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

November 14, 2017

EA–17–193

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

SUBJECT: DAVIS-BESSE NUCLEAR POWER STATION—NRC INTEGRATED INSPECTION REPORT 05000346/2017003; 07200014/2017001; AND 07200014/2017002

Dear Mr. Bezilla:

On September 30, 2017, the U.S. Nuclear Regulatory Commission (NRC) completed an integrated inspection at your Davis-Besse Nuclear Power Station. On October 3, 2017, 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, two Green findings were identified by the inspectors. These findings are both associated with violations of NRC requirements. NRC inspectors also identified one Severity Level IV violation with no associated finding. The NRC is treating these violations as Non-Cited Violations (NCVs) consistent with Section 2.3.2 of the Enforcement Policy. A finding and associated violation of the licensee's current licensing basis for tornado-generated missile protection was identified. Because this violation was identified during the discretion period covered by Enforcement Guidance Memorandum 15–002, "Enforcement Discretion for Tornado Missile Protection Noncompliance," and because the licensee has implemented compensatory measures, the NRC is exercising enforcement discretion by not issuing an enforcement action for the violation and is allowing continued reactor operation.

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

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

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

Sincerely,

***/RA Kenneth Riemer Acting for/***

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

Docket No. 50–346; 72–014
License No. NPF–3

Enclosure:
IR 05000346/2017003; 07200014/2017001;
07200014/2017002

cc: Distribution via LISTSERV®

Letter to Mark Bezilla from Jamnes Cameron dated November 14, 2017

SUBJECT: DAVIS-BESSE NUCLEAR POWER STATION—NRC INTEGRATED INSPECTION REPORT 05000346/2017003; 07200014/2017001; AND 07200014/2017002

DISTRIBUTION:
Jeremy Bowen
RidsNrrDorlLpl3-2 Resource
RidsNrrPMDavisBesse Resource
RidsNrrDirsIrib Resource
Cynthia Pederson
Kenneth O'Brien
Richard Skokowski
Allan Barker
Carole Ariano
Linda Linn
DRPIII
DRSIII
ROPreports.Resource@nrc.gov

ADAMS Accession Number: ML17318A050

| OFFICE | RIII | | RIII | | | | | |
|---|---|---|---|---|---|---|---|---|
| NAME | RSkokowski via email:bw | | KRiemer for JCameron | | | | | |
| DATE | 11/13/2017 | | 11/14/2017 | | | | | |

***OFFICIAL RECORD COPY***

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

| | |
|---|---|
| Docket No: | 50–346; 72–014 |
| License No: | NPF–3 |
| Report No: | 05000346/2017003; 07200014/2017001; 07200014/2017002 |
| Licensee: | First Energy Nuclear Operating Company (FENOC) |
| Facility: | Davis-Besse Nuclear Power Station |
| Location: | Oak Harbor, OH |
| Dates: | July 1 through September 30, 2017 |
| Inspectors: | D. Mills, Senior Resident Inspector<br>T. Briley, Resident Inspector<br>J. Rutkowski, Project Engineer<br>J. Bozga, Senior Reactor Inspector<br>R. Edwards, Senior Health Physicist<br>N. Fields, Health Physicist<br>M. Learn, Reactor Engineer<br>V. Meghani, Reactor Inspector<br>J. Neurauter, Senior Reactor Inspector<br>J. Park, Reactor Inspector |
| Approved by: | J. Cameron, Chief<br>Branch 4<br>Division of Reactor Projects |

Enclosure

**TABLE OF CONTENTS**

## SUMMARY

Inspection Report 05000346/2017003; 07200014/2017001; 07200014/2017002; 7/1/17 – 9/30/17; Davis-Besse Nuclear Power Station; Other Activities.

This report covers a 3-month period of inspection by resident inspectors and announced baseline inspections by regional inspectors. The U.S. Nuclear Regulatory Commission (NRC) program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG–1649, "Reactor Oversight Process," Revision 6.

**NRC-Identified and Self-Revealed Findings**

**Cornerstone: Barrier Integrity**

Green: A finding of very low safety significance and an associated Non-Cited Violation (NCV) of Title 10 of the Code of Federal Regulations (CFR), Part 50, Appendix B, Criterion III, "Design Control," was identified by the NRC inspectors for the failure of the licensee's design control measures to provide for verifying or checking the adequacy of design of the Auxiliary Building spent fuel cask crane and crane support structure elements. Specifically, calculations involving the Auxiliary Building structure, crane runway rails, crane rail clips, and rail clip bolts had not been verified or checked to ensure the requirements of Updated Safety Analysis Report (USAR) Section 3.8.1.2 were included. The licensee documented these issues in its Corrective Action Program (CAP) as CR–2017–05071, CR–2017–07084, and CR–2017–07114, and initiated actions to restore compliance.

The performance deficiency was determined to be of more-than-minor significance because it was associated with the Barrier Integrity cornerstone attribute of Design Control and adversely affected the cornerstone objective of providing reasonable assurance that the physical design barriers, i.e. the Auxiliary Building, protect the public from radionuclide releases caused by accidents or events. The inspectors screened the finding through Inspection Manual Chapter (IMC) 0609, Appendix A, "The Significance Determination Process for Findings At-Power," using Exhibit 3, "Barrier Integrity Screening Questions." The finding screened as of very low safety significance because the finding only represented a potential degradation of the radiological barrier function provided by the Auxiliary Building. The inspectors identified a Human Performance, Design Margin (H.6) cross-cutting aspect associated with this finding. Specifically, the licensee failed to ensure the Auxiliary Building structure, cask crane runway rails, rail clips, and rail clip bolts reflected the intended design margins established based on the design and licensing basis. (Section 4OA5.1) [H.6]

Severity Level IV-Green: A finding of very low safety significance and an associated NCV of 10 CFR 50.59(d)(1), "Changes, Tests, and Experiments," was identified by the NRC inspectors for the licensee's failure to maintain a record of a change from a method described in the USAR to another method. Specifically, the licensee failed to perform a written evaluation for the change to USAR defined load factors based on the design basis American Concrete Institute (ACI) 318–63 Code to less conservative load factors based on the ACI 318–71 Code. The licensee entered this issue into its CAP as CR–2017–03025. Planned corrective action includes updating the USAR to reflect the changes to the Design Criteria Manual (DCM) for the load factors incorporated in the 1971 ACI 318 Code.

