



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION**  
REGION III  
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August 10, 2018

Mark Bezilla  
Site Vice President  
FirstEnergy Nuclear Operating Co.  
Davis-Besse Nuclear Power Station  
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Oak Harbor, OH 43449-9760

**SUBJECT: DAVIS-BESSE NUCLEAR POWER STATION—NRC INTEGRATED INSPECTION  
REPORT 05000346/2018002**

Dear Mr. Bezilla:

On June 30, 2018, the U.S. Nuclear Regulatory Commission (NRC) completed an integrated inspection at your Davis-Besse Nuclear Power Station. On July 31, 2018, the NRC inspectors discussed the results of this inspection with you and other members of your staff. The results of this inspection are documented in the enclosed report.

Based on the results of this inspection, the NRC has identified four issues that were evaluated under the risk significance determination process as having very low safety significance (Green). The NRC has also determined that three violations are associated with these issues. Because the licensee initiated condition reports to address these issues, these violations are being treated as Non-Cited Violations (NCVs), consistent with Section 2.3.2 of the Enforcement Policy. These NCVs are described in the subject inspection report.

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

If you disagree with a cross-cutting aspect assignment or a finding not associated with a regulatory requirement in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region III; and the NRC resident inspector at Davis-Besse Nuclear Power Station.

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

Sincerely,

**/RA/**

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

Docket Nos. 50-346; 72-014  
License Nos. NPF-3

Enclosure:  
Inspection Report 05000346/2018002

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Letter to Mark Bezilla from Jamnes Cameron dated August 10, 2018

SUBJECT: DAVIS-BESSE NUCLEAR POWER STATION—NRC INTEGRATED INSPECTION  
REPORT 05000346/2018002

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U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket Numbers: 50–346; 72–014

License Numbers: NPF–3

Report Numbers: 05000346/2018002

Enterprise Identifier: I–2018–002–0015

Licensee: FirstEnergy Nuclear Operating Company (FENOC)

Facility: Davis-Besse Nuclear Power Station

Location: Oak Harbor, OH

Dates: April 1 through June 30, 2018

Inspectors: D. Mills, Senior Resident Inspector  
M. Garza, Acting Senior Resident Inspector  
J. Harvey, Resident Inspector  
J. Rutkowski, Project Engineer  
J. Beavers, Resident Inspector, Duane Arnold Energy  
Center

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

Enclosure

## SUMMARY

The U.S. Nuclear Regulatory Commission (NRC) continued monitoring licensee's performance by conducting an integrated quarterly inspection at Davis-Besse Power Plant in accordance with the Reactor Oversight Process. The Reactor Oversight Process is the NRC's program for overseeing the safe operation of commercial nuclear power reactors. Refer to <https://www.nrc.gov/reactors/operating/oversight.html> for more information. Findings and violations being considered in the NRC's assessment are summarized in the table below.

### List of Findings and Violations

Failure to Follow the Makeup and Purification Procedure			
Cornerstone	Significance	Cross-cutting Aspect	Report Section
Initiating Events	Green NCV 05000346/2018002-01 Closed	H.12	71152 – Annual Follow-Up of Selected Issues
A self-revealed Green finding and associated Non-Cited Violation of Technical Specification 5.4.1.a, Procedures, was identified when the licensee failed to follow station procedure DB-OP-06006, "Makeup and Purification System." Specifically, the licensee failed to open MU177, the Make-Up Filter 1 Outlet Isolation valve, which resulted in the isolation of letdown while swapping make-up filters.			

Failure to Apply Technical Specification for Safety Features Actuation System Instrumentation			
Cornerstone	Significance	Cross-cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000346/2018002-02 Closed	H.14	71153 – Follow-Up of Events and Notices of Enforcement Direction
The NRC identified a finding of Green significance and an associated Non-Cited Violation of Technical Specification 3.3.5.b, Safety Features Actuation System (SFAS) Instrumentation, for the licensee's failure to place the reactor in Mode 3 within six hours of identifying that two channels of Safety Features Actuation System Borated Water Storage Tank level instrumentation were inoperable. Specifically, the licensee inappropriately exited Technical Specification 3.3.5.b, and failed to place the reactor in Mode 3 while two Borated Water Storage Tank level instruments were inoperable for more than six hours.			

Failure to Perform a Procedure Affecting Quality			
Cornerstone	Significance	Cross-cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000346/2018002-03 Closed	H.8	71153 – Follow-Up of Events and Notices of Enforcement Direction
The NRC identified a finding of Green significance and an associated non-cited violation of 10 <i>Code of Federal Regulation</i> (CFR) Part 50, Appendix B, Criterion V, “Instructions, Procedures, and Drawings,” due to the licensee’s failure to implement DB–OP–03006, “Miscellaneous Instrument Shift Checks,” Specifically, the licensee declared SFAS Channel 1 operable without performing the required channel check.			

Misapplication of the Operability Determination Process			
Cornerstone	Significance	Cross-cutting Aspect	Report Section
Mitigating Systems	Green FIN 05000346/2018002-04 Closed	H.13	71153 – Follow-Up of Events and Notices of Enforcement Direction
The NRC identified a finding of Green significance due to the licensee’s misapplication of NOP–OP–1009, “Operability Determinations and Functionality Assessments.” Specifically, the licensee failed to apply the Operability Determination process in accordance with procedures.			

### Additional Tracking Items

Type	Issue Number	Title	Report Section	Status
LER	05000346/2016008-01	Application of Technical Specification for the Safety Features Actuation System Instrumentation	71153	Closed

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## PLANT STATUS

The unit remained at or near rated thermal power for the entirety of the inspection period.

On March 28, 2018, FirstEnergy Solutions (FES) / FirstEnergy Nuclear Operating Company (FENOC) verbally notified the Nuclear Regulatory Commission that they intended to shut down all four of their operating nuclear power plants. Based on that notification, the first to shut down will be Davis-Besse, by May 31, 2020. On March 31, 2018, FES, FirstEnergy Nuclear Generation (FENGEN), and FENOC filed for bankruptcy. The Nuclear Regulatory Commission continues to maintain focus on public health and safety and the protection of the environment. This will include a continuous evaluation by inspectors to determine whether the licensee's financial condition is impacting safe operation of the plant.

