UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION III
2443 WARRENVILLE RD. SUITE 210
LISLE, IL 60532-4352

August 9, 2017

Mr. Robert Coffey
Site Vice President
NextEra Energy Point Beach, LLC
6610 Nuclear Road
Two Rivers, WI 54241

SUBJECT: POINT BEACH NUCLEAR PLANT—NRC DESIGN BASES ASSURANCE INSPECTION (TEAMS): INSPECTION REPORT 05000266/2017007; 05000301/2017007

Dear Mr. Coffey:

On July 13, 2017, the U.S. Nuclear Regulatory Commission (NRC) completed a Triennial Baseline Design Bases Assurance Inspection (Teams) at your Point Beach Nuclear Plant. The enclosed report documents the results of this inspection, which were discussed on July 13, 2017, with yourself, and other members of your staff.

Based on the results of this inspection, two NRC-identified findings of very-low safety significance were identified. The findings involved a violation of NRC requirements. However, because of their very-low safety significance, and because the issues were entered into your Corrective Action Program, the NRC is treating the issues as Non-Cited Violations in accordance with Section 2.3.2 of the NRC Enforcement Policy.

If you contest the violations or significance of these Non-Cited Violations, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555 0001; with copies to the Regional Administrator, Region III; the Director, Office of Enforcement; and the NRC resident inspector at the Point Beach Nuclear Plant.

This letter, its enclosure, and your response (if any) will be made available for public inspection and copying at http://www.nrc.gov/reading-rm/adams.html and at the NRC Public Document Room in accordance with 10 CFR 2.390, "Public Inspections, Exemptions, Requests for Withholding."

Sincerely,

/RA/

Mark T. Jeffers, Chief
Engineering Branch 2
Division of Reactor Safety

Docket Nos: 50–266; 50–301
License Nos: DPR–24; DPR–27

Enclosure:
IR 05000266/2017007; 05000301/2017007

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Letter to Robert Coffey from Mark T. Jeffers dated August 9, 2017

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REGION III

Docket No:	50–266; 50–301
License No:	DPR–24; DPR–27
Report No:	05000266/2017007; 05000301/2017007
Licensee:	NextEra Energy Point Beach, LLC
Facility:	Point Beach Nuclear Plant, Units 1 and 2
Location:	Two Rivers, WI
Dates:	June 26, 2017 through July 13, 2017
Inspectors:	J. Corujo-Sandin, Engineering Inspector, Lead B. Jose, Senior Engineering Inspector, Electrical N. Feliz Adorno, Engineering Inspector, Mechanical J. Benjamin, Operations Inspector W. Hopf, Electrical Contractor J. Zudans, Mechanical Contractor
Approved by:	M. Jeffers, Chief Engineering Branch 2 Division of Reactor Safety

Enclosure

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SUMMARY

Inspection Report 05000266/2017007; 05000301/2017007, 06/26/2017 – 07/13/2017; Point Beach Nuclear Plant; Design Bases Assurance Inspection (Teams).

The inspection was a 2-week onsite baseline inspection that focused on the design of components and modifications to mitigating systems. The inspection was conducted by regional engineering inspectors and two consultants. Two Green findings were identified by the inspectors. The findings were considered a Non-Cited Violation (NCV) of U.S. Nuclear Regulatory Commission (NRC) regulations. The significance of inspection findings is indicated by their color (i.e., greater than Green, or Green, White, Yellow, Red) and determined using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process," dated April 29, 2015. Cross-cutting aspects are determined using IMC 0310, "Aspects Within the Cross-Cutting Areas," dated December 4, 2014. All violations of NRC requirements are dispositioned in accordance with the NRC's Enforcement Policy, dated November 1, 2016. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 6, dated July 2016.

NRC-Identified and Self-Revealed Findings

Cornerstones: Mitigating Systems

Green. The NRC identified a finding of very-low safety significance (Green) and an associated NCV of Title 10, *Code of Federal Regulations* (CFR), Part 50, Appendix B, Criterion XVI, "Corrective Action," for the licensee failure to correct a Condition Adverse to Quality (CAQ) associated with a seismic piping interaction affecting the Motor Driven Auxiliary Feedwater (MDAFW) system. Specifically, the licensee identified a flange clearance to the Unit 1 MDAFW suction piping was nonconforming and captured it in the Corrective Action Program (CAP) as Action Request (AR) 01684524. However, the licensee closed the AR without correcting the CAQ. The licensee captured the inspectors concern in the CAP as AR 02212810 and performed an evaluation that reasonably concluded the MDAFW remained operable.

The performance deficiency was determined to be more-than-minor because it was associated with the Mitigating Systems cornerstone attribute of protection against external factors and affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The finding screened as of very-low safety significance (Green) because it did not result in the loss of operability or functionality of mitigating systems. Specifically, the licensee performed an operability determination which concluded the stresses resulting from the seismic interaction would reasonably be bounded by the applicable stress operability limits. The team did not identify a cross-cutting aspect associated with this finding because it was not confirmed to reflect current performance because the performance deficiency occurred more than 3 years ago. Specifically, the licensee closed AR 01684524 without correcting this CAQ on September 20, 2011. (Section 1R21.3.b(1))

Cornerstones: Initiating Events and Mitigating Systems

Green. The inspectors identified a finding of very-low safety significance (Green), and an associated (NCV) of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," for the licensee's failure to identify a condition adverse to quality. Specifically, after

receiving and reviewing the Flowserve 10 CFR Part 21 report, the licensee misunderstood the information provided and failed to identify 36 safety-related valves that were nonconforming. Of these 36 valves, 14 were identified as being susceptible to pin failure based on their torque setting, 6 of which had open or close safety functions. The licensee captured the inspectors concern in the CAP as AR 02212531, and AR 02212915. In addition, the licensee performed operability evaluations that concluded the affected valves remained operable.

The performance deficiency was more-than-minor because it was associated with the equipment performance attribute of the Mitigating System and Initiating Event cornerstones, and adversely affected the cornerstone individual objectives. Using IMC 0609, Appendix A, "The Significance Determination Process for Findings At-Power," the finding screened as of very-low safety significance (Green) by answering "No" to the questions contained in Exhibit 1, and in accordance with Exhibit 2, it did not result in the loss of operability or functionality of mitigating systems. The team did not identify a cross-cutting aspect associated with this finding because the most significant cause for the error was not reflective of current performance. Specifically, the Part 21 report and associated review by the licensee occurred in February 2013. (Section 1R21.5.b(1))

REPORT DETAILS

1. REACTOR SAFETY

Cornerstone: Initiating Events, Mitigating Systems, and Barrier Integrity

1R21 Design Bases Assurance Inspection (Teams) (71111.21M)

.1 Introduction

The objective of the Design Bases Assurance Inspection is to verify that design bases have been correctly implemented for the selected risk-significant components, modifications, and that operating procedures and operator actions are consistent with design and licensing bases. As plants age, their design bases may be difficult to determine and an important design feature may be altered or disabled during a modification. The inspection also monitors the implementation of modifications to structures, systems, and components (SSC) as modifications to one system may also affect the design bases and functioning of interfacing systems as well as introduce the potential for common cause failures. The Probabilistic Risk Assessment (PRA) model assumes the capability of safety systems and components to perform their intended safety function successfully. This inspectable area verifies aspects of the Initiating Events, Mitigating Systems, and Barrier Integrity cornerstones for which there are no indicators to measure performance.

