UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION III
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LISLE, IL 60532-4352

January 27, 2017

Mr. Bryan C. Hanson
Senior VP, Exelon Generation Company, LLC
President and CNO, Exelon Nuclear
4300 Winfield Road
Warrenville, IL 60555

SUBJECT: BRAIDWOOD STATION, UNITS 1 AND 2—NRC INTEGRATED INSPECTION REPORT 05000456/2016004; 05000457/2016004; AND EMERGENCY PREPAREDNESS PROGRAM 05000456/2016501; 05000457/2016501

Dear Mr. Hanson:

On December 31, 2016, the U.S. Nuclear Regulatory Commission (NRC) completed an integrated inspection at your Braidwood Station, Units 1 and 2. On January 17, 2017, the NRC inspectors discussed the results of this inspection with the Site Vice President, Ms. M. Marchionda, and other members of your staff. The inspectors documented the results of this inspection in the enclosed inspection report. The NRC also completed its annual inspection of the Emergency Preparedness Program. This inspection began on January 1, 2016, and issuance of this letter closes Inspection Report 05000456/2016501; 05000457/2016501.

Based on the results of this inspection, the NRC has identified one issue that was evaluated under the risk significance determination process as having very low safety significance (Green). The NRC has also determined that a violation of regulatory requirements is associated with this issue. Because the issue was entered into the corrective action program (CAP) and actions were initiated to address it, this violation is being treated as a Non-Cited Violation (NCV), consistent with Section 2.3.2 of the NRC Enforcement Policy. The NCV is described in the subject inspection report. Further, the inspectors documented a licensee-identified violation which was determined to be of very low safety significance in this report. The NRC is treating this violation as a NCV consistent with Section 2.3.2.a of the NRC Enforcement Policy.

If you contest the violations or significance of these NCVs, 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: (1) the Regional Administrator, Region III; (2) the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, DC 20555–0001; and (3) the NRC Resident Inspector at the Braidwood Station.

In addition, if you disagree with the cross-cutting aspect assignment to any finding in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the Regional Administrator, Region III, and the NRC Resident Inspectors' Office at the Braidwood Station.

In accordance with 10 CFR 2.390,of the NRC's "Public Inspections, Exemptions, Requests for Withholding," of the NRC's "Rules of Practice," a copy of this letter, its enclosures, and your response, (if any), will be made available electronically for public inspection in the NRC's Public Document Room or from the Publicly Available Records System (PARS) component of the NRC's Agencywide Documents Access and Management System (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Sincerely,

/RA/

Eric R. Duncan, Chief
Branch 3
Division of Reactor Projects

Docket Nos. 50–456 and 50–457
License Nos. NPF–72 and NPF–77

Enclosures:
IR 05000456/2016004, 05000457/2016004;
and 05000456/2016501; 05000457/2016501

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U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket Nos:	50–456; 50–457
License Nos:	NPF–72; NPF–77
Report Nos:	05000456/2016004; 05000457/2016004; and 05000456/2016501; 05000457/2016501
Licensee:	Exelon Generation Company, LLC
Facility:	Braidwood Station, Units 1 and 2
Location:	Braceville, IL
Dates:	October 1 through December 31, 2016
Inspectors:	D. Kimble, Senior Resident Inspector D. Betancourt, Resident Inspector D. Sargis, Acting Resident Inspector M. Domke, Inspector, Region III Office G. Edwards, Health Physicist E. Fernandez, Inspector, Region III Office M. Garza, Emergency Preparedness Inspector T. Go, Health Physicist M. Holmberg, Senior Reactor Inspector, Region III Office B. Palagi, Senior Operations Engineer
Approved by:	E. Duncan, Chief Branch 3 Division of Reactor Projects

Enclosure

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SUMMARY

Inspection Report 05000456/2016004; 05000457/2016004; 10/01/2016 – 12/31/2016; and 05000456/2016501; 05000457/2016501; 01/01/2016 – 12/31/2016; Braidwood Station, Units 1 and 2; Inservice Inspection Activities

This report covers a 3–month period of inspection by resident inspectors and announced baseline inspections by regional inspectors. One Green finding was identified by the inspectors. The finding was 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 (SDP)," 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," dated July 2016.

NRC-Identified and Self-Revealed Findings

Cornerstone: Initiating Events

Green. A finding of very low safety significance and an associated NCV of Title 10 of the *Code of Federal Regulations (*CFR*)*, Part 50, Appendix B, Criterion IX, "Control of Special Processes," was identified by the inspectors for the licensee's failure to assure that thermocouple (TC) attachment welding was controlled and accomplished by qualified personnel using qualified procedures and to assure that the post-TC attachment weld removal non-destructive examination (NDE) was incorporated into Work Order (WO) 01836557 that provided instructions to replace a pipe segment in the safety-related portion of the feedwater (FW) system. The licensee corrective actions for this finding included documenting this issue as a potential violation of NRC requirements in Issue Report (IR) 02728742, removal of the unqualified welds, and issuing revisions to WO 01836557 that included licensee-approved weld procedures and surface examinations of FW pipe affected by unqualified TC welds.

This finding was determined to be of more than minor significance because it affected the Reactor Safety Initiating Events Cornerstone attribute of Equipment Performance and adversely affected the cornerstone objective of limiting the likelihood of events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. In particular, if left uncorrected this issue would have the potential to lead to a more significant safety concern because it increased the likelihood of an operational challenge to the plant caused by a FW system line break induced by cracking initiated from unqualified welds. The inspectors determined the finding could be evaluated using the SDP in accordance with IMC 0609, "Significance Determination Process," Attachment 0609.04, "Initial Characterization of Findings," dated June 19, 2012, and Appendix A, "The Significance Determination Process for Findings At Power," Exhibit 1, "Initiating Events Screening Questions." Under Part B, "Transient Initiators," of the Exhibit 1 questions, the inspectors answered 'No' because the finding did not result in a reactor trip and/or loss of mitigation equipment relied upon to transition the plant from the onset of the trip to a stable shutdown condition. Therefore, this finding was screened as having very low safety significance (Green).

This finding had a cross-cutting aspect of Field Presence in the cross-cutting area of Human Performance since licensee managers failed to provide adequate oversight of site and vendor personnel to assure that the TC attachment welding was controlled and accomplished by qualified personnel using qualified procedures and to assure that the post-TC attachment weld removal NDE was incorporated into WO 01836557. (H.2) (Section 1R08.1)

Licensee-Identified Violation

Cornerstone: Initiating Events

A violation of very low safety significance that was identified by the licensee was reviewed by the inspectors. Corrective actions planned or taken by the licensee were entered into the licensee's corrective action program (CAP). This violation and corrective action tracking number are listed in Section 4OA7.

REPORT DETAILS

Summary of Plant Status

Unit 1

The unit began the inspection period shutdown for refueling outage (RFO) A1R20 (see Section 1R20). On October 25, 2016, the reactor was restarted to begin the unit's 20th operating cycle. The main electrical generator was synchronized to the power grid on October 26, 2016, and reached full power operation on October 29, 2016. With the exception of minor reductions in power to support scheduled testing activities and/or reductions in unit load due to transmission system operator requests, the unit remained operating at or near full power for the remainder of the inspection period.

Unit 2

The unit began the inspection period operating at full power. With the exception of minor reductions in power to support scheduled testing activities, the unit remained operating at or near full power for the entire inspection period.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity, and Emergency Preparedness

1R01 Adverse Weather Protection (71111.01)

.1 External Flooding

a. Inspection Scope

Throughout the course of the inspection period, the inspectors evaluated the design, material condition, and procedures for coping with the design basis probable maximum flood. The evaluation included a review to check for deviations from the descriptions provided in the Updated Final Safety Analysis Report (UFSAR) for features intended to mitigate the potential for flooding from external factors. As part of this evaluation, the inspectors checked for obstructions that could prevent draining, checked that the roofs did not contain obvious loose items that could clog drains in the event of heavy precipitation, and determined whether barriers required to mitigate the flood were in place and operable. Additionally, the inspectors performed a physical inspection of the protected area to identify any modifications to the site which would inhibit site drainage during a probable maximum precipitation event or allow water ingress past a barrier. The inspectors also walked down underground bunkers/manholes subject to flooding that contained multiple train or multiple function risk-significant cables. The inspectors also reviewed the abnormal operating procedure (AOP) for mitigating the design basis flood to ensure it could be implemented as written.

These reviews by the inspectors constituted a single external flooding inspection sample as defined in Inspection Procedure (IP) 71111.01–05.

b. Findings

No findings were identified.

1R04 Equipment Alignment (71111.04)

.1 Quarterly Partial System Alignment Verifications

a. Inspection Scope

The inspectors performed partial system physical alignment verifications of the following risk-significant systems:

- Residual Heat Removal Train 1B while aligned for shutdown cooling prior to refueling cavity draining during the licensee's Unit 1 Fall refueling outage; and
- Emergency Diesel Generator (EDG) 2A with EDG 2B out-of-service for maintenance during the week ending December 17, 2016.

The inspectors selected these systems based on their risk significance relative to the Reactor Safety Cornerstones at the time they were inspected. The inspectors attempted to identify any discrepancies that could impact the function of the system and, therefore, potentially increase risk. The inspectors reviewed applicable operating procedures, system diagrams, the UFSAR, Technical Specification (TS) requirements, WOs, Issue Reports (IRs), and the impact of ongoing work activities on redundant trains of equipment in order to identify conditions that could have rendered the systems incapable of performing their intended functions. The inspectors also walked down accessible portions of the systems to verify system components and support equipment were aligned correctly and operable. The inspectors examined the material condition of the components and observed operating parameters of equipment to verify that there were no obvious deficiencies. The inspectors also verified that the licensee had properly identified and resolved equipment alignment problems that could cause initiating events or impact the capability of mitigating systems or barriers and entered them into the CAP with the appropriate significance characterization.

These activities by the inspectors constituted two partial system alignment verification inspection samples as defined in IP 71111.04–05.

b. Findings

No findings were identified.

1R05 Fire Protection (71111.05)

.1 Quarterly Fire Protection Zone Inspections

a. Inspection Scope

The inspectors conducted fire protection zone inspection tours which were focused on the availability, accessibility, and the condition of firefighting equipment in the following risk-significant plant area:

- 2B EDG and associated rooms during the week ending December 24, 2016.

The inspectors reviewed areas to assess if the licensee had implemented a fire protection program that adequately controlled combustibles and ignition sources within the plant, effectively maintained fire detection and suppression capability, maintained passive fire protection features in good material condition, and implemented adequate compensatory measures for out-of-service, degraded or inoperable fire protection equipment, systems, or features in accordance with the licensee's fire plan. The inspectors selected fire areas based on their overall contribution to internal fire risk as documented in the plant's Individual Plant Examination of External Events with later additional insights, their potential to impact equipment which could initiate or mitigate a plant transient, or their impact on the plant's ability to respond to a security event. The inspectors verified that fire hoses and extinguishers were in their designated locations and available for immediate use; that fire detectors and sprinklers were unobstructed; that transient material loading was within the analyzed limits; and fire doors, dampers, and penetration seals appeared to be in satisfactory condition. The inspectors also verified that minor issues identified during the inspection were entered into the licensee's CAP.

This activity constituted a single quarterly fire protection zone inspection tour sample as defined in IP 71111.05–05.

b. Findings

No findings were identified.

1R07 Annual Heat Sink Performance (71111.07)

.1 Heat Sink Performance

a. Inspection Scope

During the course of the inspection period the inspectors reviewed the licensee's testing of the room cooler for Charging Pump 1B to verify that potential deficiencies did not mask the licensee's ability to detect degraded performance, to identify any common cause issues that had the potential to increase risk, and to ensure that the licensee was adequately addressing problems that could result in initiating events that would cause an increase in risk. The inspectors compared the licensee's observations with acceptance criteria, the correlation of scheduled testing and the frequency of testing, and the impact of instrument inaccuracies on test results. The inspectors also verified that test acceptance criteria considered differences between testing conditions and design conditions.

The inspectors' reviews in this area constituted a single annual heat sink performance inspection sample as defined in IP 71111.07–05.

b. Findings

No findings were identified.

1R08 Inservice Inspection Activities (71111.08)

From September 26, 2016 through October 19, 2016, the inspectors conducted a review of the implementation of the licensee's inservice inspection (ISI) program for monitoring degradation of the Unit 1 reactor coolant system (RCS), steam generator (SG) tubes, emergency feedwater (FW) systems, risk-significant piping and components, and containment systems.

The activities by the inspectors described in Sections 1R08.1 through 1R08.5 that follow constituted a single ISI inspection sample as defined in IP 71111.08–05.

.1 Piping Systems Inservice Inspection

a. Inspection Scope

The inspectors observed the following non-destructive examination (NDE) mandated by the American Society of Mechanical Engineers (ASME) Code, Section XI, (or approved NRC alternative) to evaluate compliance with the ASME Code, Section XI and Section V, requirements and, if any indications and defects were detected, to determine if these were dispositioned in accordance with the ASME Code and/or NRC requirements:

- Ultrasonic examination (UT) of welds (1RC–17–05, 6, 9 and 10) in the reactor coolant system (RCS);
- UT of welds (1FW–03–04, 5, 5A and 1FW–04–17, 18, 19 and 1FW–01–19, 20, 33) in the FW system;
- UT of welds (1PZR–01–N1 – inner radius, 1PZR–01–N4A, and 1PZR–01–SE–05 – overlay weld) in the pressurizer system;
- Visual Examination of pump support (1AF01PA) in the auxiliary feedwater (AFW) system; and
- Magnetic particle examination of eight pipe-to-lug attachment welds (1MS–01–SW08 to SW09) on Main Steam Line 1D.

The inspectors observed the following NDE conducted as part of the licensee's industry initiative inspection program for thermal fatigue cracking (MRP–146 – Materials Reliability Program Management of Thermal Fatigue in Normally Stagnant Non-Isolable Reactor Coolant System Branch Lines) to determine if the examination was conducted in accordance with the licensee's augmented inspection program, industry guidance documents and associated licensee examination procedures and if any indications and defects were detected, to determine if these were dispositioned in accordance with approved procedures and NRC requirements:

- UT of weld (1RC–07–7–2) in the RCS to meet MRP–146.

The inspectors reviewed the following examination record with a recordable indication accepted for continued service to determine if acceptance was in accordance with the ASME Code, Section XI, or an NRC-approved alternative:

- Magnetic particle examination of the PG–5 pipe-to-lug attachment weld (1MS–01–SW08 to SW09) on Main Steam Line 1D.

The inspectors observed the following pressure boundary welds completed for risk-significant systems during the outage to determine if the licensee applied the preservice NDEs and acceptance criteria required by the construction code and the ASME Code, Section XI. Additionally, the inspectors reviewed the welding procedure specification and supporting weld procedure qualification records to determine if the weld procedure was qualified in accordance with the requirements of construction code and the ASME Code, Section IX:

- Unit 1 – Field Welds No. 1 and 2A on line 1FWC03DC–16" (WO 01836557)

b. Findings

(1) Inadequate Control of Welding During Feedwater System Pipe Replacement

Introduction

The inspectors identified a finding of very low safety significance (Green) and an associated NCV of 10 CFR Part 50, Appendix B, Criterion IX, "Control of Special Processes," for the licensee's failure to assure that TC attachment welding was controlled and accomplished by qualified personnel using qualified procedures and to assure that the post-TC attachment weld removal NDE was incorporated into WO 01836557 that provided instructions to replace a pipe segment in the safety-related portion of the FW system.

Description

During replacement of a 16–inch diameter segment of the safety-related portion of the FW system pipe, the inspectors identified that the licensee's vendor welded TCs to the FW system pipe without following a licensee approved weld procedure and that the staff performing this welding did not possess ASME Code, Section IX, qualifications for welding. Additionally, the licensee had not included instructions in the WO to perform NDE of the pipe after removal of the temporary attachment TC welds. The inspectors were concerned that the unqualified weld could induce cracking of the FW pipe and without follow-up NDE undetected cracks may be returned to service that increased the possibility of a FW line break. A FW system line break could result in a plant transient and pose an operational challenge for plant operators.