The inspectors determined that the licensee's failure to perform a written evaluation for this change was a performance deficiency. The finding was determined to be more than minor because the inspectors could not conclude that the implemented change would not result in a departure from a method of evaluation described in the USAR) used in establishing the design bases and therefore not require a license amendment. Because the inspectors could conclude that the concrete structures designed using ACI 318–71 load combinations would still have sufficient structural capacity to perform their design basis safety functions during a seismic event, the finding was determined to have very low safety significance corresponding to a Severity Level IV violation per Example 6.1.d.2 of the NRC Enforcement Policy. The inspectors did not identify a cross-cutting aspect associated with the finding because the finding was not representative of current licensee performance. (Section 4OA5.1)

**Cornerstone: Other**

Severity Level IV: A Severity Level IV NCV of 10 CFR 72.174, "Quality Assurance Records," was identified by the NRC inspectors for the failure of the licensee as of June 22, 2017, to maintain sufficient records to furnish evidence of activities affecting quality. Specifically, the licensee failed to maintain ultrasonic testing (UT) records which were relied upon to demonstrate that the spent fuel selected for loading in calculation C–NF–062.02–055, Revision 0, was correctly classified as intact. The licensee documented this issue in its CAP as CR–2017–06976 and took timely corrective actions.

The inspectors determined that the violation was of more than minor significance using IMC 0612, "Power Reactor Inspection Reports", Appendix E, "Examples of Minor Issues." Example 9a is applicable to this issue in that the licensee failed to maintain UT records for many fuel assemblies classified as intact for loading, and this failure to maintain records was not an isolated incident of one or two instances. The violation screened as a Severity Level IV NCV. Cross-cutting aspects are not assigned to traditional enforcement violations. (Section 4OA5.3)

**Licensee-Identified Violations**

A violation of the licensee's current site-specific licensing basis for tornado-generated missile protection was identified. Because this violation was identified during the discretionary period discussed in Enforcement Guidance Memorandum 15–002, "Enforcement Discretion for Tornado Missile Protection Noncompliance," Revision 1, and because the licensee implemented interim compensatory measures and has planned final corrective actions, the NRC is exercising enforcement discretion by not issuing an enforcement action for the underlying 10 CFR Part 50, Appendix B, Criterion III, "Design Control," violation. This violation is discussed in Section 4OA5.5.

## REPORT DETAILS

### Summary of Plant Status

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

### 1. REACTOR SAFETY

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

1R04 Equipment Alignment (71111.04)

.1 Quarterly Partial System Walkdowns

a. Inspection Scope

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

- station ventilation radiation monitors RE4598BA and RE459BB while radiation monitors RE4598AA and RE4598AB were out of service for A25X fuse replacement during the week ending August 19, 2017;
- emergency diesel generator train 2 while emergency diesel generator train 1 was out of service for planned monthly surveillance testing during the week ending August 26, 2017;
- containment spray train 1 while containment spray train 2 was out of service for planned quarterly surveillance testing during the week ending September 2, 2017; and
- motor-driven feedwater pump while auxiliary feedwater train 2 was out of service for planned monthly surveillance testing during the week ending September 2, 2017.

The inspectors selected these systems based on their risk significance relative to the Reactor Safety Cornerstones at the time they were inspected. The inspectors attempted to identify any discrepancies that could impact the function of the system and, therefore, potentially increase risk. The inspectors reviewed applicable operating procedures, system diagrams, USAR, Technical Specification (TS) requirements, outstanding work orders, 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 four partial system walkdown samples as defined in IP 71111.04–05.

b. Findings

No findings were identified.

.2 Semi-Annual Complete System Walkdown

a. Inspection Scope

During the week ending September 2, the inspectors performed a complete system alignment inspection of the component cooling water system to verify the functional capability of the system. This system was selected because it was considered both safety significant and risk significant in the licensee's probabilistic risk assessment. The inspectors walked down the system to review mechanical and electrical equipment lineups; electrical power availability; system pressure and temperature indications, as appropriate; component labeling; component lubrication; component and equipment cooling; hangers and supports; operability of support systems; and to ensure that ancillary equipment or debris did not interfere with equipment operation. A review of a sample of past and outstanding work orders was performed to determine whether any deficiencies significantly affected the system function. In addition, the inspectors reviewed the corrective action program database to ensure that system equipment alignment problems were being identified and appropriately resolved. Documents reviewed are listed in the Attachment to this report.

These activities constituted one complete system walkdown sample 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:

- Low Voltage Switchgear Room – F Bus and Station Battery Room B (Room 428 and 428 A, Fire Area X), during the week ending July 15, 2017;
- The Component Cooling Water Heat Exchanger and Pump Room (Room 328, Fire Area T), during the week ending September 30, 2017;
- High Voltage Switchgear Room B (Room 323, Fire Area Q) and Auxiliary Shutdown Panel and Transfer Switch room (Room 324, Fire Area R), during the week ending September 30, 2017; and
- Electrical Penetration Room No. 2 (Room 427, Fire Area DF), during the week ending September 30, 2017).

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

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

b. Findings

No findings were identified.

1R06 Flooding (71111.06)

.1 Underground Vaults

a. Inspection Scope

The inspectors selected underground bunkers/manholes subject to flooding that contained cables whose failure could disable risk-significant equipment. The inspectors determined that the cables were not submerged, that splices were intact, and that appropriate cable support structures were in place. In those areas where dewatering devices were used, such as a sump pump, the device was operable and level alarm circuits were set appropriately to ensure that the cables would not be submerged. In those areas without dewatering devices, the inspectors verified that drainage of the area was available, or that the cables were qualified for submergence conditions. The inspectors also reviewed the licensee's corrective action documents with respect to past submerged cable issues identified in the corrective action program to verify the adequacy of the corrective actions. The inspectors performed a walkdown of the following underground bunkers/manholes subject to flooding:

- Manhole MH3001 during work to replace cooling tower makeup pump wiring, during the week ending July 22, 2017; and
- Manholes MHSA1, MHSA2, MHSB1, and MHSB2 during routine licensee monitoring activities during the week ending July 15, 2017.