Specific documents reviewed during the inspection are listed in the Attachment to the report.

.2 Inspection Sample Selection Process

The inspectors selected risk-significant components and operator actions for review using information contained in the licensee's PRA and the Point Beach Nuclear Plant Standardized Plant Analysis Risk Model. In general, the selection was based upon the components and operator actions having a risk achievement worth of greater than 1.3 and/or a risk reduction worth greater than 1.005. Based on this process, a number of risk-significant components, including those with Large Early Release Frequency implications, were selected for the inspection. The operator actions or operating procedures selected for review included actions taken by operators both inside and outside of the control room during postulated accident scenarios associated with the selected components.

The inspectors performed a margin assessment and detailed review of the selected risk-significant components to verify that the design bases have been correctly implemented and maintained. This design margin assessment considered original design reductions caused by design modification, or power uprates, or reductions due to degraded material condition. Equipment reliability issues were also considered in the selection of components for detailed review. These included items such as performance test results, significant corrective action, repeated maintenance activities, Maintenance Rule (a)(1) status, components requiring an operability evaluation, system health reports, and U.S. Nuclear Regulatory Commission (NRC) resident inspector input of problem areas/equipment. Consideration was also given to the uniqueness and

complexity of the design, operating experience, and the available defense in depth margins. A summary of the reviews performed and the specific inspection findings identified are included in the following sections of the report.

The inspectors also identified modifications to mitigating systems for review. In addition, the inspectors selected procedures and operating experience issues associated with the selected components.

This inspection constituted 14 samples (5 components, 1 component with Large Early Release Frequency implications, 5 modifications, and 3 operating experience) as defined in Inspection Procedure 71111.21M-02.01.

.3 Component Design

a. Inspection Scope

The inspectors reviewed the Final Safety Analysis Report (FSAR) as updated, Technical Specifications, design basis documents, drawings, calculations, and other available design basis information to determine the performance requirements of the selected components. The inspectors used applicable industry standards, such as the American Society of Mechanical Engineers Code, Institute of Electrical and Electronics Engineers Standards, and the National Electric Code to evaluate acceptability of the systems' design. The NRC also evaluated licensee actions, if any, taken in response to NRC issued operating experience, such as Bulletins, Generic Letters, Regulatory Issue Summaries, and Information Notices (INs). The review was to verify that the selected components would function as designed when required and support proper operation of the associated systems. The attributes that were needed for a component to perform its required function included process medium, energy sources, control systems, operator actions, and heat removal. The attributes to verify that the component condition and tested capability was consistent with the design bases and was appropriate may include installed configuration, system operation, detailed design, system testing, equipment and environmental qualification, equipment protection, component inputs and outputs, operating experience, and component degradation.

For each of the components selected, the inspectors reviewed the FSAR, Applicable Technical Specifications, maintenance history, preventive maintenance activities, system health reports, operating experience-related information, vendor manuals, electrical and mechanical drawings, and licensee Corrective Action Program (CAP) documents. Field walkdowns were conducted for all accessible components to assess material condition, including age-related degradation and to verify that the as-built condition was consistent with the design. Other attributes reviewed are included as part of the scope for each individual component.

The following 6 components (samples) were reviewed:

- 125 Volts Direct Current Bus (D-03) and Associated Distribution Panel (D-31): The inspectors reviewed 125 Volts Direct Current (Vdc) short circuit calculations and verified the interrupting ratings of the fuses were above the calculated short circuit currents. The 125 Vdc voltage drop calculations were reviewed to determine if adequate voltage would be available for the medium voltage and low voltage switchgear circuit breaker open and close coils and spring charging motors. The inspectors reviewed the motor control logic diagrams and the

125 Vdc voltage drop calculation to ensure adequate voltage would be available for the control circuit components under all design basis conditions. The inspectors also reviewed the 125 Vdc short circuit and coordination calculations to assure coordination between various feed breaker open and close control circuit fuses, and 125 Vdc supply fuses and to verify the interrupting ratings of the control circuit fuses and the 125 Vdc control power feed fuses.

- Unit 1 Yellow Instrument Bus Inverter (1DY04): The team reviewed the circuit diagrams, the short circuit current calculation, and the coordination calculation to confirm the short circuit duty and the proper coordination between the panel fuses including ratings and branch circuit cabling with the upstream protective device. The inspectors reviewed the physical and material condition by visual inspection and reviewed health report documents to verify identification of adverse trends. The inspectors also reviewed voltage drop and minimum voltage calculations. The calculation review verified methodology, design inputs, assumptions, and results.

- Motor-Driven Auxiliary Feedwater Pump (1P-53): The team reviewed the following hydraulic calculations to assess the pump capability to perform its required mitigating functions: hydraulic model, pump minimum required flow, minimum required net positive suction head and vortexing. In addition, the team reviewed measures established by the licensee to manage the potential for steam void formation due to feedwater back-leakage into the pump discharge piping; the sizing of the cavitating venturi; and the manual and automatic pump suction switchover from the condensate storage tank to the service water (SW) system. The team also reviewed test procedures and completed tests, including pump inservice testing, to assess the associated methodology, acceptance criteria, and test results. In addition, the team interviewed licensee personnel from multiple disciplines such as operations, engineering, and maintenance.

  The team also reviewed electrical calculations, drawings and equipment modifications to determine whether adequate voltage and current would be available at the pump motor terminals for starting and running under worst case design basis loading, operation on emergency power, and grid voltage conditions. Control Logic was also reviewed for the appropriate operation. Protective relay settings and cable short circuit current capability were also reviewed as part of the electrical review to determine whether appropriate electrical protection coordination margins had been applied and whether the power supply feeder cables had been properly sized for the maximum available short circuit current capability requirements. The team reviewed modifications made to support the replacement of the pump.

- Minimum Recirculation Check Valve for the 1P-53 Motor-Driven Auxiliary Feedwater Pump (1AF-196): The team's review included installed configuration, system operation, detailed design, system Inservice Testing (IST), and operating experience. In addition, the team interviewed licensee personnel from multiple disciplines such as operations, engineering, and maintenance.

- Reactor Makeup Water to Pressurizer Relief Tank Containment Isolation Valve (1RC-508): The team inspected the component to verify that it was capable of meeting its design basis requirements. The team inspected the component, to

determine if the normally closed valve is capable of performing its design basis function to isolate its associated containment penetration (P 30c) when it is opened for the reactor water makeup function. The team reviewed IST stroke time testing, Appendix J testing, periodic Air-Operated Valve (AOV) diagnostic test results to verify acceptance criteria were met. The team evaluated whether the AOV safety functions, performance capability, and design margins were adequately monitored and maintained in accordance with Nextera's AOV Program requirements.

The design, operation, and maintenance of the valve were discussed with the system engineer to evaluate the valve's performance history, maintenance, and overall health. The team also conducted a walkdown of the valve and associated equipment to assess the material condition of the equipment and to evaluate whether the installed configuration was consistent with the plant drawings, procedures, and the design bases.

The inspectors also reviewed power and control wiring to this solenoid valve to verify circuit protection fuse size and type. The inspectors verified from the vendor manual the minimum voltage required for this solenoid and compared it to the 125 Vdc voltage drop calculation and verified that sufficient voltage will be available to this valve under design basis conditions. The inspectors also reviewed the 125 Vdc short circuit calculation to verify the calculated short circuit current at this valve is well within the interrupting capacity of the power supply fuse. The inspectors also verified that the licensee replaces this type of solenoid valves every fifth refueling outage for service life concerns.