The 1974 Edition with 1975 Addenda of the ASME Code, Section III, "Division 1 Nuclear Power Plant Components," Subsection NC, "Class 2 Components," was the applicable code for construction of welds and temporary welded attachments to the Unit 1, FW system pipe. Paragraph NC 4231.2, "Temporary Attachments and Their Removal," of this code included specific guidance for installation and removal of welded attachments associated with preheat and post-weld heat treatment equipment. Specifically, Step "d" of Paragraph NC 4231.2 required that the welder and procedure must be qualified in accordance with the ASME Code, Section IX, and Step "h" required that after the temporary attachment is removed that the area must be examined by a magnetic particle or liquid penetrant examination in accordance with the requirements of the ASME Code, Section V, and meet acceptance standards of NC–5340 or NC–5350.

On October 6, 2016, the licensee removed a 16–inch diameter segment of FW system pipe downstream of 1FW009C valve in preparation for pipe replacement in accordance with WO 01836557, which included fabrication of two new welds FW–1 and FW–2. The licensee's vendor staff installed banks of heating elements and welded four TCs (two on each side of weld FW–2) to monitor the preheat temperature in support of the new replacement pipe welds. The licensee's vendor staff used a capacitor discharge welding machine to construct the temporary attachment welds that held the type "K" TCs to the FW pipe. The inspectors identified that this welding activity was performed without following a licensee approved welding procedure and the licensee's vendor staff did not have ASME Code, Section IX, qualifications for any type of welding process. Additionally, the licensee had not included instructions in Revision 1 of WO 01836557 to perform NDE on the areas of the FW pipe affected by the temporary attachment welds used to install the TCs for monitoring the preheat temperature.

The licensee documented this issue as a potential violation of NRC requirements in IR 02728742, removed the effected welds from the FW system, and issued revisions to WO 01836557 to implement the licensee approved weld procedure for installation of TCs and to require surface examinations (e.g., MT) following the TC weld removal. Additionally, the inspectors observed a 15–minute period where the licensee's vendor left the controls unattended for the equipment that provided preheat during installation of FW 1 and 2A. Although this condition did not represent an NRC violation, the licensee reported that it did not meet site expectations for control of the preheating process and documented this issue in IR 02727446.

After completing the installation of weld material for FW 1 and 2A, the licensee performed a preservice UT examination and identified rejectable indications in these welds. This condition prompted a licensee investigation, which identified that an incorrect weld procedure specification had been incorporated into WO 01836557. This issue is discussed in Section 4OA7 as a licensee-identified violation.

Analysis

The inspectors determined that the failure to establish measures to assure that the TC attachment welding was controlled and accomplished by qualified personnel using qualified procedures and to assure that the post-TC attachment weld removal NDE was incorporated into WO 01836557 was contrary to 10 CFR 50 Appendix B, Criterion IX and constituted a performance deficiency. The inspectors determined that the performance deficiency was more than minor in accordance with Inspection Manual Chapter (IMC) 0612, Appendix B, "Issue Screening," because it affected the Initiating Events Reactor Safety Cornerstone attribute of Equipment Performance and adversely affected the cornerstone objective of limiting the likelihood of events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. Specifically, if left uncorrected, this finding would have the potential to lead to a more significant safety concern because it increased the likelihood of an operational challenge to the plant caused by a FW line break caused by cracking initiated from unqualified welds.

The inspectors determined the finding could be evaluated using the SDP in accordance with IMC 0609, "Significance Determination Process," Attachment 0609.04, "Initial Characterization of Findings," dated June 19, 2012, and Appendix A, "The Significance Determination Process for Findings At Power," Exhibit 1 "Initiating Events Screening Questions." Under Part B, "Transient Initiators," of the Exhibit 1 screening questions, the inspectors answered "No" because the finding did not result in a reactor trip and/or loss of mitigation equipment relied upon to transition the plant from the onset of the trip to a stable shutdown condition. Therefore this finding was screened as having very low safety significance (Green).

Using IMC 0310, "Aspects Within the Cross-Cutting Areas," the inspectors determined that the finding had a cross-cutting aspect in the area of Human Performance. The inspectors assigned the cross-cutting aspect of Field Presence to the finding because licensee managers failed to provide adequate oversight of site and vendor personnel to assure that the TC attachment welding was controlled and accomplished by qualified personnel using qualified procedures and to assure that the post-TC attachment weld removal NDE was incorporated into WO 01836557. (H.2)

Enforcement

Title 10 CFR Part 50, Appendix B, Criterion IX, "Control of Special Processes," requires, in part, that measures shall be established to assure that special processes, including welding, heat treating, and nondestructive testing, are controlled and accomplished by qualified personnel using qualified procedures in accordance with applicable codes, standards, specifications, criteria, and other special requirements.

Contrary to these requirements, on October 6, 2016, the licensee failed to establish measures to assure that the welding to install TCs to FW system pipe was controlled and accomplished by qualified personnel using qualified procedures and to assure that the post-TC attachment weld removal NDE required by the applicable Code was specified in Revision 1 of WO 01836557. Because this violation was of very low safety significance, was corrected, and was entered into the licensee's CAP as IR 02728742, this violation is being treated as a NCV, consistent with Section 2.3.2 of the NRC Enforcement Policy. (NCV 05000456/2016004–01)

.2 Reactor Pressure Vessel Upper Head Penetration Inspection Activities

a. Inspection Scope

For the Unit 1 reactor vessel head, a bare metal visual examination and a non-visual examination were required this outage pursuant to 10 CFR 50.55a(g)(6)(ii)(D).

The inspectors observed the bare metal visual examination conducted on the Unit 1 reactor vessel head on three penetration nozzles to determine if the activities were conducted in accordance with the requirements of ASME Code Case N–729–1, and 10 CFR 50.55a(g)(6)(ii)(D). Specifically, the inspectors determined:

- If the required visual examination scope/coverage was achieved and limitations (if applicable were recorded), in accordance with the licensee procedures;
- If the licensee criteria for visual examination quality and instructions for resolving interference and masking issues were adequate; and

- For indications of potential through-wall leakage, whether the licensee entered the condition into the corrective action system, and implemented appropriate corrective actions.

The inspectors observed and reviewed data for non-visual examinations conducted on the reactor vessel head penetrations to determine if the activities were conducted in accordance with the requirements of ASME Code Case N–729–1 and 10 CFR 50.55a(g)(6)(ii)(D). Specifically, the inspectors determined:

- If the required examination scope (volumetric and surface coverage) was achieved and limitations (if applicable, were recorded), in accordance with the licensee procedures;
- If the UT examination equipment and procedures used were demonstrated by blind demonstration testing;
- For indications or defects identified, whether the licensee documented the conditions in examination reports and/or entered this condition into the corrective action system and implemented appropriate corrective actions; and
- For Reactor Vessel Head Penetration Nozzle No. 69 and the associated repair weld overlay indications accepted for continued service, whether the licensee evaluation and acceptance criteria were in accordance with the ASME Code, Section III, 10 CFR 50.55a(g)(6)(ii)(D) and/or the NRC-approved alternative (Relief Request 13R–09).

The inspectors reviewed the records for the dye penetrant of the Penetration No. 69 J-groove weld overlay to determine if the licensee applied the acceptance criteria required by the construction code, and NRC approved Relief Request 13R–09.

b. Findings

No findings were identified.

.3 Boric Acid Corrosion Control

a. Inspection Scope

During the Unit 1 refueling outage, the inspectors observed the licensee staff performing visual examinations of the RCS within containment to determine if these examinations focused on locations where boric acid (BA) leaks could cause degradation of safety-significant components, and to determine if components with BA leaks were properly identified in the CAP.

The inspectors reviewed the following licensee evaluation of RCS and connected system components with BA leaks/deposits to determine if the licensee properly applied corrosion rates, and assessed the effects of corrosion on structural or pressure boundary integrity:

- BA evaluation for 02719973 outage safety plan (OSP) – a dry boric acid leakage at the 1RC001A.

The inspectors reviewed the following corrective actions related to evidence of BA leakage to determine if the corrective actions completed were consistent with the requirements of the ASME Code, Section XI, and 10 CFR Part 50, Appendix B, Criterion XVI:

- IR 02718235, Dry BA at Valve Packing on 1SI18879A; and
- IR 01639774, 1B CS Eductor Bolted Connection Has Dry BA.

b. Findings

No findings were identified.

.4 Steam Generator Tube Inspection Activities

a. Inspection Scope

The inspectors observed acquisition of eddy current testing (ET) data, interviewed ET data analysts, and reviewed documentation related to the SG ISI Program to determine if:

- In situ SG tube pressure testing screening criteria used were consistent with those identified in the Electric Power Research Institute (EPRI) TR 107620, "SG In Situ Pressure Test Guidelines," and that these criteria were properly applied to screen degraded SG tubes for in situ pressure testing;
- In situ pressure test records demonstrated pressure and hold times consistent with EPRI TR 107620, "In Situ Pressure Test Guidelines";
- In situ pressure test results were properly applied to SG tube integrity performance criteria identified in EPRI TR 107621;
- The numbers and/or sizes of SG tube flaws/degradation identified was bound by the licensee's previous outage operational assessment predictions;
- The SG tube ET examination scope and expansion criteria were sufficient to meet the technical specifications (TSs) and the EPRI 1003138, "Pressurized Water Reactor SG Examination Guidelines";
- The SG tube ET examination scope included potential areas of tube degradation identified in prior outage SG tube inspections and/or as identified in NRC generic industry operating experience applicable to these SG tubes;
- The licensee identified new tube degradation mechanisms and implemented adequate extent of condition inspection scope and repairs for the new tube degradation mechanism;
- The licensee implemented repair methods which were consistent with the repair processes allowed in the plant technical specification requirements and to determine if qualified depth sizing methods were applied to degraded tubes accepted for continued service;
- The licensee implemented an inappropriate "plug on detection" tube repair threshold (e.g., no attempt at sizing of flaws to confirm tube integrity);
- The licensee primary to secondary leakage (e.g., SG tube leakage) was below 3 gallons per day or the detection threshold during the previous operating cycle;

- The ET probes and equipment configurations used to acquire data from the SG tubes were qualified to detect the known/expected types of SG tube degradation in accordance with Appendix H, "Performance Demonstration for Eddy Current Examination," of EPRI 1003138, "Pressurized Water Reactor SG Examination Guidelines";
- The licensee performed secondary side SG inspections for location and removal of foreign materials;
- The licensee implemented repairs for SG tubes damaged by foreign material; and
- Inaccessible foreign objects were left within the secondary side of the SGs, and if so, that the licensee implemented evaluations which included the effects of foreign object migration and/or tube fretting damage.

The licensee did not perform in situ pressure testing of SG tubes. Therefore, no NRC review was completed for this inspection attribute.

b. Findings

No findings were identified.

.5 Identification and Resolution of Problems

a. Inspection Scope

The inspectors performed a review of ISI-related problems entered into the licensee's CAP, and conducted interviews with licensee staff to determine if:

- The licensee had established an appropriate threshold for identifying ISI-related problems;
- The licensee had performed a root cause (if applicable) and taken appropriate corrective actions; and
- The licensee had evaluated operating experience and industry generic issues related to ISI, and pressure boundary integrity.

The inspectors performed these reviews to evaluate compliance with 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," requirements.

b. Findings

No findings were identified.

1R11 Licensed Operator Requalification Program (71111.11)

.1 Resident Inspector Quarterly Review of Licensed Operator Simulator Training

a. Inspection Scope

On November 30, 2016, the inspectors observed a crew of licensed operators in the plant's simulator during a graded simulator scenario. The inspectors verified that operator performance was adequate, evaluators were identifying and documenting crew performance problems, and that training was being conducted in accordance with licensee procedures.

In addition, the inspectors verified that the licensee's personnel were observing NRC examination security protocols to ensure that the integrity of the graded scenario was being protected from compromise. The inspectors evaluated the following areas:

- Licensed operator performance;
- The clarity and formality of communications;
- The ability of the crew to take timely and conservative actions;
- The crew's prioritization, interpretation, and verification of annunciator alarms;
- The correct use and implementation of abnormal and emergency procedures by the crew;
- Control board manipulations;
- The oversight and direction provided by licensed senior reactor operators; and
- The ability of the crew to identify and implement appropriate TS actions and emergency plan actions and notifications.

The crew's performance in these areas was compared to pre-established operator action expectations and successful critical task completion requirements.

These observations and activities by the inspectors constituted a single quarterly licensed operator requalification program simulator training inspection sample as defined in IP 71111.11–05.

b. Findings

No findings were identified.

.2 Biennial Written and Annual Operating Test Results

a. Inspection Scope

The inspectors reviewed the overall pass/fail results of the annual operating test, administered by the licensee from July 18, 2016 through September 2, 2016, as required by 10 CFR 55.59(a). The results were compared to the thresholds established in IMC 0609, Appendix I, "Licensed Operator Requalification Significance Determination Process," to assess the overall adequacy of the licensee's licensed operator requalification training program to meet the requirements of 10 CFR 55.59.

These reviews by the inspectors constituted a single biennial licensed operator requalification inspection sample as defined in IP 71111.11–05.

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness (71111.12)

.1 Routine Quarterly Evaluations

a. Inspection Scope

The inspectors evaluated degraded performance issues involving the following risk-significant systems and components:

- The Unit 2 component cooling water system;
- The Unit 1 main FW pumps;
- Control room ventilation (VC) Train 0A; and
- A 6–year periodic planned maintenance work window for emergency diesel generator (EDG) 2B during the weeks ending December 17, 2016, and December 24, 2016 (Quality Control).

The inspectors reviewed events such as where ineffective equipment maintenance had or could have resulted in valid or invalid automatic actuations of engineered safeguards systems and independently verified the licensee's actions to address system performance or condition problems in terms of the following:

- Implementing appropriate work practices;
- Identifying and addressing common cause failures;
- Scoping of systems in accordance with 10 CFR 50.65(b) of the maintenance rule;
- Characterizing system reliability issues for performance;
- Charging unavailability for performance;
- Trending key parameters for condition monitoring;
- Ensuring 10 CFR 50.65(a)(1) or (a)(2) classification or re-classification; and
- Verifying appropriate performance criteria for systems, structures, and components (SSCs)/functions classified as (a)(2), or appropriate and adequate goals and corrective actions for systems classified as (a)(1).

The inspectors assessed performance issues with respect to the reliability, availability, and condition monitoring of the system. In addition, the inspectors verified maintenance effectiveness issues were entered into the CAP with the appropriate significance characterization.

For the inspection sample related to the planned 6–year periodic maintenance on EDG 2B, the inspectors also performed a quality control review for the recent maintenance activities associated with this safety-significant SSC, as discussed in IP 71111.12, Section 02.02.

These maintenance effectiveness review activities conducted by the inspectors constituted three maintenance effectiveness samples and one quality control inspection sample as defined in IP 71111.12–05.

b. Findings

No findings were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13)

.1 Maintenance Risk Assessments and Emergent Work Control

a. Inspection Scope

The inspectors reviewed the licensee's evaluation and management of plant risk for the maintenance and emergent work activities affecting risk-significant and safety-related equipment listed below to verify that the appropriate risk assessments were performed prior to removing equipment for work:

- The Unit 2 Bus 142 planned maintenance work window during the week ending October 8, 2016.

These activities were selected based on their potential risk significance relative to the Reactor Safety Cornerstones. As applicable for each activity, the inspectors verified that risk assessments were performed as required by 10 CFR 50.65(a)(4) and were accurate and complete. When emergent work was performed, the inspectors verified that the plant risk was promptly reassessed and managed. The inspectors reviewed the scope of maintenance work, discussed the results of the assessment with the licensee's probabilistic risk analyst or shift technical advisor, and verified plant conditions were consistent with the risk assessment. The inspectors also reviewed TS requirements and walked down portions of redundant safety systems, when applicable, to verify risk analysis assumptions were valid and applicable requirements were met.

The inspectors' review of these maintenance risk assessments and emergent work control activities constituted a single inspection sample as defined in IP 71111.13–05.

b. Findings

No findings were identified.

1R15 Operability Determinations and Functionality Assessments (71111.15)

.1 Operability Evaluations

a. Inspection Scope

The inspectors reviewed the following issues:

- The licensee’s evaluation of identified gas voids in Residual Heat Removal Train 1B, as documented in IR 2705084;
- The licensee’s evaluation of an adverse trend in hydraulic performance associated with Component Cooling Water Pump 2A, as documented in IR 2727486; and
- The licensee’s evaluation of potential RCS leakage outside of containment, as documented in IR 2729649.

