



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**

REGION III
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February 14, 2018

Mr. Mark Bezilla
Site Vice President
FirstEnergy Nuclear Operating Company
Davis-Besse Nuclear Power Station
5501 North State Route 2
Oak Harbor, OH 43449-9760

**SUBJECT: DAVIS-BESSE NUCLEAR POWER STATION—NRC INTEGRATED INSPECTION
REPORT 05000346/2017004 AND EMERGENCY PREPAREDNESS ANNUAL
INSPECTION REPORT 05000346/2017501**

Dear Mr. Bezilla:

On December 31, 2017, the U.S. Nuclear Regulatory Commission (NRC) completed an integrated inspection at your Davis-Besse Nuclear Power Station and the U.S. Nuclear Regulatory Commission also completed its annual inspection of the Emergency Preparedness Program. This inspection began on January 1, 2017, and the issuance of this letter closes Inspection Report 05000346/2017501.

On January 11, 2018, the NRC inspectors discussed the results of this inspection with yourself and other members of your staff. On February 12, 2018, the inspectors discussed, with you and members of the plant staff, changes in the inspection results. The results of this inspection are documented in the enclosed report.

Based on the results of this inspection, the NRC has identified two issues that were evaluated under the risk significance determination process as having very low safety significance (green). The NRC has also determined that one violation is associated with these issues. Because the licensee initiated condition reports to address this issue, the violation is being treated as a Non-Cited Violation (NCV), consistent with Section 2.3.2 of the Enforcement Policy. These issues are described in the subject inspection report. The enclosed report also documents the closure of a cited violation of very low safety significance.

Additionally, section 4OA2.5c of the enclosed report discusses a finding with an associated apparent violation for which the NRC has not reached a preliminary significance determination. This finding involved the apparent failure of the licensee to provide appropriate instructions to maintain an adequate amount of oil in the auxiliary feedwater turbine bearing oil sumps, resulting in the failure of an auxiliary feedwater pump. Since the NRC has not made a final determination in this matter, a Notice of Violation is not being issued for these inspection findings at this time. In addition, please be advised that the characterization of the apparent violation described in the enclosed inspection report may change as a result of further NRC review.

If you contest the violation or significance of the NCV, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001, with copies to the Regional Administrator, Region III; the Director, Office of Enforcement; and the NRC Resident Inspector at the Davis-Besse Nuclear Power Station.

If you disagree with the cross-cutting aspect assignment or a finding not associated with a regulatory requirement 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 U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies the Regional Administrator, Region III; and the NRC Resident Inspector at the Davis-Besse Nuclear Power Station.

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

Sincerely,

/RA/

Jamnes L. Cameron, Chief
Branch 4
Division of Reactor Projects

Docket No. 50-346
License No. NPF-3

Enclosure:
IR 05000346/2017004; 05000346/2017501

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Letter to Mark Bezilla from Jamnes Cameron dated February 14, 2018

SUBJECT: DAVIS-BESSE NUCLEAR POWER STATION—NRC INTEGRATED INSPECTION REPORT 05000346/2017004 AND EMERGENCY PREPAREDNESS ANNUAL INSPECTION REPORT 05000346/2017501

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U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket No: 50-346
License No: NPF-3

Report No: 05000346/2017004; 05000346/2017501

Licensee: FirstEnergy Nuclear Operating Company (FENOC)

Facility: Davis-Besse Nuclear Power Station

Location: Oak Harbor, OH

Dates: October 1 through December 31, 2017

Inspectors: D. Mills, Senior Resident Inspector
J. Beavers, Acting Resident Inspector
M. Bielby, Senior Operations Engineer
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Approved by: J. Cameron, Chief
Branch 4
Division of Reactor Projects

Enclosure

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SUMMARY

Inspection Report 05000346/2017004; 05000346/2017501; 10/1/17–12/31/17; Davis-Besse Nuclear Power Station; Radioactive Gaseous and Liquid Effluent Treatment, Identification and Resolution of Problems.

This report covers a three-month period of inspection by resident inspectors and announced baseline inspections by regional inspectors. Two Green findings were identified by the inspectors. One finding involved Non-Cited Violations (NCV) of the U.S. Nuclear Regulatory Commission (NRC) requirements. Additionally, one Apparent Violation was identified with significance to be determined, and one open Cited Violation is closed in this report. The significance of inspection findings is indicated by their color (i.e., greater than Green, or Green, White, Yellow, Red) and determined using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process," dated April 29, 2015. Cross-cutting aspects are determined using IMC 0310, "Aspects Within the Cross-Cutting Areas," dated December 4, 2014. All violations of NRC requirements are dispositioned in accordance with the NRC's Enforcement Policy, dated November 1, 2016. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG–1649, "Reactor Oversight Process," Revision 6.

Cornerstone: Mitigating Systems

Green. The inspectors identified a finding of very low safety significance for the licensee's failure to document a degraded condition of a safety-related system in the corrective action program (CAP), as required by licensee procedure, NOP–LP–2001. Specifically, during planned maintenance on auxiliary feedwater pump turbine (AFPT) 1, the licensee identified scoring on the outboard turbine bearing and failed to generate a condition report detailing the issue. The licensee entered this issue into the CAP as condition report (CR) 2017–12487 for evaluation.

The inspectors determined the performance deficiency was more than minor because if left uncorrected it had the potential to lead to a more significant safety concern. Specifically, the failure to document a degraded condition in the CAP did not allow the organization to properly assess the issue. Therefore, the underlying cause may not have been appropriately addressed. Using IMC 0609, Attachment 4, "Initial Characterization of Findings," issued October 7, 2016, and Appendix G, Attachment 1, "Shutdown Operations Significance Determination Process Phase 1 Initial Screening and Characterization of Findings," issued May 9, 2014, the inspectors determined the finding to be of very low safety significance (Green) because the inspectors answered no to all questions in Exhibit 3 of Appendix G, Attachment 1. The inspectors determined this finding affected the cross-cutting aspect of identification in the area of Problem Identification and Resolution, where the organization implements a corrective action program with a low threshold for identifying issues and individuals identify issues completely, accurately, and in a timely manner in accordance with the program. Specifically, the licensee failed to completely identify the degraded condition, resulting in the failure to document the issue. [P.2] (Section 4OA2)

To Be Determined. A self-revealed finding with an Apparent Violation (AV) of Title 10 of the *Code of Federal Regulations* (CFR) Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," and an associated violation of technical specification (TS) 3.7.5, "Emergency Feedwater (EFW)," was identified on September 13, 2017, due to the licensee's apparent failure to prescribe appropriate work instructions for an activity

affecting quality of the safety-related auxiliary feedwater (AFW) system. Specifically, the licensee apparently did not provide appropriate instructions to maintain an adequate amount of oil in the AFW turbine bearing oil sumps, resulting in the failure of AFW 1 on September 13, 2017. The licensee entered this issue into the CAP as CR-2017-09443 and CR-2017-09857, immediately replaced the damaged bearing, and updated the lubrication manual data sheets to include sight glass marking dimensions per vendor guidance.

The apparent performance deficiency was determined to be more than minor because the finding was associated with the Mitigating Systems cornerstone attribute of equipment performance and potentially adversely affected the cornerstone objective of ensuring the availability, capability and reliability of equipment that respond to initiating events. Specifically, the apparent performance deficiency resulted in the failure of the AFW 1. Using IMC 0609, Attachment 4, "Initial Characterization of Findings," and IMC 0609 Appendix A, "The Significance Determination Process for Findings at Power," issued June 19, 2012, the finding was screened against the mitigating systems cornerstone. The inspectors determined the finding represented an apparent actual loss of function of at least a single train for greater than its technical specification allowed outage time. Therefore, a detailed risk evaluation will be performed by a regional senior reactor analyst. Because the safety characterization of this finding is not yet finalized, it is being documented with a significance of to be determined (TBD). The inspectors determined this finding affected the cross-cutting aspect of challenge the unknown in the area of Human Performance, where individuals stop when faced with uncertain conditions. Risks are evaluated and managed before proceeding. Specifically, licensee personnel apparently did not stop when faced with uncertain conditions in the preventive maintenance procedure for replacing the AFPT sight glasses. Although the replacement of the AFPT 1 inboard bearing sight glass occurred in 1997, the licensee had the opportunity to challenge the lack of detail in the work instructions in late 2014 when the AFPT 2 outboard bearing sight glass was replaced. [H.11] (Section 4OA2)

Cornerstone: Public Radiation Safety

Green. The inspectors identified a finding of very-low safety significance and an associated NCV of Technical Specification 5.4.1 for the failure to maintain procedures for station vent releases during planned scenarios. Specifically, the inspectors identified multiple procedures that were not updated when the station vent monitors were replaced in 2014. This issue has been entered into the licensee's Corrective Action Program as CR-2017-10817. Corrective actions taken included the issuance of a Standing Order for collecting samples during accident conditions, provided "Just-In-Time" training for chemistry technicians, and revision of the outdated procedures.

The performance deficiency was determined to be more-than-minor in accordance with Inspection Manual Chapter 0612, Appendix B, "Issue Screening." Specifically, if left uncorrected, the performance deficiency had the potential to lead to a more significant safety concern in that the failure to maintain procedures to collect station vent samples under all predicted conditions could result in the inability to measure the amount of gaseous radioactivity leaving the plant and to ensure adequate protection of public health and safety from exposure to radioactive materials released into the public domain as a result of routine civilian nuclear reactor operation. The finding was assessed using Inspection Manual Chapter 0609 Appendix D, "Public Radiation Safety Significance Determination Process," and was determined to be of very-low safety significance

because the issue involved radioactive effluent releases, but did not: (1) represent a substantial failure to implement the Radioactive Effluent Release Program; or (2) result in public exposure that exceeded the dose values in Appendix I to 10 CFR, Part 50, and/or 10 CFR, Part 20.1301(e) limits. The inspectors determined that the finding had a cross-cutting component in the area of Human Performance, in the aspect of Work Management: specifically, the organization did not implement a process of planning, controlling, and executing work activities such that nuclear safety is the overriding priority. [H.5] (Section 2RS6)

REPORT DETAILS

Summary of Plant Status

The unit began the inspection period operating at full power. With the exception of small power maneuvers (e.g., reductions of 5 percent power or less) to facilitate planned evolutions and testing, the unit operated at or near full power for the entire inspection period.

1. REACTOR SAFETY

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

1R01 Adverse Weather Protection (71111.01)

.1 Winter Seasonal Readiness Preparations

a. Inspection Scope

The inspectors conducted a review of the licensee's preparations for winter conditions to verify that the plant's design features and implementation of procedures were sufficient to protect mitigating systems from the effects of adverse weather. Documentation for selected risk-significant systems was reviewed to ensure that these systems would remain functional when challenged by inclement weather. During the inspection, the inspectors focused on plant specific design features and the licensee's procedures used to mitigate or respond to adverse weather conditions. Additionally, the inspectors reviewed the Updated Safety Analysis Report (USAR) and performance requirements for systems selected for inspection, and verified that operator actions were appropriate as specified by plant specific procedures. Cold weather protection, such as heat tracing and area heaters, was verified to be in operation where applicable. The inspectors also reviewed CAP items to verify that the licensee was identifying adverse weather issues at an appropriate threshold and entering them into their CAP in accordance with station corrective action procedures. Documents reviewed are listed in the Attachment to this report. The inspectors' reviews focused specifically on the following plant systems due to their risk significance or susceptibility to cold weather issues:

- service water building;
- borated water storage tank; and
- emergency feedwater facility.

This inspection constituted one winter seasonal readiness preparations sample as defined in Inspection Procedure (IP) 71111.01–05.

b. Findings

No findings were identified.

.2 External Flooding

a. Inspection Scope

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 USAR 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 that barriers required to mitigate the flood were in place and operable. Additionally, the inspectors performed a walkdown of the protected area to identify any modification 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 for mitigating the design basis flood to ensure it could be implemented as written. Documents reviewed are listed in the Attachment to this report.

This inspection constituted one external flooding sample as defined in IP 71111.01–05.

b. Findings

No findings were identified.

1R04 Equipment Alignment (71111.04)

.1 Quarterly Partial System Walkdowns

a. Inspection Scope

The inspectors performed partial system walkdowns of the following risk-significant systems:

- station black-out diesel system concurrent with auxiliary feed pump 2 maintenance during the week ending October 28, 2017;
- emergency diesel generator systems 1 and 2 concurrent with air receiver and compressor outages during the week ending November 11, 2017; and
- service water system during the week ending November 25, 2017.

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, USAR, Technical Specification (TS) requirements, outstanding work orders (WOs), condition reports (CRs), 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 corrective action program (CAP) with the appropriate significance characterization. Documents reviewed are listed in the Attachment to this report.

These activities constituted three partial system walkdown samples as defined in IP 71111.04–05.

b. Findings

No findings were identified.

1R05 Fire Protection (71111.05)

.1 Routine Resident Inspector Tours (71111.05Q)

a. Inspection Scope

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

- service building 6, Laydown Area, during testing of the station blackout diesel during the week ending October 28, 2017;
- spent fuel pool corridor, storage to fuel handling area, fuel handling building, and fuel handling ventilation exhaust unit room during the week ending October 28, 2017;
- emergency diesel generator 1–1 and 1–2 rooms during the week ending November 11, 2017; and
- containment building 565', 585', and 603' during the week ending November 18, 2017.

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.

Using the documents listed in the Attachment to this report, 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.

Documents reviewed are listed in the Attachment to this report.

These activities constituted four quarterly fire protection inspection samples as defined in IP 71111.05–05.

b. Findings

No findings were identified.

.2 Annual Fire Protection Drill Observation (71111.05A)

a. Inspection Scope

On December 13, 2017 the inspectors observed a fire brigade drill activation to fight a simulated fire on the 603 level of the auxiliary boiler room. Based on this observation, the inspectors evaluated the readiness of the plant fire brigade to fight fires. The inspectors verified that the licensee staff identified deficiencies, openly discussed them in a self-critical manner at the drill debrief, and took appropriate corrective actions. Specific attributes evaluated were:

- proper wearing of turnout gear and self-contained breathing apparatus;
- proper use and layout of fire hoses;
- employment of appropriate firefighting techniques;
- sufficient firefighting equipment brought to the scene;
- effectiveness of fire brigade leader communications, command, and control;
- search for victims and propagation of the fire into other plant areas;
- smoke removal operations;
- utilization of pre-planned strategies;
- adherence to the pre-planned drill scenario; and
- drill objectives.

Documents reviewed are listed in the Attachment to this report.

These activities constituted one annual fire protection inspection sample as defined in IP 71111.05–05.

b. Findings

No findings were identified.

