



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION**

REGION III  
2443 WARRENVILLE RD. SUITE 210  
LISLE, IL 60532-4352

January 26, 2017

Mr. Brian D. Boles  
Site Vice President  
FirstEnergy Nuclear Operating Company  
Davis-Besse Nuclear Power Station  
5501 N. State Rte. 2, Mail Stop A-DB-3080  
Oak Harbor, OH 43449-9760

**SUBJECT: DAVIS-BESSE NUCLEAR POWER STATION—NRC INTEGRATED INSPECTION  
REPORT 05000346/2016004; 05000346/2016501**

Dear Mr. Boles:

On December 31, 2016, the U.S. Nuclear Regulatory Commission (NRC) completed an integrated inspection at your Davis-Besse Nuclear Power Station. On January 10, 2017, the NRC inspectors discussed the results of this inspection with you and other members of your staff. Inspectors documented the results of this inspection in the enclosed inspection report. The NRC also completed its annual inspection of the Emergency Preparedness Program. This inspection began on January 1, 2016, and issuance of this letter closes Inspection Report Number 2016501.

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). These findings did not involve violations of NRC requirements.

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 Regional Administrator, Region III, and the NRC Resident Inspector at the Davis-Besse Nuclear Power Station.

B. Boles

-2-

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

Sincerely,

*/RA/*

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

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

Enclosure:  
IR 05000346/2016004; 05000346/2016501

cc: Distribution via LISTSERV®

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

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

Report Nos: 05000346/2016004; 05000346/2016501

Licensee: FirstEnergy Nuclear Operating Company (FENOC)

Facility: Davis-Besse Nuclear Power Station

Location: Oak Harbor, OH

Dates: October 1, through December 31, 2016

Inspectors: P. Smagacz, Acting Senior Resident Inspector  
D. Kimble, Senior Resident Inspector  
T. Briley, Resident Inspector  
J. Cassidy, Senior Health Physicist  
A. Dahbur, Reactor Inspector  
M. Garza, Emergency Preparedness Inspector  
J. Mancuso, Reactor Engineer  
D. Mills, Nuclear Systems Engineer  
J. Rutkowski, Project Engineer  
J. Seymour, Operations Engineer  
R. Walton, Operations Engineer (Lead)

Approved by: J. Cameron, Chief  
Branch 4  
Division of Reactor Projects

Enclosure

## TABLE OF CONTENTS

SUMMARY.....	2
REPORT DETAILS.....	4
Summary of Plant Status.....	4
1. REACTOR SAFETY.....	4
1R01 Adverse Weather Protection (71111.01).....	4
1R04 Equipment Alignment (71111.04).....	5
1R05 Fire Protection (71111.05).....	6
1R11 Licensed Operator Requalification Program (71111.11).....	7
1R12 Maintenance Effectiveness (71111.12).....	10
1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13).....	14
1R15 Operability Determinations and Functional Assessments (71111.15).....	15
1R19 Post-Maintenance Testing (71111.19).....	15
1R22 Surveillance Testing (71111.22).....	16
1EP4 Emergency Action Level and Emergency Plan Changes (71114.04).....	17
1EP6 Drill Evaluation (71114.06).....	18
2. RADIATION SAFETY.....	18
2RS1 Radiological Hazard Assessment and Exposure Controls (71124.01).....	18
2RS2 Occupational As-Low-As-Is-Reasonably-Achievable Planning and Controls (71124.02).....	20
4. OTHER ACTIVITIES.....	22
4OA1 Performance Indicator Verification (71151).....	22
4OA2 Identification and Resolution of Problems (71152).....	23
4OA3 Follow-Up of Events and Notices of Enforcement Discretion (71153).....	26
4OA5 Other Activities.....	32
4OA6 Management Meetings.....	33
SUPPLEMENTAL INFORMATION.....	1
Key Points of Contact.....	1
List of Items Opened, Closed, and Discussed.....	2
List of Documents Reviewed.....	3
List of Acronyms Used.....	17

## SUMMARY

Inspection Report 05000346/2016004; 10/1/16 – 12/31/16; 05000346/2016501; 01/01/16 – 12/30/2016; Davis-Besse Nuclear Power Station; Maintenance Effectiveness; Follow-Up of Events and Notices of Enforcement Discretion.

This report covers a three-month period of inspection by resident inspectors and announced baseline inspections by regional inspectors and the annual review of emergency preparedness. Two Green findings were identified. The findings did not involve violations of the U.S. Nuclear Regulatory Commission (NRC) requirements. The significance of inspection findings is indicated by their color (i.e., greater than Green, or Green, White, Yellow, Red) and determined using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process," dated April 29, 2015. Cross-cutting aspects are determined using IMC 0310, "Aspects Within the Cross-Cutting Areas," dated December 4, 2014. All violations of NRC requirements are dispositioned in accordance with the NRC's Enforcement Policy, dated November 1, 2016. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 6, dated July 2016.

### Cornerstone: Initiating Events

- Green. A self-revealed finding of very low safety significance was identified for the licensee's failure to appropriately follow station procedures for aligning instrument air valves that support main feedwater (MFW) regulating valve operation. Specifically, two instrument air valves were not aligned to their normal operating position following planned maintenance. As a result, the Steam Generator 2 (SG 1-2) MFW Regulating Valve momentarily closed during routine steam feedwater rupture control system (SFRCS) surveillance testing and caused a plant transient. Corrective actions taken by the licensee, include but are not limited to, performance of an instrument air valve line up to validate no other valves were out of position; performance of SFRCS Actuation Channel 2 testing to verify no other half trips existed on SFRCS Actuation Channel 2 components; a configuration control stand-down with the instrument and control shop; and revisions to procedural guidance to perform additional valve position verification.

The finding was of more than minor significance because it was associated with cornerstone attribute of configuration control and adversely affected the cornerstone objective: "To limit the likelihood of events that upset plant stability and challenge critical safety functions during shutdown as well as power operations." The finding was determined to be of very low safety significance because the finding did not cause a reactor scram with the loss of mitigation equipment relied upon to transition the plant from the onset of the scram to a stable shutdown condition (e.g. loss of condenser, loss of feedwater). The inspectors determined that the finding had a cross-cutting aspect in the area of human performance. The inspectors assigned the cross-cutting aspect of "Avoid Complacency" to the finding because the procedural step to close valve IA1008A was marked as complete but was not performed correctly. Additionally, appropriate human performance error reduction tools were not adequately used to ensure valve manipulations were performed as intended. (H.12) (Section 1R12.1)

- Green. A finding of very low safety significance was self-revealed on September 10, 2016, when rainwater intrusion into the automatic voltage regulator caused a generator lockout and reactor trip. Specifically, station management failed to adequately assess the identified degraded condition of the turbine building roof vents in

accordance with station expectations and procedures when four roof vents were left stuck open although it was identified by operators that water intrusion was possible onto the stator water cooling skid and automatic voltage regulator on August 17th, 24 days prior to the event. No violation of regulatory requirements was identified because the turbine building roof vents and automatic voltage regulator are not safety related, and the applicable maintenance procedures were not covered under Title 10 of the *Code of Federal Regulations* (10 CFR) 50, Appendix B.

The finding was of more than minor safety significance because it affected the Equipment Reliability attribute of the Initiating Events cornerstone. Specifically, the failure to fully evaluate the risk associated with the stuck open turbine building roof vents affected the availability and reliability of the automatic voltage regulator causing a reactor trip. The inspectors also reviewed the examples of minor issues in IMC 0612, "Power Reactor Inspection Reports," Appendix E, "Examples of Minor Issues," dated August 11, 2009, and found no similar examples. The finding was determined to be a licensee performance deficiency of very low safety significance because the performance deficiency did not cause a reactor trip with the loss of mitigating equipment. The inspectors determined this finding affected the cross-cutting area of problem identification and resolution and the cross-cutting aspect of evaluation. The licensee did not properly evaluate the problem and assigned an incorrect priority to the work order to address the degraded roof vents. (P.2) (Section 4OA3.4)

## **REPORT DETAILS**

### **Summary of Plant Status**

The unit began the inspection period at full power. On October 14, 2016, the licensee commenced a downpower to approximately 53 percent in order to effect repairs to power supplies and circuit cards for main feedwater (MFW) pump turbine 1. The unit was returned to full power on October 16, 2016. The unit continued to operate at or near full power through the remainder of the inspection period.

### **1. REACTOR SAFETY**

#### **Cornerstones: 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 Final Safety Analysis Report (UFSAR) 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 corrective action program (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:

- emergency feedwater facility; and
- borated water storage tank (BWST).

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 Readiness for Impending Adverse Weather Condition—Heavy Snowfall Conditions and Extreme Cold

a. Inspection Scope

On December 11–12, 2016, a winter weather advisory was issued for expected snow squalls. Additionally, extreme cold conditions were forecast in the vicinity of the facility the remainder of the week ending December 17, 2016. The inspectors observed the licensee’s preparations, planning, and protection for the significant winter weather potential. The inspectors reviewed licensee procedures and discussed potential compensatory measures with control room personnel. The inspectors focused on plant management’s actions for implementing the station’s procedures for ensuring adequate personnel for safe plant operation and emergency response would be available. The inspectors conducted a site walkdown including walkdowns of various plant structures and systems to check for maintenance or other apparent deficiencies that could affect system operations during the predicted significant weather. The inspectors observed insulation, heat trace circuits, space heater operation, and weatherized enclosures to ensure operability of affected systems. 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.

This inspection constituted one readiness for impending adverse weather condition 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:

- auxiliary feedwater train 2 during auxiliary feedwater train 1 maintenance;
- decay heat/low pressure injection system train 2 during decay heat/low pressure injection train 1 maintenance; and
- emergency diesel generator (EDG) 2 during EDG1 maintenance.

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, UFSAR, 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 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:

- mechanical penetration room 2;
- emergency core cooling system room 1;
- station blackout diesel generator room; and
- mechanical penetration room 4.

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.

1R11 Licensed Operator Regualification Program (71111.11)

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

a. Inspection Scope

On November 16, 2016, the inspectors observed a crew 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 one quarterly licensed operator regualification program simulator sample as defined in IP 71111.11-05.

b. Findings

No findings were identified.

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

a. Inspection Scope

During the course of the inspection period, the inspectors performed several observations of licensed operator performance in the plant's control room to verify that operator performance was adequate and that plant evolutions were being conducted in accordance with approved plant procedures. Specific activities observed that involved a heightened tempo of activities or periods of elevated risk included, but were not limited to:

- MFW Pump 1 startup following planned maintenance and associated plant power maneuvers on October 15 and 16, 2016.

The inspectors evaluated the following areas during the course of the control room observations:

- licensed operator performance;
- the clarity and formality of communications;
- the ability of the crew to take timely and conservative actions;
- the crew's prioritization, interpretation, and verification of annunciator alarms;
- the correct use and implementation of normal operating, annunciator alarm response, and abnormal operating procedures by the crew;
- control board manipulations;
- the oversight and direction provided by on-watch SROs and plant management personnel; and
- the ability of the crew to identify and implement appropriate TS actions and notifications.

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

These observation activities by the inspectors of operator performance in the station's control room constituted one quarterly inspection sample as defined in IP 71111.11-05.

b. Findings

No findings were identified.

.3 Biennial Written and Annual Operating Test Results (71111.11A)

a. Inspection Scope

The inspectors reviewed the overall pass/fail results of the Biennial Written Examination and the Annual Operating Test administered by the licensee from October 18, through December 16, 2016, as required by Title 10 of the *Code of Federal Regulations* (10 CFR) 55.59(a). The results were compared to the thresholds established in Inspection Manual Chapter (IMC) 0609, Appendix I, "Licensed Operator Requalification Significance Determination Process," to assess the overall adequacy of the licensee's Licensed Operator Requalification Training (LORT) 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 (IP) 71111.11-05.

b. Findings

No findings were identified.

.4 Biennial Review (71111.11B)

a. Inspection Scope

The following inspection activities were conducted during the week of November 28, 2016, to assess: (1) the effectiveness and adequacy of the facility licensee's implementation and maintenance of its systems approach to training (SAT)

based LORT program, put into effect to satisfy the requirements of 10 CFR 55.59; (2) conformance with the requirements of 10 CFR 55.46 for use of a plant referenced simulator to conduct operator licensing examinations and for satisfying experience requirements; and (3) conformance with the operator license conditions specified in 10 CFR 55.53. The documents reviewed are listed in the Attachment to this report.

