19, 2014), “Size 8 Class 1530 Swing Check Valve with Position Indication,” attached to WEC report APP-PV03-VTR-184.