## INSPECTION SCOPES

Inspections were conducted using the appropriate portions of the inspection procedures (IPs) in effect at the beginning of the inspection unless otherwise noted. Currently approved IPs with their attached revision histories are located on the public website at <http://www.nrc.gov/reading-rm/doc-collections/insp-manual/inspection-procedure/index.html>. Samples were declared complete when the IP requirements most appropriate to the inspection activity were met consistent with Inspection Manual Chapter (IMC) 2515, "Light-Water Reactor Inspection Program - Operations Phase." The inspectors performed plant status activities described in IMC 2515 Appendix D, "Plant Status" and conducted routine reviews using IP 71152, "Problem Identification and Resolution." The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel to assess licensee performance and compliance with Commission rules and regulations, license conditions, site procedures, and standards.

## REACTOR SAFETY

### 71111.01—Adverse Weather Protection

#### Summer Readiness (1 Sample)

The inspectors evaluated summer readiness of offsite and alternate alternating current power systems.

### 71111.04—Equipment Alignment

#### Partial Walkdown (4 Samples)

The inspectors evaluated system configurations during partial walkdowns of the following systems/trains:

- (1) Auxiliary feedwater train 1 during planned maintenance and testing on auxiliary feedwater train 2 during the week ending April 14, 2018;
- (2) Motor driven feedwater pump during auxiliary feedwater train 2 maintenance during the week ending April 21, 2018;
- (3) Containment spray system during the week ending April 28, 2018; and
- (4) Decay heat/low pressure injection train 2 when train 1 was out of service during the week ending June 2, 2018.



#### Complete Walkdown (1 Sample)

The inspectors evaluated system configurations during a complete walkdown of the High Pressure Injection system during the week ending April 28, 2018.

#### 71111.05Q—Fire Protection Quarterly

##### Quarterly Inspection (4 Samples)

The inspectors evaluated fire protection program implementation in the following selected areas:

- (1) Emergency core cooling system pump room 1–2, (fire area A), during the week ending April 28, 2018;
- (2) Auxiliary building rooms 104, 106, 106A, and 109, (fire area A), during the week ending April 28, 2018;
- (3) Auxiliary feedwater train 2, (fire area F) during the week ending May 19; and
- (4) Component cooling water room, (fire area T), during the week ending May 26, 2018.

#### 71111.06—Flood Protection Measures

##### Underground Cables (1 Sample)

The inspectors evaluated cable submergence protection in:

- (1) Manholes mh3101, mh3108, mh3109, mh3010 during the week ending April 14, 2018.

#### 71111.07—Heat Sink Performance

##### Heat Sink (1 Sample)

The inspectors evaluated closed cooling water 3 performance following a pinhole leak repair during the week ending May 19, 2018.

#### 71111.11—Licensed Operator Requalification Program and Licensed Operator Performance

##### Operator Requalification (1 Sample)

The inspectors observed and evaluated licensed operator requalification training during the week ending May 26, 2018.

##### Operator Performance (1 Sample)

The inspectors observed and evaluated operators perform a reactor downpower and place feedwater components in manual control to support planned maintenance on a feedwater flow component during the week ending May 26, 2018.

#### 71111.12—Maintenance Effectiveness

##### Routine Maintenance Effectiveness (2 Samples)

The inspectors evaluated the effectiveness of routine maintenance activities associated with the following equipment and/or safety significant functions:

- (1) Decay heat/low pressure injection train 1; and
- (2) Component cooling water availability.

#### 71111.13—Maintenance Risk Assessments and Emergent Work Control (4 Samples)

The inspectors evaluated the risk assessments for the following planned and emergent work activities:

- (1) Auxiliary feedwater train 2 out of service for planned maintenance during the week ending May 12;
- (2) E-31A outage to relieve cable stress due to turbine building floor movement during the week ending May 12;
- (3) Control room emergency ventilation system train 1 out of service for planned maintenance during the week ending May 26; and
- (4) Decay heat/low pressure injection train 1 out of service for planned maintenance during the week ending June 2.

#### 71111.15—Operability Determinations and Functionality Assessments (4 Samples)

The inspectors evaluated the following operability determinations and functionality assessments:

- (1) Forward flow / closure valve SW277—CR 2018-03174 during the week ending April 6;
- (2) Containment Isolation Valve Train 2 position indication lights not lit—CR 2018-04305 during the week ending May 12, 2018;
- (3) Leading Edge Flow Monitor Failure—CR 2018-04296 during the week ending May 12, 2018; and
- (4) Emergency Diesel Generator 2 silencer through-wall leak—CR 2018-04599 during the week ending May 26, 2018.

#### 71111.18—Plant Modifications (1 Sample)

The inspectors evaluated the following temporary or permanent modifications:

- (1) Borated Water Storage Tank Loop Seal, ECP 16-0478, during the week ending June 23, 2018.

#### 71111.19—Post Maintenance Testing (3 Samples)

The inspectors evaluated the following post maintenance tests:

- (1) Auxiliary feedwater train 2 following planned maintenance, during the week ending May 12, 2018;

- (2) Service water train 1 following planned maintenance, during the week ending May 26, 2018; and
- (3) Decay heat/low pressure injection train 1 following planned maintenance, during the week ending June 9, 2018.

#### 71111.22—Surveillance Testing

The inspectors evaluated the following surveillance tests:

##### Routine (1 Sample)

- (1) Emergency diesel generator 1 monthly surveillance during the week ending April 7, 2018.

#### 71114.06—Drill Evaluation

##### Emergency Planning Drill (1 Sample)

The inspectors evaluated a tabletop drill at the Emergency Operating Facility on June 4, 2018.