The inspectors selected these potential operability issues based on the risk significance of the associated components and systems. The inspectors evaluated the technical adequacy of the evaluations to ensure that TS operability was properly justified and the subject component or system remained available such that no unrecognized increase in risk occurred. The inspectors compared the operability and design criteria in the appropriate sections of the TSs and Updated Final Safety Analysis Report (UFSAR) to the licensee’s evaluations to determine whether the components or systems were operable. Where compensatory measures were required to maintain operability, the inspectors determined whether the measures in place would function as intended and were properly controlled. The inspectors verified, where applicable, that the bounding limitations of the evaluations were valid. Additionally, the inspectors reviewed a sample of corrective action documents to verify that the licensee was identifying and correcting any deficiencies associated with operability evaluations.

The review of these operability determinations and functionality assessments by the inspectors constituted three inspection samples as defined in IP 71111.15–05.

b. Findings

No findings were identified.

.2 Periodic Review of Operator Workarounds

a. Inspection Scope

Operator workarounds (OWAs) are operator actions taken to compensate for degraded or non-conforming conditions. OWAs that cannot be implemented effectively can contribute to an increase in overall plant risk. As a result, the inspectors verified that the licensee was identifying OWAs at an appropriate threshold, entering them into the CAP, and addressing them in a manner that effectively managed the related adverse effects. As part of the review, the inspectors considered all existing plant conditions and the cumulative impact of the entire population of OWAs established by the licensee.

During the weeks ending October 8, through October 29, 2016, the inspectors evaluated the licensee's OWAs with respect to mitigating systems to determine if the functions of the mitigating systems were adversely impacted. Additionally, the inspectors assessed whether the OWAs had adversely impacted the ability to implement abnormal or emergency operating procedures. The inspectors placed particular emphasis on any OWAs that had not been effectively evaluated by the licensee; that had been formalized or proceduralized as the long-term corrective actions for a degraded or nonconforming condition (and therefore may not have been properly tracked by the licensee); and that may have increased the potential for human error, such as OWAs that:

- Required operations that were not consistent with current training and system knowledge;
- Required a change from long-standing operational practices;
- Required operation of a system or component in a manner that was inconsistent with similar systems or components;
- Created the potential for the compensatory action to be performed on equipment or under conditions for which it was not intended;
- Impaired access to required indications, increased dependence on oral communications, or impacted the timeliness of time-critical event mitigating actions under adverse environmental conditions;
- Required the use of equipment and interfaces that had not been designed with consideration of the task being performed;
- Required the licensee to assess and manage an increase in risk; or
- Required a license amendment in accordance with 10 CFR 50.59.

These activities by the inspectors constituted a single OWAs review inspection sample as required by IP 71111.15, Section 02.01(a).

b. Findings

No findings were identified.

1R18 Plant Modifications (71111.18)

.1 Permanent Plant Modification

a. Inspection Scope

From the beginning of the inspection period through October 19, 2016, the inspectors reviewed the following permanent modification to the licensee's facility:

- Engineering Change (EC) 401061, Unit 1 Reactor Vessel Closure Head Penetration Ultra High Pressure Cavitation Peening.

In EC 401061, the licensee approved application of a water jet cavitation peening process for the Unit 1, reactor vessel closure head penetration nozzles and J-groove welds. This process was designed to impart a compressive residual stress to the surface of the penetration nozzle and weld materials susceptible to primary water stress corrosion cracking (PWSCC) and was intended to diminish the potential for future PWSCC induced cracks and associated leakage.

The licensee expected the peened nozzles to result in a reduction in cumulative dose/exposure associated with performing future reactive nozzle repairs caused by PWSCC.

The inspectors reviewed the proposed design configuration change and associated 10 CFR 50.59 safety evaluation BRW–E–2015–113 against the design basis, the UFSAR, and the TSs to verify that the modification did not affect the operability or availability of the RCS. Additionally, the inspectors reviewed supporting industry basis documents and vendor qualification documents for the proposed water jet cavitation peening process.

During the Unit 1 Fall 2016 Refueling Outage (RFO), the inspectors observed application of the peening process for a sample of the J-groove welds and nozzle outside and inside diameter surfaces to determine if:

- The desired scope of area subject to peening was achieved and that limitations (if applicable) were recorded in accordance with the licensee procedures; and

- The peening equipment configuration was controlled and process essential variables maintained consistent with the vendor basis documents that had been demonstrated to provide the desired depth of compressive surface residual stress through mockup testing.

The inspectors observed the high-pressure jet/bubble cloud at the peening toolhead impacting vessel head surfaces from a camera mounted within the vendor tooling and noted that the peening process removed deposits and oxide layers from the J-groove weld and nozzle outside diameter surfaces resulting in a "shiny" surface relative to the surrounding darker surfaces (unpeened condition). The inspectors also observed that the essential peening process variables were maintained and controlled consistent with the qualified procedures and basis documents with two exceptions:

- During the outside diameter peening on a portion of Nozzle 75, the toolhead backpressure fell below minimum qualified value for the last 12 minutes of the peening process, as documented by the licensee's vendor in AREVA Condition Report (CR) 2016–6869. This effected a portion of the nozzle which was less susceptible to cracking (e.g. determined to have less than 20 kilopounds per square inch residual tensile stress) and vendor tests existed that demonstrated the desired depth of compressive stress would still be achieved on the peened surface; and

- During the outside diameter peening of Nozzle 42, a pressure transducer failed resulting in the loss of toolhead backpressure indication, an essential process variable, during peening of this nozzle. The licensee's vendor relied on alternate functioning equipment instruments (e.g., water flow, tool vent pressure and/or fill pressure indicators) to substitute for the failed pressure instrument. The vendor concluded that the required tool backpressure had been maintained because these alternative non-calibrated indicators displayed constant parameters during the peening of this nozzle. This was documented by the licensee's vendor in AREVA CR 2016–6629.

The licensee completed the desired scope of peening for each of the head penetration nozzles and was at the end of the inspection evaluating acceptance of the process deviations discussed above. The licensee's vendor programed motion control profiles for the peening tool head and the information entered into these profiles ensured the peening toolhead covered the desired area at the proper angle and standoff distance. The licensee's vendor produced a peening data report that recorded the three axis position of the tool head (theta, y, and wrist) at 30 second intervals as the program executed the "passes" of the toolhead over regions of the nozzle surface. Based upon this peening data report, the inspectors could not independently confirm the extent of surface covered by the vendor toolhead because an extensive knowledge of the vendor's motion control programming was required. The licensee's vendor had established access controls to ensure data entered into the motion control profile program files was not changed from that used on mockups to qualify this process.

The inspectors also reviewed the RCS pressure test conducted at normal operating pressure and observed the control rod scram time tests that were credited as the post-modification acceptance tests for EC 401061.

These reviews by the inspectors constituted a single permanent plant modification inspection sample as defined in IP 71111.18–05.

b. Findings

No findings were identified.

1R19 Post-Maintenance Testing (71111.19)

.1 Quarterly Resident Inspector Observation and Review of Post-Maintenance Testing Activities

a. Inspection Scope

The inspectors reviewed the following post-maintenance testing (PMT) activities to verify that procedures and test activities were adequate to ensure system operability and functional capability:

- Auxiliary Feedwater (AFW) Pump 1B functional testing following maintenance activities during the week ending October 22, 2016;
- Essential Service Water (SX) Pump 1B comprehensive pump testing following replacement of the pump rotating assembly during the licensee's U1 Fall 2016 RFO;
- Operational and functional testing of Main Steam Isolation Valve 1A following maintenance on the valve actuator during the week ending October 22, 2016;
- Comprehensive testing of Component Cooling Water Pump 2B following replacement of the pump rotating assembly during the week ending November 19, 2016; and
- Comprehensive testing of SX Pump 2A following replacement of the pump rotating assembly during the week ending December 3, 2016.

These activities were selected based upon the SSC's ability to impact risk. The inspectors evaluated these activities for the following (as applicable): the effect of testing on the plant had been adequately addressed; testing was adequate for the maintenance performed; acceptance criteria were clear and demonstrated operational readiness; test instrumentation was appropriate; tests were performed as written in accordance with properly reviewed and approved procedures; equipment was returned to its operational status following testing (temporary modifications or jumpers required for test performance were properly removed after test completion); and test documentation was properly evaluated. The inspectors evaluated the activities against TSs, the UFSAR, 10 CFR 50 requirements, licensee procedures, and various NRC generic communications to ensure that the test results adequately ensured that the equipment met the licensing basis and design requirements. In addition, the inspectors reviewed corrective action documents associated with the PMTs to determine whether the licensee was identifying problems and entering them in the CAP and that the problems were being corrected commensurate with their importance to safety.

The inspectors' reviews of these activities constituted five PMT inspection samples as defined in IP 71111.19–05.

b. Findings

No findings were identified.

1R20 Outage Activities (71111.20)

.1 Refueling Outage Activities

a. Inspection Scope

The inspectors reviewed the outage safety plan (OSP) and contingency plans for the A1R20 Unit 1 RFO, conducted September 25 through October 22, 2016, to confirm that the licensee had appropriately considered risk, industry experience, and previous site-specific problems in developing and implementing a plan that assured maintenance of defense-in-depth. During the RFO, the inspectors observed portions of the shutdown and cooldown processes and monitored licensee controls over the outage activities listed below:

- Licensee configuration management, including maintenance of defense-in-depth commensurate with the OSP for key safety functions and compliance with the applicable TS when taking equipment out of service;
- Implementation of clearance activities and confirmation that tags were properly hung and equipment appropriately configured to safely support the work or testing;
- Installation and configuration of reactor coolant pressure, level, and temperature instruments to provide accurate indication, accounting for instrument error;
- Controls over the status and configuration of electrical systems to ensure that TS and OSP requirements were met, and controls over switchyard activities;
- Monitoring of decay heat removal processes, systems, and components;
- Controls to ensure that outage work was not impacting the ability of the operators to operate the spent fuel pool cooling system;
- Reactor water inventory controls including flow paths, configurations, and alternative means for inventory addition, and controls to prevent inventory loss;
- Controls over activities that could affect reactivity;
- Maintenance of secondary containment as required by TSs;
- Licensee fatigue management, as required by 10 CFR 26, Subpart I;
- Refueling activities, including fuel handling and sipping to detect fuel assembly leakage;
- Startup and ascension to full power operation, tracking of startup prerequisites, physical inspection of the primary containment to verify that debris had not been left which could block emergency core cooling system suction strainers, and reactor physics testing following new core reload; and
- The licensee's identification and resolution of problems related to RFO activities.

The inspectors' reviews of these activities constituted a single RFO inspection sample as defined in IP 71111.20–05.

b. Findings

No findings were identified.

1R22 Surveillance Testing (71111.22)

.1 Surveillance Testing

a. Inspection Scope

The inspectors reviewed the test results for the following activities to determine whether risk-significant systems and equipment were capable of performing their intended safety function and to verify testing was conducted in accordance with applicable procedural and TS requirements:

- Control rod assembly insertion time testing during the licensee's Fall 2016 U1 RFO (Routine); and
- Unit 2 RCS leakage testing during the week ending December 17, 2016 (RCS).

The inspectors observed in-plant activities and reviewed procedures and associated records to determine the following:

- did preconditioning occur;
- were the effects of the testing adequately addressed by control room personnel or engineers prior to the commencement of the testing;
- were acceptance criteria clearly stated, sufficient to demonstrate operational readiness, and consistent with the system design basis;
- was plant equipment calibration correct, accurate, and properly documented;
- were as-left setpoints within required ranges; and was the calibration frequency in accordance with TSs, the UFSAR, plant procedures, and applicable commitments;
- was measuring and test equipment calibration current;
- was the test equipment used within the required range and accuracy, and were applicable prerequisites described in the test procedures satisfied;
- did test frequencies meet TS requirements to demonstrate operability and reliability;
- were tests performed in accordance with the test procedures and other applicable procedures;
- were jumpers and lifted leads controlled and restored where used;
- were test data and results accurate, complete, within limits, and valid;
- was test equipment removed following testing;
- where applicable for IST activities, was testing performed in accordance with the applicable version of Section XI of the American Society of Mechanical Engineers (ASME) Code and were reference values consistent with the system design basis;
- was the unavailability of the tested equipment appropriately considered in the performance indicator (PI) data;
- where applicable, were test results not meeting acceptance criteria addressed with an adequate operability evaluation or was the system or component declared inoperable;
- where applicable for safety-related instrument control surveillance tests, was the reference setting data accurately incorporated into the test procedure;
- was equipment returned to a position or status required to support the performance of its safety function following testing;

- were problems identified during the testing appropriately documented and dispositioned in the licensee's CAP;
- where applicable, were annunciators and other alarms demonstrated to be functional and were setpoints consistent with design requirements; and
- where applicable, were alarm response procedure entry points and actions consistent with the plant design and licensing documents.

These activities conducted by the inspectors constituted a single routine surveillance testing inspection sample and a single RCS leakage detection testing inspection sample as defined in IP 71111.22, Sections –02 and –05.

b. Findings

No findings were identified.

1EP4 Emergency Action Level and Emergency Plan Changes (71114.04)

a. Inspection Scope

The inspectors performed an in-office review of the latest revisions to the emergency plan emergency action levels (EALs), and EAL bases document to determine if these changes decreased the effectiveness of the licensee's emergency plan. The inspectors also performed a review of the licensee's 10 CFR 50.54(q) change process and emergency plan change documentation to ensure proper implementation for maintaining emergency plan integrity.

The NRC review was not documented in a safety evaluation report, and did not constitute approval of licensee-generated changes; therefore, this revision is subject to future inspection.

These reviews by the inspectors constituted a single EAL and emergency plan change inspection sample as defined in IP 71114.04–06.

b. Findings

No findings were identified.

1EP6 Drill Evaluation (71114.06)

.1 Operations Crew Simulator Training Observations

a. Inspection Scope

Inspectors observed the following training evolutions for licensed operators that required emergency plan implementation by the crews in the control room simulator.

- November 30, 2016 – morning session; and
- November 30, 2016 – afternoon session.

The training evolutions were planned and evaluated, and included independent assessment of two separate control room simulator crews. The inspectors observed event classification and notification activities performed by each crew, and also attended the post-evolution critiques for the scenarios.

The focus of the inspectors' activities was to note any weaknesses and deficiencies in the crews' performance and ensure that the licensee evaluators noted the same issues and entered them into the CAP.

The inspectors' reviews of these licensee training evolution with emergency preparedness drill aspects constituted two inspection samples as defined in IP 71114.06–06.

b. Findings

No findings were identified.

2. RADIATION SAFETY

2RS1 Radiological Hazards Control and Work Coverage (71124.01)

.1 Radiological Hazards Control and Work Coverage (02.05)

a. Inspection Scope

The inspectors evaluated ambient radiological conditions during tours of the facility. The inspectors assessed whether the conditions were consistent with applicable posted surveys, radiation work permits (RWPs), and worker briefings.

The inspectors evaluated the adequacy of radiological controls, such as required surveys, radiation protection job coverage, and contamination controls. The inspectors evaluated the licensee's use of electronic alarming dosimeters in high-noise areas as high radiation area monitoring devices.

The inspectors assessed whether radiation monitoring devices were placed on the individual's body consistent with licensee procedures. The inspectors assessed whether the dosimeter was placed in the location of highest expected dose or that the licensee properly employed an NRC approved method of determining effective dose equivalent.

The inspectors reviewed the application of dosimetry to effectively monitor exposure to personnel in work areas with significant dose rate gradients.

For select airborne area RWPs, the inspectors reviewed airborne radioactivity controls and monitoring, the potential for significant airborne levels, containment barrier integrity, and temporary filtered ventilation system operation.

The inspectors examined the licensee's physical and programmatic controls for highly activated or contaminated materials stored within pools and assessed whether appropriate controls were in place to preclude inadvertent removal of these materials from the pool.

The inspectors' activities constituted a single completed inspection sample as defined in IP 71124.01–05.

b. Findings

No findings were identified.

.2 High Radiation Area and Very High Radiation Area Controls (02.06)

a. Inspection Scope

The inspectors observed posting and physical controls for high radiation areas and very high radiation areas to assess adequacy.

The inspectors conducted a selective inspection of posting and physical controls for high radiation areas and very high radiation areas to assess conformance with performance indicators.