Specific documents reviewed during this inspection are listed in the Attachment to this report. This inspection constituted one underground vaults sample as defined in IP 71111.06–05.

b. Findings

No findings were identified.

1R11 Licensed Operator Requalification Program (71111.11)

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

a. Inspection Scope

On September 5, 2017, the inspectors observed a crew of licensed operators in the plant's simulator during licensed operator requalification 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 requalification 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

The inspectors observed operator response to a trip of control room normal ventilation on August 5, 2017; operator response and associated swap of service water trains following notification of a pinhole leak on service water pump 3 on August 28, 2017; and operator response to the failure of auxiliary feedwater pump (AFP) auxiliary1 inboard turbine bearing on September 13, 2017. These were activities that required heightened awareness or were related to increased risk. The inspectors evaluated the following areas:

- licensed operator performance;
- crew's clarity and formality of communications;

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

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

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

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness (71111.12)

.1 Routine Quarterly Evaluations

a. Inspection Scope

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

- AFP 2 governor speed oscillation during the week ending July 8, 2017;
- pinched wiring causing the failure of fuses Y210 and Y214 during the week ending August 12, 2017; and
- auxiliary feedwater pump 1 bearing failure during the week ending September 16, 2017.

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

- implementing appropriate work practices;
- identifying and addressing common cause failures;
- scoping of systems in accordance with 10 CFR 50.65(b) of the maintenance rule;
- characterizing system reliability issues for performance;
- charging unavailability for performance;
- trending key parameters for condition monitoring;
- ensuring 10 CFR 50.65(a)(1) or (a)(2) classification or re-classification; and
- verifying appropriate performance criteria for structures, systems, and components (SSCs)/functions classified as (a)(2), or appropriate and adequate goals and corrective actions for systems classified as (a)(1).

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.

This inspection constituted three quarterly maintenance effectiveness samples as defined in IP 71111.12–05.

b. Findings

(1) (Open) Unresolved Item: Pinched Wiring Causing the Failure of Fuses Y210 and Y214

Introduction: An unresolved item (URI) was identified by the inspectors relating to the significance of pinched wires and licensee's understanding of the condition and the extent of cause and condition.

Description: On July 6, 2017, during a planned replacement of fuse Y204 in electrical cabinet Y2, unrelated fuse Y214 blew. Both fuses were scheduled for replacement as part of the licensee's project to replace Shawmut A25X style fuses that are susceptible to premature failure. The failure of fuse Y214 was unexpected, and the licensee was not able to discern a direct cause. The licensee determined that the failure was the fuse itself being so unstable that any perturbation was enough to cause failure. This failure resulted in multiple systems being declared inoperable including AFP 2, safety features actuation system channel 2, decay heat removal system interlock, and radiation element RE8447. On August 8, 2017, the same electrical cabinet, Y2, was opened for replacement of fuse Y216. Following the replacement, fuses Y210 and Y214 blew. The licensee attempted replacement of the fuses, but the replacement fuses blew again, shortly after being repowered. Initial licensee evaluation of the condition revealed that the wire bundle running along the hinge side of the cabinet door was unconstrained and two of the wires had become pinched between the door and cabinet frame, which damaged the wire insulation and allowed the wires to short circuit against the cabinet frame. The failure of Y210 and Y214 resulted in multiple systems being declared inoperable including AFP 2, safety features actuation system channel 2, decay heat removal system interlock, and emergency diesel generator 2. The licensee removed and replaced the damaged portion of the wires and used wire ties to constrain the wire bundle.

The licensee entered this issue into their CAP as CRs 2017–07196 and 2017–08185. Because the licensee had yet to answer NRC inspector questions pertaining to the corrective actions and extent of condition by the end of this inspection period, the issue is being treated as a URI pending completion of the inspectors' review.
**(URI 05000346/2017003–01, Examination of Extent of Cause and Condition of Pinched Wires in Electrical Cabinets)**

(2) (Open) Unresolved Item: Auxiliary Feedwater Pump 1 Bearing Failure

Introduction: A URI was identified by the inspectors relating to the final determination of the cause of the AFP 1 turbine inboard bearing failure.

Description: On September 13, 2017, the licensee performed the scheduled quarterly surveillance test on AFP 1. This test requires the pump to run loaded with full flow of water, whereas the monthly test runs the pump only lightly loaded with water being

pumped through a minimum recirculation line. Within three minutes after the full flow adjustments were completed, the AFP 1 turbine inboard bearing high temperature alarm (>220 °F) actuated. The licensee verified the alarm was valid and manually tripped the AFP 1 turbine approximately 30 minutes after the alarm was received. Oil samples indicated bearing damage. The licensee disassembled the AFP 1 turbine bearing and observed bearing failure.

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

The licensee entered this issue into their CAP as CRs 2017–09443, 2017–09817, 2017–09527, and 2017–09857. Because the licensee had yet to complete their investigation and analysis of the event by the end of this inspection period, the issue is being treated as a URI pending the inspectors' review of the licensee's completed root cause evaluation. **(URI 05000346/2017003–02, Final Cause Determination of Auxiliary Feedwater Turbine Bearing Failure)**

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

.1 Maintenance Risk Assessments and Emergent Work Control

a. Inspection Scope

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

- emergent troubleshooting of the AFP turbine 2 speed governor and governor linkage due to speed oscillations discovered during surveillance testing during the week ending July 8, 2017;
- emergent troubleshooting on safety features actuation system channel 3 borated water storage tank level output module following unexpected light indication while testing safety features actuation system channel no. 4 during the week ending July 15, 2017; and
- troubleshooting and repair of AFP 1 turbine inboard bearing following failure during surveillance testing during the week ending September 16, 2017.