### **OTHER ACTIVITIES – BASELINE**

#### 71151—Performance Indicator Verification (3 Samples)

The inspectors verified licensee performance indicators submittals listed below:

- (1) MS05: Safety System Functional Failures (SSFFs) for the period from the second quarter 2017 through the first quarter 2018;
- (2) MS06: Emergency AC Power Systems for the period from the second quarter 2017 through the first quarter 2018; and
- (3) MS07: High Pressure Injection Systems for the period from the second quarter 2017 through the first quarter 2018.

#### 71152—Problem Identification and Resolution

##### Annual Follow-Up of Selected Issues (1 Sample)

The inspectors reviewed the licensee's implementation of its corrective action program related to the following issues:

- (1) CR 2018–03036; Misposition of Make Up Filter 1 Outlet Isolation (MU177)  
One violation for this issue is documented in this report.

#### 71153—Follow-Up of Events and Notices of Enforcement Discretion

##### Licensee Event Reports (1 Sample)

The inspectors evaluated the following licensee event reports which can be accessed at <https://lersearch.inl.gov/LERSearchCriteria.aspx>:

- (1) Licensee Event Report (LER) 05000346/2016–008–01, Application of Technical Specifications for the Safety Features Actuation System Instrumentation. Two violations and a finding for this issue are documented in this report. This LER is closed.

#### Evaluation of Davis-Besse Safety Condition in Light of Financial Conditions

The licensee's parent company, FirstEnergy Solutions, was under bankruptcy protection/reorganization during the inspection period. As such, NRC Region III conducted special reviews of processes at Davis-Besse. Using the flexibilities in the baseline inspection program, the inspectors evaluated several aspects of the licensee's operations to assess whether any identified plant performance issues could be related to the station's financial condition. The factors reviewed included: (1) impact on regulatory-required plant staffing, (2) corrective maintenance backlog, (3) changes to the planned maintenance schedule, (4) corrective action program implementation, and (5) reduction in outage scope, including risk-significant modifications. In particular, the inspectors verified that licensee personnel continued to identify problems at an appropriate threshold and enter these problems into the corrective action program for resolution. The inspectors also verified that the licensee continued to develop and implement corrective actions commensurate with the safety significance of the problems identified.

The review of processes at Davis-Besse included continuous reviews by the Resident Inspectors, as well as the specialist-led baseline inspections completed during the inspection period which are documented previously in this report.

### **INSPECTION RESULTS**

#### 71152—Problem Identification and Resolution

Observation – Selected Issue Follow-Up for CR–2018–03036: Misposition of Make Up Filter 1 Outlet Isolation (MU 177)	71152 – Annual Sample Review
<p>On March 31, 2018, while placing makeup system filter 1 in service using DB–OP–06006, "Makeup and Purification System," Revision 42, the licensee received two unexpected alarms: "Letdown or MU [make-up] Filter dP [differential pressure] Hi" followed by "Letdown Pressure Hi." The licensee immediately opened MU12B, the Makeup Filter 2 Inlet Isolation, to establish letdown flow. During this time the letdown relief valve lifted and reseated, diverting approximately six gallons of water to the reactor coolant drain tank.</p> <p>Through the investigation of the issue, the licensee found MU177, the Make-Up Filter 1 Outlet Isolation valve, had not been opened on March 30, 2018, as required by Step 4.9.16.j of DB–OP–06006. The licensee's corrective actions included operator remediation, a requirement to have shiftly engagement calls with Operations Management, and reinforcement of the value of reverse briefs by operators as a human performance tool. This issue was documented in CR–2018–03036, "Disposition of Make-Up Filter 1 Outlet Isolation (MU177)."</p>	

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

- complete and accurate identification of the problem in a timely manner commensurate with its safety significance and ease of discovery;
- consideration of the extent of condition, generic implications, common cause, and previous occurrences;
- evaluation and disposition of operability/functionality/reportability issues;
- classification and prioritization of the resolution of the problem commensurate with safety significance;
- identification of corrective actions, which were appropriately focused to correct the problem; and
- completion of corrective actions in a timely manner commensurate with the safety significance of the issue.

The inspectors verified the licensee assessed and corrected the issue in a timely manner. A violation associated with this issue is documented in this report.

Failure to Follow the Makeup and Purification Procedure			
Cornerstone	Significance	Cross-cutting Aspect	Report Section
Initiating Events	Green NCV 05000346/2018002-01 Closed	H.12	71152 – Annual Follow-Up of Selected Issues
A self-revealed Green finding and associated Non-Cited Violation (NCV) of Technical Specification 5.4.1.a, Procedures, was identified when the licensee failed to follow station procedure DB-OP-06006, "Makeup and Purification System." Specifically, the licensee failed to open MU177, the Make-Up Filter 1 Outlet Isolation valve, which resulted in the isolation of letdown while swapping make-up filters.			
<p><u>Description:</u></p> <p>On March 31, 2018, while placing make-up system filter 1 in service using DB-OP-06006, "Makeup and Purification System," Revision 42, the licensee received two unexpected alarms: "Letdown or MU [make-up] Filter dP [differential pressure] Hi" followed by "Letdown Pressure Hi." The licensee immediately opened MU12B, the Makeup Filter 2 Inlet Isolation, to establish letdown flow.</p> <p>During investigation of the issue the licensee found MU177, the Make-up Filter 1 Outlet Isolation Valve, unexpectedly closed. This was because on March 30, 2018, when preparing to swap filters, the licensee failed to follow Step 4.9.16.j of DB-OP-06006, which required opening of MU177. Additionally, the licensee determined that while letdown flow was isolated, the letdown relief valve lifted and reseated. Approximately six gallons of water were diverted to the reactor coolant drain tank.</p>			

**Corrective Actions:** The licensee's corrective actions included operator remediation, a requirement to have shiftly engagement calls with operations management, and reinforcement of the value of reverse briefs by operators as a human performance tool.

**Corrective Action Reference:** This issue was documented in CR-2018-03036, "Misposition of Make-Up Filter 1 Outlet Isolation (MU177)."