The inspectors reviewed procedural changes to assess the adequacy of access controls for high and very high radiation areas to determine whether procedural changes substantially reduced the effectiveness and level of worker protection.

The inspectors assessed the controls the high radiation areas greater than one rem/hour and areas with the potential to become high radiation areas greater than one rem/hour for compliance with TSs and licensee procedures.

The inspectors assessed the controls for very high radiation areas and areas with the potential to become very high radiation areas. The inspectors also assessed whether individuals were unable to gain unauthorized access to these areas.

The inspectors' activities constituted a single completed inspection sample as defined in IP 71124.01–05.

b. Findings

No findings were identified.

.3 Radiation Worker Performance and Radiation Protection Technician Proficiency (02.07)

a. Inspection Scope

The inspectors observed radiation worker performance and assessed their performance with respect to radiation protection work requirements, the level of radiological hazards present, and RWP controls.

The inspectors assessed worker awareness of electronic alarming dosimeter setpoints, stay times, or permissible dose for radiologically significant work as well as expected response to alarms.

The inspectors observed radiation protection technician performance and assessed whether the technicians were aware of the radiological conditions and RWP controls and whether their performance was consistent with training and qualifications for the given radiological hazards.

The inspectors observed radiation protection technician performance of radiation surveys and assessed the appropriateness of the instruments being used, including calibration and source checks.

The inspectors' activities constituted a single completed inspection sample as defined in IP 71124.01–05.

b. Findings

No findings were identified.

.4 Problem Identification and Resolution (02.08)

a. Inspection Scope

The inspectors assessed whether problems associated with radiological hazard assessment and exposure controls were being identified at an appropriate threshold and were properly addressed for resolution. For select problems, the inspectors assessed the appropriateness of the corrective actions. The inspectors also assessed the licensee's program for reviewing and incorporating operating experience.

The inspectors reviewed select problems related to human performance errors and assessed whether there was a similar cause and whether corrective actions taken resolve the problems.

The inspectors reviewed select problems related to radiation protection technician error and assessed whether there was a similar cause and whether corrective actions taken resolve the problems.

The inspectors' activities constituted a single completed inspection sample as defined in IP 71124.01–05.

b. Findings

No findings were identified.

2RS2 Occupational As-Low-As-Reasonably-Achievable Planning and Controls (71124.02)

.1 Implementation of As-Low-As-Reasonably-Achievable and Radiological Work Controls (02.04)

a. Inspection Scope

The inspectors reviewed the radiological administrative, operational, and engineering controls planned for selected radiologically significant work activities and evaluated the integration of these controls and as-low-as-reasonably-achievable (ALARA) requirements into work packages, work procedures and/or RWPs.

The inspectors conducted observations of in-plant work activities and assessed whether the licensee had effectively integrated the planned administrative, operational, and engineering controls into the actual field work to maintain occupational exposure ALARA. The inspectors observed pre-job briefings, and determined if the planned controls were discussed with workers. The inspectors compared the placement and use of shielding, contamination controls, airborne controls, RWP controls, and other engineering work controls with the ALARA plans.

The inspectors assessed licensee activities associated with work-in-progress to ensure the licensee was tracking doses, performed timely in-progress reviews, and, when jobs did not trend as expected, appropriately communicated additional methods to be used to reduce dose.

The inspectors evaluated whether health physics and ALARA staff were involved with the management of radiological work control when in-field activities deviated from the planned controls. The inspectors assessed whether the outage control center and station management provided sufficient support for ALARA pre-planning.

The inspectors' activities constituted a partial inspection sample as defined in IP 71124.02–05.

b. Findings

No findings were identified.

.2 Radiation Worker Performance (02.05)

a. Inspection Scope

The inspectors observed radiation worker and radiation protection technician performance during work activities being performed in radiation areas, airborne radioactivity areas, or high radiation areas to assess whether workers demonstrated the ALARA philosophy in practice and followed procedures. The inspectors observed radiation worker performance to evaluate whether the training and skill level was sufficient with respect to the radiological hazards and the work involved.

The inspectors interviewed individuals from selected work groups to assess their knowledge and awareness of planned and/or implemented radiological and ALARA work controls.

The inspectors' activities constituted a single completed inspection sample as defined in IP 71124.02–05.

b. Findings

No findings were identified.

4. OTHER ACTIVITIES

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity, Emergency Preparedness, Public Radiation Safety, Occupational Radiation Safety, and Security

4OA1 Performance Indicator Verification (71151)

.1 Unplanned Power Changes Per 7000 Critical Hours (1E03)

a. Inspection Scope

The inspectors sampled licensee submittals for the Unplanned Power Changes Per 7000 Critical Hours performance indicator (PI) for Unit 1 and Unit 2 for the period from January 2016 through December 2016. To determine the accuracy of the PI data reported during those periods, PI definitions and guidance contained in Nuclear Energy Institute (NEI) 99–02, "Regulatory Assessment Performance Indicator Guideline," Revision 7, dated August 31, 2013, were used.

The inspectors reviewed the licensee's operator narrative logs, IRs, maintenance rule records, event reports, and NRC integrated inspection reports for the period of January 1, 2016 through December 31, 2016, to validate the accuracy of the submittals. The inspectors also reviewed the licensee's CAP database to determine if any problems had been identified with the PI data collected or transmitted for this indicator.

These reviews by the inspectors constituted two unplanned power changes per 7000 critical hours inspection samples as defined in IP 71151–05.

b. Findings

No findings were identified.

4OA2 Identification and Resolution of Problems (71152)

.1 Routine Review of Items Entered into the Corrective Action Program

a. Inspection Scope

As part of the various baseline IPs discussed in previous sections of this report, the inspectors routinely reviewed issues during baseline inspection activities and plant status reviews to verify they were being entered into the licensee's CAP at an appropriate threshold, that adequate attention was being given to timely corrective actions, and that adverse trends were identified and addressed. Attributes reviewed included: identification of the problem was complete and accurate; timeliness was commensurate with the safety significance; evaluation and disposition of performance issues, generic implications, common causes, contributing factors, root causes, extent-of-condition reviews, and previous occurrences reviews were proper and adequate; and that the classification, prioritization, focus, and timeliness of corrective actions were commensurate with safety and sufficient to prevent recurrence of the issue.

These routine reviews for the identification and resolution of problems did not constitute any additional inspection samples. Instead, by procedure they were considered an integral part of the inspections performed during the quarter and documented in Section 1 of this report.

b. Findings

No findings were identified.

.2 Daily Corrective Action Program Reviews

a. Inspection Scope

In order to assist with the identification of repetitive equipment failures and specific human performance issues for follow-up, the inspectors performed a daily screening of items entered into the licensee's CAP. This review was accomplished through inspection of the station's daily IR packages.

These daily reviews were performed by procedure as part of the inspectors' daily plant status monitoring activities and, as such, did not constitute any separate inspection samples.

b. Findings

No findings were identified.

.3 Semi-Annual Trend Review: Issues Associated with Process and Area Radiation Monitors

a. Inspection Scope

The inspectors performed a review of the licensee's CAP and associated documents to identify trends that could indicate the existence of a more significant safety issue. The inspectors' review was focused on repetitive equipment issues, but also considered the results of daily inspectors CAP item screening discussed in Section 4OA2.2 above, licensee trending efforts, and licensee human performance results. The inspectors' review nominally considered the six-month period of June 1, through December 31, 2016, although examples expanded beyond those dates where the scope of the trend warranted.

The review also included issues documented outside the normal CAP in major equipment problem lists, repetitive and/or rework maintenance lists, departmental problem/challenges lists, system health reports, quality assurance audit/surveillance reports, self-assessment reports, and maintenance rule assessments. The inspectors compared and contrasted their results with the results contained in the licensee's CAP trending reports. Corrective actions associated with a sample of the issues identified in the licensee's trending reports were reviewed for adequacy.

This review constituted a single semi-annual trend inspection sample as defined in IP 71152–05.

b. Observations

During the course of the review period for this inspection sample, the inspectors noted several examples of issues involving process and area radiation monitors. Specific items associated with this trend included, but were not limited to:

- Multiple separate issues involving process radiation monitors and related equipment. The inspectors' reviews identified over fifty separate issues during the period under review involving process radiation monitors and/or related equipment. This was significantly more than what would typically be encountered at an average dual unit facility over the same time period.
- Multiple separate issues involving area radiation monitors and related equipment. The inspectors' reviews identified over twenty separate issues during the period under review involving area radiation monitors and/or related equipment. As with the number of issues associated with process radiation monitors above, this was more than what would typically be encountered at an average dual unit facility.
- Recurring issues with a control room ventilation radiation monitor (0PR31J). From November 11, 2016, through November 13, 2016, control room operators observed numerous worsening spikes associated with the gas channel on the Train A control room ventilation radiation monitor (0PR31J), ultimately resulting in the declaration of that instrument being inoperable and an unplanned entry into TS 3.3.7, Condition A, at 9:33 a.m. on November 13, 2016. The licensee conducted extensive troubleshooting on the instrument, effected repairs, and

exited TS 3.3.7, Condition A, at 6:38 a.m. on November 27, 2016, upon declaring the gas channel operable. Less than an hour later, the licensee was forced to again enter TS 3.3.7, Condition A, at 7:32 a.m. on November 27, 2016, when the gas channel resumed spiking. Additional troubleshooting was performed and repairs made, ultimately resulting in the gas channel being declared operable and TS 3.3.7, Condition A, exited at 8:37 a.m. on December 2, 2016.

- Recurring and ongoing issues with a Unit 2 containment ventilation radiation monitor (2AR11J). Spiking on this area radiation monitor had resulted in numerous control room alarms and corresponding containment purge system isolation signals (e.g. October 4, 2016; November 11, 2016; November 14, 2016; December 9, 2016; December 15, 2016; December 19, 2016). Through examination of containment conditions and data from the corresponding redundant area radiation monitor (2AR12J) the licensee determined that the spikes were erroneous indications. Troubleshooting was ongoing at the end of the inspection period.

In discussions with licensee engineering and management personnel, it appeared that the licensee's issues in this area stem from aging/obsolescent equipment and components combined with an unusually large number of radiation monitors in the plant, many of which were connected in communications pathways making removal from service and replacement problematic. While the licensee had a thorough understanding of the issues and a comprehensive plan for resolution, many of the target dates for completion were well out into the future; some as far out as December 31, 2018. Although these issues individually had not resulted in any significant consequences, in the aggregate they continue to pose a large distraction for control room operators. As such, additional licensee investigation and reexamination of the target dates associated with the licensee's plan for resolution may be warranted.

c. Findings

No findings were identified.

.4 Follow-Up Sample for In-Depth Review: Review of Clearance and Tagging Issue During the Unit 1 Refueling Outage (A1R19)

a. Inspection Scope

On October 1, 2016, during maintenance work to replace a diaphragm of a valve associated with the chemical volume control system (CVCS) boric acid blender (1CV111B), maintenance technicians encountered gas relieving from the bonnet to body joint. The source of the gas was the 10 psig nitrogen blanket on the CVCS volume control tank. Upon review of the clearance order it was discovered that the isolation boundaries were not adequate and only addressed valve actuator work with special instructions that indicated that no process side work was allowed. The inspectors selected the licensee's associated CAP document, IR 2722783, "Level 2 Clearance and Tagging Event – Technicians Encountered Unexpected Gas at the Valve Body-To-Bonnet During Safety Verification Check for a Chemical Volume Control System Valve," for an in-depth review to determine if the licensee had addressed the potential impacts of the identified clearance and tagging event, and to review corrective actions associated with this issue.

As applicable, the inspectors verified the following attributes during their review of the licensee's corrective actions for the above issue report and other related issue reports:

- Complete and accurate identification of the problem in a timely manner commensurate with its safety significance and ease of discovery;
- Consideration of the extent of condition, generic implications, common cause, and previous occurrences;
- Evaluation and disposition of operability/functionality;
- Classification and prioritization of the resolution of the problem commensurate with safety significance;
- Identification of root and contributing causes of the problem;
- Identification of corrective actions, which were appropriately focused to correct the problem; and
- Completion of corrective actions in a timely manner commensurate with the safety significance of the issue.

The inspectors' activities constituted a single follow-up/in-depth review inspection sample as defined in IP 71152–05.

b. Observations

As discussed above, on October 1, 2016, the licensee experienced a clearance and tagging event when maintenance technicians encountered gas relieving from the body to bonnet connection of valve 1CV111B. The technicians suspended the work and contacted operations personnel. At the time the maintenance activity was being performed, the alignment of the system due to the outage conditions on the unit resulted in no impact on the operability of any equipment important to safety.

The licensee performed a root cause evaluation (RCE) to examine the clearance order development, actions from similar tagging events, and latent organizational weaknesses. Their investigation concluded that the root cause of the event was that the clearance order writer, approver, and challenger all failed to review the scope of the clearance request and associated work instructions to ensure that adequate clearance order boundaries were established. Additionally three contributing causes were identified, including:

- Contributing Cause 1: Procedure OP–AA–109–101, "Clearance and Tagging," did not provide adequate guidance for the level of detail expected for suggested isolation points;
- Contributing Cause 2: Examples of imprecise communication in the clearance request, as well as development and authorization of the clearance order failed to ensure mutual understanding; and
- Contributing Cause 3: Special instructions were not reviewed at the pre-job brief, workers were not aware that no process work was allowed, and drawings were not utilized to validate the zone of protection prior to work.

The licensee took a number of initial corrective actions for this event that included, in part:

- Suspending the qualifications of the individuals involved;
- Issuing a site human performance alert; and

- Briefing Operations clearance writers and approvers on clearance process requirements to review clearance requests, work instructions, and procedures.

Additionally, following identification of the event the licensee reviewed all outage clearances, both active and pending, to ensure that the scope of the work was adequately addressed by the applicable clearances. No additional discrepancies were identified during that review.

Following completion of the licensee's RCE, the inspectors reviewed the corrective actions for the event, which included:

- The licensee performing return-to-work briefings for all operations and maintenance personnel;
- The conduct of cross-department desktop observations for planning, writing, and approving clearance orders and other clearance holder processes;
- The conduct of training evolutions for affected departments; and
- Revision to the affected procedure for clearance orders to include improved guidance for the clearance order planners.

c. Findings

No findings were identified.

4OA3 Follow-Up of Events and Notices of Enforcement Discretion (71153)

.1 (Closed) Licensee Event Report 05000456/2016001–00; 05000457/2016001–00: Auxiliary Feedwater Diesel Intake Design Deficiency Related to Turbine Building High Energy Line Break Resulted in an Unanalyzed Condition Due to Insufficient Validation of Vendor Analysis Inputs

On March 4, 2016, during a periodic NRC Component Design Bases Inspection (CDBI), a concern was raised regarding why it was acceptable for the diesel-driven auxiliary feedwater (AFW) pump engine combustion air intake to be located in the turbine building, a nonsafety-related structure. Additional licensee evaluations completed determined that the existing configuration did not adequately support diesel engine operation with high energy line break conditions in the turbine building. As a result, the license entered TS 3.7.5, "Auxiliary Feedwater System," Condition A, "One Auxiliary Feedwater Train Inoperable," for one train (Train B) of AFW inoperable on Units 1 and 2. Train B of AFW was declared operable on Units 1 and 2 following a corrective action to install a temporary configuration change to provide engine combustion air intake from the auxiliary building.

This issue was previously addressed by the NRC CDBI in Section 1R21.3b of Inspection Report 05000456/2016008; 05000457/2016008 (ADAMS Accession No. ML16118A081). This licensee event report is closed.

This event follow-up review by the inspectors constituted a single inspection sample as defined in IP 71153–05.

4OA6 Management Meetings

.1 Exit Meeting Summary

On January 17, 2017, the inspectors presented the inspection results to Ms. M. Marchionda, Site Vice President, and other members of the licensee staff. The licensee acknowledged the issues presented. The inspectors confirmed that none of the potential report input discussed was considered proprietary.

.2 Interim Exit Meetings

Interim exits were conducted for:

- The results of engineering inspections in the areas of Plant Modifications and Inservice Inspection (ISI) with the Site Vice President, Ms. M. Marchionda, and other members of the licensee staff on September 1, 2016, and October 19, 2016;
- The results of Radiation Safety inspections with Ms. M. Marchionda, Site Vice President, and other members of the licensee staff on October 7, 2016; and
- The results of reviews conducted for Emergency Action Levels (EALs) and Emergency Plan Changes with Ms. D. Poi, Emergency Preparedness Manager, via teleconference on December 14, 2016.