These activities were selected based on their potential risk significance relative to the Reactor Safety Cornerstones. As applicable for each activity, the inspectors verified that risk assessments were performed as required by 10 CFR 50.65(a)(4) and were accurate and complete. When emergent work was performed, the inspectors verified that the plant risk was promptly reassessed and managed. The inspectors reviewed the scope of maintenance work, discussed the results of the assessment with the licensee's

probabilistic risk analyst or shift technical advisor, and verified plant conditions were consistent with the risk assessment. The inspectors also reviewed TS requirements and walked down portions of redundant safety systems, when applicable, to verify risk analysis assumptions were valid and applicable requirements were met.

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

b. Findings

No findings were identified.

1R15 Operability Determinations and Functional Assessments (71111.15)

.1 Operability Evaluations

a. Inspection Scope

The inspectors reviewed the following issues:

- the operability and functionality of the control room emergency air temperature control system following discovery of heat exchanger end bell flange bolts, as documented in CR 2017–07557 during the week ending July 22, 2017;
- the operability and functionality of the control room shift manager's office door (door 512) following unexpected opening when challenged, as documented in CR 2017–07996 during the week ending August 5, 2017;
- the operability and functionality of auxiliary feedwater pump 1 following identification of an inoperable suction piping support strut, as documented in CR 2017–03539 during the week ending August 12, 2017;
- the operability and functionality of Appendix R transfer switches BCE11 and BCE12 for safety-related 480V Bus E1 following identification of a missed surveillance test, as documented in CR 2017–08778 during the weeks ending August 26, 2017 through September 2, 2017; and
- the operability and functionality of service water pumps 1, 2, and 3 following identification of pin hole leaks on their associated strainer blowdown lines, as documented in CRs 2017–08068, 2017–08573, and 2017–08864, during the weeks ending August 5, 2017 through September 30, 2017.

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

associated with operability evaluations. Documents reviewed are listed in the Attachment to this report.

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

b. Findings

No findings were identified.

1R18 Plant Modifications (71111.18)

.1 Plant Modifications

a. Inspection Scope

The inspectors reviewed the following permanent changes to the facility:

- Engineering Change Package (ECP) 17–0090–000; Confirm SB relative humidity/2017 crack monitoring; Revision 0; and
- ECP 17–0105–000; Remove Shield Building Coating; Revision 0.

The inspectors reviewed the configuration changes and associated 10 CFR 50.59 regulatory evaluation documents against the design basis, the USAR and the TS, as applicable, to verify that these permanent changes to the facility did not affect the operability or availability of any safety-related systems, structures or components (SSCs) or SSCs important to safety. The inspectors verified that relevant procedure, design and licensing documents were properly updated. Finally, the inspectors discussed the plant modifications with engineering to ensure that the individuals were aware of how plant operation with these modifications in place could impact overall plant performance. Documents reviewed are listed in the Attachment to this report.

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

b. Findings

No findings were identified.

1R19 Post-Maintenance Testing (71111.19)

.1 Post-Maintenance Testing

a. Inspection Scope

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

- AFP 2 testing following adjustment of the turbine speed governor and repair of the governor linkage during the week ending July 8, 2017;
- station blackout diesel generator testing following repair of the overspeed trip switch during the week ending July 15, 2017;

- safety features actuation system channel 3 functional testing following an output module replacement for an unexpected light indication during the week ending July 15, 2017;
- control room emergency air temperature control system testing following the replacement of the heat exchanger end bell flange bolts, during the week ending July 22, 2017;
- AFP 1 monthly testing following turbine trip throttle valve troubleshooting (would not trip closed from 10 percent open) during the week ending August 19, 2017;
- AFP 2 testing following turbine steam admission valve maintenance during the week ending September 2, 2017; and
- AFP 1 quarterly testing following replacement of the turbine inboard bearing during the week ending September 16, 2017.

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

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

b. Findings

No findings were identified.

1R22 Surveillance Testing (71111.22)

.1 Surveillance Testing

a. Inspection Scope

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

- high pressure injection train 1 pump and valve quarterly testing during the week ending August 26, 2017 (in-service test); and

- reactor coolant system water inventory balance testing during the weeks ending August 19, 2017 through September 30, 2017, (reactor coolant system).

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

- did preconditioning occur;
- the effects of the testing were adequately addressed by control room personnel or engineers prior to the commencement of the testing;
- acceptance criteria were clearly stated, demonstrated operational readiness, and were consistent with the system design basis;
- plant equipment calibration was correct, accurate, and properly documented;
- as-left setpoints were within required ranges; and the calibration frequency was in accordance with TSs, the USAR, procedures, and applicable commitments;
- measuring and test equipment calibration was current;
- test equipment was used within the required range and accuracy; applicable prerequisites described in the test procedures were satisfied;
- test frequencies met TS requirements to demonstrate operability and reliability; tests were performed in accordance with the test procedures and other applicable procedures; jumpers and lifted leads were controlled and restored where used;
- test data and results were accurate, complete, within limits, and valid;
- test equipment was removed after testing;
- where applicable for inservice testing activities, testing was performed in accordance with the applicable version of Section XI, American Society of Mechanical Engineers code, and reference values were consistent with the system design basis;
- where applicable for safety-related instrument control surveillance tests, reference setting data were accurately incorporated in the test procedure;
- prior procedure changes had not provided an opportunity to identify problems encountered during the performance of the surveillance or calibration test;
- equipment was returned to a position or status required to support the performance of its safety functions; and
- all problems identified during the testing were appropriately documented and dispositioned in the CAP.

Documents reviewed are listed in the Attachment to this report.

This inspection constituted one in-service 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.