**Performance Assessment:**

**Performance Deficiency:** The inspectors determined the licensee's failure to follow DB-OP-06006, Makeup and Purification System, Revision 42, was a performance deficiency. Specifically, the licensee failed to open MU177, Make-Up Filter 1 Outlet Isolation, as required by Step 4.9.16.j.

**Screening:** The performance deficiency was more than minor because it was associated with Initiating Events cornerstone attribute of equipment performance, and adversely affected the cornerstone objective of limiting the likelihood of events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. Specifically, the licensee's failure to open MU177 resulted in the letdown relief valve lifting, diverting reactor coolant to the reactor coolant drain tank.

**Significance:** Using Inspection Manual Chapter (IMC) 0609, Attachment 4, "Initial Characterization of Findings," and IMC 0609 Appendix A, "The Significance Determination Process for Findings at Power," issued June 19, 2012, the finding was screened against the Initiating Events cornerstone. The inspectors determined this issue was of very low safety significance (Green) because the inspectors answered "No" to all the screening questions.

**Cross Cutting Aspect:** This finding has a cross-cutting aspect of Avoid Complacency in the area of the Human Performance because the licensee failed to recognize and plan for the possibility of mistakes, latent issues, and inherent risk, even while expecting successful outcomes. Individuals implement appropriate error reduction tools. Specifically, the licensee did not appropriately implement error reduction tools. [H.12]

**Enforcement:**

**Violation:** Technical Specification 5.4.1.a, Procedures, states, in part, written procedures shall be established, implemented, and maintained covering the following activities: the applicable procedures recommended in Regulatory Guide 1.33, Revision 2, Appendix A, February 1978. Section 3.n of Regulatory Guide 1.33, Revision 2, Appendix A, February 1978, states, in part, instructions for energizing, filling, venting, draining, startup, shutdown, and changing modes of operation should be prepared, as appropriate, for the following systems: chemical and volume control system (including letdown/purification system). Step 4.9.16.j of DB-OP-06006, "Makeup and Purification System," Revision 42, stated, open MU177, Make-up Filter 1 Outlet Isolation.

Contrary to the above, on March 30, 2018, the licensee failed to implement a written procedure required by Technical Specification 5.4.1.a. Specifically, the licensee failed to implement procedure DB-OP-06006, "Makeup and Purification System," Revision 42, which resulted in the isolation of letdown while swapping make-up filters.

Disposition: Because it was of very low safety significance and was entered into the licensee's corrective action program as CR-2018-03036, this violation is being treated as an NCV consistent with Section 2.3.2 of the Enforcement Policy. **(NCV 05000346/2018002-01: Failure to follow Makeup and Purification Procedure)**

71153—Follow-Up of Events and Notices of Enforcement Discretion

Failure to Apply Technical Specification for Safety Features Actuation System Instrumentation			
Cornerstone	Significance	Cross-cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000346/2018002-02 Closed	H.14	71153 – Follow-Up of Events and Notices of Enforcement Direction
<p>The NRC identified a finding of Green significance and an associated NCV of Technical Specification 3.3.5, Safety Features Actuation System (SFAS) Instrumentation for the licensee's failure to place the reactor in Mode 3 within six hours of identifying that two channels of SFAS Borated Water Storage Tank level instrumentation were inoperable. Specifically, the licensee exited Technical Specification (TS) 3.3.5.b, the six hour shutdown technical specification, while two BWST level instruments were still inoperable.</p>			
<p><u>Description:</u></p> <p>Licensee Event Report (LER) 05000346/2016-008-01, Application of Technical Specifications for the Safety Features Actuation System Instrumentation.</p> <p>On June 30, 2016 at 0829 EDT, Channel 1 of the Borated Water Storage Tank (BWST) level instrumentation for the Safety Features Actuation System (SFAS) was declared inoperable and removed from service for scheduled maintenance. The Limiting Condition for Operation (LCO) for Technical Specification 3.3.5 stated in part, four channels of SFAS instrumentation for each Parameter [BWST level] shall be operable. At this time, Reactor Operators entered TS 3.3.5.a, which required the inoperable channel be tripped. Later that day at 2344, Channel 2 became inoperable due to a loss of power from a failed power supply. At this time, operators should have entered TS 3.3.5.b, which required restoring at least one channel immediately or placing the reactor into Mode 3 (hot shutdown), within six hours. At 0140 on July 1, 2016, operators realized that they should apply TS 3.3.5.b, but did not enter the Technical Specification until 0245. At 0330, operators exited TS 3.3.5.b with Channel 1 declared operable with compensatory measures, including proceduralized operator actions to be performed for a manual suction swap. At that time, the Channel 1 instrument was electrically and physically disconnected and incapable of performing its function or passing the Technical Specification required surveillance, which is required to be met in all modes of applicability of the LCO.</p> <p>The inspectors questioned the licensee's basis for operability. From discussions with the licensee on July 1, 2016, the inspectors determined the defined compensatory measures were not sufficient for the licensee to declare Channel 1 operable. At 1325 on July 1, 2016, the licensee declared Channel 1 inoperable and reentered TS 3.3.5.b. At 1351, the licensee exited TS 3.3.5.b after maintenance was completed and Channel 1 was restored to service.</p>			

The inspectors determined the reactor had been in a Mode other than Mode 3 (or lower) for a total of 14 hours and 7 minutes.

**Corrective Actions:** The corrective actions included reentering TS 3.3.5.b and performing corrective maintenance on the Channel 1 instrumentation to restore it to operable. The Licensee performed a root cause analysis and developed a case study from lessons learned. Additionally, the licensee issued an operations standing order; revised multiple procedures; and performed additional training regarding lessons learned from this event, Technical Specification compliance, and correct application of the operability determination process.

**Corrective Action Reference:** The licensee documented this issue in CR 2016-08419 "Performance review of LCO 3.3.5 application during LT1525A maintenance."