- Licensee Regualification Examinations (10 CFR 55.59(c); SAT element 4 as defined in 10 CFR 55.4): The inspectors reviewed the licensee's program for development and administration of the LORT biennial written examination and annual operating tests to assess the licensee's ability to develop and administer examinations that are acceptable for meeting the requirements of 10 CFR 55.59(a).
  - The inspectors conducted a detailed review of one biennial requalification written examination version to assess content, level of difficulty, and quality of the written examination materials. (02.03)
  - The inspectors conducted a detailed review of ten Job Performance Measures (JPMs), four simulator scenarios to assess content, level of difficulty, and quality of the operating test materials. (02.04)
  - The inspectors observed the administration of the annual operating test and biennial written examination to assess the licensee's effectiveness in conducting the examination(s), including the conduct of pre-examination briefings, evaluations of individual operator and crew performance, and post-examination analysis. The inspectors evaluated the performance of Operating Crew 4 in parallel with the facility evaluators during three dynamic simulator scenarios, and evaluated various licensed crew members concurrently with facility evaluators during the administration of several JPMs. (02.05)
  - The inspectors assessed the adequacy and effectiveness of the remedial training conducted since the last requalification examinations to ensure that the licensee addressed weaknesses in a licensed operator's performance identified during requalification exams. The inspectors reviewed remedial training procedures and one individual remedial training plan. (02.07)
- Conformance with Examination Security Requirements (10 CFR 55.49): The inspectors conducted an assessment of the licensee's processes related to examination physical security and integrity (e.g., predictability and bias) to verify compliance with 10 CFR 55.49, "Integrity of Examinations and Tests." The inspectors reviewed the facility licensee's examination security procedure, and observed the implementation of physical security controls (e.g., access restrictions and simulator I/O controls) and integrity measures (e.g., security agreements, sampling criteria, bank use, and test item repetition) throughout the inspection period. (02.06)
- Conformance with Operator License Conditions (10 CFR 55.53): The inspectors reviewed the facility licensee's program for maintaining active operator licenses and to assess compliance with 10 CFR 55.53(e) and (f). The inspectors reviewed the procedural guidance and the process for tracking on-shift hours

for licensed operators, and which control room positions were granted watch-standing credit for maintaining active operator licenses. Additionally, medical records for eight licensed operators were reviewed for compliance with 10 CFR 55.53(I). (02.08)

- Conformance with Simulator Requirements Specified in 10 CFR 55.46: The inspectors assessed the adequacy of the licensee's simulation facility (simulator) for use in operator licensing examinations and for satisfying experience requirements. The inspectors reviewed a sample of simulator performance test records (e.g., transient tests, malfunction tests, scenario based tests, post-event tests, steady state tests, and core performance tests), simulator discrepancies, and the process for ensuring continued assurance of simulator fidelity in accordance with 10 CFR 55.46. The inspectors reviewed and evaluated the discrepancy corrective action process to ensure that simulator fidelity was being maintained. Open simulator discrepancies were reviewed for importance relative to the impact on 10 CFR 55.45 and 55.59 operator actions as well as on nuclear and thermal hydraulic operating characteristics. (02.09)
- Problem-Identification and Resolution (P&IR) (10 CFR 55.59(c); SAT element 5 as defined in 10 CFR 55.4): The inspectors assessed the licensee's ability to identify, evaluate, and resolve problems associated with licensed operator performance (a measure of the effectiveness of its LORT program and their ability to implement appropriate corrective actions to maintain its LORT Program up-to-date). The inspectors reviewed documents related to licensed operator performance issues (e.g., recent examination and inspection reports including Cited and Non-Cited Violations (NCVs); NRC End-of-Cycle and Mid-Cycle reports; NRC plant issue matrix; licensee event reports (LERs); licensee condition/problem identification reports including documentation of plant events and review of industry operating experience). The inspectors also sampled the licensee's quality assurance oversight activities, including licensee training department self-assessment reports. (02.10)

This inspection constituted one biennial licensed operator requalification program inspection sample as defined in IP 71111.11-05.

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness (71111.12)

.1 Routine Quarterly Evaluations

a. Inspection Scope

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

- the performance of MFW pump turbine controls;
- the performance of MFW regulating valves; and
- the containment shield building and its condition/performance monitoring program.

The inspectors reviewed events such as where ineffective equipment maintenance had 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).

The inspectors assessed performance issues with respect to the reliability, availability, and condition monitoring of the system. In addition, the inspectors verified maintenance effectiveness issues were entered into the CAP with the appropriate significance characterization. Documents reviewed are listed in the Attachment to this report.

These maintenance effectiveness review activities conducted by the inspectors constituted three quarterly maintenance effectiveness samples as defined in IP 71111.12-05.

b. Findings

(1) Mispositioned Instrument Air Valves Result in Plant Transient

Introduction

A self-revealed finding (FIN) of very low safety significance (Green) was identified for the licensee's failure to appropriately follow station procedures for aligning instrument air valves that support MFW regulating valve operation. Specifically, two instrument air valves were not aligned to their normal operating position following planned maintenance. As a result, the steam generator 2 (SG 1-2) MFW regulating valve momentarily closed during routine steam feedwater rupture control system (SFRCS) surveillance testing and caused a plant transient.

Discussion

On May 31, 2016, at approximately 10:21 a.m., planned testing of SFRCS actuation channel 1 was in progress. This was the first performance of this test since the unit returned to operation following refueling outage (RFO) 19. Unexpectedly, operators in the control room received several overhead annunciator alarms coincident with a rapid swing in plant power and indications that the SG 1-2 MFW regulating valve (SP6A) had gone closed and then reopened.

In accordance with established procedures for responding to such an event, control room operators took manual control of integrated control system (ICS) stations for reactor demand, SG/reactor demand, both MFW regulating valves, both MFW startup valves, and both MFW loop demands. The control room crew was then able to arrest the transient and stabilize plant power at approximately 89 percent.

Initial evaluation of the transient by the licensee revealed that two instrument air valves associated with control air for SP6A (IA1008D, SVSP6A1 Bypass; and IA1008A, SVSP6A1 Maintenance Isolation) were out of their normal positions. The mispositioned valves had the effect of placing SP6A in a “half trip” condition, such that when SFRCS actuation channel 1 was being tested SP6A unintentionally responded to the test signal.

The licensee entered this issue into their CAP as condition reports (CRs) 2016–07282, 2016–07286, 2016–07337, and 2016–08386.

The licensee performed a full apparent causal evaluation and determined the primary cause of SP6A closing during the performance of SFRCS actuation channel 1 testing was IA1008A being in the closed position (normally open) which isolated one air supply path to SP6A. SFRCS actuation channel 1 testing momentarily isolated the second air supply line to SP6A which caused the valve to go closed due to a loss of air.

The licensee had recently replaced the existing electric to pneumatic convertor for SP6A with a voltage to current convertor and digital positioner during RFO 19. IA1008A was manipulated for test gauge installation and removal during the first time performance of post maintenance test procedure DB–MI–05330, “Steam Generator 1–2 Main Feedwater Control Valve SP6A Calibration and Loss of Instrument Air Test”. In particular, procedure step 8.1.12 stated “Open IA1008A, SVSP6A1 Maintenance Isolation Valve” following test gauge removal. The licensee determined this step, although marked as complete, was not performed correctly, and IA1008A was left in the closed position.

IA1008D being in the open (normally closed) position was determined to be a contributing cause because it masked the fact that IA1008A was closed by providing a path for air pressure to the indicator on pressure control valve PCV1008L which made it appear like IA1008A was open. IA1008D being in the wrong position would not directly cause a trip of SP6A.

The licensee determined the cause of IA1008D being open instead of closed was a latent issue associated with maintenance performed in 2011 under work order (WO) 200423353 to rebuild solenoid valves SVSP6A1 and SVSP6A2, which opened IA1008D but did not restore the valve to the closed position. The safety-related function of SP6A to trip closed on a SFRCS signal was not impacted with the mispositioned instrument air valves

Corrective actions taken by the licensee, include but are not limited to, performance of an instrument air valve line up to validate no other valves were out of position; performance of SFRCS actuation channel 2 testing to verify no other half trips existed on SFRCS actuation channel 2 components; a configuration control stand-down with the instrument and control shop; and revisions to procedural guidance to perform additional valve position verifications.

## Analysis

The inspectors reviewed this finding using the guidance contained in Appendix B, "Issue Screening," of IMC 0612, "Power Reactor Inspection Reports." The inspectors determined that the licensee's failure to appropriately follow station procedures for aligning instrument air valves that support MFW regulating valve operation constituted a performance deficiency that was reasonably within the licensee's ability to foresee and correct and should have been prevented. This finding was associated with the Initiating Events Cornerstone of Reactor Safety and was determined to be of more than minor significance because it was associated with cornerstone attribute of configuration control, and adversely affected the cornerstone objective: "To limit the likelihood of events that upset plant stability and challenge critical safety functions during shutdown as well as power operations."

In accordance with IMC 0609, "Significance Determination Process," Attachment 0609.04, "Initial Characterization of Findings," Table 3, "SDP Appendix Router," dated October 7, 2016, the inspectors determined this finding affected the Initiating Events Cornerstone, specifically the Transient Initiators contributor, and would require review using IMC 0609, Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," dated June 19, 2012, since at the time of the event the reactor was operating at power. The inspectors performed a Phase 1 SDP review of this finding using the guidance provided in IMC 0609, Appendix A, Exhibit 1, "Initiating Events Screening Questions," and answered "No" to Question B, "Did the finding cause a reactor scram AND the loss of mitigation equipment relied upon to transition the plant from the onset of the scram to a stable shutdown condition (e.g. loss of condenser, loss of feedwater)?" Therefore, this finding was determined to be of very low safety significance (Green).

Using IMC 0310, "Aspects Within the Cross-Cutting Areas," the inspectors determined that the finding had a cross-cutting aspect in the area of human performance. The inspectors assigned the cross-cutting aspect of "Avoid Complacency" to the finding because the procedural step to close IA1008A was marked as complete but was not performed correctly. Additionally, appropriate human performance error reduction tools were not adequately used to ensure valve manipulations were performed as intended. (IMC 0310 H.12)

## Enforcement

The quality of procedures and work instructions intended for use in safety-related applications is regulated under Appendix B of 10 CFR Part 50, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants." Because neither the instrument air system nor the MFW Regulating Valves are safety-related, the inspectors determined that the finding did not involve any corresponding violation of regulatory requirements (**FIN 05000346/2016004-01, Mispositioned Instrument Air Valves Result in Plant Transient**).

### .2 Periodic Evaluation

#### a. Inspection Scope

The inspectors reviewed the licensee's latest 10 CFR 50.65(a)(3) periodic evaluation and verified the following attributes:

- The periodic evaluation was completed as required (i.e., once each refueling cycle, but not to exceed 24 months between evaluations);
- The licensee reviewed its (a)(1) goals, (a)(2) performance criteria, monitoring, and preventive maintenance activities, and effectiveness of corrective actions;
- The licensee incorporated industry operating experience into its Maintenance Rule Program, where practicable; and
- The licensee made appropriate adjustments to its Maintenance Rule Program as a result of the evaluation.

In addition, the inspectors verified problems associated with the effectiveness of plant maintenance for risk-significant SSCs were entered into the licensee's CAP with the appropriate characterization and significance. Selected CRs were reviewed to verify corrective actions were appropriate and implemented as scheduled.

This inspection constituted one quarterly maintenance effectiveness sample as defined in IP 71111.12-05.

b. Findings

No findings were identified.

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

.1 Maintenance Risk Assessments and Emergent Work Control

a. Inspection Scope

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

- emergent repair and replacement activities associated with SFRCS logic channel 4 steam generator 1 level indication (LISP9B7) intermittently failing during the week ending October 3, 2016.

This activity was selected based on the potential risk significance relative to the Reactor Safety Cornerstones. As applicable for the 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 technical specification (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.

This maintenance risk assessment and emergent work control activity constituted one sample 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:

- CR 2016–10710; Reduced Capacity of CREATCS Water Cooled Condenser due to Reduced Service Water Supply flow;
- CR 2016–13203; Incore String 43, Level 2 Nonfunctional;
- CR 2016–12853; Maintenance Fundamentals Shortfall – Voltmeter Connected Incorrectly During Instrumentation and Controls (I&C) Safety Feature Actuation System Testing; and
- CR 2016–08795; Shield Building Bore S12–666.0–4 Inspection Findings.

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 updated safety analysis report (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.