1EP6 Drill Evaluation (71114.06)

.1 Emergency Preparedness Drill Observation

a. Inspection Scope

The inspectors evaluated the conduct of a routine licensee emergency drill on August 8, 2017, to identify any weaknesses and deficiencies in classification, notification, and protective action recommendation development activities. The inspectors observed emergency response operations in the simulator and technical support center to determine whether the event classification, notifications, and protective action recommendations were performed in accordance with procedures. The inspectors also attended the licensee drill critique to compare any inspector-observed weakness with those identified by the licensee staff in order to evaluate the critique and to verify whether the licensee staff was properly identifying weaknesses and entering them into the corrective action program. As part of the inspection, the inspectors reviewed the drill package and other documents listed in the Attachment to this report.

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

b. Findings

No findings were identified.

## 4. OTHER ACTIVITIES

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

4OA2 Identification and Resolution of Problems (71152)

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

a. Inspection Scope

As discussed in previous sections of this report, the inspectors routinely reviewed issues during baseline inspection activities and plant status reviews to verify they were being entered into the licensee's corrective action program at an appropriate threshold, adequate attention was being given to timely corrective actions, and adverse trends were identified and addressed. Some minor issues were entered into the licensee's corrective action program as a result of the inspectors' observations; however, they are not discussed in this report.

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

b. Findings

No findings were identified.

4OA5 Other Activities

.1 Review of 10 CFR 72.212 Evaluations at Operating Plants (60856.1)

a. Inspection Scope

The inspectors evaluated the licensee's control of heavy loads program that supports the initial loading of an Independent Spent Fuel Storage Installation (ISFSI) at the Davis-Besse Nuclear Power Station. The inspection included in-office and on-site reviews of plant design calculations including structural evaluations associated with the seismic design of the auxiliary building structure, crane runway rails, crane rail clips, crane rail clip bolts, and crane support structure. Additionally, the inspectors reviewed inspection, testing, and maintenance documentation associated with the spent fuel cask crane, as well as documentation supporting the upgrade of the spent fuel cask crane to single failure proof in accordance with NUREG-0554, "Single Failure Proof Cranes for Nuclear Power Plants," and American Society of Mechanical Engineers (ASME) NOG–1–2004, "Rules for Construction of Overhead and Gantry Cranes (Top Running Bridge, Multiple Girder)."

The inspectors determined the licensee's compliance with the commitments and requirements of 10 CFR Part 50, 10 CFR Part 72, the cask Certificate of Compliance (CoC), the plant USAR, the cask Final Safety Analysis Report (FSAR), the plant TSs, and the cask TSs.

b. Findings

(1) Failure to Perform Adequacy Evaluation of Cask Crane Components and Crane Support Structure

Introduction: The inspectors identified a finding of very low safety significance (Green) and an associated NCV of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," for the failure of the licensee's design control measures to provide for verifying or checking the adequacy of design of the auxiliary building spent fuel cask crane and crane support structure elements. Specifically, calculations involving the auxiliary building structure, crane runway rails, crane rail clips, and rail clip bolts had not been verified or checked to ensure the requirements of USAR Section 3.8.1.2 were included.

Description: The process of safely moving spent nuclear fuel from the spent fuel pool to the ISFSI would place heavy loads on existing structures and components that must be evaluated to ensure structural integrity when subjected to the design loads. The auxiliary building is a reinforced concrete structure that contains the spent fuel pool and an overhead crane that was designed to handle dry fuel storage casks. The USAR Section 3.8.1 classified the Auxiliary Building structure as Seismic Category I and subject to Appendix B of 10 CFR Part 50 requirements. The inspectors reviewed the licensee's implementation of the control of heavy loads program for ISFSI operations. Per ECP 15–0094, "Cask Crane H4–MC Single Failure Proof Upgrade," Revision 1, the upgraded crane was qualified to satisfy the requirements of ASME NOG–1–2004 and NUREG 0554. In addition, Calculation 155170–C–C–00004, "Auxiliary Building Structural Qualification," Revision 3, evaluated the auxiliary building structure for the applied loading from the auxiliary building spent fuel cask crane.

The inspectors reviewed design calculations for the spent fuel cask crane and crane support structure in the auxiliary building. The auxiliary building structure includes the corbels, which are reinforced concrete brackets off the auxiliary building walls that support the crane runway rails. The crane runway rails are restrained by evenly spaced crane rail clips that are held by rail clip bolts that keep the crane rail structure in place. The cask crane wheels rest on the runway rails, thereby transferring the crane load through the crane rails, crane rail clips, and rail clip bolts to the corbels, which eventually transfer the load to the auxiliary building structure. The design and licensing basis requirements for the auxiliary building, cask crane runway rails, rail clips, and rail clip bolts were defined in USAR Section 3.8.1.2, "Code." This section indicates that the auxiliary building structure is designed to meet the requirements of ACI 318–63, "Building Code Requirements for Reinforced Concrete Structures," and the applicable edition of the American Institute of Steel Construction (AISC) manual, "Specification for the Design, Fabrication, and Erection of Structural Steel for Buildings."

During review of Calculation 155170–C–C–00004, "Auxiliary Building Structural Qualification," Revision 3, and subsequent applicable calculation revision licensee responses associated with the auxiliary building structure, spent fuel cask crane runway rails, rail clips, and rail clip bolts, the inspectors identified the following examples where the licensee failed to meet the requirements in 10 CFR Part 50, Appendix B, Criterion III, "Design Control":

In Calculation 155170–C–C–00004, Revision 3, the licensee failed to consider all structural members that transfer the applicable crane loads to the seismic class I supporting structure. Specifically, the shear loading on the rail clip bolts due to the lateral crane wheel load on the crane runway rails was not considered to demonstrate compliance with AISC, 7$^{th}$ Edition.