The inspectors confirmed that none of the potential report input discussed was considered proprietary. Proprietary material received by the inspectors and reviewed in the course of these inspections was returned to the licensee.

4OA7 Licensee-Identified Violation

The following violation of very low significance (Green) was identified by the licensee and is a violation of NRC requirements that meets the criteria of the NRC Enforcement Policy for being dispositioned as a Non-Cited Violation (NCV).

.1 Lack of a Qualified Welding Procedure

Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, Appendix B, Criterion IX, "Control of Special Processes," requires, in part, that measures shall be established to assure that special processes, including welding, heat treating, and nondestructive testing, are controlled and accomplished by qualified personnel using qualified procedures in accordance with applicable codes, standards, specifications, criteria, and other special requirements. Contrary to these requirements, on October 15, 2016, the licensee failed to establish measures to assure welds feedwater (FW) 1 and FW 2A, as discussed in Revision 1 of work order (WO) 01836557, were welded with a procedure that was qualified for welding in accordance with American Society of Mechanical Engineers (ASME) Code, Section IX, on material that required impact tests. This violation was entered into the licensee's CAP as IR 02728742 and the licensee cutout and removed the effected welds from the FW system.

The inspectors determined that the performance deficiency was of more than minor significance in accordance with Inspection Manual Chapter (IMC) 0612, Appendix B, "Issue Screening," because it affected the Initiating Events Reactor Safety Cornerstone attribute of Equipment Performance and adversely affected the cornerstone objective of limiting the likelihood of events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. Specifically, if left uncorrected, this finding would have the potential to lead to a more significant safety concern because it increased the likelihood of an operational challenge to the plant caused by a FW line break caused by cracking initiated from unqualified welds, which were not fabricated to ensure that adequate impact toughness was established.

The inspectors determined the finding could be evaluated using the SDP in accordance with IMC 0609, "Significance Determination Process," Attachment 0609.04, "Initial Characterization of Findings," dated June 19, 2012, and Appendix A, "The Significance Determination Process for Findings At-Power," Exhibit 1, "Initiating Events Screening Questions." The inspectors answered "No" to questions under B Transient Initiators because the finding did not result in a reactor trip and loss of mitigation equipment relied upon to transition the plant from the onset of the trip to a stable shutdown condition and therefore screened the finding as having very low safety significance (Green).

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee

M. Marchionda, Site Vice President
A. Ferko, Plant Manager
P. Rausch, Operations Director
J. Bashor, Engineering Director
K. Dovas, Training Director
J. Cady, Radiation Protection Manager
B. Finlay, Security Manager
R. Hall, Chemistry Manager
D. Poi, Emergency Preparedness Manager
S. Reynolds, Regulatory Assurance Manager
K. Sahadewan, Reactor Engineering Supervisor
W. Spahr, Maintenance Director
R. Schliessmann, NRC Coordinator
J. Taff, Licensed Operator Training Lead

U.S. Nuclear Regulatory Commission

E. Duncan, Chief, Reactor Projects Branch 3

LIST OF ITEMS OPENED, CLOSED AND DISCUSSED

Opened and Closed

05000456/2016004–01	NCV	Inadequate Control of Welding During FW System Pipe Replacement (Section 1R08.1)

Closed

05000456/2016001–00; 05000457/2016001–00	LER	Auxiliary Feedwater Diesel Intake Design Deficiency Related to Turbine Building High Energy Line Break Resulted in an Unanalyzed Condition Due to Insufficient Validation of Vendor Analysis Inputs (Section 4OA3.1)

Discussed

05000456/2016008–02; 05000457/2016008–02	NCV	Failure to Verify Air Intake for Diesel Driven Auxiliary Feedwater Pump Was Adequately Protected From a High Energy Line Break (Section 4OA3.1)

LIST OF DOCUMENTS REVIEWED

The following is a partial list of documents reviewed during the inspection. Inclusion on this list does not imply that the NRC inspector reviewed the documents in their entirety, but rather that selected sections or 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.

1R01 Adverse Weather Protection

Procedures:
- 0BwOS XFT-A3; Unit Common Cold Weather Surveillance; Revision 11
- WC-AA-107; Seasonal Readiness; Revision 17

1R04 Equipment Alignment

Procedures:
- BwOP DG-E3; Electrical Lineup – Unit 2 2A Diesel Generator; Revision 7
- BwOP VD-E2; Electrical Lineup – Unit 2 Operating, Revision 3E1
- BwOP DO-M12; Operating Mechanical Lineup Unit 2 D/G 2A Fuel Oil; Revision 4
- BwOP DG-M3; Operating Mechanical Lineup Unit 2 2A D/G; Revision 15
- 1BwOA PRI-10; Loss of RH Cooling; Revision 107
- BwOP RH-6; Placing the RH System in Shutdown Cooling; Revision 56
- BwOP RH-E1; Electrical Lineup – Operating; Revision 9
- BwOP RH-M2; Operating Mechanical Lineup 1B Train; Revision 10

Drawings and Prints:
- M-62, Sheet 1; Diagram of Residual Heat Removal Unit 1; Revision BR
- M-98; Diesel Generator Rooms 2A & 2B Ventilation System; Revision Y
- M-130, Sheet 1A; Diesel Oil and Fuel Oil Supply Unit 2; Revision BN
- M-130, Sheet 1B; Diesel Oil and Fuel Oil Supply Unit 2; Revision BM
- M-152, Sheet 10; Manufacturer's Supplemental Diagram Diesel Generator Fuel Schematic; Revision I
- M-152, Sheet 15; Manufacturer's Supplemental Diagram of Diesel Generator Control Diagram Shutdown System Units 1 & 2; Revision L
- M-152, Sheet 16; Manufacturer's Supplemental Diagram Diesel Generator Control Diagram Pressure Gauge Lines and Alarms; Revision F
- M-152, Sheet 18; Starting Air; Revision V
- M-152, Sheet 19; Cooling Water Units 1 & 2; Revision F
- M-152, Sheet 20; Control Diagram Starting Systems and Alarms; Revision G

Training Documents:
- DG-3; D/G Control Air; Revision 8
- DG-5; D/G Governor Control; Revision 6
- DG-6; D/G Air Start / Pneumatic Protection; Revision 11
- DG-7; D/G Pneumatic Protection; Revision 8
- DG-8; D/G Pneumatic Protection; Revision 7

1R05 Fire Protection

Procedures:
- BwOP FP-100; Fire Response Guidelines; Revision 22

- BwOP FP-100T37; Attachment 37: Fire Zones 9.1-1, 9.1-2, 9.2-1, 9.2-2, 9.3-1, 9.3-2, 9.4-1, 9.4-2 Unit 1/Unit 2 Diesel Generator and Diesel Generator Day Tank Rooms 1D-71, 1D-72, 1S-37, 1S-38, 1S-39, 1S-40, 2D-71, 2D-72, 2S-37, 2S-38, 2S-39, 2S-40; Revision 6
- BwOP FP-49T2; Unit 2 Fire Detection/Suppression Zones (2PM09J), Table 2; Revision 1

Pre-Fire Plans:
- No. 89; DG 401', Diesel Generator Room 2B and Day Tank Room, Fire Zones 9.1-2, 9.4-2; Revision 0
- No. 194; AB 401', DG 2B and Switchgear Room Air Shaft, Fire Zone 18.1-2; Revision 0
- No. 195; AB 426', DG 2B and Switchgear Room Air Shaft, Fire Zone 18.1-2; Revision 0
- No. 196; AB 451', DG 2B and Switchgear Room Air Shaft, Fire Zone 18.1-2; Revision 0

1R08 Inservice Inspection Activities

Action Requests/Issue Reports:
- 02729200; Weld Temperature Impact on 1FW009C; October 17, 2016
- 02728742; Incorrect Weld Procedure Used on 1FW03DC Piping; October 15, 2016
- 02727868; NRC Concern with Thermocouple Attachments; October 13, 2016
- 02727446; NRC ID - Unattended Preheat Monitoring; October 12, 2016
- 02725552; NDE Required for Thermocouple Removal; October 7, 2016
- 02723860; NRC Question on Wesdyne EX-ISI-210; October 4, 2016
- 02719973; OSP-A Dry Boric Acid Leakage at the 1RC001A; September 26, 2016
- 02718235; Dry Boric Acid at Valve Packing on 1SI18879A; September 26, 2016
- 02690249; Westinghouse NSAL-16-1, Baffle Former Bolts; August 12, 2016
- 02611707; Incorrect UTC Documented on Weld Rod Slips; January 12, 2016
- 02571340; A2R18 ISI Examination Results; October 15, 2015
- 02603954; Piping Downstream of 1RH8729A Has a Through-Wall Leak; December 23, 2015
- 02510119; Wrong UTC Number on Weld Record; June 4, 2015
- 02571599; PT Indications Found SG B Channel Head; October 15, 2015
- 01639774; 1B CS Eductor Bolted Connection Has Dry Boric Acid; April 27, 2014

Procedures:
- ER-AA-335-014-2003; VT-1 Visual Examination in Accordance With ASME 2001 Edition, 2003 Addenda; Revision 0
- ER-AA-335-016; VT-3 Visual Examination of Component Supports, Attachments, and Interiors of Reactor Vessels; Revision 9
- ER-AA-335-001; Bare Metal Visual Examination for Nickel Alloy Materials; Revision 5
- ER-AA-335-003; Magnetic Particle Examination; Revision 7
- EXE-PDI-UT-1; Ultrasonic Examination of Ferritic Piping Welds in Accordance With PDI-UT-1; Revision 7
- EXE-PDI-UT-2; Ultrasonic Examination of Austenitic Piping Welds in Accordance With PDI-UT-2; Revision 7
- EXE-PDI-UT-108; Ultrasonic Examination of Weld Overlaid Similar and Dissimilar Metal Welds in Accordance With PDI-UT-08; Revision 0
- EXE-UT-210; Manual Ultrasonic Examination of Vessel Welds Greater than 2"; Revision 4
- EXE-UT-59; Ultrasonic Examination of the Braidwood and Byron Pressurizer Safety, Relief and Spray Nozzle Inside Radius Sections; Revision 3
- ER-AP-331-1002; Boric Acid Corrosion Control Program Identification, Screening and Evaluation; Revision 9
- ER-AP-331; Boric Acid Control (BACC) Program; Revision 7

- ER-AP-331-1001; BACC Inspection Locations, Implementation and Inspection Guidelines; Revision 8
- ER-AP-335-001; Bare Metal Visual Examination For Nickel Alloy Materials; Revision 5

Engineering Changes:
- 374961; M-1MS07002C, Evaluation for MT Indications on Shear Lugs Westinghouse NDE Report A1R14-MT-001 Component 1MS-07-SW08 (Shear Lugs); April 15, 2009
- 402443; Engineering Evaluation to Address All Aspects of Braidwood Unit 1 Containment Moisture Barrier Class CC Degraded Areas Examined in A1R18 (WO 1688061-01 and 1705539-02); July13, 2015

Performance Demonstration Qualification Sheets:
- Procedure 54-ISI-603; Revision 5; May 9, 2015
- Procedure 54-ISI-604; Revision 5; September 17, 2015
- Procedure PDI-UT-1; Revision F; July 25, 2016
- Procedure PDI-UT-2; Revision G; July 25, 2016
- Procedure PDI-UT-8; Revision H; July 25, 2016

Nondestructive Examinations:
- 2015-046; Radiographic Examination Welds 1, 2, 3 on 1AF03EB-4”; March 13, 2015
- 2015-047; Radiographic Examination Welds 4, 5 on 1AF03EC-4”; March 13, 2015
- A1R12-UT-081; Ultrasonic Examination 1PZR-01-N4A; April 29, 2006
- A1R19-UT-007; Ultrasonic Examination 1RC-17-05; October 1, 2016
- A1R19-UT-005; Ultrasonic Examination 1RC-07-07-02; September 30, 2016
- A1R19-UT-008; Ultrasonic Examination 1RC-17-06; October 1, 2016
- A1R19-UT-009; Ultrasonic Examination 1RC-17-09; October 1, 2016
- A1R19-UT-010; Ultrasonic Examination 1RC-17-10; October 1, 2016
- A1R19-UT-024; Ultrasonic Examination 1PZR-01-N4A; October 6, 2016
- UT-A1R19-032; Ultrasonic Examination 1RH-06-31; Dated October 4, 2016.
- UT-A1R19-033; Ultrasonic Examination 1RH-06-35 & 36; Dated October 9, 2016.
- UT-A1R19-034; Ultrasonic Examination 1RH-06-44; Dated October 4, 2016.
- A1R19-UT-035; Ultrasonic Examination 1FW-03-04; Dated October 7, 2016.
- A1R19-UT-034; Ultrasonic Examination 1FW-03-05A; Dated October 7, 2016.
- A1R19-UT-036; Ultrasonic Examination 1FW-03-05; Dated October 7, 2016.
- A1R19-PT-56; Liquid Penetrant Examination Reactor Head Nozzle 69; October 2, 2016
- PT-A1R19-082; Liquid Penetrant Examination Reactor Head Nozzle 69; October 2, 2016
- A1R19-MT-001; Magnetic Particle Examination 1MS-01SW08 to SW09; October 4, 2016

Welder Performance Qualifications:
- Welder L4530; September 20, 2016
- Welder JM6795; December 3, 2014

Work Orders:
- 01836557; Replacement of FAC Component 1FW151; Revision 1, 2 and 3
- 01722810; Flex Connections to AF in MS Valve Room; Revision 2

Other:
- AREVA CR 2016-6869; Tool Pressure Fell Below Minimum Acceptable - Nozzle 75; October 15, 2016
- PQR 1-50C; January 3, 1984
- PQR A-001; October 19, 1998
- PQR A-002; March 9, 1999

- Site Approved Inspection Techniques; September 28, 2016
- Site Validation of EPRI Appendix H/ Appendix I Techniques; September 28, 2016
- WPS 1-1-GTSM-PWHT; Revision 2
- WPS(LECD); Revision 1
- AREVA 54-ISI-603-008; Automated Ultrasonic Examination of RPV Closure Head Penetrations Containing Thermal Sleeves; August 20, 2015
- AREVA 54-ISI-604-013; Automated Ultrasonic Examination of Open Tube RPV Closure Head Penetrations; August 24, 2015

1R07 Heat Sink Performance

Other:
- ER-AA-340-1002; HX Inspection Report 1VA065B, 1B CV Pump Room Cubical Cooler; October 5, 2016

1R11 Licensed Operator Requalification Program

Procedures:
- OP-AA-101-111-1001; Operations Standards and Expectations; Revision 18
- OP-AA-101-113; Operator Fundamentals; Revision 10
- OP-AA-101-113-1006; 4.0 Crew Critique Guidelines; Revision 7
- OP-AA-103-102; Watch-Standing Practices; Revision 16
- OP-AA-103-102-1001; Strategies for Successful Transient Mitigation; Revision 0
- OP-AA-103-103; Operation of Plant Equipment; Revision 1
- OP-AA-104-101; Communications; Revision 3
- OP-AA-111-101; Operating Narrative Logs and Records; Revision 11
- OP-AA-300; Reactivity Management; Revision 10
- TQ-AA-10; Systematic Approach to Training Process Description; Revision 4
- TQ-AA-150; Operator Training Program; Revision 14
- TQ-AA-155; Conduct of Simulator Training and Evaluation; Revision 6
- TQ-AA-306; Simulator Management; Revision 8
- TQ-BR-201-0113; Braidwood Training Department Simulator Examination Security Actions; Revision 19

Other:
- LORT Annual Exam Status Braidwood Generating Station 2016

1R12 Maintenance Effectiveness

Action Requests/Issue Reports:
- 1605535; 0A VC-Need WO Generated for Replacement of 0VC24Y Hydramotor; January 8, 2014
- 1608429; Low Oil Level 0WO01CA; January 15, 2014
- 1613563; NRC Mod/50.59 Inspection – Review of BRW-5-2011-138; January 24, 2014
- 1621733; 0A VC Chiller Oil Level is Low; February 15, 2014
- 1625652; 0A VC Chiller (0WO01CA) Oil Level Low; February 25, 2014
- 1643432; U2 CC Surge Tank Level Rise; April 4, 2014
- 1647634; 0A VC Chiller Troubleshooting Critique; April 3, 2014
- 1651787; Unable to Perform 0A VC Chiller Capacity Test; April 25, 2014
- 1653228; VC Maintenance Rule (A)(1) Determination; April 29, 2014
- 1668368; ACE Actions Needed for VC Hydramotor Failure; June 5, 2014
- 1681301; FME: 0PR032J Operate Failure; July 13, 2014