1R06 Flooding (71111.06)

.1 Internal Flooding

a. Inspection Scope

The inspectors reviewed selected risk important plant design features and licensee procedures intended to protect the plant and its safety-related equipment from internal flooding events. The inspectors reviewed flood analyses and design documents, including the USAR, engineering calculations, and abnormal operating procedures to identify licensee commitments. The specific documents reviewed are listed in the Attachment to this report. In addition, the inspectors reviewed licensee drawings to identify areas and equipment that may be affected by internal flooding caused by the failure or misalignment of nearby sources of water, such as the fire suppression or the circulating water systems. The inspectors also reviewed the licensee's corrective action documents with respect to past flood-related items identified in the corrective action program to verify the adequacy of the corrective actions. The inspectors performed a walkdown of the following plant area(s) to verify drains and sumps were clear of debris and were operable, and that the licensee complied with its commitments:

- main condenser pit with the main feed pumps and motor driven feed pump, and ventilation openings to auxiliary feedwater pump rooms, door openings to switchgear rooms, and pathways to the service water tunnel that could be impacted by a circulating water system expansion joint failure during the week ending October 28, 2017; and
- service water intake structure and tunnel during the week ending November 25, 2017.

Documents reviewed during this inspection are listed in the Attachment to this report. This inspection constituted two internal flooding sample as defined in IP 71111.06–05.

b. Findings

No findings were identified.

1R11 Licensed Operator Regualification Program (71111.11)

.1 Resident Inspector Quarterly Review of Licensed Operator Regualification (71111.11Q)

a. Inspection Scope

On 10/10/2017 and 11/22/2017, the inspectors observed crews of licensed operators in the plant's simulator during licensed operator regualification training. 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. The inspectors evaluated the following areas:

- licensed operator performance;
- crew's clarity and formality of communications;
- ability to take timely actions in the conservative direction;
- prioritization, interpretation, and verification of annunciator alarms;
- correct use and implementation of abnormal and emergency procedures;
- control board manipulations;
- oversight and direction from supervisors; and
- ability 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. Documents reviewed are listed in the Attachment to this report.

This inspection constituted two quarterly licensed operator regualification program simulator samples as defined in IP 71111.11–05 and the sample completed on 11/22/2017 satisfied the inspection program requirement for the resident inspectors to observe a portion of an in-progress annual regualification operating test during a training cycle in which it was not observed by the NRC during the biennial portion of this IP.

b. Findings

No findings were identified.

.2 Resident Inspector Quarterly Observation During Periods of Heightened Activity or Risk (71111.11Q)

a. Inspection Scope

On 12/03/2017, the inspectors observed a reactor power reduction from 100 percent to 95 percent and subsequent control rod drive testing. This was an activity that required heightened awareness or was related to increased risk. The inspectors evaluated the following areas:

- licensed operator performance;
- crew's clarity and formality of communications;
- ability to take timely actions in the conservative direction;
- prioritization, interpretation, and verification of annunciator alarms (if applicable);
- correct use and implementation of procedures;
- control board (or equipment) manipulations;
- oversight and direction from supervisors; and
- ability to identify and implement appropriate TS actions and Emergency Plan actions and notifications (if applicable).

The performance in these areas was compared to pre-established operator action expectations, procedural compliance and task completion requirements. Documents reviewed are listed in the Attachment to this report.

This inspection constituted one quarterly licensed operator heightened activity/risk sample as defined in IP 71111.11-05.

b. Findings

No findings were identified.

.3 Annual Operating Test Results (71111.11A)

a. Inspection Scope

The inspector reviewed the overall pass/fail results of the Annual Operating Test, administered by the licensee from October 18 through December 14, 2017, required by 10 CFR 55.59(a). The results were compared to the thresholds established in Inspection Manual Chapter 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. (02.02)

This inspection constituted one annual licensed operator requalification examination results sample as defined in Inspection Procedure 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:

- Gamma Metrics Channel 1 Wide Range Neutron Flux Monitor irregularities during the week ending December 30, 2017;
- Unit 2 Startup Transformer Deluge System during the weeks ending December 23 and December 30, 2017;
- pinched wiring causing the failure of fuses Y210 and Y214 during the week ending August 12, 2017; and
- AFWT 1 bearing failure during the week ending September 16, 2017.

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 structures, systems, and components (SSCs)/functions classified as (a)(2), or appropriate and adequate goals and corrective actions for systems classified as (a)(1).

This inspection constituted four quarterly maintenance effectiveness samples 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:

- reactor protection system channel 1 emergent maintenance concurrent with emergency diesel generator 2 outage during the week ending November 4, 2017; and
- decay heat removal system leak concurrent with Unit 1 start-up transformer outage during the week ending December 16, 2017.

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.

Documents reviewed during this inspection are listed in the Attachment to this report. These maintenance risk assessments and emergent work control activities constituted two samples as defined in IP 71111.13–05.

b. Findings

No findings were identified.

1R15 Operability Determinations and Functional Assessments (71111.15)

.1 Operability Evaluations

a. Inspection Scope

The inspectors reviewed the following issues:

- the operability and functionality of the service water pump motors and onsite AC system following installation of a refurbished service water pump motor and the discovery of a calculation error as documented CR 2017–01330 during the week ending December 23, 2017;
- the operability and functionality of EDG 1 following a roof leak and spurious alarm indications as documented in CR 2017–10360 during the week ending October 14, 2017;
- the operability and functionality of AFPs 1 and 2 following discovery of incorrectly marked outboard turbine bearing oil sight glasses as documented in CR 2017–10646 and CR 2017–10663 during the week ending October 28, 2017; and
- the operability and functionality of decay heat removal system Train 1 following discovery of discharge isolation valve leak by as documented in CR 2017–12158 and a paint chip in an oil sample as documented by CR 2017–12188, during the week ending December 16, 2017.

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 TS and USAR 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 determined, where appropriate, compliance with bounding limitations associated with the evaluations. Additionally, the inspectors reviewed a sampling of corrective action documents to verify that the licensee was identifying and correcting any deficiencies associated with operability evaluations. Documents reviewed are listed in the Attachment to this report.

This operability inspection constituted four samples as defined in IP 71111.15–05.

b. Findings

No findings were identified.

1R18 Plant Modifications (71111.18)

.1 Plant Modifications

a. Inspection Scope

The inspectors reviewed the following modification:

- emergency feedwater facility heating and ventilation modifications as documented in engineering change package (ECP) 17–0097.

The inspectors reviewed the configuration changes and associated 10 CFR 50.59 safety evaluation screening against the design basis, the USAR, and the TS, as applicable, to verify that the modification did not affect the operability or availability of the affected system(s). The inspectors, as applicable, observed ongoing and completed work activities to ensure that the modifications were installed as directed and consistent with the design control documents; the modifications operated as expected; post-modification testing adequately demonstrated continued system operability, availability, and reliability; and that operation of the modifications did not impact the operability of any interfacing systems. As applicable, the inspectors verified that relevant procedure, design, and licensing documents were properly updated. Lastly, the inspectors discussed the plant modification with operations, engineering, and training personnel to ensure that the individuals were aware of how the operation with the plant modification in place could impact overall plant performance. Documents reviewed are listed in the Attachment to this report.

This inspection constituted one permanent plant modification sample as defined in IP 71111.18–05.

b. Findings

No findings were identified.

1R19 Post-Maintenance Testing (71111.19)

.1 Post-Maintenance Testing

a. Inspection Scope

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

- makeup pump 1 following scheduled maintenance activities, during the week ending October 21, 2017;
- emergency ventilation system 1 following scheduled maintenance activities, during the week ending October 21, 2017;
- AFP 2 following scheduled preventive maintenance activities, during the week ending October 28, 2017;
- EDG 2 following 2-year preventive maintenance, during the week ending November 11, 2017;
- BD transformer outage relay 87/XBD cyber security controls, during the week ending December 2, 2017;
- AFP 2 following scheduled maintenance activities, during the week ending 12/9; and
- decay heat pump number 1 following maintenance performed on discharge check valve during the week ending 12/16.

These activities were selected based upon the structure, system, or component'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 Part 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 post-maintenance tests 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. Documents reviewed are listed in the Attachment to this report.

This inspection constituted seven post-maintenance testing samples as defined in IP 71111.19-05.

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:

- offsite AC sources testing during the week ending December 16, 2017;
- reactor coolant system water inventory balance testing during the weeks ending August 19, 2017 through December 31, 2017;
- diverse scram system channel 1 and 2 functional tests during the week ending November 4, 2017;
- EDG 2 184 day test during the week ending November 4, 2017;
- containment personnel and emergency airlocks seal leakage test and daily inspection and containment closeout inspection during the week ending November 18, 2017; and
- AFP 1 monthly test during the week ending October 13, 2017 and quarterly test during the week ending December 8, 2017.

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

- did preconditioning occur;
- the effects of the testing were adequately addressed by control room personnel or engineers prior to the commencement of the testing;
- acceptance criteria were clearly stated, demonstrated operational readiness, and were consistent with the system design basis;
- plant equipment calibration was correct, accurate, and properly documented;
- as-left setpoints were within required ranges; and the calibration frequency was in accordance with TSs, the USAR, procedures, and applicable commitments;
- measuring and test equipment calibration was current;
- test equipment was used within the required range and accuracy; applicable prerequisites described in the test procedures were satisfied;
- test frequencies met TS requirements to demonstrate operability and reliability; tests were performed in accordance with the test procedures and other applicable procedures; jumpers and lifted leads were controlled and restored where used;
- test data and results were accurate, complete, within limits, and valid;
- test equipment was removed after testing;
- where applicable for inservice testing activities, testing was performed in accordance with the applicable version of Section XI, American Society of Mechanical Engineers code, and reference values were consistent with the system design basis;
- where applicable, test results not meeting acceptance criteria were addressed with an adequate operability evaluation or the system or component was declared inoperable;

- where applicable for safety-related instrument control surveillance tests, reference setting data were accurately incorporated in the test procedure;
- where applicable, actual conditions encountering high resistance electrical contacts were such that the intended safety function could still be accomplished;
- prior procedure changes had not provided an opportunity to identify problems encountered during the performance of the surveillance or calibration test;
- equipment was returned to a position or status required to support the performance of its safety functions; and
- all problems identified during the testing were appropriately documented and dispositioned in the CAP.

Documents reviewed are listed in the Attachment to this report.

This inspection constituted six routine surveillance tests 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 regional 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 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. The specific documents reviewed during this inspection are listed in the Attachment to this report.

This EAL and Emergency Plan Change inspection constituted one sample as defined in Inspection Procedure 71114.04–06.

b. Findings

No findings were identified.

1EP6 Drill Evaluation (71114.06)

.1 Emergency Preparedness Drill Observation

a. Inspection Scope

The inspectors evaluated the conduct of a routine licensee emergency drill on October 10, 2017, to identify any weaknesses and deficiencies in classification, notification, and protective action recommendation development activities. The

inspectors observed emergency response operations in the simulator and technical support center to determine whether the event classification, notifications, and protective action recommendations were performed in accordance with procedures. The inspectors also attended the licensee drill critique to compare any inspector-observed weakness with those identified by the licensee staff in order to evaluate the critique and to verify whether the licensee staff was properly identifying weaknesses and entering them into the corrective action program. As part of the inspection, the inspectors reviewed the drill package and other documents listed in the Attachment to this report.

This emergency preparedness drill inspection constituted one sample as defined in IP 71114.06–05.

b. Findings

No findings were identified.

.2 Training Observation

a. Inspection Scope

The inspector observed a simulator training evolution for licensed operators on October 10, 2017, which required emergency plan implementation by a licensee operations crew. This evolution was planned to be evaluated and included in performance indicator data regarding drill and exercise performance. The inspectors observed event classification and notification activities performed by the crew. The inspectors also attended the post-evolution critique for the scenario. The focus of the inspectors' activities was to note any weaknesses and deficiencies in the crew's performance and ensure that the licensee evaluators noted the same issues and entered them into the corrective action program. As part of the inspection, the inspectors reviewed the scenario package and other documents listed in the Attachment to this report.

This inspection of the licensee's training evolution with emergency preparedness drill aspects constituted one sample as defined in IP 71114.06–05.

b. Findings

No findings were identified.

2. RADIATION SAFETY

2RS5 Radiation Monitoring Instrumentation (71124.05)

.1 Walkdowns and Observations (02.02)

a. Inspection Scope

The inspectors assessed select portable survey instruments that were available for use for current calibration and source check stickers, and instrument material condition and operability.

The inspectors observed licensee staff demonstrate performance checks of various types of portable survey instruments. The inspectors assessed whether high-range instruments responded to radiation on all appropriate scales.

The inspectors walked down area radiation monitors and continuous air monitors to determine whether they were appropriately positioned relative to the radiation sources or areas they were intended to monitor. The inspectors compared monitor response with actual area conditions for selected monitors.

The inspectors assessed the functional checks for select personnel contamination monitors, portal monitors, and small article monitors to verify they were performed in accordance with the manufacturer's recommendations and licensee procedures.

These inspection activities constituted one complete sample as defined in Inspection Procedure (IP) 71124.05–05.

b. Findings

No findings were identified.

.2 Calibration and Testing Program (02.03)

a. Inspection Scope

The inspectors assessed laboratory analytical instruments used for radiological analyses to determine whether daily performance checks and calibration data indicated that the frequency of the calibrations was adequate and there were no indications of degraded instrument performance. The inspectors assessed whether appropriate corrective actions were implemented in response to indications of degraded instrument performance.

The inspectors reviewed the methods and sources used to perform whole body count functional checks before daily use and assessed whether check sources were appropriate and aligned with the plant's isotopic mix. The inspectors reviewed whole body count calibration records since the last inspection and evaluated whether calibration sources were representative of the plant source term and that appropriate calibration phantoms were used. The inspectors looked for anomalous results or other indications of instrument performance problems.

Inspectors reviewed select containment high-range monitor calibration and assessed whether an electronic calibration was completed for all range decades, with at least one decade at or below 10 rem/hour calibrated using an appropriate radiation source, and calibration acceptance criteria was reasonable.

The inspectors reviewed select monitors used to survey personnel and equipment for unrestricted release to assess whether the alarm setpoints were reasonable under the circumstances to ensure that licensed material was not released from the site. The inspectors reviewed the calibration documentation for each instrument selected and discussed the calibration methods with the licensee to determine consistency with the manufacturer's recommendations.

The inspectors reviewed calibration documentation for select portable survey instruments, area radiation monitors, and air samplers. The inspectors reviewed detector measurement geometry and calibration methods for portable survey instruments and area radiation monitors calibrated on-site and observed the licensee demonstrate use of the instrument calibrator. The inspectors assessed whether appropriate corrective actions were taken for instruments that failed performance checks or were found significantly out of calibration, and that the licensee had evaluated the possible consequences of instrument use since the last successful calibration or performance check.

The inspectors reviewed the current output values for instrument calibrators. The inspectors assessed whether the licensee periodically measured calibrator output over the range of the instruments used with measuring devices that have been calibrated by a facility using National Institute of Standards and Technology traceable sources and corrective factors for these measuring devices were properly applied in its output verification.