- Service Water Pump (P-32F): The team inspected the 'F' motor-driven SW pump to verify that it was capable of meeting its design basis requirements. The SW pump safety related function is to provide Lake Michigan cooling water flow to mitigate the consequences of a Loss of Coolant accident in one unit while supporting normal cooling flow to the unaffected unit. The team reviewed system drawings, analyses, procedures, recent modifications, and test results associated with operation of the SW pump under postulated transient, accident, and station blackout conditions. The analyses included considerations for hydraulic performance, hydraulic instability, net positive suction head, required total developed head, pump vibration analysis (shaft critical speed and column natural frequency), pump run-out conditions, operable but non-conforming condition, and potential for vortex formation at the suction source. Seismic design documentation was reviewed to verify pump design was consistent with limiting seismic conditions. The team also evaluated the pump suction alarm setpoint to verify that it had an adequate basis. The IST results were reviewed to verify acceptance criteria were met and performance degradation would be identified, taking into account set-point tolerances and instrument inaccuracies. Additionally, IN 2007-06 was reviewed for applicability and corrective actions taken. The team interviewed system, test, and design engineers to discuss pump performance and maintenance history to determine the overall condition of the pump.

  The team reviewed electrical calculations, drawings and equipment modifications to determine whether adequate voltage and current would be available at the pump motor terminals for starting and running under worst case design basis

loading, operation on emergency power, and grid voltage conditions. Control Logic was also reviewed for the appropriate operation. Protective relay settings and cable short circuit current capability were also reviewed as part of the electrical review to determine whether appropriate electrical protection coordination margins had been applied and whether the power supply feeder cables had been properly sized for the maximum available short circuit current capability requirements.

b. Findings

(1) Failure to Correct a Condition Adverse to Quality Associated with a Seismic Interaction of the Motor-Driven Auxiliary Feedwater Piping

Introduction: The team identified a finding of very-low safety significance (Green) and an associated Non-Cited Violation (NCV) of Title 10 of the *Code of Federal Regulations* (CFR), Part 50, Appendix B, Criterion XVI, "Corrective Action," for the licensee failure to correct a Condition Adverse to Quality (CAQ) associated with a seismic piping interaction affecting the Motor Driven Auxiliary Feedwater (MDAFW) system. Specifically, the licensee identified a flange clearance to the Unit 1 MDAFW suction piping was nonconforming and captured it in the CAP as Action Request (AR) 01684524. However, the licensee closed the AR without correcting the CAQ.

Description: On September 7, 2011, the licensee identified a small clearance between a blind flange and the MDAFW common suction piping from the condensate storage tanks (CSTs). Specifically, a clearance of approximately 0.2 inches existed between the blind flange located downstream of the unit cross-tie drain/FLEX valve (i.e., valve AF-201) and the piping section upstream of the Unit 1 MDAFW CST supply isolation valve (i.e., valve 1AF-190). The licensee captured this condition in their CAP as AR 01684524 as a CAQ.

On June 28, 2017, the team noted the small clearance during a walkdown and subsequently learned that AR 01684524 was closed without correcting this CAQ on September 20, 2011. As a result of the team questions, the licensee determined that the potential existed for the blind flange to impact the MDAFW suction piping. Specifically, the piping associated with the blind flange would have had a maximum displacement of 2.2 inches during a safe shutdown earthquake. However, the associated impact force had not been evaluated as required by the construction code of the MDAFW piping. Specifically, Section 101.5.1, "Impact," of the 1967 Edition of the USAS B31.1 code stated, "Impact forces caused by all external and internal conditions shall be considered in the piping design." The team was concerned because the failure of the pressure boundary at this location would challenge the Units 1 and 2 MDAFW capability to switchover their suction to their safety-related water supply and would drain the CSTs into locations containing safety-related equipment.

The licensee captured the inspectors concern in the CAP as AR 02212810. The immediate corrective action was to perform an evaluation that reasonably concluded the MDAFW remained operable. Specifically, the licensee reasonably estimated the total impact stresses would be less than the applicable operability limits. The proposed corrective action to restore compliance at the time of this inspection was to modify the piping to eliminate the seismic interaction.

Analysis: The team determined that the failure to correct a CAQ associated with a seismic piping interaction affecting the MDAFW system was contrary to 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," and was a performance deficiency. The performance deficiency was determined to be more-than-minor because it was associated with the Mitigating Systems cornerstone attribute of protection against external factors and affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the failure to correct the unanalyzed pipe clearance did not ensure MDAFW system would remain available and capable to provide its accident mitigating function.

The team determined the finding could be evaluated using the Significance Determination Process in accordance with Inspection Manual Chapter (IMC) 0609, "Significance Determination Process," Attachment 0609.04, "Initial Characterization of Findings," issued on October 7, 2016. Because the finding impacted the Mitigating Systems cornerstone, the inspectors screened the finding through IMC 0609, Appendix A, "The Significance Determination Process for Findings At-Power," issued on June 19, 2012, using Exhibit 2, "Mitigating Systems Screening Questions." The finding screened as of very-low safety significance (Green) because it did not result in the loss of operability or functionality of mitigating systems. Specifically, the licensee performed an operability determination which concluded the stresses resulting from the seismic interaction would reasonably be bounded by the applicable stress operability limits.

The team did not identify a cross-cutting aspect associated with this finding because it was not confirmed to reflect current performance because the performance deficiency occurred more than 3 years ago. Specifically, the licensee closed AR 01684524 without correcting this CAQ on September 20, 2011.

Enforcement: Title 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," states, in part, that measures shall be established to assure that CAQs, such as failures, malfunctions, deficiencies, deviations, defective material and equipment, and non-conformances, are promptly identified and corrected.

Contrary to the above, from September 7, 2011, to at least June 28, 2017, the licensee failed to correct a CAQ. Specifically, on September 7, 2011, the licensee identified a flange clearance associated with the Unit 1 MDAFW suction piping was nonconforming and captured it in the CAP as AR 01684524. However, the licensee closed AR 01684524 on September 20, 2011, without correcting this CAQ.

The licensee is still evaluating the planned corrective actions. However, the inspectors determined that the continued non-compliance does not present an immediate safety concern because the licensee performed an evaluation that reasonably concluded the MDAFW system remained operable.

Because this violation was of very-low safety significance and was entered into the licensee's CAP as AR 02212810, this violation is being treated as a NCV, consistent with Section 2.3.2.a of the NRC Enforcement Policy. **(NCV 05000266/2017007-01; NCV 05000301/2017007-01, Failure to Correct a Condition Adverse to Quality Associated with a Seismic Interaction of the Motor-Driven Auxiliary Feedwater Piping)**

.4 Mitigating System Modifications

a. Inspection Scope

The inspectors reviewed 5 permanent plant modifications to mitigating systems that had been installed in the plant during the last 3 years. This review included in-plant walkdowns for portions of the modified Auxiliary Feedwater (AFW) System, SW System and station batteries D-05 and D-06. The inspectors reviewed the modifications to verify that the design bases, licensing bases, and performance capability of the components had not been degraded through modifications. The modifications were selected based upon risk significance, safety significance, and complexity. The inspectors reviewed the modifications selected to determine if:

- the supporting design and licensing basis documentation was updated;
- the changes were in accordance with the specified design requirements;
- the procedures and training plans affected by the modification have been adequately updated;
- the test documentation as required by the applicable test programs has been updated; and
- post-modification testing adequately verified system operability and/or functionality.