In Calculation 155170–C–C–00004, Revision 3 and subsequent applicable calculation revision, the licensee did not address the most critical load rail clip pairs in the analysis to demonstrate compliance with AISC, 7$^{th}$ Edition. Inspectors noted that the clips were located at 24 inch spacing while the wheels were spaced at 52 ¾ inch apart. Based on this configuration, the inspectors determined that the crane wheel with the most critical loading being located at the center of clips would result in maximum impact and that most of the load would be resisted by a single pair of clips. However, the analysis was based on an unverified assumption that the crane wheel load was equally restrained by each of the pair of clips along 34 feet of rail. Also, the licensee applied a non-conservative assumption that the rail clips on both sides of the rail were subject to the bending moment of equal magnitude due to the crane wheel load, when in fact, the rail clips on only one side of the rail would be subject to such bending moment. Furthermore, the licensee applied a non-conservative assumption that the rail clip bolts on both sides of the rail were subject to the shear loading of equal magnitude due to the crane wheel load, when in fact, the rail clip bolts on only one side of the rail would be subject to such shear loading.

In Calculation 155170–C–C–00004, Revision 3 and subsequent applicable calculation revisions, the licensee failed to verify that the applicable loads considered in calculation of structural members represented the worst case loading condition. Specifically, in their calculation of required strength for the corbels in the auxiliary building in accordance with ACI 318–63, the inspectors determined that the operating basis earthquake seismic vertical wheel load of 28–kips did not represent the worst case load as analyzed in

Calculation No. CAL–21416–SE–001, “Crane Structural Analysis & Evaluation,” Revision 2. Also, the licensee failed to verify that the operating basis earthquake seismic lateral/vertical wheel load combination considered in the analysis represented the worst case condition when calculating the loading on crane rail clips and bolts.

Upon identification by the inspectors, the licensee entered these issues into its CAP as CR–2017–05071, “Cask Crane Auxiliary Building Structural Analysis,” dated May 4, 2017; CR–2017–07084, “Cask Crane Auxiliary Building Seismic Analysis,” dated June 30, 2017; and CR–2017–07114, “Cask Crane Concrete Corbel Seismic Load Discrepancy,” dated July 2, 2017. The licensee initiated actions to restore compliance.

Analysis: The inspectors determined that the failure of the licensee’s design control measures to provide for verifying or checking the adequacy of design of the auxiliary building spent fuel cask crane and crane support structure elements was a performance deficiency. The performance deficiency was determined to be more-than-minor in accordance with IMC 0612, “Power Reactor Inspection Reports,” Appendix B, “Issue Screening,” dated September 7, 2012, because it was associated with the Barrier Integrity cornerstone attribute of Design Control and adversely affected the cornerstone objective of providing reasonable assurance that the physical design barriers, i.e. the auxiliary building, protect the public from radionuclide releases caused by accidents or events. Specifically, compliance with ACI 318-63 and the applicable edition of the AISC manual as delineated in USAR Section 3.8.1.2 for the auxiliary building structure, cask crane rails, rail clips, and rail clip bolts demonstrated structural integrity of structures, systems, and components described in the USAR, when subjected to design loads as part of safe load handling of heavy loads near the spent fuel pool, and to ensure integrity of the spent fuel cask.

The inspectors determined the finding could be evaluated using the Significance Determination Process (SDP) in accordance with IMC 0609, “Significance Determination Process,” Attachment 0609.04, “Initial Characterization of Findings,” issued on October 7, 2016. Because the finding impacted the Barrier Integrity cornerstone, the inspectors screened the finding through IMC 0609, Appendix A, “The Significance Determination Process for Findings at Power,” effective on July 1, 2012, using Exhibit 3, “Barrier Integrity Screening Questions.” The finding screened as of very low safety significance (Green) because the finding only represented a potential degradation of the radiological barrier function provided by the auxiliary building. Specifically, the subsequent applicable licensee responses to the inspector’s concerns provided reasonable expectation that the auxiliary building structure would perform its intended design function in the design basis events.

This finding was associated with a cross-cutting aspect in the area of Human Performance, Design Margins. Specifically, the licensee failed to ensure that the auxiliary building structure, cask crane runway rails, rail clips, and rail clip bolts reflected the intended design margins established based on the design and licensing basis. [H.6]

Enforcement: Title 10 CFR Part 50, Appendix B, Criterion III, “Design Control,” requires, in part, that the design control measures provide for verifying or checking the adequacy of design, such as by the performance of design reviews, by the use of alternate or simplified calculation methods, or by the performance of a suitable testing program. For Davis-Besse, the auxiliary building, cask crane runway rails, rail clips, and rail clip bolts were designed to meet the requirements specified in USAR Section 3.8.1.2.

Contrary to the above, the licensee failed to ensure design control measures adequately provided for verifying or checking the adequacy of design for the aforementioned structure and components. Specifically:

On September 15, 2016, in Calculation 155170–CC–00004, "Auxiliary Building Structural Qualification," Revision 3, the licensee failed to consider all structural members that transfer the applicable crane loads to the seismic class I supporting structure. Specifically, the shear loading on the rail clip bolts due to the lateral crane wheel load on the crane runway rails was not considered to demonstrate compliance with AISC, 7th Edition.

On September 15, 2016, in Calculation 155170–C–C–00004, Revision 3, and subsequent applicable calculation revision, the licensee failed to address the most critical location for application of the wheel loads, and the licensee's analyses of the rail clip pairs to demonstrate compliance with AISC, 7th Edition, were based on unverified assumptions.

On September 15, 2016, in Calculation 155170–C–C–00004, Revision 3, and subsequent applicable calculation revision, the licensee failed to verify that the applicable loads considered in the calculation of corbel strength in the auxiliary building, crane rail clips, and rail clip bolts represented the worst case loading condition.

This violation is being treated as an NCV, consistent with Section 2.3.2.a of the Enforcement Policy because it was of very low safety significance and was entered into the licensee's corrective action program, as CR–2017–05071, CR–2017–07084, and CR–2017–07114. **(NCV 05000346/2017003–03, Failure to Perform Adequate Evaluation of Cask Crane Components and Crane Support Structure)**

(2) Failure to Perform 10 CFR 50.59 Evaluation

Introduction: A finding of very low safety significance (Green) and an associated Severity Level IV NCV of 10 CFR Part 50.59, "Changes, Tests, and Experiments," was identified by the inspectors for the licensee's failure to maintain records that included a written safety evaluation which provided the bases for determining that the change to a design basis code load combination did not require a license amendment.