**Performance Assessment:**

**Performance Deficiency:** The inspectors determined the licensee's failure to place the reactor in Mode 3 within six hours, as required by TS 3.3.5.b, was a performance deficiency. Specifically, with two channels of the BWST level instrumentation inoperable, the licensee failed to enter Mode 3 within six hours.

**Screening:** The finding was determined to be more than minor because it was associated with the Mitigating Systems function of Long Term Heat Removal, and affected the cornerstone's objective of ensuring the availability, reliability, and capability of systems to respond to initiating events to prevent undesirable consequences. Specifically, the finding resulted in the loss of the emergency core cooling system (ECCS) suction swap permissive function, which could have resulted in the loss of system safety function (i.e., ECCS due to a premature suction source transfer).

**Significance:** The inspectors determined the finding could be evaluated using the SDP in accordance with IMC 0609, "Significance Determination Process," Attachment 0609.04, "Phase 1-Initial Screening and Characterization of Findings," for the Mitigating Systems cornerstone. The inspectors evaluated the finding using Appendix A, "The Significance Determination Process for Findings At-Power." The inspectors answered "Yes" to Question A.2 in Exhibit 2 because the finding represented the inoperability of the ECCS suction swap permissive for fourteen hours, which was greater than the TS 3.3.5 allowed outage time of 6 hours for this function. Therefore, a detailed risk evaluation was performed using IMC 0609, Appendix A. The risk evaluation was performed by Region III SRAs and the bounding core damage frequency ( $\Delta$ CDF) was determined to be  $7.0\text{E}-7/\text{yr}$ . Since the total estimated change in core damage frequency was less than  $1.0\text{E}-6/\text{year}$ , the finding/violation was initially determined to be Green. Additionally since the  $\Delta$ CDF was greater than  $1.0\text{E}-7/\text{year}$ , the finding was reviewed for potential Large Early Release Frequency (LERF) contribution. Davis Besse is a 2-loop Babcock and Wilcox Pressurized Water Reactor with a large dry containment. The core damage sequences important to LERF were steam generator tube rupture events and inter-system LOCA events. These events were not the dominant core damage sequences for this finding. Therefore, based on the detailed risk evaluation, the SRAs confirmed that the finding was of very-low safety significance (Green).

**Cross Cutting Aspect:** This finding had a cross-cutting aspect of Conservative Bias in the area of Human Performance, which states individuals use decision making practices that emphasize prudent choices over those that are simply allowable. A proposed action is determined to be safe in order to proceed, rather than unsafe in order to stop. Specifically,



the licensee failed to use decision making practices that emphasized prudent choices, over those that they believed were simply allowable. [H.14]

Enforcement:

Violation: Technical Specification 3.3.5.b, SFAS Instrumentation, states in part, with one of more Parameters with two or more channels inoperable, be in Mode 3 within six hours.

Enforcement Actions: Contrary to the above, on July 1, 2016, the licensee failed to place the reactor into Mode 3 within six hours of identifying one Parameter of SFAS instrumentation with two channels inoperable. Specifically, licensee operators entered TS 3.3.5.b. at 0245 hours on July 1, 2016, following the determination that Channels 1 and 2 of SFAS Instrumentation were inoperable. At 0330, licensee operators used inappropriate actions to declare Channel 1 of SFAS Instrumentation operable, and subsequently failed to place the reactor in Mode 3 before 0845 hours on July 1, 2016. Licensee operators appropriately exited TS 3.3.5.b. at 1351 hours on July 1, 2016.

Disposition: Because it was of very low safety significance and was entered into the licensee's corrective action program as CR-2016-08419, this violation is being treated as an NCV consistent with Section 2.3.2 of the Enforcement Policy. **(NCV 05000346/2018002-02: Failure to Apply Technical Specification for SFAS Instrumentation)**

Failure to Perform a Procedure Affecting Quality			
Cornerstone	Significance	Cross-cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000346/2018002-03 Closed	H.8	71153 – Follow-Up of Events and Notices of Enforcement Direction
The NRC identified a finding of Green significance and an associated non-cited violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," due to the licensee's failure to implement DB-OP-03006, "Miscellaneous Instrument Shift Checks," Specifically, the licensee declared SFAS Channel 1 operable without performing the required channel check.			
<p><u>Description:</u></p> <p>Licensee Event Report (LER) 05000346/2016-008-01, Application of Technical Specifications for the Safety Features Actuation System Instrumentation.</p> <p>On June 30, 2016, at 0829 EDT, Channel 1 of the Borated Water Storage Tank (BWST) level instrumentation for the Safety Features Actuation System (SFAS) was declared inoperable and removed from service for scheduled maintenance. On July 1, 2016, at 0330, the channel was declared operable with reference to compensatory measures. At that time, the Channel 1 instrument was electrically and physically disconnected, and incapable of performing its function.</p> <p>On July 1, 2016, at 0700, the licensee performed DB-OP-03006, "Miscellaneous Instrument Shift Checks." Step 2.1.1 states, in part, a channel check shall be the qualitative assessment,</p>			

by observation, of channel behavior during operation. Section 4.2 requires a channel check comparison for all four channels of the BWST level instrumentation. At that time, the level instrumentation string for Channel 1 was de-energized, with the level instrument disassembled. The licensee declared the channel check results satisfactory for Channel 1 by referring to compensatory measures, including proceduralized operator actions that were not applicable to the DB-OP-03006 acceptance criteria.

The inspectors questioned the licensee's basis for operability and noted that the Channel 1 level instrument was not energized and was not physically attached to the system. The inspectors subsequently determined the licensee failed to complete section 4.2 of DB-OP-03006 for Channel 1 in accordance with Step 2.1.1 because the instrument string was not in operation at the time the surveillance was completed. Additionally, the inspectors determined the compensatory measures were not sufficient for the licensee to credit them toward satisfactory test results.