The inspectors also used applicable industry standards to evaluate acceptability of the modifications. The modifications listed below were reviewed as part of this inspection effort:

- Engineering Change (EC)EC 0281270 Revision 2, Addition of 60th Cell to Batteries D-05 and D-06;
- EC 0257927 Revision 1, Replace D-06 Station Battery;
- EC 0258407 Revision 0, Auxiliary Switch Wiring Configuration of SCI Inverter Breaker B2;
- EC 259830 Revision 5, EPU - Replacement MDAFW Pump and Piping Installation Only; and
- EC 0272153 Revision 19, SW System Vertical Pump Replacements.

b. Findings

No findings were identified.

.5 Operating Experience

a. Inspection Scope

The inspectors reviewed 3 operating experience issues (samples) to ensure that NRC generic concerns had been adequately evaluated and addressed by the licensee. The operating experience issues listed below were reviewed as part of this inspection:

- Part 21 Report No. 2013-09-00, “Wedge Pin Failure in Anchor Darling Motor Operated Double Disc Gate Valve at Browns Ferry Nuclear Plant Unit 1;”
- IN 2000-06, “Offsite Power Voltage Inadequacies” and
- IN 2016-01, “Commercial Grade Dedication of ABB Relays.”

b. Findings

(1) Failure to Identify Non-Conforming Conditions after Receipt of Anchor Darling Double Disc Gate Valve Related Part 21 Report

Introduction: The inspectors identified a finding of very-low safety significance (Green), and an associated NCV of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action", for the licensee's failure to identify a condition adverse to quality. Specifically, after receiving and reviewing a Flowserve 10 CFR Part 21 report, the licensee misunderstood the information provided and failed to identify 36 safety-related valves that were nonconforming. Of these 36 valves 14 were identified as being susceptible to pin failure based on their torque setting, six of which had open or close safety functions.

Description: On January 4, 2013, Tennessee Valley Authority issued a 10 CFR Part 21 report following the failure of an Anchor Darling Double Disk Gate Valve reactor side disc to seat properly due to a broken wedge pin. The report described that the cause of the pin failure was determined to be that the valve stem was not adequately torqued into the upper wedge when assembled by the vendor.

On February 25, 2013, the valve vendor, Flowserve, issued a separate but related 10 CFR Part 21 report for the same Tennessee Valley Authority valve failure. Flowserve described that the pin was designed to ensure that the joint does not loosen due to vibration and other secondary loads and that the pin shearing can allow stem rotation and ultimately result in stem to wedge separation. Similarly, the report identified that the wedge pin failed due to excessive load on the pin because the system operating torque had exceeded the unknown preassembly torque to tighten the stem into the upper wedge combined with the wedge pin material strength. Attachment 1 within this 10 CFR Part 21 report, provided a recommended standard stem preload torque based upon valve size and pressure class. Point Beach was listed in the Part 21 report as a customer for the parts and was sent a copy of the 10 CFR Part 21 report from Flowserve.

On March 4, 2013, the licensee entered this issue into their CAP as AR 01853370. The licensee determined that 44 valves were in-service and that 36 out of the 44 valves were safety-related (Reference: CMP 2.2.7 Engineering Instructions for Performing Valve Operator Checkouts, Revision 14). The licensee evaluated the issue by assuming that the stem was pre-torqued into the wedge at the recommended Attachment 1 value in the Flowserve 10 CFR Part 21 report. Using this pre-load value, the licensee concluded that the maximum operating torque values had not and would not break the wedge pin during valve operation. Therefore, all 36 safety-related valves were dispositioned as conforming to the design requirements and, therefore, no corrective actions were necessary.

The team identified that the licensee had misunderstood the 2013 10 CFR Part 21 report. Specifically, the licensee used the Flowserve Part 21 report Attachment 1 recommended pre-torque table as the known assembly torque instead of the recommended torque to correct the issue. The licensee entered this issue into their CAP as AR 02212531, and AR 02212915. The licensee re-evaluated the issue and identified that 14 of the 44 valves had a maximum operating torque that could challenge the minimum strength of the wedge pin. This issue could lead to overstressing and breaking the wedge pin during valve operations and ultimately cause valve failure.

The 6 of the 14 valves had open or close safety functions. The licensee performed an operability evaluations for these 14 valves and concluded that the valves could perform their specified function when providing an allowance for stem to wedge thread friction when thrust was applied.

Analysis: The inspectors determined that the failure to identify the 36 safety-related valves with the non-conforming condition, after the receipt of the Flowserve 10 CFR Part 21 report, was a performance deficiency. Specifically, the licensee misunderstood the 10 CFR Part 21 report following receipt and evaluation although the report adequately described the issue and provided the licensee with specific contact information if any licensee had questions or confusion.

The inspectors evaluated if the performance deficiency was more-than-minor by reviewing the safety-related and any nonsafety-related function(s) associated with the 44 valves and reviewing those valves (14 total) in which the operating torque exceeded the minimum wedge pin material strength. The team focused their review on two groups of valves. Specifically:

- Low head safety injection pump suction from the reactor coolant system (RCS) [Unit 1 and Unit 2 RH-700 trains; two valves total]; and the
- Safety injection accumulator isolation [Unit 1 and Unit 2 SI-841(A) and (B) trains; four valves total].

The inspectors determined that the performance deficiency was more-than-minor because it was associated with the equipment performance attribute of the Mitigating System cornerstone and adversely affected the cornerstone objective to ensure the availability, capability, and reliability of systems that respond to initiating events to prevent core damage. Specifically, the SI-841 valves have a safety function to remain open during a loss of coolant accident to inject highly concentrated boric acid into the RCS. The SI-841 valves are shut in accordance with emergency operating procedures to prevent nitrogen gas from unnecessarily entering the RCS. In addition, the RH-700 valves perform an active safety-related function to close. Specifically, the RH-700 valves must be capable of closure, if open, to allow Residual Heat Removal to be realigned to the Emergency Core Cooling System mode of operation. Also, low head safety injection pump suction from the RCS valves RH-700 perform a nonsafety-related risk-significant mitigating function to place residual heat removal in the RCS cooling mode to reach cold shutdown conditions.

Additionally, the inspectors determined that the performance deficiency was more-than-minor because it was associated with the equipment performance attribute for the Initiating Event cornerstone and adversely affected the cornerstone objective to limit the likelihood of events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. Specifically, RH-700 has a safety function in the closed position to preserve the pressure integrity of the RCS as one of two pressure isolation valves.

The inspectors determined that the finding could be evaluated using the Significance Determination Process in accordance with IMC 0609, “Significance Determination Process,” dated April 29, 2015, and Attachment 0609.04, “Initial Characterization of Findings,” dated October 7, 2016. Because this finding was associated with the Initiating Event and Mitigating Systems cornerstones, the inspectors screened the finding through

IMC 0609 Appendix A, "The Significance Determination Process for Findings At-Power," using Exhibits 1, "Initiating Events Screening Questions" and Exhibit 2, "Mitigating Systems Screening Questions." The inspectors determined that this finding was of very-low safety significance (Green) by answering "No" to all the questions contained in Exhibit 1 and answering "Yes" to question A.1 of Exhibit 2, because the finding was a deficiency that affected the design of mitigating SSCs, however the SSCs maintained their operability and functionality. Specifically, the licensee performed operability evaluations for the affected SSCs and concluded these remained operable.