- 1682587; Comp PT for 2B RH HX CC Flow (F0618) Indicates 230 GPM; July 16, 2014
- 2387042; 0A VC Chiller Oil Level Trending Lower Towards Empty; September 27, 2014
- 2401375; 0A VC Chiller Low Oil Level – 0WO01CA; October 25, 2014
- 2403957; 2B EDG – Fuel Leak at Piping Connection on Fuel Pump Discharge; October 30, 2014
- 2440501; 2B EDG – Fuel Leak at Threaded Connection with Engine Running; January 21, 2015
- 2428191; 0A VC Oil Level Low; December 20, 2014
- 2429493; 0A VC Chiller Oil Level at 5 Percent; December 25, 2014
- 2431588; 0VC10A Breaker Found Tripped; December 31, 2014
- 2433470; FME 2CC01A AS-Found ID Inspection; January 6, 2015
- 2447540; 2CC01A – Documented Tube Plugging per Eddy Current Data; February 4, 2015
- 2487895; 1B TDFWPP Improper Response on Pump Startup – 1FW01PB; April 20, 2015
- 2488367; 1B FW Pump was Stopped Due to High Bearing Drain Temp; April 20, 2015
- 2489028; 4.0 Critique for 1B FW Shutdown; April 20, 2015
- 2494923; 0A VC Chiller Oil Level is at 90 Percent – 0WO01CA; May 3, 2015
- 2498358; Failed PMT on 0A VC SG – 0VC01BA; May 10, 2015
- 2540906; FW-09 – Train FW02P; August 12, 2015
- 2571704; OSP-A LLRT Failure for 2CC9486; October 16, 2015
- 2572568; OSP-X NER NC-015-010-Y Inspection of 2CC40AC; October 17, 2015
- 2596104; 1B MFP Manual Trip; December 4, 2015
- 2597012; 1B TDFWP High Frequency Oscillations on LP Governor Valve; December 7, 2015
- 2598727; 1B FW Pump Speed Tachometer 1SI-FW284 is Pegged High; December 10, 2015
- 2641666; Control Room HVAC Chem. Survey Needs Further Analysis; March 17, 2016
- 2646671; 2B CC Pump Seal Leak; March 28, 2016
- 2659744; Motor and Oil Temperatures Low Out of Band; April 22, 2016
- 2704357; 0A VC Chiller Condenser Pressure High with 0SX066A Full Open; August 15, 2016
- 2707333; Intermittent MCR D/P Alarms – 0PO1-VC038D; August 23, 2016
- 2727486; IST Adverse Trend – 2CC01PA Pump Data Point; October 12, 2016
- 2729704; OSP-A 1B FW Pump RPM Pegged High – 1SI-FW284; October 18, 2016
- 2730494; OSP-A 1C TDFWP EH Leak Near Interface Diaphragm Valve; October 20, 2016
- 2730616; OSP-R 1C TDFWP Resets Slowly – 1PS-FW192; October 20, 2016
- 2731431; OSP-A 1 Drop Per Minute EH Leak; October 23, 2016
- 2732469; 1B FW Pump Has No Speed Indication – 1FW01PB; October 25, 2016
- 2732471; 1FW01PB Speed Control Discrepancy; October 25, 2016
- 2732510; 1BwOA SEC-1 Entered – 1A FW PP Trip – 1FW01PA; October 25, 2016
- 2732590; Leads Incorrectly Landed on 1SY-FW215; October 26, 2016
- 2741191; 2A CC Pump 2CC01PA Would Not Drain Via Normal Drain Line; November 14, 2016
- 3952225; 2B EDG 6-Year Piston and Cylinder Liner Inspection Results; December 13, 2016
- 3953836; Cylinder Air Control Linkage Diesel Generator Need Rebuilt; December 16, 2016
- 3954108; Coupling for 2VD01YB Was Not Like for Like; December 16, 2016
- 3954167; 2B EDG Trip Air Header Leak Rate Exceeds Acceptance Criteria; December 17, 2016
- 3954190; Conditions Prohibit Performance of WO 01741102; December 17, 2016
- 3954278; Lube Oil Cooler Stationary Head Leak; December 17, 2016
- 3954293; Bolt Stripped on Explosive Cover; December 17, 2016
- 3954476; 2B EDG Lessons Learned – DG Crankcase Lube Oil; December 18, 2016
- 3954488; 2B EDG Butterfly Valve Will Not Reset Properly; December 18, 2016
- 3954568; 2B DG Trip; December 19, 2016
- 3954569; 2B DG Trip; December 19, 2016

- 3955475; 2B DG and Output Breaker Trip; December 21, 2016
- 3955985; 2DG01KB PV-10 Check Valves Potentially Failed; December 22, 2016

Procedures:
- BwMP 3100-022A11; Power Cylinder Resolution Steps; Revision 6
- BwMP 3100-082; Diesel Generator 6 Year Inspection; Revision 30
- ER-AA-310-1004; Maintenance Rule – Performance Monitoring; Revision 13
- ER-AA-330-009; ASME Section XI Repair/Replacement Program; Revision 10
- MA-AA-716-001; Quality Material/Components Control and Identification/Segregation of Non-Conforming Items; Revision 8
- MA-AA-736-600; Torqueing and Tightening of Bolted Connections; Revision 3
- SM-AA-300-1002; Bill of Material Development and Right Parts Selection for Maintenance; Revision 7

Work Orders;
- 01699678; Minor Oil Leak at Quad Ring in Upper Oil Cooler for 2B EDG; December 14, 2016
- 01831852; 2DOF3AB – Repair Fuel Leak; December 15, 2016
- 01840920; Perform 2 Year Inspection of the 2B Diesel Generator; December 11, 2016
- 01841448; 2DG01EB Diesel Generator Exciter Inspection (2B EDG); December 19, 2016
- 01856165; 2B EDG 6 Year Inspection; December 12, 2016
- 01856429; Inspect Lube Oil Heat Exchanger; December 14, 2016

Engineering Evaluations/Engineering Change Requests:
- ECR 407974; Evaluate Higher Torque Value for Lube Oil Cooler Upper Stationary Flange Connection; March 7, 2013

Drawings and Prints:
- M-152, Sheet 10; Diesel Generator Fuel Oil Schematic; Revision I
- M-152, Sheet 14; Diesel Generator Jacket Water Schematic, Units 1 and 2; Revision V
- M-152, Sheet 19; Diagram of Cooling Water, Units 1 and 2; Revision F

Other:
- FW-09 Braidwood Unit 1; Provide Proper Feedwater Flow From CB System to Steam Generator
- MR Function Evaluation; Unit 0 VC1; November 30, 2014 to November 30, 2016

1R13 Maintenance Risk Assessments and Emergent Work Control

Procedures:
- ER-AA-600-1042; On-Line Risk Management; Revision 10
- OP-AA-108-117; Protected Equipment Program; Revision 4
- WC-AA-101; On-Line Work Control Process; Revision 26
- WC-AA-104; Integrated Risk Management; Revision 24

1R15 Operability Evaluations

Action Requests/Issue Reports:
- 2603954; Piping Downstream of 1RH2729A Has a Through Wall Leak; December 23, 2015
- 2705084; Gas Void Found in 1B RH Cold Leg; August 16, 2016
- 2716341: Gas Voids Found RH Cold Legs and SI Hot Legs; September 15, 2016
- 2716342; Known Gas Void at Line 2SI03BA; September 15, 2016
- 2725312; 1WE80B Leaking During PMT of 1RH8729A; October 6, 2016

- 2727486; IST Adverse Trend – 2CC01PA Pump Data Point; October 12, 2016
- 2729649; NRC Question on Leakage Impact to NUREG 0737 Requirements; October 18, 2016
- 2730560; 2CC01PA Seal Leak Getting Worse; October 20, 2016
- 2731087' Non-Conservatism in 3DFAC Analysis at Byron/Braidwood; October 21, 2016

Procedures:
- BwOP FC-1; Fuel Pool Cooling System Start Up; Revision 26
- BwOP FC-1; Fuel Pool Cooling System Shutdown; Revision 18
- BwOP FC-16; Startup and Shutdown of the U-2 Fuel Pool Cooling Purification Loop on the U-2 Fuel Pool Cooling System; Revision 9
- 1BwOA REFUEL-2; Refueling Cavity or Spent Fuel Pool Level Loss Unit 1; Revision 105
- OP-AA-102-103-1001; Operator Burden/Degraded Equipment Aggregate Assessment; Revision 6
- OP-AA-102-103-1001; Operator Burden/Degraded Equipment Aggregate Assessment; Revision 7
- OP-AA-102-103; Operator Work-Around Program CM-1; Revision 4

Evaluations:
- OP-AA-108-111; 2CC01PA, 2A Component Cooling Pump Inboard Pump Mechanical Seal Water Leakage; October 18, 2016

Drawings and Prints:
- M-61, Sheet 4; Diagram of Safety Injection Unit 1; Revision BF
- M-62, Sheet 1; Diagram of Residual Heat Removal Unit 1; Revision BR
- M-63, Sheet 1A; Diagram of Fuel Pool Cooling and Clean-Up; Revision BA
- M-63, Sheet 1B; Diagram of Fuel Pool Cooling and Clean-Up; Revision BG
- M-63, Sheet 1A; Diagram of Fuel Pool Cooling and Clean-Up; Revision BC
- M-65, Sheet 7; Diagram of Boric Acid Processing; Revision Y
- M-82, Sheet 1; Diagram of Auxiliary Building Equipment Drains; Revision AX

Other:
- Commonwealth Edison Letter to NRR; Byron/Braidwood System Leakage Monitoring; December 30, 1983
- Commonwealth Edison Initial Examination Summary Report; Braidwood Unit 1 Primary Coolant Sources Outside Containment; July 26, 1988
- Commonwealth Edison Letter to NRR; Braidwood Unit 1 TMI Item III.D.1.1 – Primary coolant Sources Outside Containment; September 29, 1988
- Exelon Letter to NRC; Response to NRC Request for Additional Information with Respect to Request for License Amendment Related to Application of Alternative Radiological Source Term; November 28, 2005
- NRC Letter to Exelon; Byron/Braidwood Issuance of Amendments RE: Alternative Source Term; September 8, 2006
- Compliance with Quality Assurance Topical Report Regarding the Identification of Significant Conditions Adverse to Quality

1R18 Plant Modifications

Action Requests/Issue Reports:
- 02710360; NRC Code Issue on CETC EDM Funnel Qualification Test Results; August 30, 2016
- 02710875; NRC Questions on CETC EDM Funnel Qualification Test Results; August 31, 2016

Electric Power Research Institute:
- Document 51-9251566-000; EPRI Independent Review of AREVA Inc.; March 21, 2016
- Report 3002002952; Materials Reliability Program: Study of New Mitigation Technique Effects on Nondestructive Evaluation Inspectability; November 2014
- Report 1025839; Technical Basis for PWSCC Mitigation by SSI, MRP-267 RI; July 2012
- Report 3002006654; PWSCC Mitigation by SSI, MRP-335 R2; August 2015
- Report 3002000656; Materials Reliability Program: Effects of Surface Peening on the Inspectability of Nondestructive Evaluation; November 2013

Other:
- AREVA Report 150-8086004-001; Special Process Qualification Record; Revision 1
- AREVA 51-9253305-001; Byron and Braidwood CETC EDM Process Metallurgical Examination Qualification Test Results; Revision 1
- AREVA 51-9253305-001; Byron and Braidwood CETC EDM Process Metallurgical Examination Qualification Test Results; Revision 2
- AREVA 51-9253304-001; Byron and Braidwood CETC EDM Process Metallurgical Examination Qualification Test Plan; March 14, 2016
- AREVA 51-9253304-005; Byron and Braidwood CETC EDM Process Metallurgical Examination Qualification Test Plan; September 29, 2016
- AREVA Report 51-8083161-000; Peening Process Parameter Development Summary for RV Head Applications; Revision 0
- AREVA Report 51-9251566-000; Evaluation of the Effect of Cavitation Peening on Ultrasonic Examination of Reactor Head Penetration Nozzles; Revision 0
- AREVA Report 150-9209044-000; Rotary Peening Qualification on Alloy 600 RPVHPN; Revision 0
- AREVA Report 51-8088838-000; AREVA UHP Cavitation Peening Testing with CETC Funnels; Revision 0
- AREVA Report 51-8094268-001; UHP Cavitation Peening Motion Profile Parameters Report; Revision 1
- AREVA Report 148-9208030-001; Special Process Specification (SPS) Rotopeen Qualification of Alloy 600 RPVHPN at Shearon Harris; Revision 1
- AREVA Report 149-9208900-001; Special Process Qualification Plan (SPQP) Rotopeen Qualification of Alloy 600 RPVHPN at Shearon Harris; Revision 1
- AREVA Letter; Qualitative Assessment of Effects of Rotary Peening on Ultrasonic Examination of RVCH Penetration Housings; August 24, 2016
- AREVA Report 38-8090959-000; Evaluation of the SCC Resistance of Highly Susceptible 600 MA Alloy Treated by Cavitation Peening; Revision 0
- NRC Letter; Final Safety Evaluation of the Electric Power Research Institute MRP-335, REVISION 3, “Materials Reliability Program: Topical Report for Primary Water Stress Corrosion Cracking Mitigation by Surface Stress Improvement (Peening)”; August 24, 2016

1R19 Post Maintenance Testing

Action Requests/Issue Reports:
- 0985201; A2R14LL – 2B MSIV Accumulator Press Drops When Valve Opens; October 28, 2009
- 2723422; 1B SX Pump New Impeller Discrepancy; October 3, 2016
- 2723542; 1B SX Pump Seal Lubricant Discrepancy; October 3, 2016
- 2724435; As-Found Inspection of the 1SX01PB; October 1, 2016
- 2726545; 1B SX Motor Stator Temperature T0647 “Bad Input”; October 10, 2016
- 2726625; OSP-A 1B SX Post Maintenance Run Seal Issue – 1SX01PB; October 11, 2016

- 2727058; Increase in 1B SX Pump HP – 1SX01PB-M; October 11, 2016
- 2727189; Documentation of 1B SX Pump IST Pump Evaluation; October 12, 2016
- 2727256; NRC Questions Regarding Work Package on 1SX-01PB; October 12, 2016
- 2728553; OSP-A 1A MSIV Active Accumulator Pressure Drop While Opening; October 15, 2016
- 2742525; IST Pump Evaluation Form Required – 2CC01PA; November 18, 2016

Procedures:
- BwMP 3215-001; Periodic Inspection and Repair of MSIV Actuators; Revision 22
- BwOP AF-7; Auxiliary Feedwater Pump B (Diesel) Startup on Recirculation; Revision 46
- 1BwOSR 3.7.2.1; Main Steam Isolation Valve Full Stroke Surveillance; Revision 17
- 1BwOSR 3.7.5.4-2; Diesel Driven Auxiliary Feedwater Pump Surveillance; Revision 21
- 1BwOSR 3.7.5.7-2; Train B Auxiliary Feedwater Flow Path Operability Non-Routine Surveillance (Following Cold Shutdown); Revision 4
- 1BwOSR 5.5.8.AF-3B; Group A IST Requirements for Unit One Diesel Driven Auxiliary Feedwater Pump; Revision 20
- 2BwOSR 5.5.8.CC-7A; Comprehensive Inservice Testing (IST) Requirements for Component Cooling Pump (2CC01PA) and Discharge Check Valves; Revisions 4 and 5
- 1BwOSR 5.5.8.SX-6B; Comprehensive Inservice Testing Requirements for 1B Essential Service Water Pump (1SX01PB); Revision 9
- 1BwOS TRM 2.7.a.1; Auxiliary Feedwater Diesel Prime Mover Performance Surveillance; Revision 7
- ER-AA-321; Administrative Requirement for Inservice Testing; Revision 12
- ER-AA-321, Revision 12, Attachment 4; IST Pump Evaluation Form, Report PP-SX-11; October 11, 2016
- ER-AA-321-1007; Inservice Testing (IST) Program Corporate Technical Positions; Revision 1
- ER-AA-330-009; ASME Section XI Repair/Replacement Program; Revision 10
- MA-AA-716-012; Post-Maintenance Testing; Revision 21