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

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 activity to verify that procedures and test activities were adequate to ensure system operability and functional capability:

- decay heat pump 2 following maintenance on the discharge relief valve.

This activity was selected based upon the TS's ability to impact risk. The inspectors evaluated the activity 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 activity against TSs, the Updated Final Safety Analysis Report (UFSAR), 10 CFR Part 50 requirements, licensee procedures, and various U.S. Nuclear Regulatory Commission (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 one post-maintenance testing sample 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:

- DB-SP-03151; AFW Pump 1 Quarterly (routine);
- DB-ME-09101; Reactor Trip Breaker Maintenance and Testing (routine);
- DB-SC-03070; Emergency Diesel Generator (EDG) No. 1 Monthly Testing (routine);
- DB-ME-03051; D1 Bus Degraded Voltage Relay Calibration (routine);
- DB-SP-03376; Quarterly Makeup Pump 2 Inservice Test and Inspection (IST); and
- DB-SP-03357; RCS Water Inventory Balance (RCS).

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 (ASME) 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.

These activities conducted by the inspectors constituted four routine surveillance testing samples, one inservice test sample, and one reactor coolant system leak detection inspection sample as defined in IP 71111.22, Sections–02 and–05.

b. Findings

No findings were identified.

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

a. Inspection Scope

This inspection covers the time period from July 1, 2015, through June 30, 2016. The inspector reviewed the current revisions of the Davis-Besse Emergency Plan dated April 28, 2015, and the Davis-Besse Emergency Action Level Scheme dated July 1, 2013. The inspector also reviewed the licensee’s procedure for conducting 10 CFR 50.54(q) screenings and evaluations. Each of these documents were last

updated before the inspection period. The inspector verified that there were no changes made to the Davis-Besse Emergency Plan and Emergency Action Levels during this inspection period. Therefore, there were no minimum samples available to conduct this inspection

b. Findings

No findings were identified.

1EP6 Drill Evaluation (71114.06)

.1 Emergency Preparedness Drill Observations

a. Inspection Scope

The inspectors evaluated the conduct of the following planned licensee full scale integrated emergency preparedness (EP) drills:

- October 11, 2016; and
- October 25, 2016.

The inspectors observed emergency response operations in the simulator and the technical support center to determine whether the event classification, notifications, and protective action recommendations were performed in accordance with procedures, and to identify any weaknesses or deficiencies in classification, notification, or protective action recommendation development activities. The inspectors also attended the licensee drill critique to compare any inspector-observed weaknesses 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 CAP. As part of their inspection activities, the inspectors reviewed the drill packages for each scenario and other documents listed in the Attachment to this report.

The inspectors' reviews of these EP drill scenarios and other related activities constituted two inspection samples as defined in IP 71114.06-06.

b. Findings

No findings were identified.

**2. RADIATION SAFETY**

**Cornerstone: Occupational Radiation Safety**

2RS1 Radiological Hazard Assessment and Exposure Controls (71124.01)

.1 Radiological Hazard Assessment (02.02)

a. Inspection Scope

The inspectors determined if there have been changes to plant operations since the last inspection that may have resulted in a significant new radiological hazard for onsite individuals. The inspectors evaluated whether the licensee assessed the potential impact of these changes and implemented periodic monitoring, as appropriate, to detect

and quantify the radiological hazard. The inspectors reviewed the last two radiological surveys from selected plant areas and evaluated whether the thoroughness and frequency of the surveys were appropriate for the given radiological hazard.

These inspection activities supplemented those documented in Inspection Report (IR) 05000346/2016002 (Agencywide Document Access Management System (ADAMS) Accession No. ML16207A600) and constituted one complete sample as defined in IP 71124.01–05.

b. Findings

No findings were identified.

.2 Contamination and Radioactive Material Control (02.04)

a. Inspection Scope

The inspectors assessed whether instrumentation was used at its typical sensitivity levels based on appropriate counting parameters or whether the licensee had established a de facto release limit.

The inspectors selected several sealed sources from the licensee's inventory records and assessed whether the sources were accounted for and verified to be intact. The inspectors also evaluated whether any transactions, since the last inspection, involving nationally tracked sources were reported in accordance with Title 10 of the CFR, Part 20.2207.

These inspection activities supplemented those documented in IR 05000346/2016002 and constituted one complete sample as defined in IP 71124.01–05.

b. Findings

No findings were identified.

.3 Problem Identification and Resolution (02.08)

a. Inspection Scope

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

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

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

These inspection activities supplemented those documented in IR 05000346/2016002 and constituted one complete sample as defined in IP 71124.01–05.

b. Findings

No findings were identified.

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

.1 Radiological Work Planning (02.02)

a. Inspection Scope

The inspectors compared the results achieved with the intended dose established in the as-low-as-reasonably-achievable (ALARA) planning. The inspectors compared the person-hour estimates provided by work groups to the RP group with the actual work activity time results, and evaluated the accuracy of these time estimates. The inspectors evaluated the reasons for any inconsistencies between intended and actual work activity doses.

The inspectors evaluated whether post-job reviews were conducted to identify lessons learned and entered into the licensee's CAP.

These inspection activities supplemented those documented in IR 05000346/2016002 and constituted one complete sample as defined in IP 71124.02–05.

b. Findings

No findings were identified.

.2 Verification of Dose Estimates and Exposure Tracking Systems (02.03)

a. Inspection Scope

The inspectors assessed whether the assumptions and basis for the current annual collective exposure estimate were reasonably accurate. The inspectors assessed source term reduction effectiveness and reviewed applicable procedures for estimating exposures from specific work activities.

The inspectors reviewed the assumptions and bases in ALARA work planning documents for selected activities and verified that the licensee has established measures to track, trend, and if necessary, to reduce occupational doses for ongoing work activities.

The inspectors determined whether a dose threshold criteria was established to prompt additional reviews and/or additional ALARA planning and controls and evaluated the licensee's method of adjusting exposure estimates, or re-planning work, when unexpected changes in scope or emergent work were encountered. The inspectors determined if adjustments to exposure estimates were based on sound RP and ALARA principles or if they are just adjusted to account for failures to control the work. The inspectors evaluated whether there was sufficient station management review and approval of adjustments to exposure estimates and that the reasons for the adjustments were justifiable.

The inspectors reviewed selected occasions with inconsistent or incongruent results from the licensee's intended radiological outcomes to determine whether the cause was attributed to a failure to adequately plan work activities, or failure to provide sufficient management oversight of in-plant work activities, or failure to conduct the work activity without significant rework, or failure to implement radiological controls as planned.

These inspection activities supplemented those documented in IR 05000346/2016002 and constituted one complete sample as defined in IP 71124.02–05.

b. Findings

No findings were identified.

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

a. Inspection Scope

The inspectors compared the radiological results achieved with the intended radiological outcomes and verified that the licensee captured lessons learned for use in the next outage.

These inspection activities supplemented those documented in IR 05000346/2016002 and constituted one complete sample as defined in IP 71124.02–05.

b. Findings

No findings were identified.

.4 Problem Identification and Resolution (02.06)

a. Inspection Scope

The inspectors reviewed self-assessments and/or audits performed of the ALARA program and determined if these reviews identified problems or areas for improvement.

The inspectors assessed whether problems associated with ALARA planning and controls were being identified by the licensee at an appropriate threshold and properly addressed for resolution.

These inspection activities supplemented those documented in IR 05000346/2016002 and constituted one complete sample as defined in IP 71124.02–05.

b. Findings

No findings were identified.

#### 4. OTHER ACTIVITIES

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

#### 4OA1 Performance Indicator Verification (71151)

##### .1 Reactor Coolant System Leakage

###### a. Inspection Scope

The inspectors sampled licensee submittals for the RCS Leakage performance indicator for the period from the fourth quarter 2015 through the third quarter 2016. To determine the accuracy of the performance indicator data reported during those periods, Performance Indicator 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 logs, RCS leakage tracking data, issue reports, event reports and NRC Integrated IRs for the period of October 2015 through September 2016 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 performance indicator 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 reactor coolant system leakage sample as defined in IP 71151-05.

###### b. Findings

No findings were identified.

##### .2 Occupational Exposure Control Effectiveness

###### a. Inspection Scope

The inspectors sampled licensee submittals for the Occupational Exposure Control Effectiveness Performance Indicator for the period from the second quarter of 2015 through the third quarter of 2016. The inspectors used Performance Indicator 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 Performance Indicator data reported during those periods. The inspectors reviewed the licensee's assessment of the Performance Indicator for occupational radiation safety to determine if the indicator related data was adequately assessed and reported. To assess the adequacy of the licensee's Performance Indicator data collection and analyses, the inspectors discussed with RP staff the scope and breadth of its data review and the results of those reviews. The inspectors independently reviewed electronic personal dosimetry dose rate and accumulated dose alarms and dose reports and the dose assignments for any intakes that occurred during the time period reviewed to determine if there were potentially unrecognized occurrences.

The inspectors also conducted walkdowns of numerous locked high and very high radiation area entrances to determine the adequacy of the controls in place for these areas. Documents reviewed are listed in the Attachment to this report.

This inspection constituted one occupational exposure control effectiveness 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 CAP 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 CAP 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 Daily Corrective Action Program Reviews

a. Inspection Scope

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

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

b. Findings

No findings were identified.

### .3 Semi-Annual Trend Review

#### 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 plant status control events, but also considered the results of daily inspectors CAP item screening discussed in Section 40A2.2 above, licensee trending efforts, and licensee human performance results. The inspectors' review nominally considered the six-month period of July 1, 2016, through December 31, 2016, although examples expanded beyond those dates where the scope of the trend warranted.

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

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

#### b. Observations

During the course of the review period for this inspection sample, the inspectors noted several examples of issues involving weaknesses in the operator and maintenance fundamentals that were the direct cause of plant status control events. Specific examples associated with this trend included, but were not limited to:

- 2016-07282; Misposition: Level 2 Plant Status Control Event Leads to Inadvertent Technical Specification (TS) 3.4.1, Condition A Entry;
- 2016-08255; Level 4 Plant Status Control Event Incorrect Pushbutton Depressed During Instrumentation and Controls (I&C) Testing;
- 2016-08657; Misposition: Diesel Fire Pump Coolant Leak Due to Level 3 Plant Status Control Event;
- 2016-10846; Mispositioning Plant Status Control Level 3 Event – Main Steam Line 1 Turbine Bypass Valve Outlet Drain Isolations Found Closed;
- 2016-10883; Mispositioning Plant Status Control Level 3 – RC1719A Containment Vent Header Isolation Found Closed; and
- 2016-11004; Misposition – E1 & F1 on Transformers with Shutdown Tap Settings While in Mode 4 (Level 2).

These and other examples were included in a common cause evaluation, CR 2016-11681, "Common Cause Evaluation for DB Performance Issues," and evaluated in aggregate with other items. Overall, the inspectors concluded that the decline in performance, including the trend in plant status control events, was understood by the licensee. The corrective actions planned in the common cause evaluation, along with an independent performance improvement plan, should improve the performance of plant operators and maintenance personnel.

c. Findings

No findings were identified.

.4 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 2016 periodic examination, the licensee identified a growth in crack width at a rate higher than predicted in several localized areas which was entered into the licensee's CAP. In some instances, the measured crack width exceeded the analysis previously performed at selected universities referenced in IR 05000346/2014008 to credit full reinforcement capacity in those areas. The licensee drilled multiple new core bores and performed supplemental IR mapping to determine the extent of condition. Laminar crack propagation was also observed in some locations based on visual observation and impulse response mapping and was similar to the predicated propagation pattern.

As a result of the increased crack widths, the licensee performed an operability evaluation 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 determination and agreed that the shield building remained capable of performing its intended safety function.

The licensee drilled a new core bore to determine the relative humidity level of the shield building. The licensee identified similar to slightly higher levels of shield building relative humidity compared to previous years indicating the relative humidity is not decreasing as predicted.

Corrective actions planned to date include, but are not limited to, performance of a humidity study to confirm the relative humidity levels observed and development of an associated mitigation plan; performance of a rebar corrosion study 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 increase in crack width the licensee has postponed its planned license amendment submittal to allow time for additional analysis and development of potential mitigation strategies. The NRC will follow-up on the licensee's corrective actions which will be documented in a future IR.

c. Findings

No findings were identified.