The team did not identify a cross-cutting aspect associated with this finding because the most significant cause for the error was not reflective of current performance. Specifically, the Part 21 report and associated review by the licensee occurred in February 2013.

Enforcement: Title 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," requires, 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 non-conformances are promptly identified.

Contrary to the above, from March 4, 2013, through June 27, 2017, the licensee failed to identify a condition adverse to quality. Specifically, on March 4, 2013 after receiving and reviewing the Flowserve 10 CFR Part 21 report, the licensee misunderstood the information provided and failed to identify 36 safety-related valves that were nonconforming to 10 CFR Part 50, Appendix B, Quality Assurance requirements. Of these 36 valves, 14 were identified as being susceptible to pin failure based on their torque setting, 6 of which had open or close safety functions.

The licensee is evaluating planned corrective actions. However, the inspectors determined that the continued non-compliance does not present an immediate safety concern because the licensee performed an evaluation that reasonably concluded the affected valves remained operable.

Because this violation was of very-low safety significance and was entered into the licensee's CAP as AR 02212531 and AR 02212915, this violation is being treated as a NCV, consistent with Section 2.3.2.a of the NRC Enforcement Policy.
(NCV 05000266/2017007-02, NCV 05000301/2017007-02, Failure to Identify Non-Conforming Conditions after Receipt of Anchor Darling Double Disc Gate Valve Related Part 21 Report)

.6 Operating Procedure Accident Scenarios

a. Inspection Scope

The inspectors performed a detailed reviewed of the general operating procedures for the motor driven AFW pump, SW system, and safety-related station batteries. Precautions, limitations, and instructions for operating the systems and components were compared to the FSAR, design assumptions, and training materials to determine if the equipment was being operated as assumed within the current licensing basis. In addition, the inspectors observed the station simulator modeling and expected operator response for these systems during the following accidents or transients scenarios:

- Anticipated Transient without a Scram;
- Loss of Feedwater; and
- Station Blackout.

The inspectors performed a margin assessment and detailed review of eight risk-significant, operator actions. These actions were selected from the licensee's PRA rankings of human action importance based on risk achievement worth values and other factors. Where possible, margins were determined by the review of the assumed design basis and FSAR response times and performance times documented by the licensee. For the selected operator actions, the inspectors performed a detailed review and walk through of associated procedures to determine if the selected actions could be performed as assumed within the current licensing basis. The following operator actions were reviewed:

- AFW Suction Swap from the Condensate Storage Tank to SW Supply;
- Locally Shut SW Pump Discharge Valve following SW Pump Trip;
- Isolate Zurn Strainer if not Intact;
- Manually Backwash SW Strainer;
- Manual Control of AFW Pump Discharge Valves;
- Take Local Manual Control of Motor Driven AFW Pump if Control Room is not Accessible;
- Gagged Open AFW Recirculation Valves Following a Loss of Instrument Air; and
- Restoration of Safety-Related Battery Charger Following Loss of AC Power.

b. Findings

No findings were identified.

4. OTHER ACTIVITIES

4OA2 Identification and Resolution of Problems

.1 Review of Items Entered Into the Corrective Action Program

a. Inspection Scope

The inspectors reviewed a sample of the selected component problems identified by the licensee and entered into the CAP. The inspectors reviewed these issues to verify an appropriate threshold for identifying issues and to evaluate the effectiveness of corrective actions related to design issues. In addition, corrective action documents written on issues identified during the inspection were reviewed to verify adequate problem identification and incorporation of the problem into the CAP. The specific corrective action documents sampled and reviewed by the inspectors are listed in the attachment to this report.

The inspectors also selected two issues identified during previous Component Design Basis Inspections to verify that the concern was adequately evaluated and corrective actions were identified and implemented to resolve the concern, as necessary. The following issues were reviewed:

- NCV 05000266/2015008-01; 05000301/2015008-01, Failure to Promptly Correct Conditions Adverse to Quality Regarding Electrical Power Cable Sizing and Protection;
- NCV 05000266/2011009-02; 05000301/2011009-02, Failure to Incorporate Minimum AFW Flow Rate Requirements Into Emergency Procedures.

b. Findings

No findings were identified.

4OA6 Management Meetings

.1 Exit Meeting Summary

On July 13, 2017, the inspectors presented the inspection results to Mr. Coffey, and other members of the licensee staff. The licensee acknowledged the issues presented. The inspectors asked the licensee whether any materials examined during the inspection should be considered proprietary. Several documents reviewed by the inspectors were considered proprietary information and were either returned to the licensee or handled in accordance with NRC policy on proprietary information.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee

R. Coffey, Site Vice President
R. Craven, Plant General Manager
D. Shepherd, Design Engineering Manager
E. Schultz, Licensing Manager
D. Hofstra, Operations Supervisor
M. Rosseau, Design Engineering Supervisor
K. Locke, Licensing

U.S. Nuclear Regulatory Commission

T. Hartman, Senior Resident Inspector
K. Barclay, Resident Inspector

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened and Closed

05000266/2017007-01, 05000301/2017007-01	NCV	Failure to Correct a Condition Adverse to Quality Associated with a Seismic Interaction of the Motor-Driven Auxiliary Feedwater Piping
05000266/2017007-02, 05000301/2017007-02	NCV	Failure to Identify Non-Conforming Conditions after Receipt of Anchor Darling Double Disc Gate Valve Related Part 21 Report

Discussed

None

LIST OF DOCUMENTS REVIEWED

The following is a list of documents reviewed during the inspection. Inclusion on this list does not imply that the NRC inspectors reviewed the documents in their entirety, but rather, that selected sections of portions of the documents were evaluated as part of the overall inspection effort. Inclusion of a document on this list does not imply NRC acceptance of the document or any part of it, unless this is stated in the body of the inspection report.

CALCULATIONS

Number	Description or Title	Date or Revision
11-144	Structural Evaluation of Service Water Pump Sole Plate Anchorage	0
91C2696-C-012	USI A-46/IPEEE, Equipment Fragilities for P-32A to P-32F	06/05/1999
96-0059	Service Water Model Input Deck Updates	11
96-0246	Uncertainty of Service Water Pump In-Service Testing	8
97-0211	AFW Pump Low Suction Pressure Trip Time Delay Relay Uncertainty	2B
97-0215	Water Volume Swept by all four AFW Pumps Following a Seismic/Tornado Event Affecting Both Units	5A, 5B
97-0231	AFW Pump Low Suction Pressure Trip Instrument Loop Uncertainty/Setpoint Calculation	3
99-0052	Service Water Low Flow Conditions	3
2004-0002	AC Electrical System Analysis	5
2004-0009	13.8kV and 4.16kV Protection and Coordination	2E
2005-0005	120V AC Short Circuit Analysis (Safety-Related)	0
2005-0011	AFW Thermal Hydraulic Flow Model	1C
2005-0015	Motor Driven Auxiliary Feedwater Pump Motive Force	0, A, B
2008-0014	Determination of Power Cable Ampacities & Verification of OL Protection Calculation	0
2009-06582	Available Water in Volume of Piping in the Protected Portion of MDAFW Pump Suction	0A
2009-06932	Nitrogen or Compressed Air Backup System for MDAFP Discharge Valves and Flow Recirculation Valves	1
2014-0005	Service Water Pump Anchor Bolt Contingency Analysis	0
2014-0006	Lateral Loads on Service Water Pump Anchorage	0
2016-0005	125 Vdc Cable Protection Calculation	0
CN-SEE-III-08-3	Point Beach 1&2 Minimum CST Volume for EPU Program	0
N-93-057	D06 DC System Sizing, Voltage Drop and Short Circuit Calculations	7
N-93-058	D105 DC System Sizing, Voltage Drop and Short Circuit Calculations	8
N-93-059	DC ETAP Calculation Reconstitution Project	8
N-94-064	VNBI (HX-lOSAJB) SW Flow vs Temperature Requirement	6
No. 627.0	Volian Enterprises Calc. EOP Setpoint L.4	01/26/2016
P-89-037	Determination of SW Pump Minimum Submergence (Peerless)	2
PBNP-IC-42	CST Water Level Instrument Scaling and Loop Uncertainty/Setpoint Calculation	2C
PSV100085753-02	Seismic Qualification Analysis for 22GMCX 1-Stage Vertical Pump	4