Work Orders:
- 01815801 02; IST-D&I-1AF014E – 1BwOSR 3.7.5.7-2 (Flow) and Leak Check; October 18, 2016
- 01826775 01; U1 AF Diesel Prime Mover Performance Surveillance; October 17, 2016
- 01832969 02; Perform 18 Month Inspection in Support of 1BwVS 7.1.2.3.C-1; October 18, 2016
- 01912895 02; Need Contingency WO for 1SX01PB Impeller Replacement; October 12, 2016
- 01960608 01 & 02; OSP-A 1A MSIV Active Accumulator Pressure Drop While Opening; October 21, 2016
- 01961548; 2CC01PA Seal Leak Getting Worse; December 14, 2016

Other:
- ASME OM Code, Subsection ISTB; Inservice Testing of Pumps in Light-Water Reactor Nuclear Power Plants; 2001 Edition
- Sulzer Pumps Inc. Letter; Braidwood Essential Service Water Pump – Impeller Dimensions; October 5, 2016
- PI-AA-125-1003; Apparent Cause Evaluation Charter; IR 02718519, Emergent Repair of 1SX01PB and 2SX01PA; Revision 3

1R20 Refueling and Other Outage Activities

Action Requests/Issue Reports:
- 2705092; CB&I NES-MS-04.1 Revision 7 Knowledge Gap Identified; August 11, 2016
- 2719907; The C Phase is Not Completely at 90 Degrees; September 26, 2016
- 2719908; OSP-A 1MS001A-A1 Replacement; September 26, 2016
- 2719932; Missed Scheduled PMT Due to Delay in Other Tasks; September 26, 2016
- 2720087; OSP-A 1B Bus Duct Cooling Damper Failed to Close on Fan S/D; September 26, 2016
- 2720116; Work Staging Areas Not in Compliance with MA-AA-716-026; September 16, 2016
- 2720157; OSP 1CV131 is Stuck at About Two-Thirds Open; September 26, 2016
- 2720298; OSP CCP Equip Tag 1CV03015S Found on Floor by NRC Inspector; September 26, 2016
- 2720469; Received Unexpected Alarm 2-21-D6 “125V DC Bus 211 Ground”; September 27, 2016
- 2720496; A1R19-LL Critical Path Impact (Polar Crane); September 27, 2016
- 2720563; A1R19LL – PBI for Div. 11 Switchgear Room for Feed Breakers GTD’s; September 26, 2016
- 2720565; A1R19LL – ATWS Testing Delays; September 27, 2016
- 2720600; 1A SX Cubicle Cooler Flow Gauge Stuck Low at 120 GPM; September 27, 2016
- 2719990; A1R19LL for Gas Void Monitoring of IMB Locations; September 26, 2016
- 2722157; 1SI8808D Time Stroke Closed Below Minim; September 30, 2016
- 2722165; Unit 2 Station Air Compressor Trip – 2SA01C; September 30, 2016
- 2722746; OSP 1SI881C Check Valve Body to Bonnet Leak; October 1, 2016
- 2722879; OSP 1AF058A and 1AF059A Failed Leak Test; October 1, 2016
- 2722930; Incorrect Size of Strainer Screen Installed in 1GS09MA; October 1, 2016
- 2723206; A1R19LL AF Pump Procedure Enhancement; October 2, 2016
- 2723199; OSP Rejectable Indications on CRDM Pen 69 Weld Buildup; October 2, 2016
- 2723318; PMT – Failure Unit 2 SAC Trip – High Speed Pinion Vibe Trip; October 3, 2016
- 2724435; As-Found Inspection of the 1SX01PB; October 1, 2016
- 2728012; OSP-A 1FI-WG055 Reads >5 GPM With 1WG021C Closed; October 14, 2016
- 2728035; OSP-X 1L-0180 RCP 1B Standpipe Level PMT Failed; October 14, 2016
- 2728039; OSP-A 1RY802B Air Leak at Diaphragm; October 14, 2016
- 2728276; A1R19LL NRC ID Procedure Enhancement; October 14, 2016
- 2728280; Feedwater Pipe 1FW03DC-16” Pipe Replacement Failed Ultrasonic Testing; October 14, 2016
- 2728286; OSP-A 1B Excitation Contactor Above Normal Operating Temp; October 14, 2016
- 2728327; A1R19LL Oden Pre-Testing of Molded Case Breakers; October 14, 2016
- 2728332; CT, Summary of A1R19 Equipment Deficiencies for Generator; October 14, 2016
- 2728335; CT Summary of A1R19 Equipment Deficiencies for Exciter; October 14, 2016
- 2728355; 1SI2018B Leaks by Seat During 1RH01SB Pressure Test; October 13, 2016
- 2728371; A1R19LL Oden Testing 600A MCC Feed Breakers; October 14, 2016
- 2728386; OSP-A 1SD002E Failed PMT Air Blowing From Solenoid; October 14, 2016
- 2728482; OSP-A Portable Turbo TOC Purifier Won’t Develop Press/Flow; October 15, 2016
- 2728494; BwOP RY-3 Needs Change; October 15, 2016
- 2728509; Fatigue Assessment/Waiver; October 15, 2016
- 2728516; A1R19 – Question Charpy V-Notch Test for New Material 1FW03DC; October 15, 2016
- 2728528; OSP-A Request 1HD101C Limit Switch Adjustment (1ZS-HD101C-B; October 15, 2016

- 2728529; OSP-A Closed Limit Switch Adjustment Requested (1ZS-HD121B-b); October 15, 2016
- 2728535; PM Identified Decline in CFAM Points for September; October 15, 2016
- 2728536; Gland Water Vibrations Excessive; October 15, 2016
- 2728541; Loss of Lip Seal Material During Peening of CETC; October 15, 2016
- 2728546; Chemistry Employee Injury From Fall; October 15, 2016
- 2728553; OSP 1A MSIV Active Accumulator Pressure Drop While Opening; October 15, 2016
- 2728581; OSP-A PMT Failed WO 1847535-02 1CV190; October 15, 2016
- 2728621; OSP Unexpected Alarm – FW Pump Turb Bearing Oil High Temp; October 16, 2016
- 2728629; Engineering Outage Plan Gap; October 16, 2016
- 2728653; OSP Failed PMT – 1CW097B Tripped After Moving Approximately 10 Percent; October 16, 2016
- 2728654; A1R19LL-Create Procedure for AFW Pump Motor Uncoupled Run; October 16, 2016
- 2728655; OSP Failed PMT – 1CW096D Tripped After Moving Approximately 90 Percent; October 16, 2016
- 2728656; OSP Failed PMT – 1CW096C Tripped After Moving Approximately 10 Percent; October 16, 2016
- 2728657; OSP Failed PMT – 1CW04FC-B Dual Indication; October 16, 2016
- 2728663; 1CV8385A & 1CV8386A Need to be Replaced ASAP; October 16, 2016
- 2728675; New EHC Panel has the Field Wiring on Wrong Terminal Points; October 16, 2016
- 2728679; OSP Main Turbine Zero Speed Alarm Toggling (1PS-TO046); October 16, 2016
- 2728681; Security – Evaluate Adding Language to SY-BR-101-116; October 16, 2016
- 2728736; U1 Voltage Regulator Cal. Data OOT; October 15, 2016
- 2728742; Incorrect Weld Procedure Used on 1FW03DC Piping; October 15, 2016
- 2728744; OSP Transmitter 1PT-VP205A Failed to Calibrate; October 16, 2016
- 2728752; Good Catch – THU 7300 Test Switch Position; October 16, 2016
- 2728576; 1FP450 Failed its As-Found Pop Test; October 16, 2016
- 2728757; OSP Dual Indication for 1FW039B (IST Valve); October 16, 2016
- 2728760; Standards Team Walkdown Observation; October 16, 2016
- 2728762; OSP Steam Leak Preventing Gap of #8 BRG. VIB. Probe U1 Turbine; October 16, 2016
- 2728810; PCRA – 1BwOSR 3.4.11.2; October 16, 2016
- 2728815; Key Core Needs to be Updated for 1SX173 in 1BwOS XLE-R1; October 17, 2016
- 2728823; Security Patrol Vehicle Struck in the Parking Lot; October 16, 2016
- 2728835; 1AR0221 for 1D MS Line Spiked to 14 MR/HR and Remains There; October 17, 2016
- 2728847; Unit 1 ETA Port-O-Feed Containment has Debris in it; October 17, 2016
- 2728854; 1AF Diesel Cranking Speed Recorder Inoperable; October 17, 2016
- 2728864; Locked in Alarm After Return to Service; October 17, 2016
- 2728866; 1B CD Pump Oil Cooler Weeps Water and Oil – 1CD05AB; October 17, 2016
- 2729098; Employee Injured Hand While Working on Ultra High Pressure Pump; October 17, 2016

Procedures:
- 1BwOA PRI-10; Loss of RH Cooling; Revision 10
- 1BwOA REFUEL-2; Refueling Cavity of Spent Fuel Pool Level Loss; Revision 105
- 1BwOS TRM 2.5.b.1; Containment Loose Debris Inspection; Revision 14
- 1BwOS XPC-W1; Containment Penetration Status Weekly Surveillance; Revision 24
- LS-AA-119; Fatigue Management and Work Hour Limits; Revision 12
- LS-AA-119; 10 CFR 26 Work Hour Limits Waiver; Revision 12

- OU-AP-104; Shutdown Safety Management Program Byron/Braidwood Annex; Revision 22
- SA-AA-115; Work at Heights Procedure; Revision 14

Other:
- 1B RH Pump Designated Protected for Shutdown Cooling; September 25, 2016
- A1R19 Outage BT-3-4; September 26, 2016
- A1R19 Unit 1 SAT 142-1 and 142-1 Protection for Power Feed; September 25, 2016
- SFP Time to Boil Comp Measures with Temp Power Supplying 1FC01P; September 25, 2016
- 1A SI Protected at the Makeup Train; September 25, 2016
- A1R19 Overview Schedule (By Day); September 25 through October 20, 2016
- A1R19 Protected Equipment Summary; September 27, 2016
- A1R19 Restart Review PORC; October 21, 2016
- A1R19 Pre-outage Approval Shutdown Safety Review Board; September 23, 2016; Revision 23
- A1R19 2 Month Readiness Review; July 14, 2016
- A1R19 Containment Closure Plan; August 17, 2016
- Braidwood Unit-1 (A1R19) Readiness Challenge Review RVCH Cavitation Peening; August 31, 2016
- Radiography to be Conducted Wednesday October 19, 2016, Requires Certain Areas Be Vacated
- Braidwood A1R19 Outage Standards Team Report
- Event Issue Report – IR 2723199; PT Indications on Unit 1 CRDM Penetration 69 Seal Weld Repair
- Braidwood HU Alert; Negative Trend in Use of Human Performance Verification Tools – IRs 2721008 & 2721064
- Braidwood HU Alert; Worker Exceeded RWP Accumulated Dose Limits Resulting in an Accumulated Dose Alarm – IR 2723898; October 4, 2016

1R22 Surveillance Testing

Action Requests/Issue Reports:
- 2731293; Missed Procedure Steps in SSPS Surveillance; October 22, 2016
- 3947040; Problem with RCS Leak Rate Surveillance 1/2BWOSR 3.4.13.1; November 29, 2016

Procedures:
- ER-AP-331-1003; RCS Leakage Monitoring and Action Plan; Revision 9
- 1BwOS TRM 3.1.k.1; DRPI Operability Verification Prior to and During Rod Drop Testing Daily Surveillance; Revision 6
- BwISR 3.1.4.3.a; Rod Drop Time (Automatic); Revision 9
- BwVS 500-6; Low Power Physics Test Program; Revision 41
- 2BwOSR 3.4.13.1; Unit Two Reactor Coolant System Water Inventory Balance Surveillance; Revision 36

Work Orders:
- 01826671; Low Power Physics Test Program with Dynamic Rod Worth Measure; October 25, 2016
- 01826774; Special Test Exceptions Rod Position Indication System Daily; October 24, 2016
- 01831268; Automatic Rod Drop Time; October 25 - 26, 2016

Drawings and Prints:
- A-333; Containment Building Basement Floor Plan Area 1; Revision X
- A-701; Plumbing Containment Building Flow Diagram; Revision 7

- M-65; Sheet 2A, Diagram of Boric Acid Processing Units 1 & 2; Revision BA
- M-65; Sheet 2B, Diagram of Boric Acid Processing Units 1 & 2; Revision BA
- M-135, Sheet 6; Diagram of Reactor Coolant Unit 2; Revision AD
- M-135, Sheet 7; Diagram of Reactor Coolant Boundary Leak Detection System; Revision S
- M-138, Sheet 4B; Diagram of Chemical & Volume Control & Boron Thermal Regeneration Unit 2; Revision BJ
- M-138, Sheet 5B; Diagram of Chemical & Volume Control & Boron Thermal Regeneration Unit 2; Revision G
- M-141, Diagram of Reactor Building Containment Equipment Drains & Vents to Rad Waste; Revision AP
- S-1066; Containment Building Sections and Details; Revision M

1EP4 Emergency Action Level and Emergency Plan Changes

Procedures:
- EP-AA-1000; Exelon Nuclear Standardized Radiological Emergency Plan; Revisions 27 and 28
- EP-AA-1001; Addendum 3, Emergency Action Levels for Braidwood Station; Revisions 0 and 1

Other:
- Evaluation 15-06; 50.54(q) Evaluation and Effectiveness Review, LAR—Training Frequency; June 19, 2015
- Evaluation 16-022; 50.54(g) Evaluation and Effectiveness Review, EALs for Braidwood Station; February 1, 2016
- License Amendment Request to Adopt Emergency Action Level Schemes Pursuant to NEI 99-01; Revision 6, “Development of Emergency Action Levels for Non-Passive Reactors”

1EP6 Drill Evaluation

Procedures:
- EP-AA-1000; Exelon Nuclear Standardized Radiological Emergency Plan; Revision 28
- EP-AA-1001; Exelon Nuclear Emergency Action Levels for Braidwood Station; Addendum 3, Revision 2
- EP-AA-1001; Exelon Nuclear Radiological Emergency Plan Annex for Braidwood Station; Revision 33
- EP-AA-111; Emergency Classification and Protective Action Recommendations; Revision 19
- EP-AA-112-100; Control Room Operations; Revision 14
- EP-AA-122; Drills and Exercise Program; Revision 18
- EP-AA-125-1002; ERO Performance – Performance Indicator Guidance; Revision 12
- EP-MW-114-100; Midwest Region Off-Site Notifications; Revision 16

2RS1 Radiological Hazard Assessment and Exposure Controls

Action Requests/Issue Reports:
- 2725157; Personal Contamination Event During Installation of Diaphragms on A/D Steam Generator Platforms; October 6, 2016
- 2723898; Worker Received an Accumulated Dose Alarm Working on 1RC8042A Valve Replacement Inside the Missile Barrier; October 4, 2016
- 02724313; Emerging Trend – Rad Worker Practice Events Were Identified During the Outage; October 5, 2016

- 2724407; RCA Boundary Challenged by a Contaminated Laser Pointer on a Lanyard as the Individual Exited the RCA; October 5, 2016
- 2703875; RW Filter Liner Shipment Work was Discontinued Because Higher than Expected Dose Rate Encountered; August 12, 2016
- 2724590; Week One of EOS Observation Roll Up by Radiation Protection; October 5, 2016