Specifically, paragraph 3.8.1.1.7 of the USAR documents that the design of concrete Class I structures is based on the ACI 318–63 Code, and USAR Section 3.8.1.3 defines the load combinations for concrete design. However, the inspectors identified that the licensee allowed the use of a less conservative ACI 318–71 Code load combination for a normal operation load combination in Section II.H.3.2.2.1 of the licensee's DCM. Specifically, the licensee failed to maintain a record of this change from a method described in the USAR to another method without performing a written safety evaluation.

Description: The inspectors identified that the licensee's DCM allowed a less conservative design load combination for design of Class I concrete than defined in the USAR during review of licensee design documents that demonstrated the auxiliary building maintained the USAR defined design requirements for Class I concrete structures during heavy load transport and laydown of the dry cask storage system.

Specifically, Paragraph 3.8.1.1.7 of the USAR specifies load combinations based on the ACI 318-63 Code. In particular, the USAR specifies load combination / load factors:

- U (design capacity)= 1.5 D (Dead Load) + 1.8 L (Live Load).

However, Section II.H.3.2.2.1 of the DCM allows less conservative load factors from the ACI 318–71 Code to be used for Class I concrete design:

- U = 1.4 D + 1.7 L.

The inspectors reviewed the technical justification in the DCM to substitute the ACI 318–71 load factors for Class I concrete design. However, the licensee did not update the USAR with this change nor evaluate the change in accordance with the 10 CFR 59.59 rule. In addition, at the conclusion of the inspection, the licensee did not provide a written safety evaluation for this change in accordance with 10 CFR 50.59.

Title 10 CFR 50.59(d)(1) states, in part, that the licensee shall maintain records of changes in the facility to the extent that these changes in the facility constitute changes as described in the safety analysis report. These records must include a written safety evaluation which provides the bases for the determination that the change does not require a license amendment.

In addition, 10 CFR 50.59(a)(1) defines a change to mean a modification or addition to, or removal from, the facility or procedures that affects a design function, method of performing or controlling the function, or an evaluation that demonstrates the intended function will be accomplished. Section 3.3 of NEI 96–07, in part, defines a change as a modification or addition to, or removal from, the facility or procedures that affects an evaluation that demonstrates that intended functions will be accomplished. In addition, Section 4.2.1.1, "Screening of Changes to the Facility as Described in the USAR," of NEI 96–07 provides the following guidance: "Changes are 'screened in' (i.e., require a 10 CFR 50.59 evaluation) if they adversely affect an SSC design function." Hence, the use of lower design load factors in calculations for Class I concrete structures than the load factors established in the licensing basis would require a 10 CFR 50.59 evaluation to be performed.

Further, 10 CFR 50.59(a)(2) defines, in part, departure from a method of evaluation described in the USAR used in establishing the design bases or in the safety analyses means: (i) changing any of the elements of the method described in the USAR unless the results of the analysis are essentially the same; or (ii) changing from a method described in the USAR to another method unless that method has been approved by NRC for the intended application.

Further, 10 CFR 50.59(c)(2)(viii) requires the licensee obtain a license amendment if the change would result in a departure from a method of evaluation described in the USAR used in establishing the design bases or in the safety analyses. The inspectors noted that Example 1 of Section 4.3.8.3, "Does the Activity Result in a Departure from a Method of Evaluation Described in the USAR Used in Establishing the Design Basis or in the Safety Analysis?" of NEI 96–07, provided guidance for a change in USAR damping that would require prior NRC approval. Specifically, "using a higher damping value to represent the response of the piping to acceleration from the postulated earthquake in the analysis would result in lower calculated stresses because the increased damping reduces the loads." Similarly, use of lower load factors in structural analysis of concrete structures would result in lower calculated stresses. Since USAR load factors from the ACI 318–63 Code were used in establishing the design bases for

the Class I concrete structures, and since this is a change to an element of the method that is not conservative and is not essentially the same, this change would require prior NRC-approval under this criterion. In addition, the inspectors did not identify that use of lower load factors described above has been approved by NRC for the intended application.

Therefore, the inspectors could not conclude the change to the design bases load combination factors would not result in a departure from a method of evaluation described in the USAR used in establishing the design bases and not require a license amendment.

Analysis: The inspectors determined that the licensee's failure to perform a written safety evaluation which provides the bases for the determination that the change to a design basis load combination does not require a license amendment was a performance deficiency. The finding was more than minor because the inspectors could not conclude the change to the design bases load combination factors would not result in a departure from a method of analysis described in the USAR used in establishing the design bases and not require a license amendment.

Because violations of 10 CFR 50.59 are considered to be violations that potentially impede or impact the regulatory process, they are dispositioned using the traditional enforcement process instead of the SDP. However, if possible, the underlying technical issue is evaluated under the SDP to determine the severity of the violation. The inspector determined the finding could be evaluated using the SDP in accordance with IMC 0609, "Significance Determination Process," Attachment 0609.04, "Initial Characterization of Findings." In accordance with Table 2, this issue affects the Barrier Integrity Cornerstone. For Table 3 – SDP Appendix Router, the inspector answered 'No' to the questions, and therefore, the finding was evaluated using the SDP in accordance with IMC 0609, "The SDP for Findings at Power," Appendix A, Exhibit 3, "Barrier Integrity Screening Questions." The inspector answered "No" to all the questions in Exhibit 3. In particular, because the Class I concrete structures remained operable (capable of performing its safety function during a seismic event), the finding was determined to have very low safety significance (Green) corresponding to a Severity Level IV violation per Example 6.1.d.2 of the NRC Enforcement Policy.

The inspectors determined the finding did not have a cross-cutting aspect because it is not representative of current licensee performance. Specifically, the licensee revised the DCM to allow use of the lower load factors after January 1978.