**Corrective Actions:** The corrective actions included declaring Channel 1 inoperable and performing corrective maintenance on the Channel 1 instrumentation to restore it to operable. The Licensee performed a root cause analysis and developed a case study from lessons learned. Additionally, the licensee issued an operations standing order; revised multiple procedures; and performed additional training regarding lessons learned from this event, Technical Specification compliance, and correct application of the operability determination process.

**Corrective Action Reference:** The licensee documented this issue in CR 2016-08419, "Performance review of LCO 3.3.5 application during LT1525A maintenance."

#### Performance Assessment:

**Performance Deficiency:** The inspectors determined the licensee's failure to implement DB-OP-03006 was a performance deficiency. Specifically, step 2.1.1 requires a channel check be performed by observation during operation. However, the licensee could not perform the BWST level channel check comparison for Channel 1, as required by Step 4.2, because the Channel 1 instrument string was de-energized and disconnected from its associated system.

**Screening:** The performance deficiency was determined to be more than minor because it was associated with the Mitigating Systems cornerstone attribute of Equipment Performance and affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the failure to follow procedures to establish the operability of SFAS Channel 1 negatively affected the ability of the system to perform its accident mitigating function. Additionally, this failure led to a violation of Technical Specifications as detailed elsewhere in this report.

**Significance:** The inspectors assessed the significance of the finding using IMC 0609.04, "Initial Characterization of Findings," and IMC 0609, Appendix A, Exhibit 2, "Mitigating Systems Screening Questions." The inspectors determined that this performance deficiency did not result in a loss of a single train of a safety system for greater than its Technical Specification allowed outage time. Therefore, the inspectors determined the finding to be of very low safety significance (Green).

Cross Cutting Aspect: This finding had a cross-cutting aspect of Procedure Adherence in the area of Human Performance, which states individuals follow processes, procedures, and work instructions. Specifically, the licensee declared the SFAS Channel 1 operable without meeting the acceptance criteria of the required procedures. [H.8]

Enforcement:

Violation: Title 10 CFR Appendix B, Criterion V, "Instructions, Procedures, and Drawings," requires, in part, that activities affecting quality be prescribed by documented instructions, procedures, or drawings, of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions, procedures, or drawings. Instructions, procedures, or drawings shall include appropriate quantitative or qualitative acceptance criteria for determining that important activities have been satisfactorily accomplished. Step 2.1.1 of DB-OP-03006, Revision 55, an Appendix B procedure affecting Technical Specification-required equipment, states, in part, a channel check shall be the qualitative assessment, by observation, of channel behavior during operation.

Contrary to the above, on July 1, 2016, the licensee failed to accomplish activities affecting quality in accordance with procedures of a type appropriate to the circumstances. Specifically, the licensee attempted to perform the Channel 1 BWST level instrument channel check while the instrument was de-energized and physically disconnected from its associated system, and thus not operating.

Disposition: Because it was of very low safety significance and was entered into the licensee's corrective action program as CR-2016-08419, this violation is being treated as an NCV consistent with Section 2.3.2 of the Enforcement Policy. **(NCV 05000346/2018002-03: Failure to Perform a Procedure Affecting Quality)**

Misapplication of the Operability Determination Process

Cornerstone	Significance	Cross-cutting Aspect	Report Section
Mitigating Systems	Green FIN 05000346/2018002-04 Closed	H.13	71153 – Follow-Up of Events and Notices of Enforcement Direction

The NRC identified a finding of Green significance due to the licensee's misapplication of NOP-OP-1009, "Operability Determinations and Functionality Assessments." Specifically, the licensee failed to apply the Operability Determination process in accordance with procedures.

Description:

Licensee Event Report (LER) 05000346/2016-008-01, Application of Technical Specifications for the Safety Features Actuation System Instrumentation.

On June 30, 2016, at 0829 EDT, Channel 1 of the Borated Water Storage Tank (BWST) level instrumentation for the Safety Features Actuation System (SFAS) was declared inoperable

and removed from service for scheduled maintenance. At this time, Reactor Operators entered TS 3.3.5.a, which required the inoperable channel be tripped. On July 1, 2016, at 0330, the channel was declared operable with reference to compensatory measures. At this time, the Channel 1 instrument was electrically and physically disconnected, and incapable of performing its function. A Prompt Operability Determination (POD) was initiated in an attempt to evaluate operability based on the compensatory measures. NOP-OP-1009, "Operability Determinations and Functionality Assessments" step 4.3.11 required that in the case of POD's which have compensatory measures, the engineering director or designee must grant concurrence. However, the duty engineering manager (director's designee) indicated that operability could not be supported because the instrument could not meet its surveillance requirements, and therefore, he did not provide his concurrence.

The inspectors questioned the licensee's basis for operability. From discussions with the licensee on July 1, 2016, the inspectors determined the defined compensatory measures were not sufficient for the licensee to declare Channel 1 operable. At 1325 on July 1, 2016, the licensee agreed with the inspectors' assessment and declared Channel 1 inoperable. At 1351 maintenance was completed on Channel 1 and the channel was restored to service.

**Corrective Actions:** The corrective actions included declaring channel 1 inoperable and performing corrective maintenance on the Channel 1 instrumentation to restore it to operable. The Licensee performed a root cause analysis and developed a case study from lessons learned. Additionally, the licensee issued an operations standing order, performed additional training regarding lessons learned from this event, Technical Specification compliance, and correct application of the operability determination process.

**Corrective Action Reference:** The licensee documented this issue in CR 2016-08416, "Performance review of LCO 3.3.5 application during LT1525A maintenance."

#### Performance Assessment:

**Performance Deficiency:** The inspectors determined the licensee's failure to implement NOP-OP-1009 was a performance deficiency. Specifically, step 4.3.11 required that in the case of a POD relying on compensatory measures, the engineering director or designee must grant concurrence. However, the engineering duty manager (director's designee) stated that operability could not be supported and that a POD could not be performed because the instrument could not meet its surveillance requirements, and therefore did not provide his concurrence.