The inspectors reviewed the licensee's 10 CFR Part 61, "Licensing Requirements for Land Disposal of Radioactive Waste," source term to assess whether calibration sources used were representative of the types and energies of radiation encountered in the plant.

These inspection activities constituted one complete sample as defined in IP 71124.05-05.

b. Findings

No findings were identified.

.3 Problem Identification and Resolution (02.04)

a. Inspection Scope

The inspectors evaluated whether problems associated with radiation monitoring instrumentation were being identified by the licensee at an appropriate threshold and were properly addressed for resolution. The inspectors assessed the appropriateness of the corrective actions for a selected sample of problems documented by the licensee that involve radiation monitoring instrumentation.

These inspection activities constituted one complete sample as defined in IP 71124.05-05.

b. Findings

No findings were identified.

2RS6 Radioactive Gaseous and Liquid Effluent Treatment (71124.06)

.1 Walkdowns and Observations (02.02)

a. Inspection Scope

The inspectors walked down select effluent radiation monitoring systems to evaluate whether the monitor configurations aligned with Offsite Dose Calculation Manual (ODCM) descriptions and to observe the material condition of the systems.

The inspectors walked down selected components of the gaseous and liquid discharge systems to evaluate whether equipment configuration and flow paths align with plant documentation and to assess equipment material condition. The inspectors also assessed whether there were potential unmonitored release points, building alterations which could impact effluent controls, and ventilation system leakage that communicated directly with the environment.

For equipment or areas associated with the systems selected for review that were not readily accessible, the inspectors reviewed the licensee's material condition surveillance records.

The inspectors walked down filtered ventilation systems to assess for conditions such as degraded high-efficiency particulate air /charcoal banks, improper alignment, or system installation issues that would impact the performance or the effluent monitoring capability of the effluent system.

As available, the inspectors observed selected portions of the routine processing and discharge of radioactive gaseous effluent to evaluate whether appropriate treatment equipment was used and the processing activities aligned with discharge permits.

The inspectors determined if the licensee has made significant changes to their effluent release points.

As available, the inspectors observed selected portions of the routine processing and discharging of liquid waste to determine if appropriate effluent treatment equipment was being used and that radioactive liquid waste was being processed and discharged in accordance with procedure requirements and aligned with discharge permits.

These inspection activities constituted one complete sample as defined in IP 71124.06–05.

b. Findings

No findings were identified.

.2 Calibration and Testing Program (02.03)

a. Inspection Scope

The inspectors reviewed calibration and functional tests for select effluent monitors to evaluate whether they were performed consistent with the ODCM. The inspectors assessed whether National Institute of Standards and Technology traceable sources

were used, primary calibration represented the plant nuclide mix, secondary calibrations verified the primary calibration, and calibration encompassed the alarm set points.

The inspectors assessed whether effluent monitor alarm set points were established as provided in the ODCM and procedures.

The inspectors evaluated the basis for changes to effluent monitor alarm set points.

These inspection activities constituted one complete sample as defined in IP 71124.06–05.

b. Findings

No findings were identified.

.3 Sampling and Analyses (02.04)

a. Inspection Scope

The inspectors reviewed select effluent sampling activities and assessed whether adequate controls had been implemented to ensure representative samples were obtained.

The inspectors reviewed select effluent discharges made with inoperable effluent radiation monitors and assess whether controls were in place to ensure compensatory sampling was performed consistent with the ODCM and that those controls were adequate to prevent the release of unmonitored effluents.

The inspectors determined whether the facility was routinely relying on the use of compensatory sampling in lieu of adequate system maintenance.

The inspectors reviewed the results of the Inter-Laboratory Comparison Program to evaluate the quality of the radioactive effluent sample analyses and assessed whether the Inter-Laboratory Comparison Program included hard-to-detect isotopes as appropriate.

These inspection activities constituted one complete sample as defined in IP 71124.06–05.

b. Findings

No findings were identified.

.4 Instrumentation and Equipment (02.05)

a. Inspection Scope

The inspectors reviewed the methodology used to determine the effluent stack and vent flow rates to determine if the flow rates were consistent with plant documentation, and that differences between assumed and actual stack and vent flow rates did not affect the results of the projected public doses.

The inspectors assessed whether surveillance test results for Technical Specification (TS) required ventilation effluent discharge systems met TS acceptance criteria.

The inspectors assessed calibration and availability for select effluent monitors used for triggering emergency action levels or for determining protective action recommendations.

These inspection activities constituted one complete sample as defined in IP 71124.06–05.

b. Findings

The inspectors identified two issues of concern during this inspection activity; the first resulted in a finding and violation of the NRC requirements and the second required more information to determine if a performance deficiency existed. Each are described below.

(1) Failure to Maintain Procedures for Station Vent Releases Under All Conditions

Introduction: The inspectors identified a finding of very-low safety significance (Green) and an associated NCV of TS 5.4.1 for the failure to maintain procedures for station vent releases during planned scenarios. Specifically, the inspectors identified multiple procedures that were not updated when the station vent monitors were replaced in 2014.

Description: The licensee replaced the normal range and accident range station vent monitors in 2014 with ECP 04–0006, “Replace Kaman Radiation Monitors.” The replacement monitors were manufactured by a different company than the original monitors and included different hardware for controlling the sample flow through the monitors.

Station vent sampling is required by TS 5.5.3.a and 5.5.3.c and Table 3–1, as well as Radioactive Gaseous Effluent Monitoring Instrumentation Items 4a, 4b, 4c, and 4e of the ODCM. The licensee maintained surveillance test procedure DB–CN–03008, “Station Vent Releases, Weekly Radiological Monitoring, Sampling, and Analysis of RE4598AA,” Revision 15, for normal routine sample collection from the station vent monitor. However, the licensee also had other active procedures for collecting samples from the station vent that were not updated with the new equipment used to monitor releases from the station vent. Specifically, the inspectors identified the following procedures could not be used with the equipment installed in 2014:

- DB–CN–12001: Station Vent Releases, Noble Gas Activity, RE 4598 Inoperable; Revision 2;
- DB–CN–12006: Station Vent Releases, Particulate and Iodine Samplers Inoperable; Revision 3;
- DB–CN–12007: Station Vent Releases, Samplers Flow Rate Measuring Device Inoperable; Revision 2; and
- DB–CH–06012: Accident Range Station Vent Monitor Operation; Revision 1.

The process used by the licensee for the identification and revision of documents supporting the design change was in licensee procedure NOP–CC–2004, “Design Interface Reviews and Evaluations.” This process identified that these four procedures were required to support the installation of the new monitors and were “Required to be issued concurrent with the change package.” However, a few weeks later, the priority of

the procedure change requests was revised to, "Later – can be completed when responsible organization deems appropriate." It appears that the change did not receive review or concurrence from design engineering installing the modification, operations implementing the modification, or any other group or individual within the organization.

Analysis: The inspectors determined that the failure to maintain procedures for ventilation air monitoring was an issue of concern. Because the inspectors concluded that this activity was within the licensee's ability to foresee and should have been prevented, it was a performance deficiency.

The performance deficiency was determined to be more-than-minor in accordance with Inspection Manual Chapter 0612, Appendix B, "Issue Screening." Specifically, if left uncorrected, the performance deficiency had the potential to lead to a more significant safety concern; in that the failure to maintain procedures to collect station vent samples under all predicted conditions could result in the inability to measure the amount of gaseous radioactivity leaving the plant and to ensure adequate protection of public health and safety from exposure to radioactive materials released into the public domain as a result of routine civilian nuclear reactor operation.

The finding was assessed using Inspection Manual Chapter 0609 Appendix D, "Public Radiation Safety Significance Determination Process," the finding was determined to be of very-low safety significance (Green) because the issue involved radioactive effluent releases, but did not: (1) represent a substantial failure to implement the Radioactive Effluent Release Program; or (2) result in public exposure that exceeded the dose values in Appendix I to 10 CFR Part 50, and/or 10 CFR 20.1301(e) limits.

The inspectors determined that the finding had a cross-cutting component in the area of Human Performance, in the aspect of Work Management: specifically, the organization did not implement a process of planning, controlling, and executing work activities such that nuclear safety is the overriding priority. (H.5).

Enforcement: The TS 5.4.1 requires, in part, that the licensee shall establish, implement, and maintain applicable procedures recommended in Regulatory Guide 1.33, Revision 2, Appendix A. The inspectors identified that Section 7.c of Appendix A recommends procedures for ventilation air monitoring for Pressurized Water Reactor Gaseous Effluent Systems.

Contrary to the above, from April 22, 2014, and ongoing through interim exit on October 27, 2017, the licensee did not maintain the procedures for ventilation air monitoring with the new gaseous effluent monitors. Corrective actions taken included the issuance of a Standing Order for collecting samples during accident conditions, provided "just-in-time" training for chemistry technicians, and revision of the outdated procedures. Because this violation was of very-low safety significance (Green) and was entered into the licensee's CAP as CR-2017-10817, this violation is being treated as a NCV consistent with Section 2.3.2 of the NRC Enforcement Policy. **(NCV 05000346/2017004-01, Failure to Maintain Procedures Associated with Ventilation Air Monitoring)**

(2) Interface Between New Accident Range Ventilation Monitors and the Emergency Preparedness Dose Assessment Program

Introduction: During inspection activities associated with the accident range station vent monitor, the inspectors identified an unresolved item (URI) associated with the interface between the monitor and the Dose Assessment Program used to project dose to members of the public during potential accident conditions.

Description: The licensee replaced the accident range station vent monitors in 2014 using ECP 04-0006, "Replace Kaman Radiation Monitors." The replacement monitors were manufactured by a different company than the original monitors, had different detection capabilities, different system calibration, and different computer hardware to convert detector output into usable information.

The licensee could not immediately provide specifics regarding the interface between the new accident range monitors and the program used during accident conditions for providing dose projections and the resulting protective action recommendations. The inspectors focus of concern was how the new accident range monitors accounted for the potentially rapidly changing mixture of radioactive gases during the early phase of a postulated accident. Consequently, this issue remains under review by the NRC awaiting for additional information from the licensee to verify the new monitor interface to determine if it represents a performance deficiency and is categorized as a URI.
(URI 05000346/2017004-03, Interface Between New Accident Range Ventilation Monitors and the Emergency Preparedness Dose Assessment Program)

.5 Dose Calculations (02.06)

a. Inspection Scope

The inspectors reviewed significant changes in reported dose values compared to the previous radiological effluent release report to evaluate the factors which may have resulted in the change.

The inspectors reviewed radioactive liquid and gaseous waste discharge permits to assess whether the projected doses to members of the public were accurate.

Inspectors evaluated the isotopes that are included in the source term to assess whether analysis methods were sufficient to satisfy detectability standards. The review included the current Part 61 analyses to ensure hard-to-detect radionuclides are included in the source term.

The inspectors reviewed changes in the licensee's offsite dose calculations to evaluate whether changes were consistent with the ODCM and Regulatory Guide 1.109. Inspectors reviewed meteorological dispersion and deposition factors used in the ODCM and effluent dose calculations to evaluate whether appropriate factors were being used for public dose calculations.

The inspectors reviewed the latest Land Use Census to assess whether changes have been factored into the dose calculations.

For select radioactive waste discharges, the inspectors evaluated whether the calculated doses were within the 10 CFR Part 50, Appendix I, and TS dose criteria.

The inspectors reviewed select records of abnormal radioactive waste discharges to ensure the discharge was monitored by the discharge point effluent monitor. Discharges made with inoperable effluent radiation monitors, or unmonitored leakages were reviewed to ensure that an evaluation was made to account for the source term and projected doses to the public.

These inspection activities constituted one complete sample as defined in IP 71124.06–05.

b. Findings

No findings were identified.

.6 Problem Identification and Resolution (02.07)

a. Inspection Scope

Inspectors assessed whether problems associated with the Effluent Monitoring and Control Program were being identified by the licensee at an appropriate threshold and were properly addressed for resolution. In addition, they evaluated the appropriateness of the corrective actions for a selected sample of problems documented by the licensee involving radiation monitoring and exposure controls.

These inspection activities constituted one complete sample as defined in IP 71124.06–05.

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

40A1 Performance Indicator Verification (71151)

.1 Mitigating Systems Performance Index—Heat Removal System

a. Inspection Scope

The inspectors sampled licensee submittals for the Mitigating Systems Performance Index (MSPI) - Heat Removal System performance indicator for the fourth quarter of 2016 through the third quarter of 2017. To determine the accuracy of the performance indicator (PI) data reported during those periods, PI definitions and guidance contained in the Nuclear Energy Institute (NEI) Document 99–02, “Regulatory Assessment Performance Indicator Guideline,” Revision 7, dated August 31, 2013, were used. The inspectors reviewed the licensee’s operator narrative logs, issue reports, event reports, MSPI derivation reports, and NRC Integrated Inspection Reports for the period of the fourth quarter of 2016 through the third quarter of 2017 to validate the accuracy of the submittals. The inspectors reviewed the MSPI component risk coefficient to determine if it had changed by more than 25 percent in value since the previous inspection, and if so,

that the change was in accordance with applicable NEI guidance. The inspectors also reviewed the licensee's issue report database to determine if any problems had been identified with the PI data collected or transmitted for this indicator and none were identified. Documents reviewed are listed in the Attachment to this report.

This inspection constituted one MSPI heat removal system sample as defined in IP 71151-05.

b. Findings

No findings were identified.

.2 Mitigating Systems Performance Index—Residual Heat Removal System

a. Inspection Scope

The inspectors sampled licensee submittals for the Mitigating Systems Performance Index - Residual Heat Removal System performance indicator for the fourth quarter of 2016 through the third quarter of 2017. To determine the accuracy of the PI data reported during those periods, PI definitions and guidance contained in the NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 7, dated August 31, 2013, were used. The inspectors reviewed the licensee's operator narrative logs, issue reports, MSPI derivation reports, event reports and NRC Integrated Inspection Reports for the period of the fourth quarter of 2016 through the third quarter of 2017 to validate the accuracy of the submittals. The inspectors reviewed the MSPI component risk coefficient to determine if it had changed by more than 25 percent in value since the previous inspection, and if so, that the change was in accordance with applicable NEI guidance. The inspectors also reviewed the licensee's issue report database to determine if any problems had been identified with the PI data collected or transmitted for this indicator and none were identified. Documents reviewed are listed in the Attachment to this report.

This inspection constituted one MSPI residual heat removal system sample as defined in IP 71151-05.

b. Findings

No findings were identified.