.5 Annual Follow-Up Sample for In-Depth Review: Inspection of Implementation of Interim Cyber Security Milestones 1 – 7

a. Inspection Scope

During the week of October 3, 2016, inspectors completed a problem identification and resolution (PI&R) inspection of the findings and/or violations given enforcement discretion in IR 05000346/2013405, "Inspection of Implementation of Interim Cyber Security Milestones 1 – 7," dated June 20, 2013 (ADAMS Accession No. ML13172A144).

This review constituted one in-depth PI&R inspection samples as defined in IP 71152.

b. Findings

The inspection results are discussed in IR 05000346/2016409 (ADAMS Accession No. ML16348A496) dated December 12, 2016.

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

.1 (Retraction) Event Notification No. 52247: Essential Busses Not Aligned to Power Transformers During Plant Startup

On September 16, 2016, the licensee was preparing to start up the unit from a forced maintenance outage when it was discovered that the 480 volts alternating current (VAC) essential busses E1 and F1 were being supplied from the shutdown operations transformers, instead of being aligned to the power operations transformers for Mode 4 in accordance with TS 3.8.9. EN 52247 was previously discussed in Section 4OA3.3 of IR 05000346/2016003 (ADAMS Accession No. ML16309A098).

Since the event, the licensee performed an evaluation and concluded that the essential busses remained capable of performing its required functions while connected. Based on this evaluation, the licensee submitted a retraction to EN 52247 on November 9, 2016.

The inspectors reviewed the basis for the retraction and agreed that the 480 VAC essential busses would have been able to perform their required safety functions. Although the licensee failed to follow procedure DB-OP-06900, "Plant Heatup," the inspectors concluded the performance deficiency was minor since no inoperability of the essential busses occurred.

This event follow-up review by the inspectors did not constitute an inspection sample as defined in IP 71153-05.

.2 (Closed) Licensee Event Report 05000346/2016006-00: Potential to Trip Emergency Diesel Generator on High Crankcase Pressure

On June 16, 2016, Davis-Besse was in Mode 1 at 100 percent reactor power. At 1137 hours, during review of operating experience, an issue was identified for the potential impact of low barometric pressure associated with a tornado on the emergency diesel generators (EDGs). The EDGs are equipped with a crankcase positive pressure trip with a set point of approximately 1 inch of water. It was determined that a design basis tornado could create sufficient low pressure to potentially actuate the crankcase positive pressure trip due to different vent paths between the EDG room and the EDG crankcase. If the crankcase pressure trip occurs before the EDG starts on an emergency signal due to the tornado, the crankcase pressure trip would cause an EDG lockout. The EDG lockout would then prevent either an EDG normal or emergency start until operators could manually reset the lockout. This condition could potentially affect both EDGs simultaneously.

The licensee submitted EN 52010 on June 16, 2016, to report the condition as required by Title 10 of the *Code of Federal Regulations* (10 CFR) 50.72(b)(3)(ii)(B) for an unanalyzed condition. The licensee performed an evaluation of the condition and submitted License Event Report (LER) 05000346/2016-006-00 to the NRC to report this event in accordance with 10 CFR 50.73(a)(2)(i)(B), 10 CFR 50.73(a)(2)(ii)(B), and 10 CFR 50.73(a)(2)(v)(A) through (D) because the condition potentially affected the operability of both EDGs simultaneously during a tornado event.

The inspectors reviewed the LER and causal analysis for the condition. This was an original EDG protective logic circuitry design issue that did not anticipate the interaction between the crankcase pressure trip and the outside atmospheric pressure. The original design of the EDGs' protective devices did not anticipate the interaction between the high crankcase pressure switch and atmospheric pressure outside of the EDG rooms of the auxiliary building during a tornado event. Additionally, there were no means to bypass or delay a trip signal in the normal, standby mode which contributed to the susceptibility of the high crankcase pressure switch to possibly actuate during a tornado event. Neither the licensee nor other utilities recognized that differential pressures due to a tornado could actuate an EDG high crankcase pressure switch until the recent operating experience. Therefore, the inspectors concluded that no performance deficiency existed because this was not within the licensee's ability to foresee and prevent.

The licensee entered this issue into their CAP as CR 2016–07816. Initial corrective actions taken by the licensee included establishment of compensatory actions to defeat the EDG crankcase pressure trips on each engine prior to the onset of severe weather in the area surrounding the site. Temporary modifications for each EDG were completed on June 25, 2016, prior to the onset of inclement weather in the local area; these actions disabled the EDG lockout associated with the EDG crankcase positive pressure trip. A long-term corrective action planned is for a permanent modification to disable the EDG high crankcase pressure switches trip logic.

This LER is closed. This event follow-up review by the inspectors constituted one inspection sample as defined in IP 71153–05.

.3 (Closed) Licensee Event Report 05000346/2016007–00: Pressurizer Code Safety Valve Setpoint Test Failures

On March 26, 2016, Davis-Besse commenced refueling outage (RFO) 19. Per the outage plan, the site’s pressurizer safety valves were removed and sent to an offsite vendor for testing and refurbishment. On June 21, 2016, the licensee received information from the testing vendor that the two pressurizer safety valves had as-found lift setpoints (2559 pounds per square inch gauge (psig) and 2554 psig) that were slightly above the limits specified in TS 3.4.10 (2525 psig). The licensee attributed the as-found values to setpoint drift during operation. A past operability evaluation was completed by the licensee and concluded the pressurizer safety valves had been inoperable during a portion of their service in the operating cycle.

The inspectors’ review of this event determined that the safety significance of the issue was minimal. While both valves had as-found setpoints that exceeded the TS allowed value, the highest out-of-tolerance setpoint was 39 psig higher than the required value, and the discrepancy would not have adversely impacted either valve’s ability to have fulfilled its safety function had either been called upon to do so during the previous period of reactor operation. Consequently, the inspectors determined that this failure to comply with TS 3.4.10 was a violation of minor safety significance that was not subject to formal enforcement action in accordance with Section 2.3 of the NRC Enforcement Policy.

The licensee had entered these failures into their CAP as CR 2016–07957. Corrective actions for this event include revising TSs to better align with American Society of Mechanical Engineers (ASME) code requirements on as-found testing and improving valve repeatability by adding spring testing. As-left testing procedures will be changed to require three consecutive lifts vice the two lifts currently used.

This LER is closed. This event follow-up review by the inspectors constituted one inspection sample as defined in IP 71153–05.

.4 (Closed) Licensed Event Report 05000346/2016009–00, “Reactor Trip Due to Rainwater Intrusion and Auxiliary Feedwater Actuation on High Steam Generator Level”

a. Inspection Scope

On September 10, 2016, a valid automatic reactor trip signal actuated when the main turbine tripped due to a main generator lockout. Rainwater intrusion into the main generator automatic voltage regulator cabinet caused an electrical fault that initiated the

generator lockout. Following the reactor trip, the auxiliary feedwater system automatically actuated due to a high steam generator (SG) water level in one of the two SGs as a result of a failure of the integrated control system (ICS) to maintain water level due to a circuit component failure.

The licensee completed a notification call (Event Notification 52232) on September 10, 2016 to report the automatic reactor trip as required by 10 CFR 50.72(b)(2)(iv)(B) as an event or condition that resulted in actuation of the reactor protection system when the reactor is critical and the actuation of the auxiliary feedwater system as required by 10 CFR 50.72(b)(3)(iv)(A) as an event or condition that resulted in valid actuation of the auxiliary feedwater system. The licensee submitted LER 05000346/2016009-00 to report this event in accordance with 10 CFR 50.73(a)(2)(iv)(A) as an event or condition that resulted in the manual or automatic actuation of the reactor protection system and the auxiliary feedwater system.

The inspectors reviewed the LER and identified one finding for the reactor trip and did not identify a performance deficiency for the auxiliary feedwater actuation on high SG level.

This inspection constituted one event follow-up inspection sample as defined in IP 71153.

b. Findings

Introduction

A finding of very low safety significance was self-revealed on September 10, 2016, when rainwater intrusion into the automatic voltage regulator caused a generator lockout and reactor trip. Specifically, station management failed to adequately assess the identified degraded condition of the turbine building roof vents in accordance with station expectations and procedures when four roof vents were left stuck open although it was identified by operators that water intrusion was possible onto the stator water cooling skid and automatic voltage regulator on August 17, 2016, 24 days prior to the event.

Discussion

On August 14, 2016, plant operators were directed to close the turbine building roof vents that have been cycled routinely for temperature control. Four of the fourteen roof vents would not stay closed, and operators initiated notifications to repair the roof vents. Three days later on August 17, 2016, a heavy rain storm passed through the site, and it was observed by operators that water was falling through the grating on the top level of the turbine building and down onto the stator water cooling skid below. Operators initiated CR 2016-09961 and identified the collective material deficiencies and the potential risks associated with the open roof vents to allow wetting of the stator water cooling pumps.

When the issue was brought up at the morning meeting on August 18, 2016, by the shift manager, the fix-it-now team said it would look into the status of the roof vents. The fix-it-now team noted that the roof vents required either latch replacements or extensive latch repair. All issues were rolled into an existing work order (WO) for the roof vents but was assigned a low priority.

On August 19, 2016, operations held their morning review of the new CRs in the management review board package prepared for the day. CR 2016-09961 was included in the package but was not discussed. The management review board also had no discussion on the CR and failed to recognize the risk to generation that was clearly stated and identified in the CR. These actions were not aligned with station expectations or procedures for risk mitigation as outlined in licensee procedure NOP-OP-1007, "Risk Management." Later in the day, a duty team phone call decided not to carry the issue forward into the following week.

Operators attempted to close the roof vents again on August 27, 2016, but were unsuccessful. A catch basin was set up to capture any water that made it through the roof vents. A maintenance information tag was attached that stated: "Roof vent is broke open. Do not remove rainwater catch. The water can leak through the floor plugs onto Exciter cabinet & SCW skid." This condition existed until September 10, 2016, when, during a heavy rain storm, rain fell through open turbine building roof vents onto the main turbine operating deck. Water pooled on the deck and ran down a vibration joint between the turbine generator pedestal and the deck, falling onto the top of the automatic voltage regulator cabinet. The water then migrated into the cabinet through conduit penetrations on top of the cabinet. If the condition was properly evaluated through the use of licensee procedure NOP-OP-1007, a higher priority WO would have been generated ensuring repairs at a maximum of 21 days after identification of the issue.

The inspectors reviewed the licensee's root cause evaluation for the event and concurred with its conclusions. There were two root causes identified:

- Operations Shift Managers did not advocate adequate and timely compensatory actions to eliminate the risk to generation posed by rain falling onto energized equipment through a stuck open Turbine Building roof vent; and
- Station management failed to recognize the roof vent rain issue as a potential imminent risk to generation.

There were two contributing causes identified:

- Long-standing issues with the degraded material condition of the turbine building ventilation system fostered an increasing reliance upon the turbine building roof vents (as a work-around) to help moderate the ambient temperatures in the turbine building; and
- The operating crews had a less than adequate understanding of the collective significance of the roof vent material condition issues due to the substandard configuration control methods utilized for the roof vents.

Corrective actions included, but not limited to, closing the turbine building roof vents, sealing the conduit penetrations on the top of the automatic voltage regulator cabinet to prevent water intrusion, improved configuration control of the roof vents, and replacement of the failed ICS module.

## Analysis

The inspectors determined the licensee's failure to adequately evaluate the degraded condition of the turbine building roof vents with the identification by operators that severe weather could affect systems and components that may initiate a plant transient in accordance with licensee procedure NOP-OP-1007 for risk management was a licensee performance deficiency warranting a significance evaluation. Consistent with the guidance in Inspection Manual Chapter (IMC) 0612, "Power Reactor Inspection Reports," Appendix B, "Issue Screening," dated September 7, 2012, the inspectors determined this performance deficiency was of more than minor safety significance, and thus a finding, because the performance deficiency affected the Equipment Reliability attribute of the Initiating Events cornerstone. Specifically, the failure to fully evaluate the risk associated with the stuck open turbine building roof vents affected the availability and reliability of the automatic voltage regulator causing a reactor trip. The inspectors also reviewed the examples of minor issues in IMC 0612, "Power Reactor Inspection Reports," Appendix E, "Examples of Minor Issues," dated August 11, 2009, and found no similar examples.