**Screening:** The performance deficiency was determined to be more than minor because it was associated with the Mitigating Systems cornerstone attribute of Equipment Performance and affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the failure to follow procedures to establish the operability of SFAS Channel 1 negatively affected the ability of the system to perform its accident mitigating function. Additionally, this failure led to a violation of Technical Specifications as detailed elsewhere in this report.

**Significance:** The inspectors assessed the significance of the finding using IMC 0609.04, "Initial Characterization of Findings," and IMC 0609, Appendix A, Exhibit 1, "Initiating Events Screening Questions." The inspectors determined that this performance deficiency did not 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. Therefore, the inspectors determined the finding to be of very low safety significance (Green).

Cross Cutting Aspect: This finding had a cross-cutting aspect of Consistent Process in the area of Human Performance, which states individuals use a consistent, systematic approach to make decision. Risk insights are incorporated as appropriate. Specifically, the licensee continued to push forward in the POD process despite the fact that they could not meet the requirements of the process. [H.13]

**Enforcement:** No violation was identified. **(FIN 05000346/2018002–04: Misapplication of the Operability Determination Process)**

## EXIT MEETINGS AND DEBRIEFS

The inspectors confirmed that proprietary information was controlled to protect from public disclosure. No proprietary information was documented in this report.

- On July 31, 2018, the inspectors presented the quarterly integrated inspection results to Mr. M. Bezilla and other members of the licensee staff.

## DOCUMENTS REVIEWED

### 71111.01—Adverse Weather Protection

- Davis-Besse Off-site Power Voltage Assessment; Summer 2018
- DB-OP-01300; Switchyard Management; Revision 14
- DB-OP-02546; Degraded Grid; Revision 07
- DB-OP-06311; 345 KB Switchyard No. 1 (Main) Transformer, No. 11 (Auxiliary) Transformer, and Startup Transformer (01 and 02); Revision 48
- DB-OP-06913; Seasonal Plant Preparation Checklist; Revision 30
- DB-SC-03023; Off-site AC Sources Lined Up and Available; Revision 34
- NOBP-CC-2008; Transformer, Switchyard, and Grid Reliability Design Interface and Control; Revision 01
- NOP-CC-3002-01; AC Power Systems Analysis; Revision 05
- NOP-OP-1003; Grid Reliability Protocol; Revision 09

### 71111.04—Equipment Alignment

- CR-2015-00459; 2015 CDBI SA: Auxiliary Feed Pump (AFP) 1 and 2 Response Time Testing
- Davis-Besse Nuclear Power Station Lubrication Date Sheet; Decay Heat Pumps and Motors, Auxiliary Building, 545' Level
- DB-OP-06011; High Pressure Injection System; Revision 31
- DB-OP-06012; Decay Heat Pump; Revision 71
- DB-OP-06013; Containment Spray System; Revision 26
- DB-OP-0623; Auxiliary Feedwater System; Revision 42
- DB-OP-06262; Valve Line Up Checklist for CCW Pump 2; Revision 38
- DB-SS-03090; Motor Driven Feed Pump Monthly Valve Verification; Revision 11
- M-0060; Auxiliary Feedwater System; Revision 59
- OS-003; High Pressure Injection System; Revision 36
- OS-005; Containment Spray System; Revision 14

#### 71111.05AQ—Fire Protection Annual/Quarterly

- PFP-AB-238; Auxiliary Feed Pump 2 Room; Revision 4
- PFP-AB-328; Protected Area Pre-Fire Plan-Component Cooling Water Heat Exchanger and Pump Room; Revision 4
- Pre-Fire Plan; PFP-AB-115, Revision 5, ECCS Pump Room 1-2
- Pre-Fire Plan; PFP-AB-109, Revision 7, Rooms 104, 106, 106A and 109

#### 71111.06—Flood Protection Measures

- DWG E-328; Raceway & Grounding Start-Up, Main & Aux Transformers; Revision 15
- WO 200676046; Electric Hand/Manholes

#### 71111.07—Heat Sink Performance

- CR 2018-00844; CCW Hx 1-3 Pin-Hole Leak
- WO200741172 DB-SUB16-03; Component Cooling Water Heat Exchanger

#### 71111.11—Licensed Operator Regualification Program and Licensed Operator Performance

- DB-OP-06401; Integrated Control System Operating Procedure; Revision 27
- DB-OP-06902; Revision 62
- NOBP-TR-1151; 4.0 Crew Critique; 09/28/17
- NOP-OP-1002; Conduct of Operations; Revision 12

#### 71111.12—Maintenance Effectiveness

- 2017-2; Davis Besse System Health Report; Decay Heat Low Pressure Injection; 02/01/2018
- Cycle 20 Periodic Maintenance Effectiveness Assessment Report
- CR 201709888; CCW 2 Cable Testing Exceeded the Acceptance Criteria; 09/27/2017
- CR 201700704; CRD Booster Pump 1 Trip; 01/21/2017
- CR 201805257; CRD Booster Pump 2 Trip on Overload; 06/06/2018
- CR 201702171; CCW Train 3 Exceeded Maintenance Rule Unavailability Limit
- CCW System Health Report; 2017-02

#### 71111.13—Maintenance Risk Assessments and Emergent Work Control

- CA 03-05256-01; Control Room Habitability Systems Licensing Basis Validation; Attachment 2
- CR 2018-05995; UFSAR Description of CREVS and CREATCS does not Match Technical Specifications; 06/29/2018
- Davis-Besse Unit 1 UFSAR; Revision 30
- DBBP-OPS-0011; Protected Equipment Posting; Revision 10
- DB-SS-03301; Control Room Unfiltered Air Inleakage Test for Control Room Emergency Ventilation, Train 1; Revision 00
- Drawing 05-020 SH 1; Operational Schematic Service Water System; Revision 100
- Drawing 05-032B; Operational Schematic Control Room Emergency Ventilation System; Revision 22
- NOP-LP-4008; Licensing Document Change Process; Revision 5
- NOP-LP-4008; Licensing Documents Change Process; Revision 1
- NOP-OP-1007; Risk Management; Revision 25