.3 Mitigating Systems Performance Index—Cooling Water Systems

a. Inspection Scope

The inspectors sampled licensee submittals for the Davis-Besse Mitigating Systems Performance Index Cooling Water Systems performance indicator (PI) for the period from the fourth quarter 2016 through the third quarter 2017. To determine the accuracy of the PI data reported during those periods, PI definitions and guidance contained in the NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 7, dated August 31, 2013, were used. The inspectors reviewed the licensee's operator narrative logs, issue reports, MSPI derivation reports, event reports and NRC Integrated Inspection Reports for the period of the fourth quarter 2016 through the third quarter 2017 to validate the accuracy of the submittals. The inspectors reviewed the

MSPI component risk coefficient to determine if it had changed by more than 25 percent in value since the previous inspection, and if so, that the change was in accordance with applicable NEI guidance. The inspectors also reviewed the licensee's issue report database to determine if any problems had been identified with the PI data collected or transmitted for this indicator and none were identified. Documents reviewed are listed in the Attachment to this report.

This activity constituted one MSPI cooling water system sample as defined in IP 71151-05.

b. Findings

No findings were identified.

.4 Reactor Coolant System Leakage

a. Inspection Scope

The inspectors sampled licensee submittals for the Reactor Coolant System Leakage performance indicator (PI) Units 1, for the period from the fourth quarter 2016 through the third quarter 2017. To determine the accuracy of the PI data reported during those periods, PI definitions and guidance contained in the NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 7, dated August 31, 2013, were used. The inspectors reviewed the licensee's operator logs, reactor coolant system leakage tracking data, issue reports, event reports and NRC Integrated Inspection Reports for the period of October 2016 through September 2017 to validate the accuracy of the submittals. The inspectors also reviewed the licensee's issue report database to determine if any problems had been identified with the PI data collected or transmitted for this indicator and none were identified. Documents reviewed are listed in the Attachment to this report. This activity constituted one reactor coolant system leakage sample as defined in IP 71151-05.

b. Findings

No findings were identified.

.5 Radiological Effluent Technical Specification/Offsite Dose Calculation Manual
Radiological Effluent Occurrences

a. Inspection Scope

The inspectors sampled licensee submittals for the radiological effluent TS/ODCM radiological effluent occurrences PI for the period from the second quarter 2016 through the second quarter 2017. The inspectors used PI definitions and guidance contained in the NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 7, dated August 2013, to determine the accuracy of the PI data reported during those periods. The inspectors reviewed the licensee's issue report database and selected individual reports generated since this indicator was last reviewed to identify any potential occurrences such as unmonitored, uncontrolled, or improperly calculated effluent releases that may have impacted offsite dose. The inspectors reviewed gaseous effluent summary data and the results of associated offsite dose calculations for selected dates to determine if indicator results were accurately reported. The

inspectors also reviewed the licensee's methods for quantifying gaseous and liquid effluents and determining effluent dose. Documents reviewed are listed in the Attachment to this report.

This inspection constituted one Radiological Effluent TS/ODCM radiological effluent occurrences sample 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 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 corrective action program at an appropriate threshold, adequate attention was being given to timely corrective actions, and adverse trends were identified and addressed. Some minor issues were entered into the licensee's corrective action program as a result of the inspectors' observations; however, they are not discussed in this report.

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.

b. Findings

No findings were identified.

.2 Semi-Annual Trend Review

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 4OA2.1 above, licensee trending efforts, and licensee human performance results. The inspectors' review nominally considered the six-month period of July 1 to December 31, 2017, 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.

Observations

During the course of the review period for this inspection sample, the inspectors noted that the licensee has been challenged by a large number of low level performance issues and errors. Though many of these issues are directly attributable to human performance and/or procedural compliance, there are a number that can be attributed to procedural or training deficiencies. Some of the issues represent chronic problems that have challenged the licensee for months or even years. Specific examples associated with this trend included, but were not limited to:

- During the fourth quarter of 2017, the plant control room received erratic indications from channel 2 of the borated water storage tank (BWST) level indicator. The licensee determined that the likely cause was a failure to properly purge the instrumentation line of air during the previous BWST level instrument calibration. Apparently the line was purged, but because the procedure failed to include any direction for how to perform the purge, not enough volume was removed from the line to evacuate all of the air.
- Installation of service water pump motors requires equipment operators to measure the outputs of the motor thermocouples with the motor operating at temperature, and land the highest reading thermocouple to provide temperature data to the control room. During the installation of the number 3 service water pump motor, there were several thermocouples that indicated the exact same temperature. The procedure fails to provide guidance as to how to pick between identically reading thermocouples.
- The licensee experienced repeated leaks from roof plugs on the intake structure over a period of years. This came to attention during the first quarter of 2017 when the licensee was noted to use silicone caulk that was several years past the manufacturer's recommended shelf life. At the same time it was noted that the licensee had experienced problems with silicone caulk failing to cure properly and thus not performing. A shelf life extension was performed per procedure but the engineering analysis/justification for the extension was poorly documented and appeared to be based on engineering judgement. Because of the sparse documentation, there is no way to determine why the original extension was granted and no way for current plant personnel to determine what part of the process broke down. The licensee has since re-evaluated the shelf lives of a variety of materials, but the business practice governing shelf life extensions has not been revised and there has been no procedure change to ensure that future shelf life extensions are thoroughly documented and properly vetted.
- As discussed in section 4OA2, the AFPT 1 bearing failure was caused by inadequate guidance as to how to establish sight glass indications and when to add oil. Procedures including the licensee's lubrication manual failed to include adequate guidance such as a diagram or alternately to direct the reader to an adequate reference. This led to incorrect oil sight glass indications and eventually resulted in the bearing oil reservoir being under filled.
- The problem solving and decision making procedure lacks detail/guidance for ensuring clear communication and turnover. For example, in response to the failure of the AFPT bearing (see section 4OA2) the licensee formed a problem solving team. During the course of the problem solving team investigation, poor

communications and a series of poor turnovers between problem solving team shifts led to the mistaken belief that an extent of condition had been performed and that all other AFW oil sight glasses were correctly marked. It was not until a month later that the licensee discovered that an extent of condition had not been performed, and that the outboard oil sight glass on both the train 1 and 2 AFW turbines were also incorrectly marked.

- Licensee procedures governing operability determinations provide insufficient guidance as to when to employ an immediate operability determination versus a prompt operability determination, and how to properly document an immediate operability determination. This lack of procedural guidance has the potential to result in inconsistent application of the operability determination process, and has led to inconsistent documentation of the operator's justification for making an operability call.

While individually none of these examples may suggest an ongoing problem of any significance; when viewed in the aggregate, they may possibly indicate a programmatic weakness. For these and other procedural deficiencies that are repetitive in the sense that a similar gap has been identified in various procedures, the concern is that the station is missing the opportunity to identify and resolve procedural deficiencies prior to the use of the procedure. Alternately, the station may be missing an opportunity to identify areas for which training could prevent errors. For those issues that are concerns that have gone unresolved, the station may be missing the opportunity to fix the issue before it has an adverse impact. NRC inspectors will continue to monitor the station's focus on addressing procedural or training issues before they have a detrimental impact.

b. Findings

No findings were identified.

.3 Annual Follow-Up Sample for In-Depth Review: Review of Licensee Periodic Core Bore Visual Examinations for Shield Building Concrete Cracking Follow-Up

a. Inspection Scope

As part of the continued long-term monitoring of the shield building laminar cracking condition documented in IR 05000346/2014008 (ADAMS Accession No. ML15148A489), the licensee subjected a sample of existing shield building core bores to visual examination as prescribed by licensee procedure EN-DP-01511, "Structures Monitoring." One purpose of the core bore visual examinations conducted under this procedure was to determine if any growth or change in the nature of the cracks had occurred by measurement of crack width and comparison to historical values. In areas of identified laminar crack planar propagation, addition impulse response mapping was performed to provide a relative indication of the extent of propagation.

During the course of this in-depth review, the inspectors verified the status of the licensee's core bore visual examinations, as well as their evaluations and corrective action documents resulting from shield building laminar cracking not identified by previous visual examinations. In addition, the inspectors reviewed the licensee's plans for follow-on examinations and corrective actions that had been established to verify that the classification, prioritization, focus, and timeliness of these actions were commensurate with the safety significance of the issue.

Documents reviewed are listed in the Attachment to this report.

The review of this issue by the inspectors constituted one annual follow-up inspection sample for in-depth review as defined in IP 71152–05.

b. Observations

During the 2017 periodic examination, the licensee identified laminar cracks in previously uncracked bores, additional growth in crack width, and new vertical cracks at the shield building exterior surface which were entered into the licensee's CAP. In some instances, the measured laminar crack width exceeded the crack widths induced during testing previously performed at selected universities referenced in IR 05000346/2014008 to credit full reinforcement capacity in those areas. The licensee drilled new core bores to determine the extent of condition. Laminar crack propagation was also observed at some locations based on visual examination and was similar to the predicated propagation pattern.

As a result of the increased crack width, the licensee performed operability evaluations of the shield building and determined that the shield building remained operable based on the increased crack widths being localized in nature and engineering calculations that utilize the approach of considering reinforcement not effective in areas of laminar cracking. The NRC reviewed the licensee's operability determinations and determined as reasonable the licensee's assessment that the shield building remained capable of performing its intended safety function.

Corrective actions completed or planned to date include, but are not limited to, installation of concrete relative humidity probes in the shield building to confirm the relative humidity levels observed and development of an associated mitigation plan; concrete removal and repair for rebar inspection at two locations to determine the corrosion potential of the shield building reinforcement; and development of a comprehensive plan for re-establishing shield building conformance to the design and licensing basis of the facility with the increase in crack widths.

As a result of the observed increases in laminar crack width, the licensee postponed its planned license amendment submittal to allow time for additional analysis and development of potential mitigation strategies. The NRC will continue to follow-up on the licensee's corrective actions which will be documented in a future report.

c. Findings

No Findings were identified.

.4 Annual Follow-Up Sample for In-Depth Review: Review of Licensee Corrective Actions to Determine Extent of Shield Building Rebar Corrosion

a. Inspection Scope

The inspectors reviewed licensee corrective action activities associated with the removal and repair of concrete for rebar inspection to determine the corrosion potential of the shield building reinforcement. As documented in CR–2016–08795 (shield building shoulder 12, bore S12–666.0–4) and CR–2016–09073 (shield building shoulder 13, bore S13–631.0–8), the licensee identified laminar crack growth including crack widths that

exceeded bounds of this parameter in tests that determined rebar splice strength. As a result, the licensee initiated ECP 17–0211–000, “Shield Building Concrete Removal and Repair for Rebar Inspection,” to determine the corrosion potential of the shield building reinforcement. At the time of this inspection, the licensee only completed ECP 17–0211–000 activities associated with shoulder 12. Therefore, the inspectors reviewed and observed a sample of licensee documents and activities for concrete removal and repair at shoulder 12 including:

- Engineering Change Package 17–0211–000 allowed shield building concrete removal and repair during plant operation. At shoulder 12, ECP 17–0211–000 removed a portion of shield building exterior concrete that was approximately 10 feet around the circumference (horizontal), 20 feet in height (vertical), and of varying depth (a minimum of 2 inches beyond the outer structural rebar mat) to expose the rebar for examination of corrosion and to provide adequate bonding between replacement concrete and rebar. The inspectors reviewed licensee calculations that demonstrated that the shield building would be capable to perform its design basis safety functions throughout the concrete removal and repair activity. Specifically, the inspectors reviewed calculations that demonstrated the shield building maintained adequate radiation shielding, barrier protection for tornado missiles, and structural capacity during an earthquake while in a degraded condition with concrete removed.
- The inspectors verified that removal and repair of concrete was performed in accordance with licensee procedures and industry standards. In particular, the inspectors verified concrete excavation beyond structural rebar was sufficient to ensure adequate bonding between the replacement concrete and rebar.
- The inspectors directly observed a portion of exposed rebar during concrete removal. Inspectors noted evidence of rebar corrosion. The inspectors verified the licensee entered identified rebar corrosion into the CAP. The inspectors reviewed the licensee’s criteria to remove and replace corroded rebar, the method to splice replacement rebar to existing rebar, and the test results that demonstrated rebar design strength would be achieved for mechanical splice components used in the repair. The inspectors further reviewed licensee evaluations that determined the shield building remained operable, capable of performing its design basis safety functions, with the identified rebar corrosion.
- The inspectors directly observed licensee activities during concrete replacement including testing of concrete prior to installation. Specifically, the inspectors observed that for each truck load only concrete that was within slump, air entrainment, and temperature test acceptance ranges was installed. The inspectors also observed concrete placement into cylinders segregated for later testing to verify 28–day design compressive strength.
- Finally, the inspectors reviewed test reports that demonstrated the installed concrete cured to the 28–day minimum design compressive strength.

Documents reviewed are listed in the Attachment to this report.

The review of this issue by the inspectors constituted one annual follow-up inspection sample for in-depth review as defined in IP 71152–05.

b. Findings

No findings were identified.

.5 Annual Follow-Up of Selected Issues: Auxiliary Feedwater Pump Turbine 1 Inboard Bearing Failure

a. Inspection Scope

The inspectors selected the following condition report for in-depth review:

- Condition Report 2017–09857, #1 Auxiliary Feedwater Pump Turbine Inboard Bearing Failure.

As appropriate, the inspectors verified the following attributes during their review of the licensee's corrective actions for the above condition report and other related condition 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;
- classification and prioritization of the resolution of the problem commensurate with safety significance;
- identification of the root and contributing causes of the problem;
- identification of corrective actions, which were appropriately focused to correct the problem;
- completion of corrective actions in a timely manner commensurate with the safety significance of the issue;
- effectiveness of corrective actions taken to preclude repetition; and
- evaluation of applicability for operating experience and communication of applicable lessons learned to appropriate organizations.

The inspectors discussed the corrective actions and associated evaluations with licensee personnel.

This review constituted one in-depth problem identification and resolution inspection sample as defined in IP 71152.

b. Observations

The licensee generated CR–2017–09857 to evaluate an event that occurred on September 13, 2017. During performance of DB–SP–03151, “AFP 1 Quarterly Test,” several minutes after full flow conditions were established, the licensee received a high temperature alarm (>220 degree Fahrenheit) associated with the auxiliary feed pump turbine (AFPT) 1 inboard bearing. Step 2.2.3 of DB-SP-03151 stated, “maximum AFPT 1 bearing metal temperature is 220 degrees Fahrenheit.” The licensee secured the system in response to the alarm. The initial oil sample taken from the turbine inboard bearing was black, indicating potential bearing failure. The licensee documented this in CR-2017-09443 and took immediate corrective actions to replace the bearing. A successful post-maintenance test was performed and the licensee declared AFW 1 operable on September 16, 2017.

The licensee's root cause evaluation (RCE) determined the failure mechanism to be inadequate lubrication due to an incorrectly marked sight glass, and the root cause to be that preventive maintenance instructions for replacing the sight glass did not include guidance for setting the required operational bands. Specifically, the licensee found the denoted oil level band on the AFPT 1 inboard bearing sight glass was approximately 15/16 inches, as opposed to the vendor recommended 3/8 inches.