Radiation Work Permits (RWPs):
- 1BW-01-16-00701; Steam Generator Bowl Drains Install and Remove; Revision 0
- 1BW-01-16-00534; A1R19 Reactor Head Peening Task 5 – Emergent Entries Under Reactor Head; Revision 0
- 1BW-01-16-00702; Steam Generator Support; Revision 0
- 1BW-01-16-00703; Task 1- Steam Generator Platform Set-Up/Teardown and Decontamination; Task 2 – Steam Generator Equipment and Staging Activities; Revision 0
- 1BW-01-16-00704; Steam Generator Install/Remove Nozzle Covers; Revision 0
- 1BW-01-16-00705; Steam Generator Eddy Current Testing and Tube Repair; Revision 0
- 1BW-01-16-00401; Radiography Activities; Revision 0
- 1BW-01-16-00710; Steam Generator Manway/ Diaphragms Works and Bolt Cleaning; Revision 0
- 1BW-01-16-00708; Steam Generator Secondary Side Pre Heater FOSAR Inspections; Revision 0
- 1BW-01-16-00534; Task 2 – Rx Head Peening with No Under-Head Work; Task 3- Head Peening RP and Decontamination Support; Revision 0
- 1BW-01-16-00534; Task 5 – Rx Head Emergent Under-Head Entry; Revision 0
- 1BW-01-16-00534; Task 4 – Rx Head CETC EDM Scalloping; Revision 0

Procedures:
- RP-AA-201; Dosimetry Issue, Usage and Control; Revision 26
- RP-AA-350; Personnel Contamination Monitoring, Decontamination and Reporting; Revision 12
- RP-AA-401-1002; Radiological Risk Management; Revision 8
- RP-AA-401-1003; Contamination Control Best Practice Application; Revision 3
- RP-AA-403; Administration of the Radiation Work Permit Program; Revision 8
- RP-AA-441; Methodology for Estimating Airborne Radioactivity Based Upon Contamination Levels and Work Activities; Revision 6
- RP-AA-460; Controls for High and Locked High Radiation Areas; Revision 29
- RP-AA-460-001; Controls for Very High Radiation Areas; Revision 6
- RP-AA-460-002; Additional High Radiation Exposure Control; Revision 3
- RP-AA-461; Radiological Controls for Contaminated Water Diving Operations; Revision 7
- RP-AA-462; Controls for Radiographic Operations; Revision 11

Other:
- Team Industrial Services IEMA License IL-01136-01; Radiography License for NDE Work Activities
- RP-AA-800-001; National Source Tracking System 2016 Annual Inventory Reconciliation 2B.127
- 2016 Annual Inventory Reconciliation Report; NSTS Notification of 2016 Submission Acknowledgement ID 5851; License No. NPF-72

2RS2 Occupational ALARA Planning and Controls

ALARA Plans:
- ALARA PLAN; RWP-1BW-01-16-00701; Steam Generator Bowl Drains Install and Remove; Revision 21
- ALARA PLAN; RWP-1BW-01-16-00534; A1R19 Reactor Head Peening Task 5 – Emergent Entries Under Reactor Head; Revision 21
- ALARA PLAN; RWP-1BW-01-16-00702; Steam Generator Support; Revision 21
- ALARA PLAN; RWP-1BW-01-16-00703; Task 1- Steam Generator Platform Set-Up/Teardown and Decontamination; Task 2 – Steam Generator Equipment and Staging Activities; Revision 21
- ALARA PLAN; RWP-1BW-01-16-00704; Steam Generator Install/Remove Nozzle Covers; Revision 21
- ALARA PLAN; RWP-1BW-01-16-00705; Steam Generator Eddy Current Testing and Tube Repair; Revision 21
- ALARA PLAN; RWP-1BW-01-16-00401; Radiography Activities; Revision 21
- ALARA PLAN; RWP-1BW-01-16-00710; Steam Generator Manway/ Diaphragms Works and Bolt Cleaning; Revision 21
- ALARA PLAN; RWP-1BW-01-16-00708; Steam Generator Secondary Side Pre Heater FOSAR Inspections; Revision 21
- ALARA PLAN; RWP-1BW-01-16-00534; Task 2 – Rx Head Peening with No Under-Head Work; Task 3- Head Peening RP and Decontamination Support; Revision 21
- ALARA PLAN; RWP-1BW-01-16-00534; Task 5 – Rx Head Emergent Under-Head Entry; Revision 21

Procedures:
- RP-AA-400; ALARA Program; Revision 13
- RP-AA-400-1007; Elevated Dose Rate Response Planning; Revision 3
- RP-AA-401; Operational ALARA Planning and Controls; Revision 21

4OA1 Performance Indicator Verification

Procedures:
- LS-AA-2001; Collecting and Reporting of NRC Performance Indicator Data; Revision 14

4OA2 Problem Identification and Resolution

Action Requests/Issue Reports:
- 2677205; Degraded Sample Flow 0PR05J; June 3, 2016
- 2678005; 2AR022J 2C SG: No Pulses and Failed Check Source; June 6, 2016
- 2679384; 2PR21J Does Not Pass it's Vacuum Switch Test; June 8, 2016
- 2680485; 2AR13J VCT Area Rad Monitor Failing High; June 11, 2016
- 2680855; 0PR26J Iodine Channel Failed Check Source; June 13, 2016
- 2681591; 1PR27J Flow Switch Sticks (1FS-PR159); June 15, 2016
- 2681595; 0PR05J Loss of Sample Flow; June 15, 2016
- 2681891; 0PR31J – Operate Failure; June 15, 2016
- 2682050; 0PR42J Driving MCR Alarms During Heavy Rains; June 15, 2016
- 2682324; 1RE-PR006 Unexpected Alarm – Rm-11; June 16, 2016
- 2682555; Received Unexpected RM-11 Alarm; June 16, 2016
- 2683097; 1PR13J – Loss of Flow Alarm; June 18, 2016
- 2683108; 1RE-AR022D Hi Rad Alarm; June 18, 2016
- 2685434; 0PR60J Rad Skid in Alarm; June 24, 2016
- 2685823; 2RE-AR023B Received Unexpected RM-11 Alarm; June 26, 2016

- 2686350; 1AR11J Has a New Failure Mode – 1RT-AR011; June 27, 2016
- 2687153; Rad Monitor 0PR26J Source Check Failed; June 29, 2016
- 2688587; Received Unexpected RM-11 Alarm – 0PR14J; July 2, 2016
- 2688591; Received Unexpected RM-11 Alarm – 2PR30J; July 2, 2016
- 2689430; Cooling Fan on Sample Pump Motor 1PR09J Broke; July 6, 2016
- 2690557; Communications Activity Will Not Clear; July 8, 2016
- 2690988; Unexpected RM-11 Alarm and Annunciator 0-34-E8; July 10, 2016
- 2691003; 0PR14J Not Alarming When “High Pressure” Condition Exists; July 10, 2016
- 2691488; Radiation Monitor Communication Loop 5A is Degraded; July 11, 2016
- 2692411; 2RE-AR024A High Voltage Power Supply; July 13, 2016
- 2693195; TSC Rad Monitor Hi Alarm on Particulate Channel; July 15, 2016
- 2693751; 1PR09J Sample Pump Seized; July 18, 2016
- 2695473; Received Unexpected RM-11 Alarm – 1PR27J; July 21, 2016
- 2696163; 2AR022J Failed Automatic Check Source; July 24, 2016
- 2696485; 0PR05J Low Flow Issues Continue; July 25, 2016
- 2698047; 0PR42J Driving MCR Alarms During Heavy Rains; July 28, 2016
- 2698513; 1{R09J Not Starting After Repair/Troubleshooting; July 29, 2016
- 2699071; 1RE-AR022D Apparent Stuck C/S; August 1, 2016
- 2699099; Area Radiation Monitor Spike (2RE-AR025A); August 1, 2016
- 2699380; Degraded Sample Flow Trends for 0PR10J; August 1, 2016
- 2701911; 0PR26J Auto Check Source Failed; August 8, 2016
- 2700916; Low Flow on 0PR05J Following RTS; August 4, 2016
- 2701020; Unexpected RM-11 Alarm: 2RE-AR023B; August 5, 2016
- 2701618; 2PR13J Sample Pump Will Not Start; August 6, 2016
- 2702043; 0PR24J Failed Auto Check Source; August 8, 2016
- 2703216; 0PR05J Has Low Flow; August 11, 2016
- 2703527; 2AR022J Failed Automatic and Manual Check; August 11, 2016
- 2703606; 0RT-PR002 Communications Activity Will Not Clear; August 12, 2016
- 2703927; Update Background Counts for 0RE-PR002A WO 1783045-01; August 12, 2016
- 2704086; Unexpected RM-11 Alarm 0PR15J; August 13, 2016
- 2707620; 1PR27J Bringing in Alert Alarms; August 23, 2016
- 2708284; 0PR42J Causing MCR Alarms During Heavy Rains; August 25, 2016
- 2709373; 0PR42J in Alarm Due to Rain; August 28, 2016
- 2710085; 0RT-PR025 is Not Working; August 30, 2016
- 2714515; 1AR22J Spiked to a Reading of 24 MR/HR and Remains There; September 11, 2016
- 2716327; Status Cues Not flashing on RM-11 During Testing; September 15, 2016
- 2717539; 0PR12J Pump is Shaking and Noisy; September 19, 2016
- 2717631; Failed Channel on 1PR17J; September 20, 2016
- 2718512; 0AR068J High Rad Alarm Spiking; September 21, 2016
- 2719248; 2PR01J Channel Status Cue Does Not Flash; September 23, 2016
- 2719486; 0PR33J Gas Channel Check Source Test Failure; September 23, 2016
- 2719836; 2AR011J U2 Containment FH ICDT Rad Monitor Spike High; September 25, 2016
- 2720235; 0PR26J Auto Check Source Failed; September 26, 2016
- 2720244; 0PR24J Failed Auto C/S; September 26, 2016
- 2722783; Level 2 Clearance and Tagging Error During A1R19 (Subsequent MRC Investigation); October 1, 2016
- 2723209; High Radiation Alarms on 1PR21J; October 2, 2016
- 2723218; 0PR10J High Rad Alarm Spike Causes Early Release Termination; October 2, 2016
- 2723314; 2PR21J Multiple High Rad Spikes; October 3, 2016
- 2723861; U2 Containment Vent Isolation Alarm From 2AR11J Spike; October 4, 2016

- 2724775; Unexpected Alarm, SWMP Trouble – 0PR42J; October 6, 2016
- 2728835; 1AR022J for 1D MS Line Spiked to 24 MR/HR and Remains There; October 17, 2016
- 2730260; OSP-X 1RE-PR011B (1PR11 Gas Channel) Reading 0.00+00; October 20, 2016
- 2731205; 0AR066J Monitor Communications Failure; October 22, 2016
- 2731308; 1AR022J for 1C MS Line Spiked to 5 MR/HR and Remains There; October 22; 2016
- 2731409; 1AR022J for 1D MS Line Failed Checksource; October 23, 2016
- 2731529; 1AR22J 'A' Detector Loss of Pulses; October 23, 2016
- 2732506; 0AR068J High Rad Alarm Spiking; October 25, 2016
- 2732631; -PR31J Iodine Channel Failed Check Source; October 26, 2016
- 2734865; 0PR38J Iodine Channel Failed Auto and Manual Check Source; October 31, 2016
- 2735033; 0PR24J Failed Auto Check Source; October 31, 2016
- 2736344; MCR Distraction – Sewage Waste Monitoring Alarms; November 2, 2016
- 2736839; 1PR01J Channel Status Cue Does Not Flash; November 3, 2016
- 2737605; RM11 Communication Loop 5A is Degraded; November 5, 2016
- 2738457; 1PR17J Gas Channel Erratic Output (1RE-PR017B); November 8, 2016
- 2738793; 1PR17J Loss of Sample Flow; November 8, 2016
- 2739865; Unexpected Alarm 2-5-C7 Containment Vent Isolation; November 11, 2016
- 2739983; 0PR40J Iodine Channel Failed Check Source Test; November 11, 2016
- 2740589; 0PR31J Gas Channel Spiking (0RE-PR031B); November 13, 2016
- 2741032; 2AR11J Spiked to ~300MR/HR for About 1 Second U2 VQ Isolation; November 14, 2016
- 2741411; Unexpected Annunciator – 1RE-AR023A; November 15, 2016
- 2741654; 2AR11J Value Rising Faster Than 2AR12J; November 16, 2016
- 2741661; 0RE-AR045 (0RT-AR068) Spiking (Drumming Station Rad Monitor); November 16, 2016
- 2741839; Unexpected Annunciator – 0RE-PR-24C; November 19, 2016
- 2742188; INT ABB Maintenance: 1PR11J Will Not Clear Poll Counts; November 17, 2016
- 2742379; Unexpected RM-11 Alarm – 0RE-PR060A; November 17, 2016
- 3946027; 0A VC Absorber Did Not Go On Line During Rad Spike; November 27, 2016
- 3946028; Spike on 0PR31J; November 27, 2016
- 3946444; MCR Distraction – Sewage Waste Monitoring Alarms; November 18, 2016
- 3947920; 2PR011J Communications Issue (COMM Loop 5) December 1, 2016
- 3949123; Unexpected 1PR27J Alert Alarm; December 4, 2016
- 3949924; High Rad and Interlock Light Lit – 2RT-PR021; December 6, 2016
- 3949935; 2R-PR030 Check Source Values Below Reference Values; December 6, 2016
- 3951125; 2AR011J Spiked to 124 MR/HR for 10 Seconds Causing U2 VQ Isolation; December 9, 2016
- 3952124; Unexpected Alarm: 2PR27J Loss of Sample Flow; December 12, 2016
- 3953229; 2AR11J Spike Caused U2 Containment Vent Isolation Alarm; December 15, 2016
- 3953770; -PR34J Failing With No MCR Alarm Received; December 16, 2016
- 3954437; Received Unexpected RM-11 Alarm and Annunciator 0-34-E8; December 18, 2016
- 3954868; 2AR11J Declared Inoperable Due to Diverging and Spiking Ind.; December 19, 2016
- 3956242; Received Unexpected RM-11 Alarm – 2PR30J; December 23, 2016

Work Orders:
- 01916868; 0PR31J Gas Channel Spiking (0RE-PR031B); December 2, 2016

Other:
- Root Cause Investigation Report (IR 2722783); Level 2 Clearance and Tagging Error During A1R19; Revision 3

- Records Matrix 2016-12; January 3, 2017

4OA3 Event Followup

Action Requests/Issue Reports:
- 2635702; CDBI – Question on AF Diesel Air Intake; March 4, 2016

Other:
- ACE 2635702; AF Diesel Intake Design Deficiency Related to Turbine Building HELB; March 4, 2016
- NRC 10 CFR 50.73 Licensee Event Report System; December 2, 2015\EA-15-005; LaSalle Station Unresolved Item Closure Inspection Report 05000373/2015010; 05000374/2015010 and Exercise of Enforcement Discretion; November 4, 2015

LIST OF ACRONYMS USED

ADAMS	Agencywide Document Access Management System
AFW	Auxiliary Feedwater
ALARA	As-Low-As-Is-Reasonably-Achievable
AOP	Abnormal Operating Procedure
ASME	American Society of Mechanical Engineers
BA	Boric Acid
CAP	Corrective Action Program
CDBI	Component Design Bases Inspection
CFR	*Code of Federal Regulations*
CVCS	Chemical Volume Control System
EAL	Emergency Action Levels
EC	Engineering Change
EDG	Emergency Diesel Generator
EPRI	Electric Power Research Institute
ET	Eddy Current Testing
FW	Feedwater
IMC	Inspection Manual Chapter
IP	Inspection Procedure
IR	Inspection Report
IR	Issue Report
ISI	Inservice Inspection
LER	Licensee Event Report
NCV	Non-Cited Violation
NDE	Non-Destructive Examination
NRC	U.S. Nuclear Regulatory Commission
OSP	Outage Safety Plan
OWA	Operator Workaround
PARS	Publicly Available Records System
PI	Performance Indicator
PMT	Post-Maintenance Testing
PWSCC	Primary Water Stress Corrosion Cracking
RCE	Root Cause Evaluation
RCS	Reactor Coolant System
RFO	Refueling Outage
RWP	Radiation Work Permit
SDP	Significance Determination Process
SG	Steam Generator
SSC	System, Structure, and Component
SX	Essential Service Water
TC	Thermocouple
TS	Technical Specification
UFSAR	Updated Final Safety Analysis Report
UT	Ultrasonic Examination
VC	Main Control Room Ventilation System
WO	Work Order

Letter to Bryan C. Hanson from Eric Duncan dated January 27, 2017

SUBJECT: BRAIDWOOD STATION, UNITS 1 AND 2—NRC INTEGRATED INSPECTION REPORT 05000456/2016004; 05000457/2016004; AND EMERGENCY PREPAREDNESS PROGRAM 05000456/2016501; 05000457/2016501

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