CORRECTIVE ACTION DOCUMENTS GENERATED DUE TO THE INSPECTION

Number	Description or Title	Date
AR 02206860	Vertical Supports for SW Pump Check Valves Have Gaps	05/24/2017
AR 02212421	2017 DBAI: NAMS Equip ID References BID Spec	06/27/2017
AR 02212531	NRC Identified Part 21 Response Contains Error	06/27/2017
AR 02212552	IA Regulator IA-929 for 1RC-508 Appears to be pegged high. Includes WR94162407 to correct situation.	06/27/2017
AR 02212552	DBAI – IA-929 Regulator Pressure Gauge Pegged HI for 1RC-508	06/27/2017
AR 02212633	DBAI: Documentation Issue in Calc. 2005-0005	06/28/2017
AR 02212708	1SW-2908 Packing Leak	06/28/2017
AR 02212715	Z-36 Hoist Dangling Power Cable Plug in Overhead	06/28/2017
AR 02212798	DBA Inspection – UFSAR MDAFW Pumps Discussion	06/28/2017
AR 02212810	2017 DBAI – Blind Flange Clearance Appx. 0.2" from AF Supply	06/28/2017
AR 02212887	DBAI 2017 Documentation Issue in Calc PBNP-IC-42 Rev. 2C	06/29/2017
AR 02212915	Scope of ADDDGV Part 21 Wedge Pin Shear Analysis	06/29/2017
AR 02212930	BG AOP 5B – Loss of Instrument Air Enhancement	06/29/2017
AR 02213100	DBAI 2017 Calculation 2009-06571 Does Not Exist in NAMS	06/30/2017
AR 02213167	2017 DBAI: Action Request Not Issued After Test Failure	06/30/2017
AR 02213658	2017 DBAI: PBNB Procedures Found to Have Outdated Reference	07/05/2017
AR 02213668	Trend – NRC Identified PI&R Related Issues	07/05/2017
AR 02213759	2017 DBAI: PBNP Does Not Have AFP Water Hammer Assessment	07/06/2017
AR 02214538	Bases for EOP Set Point L.4 and L.27 Confusing	07/12/2017
AR 02214780	DBAI 2017: Review Verbiage in 5th Interval DOC Section 3.10	07/12/2017
AR 02214823	DBAI 2017 PM's Not Scheduled IAW Current Manufacturer Recommendation	07/12/2017
PCR 02213647	0-SOP-SW-107 – Service Water Pump Operation Revise Step 3.3	07/05/2017
PCR 02213649	OI-70- Service Water System Operation Revise Step 3.10	07/05/2017
PCR 02213655	NP 7.4.4- ASME OM Code Pump and Valve Inservice Testing (S) Revise Steps 2.3.5, 4.1.4c and Reference 5.5 to Replace NP 10.2.7 (SUPERCEDED) with MA-AA-203-1000	07/05/2017
PCR 02214272	DBAI 2017: Add Calibration of the Agastat 62/4044 and 62/4044C Unit 1	07/10/2017
PCR 02214273	DBAI 2017: Add Calibration of the Agastat 62/4044 and 62/4044C Unit 2	07/10/2017
PCR 02214308	DBAI 2017: Update Procedure to Replace Approximate Times ORT 3C Unit 1	07/10/2017

CORRECTIVE ACTION DOCUMENTS REVIEWED DURING THE INSPECTION

Number	Description or Title	Date
AR 01154103	Seismic Acceptance of Replacement ASCO Solenoid Valves	09/08/2009
AR 01681176	CST Low Level Alarm Setpoints have Procedure Issues	08/25/2011
AR 0184009	Part 21: Anchor Darling (Flowserve) Double Disc Gate Valves	01/16/2013
AR 01841249	First Quarter Service Water Pump IST Results	05/22/2013

CORRECTIVE ACTION DOCUMENTS REVIEWED DURING THE INSPECTION

Number	Description or Title	Date
AR 01841381	AR 1840008 Action Item #1 Part 21 for 10 " Anchor Darling Valves	06/12/2017
AR 01853370	Part 21 Flowserve: Anchor Darling Double Disc Gate Valves	03/04/2013
AR 01961050	Simulator Testing Revealed Potential AFW Issue	04/24/2014
AR 01972689	Unexpected 1P-30A Bearing Cooling Flow Low Alarm	06/26/2014
AR 01994529	NRC IN 2014, Potential Circuit Failure-Induced Secondary Fires	09/29/2014
AR 02006570	IT 07 Test Results Lower Than Expected	11/20/2014
AR 02035020	2015 CDBI: Track Ampacity Issues	03/25/2015
AR 02035680	2015 CDBI Green NCV-Timeliness of Corrective Action	03/27/2015
AR 02080284	As Found Condition During P-32F Anchor Sleeve Removal	10/13/2015
AR 02083030	Washers Not Installed Under SW Anchor Bolt Nuts	11/09/2015
AR 02083125	High Vibration on P-32F Initial Run	10/21/2015
AR 02083207	P-032F Service Water Pump Bearing Noise	10/21/2015
AR 02101619	P-032F Unusual Motor Noise	01/13/2016
AR 02112583	NRC IN 2016-01, Commercial Grade Dedication of Allen Bradley Type 700 RTC Relays	02/24/2016
AR 02191374	Concerns With P-032 E&F SW Pump IST Re-Baselining Plans (PWE)	04/13/2017
AR 02198815	2PI-4013 Was Over-ranged	04/14/2017
AR 02201950	Overranged Gauged Used in IT 09A/OOT Condition Not Evaluated	04/27/2017
AR 02202641	L1 Assessment – Anchor Darling DD Gate Valves Response	05/01/2017
AR 01067733	PI&R - Evaluate the Repeatability of NDE Data on SW	08/06/2007
AR 01309177	PI&R - Evaluate the Repeatability of NDE Data on SW	08/06/2007
AR 02115093	1 RC 508-S Solenoid Replacement	01/30/2017
CR 01226467	Non-Compliance with FSAR for Cable Overload Protection	01/22/2003
CR 02071120	2DY-04 Swapped over to backup "dirty" power	09/29/2015
CR 02148598	1DY-04 Inverter Swapped to Backup Power	09/19/2016
OE 1060949	OE Evaluation of SER 07-06	N/A
OE 1080696	OE Evaluation of 2007-006	N/A
PCR 02083134	IT 07F – P32F Service Water Pump (Quarterly) New Baseline	07/05/2017