The inspectors determined that the last known replacement of the AFPT 1 inboard bearing sight glass was in 1997, as documented in preventive maintenance work order 3-97-1700-01. The work order instructions stated, in part, "paint black/red operating band on replacement sightglasses," and did not include any specific dimensions for the bands. Additionally, the work order did not provide direction to reference the turbine vendor manual, which contained guidance for calibrating the sight glass.

The AFPT 2 outboard bearing was replaced in October 2014, under WO 200537045. The preventive maintenance (PM) WO for that replacement did not provide guidance for the required oil level band and the work in progress log did not include the as-left oil band. The inspectors noted this lack of work order detail was similar to that of the 1997 AFPT 1 inboard bearing sight glass replacement.

The documented extent of condition review performed in October 2017, in response to the September 13, 2017, event, identified that the AFPT outboard bearings on both trains were also incorrectly marked. The licensee subsequently remarked the sight glasses using vendor guidance.

During the course of the review for this inspection sample, the inspectors reviewed additional condition reports associated with the inboard and outboard bearings on both trains of the turbine driven auxiliary feedwater system. This included the condition reports generated after the October 2017 extent of condition review. The inspectors noted the licensee had several potential missed opportunities to identify the incorrect markings on AFPT 1 and AFPT 2 bearing sight glasses. Specific examples associated with the inspectors' observations included, but were not limited to:

- In 2001, the licensee initiated an effort to upgrade the Lubrication Manual as the basis for implementing the lubrication program. During this time, CR-2001-0012 was generated describing general confusion among operators and maintenance personnel regarding the markings on the oil sight glasses and what the markings represented. A photograph of the AFPT 2 outboard bearing sight glass, among other sight glasses, was attached to the CR as an example. However, the corrective actions only included providing guidance for level in sight glasses on plant pumps and motors.
- In 2011, the licensee generated CR-2011-91279, which discussed the upper portion of the AFP 1 outboard bearing sight glass band being higher than recommended by the Lubrication Manual. The licensee created notification 600671526 to rework the oil level bands of the outboard pump bearing, and to verify the oil level bands of the inboard pump bearing and both bearings on the AFPT. Notification 600671527 was submitted to perform the same verification on AFPT 2. The licensee verified the sight glass markings for both pumps, however, the notifications documented the turbine bearing sight glass bands could not be verified with the dimensions specified in the Lubrication Manual because the

lubrication sheets did not list the requirements for oil level. The closure of CR–2011–91279 stated that both notifications were completed satisfactorily, although the level bands of the AFPT sight glasses were not verified.

- Beginning on March 31, 2016, the licensee started a planned AFPT 1 preventive maintenance inspection and overhaul activity under WO 200423148. During this activity, the licensee identified a degraded condition on the AFPT 1 outboard bearing, described as “significant scoring” in the work-in-progress log. The significant scoring was not documented in the CAP, and thus the condition and cause were not evaluated per the licensee’s process. This is discussed below as NCV 05000346/2017004–04. The licensee’s extent of condition associated with the September 13, 2017, bearing damage RCE found that the AFPT 1 outboard bearing also had a miscalibrated sight glass. The inspectors determined that the “significant scoring” identified in early 2016 was potentially a missed opportunity to identify the incorrect sight glass markings.
- Between September 13, 2017, and September 15, 2017, as a result of the inboard bearing failure, the licensee performed several extent of condition activities on the outboard AFPT bearings for both trains, and the inboard bearing on AFPT 2. This included checking that oil levels were within band, the 3/8 inch width of the band appeared correct, and the markings appeared to be in the right locations. On September 22, 2017, the AFPT 2 inboard bearing oil level markings were verified per maintenance notification 601123269; however, the other activities associated with the outboard bearings were not fully documented. On October 20, 2017, the root cause team determined that documentation for the extent of condition reviews was lacking, and initiated an effort to formally verify the markings on the turbine outboard bearing sight glasses. The licensee found both AFPT outboard bearing sight glasses mismarked, as documented in CR–2017–10646 and CR–2017–10663. The inspectors noted the initial extent of condition activities were a potential missed opportunity to identify earlier that the outboard bearing sight glasses were also mismarked.

The inspectors noted that the two most recent observations may indicate the need for additional licensee focus on the problem identification and resolution program.

c. Findings

(1) Failure to Provide Detailed Work Instructions for an Activity Affecting Quality

Introduction: A self-revealed finding with an Apparent Violation (AV) of Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, Appendix B, Criterion V, “Instructions, Procedures, and Drawings,” and an associated apparent violation of TS 3.7.5, “Emergency Feedwater (EFW),” was identified on September 13, 2017, due to the licensee’s apparent failure to prescribe appropriate work instructions for an activity affecting quality of the safety-related auxiliary feedwater (AFW) system. Specifically, the licensee failed to provide appropriate instructions to maintain an adequate amount of oil in the AFW turbines bearing oil sumps, resulting in the failure of AFW 1 on September 13, 2017.

Description: On September 13, 2017, the licensee began performance of DB-SP-03151, "AFP 1 Quarterly Test." Several minutes after full flow conditions were established, the licensee received a high temperature alarm (>220 degree Fahrenheit) associated with the AFPT 1 inboard bearing. Step 2.2.3 of DB-SP-03151 stated, "maximum AFPT 1 bearing metal temperature is 220 degrees Fahrenheit." The licensee secured the system. The initial oil sample taken from the turbine inboard bearing was black, indicating potential bearing failure. The licensee documented this in condition report CR-2017-09443 and took immediate corrective actions to replace the bearing. A successful post-maintenance test after bearing replacement was performed and the licensee declared AFW 1 operable on September 16, 2017.

The inspectors reviewed the licensee's root cause evaluation (RCE), procedures, maintenance packages and previous condition reports. The RCE determined the failure mechanism to be inadequate lubrication due to an incorrectly marked sight glass, and the root cause to be that preventive maintenance (PM) instructions for replacing the sight glass did not include guidance for setting the required operational bands. Specifically, the licensee found the oil level allowable band on the AFPT 1 inboard bearing sight glass was approximately 15/16 inches, as opposed to the vendor recommended 3/8 inches.

Oil was last removed from the sight glass sump during the sampling on June 21, 2017, after the last quarterly surveillance. Therefore, the inspectors determined the AFW train had been unavailable since that surveillance. At that time, the mechanic was not required to add oil after the sample was taken because the oil level was left within the denoted acceptable sight glass band. Through discussions with the licensee the inspectors were informed that, although not procedurally required, common work practice was to add oil after sampling so the as-left level was within the mid to high range on the sight glass band. On September 13, 2017, the licensee observed the as-found oil level to be slightly less than the midpoint.

The sight glasses are replaced on an as needed basis. The inspectors determined the last known time the AFPT 1 inboard bearing sight glass was replaced was in 1997, as documented in preventive maintenance WO 3-97-1700-01. The work order instructions stated, in part, "paint black/red operating band on replacement sightglasses," and did not include any specific dimensions for the bands. Additionally, the WO did not provide direction to reference the turbine vendor manual, which contained guidance for calibrating the sight glass. The last AFPT sight glass that was replaced for either train was in October 2014, under WO 200537045, for the AFPT 2 outboard bearing. As stated in the RCE, the PM instructions did not provide guidance for the required oil level band and the work in progress log for the AFPT 2 outboard bearing replaced did not include the as-left oil band. The documented extent of condition review performed in October 2017 identified that the AFPT outboard bearings on both trains were incorrectly marked. The licensee subsequently remarked the sight glasses using vendor guidance.

The licensee updated the data sheets for all AFPT bearings in the lube oil manual to include the sight glass marking dimensions per the vendor guidance. Additionally, the licensee updated the oil sampling procedure to require that the volume of oil removed during sampling be replaced. The licensee is currently performing an extent of condition to ensure other critical equipment sight glasses were correctly marked, and the

Lubrication Manual data sheets included basis information, as documented in CR-2017-09857.

Analysis: The inspectors determined that the licensee's apparent failure to prescribe appropriate work instructions for an activity affecting quality was an apparent performance deficiency. Specifically, the licensee apparently did not provide appropriate instructions to maintain an adequate amount of oil in the AFW turbines bearing oil sumps resulting in the failure of AFW 1 on September 13, 2017. The apparent performance deficiency was determined to be more than minor because the apparent deficiency was associated with the Mitigating Systems cornerstone attribute of equipment performance and adversely affected the cornerstone objective of ensuring the availability, capability and reliability of equipment that respond to initiating events. Specifically, the performance deficiency resulted in the failure of the AFW 1. Using Inspection Manual Chapter (IMC) 0609, Attachment 4, "Initial Characterization of Findings," and IMC 0609 Appendix A, "The Significance Determination Process for Findings at Power," issued June 19, 2012, the finding was screened against the mitigating systems cornerstone. The inspectors determined the finding represented an actual loss of function of at least a single train for greater than its technical specification allowed outage time. Therefore, a detailed risk evaluation will be performed by a regional senior reactor analyst. Because the significance characterization of this finding is not yet finalized, it is being documented with a significance of to be determined (TBD).

The inspectors determined this apparent finding affected the cross-cutting aspect of challenge the unknown in the area of Human Performance, where individuals stop when faced with uncertain conditions. Risks are evaluated and managed before proceeding. Specifically, licensee personnel did not stop when faced with uncertain conditions in the preventive maintenance procedure for replacing the AFPT sight glasses. Although the replacement of the AFPT 1 inboard bearing sight glass occurred in 1997, the licensee had the opportunity to challenge the lack of detail in the work instructions in late 2014 when the AFPT 2 outboard bearing sight glass was replaced. [H.11]

Enforcement: Title 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," requires, in part, activities affecting quality be prescribed by documented instructions, procedures, or drawings, of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions, procedures, or drawings. Instructions, procedures, or drawings shall include appropriate quantitative or qualitative acceptance criteria for determining that important activities have been satisfactorily accomplished.

Technical Specification 3.7.5, Emergency Feedwater (EFW), limiting condition for operation states, in part, three EFW trains shall be operable, consisting of: two Auxiliary Feedwater (AFW) trains; and the Motor Driven Feedwater Pump (MDFP) train. Condition B states, with one EFW train inoperable for reasons other than Condition A in Mode 1, 2, or 3, an action of restoring the EFW train to operable status within 72 hours. Since the last known replacement of the sight glass in 1997, the licensee apparently did not prescribe documented instructions appropriate to the circumstances for an activity affecting quality of the safety-related auxiliary feedwater system. This resulted in the failure to properly maintain an adequate amount of oil in the AFPT 1 inboard bearing oil sump which resulted AFPT 1 being inoperable from June 21, 2017, when oil was removed from the turbine inboard bearing oil sump for sampling, until the bearing was

replaced and the system successfully restored on September 16, 2017, a period greater than the allowed by the limiting condition for operation outage time provided in TS 3.7.5.

The licensee documented this issue in CR-2017-09857. Corrective actions implemented included replacing the inboard bearing, recalibrating the sight glass using the vendor guidance, and adding that guidance to the Lubrication Manual. Additionally, the licensee is planning to verify the sight glasses on other safety significant systems. The inspectors continue to review the results of this inspection. The results of the completed review will be documented in Inspection Report 05000346/2018010.

(Pending final determination of the safety significance, this finding is identified as AV 05000346/2017004-03: Apparent Failure to Prescribe Appropriate Work Instructions for an Activity Affecting Quality)

(2) Failure to Document a Degraded Condition on the AFPT 1 Outboard Bearing

Introduction: The inspectors identified a finding of very low safety significance (Green) for the licensee's failure to document a degraded condition of a safety-related system in the CAP, as required by licensee procedure, NOP-LP-2001. Specifically, during planned maintenance on the AFPT 1, the licensee identified scoring on the outboard turbine bearing and failed to generate a condition report detailing the issue.

Description: Beginning on March 31, 2016, the licensee started a planned, preventive maintenance inspection and overhaul activity on the safety-related AFPT 1. This activity was completed under WO 200423148. During this activity, the licensee identified a degraded condition on the AFPT outboard bearing, described as "significant scoring" in the work in progress log. The licensee replaced the bearing. The inspectors requested a copy of the condition report documenting the scoring from the licensee; however, the licensee stated a condition report was not generated.

Section 4.3.2 of NOP-LP-2001, "Corrective Action Program," Revision 37, states "a CR shall be initiated upon discovery of any degraded conditions that affect a safety SSC or any USAR described systems, structures, or components". Section 3.3 of NOP-OP-1009, "Operability Determinations and Functionality Assessments," Revision 5, defines a degraded condition, in part, as "a condition in which the qualification of an SSC or its functional capability is reduced. Examples of degraded conditions are failures, malfunctions, deficiencies, deviations, and defective material and equipment." The licensee failed to follow NOP-LP-2001 and thus, failed to evaluate the degraded condition associated with the AFPT outboard bearing.

Analysis: The inspectors determined the failure to document a degraded condition in the CAP for a safety related system, as required by NOP-LP-2001, was a performance deficiency. Specifically, during planned AFPT 1 maintenance, the licensee identified scoring on the outboard turbine bearing and failed to generate a condition report to track and assess the issue. The inspectors determined the performance deficiency was more than minor because if left uncorrected it had the potential to lead to a more significant safety concern. Specifically, the failure to document a degraded condition in the CAP did not allow the organization to properly assess the issue. Therefore, the underlying cause may not have been appropriately addressed. Using IMC 0609, Attachment 4, "Initial Characterization of Findings," issued October 7, 2016, and Appendix A, "The Significance Determination Process for Findings At-Power," issued June 19, 2012, the inspectors

determined the finding to be of very low safety significance (Green) because the inspectors answered no to all questions in Exhibit 2.

The inspectors determined this finding affected the cross-cutting aspect of evaluation in the area of Problem Identification and Resolution, where the organization thoroughly evaluates issues to ensure that resolutions address cause and extent of conditions commensurate with their safety significance. Specifically, the licensee failed to thoroughly evaluate the degraded condition, resulting in the failure to document the issue. [P.2]

Enforcement: Sections 4.3.3 of NOP–LP–2001, “Corrective Action Program,” states, a CR shall be initiated upon discovery of any Degraded Conditions that affect a safety SSC or any USAR described systems, structures, or components.

Contrary to the licensee procedure requirement, since the condition discovery on April 6, 2016, the licensee failed to document a degraded condition affecting the safety-related AFW 1 system, as required by licensee procedure NOP–LP–2001, until identified by the inspectors. The licensee’s immediate corrective actions at the time of condition discovery included replacing the bearing. **(FIN05000346/2017004–04: Failure to Document a Degraded Condition on the AFPT 1 Outboard Bearing)**

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

.1 (Closed) Licensee Event Report 05000346/2017–002–00: Auxiliary Feedwater Pump Turbine Bearing Damaged due to Improperly Marked Lubricating Oil Sight Glass

a. Inspection Scope

On September 13, 2017, during performance of a routine, quarterly surveillance of the safety related auxiliary feedwater 1, the licensee received a high temperature alarm on the AFPT 1 inboard bearing. The licensee tripped the turbine and, upon disassembly, found the inboard bearing damaged. The licensee replaced the bearing, performed a successful post-maintenance test of the system and initiated a root cause investigation.