- Procedure NOP-OP-1007; Risk Management; Revision 25

#### 71111.15—Operability Determinations and Functionality Assessments

- CR 2018-04305; Y212 Fuse Blown During TD14950; 05-08/2018
- CR 2018-03174; SW277 Excessive Leakage
- CR 2018-04296; LEFM Parameter Revision Results in Changes to Indicated Loop Flows; 05/08/2018
- CR 2018-04599
- DB-PF-03020; Service Water Train 1 Valve Test; Revision 42
- DB-SC-03121; SFAS Train 2 Integrated Response Time Test; Revision 07
- WO 200676009; PF3020-033 05.000 SW276, SW277

#### 71111.18—Plant Modifications

- CR 201800027; BWST Loop Seal Pipe Elevation Discrepancy; 01/02/2018
- CR 201803211; BWST Leak Near BW33 Outside; 04/06/2018
- Engineering change package 16-0478-001, Loop Seal in BWST to SFP Purification Supply Pipe Civil Structural
- Engineering Change Package 16-0478-002, Loop Seal in BWST to SFP Purification Supply Pipe Piping and Mechanical
- Engineering Change Package 16-0478-003, Loop seal in BWST to SFP Purification Supply Pipe (freeze protection)

#### 71111.19—Post Maintenance Testing

- CA 2011-02670; WO 200481565 was Initiated to Troubleshoot DH2733; 04/29/2016
- CR 2015-08968; Evaluation of Service Water Pump P3-1 Baseline Data; 07/02/2015
- CR 2018-04974; Critical Preventive Order Removed from Schedule at T-0; 05/29/2018
- DB-PF-03017; Service Water Pump 1 Testing; Revision 23
- Procedure DB-SP-03161, AFW Train 2 Level Control, Interlock, and Flow Transmitter Test, Revision 34
- WO 200683205; Perform SW Pump 1 Quarterly Test; 05/22/2018
- WO 200683879; DH/LPI 1-1 Quarterly; 05/30/2018
- WO 200747497, AFP 2 Quarterly Test; 05/07/2018
- WO 200704976 DB-SUB049-02; Decay Heat and Low Pressure Injection; 05/31/2018

#### 71111.22—Surveillance Testing

- DB-SC-03070; Emergency Diesel Generator 1 Monthly Test; Revision 38

#### 71114.06—Drill Evaluation

- CR 2018-05418; ERO Tabletop Drill Improvement Opportunities; 06/11/2018

#### 71151—Performance Indicator Verification

- Station Unit Logs

### 71152—Problem Identification and Resolution

- CR 2018-03036; Misposition of Make Up Filter 1 Outlet Isolation (MU17); 03/31/2018
- NOBP-OP-0004; Plant Status Control and Worker Protection Events; Revision 17
- Drawing M-031C; Piping and Instrument Diagram Make Up and Purification System; Revision 43
- Drawing M031A; Piping and Instrument Diagram Make Up and Purification System; Revision 52
- DB-OP-06006; Makeup Filter 1 Replacement; Revision 42

### 71153—Follow-Up of Events and Notices of Enforcement Discretion

- Station Unit Logs
- LER 2016-008-01; Application of Technical Specification for the Safety Features Actuation System Instrumentation
- Root Cause Analysis Report; CR-2016-08419; 10/07/2016
- DB-OP-06405; Safety Features Actuation System Procedure; Revisions 13 & 14
- DB-OP-03006; Miscellaneous Instrument Shift Checks; Revisions 55 & 61
- DB-MI-03145; Functional Test/Calibration of LT-1525A BWST Level Transmitter to SFAS Channel 1; Revisions 9 & 12
- DB-MI-03146; Functional Test/Calibration of LT-1525B BWST Level Transmitter to SFAS Channel 2; Revisions 9 & 12
- DB-SC-03110; SFAS Channel 1 Functional Test; Revisions 20 & 22
- DB-SC-03111; SFAS Channel 2 Functional Test; Revisions 16 & 18
- NOP-OP-1002; Conduct of Operations; Revisions 11 & 12
- NOP-OP-1009; Operability Determinations and Functionality Assessments; Revisions 6 & 8
- NOBP-OP-0014; FENOC Duty Teams; Revision 2 & 5
- NOBP-OP-1002; Operations Administrative Guidelines and Common Processes; Revision 2&4
- NOBP-OP-0002; Operations Briefing and Challenge Calls; Revisions 3 & 4
- NOBP-OP-0002-05; Control Room Shift Brief Checklist
- NOBP-OP-0002-05A; Control Room Shift Brief Checklist
- NORM-OP-1002; Conduct of Operations; Revision 6
- NOP-OP-1015; Event Notifications; Revisions 3 & 6
- CR 2016-08419; Performance Review of LCO 3.3.5 application during LT1525A maintenance
- CR 2016-08699; Crew Briefing Performance Shortfall
- CR 2016-13611; Did Not Receive VP Approval Within 30 Days After CARB Approval
- CR 2016-11711; Red Key Performance Indicator D-SPO-05L - Open CRs With Extensions
- CR 2017-07598; Technical Specification Upgrade Criteria Not Accurately Communicated On 1530 Duty Team Phone Call
- CR 2016-11681; Common Cause Evaluation For DB Performance Issues
- CR 2016-10440; Red Key Performance Indicator D-SPO-05L - Open CRs With Extensions
- CR 2016-13335; Fleet Operations Elevation Letter – Regulatory Document Implementation – Supplemental Review
- CR 2016-08700; Delayed Request For Prompt Operability Determination
- CR 2016-08402; SFAS Channel 2 +15V Power Supply Failure
- CR 2016-08765; Restoration of SFAS CH1 (LT-1525A) – Assessment Of Organizational Response To Extended Work Window
- CR 2016-08539; “A” Schedule Work Not Completed By Instrument and Control Shop
- CR 2016-08922; Assessment of Schedule Adherence for Maintenance Activities
- CR 2016-08415; Parameter 5 BWST Level-Low Low Operability