DRAWINGS

Number	Description or Title	Revision
043675	9 STG Orifice Assembly	A
499B466, Sh. 758	Elementary Wiring Diagram, Remote Operated Valves ½ ROV-371, 508, 769 & 846	15
82933	1RC 508 Reactor Water Makeup Containment Isolation Valve	N/A
E-1620E-B	Wiring Diagram Main Control Board Section C01	20
E7-Sh 2_12	120V Instrument AC System	0
M-217 Sh.1	P&ID MDAFW Units 1 & 2	104
M-217 Sh.3	P&ID MDAFW Unit 1	8
M-2217	P&ID MDAFW Unit 2	7
PB 01 MCVK 00420	Chemical and Volume Control System	20
PB 01 MRCK 00240	Reactor Coolant System	40
PB 01 MWSK 00151	P&ID Service Water Unit 1	46

DRAWINGS

Number	Description or Title	Revision
PB 01 MWSK 00230	P&ID Service Water Unit 1	23
PB 01 MWSK 00388	P&ID Service Water Unit 1	81
PB 01 MWSK 00470	P&ID Service Water Unit 1	68
PB 01 MWSK 01042	P&ID Service Water Unit 1	39
PB 19843	Elementary Wiring Diagram 4160V SWGR 1A06 Cubicle B3 (1P-53)	1
PB31 EWHS-165 -008	Elementary Wiring Diagram Service Water Pmp P-032F	3

10 CFR 50.59 DOCUMENTS (SCREENINGS/SAFETY EVALUATIONS)

Number	Description or Title	Date
EC 258407	Auxiliary Switch Wiring SCI Inverter B2 (Pre-Screening)	12/10/07
SCR 2012-0086	EC 272153 Service Water System Vertical Pump Replacements	7/12/12
SCR 2015-0108	Establishing New Inservice Testing Program Acceptance Criteria for P-32F, Service Water Pump	10/19/15

MISCELLANEOUS

Number	Description or Title	Date or Revision
CEH Report No. 272 10	Point Beach Nuclear Station Units 1 & 2 Service Water Pumps Physical Hydraulic Model Study	03/2010
DBD – 09	Reactor Coolant System – Section 2.8	14
DBD – T – 38	Containment Isolation Topical Design Basis Documentation	3
DBD-12	Service Water System(SW) Design Basis Document	26
FAI 09-241	Test Report for the PB CST Vortex Suppressors	0
IN 2007-06	Potential Common Cause Vulnerabilities in Essential Service Water Systems	02/09/2007
IST Program	PBNP Inservice Testing Background Valve Data Sheet – 1RC-0058	N/A
IST Program	PBNP Inservice Testing Background Valve Data Sheet – 0P-32F, Service Water	N/A
IST Program Document	PBNP Inservice Testing Program 5th Interval	6
N/A	PBNP Inservice Testing Background Valve Data Sheet (1RC-508)	N/A
NPL 2012-0165	Point Beach Power Plant New Service Water Pump Submergence to Prevent Type 4 and Type 5 Vortex	07/11/2012
NPM 2016-0046	2015 Service Water ISI Program Annual Report	03/17/2016
NPM 2017-0050	2016 Service Water ISI Program Annual Report	05/08/2017
PB – 732	Point Beach Nuclear Plant Bid Specification Service Water System Vertical Pump Replacement OP-032A,B,C,D,E,F	2
PBF-2034	Control Room Log – U1	94
Pump Data	SW Pump Replacement History, IST Flows and Vibration Levels - Updated 1/16/2013, JAS	Various

MISCELLANEOUS

Number	Description or Title	Date or Revision
RMP 9216-3A	Service Water Pump Vibration Testing and Balancing for Post Maintenance Testing	10/18/2015
STPT 25.1	Point Beach Nuclear Power Point Setpoint Document	14
SWP	Service Water Inservice Inspection Program	6
System Health Report	Unit 1 Reactor Coolant (RC) System Performance: 4th Quarter-2016	05/30/2017
System Health Report	Q2-2017, PB Unit 1 SW – Service Water	05/31/2017
System Health Report	Unit 1 Y Vital Instrument Bus 120 VAC	05/13/2017
Trend Data for 1 RC 508	Stroke Time (Open and Close) Including Graphs for 1RC-508	Various Dates
Trend Data for P 32F SW PUMP	Flow, Pressure, Vibration and Oil Analyses Results	Various Dates
VTM	22 GMCX 1 Stage Vertical Pump S/N 489421 thru 489428	4
VTM 00411	Grinnell Company, Inc. Diaphram Valves and Microswitches	12
WCAP-110858	Safety Evaluation of Topical Report “AMSAC Generic Design Package”	
WM-01.56	Work History Report 1RC-508	05/25/2017

MODIFICATIONS

Number	Description or Title	Date or Revision
EC259830	EPU - Replacement MDAFW Pump and Piping Installation Only	5
EC13407	Transition to New Motor-Driven AFW Pump Trains for Units 1 and 2	0
EN-AA-100	Design Control Program	6
EC271275	Hydraulic Evaluation of Sulzer Pump Offering for Replacement SW Pumps	05/10/2011
EC271222	Hydraulic Comparison of SW Pump Bids	04/05/2011
EC272153	Service Water System Vertical Pump Replacements	19
EC 257927	Equivalency and Design Review for D06 Battery Replacement	0
EC 281270	Add 60th Cell to Batteries D-05 and D-06	2
EC 258407	Auxiliary Switch Wiring SCI Inverter B2	0
EC 259826	Repowering Valve	3
EC 259828	AFW Tie In to Service Water	6
EC 259829	Replacement MDAFW Electrical and I&C Tie Ins	6
EC 259831	Replacement MDAFW Power, Inst. &Cont. Installation	5
EC 259832	EPU-Install 4160 Brkr for Replacement MDAFW Pump	2
EC 259834	EPU-U1R32 Replacement MDAFW Pmp Electrical and I&C Conn.	3
EC 259830	EPU-Replacement MDAFW Pump and Piping Installation	5

OPERABILITY EVALUATIONS

Number	Description or Title	Revision
2212531	Wedge Pin Shear Analysis Failure Potential on Anchor Darling Double Disc Gate Valve MOVs with TS safety functions	0