In accordance with IMC 0609, "Significance Determination Process (SDP)," Attachment 0609.04, "Initial Characterization of Findings," Table 3, "SDP Appendix Router," dated October 7, 2016, the inspectors determined this finding affected the Initiating Events Cornerstone, specifically the Transient Initiator contributor, and would require review using IMC 0609, Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," dated June 19, 2012. The inspectors performed a Phase 1 SDP review of this finding using the guidance provided in IMC 0609, Appendix A, Exhibit 1, "Initiating Events Screening Questions," and answered "No" to question B, "Did the finding cause a reactor trip AND the loss of mitigation equipment relied upon to transition the plant from the onset of the trip to a stable shutdown condition (e.g. loss of condenser, loss of feedwater)?" because the loss of the condenser and feedwater, due to a steam line isolation was from an independent failure mechanism in which a performance deficiency was not identified and thus was not considered in the significance of the event. Therefore, the finding screened as very low safety significance (Green).

The inspectors determined this finding affected the cross-cutting area of PI&R and the cross-cutting aspect of evaluation. The licensee did not properly evaluate the problem and assigned an incorrect priority to the WO to address the degraded roof vents (IMC 0310 P.2).

## Enforcement

No violation of regulatory requirements was identified because the turbine building roof vents and automatic voltage regulator are not safety-related and the applicable maintenance procedures were not covered under 10 CFR 50, Appendix B. This issue was determined to be a finding (**FIN 05000346/2016004-02, Failure to Adequately Evaluate Degraded Turbine Building Roof Vents**).

LER 05000346/2016009-00 is closed.

## 4OA5 Other Activities

### .1 Autumn 2016 Groundwater Sampling Results

#### a. Inspection Scope

The inspectors reviewed the results of a series of groundwater samples taken from 22 wells in the plant owner-controlled area. The sampling of wells was completed as part of the licensee's voluntary groundwater monitoring initiative and in response to the results obtained earlier, as discussed in Section 4OA5 of NRC IRs 05000346/2015001 (ADAMS Accession No. ML15113B387), 05000346/2015002 (ADAMS Accession No. ML15202A203), 05000346/2015003 (ADAMS Accession No. ML15295A107), 05000346/2015004 (ADAMS Accession No. ML16034A366), 05000346/2016001 (ADAMS Accession No. ML16118A435), 05000346/2016002 (ADAMS Accession No. ML16207A600), and 05000346/2016003 (ADAMS Accession No. ML16309A098). One of the monitoring well locations sampled as part of the licensee's ongoing investigations indicated tritium levels above the 2,000 picocuries per liter (pCi/L) groundwater monitoring program threshold requiring courtesy notifications to state and local government officials and the NRC resident inspectors. The highest tritium concentration, approximately 10,527 pCi/L from a sample obtained on February 10, 2015, was located in a monitoring well, designated MW-22S, on the west side of the plant near the borated water storage tank (BWST). The formal reporting limit threshold for tritium in groundwater samples is 30,000 pCi/L, as documented in the licensee's Offsite Dose Calculation Manual.

The licensee continues to monitor wells in accordance with their groundwater monitoring program as tritium concentrations continue to lower. The inspectors have reviewed the licensee's compliance with their stated offsite agency reporting requirements and continue to track the licensee's corrective actions.

These routine reviews for samples to detect tritium in groundwater did not constitute any additional inspection samples. Instead, they were considered a part of the inspectors' daily plant status monitoring activities.

#### b. Findings

No findings were identified.

### .2 (Closed) Unresolved Item 05000346/2016002-01 Mispositioned Instrument Air Valves Result in Plant Transient

#### a. Inspection Scope

As discussed in Section 1R11.2 of NRC IR 05000346/2016002 (ADAMS Accession No. ML1607A600), on May 31, 2016, at approximately 10:21 a.m., planned testing of steam and feedwater rupture control system (SFRCS) actuation channel 1 was in progress. This was the first performance of this test since the unit returned to operation following RFO 19. Unexpectedly, operators in the control room received several overhead annunciator alarms coincident with a rapid swing in plant power and indications that the SG 1-2 main feedwater (MFW) Regulating Valve (SP6A) had gone closed and then reopened.

In accordance with established procedures for responding to such an event, control room operators took manual control of ICS stations for reactor demand, SG/reactor demand, both MFW regulating valves, both MFW startup valves, and both MFW loop demands. The control room crew was then able to arrest the transient and stabilize plant power at approximately 89 percent.

Initial evaluation of the transient by the licensee revealed that two instrument air valves associated with control air for SP6A (IA1008D, SVSP6A1 Bypass; and IA1008A, SVSP6A1 Maintenance Isolation) were out of their normal positions. The mispositioned valves had the effect of placing SP6A in a “half trip” condition, such that when SFRCS actuation channel 1 was being tested SP6A unintentionally responded to the test signal.

The licensee entered this issue into their CAP as CRs 2016–07282, 2016–07286, 2016–07337, and 2016–08386. Because the licensee had yet to complete their investigation and analysis of the event and the instrument air valve mispositioning by the end of the inspection period, the issue was treated as an unresolved item (URI) pending the inspectors’ review of the licensee’s completed cause evaluation and proposed corrective actions.

The inspectors performed a review of the licensee’s completed causal evaluation and proposed corrective actions which were documented in section 1R12.1 of this IR.

URI 05000346/2016002–01 is closed.

b. Findings

A finding for the mispositioned air instrument valves was identified and discussed in Section 1R12.1 of this report.

4OA6 Management Meetings

.1 Exit Meeting Summary

On January 10, 2017, the inspectors presented the inspection results to Mr. B. Boles and other members of the licensee staff. The licensee acknowledged the issues presented. The inspectors confirmed with the licensee the scope of material reviewed that was considered to be proprietary. Proprietary information reviewed by the inspectors was controlled in accordance with appropriate NRC policies regarding sensitive unclassified information, and has been denoted as “proprietary” in the attachment.

.2 Interim Exit Meetings

Interim exits were conducted for:

- The details of the EP Program inspection were discussed with Mr. J. Vetter, Emergency Preparedness Manager, over the phone on December 1, 2016;
- On December 2, 2016, the inspectors presented the inspection results of the operator requalification program biennial review (71111.11B) to Mr. P. McCloskey, Manager Regulatory Compliance, and other members of the staff.

The licensee acknowledged the issues presented. The inspectors confirmed that proprietary information reviewed as part of this inspection would be deleted and not put into ADAMS; and

- The inspection results for the Radiation Safety Program review with Mr. B. Boles, Site Vice President, on December 16, 2016.

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

B. Boles, Site Vice President  
K. Byrd, Director, Site Engineering  
M. Brasile, LOR Supervisor  
T. Brown, Director, Site Performance Improvement  
J. Cuff, Manager, Training  
J. Cunnings, Manager, Site Maintenance  
A. Dawson, Manager, Chemistry  
C. Gallagher, ALARA Supervisor  
T. Gaydosik, Lead Fleet Exam Team  
D. Hartnett, Superintendent, Operations Training  
T. Henline, Manager, Site Projects  
B. Howard, Manager, Site Outage Management  
D. Imlay, General Plant Manager  
G. Laird, Manager, Site Operations  
B. Matty, Manager, Recovery Team  
G. Michael, Manager, Design Engineering  
P. McCloskey, Manager, Site Regulatory Compliance  
B. Needham, Maintenance Rule  
D. Noble, Manager, Radiation Protection  
W. O'Malley, Manager, Nuclear Oversight  
R. Oesterle, Superintendent, Nuclear Operations  
R. Patrick, Manager, Site Work Management  
J. Sturdavant, Regulatory Compliance  
L. Thomas, Manager, Nuclear Supply Chain  
J. Vetter, Manager, Emergency Preparedness  
L. Willis, Manager, Site Protection  
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

05000346/2016004-01	FIN	Mispositioned Instrument Air Valves Result in Plant Transient (1R12.1)
05000346/2016004-02	FIN	Failure to Adequately Evaluate Degraded Turbine Building Roof Vents (4OA3.4)

### Closed

05000346/2016004-01	FIN	Mispositioned Instrument Air Valves Result in Plant Transient (1R12.1)
05000346/2016004-02	FIN	Failure to Adequately Evaluate Degraded Turbine Building Roof Vents (4OA3.4)
05000346/2016006-00	LER	Potential to Trip Emergency Diesel Generator on High Crankcase Pressure (4OA3.2)
05000346/2016007-00	LER	Pressurizer Code Safety Valve Setpoint Test Failures (4OA3.3)
05000346/2016009-00	LER	Reactor Trip Due to Rainwater Intrusion and Auxiliary Feedwater Actuation on High Steam Generator Level (4OA3.4)
05000346/2016002-01	URI	Mispositioned Instrument Air Valves Result in Plant Transient (4OA5.2)

### Discussed

None.

## 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 IR.

### 1R01 Adverse Weather Protection

#### Condition Reports:

- 2014-17492; Degraded Supplies Identified in the Emergency Isolation Supply Trailer
- 2016-11943; Heat Trace Circuit Indicating Open Input
- 2016-11980; Concrete Wall Blocks Doors for CFP06Q and CFP04Q From Fully Opening
- 2016-12801; EFW Pump Room Temperature is Below 60 Degrees F
- 2016-12802; Recently Installed Battery Room B Heaters Do Not Match Operations Drawings
- 2016-12804; Procedure DB-OP-06235 Provides Overly Conservative Indoor Temperature Limits for EFW Fuel Oil
- 2016-12840; Service Water Pump Room Roof Leaks When it Rains
- 2016-13891; AC Transformer Oil Level
- 2016-13974; TICEF89 EFW Tank Emersion Heater Controller Setpoint (45F) is Below the Temperature Range Required by NORM-LP-7202 DB Spec for Flex Equipment Out of Service (>45F and <120F)
- 2016-14180; Water Intrusion on Service Water Pump #1 From East Side of Roof Plug

#### Procedures:

- DB-CH-03004; Borated Water Storage Tank Analysis; Revision 23
- DB-OP-03007; Miscellaneous Instrument Daily Checks; Revision 29
- DB-OP-06235; EFW Facility Electrical and Support Systems Procedure; Revision 0
- DB-OP-06513; Auxiliary Building Non-Radioactive Areas Ventilation; Revision 27
- DB-OP-06913; Seasonal Plant Preparation Checklist; Revision 29
- RA-EP-00600; Emergency Facilities and Equipment Maintenance Program; Revision 12
- RA-EP-02870; Station Isolation; Revision 6

#### Other:

- DBEP-055-10; Emergency Facility Maintenance Summary Third Quarter Inventory 2016; October 7, 2016

### 1R04 Equipment Alignment

#### Procedures:

- DB-OP-06233; Auxiliary Feedwater System; Revision 20
- DB-OP-06012; Decay Heat and Low Pressure Injection System Operating Procedure; Revision 66
- DB-OP-06316; Diesel Generator Operating Procedure; Revision 59

#### Drawings:

- M-0017A; Diesel Generators; Revision 19
- OS-0041A; Sheet 1; Emergency Diesel Generator Systems; Revision 33

Other:

- DB-M-20160921-3; Survey Map for EECS 2; Dated September 20, 2016
- DB-M-20161005-1; Survey Map for Decay Heat Cooler Room; Dated October 5, 2016

1R05 Fire Protection

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 13
- DB-FP-00009; Fire Protection Impairment and Fire Watch; Revision 21
- DB-FP-00018; Control of Ignition Sources; Revision 12
- DB-OP-02501; Serious Station Fire; Revision 26
- DB-OP-02529; Fire Procedure; Revision 10

Pre-Fire Plans:

- PFP-AB-236; Auxiliary Building, Elevation 56'; Revision 04
- PFP-AB-105; ECCS Pump Room 1-1, Room 105, Fire Area AB; Revision 8

Drawings:

- A-222F; Fire Protection, General Floor Plan EI 565'; Revision 19

Other:

- Fire Hazard Analysis Report; Revision 26
- Fire Protection System Status
- PFP-S6-0000; Service Building 6, Laydown Area, Station Black-Out Diesel; Revision 4
- PFP-AB-314; No. 4 Mechanical Penetration Room Rooms 115Cc, 314 and 314CC, Fire Area A; Revision 8

1R11 Licensed Operator Requalification Program and Licensed Operator Performance

Condition Reports:

- 2014-16542; Misposition During Performance of DB-SC-03113, SFAS Ch 4
- 2015-02126; Missed Firewatches for Room 425
- 2015-02999; Missed Technical Specification Surveillance Trending
- 2015-04245; Unexpected Plant Response During Performance of DB-SP-03419
- 2015-08043; Misposition During DB-OP-06321
- 2015-11774; Clearance Level 2 Event, Work Document Added to Clearance
- 2015-13000; Trend on Operations Crew Failures
- 2016-00011; CWMT 1, Outlet Valve Out of Position Closed With Tank in Recirculation
- 2016-06037; MFP Used Lube Oil Tank Inadvertently Transferred to MFPT Lube Oil tank
- 2016-06515; Vibration Felt & Heard When Additional AFW Recirc Line Placed in Service
- 2016-06563; ARTS Test Trip Bypass Left in Bypass During Startup
- 2016-10846; Misposition Level 3 Event, MSL 1 TBV Outlet Drain Isolation Valve Closed
- 2016-10883; Misposition Level 3 Event; RC1719A Ctmt Vent Header Isolation Valve Found Closed
- 2016-11004; Misposition of E1 & F1 on Transformers With Shutdown Tap Settings While in Mode 4
- 2016-11138; Main Turbine Trip During Startup, Misposition Event
- 2016-12370; Banging Noise Heard While Raising Speed on MFP 1 (400 rpm)

- 2016-13332; Individuals Removed From Licensed Duties Due to Simulator Drill and Exercise Performance Failure
- 2016-13568; Licensed Operator – Biennial Written Exam Failure
- 2016-13923; Non-Licensed Operator Failed Biennial Written Exam
- 2016-14138; Licensed Operator – Biennial Written Exam Failure

Procedures:

- DBBP-OPS-1013; Control of Time Critical Actions; Revision 2
- DBBP-TRAN-0021; Simulator Configuration Control; Revision 6
- DBBP-TRAN-0025; Simulator Review Committee Charter; Revision 2
- DB-NE-03212; Zero Power Physics Testing; Revision 10
- DB-OP-06224; Main Feed Pump and Turbine; Revision 38
- DB-OP-06234; Emergency Feedwater System; Revision 0
- DB-OP-06902; Power Operations; Revision 56
- DB-TP-12425; EFW Facility Power Systems Post Installation Test Diesel Driven EFW Pump System; Revision 1
- FO-SA-2015-0070; Operations Training Programs Accreditation Objectives Focused Self-Assessment; Dated July 20, 2015
- NG-DB-00319; Control of the Emergency Operating Procedure and Technical Bases; Revision 5
- NG-NT-00600; Training and Qualification; Revision 6
- NG-NT-00601; Control of the Plant-Referenced Simulator; Revision 3
- NOBP-TR-1112; Conduct of Simulator Training and Evaluation; Revision 3
- NOBP-TR-1122; Operator Crew Performance Critiques; Various 2015 & 2016
- NOP-OP-1002; Conduct of Operations; Revision 11
- NOP-OP-1013; Control of Time Critical Operator Actions; Revision 1
- NOP-TR-1010; Licensed Operator Requalification Exam Development; Revision 2
- NOP-TR-1200; Conduct of Training; Revision 3
- NOP-TR-1280; FENOC Simulator Configuration Management; Revision 0
- NT-OT-7001; Training and Qualification of Operations Personnel; Revision 14

FENOC Business Practices and Reference Manuals:

- DBBP-TRAN-0014; License Requirements for Licensed Individuals; Revision 11
- DBBP-TRAN-0021; Simulator Configuration Control; Revision 6
- DBBP-TRAN-0502; Continuing Training Simulator Evaluations; Revision 11
- NOBP-TR-1112; FENOC Conduct of Simulator Training and Evaluation; Revision 3
- NOBP-TR-1151; Operating Crew Performance Critique; Revision 1
- NOBP-TR-1200; Operator Fundamentals; Revision 1
- DBBP-OPS-1013; Control of Time Critical Actions; Revision 2
- DBBP-OPS-1113; Control of Time Sensitive Operator Actions; Revision 1
- NORM-OP-1002; Conduct of Operations Handbook; Revision 5

Other:

- 3rd Quarter 2016; Licensed Operator Proficiency Status; Dated October 3, 2016
- Fleet Oversight Audit Report; MS-C-15-04-17; Dated April 24 through June 19, 2016
- Job Performance Measures; OPS-JPM-255; Revision 0
- Job Performance Measures; OPS-JPM-028; Revision 2
- Job Performance Measures; OPS-JPM-047; Revision 0
- Job Performance Measures; OPS-JPM-084; Revision 1
- Job Performance Measures; OPS-JPM-115; Revision 0
- Job Performance Measures; OPS-JPM-127; Revision 1

- Job Performance Measures; OPS-JPM-151; Revision 2
- Job Performance Measures; OPS-JPM-276; Revision 0
- Job Performance Measures; OPS-JPM-281; Revision 0
- Job Performance Measures; OPS-JPM-289; Revision 0
- List of Simulator Work Requests (SWRs); Dated November 28, 2016
- Remediation Training Packages (4); Dated March 3, 2016
- Return to Active Status (various RO & SRO licenses); 2015 & 2016
- Scenario Based Testing; Scenario #ORQ-INP-S206; Dated March 6, 2015
- Scenario Based Testing; Scenario #ORQ-INP-S208; Dated March 6, 2015
- Scenario Based Testing; Scenario #OTLC201504DBS101; Dated August 15, 2015
- Scenario Based Testing; Scenario #OTLC201504DBS103; Dated August 15, 2015
- Simulator Performance Indicator Report; Dated November 28, 2016
- Simulator Review Committee Minutes; Various from March 12, 2015, to October 27, 2016
- Simulator Scenario ORQ EPE S102; Revision 14
- Simulator Scenario ORQ EPE S104; Revision 13
- Simulator Scenario ORQ EPE S107; Revision 15
- Simulator Scenario ORQ EPE S107; Revision 15
- Simulator Scenario ORQ EPE S139; Revision 06
- Simulator Scenario ORQ-EPE-S134; Revision 11
- Simulator Training Certification Test N3; Core Physics Testing; Dated April 16, 2016
- Simulator Training Certification Test N6; Sixty Minute Drift Test; Dated November 5, 2015
- Simulator Training Certification Test TAB01; Manual Reactor Trip; Dated August 7, 2016
- Simulator Training Certification Test TAB05; Trip of One Reactor Coolant Pump; Dated March 20, 2016
- Simulator Training Certification Test TAB10; The PORV Fails Fully Open and HPI Does Not Actuate; Dated August 25, 2016
- SN-SA-2016-0745-003; Snapshot Self-Assessment are on Simulator Prior to the NRC 71111.11B Inspection; Dated October 17, 2016
- Steady State Testing Records for 100 Percent Power; Dated May 26, 2016
- Steady State Testing Records for 25 Percent Power; Dated May 22, 2016
- Steady State Testing Records for 75 Percent Power; Dated May 26, 2016
- Summary of Simulator Testing; Dated November 28, 2016
- Written Examination Administered During Week of December 5, 2016

## 1R12 Maintenance Effectiveness

### Condition Reports:

- 2012-06503; Unexpected Main Feed Pump 1 Speed Shifts
- 2012-07995; Steps N/A'd in Order 200424049, PM 10036 C5757D Replace MFPT #1 MDT-20 Circuit boards (maintenance plan 128567)
- 2012-09683; Rework Due to Inadequate Work Instructions in MDT20 Circuit Board Replacement PM
- 2012-09652; Speed Pickup SSPU1 for MFPT #1 Failure
- 2012-17812; HICICS36A Main Feed Pump 2 Speed Control Hand Indicating Control Demand Dropped During Transfer to Manual
- 2013-14097; Shield Building Laminar Crack Extends
- 2014-01700; Plant Transient During Shutdown of the Unit
- 2014-06892; New DB-PS152-1 Power Supply Failed Upon Power Restoration
- 2014-07929; Feedwater Valves FW780 and SP6B Leaking By
- 2014-17897; Seismic Classification for Main Feedwater Control Valves SP6A and SP6B Air Supply Tubing and Maintenance Isolation Valves is Incorrect

- 2015-05014; NRC Response to Task Interface Agreement 2014-11; Design and Licensing Basis for Shield Building
- 2015-06697; Post Trip Response of SP6A
- 2015-06841; Shield Building Bore S4-650.0-16 Findings
- 2016-01555; Loss of MDT20 Speed Pickup 1 for #1 MFPT During Plant Startup
- 2016-04963; Structures Monitoring - Annulus Concrete Spalling & Staining, Catwalk Corrosion
- 2016-07282; Misposition; Level 2 Plant Status Control Event Leads to Inadvertent Technical Specification 3.4.1, Condition A Entry
- 2016-07286; Plant Transient Due to Possible Feedwater Issue
- 2016-07305; SP6A, SG 2 MFW Control Valve, Response During Plant Transient
- 2016-07316; OS-0012A SH 2 Drawing Error for SVSP6A1
- 2016-07337; Misposition Event; SP6A Valves Found Out of Position
- 2016-08242; Main Feedwater Loop 1 (SP6B) Erratic Valve Response
- 2016-08386; Operating Crew Performance Critique for Feedwater Transient on May 31, 2016
- 2016-08484; Shield Building Bore S10-666.0-38 Inspection Findings
- 2016-08511; Shield Building Bore S9-666.0-11 Inspection Findings
- 2016-08550; Shield Building Bore S15-674.5-3 Inspection Findings
- 2016-08594; Shield Building Bore S13-633.0-11 Inspection Findings
- 2016-08644; Shield Building Bore S13-633.0-11 Inspection Findings
- 2016-08683; Shield Building Bore S7-666.0-9 Inspection Findings
- 2016-08685; Shield Building Bore S7-666.0-7 Inspection Findings
- 2016-08754; Shield Building Bore S9-785-22.5 Inspection Findings
- 2016-08795; Shield Building Bore S12-666.0-4 Inspection Findings
- 2016-08839; Shield Building Bore F5-791.0-4 Inspection Findings
- 2016-08840; Shield Building Bore S6-666.0-44 Inspection Findings
- 2016-08907; Shield Building Bore S3-650.0-11 Inspection Findings
- 2016-08909; Shield Building Bore S4-650.0-16 Inspection Findings
- 2016-08989; Shield Building Bore S10-780.0-19 Inspection Findings
- 2016-09073; Shield Building Core S13-631.0-8 Inspection Findings
- 2016-10455; Failure Mode Not Fully Evaluated for Risk in ECP 14-0565
- 2016-11221; Speed Pickup Light Out for MFPT 1
- 2016-11669; Main Feed Pump Turbine 1 - Receipt of Annunciator 10-4-C, MFPT 1 Control System Trouble - Due to Possible 30 VDC Power Supply Issue
- 2016-11840; 2016 Shield Building Inspection Summary
- 2016-11907; MFPT 1 Speed Control Transfer Meter Indicating Erratically
- 2016-12170; Annunciator 10-4-C, MFPT Control System Trouble Came Into Alarm
- 2016-12295; Main Feed Pump Turbine #1 Control Cabinet (MDT-20) Alignment Removed From 1R19 Outage Scope
- 2016-12366; MDT20 POS 2 Card Found Unstable Test Points
- 2016-12384; #1 MFPT Speed Change
- 2016-12417; MDT-20 MFPT 1 Control Board Capacitors
- 2016-12538; During MFPT#1 Calibration New Old Stock Position #2 Circuit Card Would Not Calibrate
- 2016-12591; System Monitoring: Increase in MFPT 1 and MFPT 2 RPM Speed Signal Noise
- 2016-12598; MDT 20 Circuit Cards Adjusted per Vendor Recommendation
- 2016-12642; System Monitoring: PI Data Point S657 (MFPT #1 Speed) Has Indication of Drifting Low
- 2016-13193; SA-BN-2016-0247, 2016 Integrated Control System Deep Dive Assessment, Improper Single Point Vulnerability Classifications

Procedures:

- DB-MI-03211; Channel Functional Test of SFRCS Actuation Channel 1 Logic for Mode 1; Revision 19
- DB-OP-02526; Primary to Secondary Heat Transfer Upset; Revision 4
- DB-OP-02010; Feedwater Alarm Panel 10 Annunciators; Revision 22
- DB-OP-06223; Main Feedwater System; Revision 17
- DB-OP-06224; Main Feed Pump and Turbine; Revision 38
- NOP-OP-1014; Plant Status Control; Revision 4
- DB-OP-02010; Feedwater Alarm Panel Annunciators; Revision 22
- EN-DP-01511; Structures Monitoring; Revision 5
- DB-OP-06224; Main Feed Pump and Turbine; Revision 38
- DB-MI-05330; Steam Generator 1-2 Main Feedwater Control Valve SP6A Calibration and Loss of Instrument Air Test; Revisions 0-2

Drawings:

- C-111; Shield Building Wall Development; Revision 13
- C-111A; Shield Building Exterior Developed Elevation; Revision 6
- C-111B, Sheet 1; Shield Building Continued Data for Core Bore Inspections; Revision 2
- C-111B; Shield Building Exterior Developed Elevation; Revision 2
- M-007B; Steam Generator Secondary System; Revision 61
- M-038-00137; MDT-20 Governor Setting Instructions; Revision 3

Work Orders:

- 200423353; PM 5912 SVSP6A1 Rebuild Automatic Valve
- 200510578; PM 4349 Rebuild SP6A, Main Feed Water Valve Actuator
- 200615364; SP6A Replace Converter/Positioner ECP 14-0565-001
- 200670668; PM 11829 Inspection of Shield Building Laminar Cracks
- 200681353; ECP 13-0658-003 Core Drill Shield Building
- 200694531; PM 10036 Replace MFPT #1 Circuit Board Cards
- 200694538; PM 5643 Replace MDT-20 Power Supply
- 200695275; PM 1725 Calibrate MFPT #1 MDT-20

Notifications:

- 601044661; Simple Troubleshooting Plan SVSP6A1
- 601058135; Vendor Technical Information Review Form, Impulse Response (IR) Retesting Shield Building Wall at the Davis-Besse Nuclear Station; August 8, 2016 [PROPRIETARY]
- 601064378; 10-4-C Annunciator in Alarm
- 601067980; Review BETA Failure Report – MDT-20

Engineering Change Packages:

- 12-0273-005; Drawing Update for 2016 Shield Building Core Bore Inspections; Revision 0
- 13-0658-003; Shield Building Long Term Monitoring Bores – 2016; Revision 0
- 14-0565-001; Steam Generator 1-2 Main Feedwater Control Valve Bailey RP1212 Converter Replacement; Revision 4

Calculations:

- C-CSS-099.20-054; Evaluation of Shield Building for the Permanent Condition With Outside Vertical Reinforcement Removed at Each Flute Shoulder; Revision 5
- C-CSS-099.20-056; Evaluation of Shield Building Hoop Reinforcement with Observed Cracking; Revision 3
- C-CSS-099.20-069; Shield Building Laminar Cracking Limits; Revision 0

Other:

- Davis-Besse Plant Health Report; Second Half 2015
- Davis-Besse Plant Health Report; First Half 2016
- Davis-Besse Cycle 19 Periodic Maintenance Effectiveness Assessment Report
- MRPM; Maintenance Rule Program Manual; Revision 35
- Operational Decision Making Issue 16-05; Continued Operation with an Offset in Integrated Control System Demand to MFPT #1 Speed; Revision 0
- Operational Decision Making Issue 16-05; Continued Operation of Main Feed Pump Turbine #1 with Potential Degraded MDT-20 Cabinet Components; Revision 0

1R13 Maintenance Risk Assessments and Emergent Work Control

Condition Reports:

- 2016-11434; SFRCS LISP9B7 Indication Failing to Zero

Procedures:

- DB-MI-03246; Channel Functional Test and Device Calibration of SFRCS Steam Generator Level Inputs 83C-ISLSP9A8, A9, B6 and B7 to Actuation Channel 2; Revision 16
- DB-MI-05270; Dixon/Ametek Bargraph Indicator Calibration; Revision 6
- DB-MI-03239; Functional Test and Calibration of SFRCS Steam Generator Level Transmitters LT-SP9A8, LT-SP9A9, LT-SP9B6, and LT-SP9B7 for Actuation Channel 2; Revision 11
- DB-OP-03006; Miscellaneous Instrument Shift Checks; Revision 56

Business Practices:

- DBBP-OPS-0003; On-Line Risk Management Process; Revision 12
- DBBP-OPS-0011; Protected Equipment Posting; Revision 9

Work Orders:

- 200693972; Repair / Replace SFRCS Channel 4 Steam Generator 1 Level Indicator SP9B7

1R15 Operability Determinations and Functionality Assessments

Condition Reports:

- 2013-14097; Shield Building Laminar Crack Extends
- 2015-05014; NRC Response to Task Interface Agreement 2014-11: Design and Licensing Basis for Shield Building
- 2015-06841; Shield Building Bore S4-650.0-16 Findings
- 2016-08484; Shield Building Bore S10-666.0-38 Inspection Findings
- 2016-08511; Shield Building Bore S9-666.0-11 Inspection Findings
- 2016-08550; Shield Building Bore S15-674.5-3 Inspection Findings
- 2016-08594; Shield Building Bore S13-633.0-11 Inspection Findings
- 2016-08644; Shield Building Bore S13-633.0-11 Inspection Findings
- 2016-08683; Shield Building Bore S7-666.0-9 Inspection Findings
- 2016-08685; Shield Building Bore S7-666.0-7 Inspection Findings
- 2016-08754; Shield Building Bore S9-785-22.5 Inspection Findings
- 2016-08795; Shield Building Bore S12-666.0-4 Inspection Findings
- 2016-08839; Shield Building Bore F5-791.0-4 Inspection Findings
- 2016-08840; Shield Building Bore S6-666.0-44 Inspection Findings
- 2016-08907; Shield Building Bore S3-650.0-11 Inspection Findings
- 2016-08909; Shield Building Bore S4-650.0-16 Inspection Findings
- 2016-08989; Shield Building Bore S10-780.0-19 Inspection Findings

- 2016-09073; Shield Building Core S13-631.0-8 Inspection Findings
- 2016-10710; Reduced Capacity of CREATCS Water Cooled Condenser due to Reduced Service Water Supply Flow
- 2016-11840; 2016 Shield Building Inspection Summary
- 2016-13203; Incore String 43; Level 2 Nonfunctional
- 2016-12853; Maintenance Fundamentals Shortfall – Voltmeter Connected Incorrectly During I&C Safety Feature Actuation System Testing

Drawings:

- C-111; Shield Building Wall Development; Revision 13
- C-111A; Shield Building Exterior Developed Elevation; Revision 6
- C-111B; Sheet 1; Shield Building Continued Data for Core Bore Inspections; Revision 2
- C-111B; Shield Building Exterior Developed Elevation; Revision 2

Procedures:

- DB-SP-03004; Service Water Train 2 Design Flow Verification; Revision 7
- DB-SS-03711; Functional Test for Control Room Emergency Ventilation System Train 2; Revision 13
- EN-DP-01511; Structures Monitoring; Revision 5

Notifications:

- 601058135; Vendor Technical Information Review Form, Impulse Response (IR) Retesting Shield Building Wall at the Davis-Besse Nuclear Station; August 8, 2016 [PROPRIETARY]

Calculations:

- C-CSS-099.20-054; Evaluation of Shield Building for the Permanent Condition With Outside Vertical Reinforcement Removed at Each Flute Shoulder; Revision 5
- C-CSS-099.20-056; Evaluation of Shield Building Hoop Reinforcement With Observed Cracking; Revision 3
- C-CSS-099.20-069; Shield Building Laminar Cracking Limits; Revision 0
- C-ME-028.01-011; CREVS Capacity Test
- C-NSA-011.01-016, R02; Service Water System Design Basis Flowrate Analysis and Testing Requirements

1R19 Post Maintenance Testing

Procedures:

- DB-SP-03447; Decay Heat Train 2 Pump and Valve Test (Mode 1-3); Revision 2

Work Orders:

- 200617180; DH/LPI 1-2 Quarterly Test

Drawings:

- M-033B; Piping and Instrument Diagram Decay Heat Train 1; Revision 57
- M-033C; Piping and Instrument Diagram Decay Heat Train 2; Revision 30

1R22 Surveillance Testing

Condition Reports:

- 2016-09064; System Monitoring – Exceedance of Normal Monitoring Criteria for Rate of Change of Identified Leak Rate

- 2016-09082; System Monitoring – Step Change Identified for RCP Seal Injection Flow
- 2016-14645; WW 1701 Undervoltage Relay 27A-4 Out of Calibration

Procedures:

- DB-ME-03046; D1 Bus Under Voltage Units Monthly Functional Test; Revision 23
- DB-ME-03051; D1 Bus Degraded Voltage Relay Calibration; Revision 08
- DB-ME-09101; Reactor Trip Breaker Maintenance and Testing; Revision 4
- DB-MI-03011; Channel Functional Test of Reactor Trip Breaker B; Revision 34
- DB-OP-01000; Operation of Station Breakers; Revision 32
- DB-SC-03070; Emergency Diesel Generator 1 Monthly Test; Revision 38
- DB-SP-03357; RCS Water Inventory Balance; Revision 19
- DB-SP-03376; Quarterly Makeup Pump 2 Inservice Test and Inspection, Revision 18
- DP-SP-03151; AFP 1 Quarterly Test; Revision 24
- EN-DP-01171; Engineering Implementation of the RCS Integrated Leakage Program; Revision 3
- NG-EN-00327; RCS Integrated Leakage Program; Revision 2

Work Orders:

- 200577923; PM 7368 C4603 Swap Breaker
- 200620039; AFP 1 Quarterly Test
- 200702307; SFAS CH 4 output module L244

1EP4 Emergency Action Level and Emergency Plan Changes

Procedures:

- RA-EP-01500; Emergency Classification; Revision 15
- NOP-LP-5002; Evaluation of Changes to Emergency Plans and Supporting Documents 10CFR50.54(q); Revision 6

Other:

- Davis-Besse Emergency Plan; Revision 30

1EP6 Drill Evaluation

Procedures:

- RA-EP-00200; Emergency Plan Drill and Exercise Program; Revision 12
- RA-EP-00520; Emergency Response Organization; Revision 11
- RA-EP-01500; Emergency Classification; Revision 15
- RA-EP-01600; Unusual Event; Revision 8
- RA-EP-01700; Alert; Revision 8
- RA-EP-01800; Site Area Emergency; Revision 7
- RA-EP-02010; Emergency Management; Revision 18
- RA-EP-02110; Emergency Notification; Revision 14
- RA-EP-02310; Technical Support Center Activation and Response; Revision 13

FENOC Business Practices and Reference Manuals:

- DBRM-EMER-1500A; Davis-Besse Emergency Action Level Basis Document; Revision 7
- DBRM-EMER-1500B; Hot EAL Wall Board; Revision 1
- DBRM-EMER-1500B; Cold EAL Wall Board; Revision 1
- DBRM-EMER-1500C; Davis-Besse Emergency Action Level Reference Manual; Revision 0

Other:

- Davis-Besse Emergency Preparedness October 11, 2016; Integrated Drill Manual
- Davis-Besse Emergency Preparedness October 25, 2016; Integrated Drill Manual

2RS1 Radiological Hazard Assessment and Exposure Controls

Condition Reports:

- CR-2016-04377; Individual Tailgated Through Security Door; Dated April 1, 2016
- CR-2016-14013; Dosimetry Investigation Not Initiated Without Prompting; Dated December 6, 2016
- CR-2016-06134; Contract Individual Challenged Radiography Boundary Guard; Dated April 30, 2016
- CR-2016-04708; RCP Motor Project - Unauthorized Entrance into a Contaminated Area; Dated April 6, 2016

Procedures:

- DB-HP-3000; Inventory and Leak Testing of Licensed Sources; Revision 5
- NOP-OP-4502; Control of Radioactive Material; Revision 4
- DB-HP-01447; Small Article Monitor Calibration; Revision 6

Work Orders:

- Work Order DB-HP3000-001; Inventory and Leak Testing of Licensed Sources; Dated April 2, 2016
- Work Order DB-HP3000-001; Inventory and Leak Testing of Licensed Sources; Dated October 31, 2016

Other:

- Davis-Besse Technical Requirements Manual; Section 8.7.2 Sealed Source Contamination; Revision 0

2RS2 Occupational ALARA Planning and Controls

Condition Reports:

- CR-2016-14332; Issue with Performance of Work In Progress Reviews; Dated December 15, 2016
- CR-2016-14330; Issue with Work In Progress Review Form; Dated December 15, 2016
- CR-2016-04524; 1R-19 Containment Dose Rates Higher than Expected; Dated April 4, 2016

Procedures:

- NOP-OP-4107I; Radiation Work Permit (RWP); Revision 15
- NOP-OP-4005; ALARA Program; Revision 06
- NOP-OP-4012; Outage Radiological Goal Setting; Revision 00
- NOP-OP-4010; Determination of Radiological Risk; Revision 08
- DB-HP-01152; Performance of High Exposure Work; Revision 18
- NOP-OP-4111; Five-Year Exposure Reduction Plan; Revision 3

Radiation Work Permits:

- Radiation Work Permit and Associated ALARA Files; 2016-5015 Scaffolding in Containment; Various Dates
- Radiation Work Permit and Associated ALARA Files; 2016-5104 Reactor Disassembly/Reassembly; Various Dates

- Radiation Work Permit and Associated ALARA Files; 2016-5202 Alloy 600 Mitigation on all Four High Pressure Injection Nozzles; Various Dates
- Radiation Work Permit and Associated ALARA Files; 2016-5206 Reactor Coolant Pump Motor Replacement; Various Dates

Other:

- 1R19 ALARA Post Outage; Date Not Provided
- Davis-Besse Nuclear Power Station 2016-202 Exposure Reduction Plan; Revision 0
- SN-SA-2016-0767; Self-Assessment – Snapshot; Radiological Assessment and Exposure Controls, ALARA Planning and Controls; Dated November 30, 2016

40A1 Performance Indicator Verification

Condition Reports:

- 2016-06836; Code Safety Valve; RC13B Source of Quench Tank In-Leakage
- 2016-09360; RCS Water Inventory Balance (Leak Rate) DB-SP-03357; Quench Tank Leakage Elevated
- 2016-00428; RCP 1-1 Step Change on 12/20/15 and RCP summary
- 2015-10531; System Monitoring RCP 1-1 seal leakage increase
- 2015-14825; System Monitoring RCP 1-1 seal leakage increase

Business Practices:

- NOBP-LP-4012; NRC Performance Indicators; Revision 5
- NOBP-LP-4012-53; Reactor Coolant System Leakage; Completed Forms for
- NOBP-LP-4102-57; Occupational Exposure Control Effectiveness and Supporting Documentation; Various Dates
- NOP-LP-4012; NRC Performance Indicators; Revision 5  
October 2015 through September 2016
- Select Operator Logs covering the period of October 2015 through September 2016

40A2 Problem Identification and Resolution

Condition Reports:

- 2013-14097; Shield Building Laminar Crack Extends
- 2016-00011; CWMT 1 Outlet Valve Out of Position Closed with Tank Being Recirculated
- 2016-01528; Level 3 Plant Status Control Event; Misposition RPS Channel 2 Source Range Test Module Rotary Switch
- 2016-06037; MFP Used Lube Oil Tank Inadvertently Transferred to MFPT 1 Lube Oil Tank (Level 3)
- 2016-06563; ARTS Test Trip Bypass Left in Bypass for SFRCS and Main Turbine During Start Up – Plant Status Control Misposition Event
- 2015-06841; Shield Building Bore S4-650.0-16 Findings
- 2016-07282; Misposition; Level 2 Plant Status Control Event Leads to Inadvertent Technical Specification 3.4.1, Condition A Entry
- 2016-08255; Level 4 Plant Status Control Event Incorrect Pushbutton Depressed During I&C Testing
- 2016-08484; Shield Building Bore S10-666.0-38 Inspection Findings
- 2016-08511; Shield Building Bore S9-666.0-11 Inspection Findings
- 2016-08550; Shield Building Bore S15-674.5-3 Inspection Findings
- 2016-08594; Shield Building Bore S13-633.0-11 Inspection Findings
- 2016-08644; Shield Building Bore S13-633.0-11 Inspection Findings

- 2016-08657; Misposition: Diesel Fire Pump Coolant Leak Due to Level 3 Plant Status Control Event
- 2016-08683; Shield Building Bore S7-666.0-9 Inspection Findings
- 2016-08685; Shield Building Bore S7-666.0-7 Inspection Findings
- 2016-08754; Shield Building Bore S9-785-22.5 Inspection Findings
- 2016-08795; Shield Building Bore S12-666.0-4 Inspection Findings
- 2016-08839; Shield Building Bore F5-791.0-4 Inspection Findings
- 2016-08840; Shield Building Bore S6-666.0-44 Inspection Findings
- 2016-08907; Shield Building Bore S3-650.0-11 Inspection Findings
- 2016-08909; Shield Building Bore S4-650.0-16 Inspection Findings
- 2016-08989; Shield Building Bore S10-780.0-19 Inspection Findings
- 2016-09073; Shield Building Core S13-631.0-8 Inspection Findings
- 2016-10846; Mispositioning Plant Status Control Level 3 Event – Main Steam Line 1 Turbine Bypass Valve Outlet Drain Isolations Found Closed
- 2016-10883; Mispositioning Plant Status Control Level 3 – RC1719A Containment Vent Header Isolation Found Closed
- 2016-11004; Misposition – E1 & F1 on Transformers with Shutdown Tap Settings While in Mode 4 (Level 2)
- 2016-11138; Main Turbine Trip During Startup – Misposition Event
- 2016-11681; Common Cause Evaluation for DB Performance Issues
- 2016-11840; 2016 Shield Building Inspection Summary
- 2016-13423; CAC 3 Unavailable Status Not Included in Daily Risk Summary for November 15, 2016

#### Drawings:

- C-111; Shield Building Wall Development; Revision 13
- C-111A; Shield Building Exterior Developed Elevation; Revision 6
- C-111B, Sheet 1; Shield Building Continued Data for Core Bore Inspections; Revision 2
- C-111B; Shield Building Exterior Developed Elevation; Revision 2

#### Notifications:

- 601058135; Vendor Technical Information Review Form, Impulse Response (IR) Retesting Shield Building Wall at the Davis-Besse Nuclear Station; August 8, 2016 [PROPRIETARY]

#### Procedures:

- NOP-ER-1001; Continuous Equipment Performance Improvement; Revision 5
- NOP-LP-2001; Corrective Action Program; Revision 38
- NOP-OP-1009; Operability Determinations and Functionality Assessments; Revision 6

#### Engineering Change Packages:

- 12-0273-005; Drawing Update for 2016 Shield Building Core Bore Inspections; Revision 0
- 13-0658-003; Shield Building Long Term Monitoring Bores – 2016; Revision 0

#### FENOC Business Practices:

- NOBP-LP-2001; FENOC Self-Assessment and Benchmarking; Revision 25
- NOBP-LP-2003; Employee Concerns Program; Revision 4
- NOBP-LP-2008; FENOC Corrective Action Review Board; Revision 20
- NOBP-LP-2011; FENOC Cause Analysis; Revision 19
- NOBP-OP-1009; Prompt Operability Determination and Functionality Assessment Preparation Guide; Revision 6

FENOC Policy Statements and Reference Materials:

- NOPL-LP-2003; Safety Conscious Work Environment (SCWE); Revision 2
- NOPL-LP-2007; Corrective Action Program; Revision 1
- NORM-OP-1009; SRO Review of Condition Reports; Revision 5

4OA3 Followup of Events and Notices of Enforcement Discretion

Condition Reports:

- 2010-87048; RC13A and RC13B Fail As-Found Testing at Vendor
- 2016-07816; Potential Impact of a Tornado on the Emergency Diesel Generators via the Crankcase Pressure Switch
- 2016-07957; Post 19R Code Safety Valves RC13A and RC13B Fail As-Found Setpoint Testing at Vendor
- 2016-09961; Multiple Turbine Building Roof Vents Not Closing – Near Miss
- 2016-10724; Rapid Feedwater Reduction Response Following Reactor Trip
- 2016-10725; Reactor Trip Due to Water Intrusion into the Automatic Voltage Regulator (AVR) Cabinet
- 2016-11004; Misposition – E1 & F1 on Transformers With Shutdown Tap Settings While in Mode 4
- 2016-12549; Incorrect Risk Impact for Anticipatory Reactor Trip System Interchannel Logic Testing
- 2016-14613; L244 1/5 Light Did Not Illuminate

Procedures:

- DB-OP-02000; RPS, SFAS, SFRCS Trip, or Steam Generator Tube Rupture; Revision 29
- DB-OP-02520; Load Rejection; Revision 7
- DB-OP-02526; Primary to Secondary Heat Transfer Upset; Revision 4
- DB-OP-02546; Degraded Grid; Revision 4
- DB-OP-06003; Pressurizer Operating Procedure; Revisions 31 and 32
- DB-OP-06004; Quench Tank; Revision 11
- DB-OP-06202; Turbine Operating Procedure; Revision 28
- DB-OP-06301; Generator and Exciter Operating Procedure; Revision 28
- DB-OP-06401; Integrated Control System Operating Procedure; Revision 25
- DB-OP-06402; Control Rod Drive Operating Procedure; Revision 28
- DB-SC-03113; SFAS Channel 4 Functional Test; Revision 16
- EN-DP-01511; Structures Monitoring; Revision 5
- NA-QC-00356; Transient Assessment Program; Revision 5
- NOP-LP-2001; Corrective Action Program; Revision 38

Other:

- Cause Evaluation; CR 2016-07816; Potential Impact of a Tornado on the Emergency Diesel Generators via the Crankcase Pressure Switch
- Cause Evaluation; CR 2016-11004; Misposition – E1 & F1 on Transformers With Shutdown Tap Settings While in Mode 4; November 22, 2016
- LORT
- 05000346/2016-006-00; Potential to Trip Emergency Diesel Generator on High Crankcase Pressure
- LER 05000346/2016-007-00; Pressurizer Code Safety Valve Setpoint Test Failures
- LER 05000346/2016-009-00; Reactor Trip Due to Rainwater Intrusion and Auxiliary Feedwater Actuation on High Steam Generator Level

- Root Cause Analysis Report; CR 2016-10724; Rapid Feedwater Reduction Response Following Reactor Trip
- Root Cause Analysis Report; CR 2016-10725; Reactor Trip Due to Water Intrusion Into the Automatic Voltage Regulator Cabinet; October 11, 2016

#### 4OA5 Other Activities

##### Condition Reports:

- 2016-13076; One (1) of 22 Groundwater Samples Over 2,000 PicoCuries/Liter (pCi/L) Tritium

##### Procedures:

- NOP-OP-1015; Event Notifications; Revision 3
- NOP-OP-2012; Groundwater Monitoring; Revision 9
- NOP-OP-4705; Response to Contaminated Spills/Leaks; Revision 8

##### Business Practices:

- NOBP-OP-1015; Event Notifications; Revision 5

##### Other:

- Groundwater Monitoring Well Data Covering the Period of January 2014 through December 2016

## LIST OF ACRONYMS USED

ADAMS	Agencywide Document Access Management System
ALARA	As-Low-As-Is-Reasonably-Achievable
ASME	American Society of Mechanical Engineers
BWST	Borated Water Storage Tank
CAP	Corrective Action Program
CFR	<i>Code of Federal Regulations</i>
CR	Condition Report
DRP	Division of Reactor Projects
EDG	Emergency Diesel Generator
EP	Emergency Preparedness
FIN	Finding
I&C	Instrumentation and Controls
ICS	Integrated Control System
IMC	Inspection Manual Chapter
IP	Inspection Procedure
IR	Inspection Report
JPM	Job Performance Measure
LER	Licensee Event Report
LORT	Licensed Operator Requalification Training
MFW	Main Feedwater
NCV	Non-Cited Violation
NEI	Nuclear Energy Institute
NRC	U.S. Nuclear Regulatory Commission
PARS	Publicly Available Records System
pCi/l	picocuries per liter
PI&R	Problem Identification and Resolution
psig	Pounds Per Square Inch Gauge
RCS	Reactor Coolant System
RFO	Refueling Outage
RP	Radiation Protection
SAT	Systems Approach to Training
SDP	Significance Determination Process
SFRCS	Steam Feedwater Rupture Control System
SG	Steam Generator
SSC	Structures, Systems, and Components
TS	Technical Specification
UFSAR	Updated Final Safety Analysis Report
URI	Unresolved Item
VAC	Volts Alternating Current
WO	Work Order

B. Boles

-3-

Letter to Brian Boles from Jamnes Cameron dated January 26, 2017

SUBJECT: DAVIS-BESSE NUCLEAR POWER STATION—NRC INTEGRATED INSPECTION  
REPORT 05000346/2016004; 05000346/2016501

DISTRIBUTION:

Jeremy Bowen  
RidsNrrDorLpl3-2 Resource  
RidsNrrPMDavisBesse Resource  
RidsNrrDirslrib Resource  
Cynthia Pederson  
Darrell Roberts  
Richard Skokowski  
Allan Barker  
Carole Ariano  
Linda Linn  
DRPIII  
DRSIII  
[ROPreports.Resource@nrc.gov](mailto:ROPreports.Resource@nrc.gov)

ADAMS Accession Number: ML17027A319

OFFICE	RIII							
NAME	JCameron:tt							
DATE	1/26/2017							

**OFFICIAL RECORD COPY**