The root cause team determined that the AFPT 1 inboard bearing sight glass was mismarked, which led to a low oil level in the bearing reservoir. Oil was last removed from the reservoir on June 21, 2017, for sampling after the quarterly surveillance. The as-left level was within the acceptable band marked on the sight glass; however, this band was significantly larger than the vendor recommended band, resulting in a low oil level and inadequate lubrication. As corrective actions, the licensee remarked the sight glass using vendor guidance and is performing an extent of condition review for other safety significant systems.

The inspectors reviewed the licensee’s response to the issue, including a review of the licensee’s causal evaluation, CAP documents, operator logs, and maintenance records. The inspectors did not find any issues associated with this licensee event report.

Documents reviewed are listed in the Attachment to this report. This licensee event report is closed.

This event follow-up review constituted one sample as defined in IP 71153–05.

b. Findings

No findings were identified.

40A5 Other Activities

.1 (Closed) Unresolved Item 05000346/2017003-01: Failure to Identify and Correct the Failure Mode of Essential AC Power Fuses Y210 and Y214

a. Inspection Scope

As discussed in Section 1R12.1 of NRC IR 05000346/2017003 (ADAMS Accession No. ML17318A050), on July 6, 2017, during a planned replacement of fuse Y204 in electrical cabinet Y2, unrelated fuse Y214 blew. Both fuses were scheduled for replacement as part of the licensee's project to replace Shawmut A25X style fuses that are susceptible to premature failure. The failure of fuse Y214 was unexpected, and the licensee was not able to discern a direct cause. The failure was blamed on the fuse itself being so unstable that any perturbation was enough to cause failure. This failure resulted in multiple systems being declared inoperable including AFP 2, safety features actuation system (SFAS) channel 2, decay heat removal system interlock, and radiation element RE8447. On August 8, 2017, the same electrical cabinet, Y2, was opened for replacement of fuse Y216. Following the replacement, fuses Y210 and Y214 blew. The licensee attempted replacement of the fuses, but the replacement fuses blew again, shortly after being repowered. Initial licensee evaluation of the condition revealed that the wire bundle running along the hinge side of the cabinet door was unconstrained and two of the wires had become pinched between the door and cabinet frame, which damaged the wire insulation and allowed the wires to short circuit against the cabinet frame. The failure of Y210 and Y214 resulted in multiple systems being declared inoperable including AFP 2, SFAS channel 2, decay heat removal system interlock, and emergency diesel generator EDG 2. The licensee removed and replaced the damaged portion of the wires and used wire ties to constrain the wire bundle.

The licensee entered this issue into their CAP as CRs 2017-07196 and 2017-08185. Because the licensee had yet to answer NRC inspector questions pertaining to the corrective actions and extent of condition by the end of this inspection period, the issue was treated as an URI pending completion of the inspectors' review.

The inspectors performed a review of the licensee's completed corrective actions and extent of condition documented in section 1R12.1 of this report.

The URI 05000346/2017003-01 is closed.

b. Findings

No findings were identified.

.2 (Closed) Unresolved Item 05000346/2017003–02: Final Cause Determination of Auxiliary Feedwater Turbine Bearing Failure

a. Inspection Scope

As discussed in Section 1R12.1 of NRC IR 05000346/2017003 (ADAMS Accession No. ML17318A050), On September 13, 2017, the licensee ran the scheduled quarterly AFP surveillance test. This test requires the pump to run with the pump loaded with full flow of water whereas the monthly test runs the pump only lightly loaded with water being pumped through a minimum recirculation line. Within three minutes after the full flow adjustments were completed, the AFP turbine inboard bearing high temperature alarm (>220 °F) came in. The licensee verified the alarm was valid and manually tripped the AFP turbine approximately 30 minutes after the alarm was received. Oil samples indicated potential bearing damage. The licensee disassembled the AFP turbine bearing and observed bearing failure.

Initial evaluation of the bearing by the licensee revealed that the damage was due to insufficient lubrication caused by low oil level. The oil level at the time of failure was within the indicated acceptable band of the oil sight glass, however, indicated band was significantly larger than the vendor recommended 3/8 inch and not at the correct height. The oil level in the sump was too low to sufficiently wet the oil slinger ring. This condition was determined to have existed since the previous pump quarterly test on June 21, 2017. After that test a technician pulled an oil sample, but did not replenish the oil. The oil level indicated low to mid band, but within the (incorrectly marked) acceptable range on the sight glass.

The licensee entered this issue into their CAP as CRs 2017–09443, 2017–09817, 2017–09527, and 2017–09857. Because the licensee had yet to complete their investigation and analysis of the event by the end of the previous inspection period, the issue was treated as a URI pending the inspectors' review of the licensee's completed root cause evaluation.

The inspectors performed a review of the licensee's completed corrective actions and root cause. An in-depth sample was opened for this issue and is documented in section 4OA2.5 of this report.

The URI 05000346/2017003–02 is closed.

b. Findings

A apparent violation for the auxiliary feedwater turbine bearing failure was identified and is discussed in section 4OA2.5 of this report.

.3 (Closed) Notice of Violation 05000346/2017001–01: Failure to Establish a Test Program that Demonstrates the Emergency Core Cooling System Room Coolers Will Perform Satisfactorily in Service

a. Inspection Scope

On June 26, 2014, the inspectors identified that the emergency core cooling system (ECCS) room cooler inspection procedures did not include acceptance criteria. This issue was captured by the licensee in their CAP as CR–2014–10995 and was

documented by the inspectors as NCV 05000346/2014003–04 in IR 05000346/2014003, dated July 31, 2014. The licensee closed CR–2014–10995 on October 15, 2015.

On March 23, 2017, the inspectors identified that the licensee had not corrected this NCV. This issue was captured by the licensee in the CAP as CR–2017–03328, and was documented by the inspectors as notice of violation (VIO) 05000346/2017001–01 in IR 05000346/2017001, dated May 12, 2017. This violation was cited consistent with the NRC Enforcement Policy, Section 2.3.2.a.2, because the licensee had not restored compliance and did not have objective plans to restore compliance in a reasonable time period following the identification of the NCV. On June 12, 2017, the licensee replied to the VIO in letter titled “Reply to Notice of Violation; VIO 05000346/2017001-01” (ADAMS Accession number ML17165A305). The letter included: (1) the reason for the violation; (2) the corrective steps taken and the results achieved; (3) the corrective steps that would be taken; and (4) the date that full compliance would be achieved.

On October 13, 2017, the licensee documented in CR–2017–03328 that their corrective actions were completed. Subsequently, the inspectors reviewed the licensee’s letter of reply to the VIO, the corrective action documentation, and supporting reference information to assess the causal evaluation and corrective actions. As of the date of this review, the licensee had not performed an inspection using the revised preventative maintenance templates; thus, the inspectors were unable to assess the implementation of the corrective actions taken. Nonetheless, the inspectors confirmed that acceptance criteria was developed and incorporated in the applicable preventive maintenance templates. This review did not constitute an inspection sample. This violation is closed.

40A6 Management Meetings

.1 Exit Meeting Summary

On January 11, 2018, the inspectors presented the inspection results to Mr. M. Bezilla and other members of the licensee staff. The licensee acknowledged the issues presented. On February 12, 2018, the inspectors discussed inspection result changes with Mr. M. Bezilla and other members of the licensee staff. 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 the Emergency Preparedness Program inspection with Mr. J. Vetter, Emergency Preparedness Manager, conducted over the phone on December 1, 2017;
- The 2017 licensed operator annual operating test results were discussed with Mr. D. Witt, Licensed Operator Requalification Instructor, on December 14, 2017;
- The inspection results for the Radiation Safety Program review with Mr. D. Imlay, General Plant Manager, on October 27, 2017; and
- The inspection results for the Radiation Safety Program review with Mr. D. Imlay, General Plant Manager, on December 28, 2017.

The inspectors confirmed that none of the potential report input discussed was considered proprietary. Proprietary material received during the inspection was returned to the licensee.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee

M. Bezilla, Site Vice President
B. Blair, General Plant Manager
D. Blakely, Supervisor, Nuclear Engineering Analysis
K. Byrd, Director, Site Engineering
J. Cuff, Manager, Site Training
J. Cunnings, Manager, Plant Engineering
A. Dawson, Manager, Site Chemistry
J. Earle, Chemistry Supervisor
D. Hartnett, Superintendent, Nuclear Operations
T. Henline, Manager, Site Projects
J. Hofelich, Supervisor Nuclear Supply Systems Engineering
D. Huey, Director, Site Performance Improvement
G. Laird, Manager, Site Operations
B. Matty, Manager, Site Maintenance
P. McCloskey, Manager, Site Regulatory Compliance
G. Michael, Manager, Design Engineering
D. Noble, Manager, Site Radiation Protection
G. Nordlund, Superintendent, Radiation Protection
R. Oesterle, Superintendent, Nuclear Operations Services
R. Patrick, Manager, Site Work Management
B. Pollauf, Supervisor, Nuclear Plant Systems Engineering
J. Sturdavant, Regulatory Compliance
J. Tufts, Manager, Fleet Oversight
J. Vetter, Manager, Emergency Response
L. Willis, Manager, Site Protection
D. Witt, Licensed Operator Training Instructor
G. Wolf, Supervisor, Regulatory Compliance
K. Zellers, Manager, Technical Services Engineering

U.S. Nuclear Regulatory Commission

J. Cameron, Chief, Reactor Projects Branch 4

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

05000346/2017004-01	NCV	Failure to Maintain Procedures Associated with Ventilation Air Monitoring Assessment Program (Section 2RS6)
05000346/2017004-02	URI	Interface Between New Accident Range Ventilation Monitors and the Emergency Preparedness Dose Assessment Program (Section 2RS6)
05000346/2017004-03	AV	Failure to Prescribe Appropriate Work Instructions for an Activity Affecting Quality (Section 4OA2)
000346/2017004-04	FIN	Failure to Document a Degraded Condition on the AFPT 1 Outboard Bearing (Section 4OA2)

Closed

05000346/2017001-01	VIO	Failure to Establish a Test Program that Demonstrates the ECCS Room Coolers Will Perform Satisfactorily in Service (Section 4OA5)
05000346/2017004-01	NCV	Failure to Maintain Procedures Associated with Ventilation Air Monitoring Assessment Program (Section 2RS6)
05000346/2017004-04	FIN	Failure to Document a Degraded Condition on the AFPT 1 Outboard Bearing (Section 4OA2)
05000346/2017003-01	URI	Failure to Identify and Correct the Failure Mode of Essential AC Power Fuses Y210 and Y214 (Section 4OA5)
05000346/2017003-02	URI	Final Cause Determination of Auxiliary Feedwater Turbine Bearing Failure (Section 4OA5)

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

Condition Reports:

- 2017-11764; Freeze Protection Circuits 13Q, 15Q, and 16Q Fuse Failures
- 2017-12008; Freeze Protection Circuit 60 Reads All Asterisks in Control Room
- 2017-12044; Exposed Underground Emergency Feedwater Pipe
- 2017-12425; Freeze Protection Circuit 66 Not Maintaining Temperature
- 2017-12438; Freeze Protection Circuit 123 Not Controlling Properly
- 2017-12458; Potential Freeze Protection Inadequacies in FP Panel CFPP09
- 2017-12467; BWST Drain Freeze Protection Circuitry

Procedures:

- DB-OP-06913; Seasonal Plant Preparation Checklist; Revision 30
- DBRM-EMER-1500A; Davis-Besse Emergency Action Level Basis Document; Revision 8
- NORM-LP-7222; Davis-Besse Nuclear Power Station Flooding Focused Evaluation; Revision 0
- RA-EP-02810; Tornado or High Winds; Revision 12
- RA-EP-02830; Flooding; Revision 04

1R04 Equipment Alignment

Procedures:

- DB-OP-06334; Station Blackout Diesel Generator Operating Procedure; Revision 25
- DB-OP-06316; Diesel Generator Operating Procedure; Revision 59
- DP-OP-06261; Service Water System Operating Procedure; Revision 66

Drawings:

- M-0170D; Station Blackout Diesel Generator; Revision 16
- FSK-M-HBD-509-0002; EDG C11-1 & C11-3 Starting Air; Revision 0006
- FSK-M-HBD-509-0002; EDG C11-2 Starting Air; Revision 0006
- M-0041B; Primary Service Water System; Revision 0072

1R05 Fire Protection

Condition Reports:

- 2017-04143; Incomplete Fire Barrier Documentation
- 2017-11484; Containment 565' Green Dust Identified on Horizontal Surfaces

Procedures:

- DB-FP-00003; Pre-Fire Plan Guidelines; Revision 9
- DB-FP-00005; Fire Brigade; Revision 8
- DB-FP-00007; Control of Transient Combustibles; Revision 14
- DB-FP-00009; Fire Protection Impairment and Fire Watch; Revision 22

- DB-OP-02529; Fire Procedure; Revision 10

Work Orders:

- 200693303; Fire Area 317 – Detector Impairment Containment Hatch Area
- 200727826; Fire Area 410 – Detector Impairment East Passage Pen Area
- 200693312; Fire Area 410 – Detector Impairment East Passage Pen Area

Pre-Fire Plans:

- PFP-S6-0000; Service Building 6, Laydown Area, Station Black Out Diesel; Revision 04
- PFP-AB-0404; Spent Fuel Pool Corridor Room 404; Revision 04
- PFP-S6-0000; Storage to Fuel Handling Area Room 405; Revision 04
- PFP-S6-0000; Fuel Handling Building Rooms 222, 223, 224, 300A, 306, and 400; Revision 04
- PFP-S6-0000; Service Building 6, Laydown Area, Station Black Out Diesel; Revision 04
- PFP-AB-0318; Diesel Generator 1-1 Room; Revision 07
- PFP-AB-0319; Diesel Generator 1-2 Room; Revision 07
- PFP-CB-0215; Let Down Cooler Areas; Revision 05
- PFP-CB-0220; Incore Instrumentation Trench Area; Revision 05
- PFP-CB-0315; Incore Tank Area; Revision 07
- PFP-CB-0317; Containment Air Cooler Area; Revision 07
- PFP-CB-0410; East Elevation 603"; Revision 04

Other:

- Fire Hazard Analysis; Revision 3

1R06 Flood Protection Measures

Condition Reports:

- 2016-05688; Low Pressure Condenser Circulating Water North Expansion Joint Damaged
- 2016-08121; CT873 failed to reach the THROTTLE position
- 2016-05833; CR not previously generated – HP Cond Expansion Joint cracks
- 2016-05043; 19RFO Circ Water 108" Line Condition
- 2016-05545; New Low Pressure (LP) Condenser South Inlet Circ Water Expansion Joint Damage
- 2017-06382; EAL Bases Document Insufficient Guidance for Internal Flooding

Procedures:

- DB-OP-02517; Circulating Water System Malfunctions; Revision 06
- DP-OP-06261; Service Water System Operating Procedure; Revision 66
- RA-EP-02830; Flooding; Revision 04
- RA-EP-02880 Internal Flooding; Revision 04
- DBRM-EMER-1500A; Davis-Besse Emergency Action Level Basis Document; Revision 8
- NORM-LP-7222; Davis-Besse Nuclear Power Station Flooding Focused Evaluation; Revision 0

Calculations:

- C-ECS-099.16-134; Circulating Water Expansion Joint Rupture at Condenser Inlet; Revision 1
- No. 48.13; Condenser Pit Flood Pump Flow Rates; Revision 0

Other:

- Instrument Information Sheet for LSH-3738A; Revision 0
- Instrument Information Sheet for PSL-3738A; Revision 1
- SD-025; System Description for Circulating Water System; Revision 4
- Notification 601036442; CR-2016-05688 Circ Wtr Expansion Joint
- Notification 601036167; Circ Water 108 CR 2016-05545
- UFSAR Sec. 3.6.2.7.2.13; Circulating Water System; Revision 31

1R07 Heat Sink Performance

Condition Reports:

- 2017-03328; NRC 2017 UHS Inspection: Vulnerabilities Identified with ECCS Room Cooler Clean/Inspection Strategy
- 2017-03373; Missed Opportunity: Regulatory Compliance – Repeat Violation from Triennial Heat Sink Inspection Results in NOV
- 2017-03953; Historical Inspection Data for ECCS Room Coolers
- 2017-05588; Tube Blockage Identified in DB-E42-2, ECCS Room Cooler #2
- 2017-06335; Tube Blockage Identified in DB-E42-2, ECCS Room Cooler #1

Procedures

- NOP-ER-2006; "Service Water Reliability Management Program;" Revision 3
- NOP-ER-2006; "Service Water Reliability Management Program;" Revision 4
- PM 4801; "ECCS Room Cooler 1 Clean and Inspect"
- PM 4802; "ECCS Room Cooler 2 Clean and Inspect"
- PM 4803; "ECCS Room Cooler 4 Clean and Inspect"
- PM 4804; "ECCS Room Cooler 5 Clean and Inspect"

Other:

- Letter from B. Doles to the NRC Document Control Desk; "Reply to Notice of Violation VIO 05000346/2017001-01;" 06/12/17
- Notification 600773046; "Determine Tube Plugging Criteria;" 10/13/17

1R12 Maintenance Effectiveness

Condition Reports:

- 2016-14580; Sink hole West side of Containment Near Wall to #3 Mechanical Penetration Room
- 2017-10107; Startup Transformer 2 Deluge Fire Piping Break
- 2017-10582; SU02 Deluge Piping Line Break
- 2017-10701; SU02 Clearance Activity Not Performed
- 2017-11903; Gamma Metrics Channel 1 Wide Range Reading Low
- 2017-12367; Unable to Complete Hydro Test for ECP 17-0384
- 2017-12372; Locked Open SU02 Deluge Isolation Header Valve

Procedures:

- NOP-ER-3001; Problem Solving and Decision Making; Revision 08

- NOP-ER-3004; FENOC Maintenance Rule Program; Revision 02
- DB-FP-04042; Startup Transformer 02 Deluge Test; Revision 15
- DB-SC-03180; Remote Shutdown, Post Accident Monitoring Instrumentation Monthly Channel Check; Revision 14

Work Orders:

- 200731285; NI5874B Wide Range Neutron Flux Trouble Shooting and Repair
- 200731865; Repair Replace Underground X02 Deluge Piping
- 200736618; Gamma Metrics Channel 1 Wide Range Erratic

Drawings:

- M-0216C; Deluge Isometric Drawing; Revision 23

1R13 Maintenance Risk Assessments and Emergent Work Control

Condition Reports:

- 2017-09543; DB-MI-03057 Section 8.2.10 Inadequate Initial Setup Conditions
- 2017-10860; Unexpected RPS CH 1 trip on Flux/Delta Flux/Flow
- 2017-12158; Leakage Past DH45, DH Pump 1 Discharge Isolation

Procedures:

- DB-OP-06012; Decay Heat and Low Pressure Injection System Operating Procedure; Revision 69
- DB-OP-06403; RPS and NI Operating Procedure; Revision 22
- DB-MI-03057; RPS Channel 1 Calibration; Revision 36
- NOP-OP-1007; Risk Management; Revision 24
- NOP-OP-1010; Operational Decision Making; Revision 07

Work Orders:

- 200733536; Unexpected RPS Channel 1 Trip
- 200606857; DH43 DHR Pump 1 Check Valve Maintenance

Drawings:

- M-033B; Decay Heat Train 1; Revision 58

Calculations:

- Other: NOBP-OP-1015; Event Notifications; Revision 11

1R15 Operability Determinations and Functionality Assessments

Condition Reports:

- 2017-10238; OE Line Removed From Service Due to High Grid Voltage
- 2017-12157; Potential Voiding Low Pressure Injection System
- 2017-12182; Unable to perform PM 4706 due to leak by on DH45
- 2017-12139; BACC DH43 Inactive Leak at Body to Cover Joint
- 2017-10360; Rainwater Coming in EDG ventilation
- 2017-12188; Paint Chip in Oil Sample for #1 DH
- 2017-12158; DH Pump 1 Discharge Isolation
- 2017-01330; Calculation Error for Previous Baseline Test Data Evaluation for Service Water Pump Motor 3 Performed for CR 2010-86944

- 2017-10663; Auxiliary Feedwater Pump Turbine (AFPT) #2 Outboard Bearing Oil Sump Sight Glass Markings
- 2017-10646; AFPT #1 Outboard Bearing Oil Sight Glass Level Marks

Procedures:

- DB-SP-03212; Venting of ECCS Piping; Revision 21
- DB-SP-03446; Decay Heat Train 1 Pump and Valve Test; Revision 3
- DB-OP-01300; Standard Working Procedure Switchyard Management; Revision 13 and 14
- DB-OP-06311; 345 KV Switchyard No. 1 (Main) Transformer, No. 11 (Auxiliary) Transformer, and Startup Transformers (01 and 02); Revision 48
- DB-OP-06913; Seasonal Plant Preparation Checklist; Revision 30
- NOP-OP-1003; Grid Reliability Protocol; Revision 08
- NOP-OP-1009; Operability Determinations and Functionality Assessments; Revision 07
- NOBP-CC-2008; Transformer, Switchyard, and Grid Reliability Design Interface and Control; Revision 01

Work Orders:

- 200606857; Decay Heat Pump Discharge Check Valve Maintenance

Drawings:

- OS-Sheet 4; Decay Heat System; Revision 52

Other:

- NORM-OP-1009; SRO Review of Condition Reports; Revision 07

1R18 Plant Modifications

Condition Reports:

- 2016-14214; EFW Facility Temperature Concerns
- 2017-02870; EFW Lower Level EFW and Fire Piping Exposed to Freezing Temperatures
- 2016-14410; Freezing Conditions in the EFW Building

Procedures:

- DB-OP-06235; EFW Facility Electrical and Support Systems Procedure; Revision 02

Work Orders:

- 200609951; ECP 13-0195-007 Construction of EFS Facility
- 200712561; ECP 17-0097 Freeze Protect WFWF Fire Line
- 200712568; ECP 17-0097 Reorient Fan C42C
- 200712574; ECP 17-0097 Modify the EFW Facility Ventilation System

Other:

- ECP 17-0097; Emergency Feedwater Facility HVAC Modification

1R19 Post Maintenance Testing

Condition Reports:

- 2016-10128; Make Up Pump 1 Failed Motor Cable Insulation Test

- 2017-10539; Make Up Pump 1 Failed Motor Cable Insulation Test
- 2017-10586; Damper CV5000A Failed to Open During DB-SS-03250 Monthly Surveillance
- 2017-10587; Emergency Ventilation System Train 1 Filter C1 Exceeded High DP Limit During Testing
- 2017-10731; AFP Speed hunting at Low Speed Stop

Procedures:

- DB-SP-03371; Quarterly Makeup Pump 1 Inservice Test And Inspection; Revision 18
- DB-OP-06006; Makeup and Purification System; Revision 41
- DB-SS-03250; Emergency Ventilation System Train 1 Monthly Test; Revision 8
- DB-OP-06504; Emergency Ventilation System; Revision 19
- DB-SP-03160; AFP Quarterly Test; Revision 18
- DB-OP-06233; Auxiliary Feedwater System; Revision 40
- DB-ME-05330; Schweitzer SEL 387-5 Differential Relay; Revision 01
- DB-OP-06315; 4160 Volt Switching Procedure; Revision 18

Work Orders:

- 200588257; Make Up Pump 1 Replace Breaker Agastat Relay
- 200677981; Lubricate Make Up Pump, Motor, and Speed Increaser
- 200691975; Make Up Pump 1 Motor Cable Maintenance
- 200673002; EVS Preventative Maintenance
- 200732815; EVS Controller Troubleshooting
- 200732809; EVS Controller Replacement
- 200588257; Replace Breaker Agastat Relay
- 200677981; Lubricate Pump, Motor, and Speed Increaser
- 200691975; Make Up Pump 1 Motor Cable Maintenance
- 200675595; Relay 87/XBD Cyber Security Controls
- 200599868; HBBD Breaker Swap

Drawings:

- OS-017A Sheet 1; Auxiliary Feedwater System; Revision 34
- OS-033D; Emergency Ventilation System; Revision 15
- OS-002 Sheet 1; Makeup and Purification System; Revision 30

1R22 Surveillance Testing

Condition Reports:

- 2016-06927; Consistent Negative Values Observed on RCS Unidentified Leakage
- 2017-10478; RCS Integrated Leakage Program Tier I Standard Action Level Exceedance
- 2016-06405; Unexpected Annunciator During DSS Channel 2 Testing
- 2017-10951; Unexpected Annunciator During DSS Channel 2 Testing
- 2017-11484; Unidentified Green Dust Found in Containment 565

Procedures:

- DB-OP-03013; Containment Daily Inspection and Containment Closeout Inspection; Revision 10
- DB-CH-03031; Primary-to-Secondary Leakage Determination; Revision 13
- DB-PF-03291; Containment Personnel and Emergency Airlocks Seal Leakage Test; Revision 14

- DB-SP-03357; RCS Water Inventory Balance (various 9/26/17 - 12/31/17); Revision 9
- DB-SC-04112; DSS Channel 1 Functional Test; Revision 6;
- DB-SC-04113; DSS Channel 2 Functional Test; Revision 6;
- DB-SC-03077; Emergency Diesel Generator 2 184 Day Test; Revision 30
- DB-SC-04227; Emergency Diesel Generator 2 Overspeed Trip Test; Revision 02
- DB-SC-03023; Off-site AC sources lined up and available; Revision 34

Work Orders:

- 200706117; N11 Source Range Maintenance
- 200706104, N12 Source Range Maintenance

1EP4 Emergency Action Level and Emergency Plan Changes

Procedures:

- NOP-LP-5002; Evaluation of Changes to Emergency Plans and Supporting Documents 10 CFR 50.54(q); Revision 6
- EPL-JFG5054Q_FEN-01; 10 CFR50.54(q) Job Familiarization Guide; Revision 1
- RA-EP-01500; Emergency Classification; Revisions 15 and 16
- L-16-020; Evaluation of Proposed License Amendment; Dated February 17, 2016
- L-16-256; Response to July 22, 2016 Request for Additional Information; Dated September 6, 2016
- DBRM-EMER-1500A; Davis-Besse Emergency Action Level Basis Document; Revisions 7 and 8
- RA-EP-01600; Unusual Event; Revision 9
- RA-EP-01700; Alert; Revision 9
- RA-EP-01800; Site Area Emergency; Revision 8
- RA-EP-01900; General Emergency; Revision 10

Other:

- 10 CFR 50.54(q); Evaluator Qualification Record; Dated July 11, 2017
- Lesson Plan EPL-5054Q_FEN-01; 10 CFR 50.54(q) Evaluation; Revision 6
- 10 CFR 50.54(q); Screening DB-2017-012-00; Dated June 13, 2017
- 10 CFR 50.54(q); Screening DB-2016-025-00; Dated December 8, 2016
- 10 CFR 50.54(q); Evaluation DB-2017-012-00; Dated May 26, 2017
- 10 CFR 50.54(q); Screening DB-2017-019-00; Dated June 23, 2017
- Davis-Besse Nuclear Power Station Emergency Plan; Revisions 30, 31, and 32

2RS5 Radiation Monitoring Instrumentation

Condition Reports:

- 2017-08711; Higher Ambient Temperature Noted Around the Station Vent Stack Radiation Monitors
- 2016-07837; Argos-5AB Found in "Fault" Alarm; June 17, 2016
- 2016-07675; Argos Unit In Fault – Detector Failure; June 11, 2016
- 2016-01520; Perform Aggregate Review of Instrument Malfunctions; February 1, 2016
- 2017-10790; NRC Question on Neutron Source Decay Standardization; October 26, 2017

Procedures:

- SA-BN-2017-0611; Radiation Monitoring Instrumentation (Q4 2017 – NRC Inspection Procedure 71124.05); September 27, 2017
- DB-HP-01320; Operation of Whole Body Counters; Revision 11
- DB-HP-01325; Operation of the ABACOS 2000 Accuscan II Whole Body Counting System; Revision 2
- DB-HP-01324; Accuscan-II Whole Body Counter Calibration and Performance Checks; Revision 2
- DB-HP-01322; Body Counter Calibration and Performance Testing; Revision 6
- DB-HP-01435; Calibration and Use of the Portal Monitor SPM 904C/SPM 906; Revision 5
- DB-HP-01465; ARGOS-5 Personnel Contamination Monitor Calibration and Use; Revision 4
- DB-HP-01447; Small Article Monitor Calibration; Revision 6
- DB-HP-01432; ASP-1 Calibration and Use; Revision 4

Other:

- Instrument Reliability Review for the Period of January 1, 2014 to March 1, 2016
- Notification 601134001; Enhance Weekly Source Check Study; October 24, 2017
- Radiation Protection Instrument Vendor Calibration Certificate; REM 500; LI 2.7.676; June 5, 2017
- Calibration Data Sheet – Small Article Monitor; LI 2.12.86; August 17, 2017
- Calibration Data Sheet – MG Telepole; LI 2.7.578; June 9, 2017
- Calibration Data Sheet – ASP-1 NRD; LI 2.7.325; August 27, 2017
- Calibration Data Sheet – ASP-1 NRD; LI 2.7.233; August 22, 2017
- Calibration Data Sheet – ASP-1 NRD; LI 2.7.231; August 18, 2017
- Calibration Data Sheet – AMP 50/100/200; LI 2.7.398; October 3, 2017
- AMS-4 Calibration Record; LI 2.8.183; August 10, 2017
- ARGOS Calibration Record; LI 2.12.106; February 15, 2017
- Calibration Data Sheet – CRONOS-4; LI 2.12.98; March 14, 2017
- Fluke 451B Calibration Record; LI 2.7.535; July 10, 2017
- Calibration Data Sheet – GEM-5; LI 2.12.93; November 14, 2016
- Calibration Data Sheet – Air Sampler; LI 2.8.33E; July 26, 2017
- Frisker Calibration Data Sheet; LI 2.7.540; July 23, 2017
- Calibration Data Sheet – Lapel Sample Pump; LI 2.8.163; August 1, 2017
- Portal Calibration Data Record; LI 2.12.66; July 31, 2017
- Frisker Calibration Data Sheet; LI 2.7.33; July 8, 2017

2RS6 Radioactive Gaseous and Liquid Effluent Treatment

Condition Reports:

- 2016-11580; ODCM Alteration Documentation Package Issues; September 29, 2016
- 2017-10817; NRC Identified – Procedures not Updated in a Timely Manner; October 26, 2017
- 2017-10830; Disparity Found in the 2015 Annual Radiological Environmental Operating Report; October 27, 2017

Procedures:

- SA-BN-2017-0672; Radioactive Gaseous and Liquid Effluent Treatment; September 29, 2017

- DB-CH-12001; Station Vent Releases, Noble Gas Activity, RE 4598 Inoperable; Revision 2
- DBRM-EMER-5003; Equipment Important to Emergency Response; Revision 15
- DB-CH-06012; Accident Range Station Vent Monitor Operation; Revision 1
- DB-CN-12006; Station Vent Releases, Particulate and Iodine Samplers Inoperable; Revision 3
- DB-CN-12007; Station Vent Releases, Samplers Flow Rate Measuring Device Inoperable; Revision 2
- DB-OP-03011; Radioactive Liquid Batch Release; Release 15-030; July 30, 2015
- DB-OP-03011; Radioactive Liquid Batch Release; Release 15-031; August 7, 2015
- DB-OP-03011; Radioactive Liquid Batch Release; Release 15-032; August 12, 2015
- DB-OP-03011; Radioactive Liquid Batch Release; Release 17-038; October 19, 2017
- M-340DQ-00357-01; Primary Calibration Reports for Station Vent Monitors; February 18, 2014

Other:

- Notification 60106361; DB-CH-06012 – Rewrite for Mirion Monitors; September 26, 2016
- Notification 600807282; DB-CN-12001 Revise for ECP 04-0006; January 17, 2013
- Notification 600807283; DB-CN-12006 – Revise for ECP 04-0006; January 17, 2013
- Surveillance DB-CN30001-001; Liquid/Gaseous Release Dose Commitment; Various Dates
- Radioactive Gaseous Batch Release Permit; 17-003G; August 27, 2017
- Annual Radiological Environmental Operating Report including the Radiological Effluent Release Report; Davis-Besse Nuclear Power Station; 2014
- Annual Radiological Environmental Operating Report including the Radiological Effluent Release Report; Davis-Besse Nuclear Power Station; 2015
- Annual Radiological Environmental Operating Report including the Radiological Effluent Release Report; Davis-Besse Nuclear Power Station; 2016

40A1 Performance Indicator Verification

Condition Reports:

- 2017-09724; Radiochemistry Iron-55 (Fe-55) Cross Check Sample Analysis Result Disagreement; September 21, 2017
- 2017-10832; NRC Identified: Monthly DB-CN-03001 Performance Lagging; October 27, 2017

Procedures:

- NOBP-LP-4012-51; MSPI Support Cooling Water System – Component Cooling Water System; October 2016 through September 2017
- NOBP-LP-4012-51; MSPI Support Cooling Water System – Service Water System; October 2016 through September 2017
- NOBP-LP-4012-53; Reactor Coolant System Leakage, October 2016 – September 2017; Revision 00
- NOBP-LP-4012-58; RETS/ ODCM Radiological Effluent Occurrence; Revision 00; April 2016 through June 2017

Other:

- Control Room Operator Logs; October 2016, and February, March, August 2017
- NEI 99-02; Regulatory Assessment Performance Indicator Guideline; Revision 7

- Mitigating System Performance Index Basis Document; Revision 5
- Reactor Oversight Program Mitigating System Performance Index Basis Document, Davis-Besse Nuclear Power Station, Revision 5

4OA2 Problem Identification and Resolution

Condition Reports:

- 2017-12487; AFPT 1 Outboard Bearing Scoring Identified during 19RFO Overhaul
- 2011-91279; AFP 1 Outboard Bearing Site Glass Level Indication Bands are Set High
- 2017-09685; Evaluate Operator Performance in Response to AFPT #1 Pump End Bearing High Temperature
- 2017-09688; Aux. Feed Pump Turbine #1 Elevated Particulate Levels in Oil Samples from Inbd and Outb Bearing Reservoirs
- 2017-09817; AFPT 1 O/B Bearing Elevated Temperature
- 2002-06767; LIR-AFW-JCO Inputs Not Bounding
- 2017-09527; Incorrect AFPT Inboard Bearing Sight Glass Minimum Levels
- CR 01-0012; Confusion Exists Regarding the Location of Oil Addition Points on Various Pumps
- 2017-09443; AFPT 1 P/E BRG MT Came into Alarm, AFPT 1 Tripped Locally
- 2017-09857; #1 Auxiliary Feedwater Pump Exceeded its Allowed Unavailability
- 2017-10839; Documentation and Communication of AFW Pump Turbine Bearing Oil Level Extent of Condition Reviews
- 2017-10663; Auxiliaty Feedwater Pump Turbine (AFPT) #2 Outboard Bearing Oil Sump Sight Glass Markings
- 2017-10646; AFPT #1 Outboard Bearing Oil Sight Glass Level Marks
- 2016-08795; Shield Building Bore S12-666.0-4 Inspection Findings
- 2016-09073; Shield Building Bore S13-631.0-8 Inspection Findings
- 2017-07686; Shield Building Bore S3-650.0-11 Findings
- 2017-07729; Shield Building Bore S9-785.0-22.5 Findings
- 2017-07787; Shield Building Bore S9-666.0-12 Findings
- 2017-07788; Shield Building Bore S10-740-35 Findings
- 2017-07789; Shield Building Bore S4-650.0-16 Findings
- 2017-07832; Exterior Surface Vertical Crack on Shoulder 10
- 2017-07833; Shield Building Bore S10-740-41 Findings
- 2017-07868; Shield Building Bore S10-780.0-19 Findings
- 2017-07870; Shield Building Bore S7-666.7 Findings
- 2017-07873; Shield Building Bore S7-666.0-9 Findings
- 2017-07878; Shield Building Bore S4-650.0-13 Findings
- 2017-07975; Shield Building Bore S9-782.5-22 Findings
- 2017-07976; Shield Building Bore S6-666.0-44 Findings
- 2017-07979; Shield Building Bore S5-666.0-10 Findings
- 2017-08017; Shield Building Bore S12-666.0-4 Findings
- 2017-08188; Shield Building Bore S15-674.5-3 Findings
- 2017-08189; Shield Building Bore S9-666.0-11 Findings
- 2017-08190; Shield Building Bore S13-633.0-11 Findings
- 2017-08191; Shield Building Bore S10-666.0-38 Findings
- 2017-08893; Shield Building Bore S9-653.0-9 Findings
- 2017;10519; Additional Material Removal Required for Shield Building Shoulder 12
- 2017-10796; Shield Building Reinforcement Corrosion
- 2017-11112; Shoulder 12 Concrete Rework Findings at Bottom Limits of Repair

- 2017-00866; Concerns with SW Pump Room Roof Caulk
- 2017-02114; Crack in Expansion Joint on North Wall/Floor 404 Corridor on 603'
- 2013-02319; Penetration Seal Fails Visual Inspection
- 2016-12624; Deteriorating Architectural Panels on the Relay House
- 2011-05630; Decay Heat Pit has a Crack in the Caulking that may have been Caused by/during the ILRT
- 2011-92426; Improper Seal Material used on Penetration 300-F-033/205-C-INACC
- 2016-13055; Degraded Condition of Expansion Joint Along Fire Barrier Wall
- 2016-14591; Water Intrusion Splashing on Flex Charging Pump P296-1
- 2016-12840; Service Water Pump Room Roof Leaks When it Rains
- 2011-92666; Rain Water Entering EDG Rooms through Missile Barriers
- 2011-05687; Decay Heat Valve Pit Leak Test does not Meet Acceptance Criteria
- 2014-12145; Rain Water Intrusion into Emergency Diesel Generator Rooms
- 2016-05833; HP Cond Expansion Joint Cracks
- 2015-08425; Water Intrusion into E41B
- 2015-12344; SWP Room Roof Leak
- 2016-08483; Intake Structure Roof Leak
- 2016-08336; Long Standing Maintenance Issues in Intake Structure
- 2016-10942; Intake Structure Roof Leak
- 2017-00778; Gap in Gum Rubber Seat for Intake Structure Roof Hatch
- 2015-11466; the Intake Structure Roof Hatch Plug Over SWP #3 Is Leaking
- 2017-03648; Roof Leak in Service Water Pump Room
- 2016-02595; Roof Leak into the Service Water Pump Room
- 2015-08252; Water Leaking onto E41B From Roof of Service Water Pump House
- 2016-14180; Water Intrusion in SWP #1 from East Side of Roof Plug
- 2017-10401; SFAS CH2 BWST Level
- 2017-10418; LT 1525 B Obrien Box Seal
- 2017-10561; Question Regarding ECP 16-0478 Installed BWST Level Transmitter
- 2017-11295; BWST Level Indicator LI1525C may need Calibrated

Procedures:

- DB-OP-02000; RPS, SFAS, SFRCS Trip, or SG Tube Rupture; Revision 29
- DB-OP-02700; Station Blackout; Revision 00
- NOBP-LP-2011; FENOC Cause Analysis; Revision 21
- DB-SP-03151; AFP 1 Quarterly Test; Revision 25
- DB-MS-09010; Concrete Placement Procedure; Revision 3
- EN-DP-01511; Structures Monitoring; Revision 7
- DB-MS-09075; Sealing Equipment Hatches on the Intake Structure; Revision 1
- NOP-MS-2001; Procurement of Materials and Services; Revisions 13, 14, 15
- NOP-ER-3001; Problem Solving and Decision Making; Revision 8
- NOP-OP-1009; Operability Determinations and Functionality Assessments
- NORM-OP-1009; SRO Review of Condition Reports
- NOBP-OP-1009; Prompt Operability Determination and Functionality Assessment Preparation Guide

Work Orders:

- 3-97-1700-01; K3-1 LUB / CK TTV
- 200000249; K3-1 LUB / CK TTV
- 200423148; PM 2391 K3-1 Insp/Overhaul AFPT 1

Drawings:

- M-36-66-1; Turbine; Drawing 800370E
- M-006D; Auxiliary Feedwater System; Revision 59
- C-111A; Shield Building Exterior Developed Elevation; Revision 7
- C-111B, Sheet 1; Shield Building Continued Data for Core Bore Inspections; Revision 3
- C-111B; Shield Building Exterior Developed Elevation; Revision 3

Other:

- M-036-00021; Terry Turbine Instruction Manual for Turbines; Revision 20
- PO 45390052; Quality Control Receiving Inspection Report
- Log Entries Report 9/13/17-9/20/17
- AFPT #1 I/B Bearing Oil Analysis
- 50.59 Screen No. 17-01519; Shield Building Concrete Removal and Repair for Rebar Inspection; Revision 0
- Specification 12501-C-3301Q; Technical Specification for Operational Phase for Purchase of Ready Mixed Concrete for the Toledo Edison Company Davis-Besse Nuclear Power Station Unit 1; Revision 3
- Specification 12501-C-401Q; Technical Specification for Operational Phase for Forming, Placing, Finishing, and Curing of Concrete for the Toledo Edison Company Davis-Besse Nuclear Power Station Unit 1; Revision 0
- Test Report 181228-0007; Bowser Morner Test Report: Concrete Compressive Strength Test; 12/09/2017
- Test Report TOL003-17-10-73776-3; Element Materials Technology Test Report: Mechanical Splice Tests, #10 Rebar and #11 Rebar; 11/11/2017
- VTI 601021774; University Tests that Developed 0.050" Laminar Crack
- ECP 17-0211-000; Shield Building Concrete Removal and Repair for Rebar Inspection; Revision 0
- ECP 17-0211-001; Shield Building Concrete Removal and Repair for Rebar Inspection; Revision 0
- 601132115; Engineering Evaluation Request: Shield Building Rebar use-as-is Criteria; 10/20/2017
- C-CSS-099.20-069; Shield Building Laminar Cracking Limits; Revision 0
- C-CSS-099.20-072; Shield Building Evaluation for Interim Condition with Partial and Limited Concrete Removal in Specified Areas of Shoulders 12 & 13; Revision 0
- C-NSA-028.01-010; MHA EAB and LPZ Shield Building Core Drill Dose; Revision 0
- C-NSA-028.01-010, Revision 0; MHA EAB and LPZ Shield Building Core Drill Dose; Addendum 1

LIST OF ACRONYMS USED

AC	Alternating Current
ADAMS	Agencywide Document Access Management System
AFP	Auxiliary Feedwater Pump
AFPT	Auxiliary Feedwater Pump Turbine
AFW	Auxiliary Feedwater
AV	Apparent Violation
BWST	Borated Water Storage Tank
CAP	Corrective Action Program
CFR	<i>Code of Federal Regulations</i>
CR	Condition Report
DRP	Division of Reactor Projects
EAL	Emergency Action Levels
ECCS	Emergency Core Cooling System
ECP	Engineering Change Package
EDG	Emergency Diesel Generator
EFW	Emergency feedwater
IMC	Inspection Manual Chapter
IP	Inspection Procedure
IR	Inspection Report
MSPI	Mitigating System Performance Index
NCV	Non-Cited Violation
NEI	Nuclear Energy Institute
NRC	U.S. Nuclear Regulatory Commission
ODCM	Offsite Dose Calculation Manual
PI	Performance Indicator
PI&R	Problem Identification and Resolution
PM	Post Maintenance
RCE	Root Cause Evaluation
RCS	Reactor Coolant System
SSC	Systems, Structures, and Components
TBD	To Be Determined
TS	Technical Specification
USAR	Updated Safety Analysis Report
URI	Unresolved Item
VIO	Notice of Violation
WO	Work Order