PROCEDURES

Number	Description or Title	Revision
0-SOP-DC-003	System Operating Procedure, 125 Vdc System Bus D-03 and Components	15
0-SOP-DC-003	125 Vdc Systems Bus D-03 and Components	19
0-SOP-DC-005	System Operating Procedure 125 Vdc System Swing Busses and Components	19
0-SOP-SW-107	Service Water Pump Operation	0,4
1ICP 02.031	1P-53 MDAFW Suction Header Pressure Trip Channel Operability Test	6
1ICP 04-032-2	1P-53 MDAFW Instrumentation Calibration	9
1-SOP-AF-001	Auxiliary Feedwater System Operation – Motor Driven	2
1-SOP-Y-001	Shifting 120V RPS/Safeguards Instrument Buses	7
AD-AA-100-1004	Preparation, Revision, Review and Approval of Site-Specific Procedures	22
AOP 0.0	Vital DC System Malfunction	36
AOP 5B	Loss of Instrument Air	47
AOP 9A	Service Water System Malfunction	34
AOP-23	Establishing Alternate AFW Suction Supply	9
AOP-23 Unit1	Establishing Alternate AFW Suction Supply	9
AOP-2C Unit 2	AFW Pump Steam Binding or Overheating	13
AOP-5B	Loss of Instrument Air	47
AOP-9A	Service Water System Malfunction	27
ARB C01 A 3-9	T-24A or B CST Level Low-Low	6
BG AOP 5B	Loss of Instrument Air Background Document	22
CL 13E Part 2	Auxiliary Feedwater Valve Lineup Motor Driven	54
CL 9C	Reactor Water Makeup System	15
CMP 2.2.7	Engineering Instructions for Performing Valve Operator Checkouts	14
CMP 2.2.8.14	MOV Design Basis Review for Valve Family 14	3
CMP 2.2.8.3	MOV Design Basis Review for Valve Family 3	3
CMP 2.3	Relief/Safety Valves	24
DG-M09	Design Requirements for Piping Stress Analysis	3
DG-M10	Pipe Support Guidelines	3
EN-AA-100	Design Control Program	6
EN-AA-100-1004	Calculation Procedure	6
EN-AA-205-1100	Design Change Packages	21
EOP 0.1	Unit 1 Reactor Trip Response	39
EOP 0.2	Natural Circulation Cooldown	33
EOP 1	Loss of Reactor or Secondary Coolant	44
EOP 2	Faulted Steam Generator	25
EOP 3	Steam Generator Tube Rupture	51
EOP E-0	Reactor Trip or Safety Injection	3
EOP-0	Reactor Trip or Safety Injection	64

PROCEDURES

Number	Description or Title	Revision
FP-MA-ES-01	Administrative Procedure for Electrical Safety	19
IT 07F	P-32F Service Water Pump (Quarterly)	41
IT 400	Test of 1P-53 MDAFW Pump and Valves	7
IT 400A	1AF-4067, 1P-53 AFP Service Water Supply Isolation, Stroke Test	3
IT 400B	1P-53 Motor Driven AFW Pump Backup Air System Pressure Decay Test (Refueling) Unit 1	3
IT 400C	Test of 1P-53, MDAFW Pump with Flow to U1 Steam Generators	5
IT 405B	2P-53 Motor Driven AFW Pump Backup Air System Pressure Decay Test (Refueling) Unit 2	3
NP 7.7.22	Service Water and Fire Protection Inspection Program	8
NP 8.3.8	Maintenance Calibrations Response and Review	6
OI - 70	Service Water System Operation	77
OI 62B	TDAFW System (P-29)	34
OI 70	Service Water System Operation	77
OM 4.3.8	Control of Time Critical and Time Sensitive Operator Actions	14
OP 4A	Filling and Venting Reactor Coolant System	87
ORT 3C Unit 1	AFW System and AMSAC Actuation Unit 1	17
ORT 42	RMUW to Containment Unit 1	24
PC 43 Part 5	SW to Auxiliary Feedwater Pump Line Flush Monthly	22
PC 8 Part 2	Monthly AFW Pump Discharge Piping Temperature Checks	7
PI-AA-103-1000	Human Performance Program Error Reduction Tools	8
RMP 9216-5A	Service Water Pump Wet End Assembly Inspection and Maintenance	1

SURVEILLANCES (COMPLETED)

Number	Description or Title	Date or Revision
1 RMP 9045-5	1DY-04 Yellow Channel Instrument Bus Static Inverter Maintenance Procedure	26
40103516	EC 272153 P-32F IST Test per IT 07	10/19/2015
40139790	1RC 508-0 Diagnostic Check	02/11/2013
40310262	Reactor Coolant Valves Quarterly (Unit1) – IT-20	02/23/2015
40386922	Reactor Coolant Valves Quarterly (Unit1) – IT-20	03/01/2016
40403330	Reactor Coolant Valves Quarterly (Unit1) – IT-20	08/12/2016
40424979	Reactor Coolant Valves Quarterly (Unit1) – IT-20	09/01/2016
40462502	IT-07F, P-32F Service Water Pump Test	02/15/2017
40464990	Reactor Coolant Valves Quarterly (Unit1) – IT-20	03/14/2017
40480737	2 Year IT-07F, P-32F Service Water Pump Comprehensive	05/17/2017
N/A	Type C Containment Isolation Valve Historical Performance Factor Matrix	Various

WORK DOCUMENTS

Number	Description or Title	Date
WO 00059962	Inspect and Maintain Pump (P 32-F)	05/16/2008
WO 00372564	EC13407, PBTP 206 Transition to Replace MDAFW PumpTrain	06/13/2011

WORK DOCUMENTS

Number	Description or Title	Date
WO 40070001	ICP 13.9 – CST Level	09/13/2011
WO 40177728	ICP 13.9 – CST Level	05/21/2013
WO 40213280	Perform 10 Year Inspection of 125 Vdc Distribution Panel D-03	12/15/2015
WO 40221355	ICP 13.9 – CST Level	11/20/2014
WO 40234936	ORT 3C AFW System and AMSAC Actuation Unit 1	10/23/2014
WO 40234948	1-TS-AF-001, Documentation of AFW Flow Path Alignment	10/29/2014
WO 40234954	Test of 1P-53, MDAFW Pump with Flow to U1 Steam Generators	10/27/2014
WO 40273227	T-2 PRT Gas Analyzer System Isolation Solenoid	02/29/2016
WO 40273234	1RC-508-S // Replace SOV	03/04/2016
WO 40273234	1RC-508-S // Bench Check Spare Solenoid	03/09/2016
WO 40305425	ORT 3C AFW System and AMSAC Actuation Unit 2	10/21/2015
WO 40320876	1DY-04 Maintain and Inspect Inverter	04/16/2015
WO 40335490	ICP 13.9 – CST Level	03/02/2016
WO 40343302	IT-400C, Test of 1P-53 AFW Pump with Flow to U1 S/G's	03/30/2017
WO 40343316	ORT 3C AFW System and AMSAC Actuation Unit 1	03/26/2016
WO 40357051	1ICP 04.032-2; 1P-53 MDAFW Instrumentation Calibration	03/31/2016
WO 40357372	IT-400B, 1P-53 AFW Pump Backup Air System Pressure Decay Test	03/27/2016
WO 40430279	IT-405B, 2P-53 AFW Pump Backup Air System Pressure Decay Test	04/09/2017
WO 40430291	ORT 3C AFW System and AMSAC Actuation Unit 2	04/08/2017
WO 40483505	1ICP 02.031, 1P-53 MDAFW Suction Header Pressure Trip Channel Operability Test	05/30/2017
WO 40483507	IT-400, Test of 1P-53 MDAFW Pump and Valves	05/30/2017
WO 40483906	IT-400A, 1AF-4067, 1P-53 AFP Service Water Supply Isolation, Stroke Test	05/29/2017
WO 40521730	1ICP2.3A, Reactor Protection Logic Test Train A	03/23/2017

LIST OF ACRONYMS USED

AFW	Auxiliary Feedwater
AOV	Air-Operated Valve
AR	Action Request
CAP	Corrective Action Program
CAQ	Condition Adverse to Quality
CFR	*Code of Federal Regulations*
CST	Condensate Storage Tank
EC	Engineering Change
FSAR	Final Safety Analysis Report
IMC	Inspection Manual Chapter
IN	Information Notice
IST	Inservice Testing
MDAFW	Motor-Driven Auxiliary Feedwater
NCV	Non-Cited Violation
NRC	U.S. Nuclear Regulatory Commission
PRA	Probabilistic Risk Assessment
RCS	Reactor Coolant System
SSC	Structure, System and Component
SW	Service Water
Vdc	Volts Direct Current