Enforcement: Title 10 CFR 50.59(d)(1) states, in part, that the licensee shall maintain records of changes in the facility to the extent that these changes in the facility constitute changes as described in the safety analysis report. These records must include a written safety evaluation which provides the bases for the determination that the change does not require a license amendment.

Contrary to the above, as of September 12, 2017, the licensee made changes to an ACI 318–63 design basis load combination described in the USAR without performing a written safety evaluation which provides the bases for the determination that the change does not require a license amendment. Specifically, the licensee's DCM allows a less conservative design load combination for design of Class I concrete than defined in the USAR.

The issue was entered into the CAP as CR 2017–03025. Planned corrective action includes updating the USAR to reflect the changes made to the DCM for the load factors incorporated in the 1971 ACI–318 code. Because this violation was of very low safety significance (Green) and was entered into the licensee's CAP, this violation is being treated as an NCV consistent with Section 2.3.2a of the NRC Enforcement Policy. **(NCV 05000346/2017003–04 Failure to Perform 10 CFR 50.59 Evaluation)**

.2 Review of 10 CFR 72.212(b) Evaluations at Operating Plants (60856)

a. Inspection Scope

The inspectors evaluated the licensee's compliance with the requirements of 10 CFR 72.212 and 10 CFR 72.48. The inspection consisted of interviews with cognizant personnel and review of documentation.

Prior to use of a dry cask storage system, the licensee is required to perform written evaluations in accordance with 10 CFR 72.212(b)(5)(i) to establish that the terms, conditions, and specifications of a CoC or an amended CoC have been met. Additionally, the licensee is required to perform written evaluations to establish that the requirements of 10 CFR 72.104 have been met in accordance with 10 CFR 72.212(b)(5)(iii). "Davis-Besse Nuclear Power Station ISFSI 10 CFR 72.212 Evaluation Report NRC Part 72 Docket Number 72–14," Revision 0, dated June 26, 2017, documents that these written evaluations were performed before the first use of CoC 072–01004, Amendment 13, Revision 1, by the licensee. In Enclosure 1, this same 72.212 Evaluation Report also documents the written evaluations performed before the initial loading of three CoC 072–01004, Amendment 0 (initial CoC issuance) casks in 1996.

The inspectors reviewed and assessed the licensee's 10 CFR 72.212 Evaluation Report to verify that applicable reactor site parameters, such as fire and explosions, tornadoes, wind-generated missile impacts, seismic qualifications, lightning, flooding, and temperature, had been evaluated for acceptability with bounding values specified in the Transnuclear (TN) NUHOMS FSAR and associated analyses in accordance with 10 CFR 72.212(b)(6).

Per 10 CFR 72.212(b)(8), prior to use, the licensee is required to determine whether activities under the general license involve a change to the facility TSs or require a license amendment. The inspectors reviewed the licensee's 10 CFR 72.212 Evaluation Report conclusion that a facility license amendment was not necessary.

b. Findings

No violations were identified.

.3 Preoperational Testing of Independent Spent Fuel Storage Installations at Operating Plants (60854.1)

a. Inspection Scope

The licensee has three loaded TN NUHOMS (CoC 072–01004, Amendment 0) horizontal storage modules (HSMs) on the ISFSI pad from an ISFSI loading campaign performed in 1996 and therefore has an operational ISFSI. No additional dry cask

loading activities had been performed by the licensee in the two decades since. Due to the long hiatus in active loading activities, the inspectors performed a preoperational testing inspection both to assess the licensee's planned preoperational ISFSI testing activities and to assess the licensee's readiness to load spent fuel into the ISFSI in accordance with CoC 072–01004, Amendment 13, Revision 1.

The inspectors reviewed documents, interviewed plant personnel, and performed in-field observations to assess the licensee's preoperational testing of an ISFSI. The licensee's preoperational testing activities took place partially at a TN facility in Aiken, South Carolina and partially at the licensee's facility. The inspectors reviewed ISFSI loading and unloading procedures to ensure that they met the commitments and requirements in the cask FSAR, the cask CoC, 10 CFR Part 72, and the cask TSs. The inspectors verified that the loading and unloading procedures were prepared, reviewed, and approved in accordance with the licensee's administrative programs, and that the procedures ensure all required critical activities would be performed. The inspectors also reviewed select 10 CFR 72.48 and 10 CFR 50.59 reviews related to ISFSI operations.

A review of corrective action reports related to ISFSI activities written during the inspection period indicated that the licensee was identifying and correcting conditions adverse to quality.

The inspectors performed an independent assessment that the licensee had adequately demonstrated its readiness to safely perform ISFSI loading and unloading operations.

(1) Dry Run Activities

The licensee performed preoperational dry run activities to satisfy the eighth condition of the TN NUHOMS Storage System CoC, docket number 072–01004, Amendment 13, Revision 1. NRC inspectors observed these dry run activities.

Specifically, the inspectors observed the licensee perform the following activities at the TN facility: welding of a dry shielded canister (DSC), hydrogen monitoring during welding, dye penetrant testing (PT) after welding, helium leak testing, bulk water removal, blowdowns, vacuum drying, DSC pressure test using helium, and helium backfill.

The licensee performed a tabletop exercise to demonstrate DSC lid-cutting. This tabletop included a video presentation of the weld-cutting apparatus cutting through the lid of a mock-up DSC and a walkdown of the weld-cutting apparatus which was being stored at the TN facility.

The inspectors also observed the licensee perform the following activities onsite: insertion and removal of a DSC into an HSM; transport of a transfer cask (TC) between the ISFSI and the Auxiliary Building, upending of a TC from the transporter to the cask wash pit (dry), movement of the TC between the cask wash pit and the spent fuel pool, and partial insertion of a dummy fuel assembly into the DSC basket in the spent fuel pool.

During dry run activities, the dummy fuel assembly was only partially inserted (approximately 12 inches) into the basket cells to avoid potential introduction of foreign

material into the DSC basket due to defects in the dummy fuel assembly. While partially inserting a dummy fuel assembly is not adequate to meet the Fuel Loading requirement of Condition 8 of CoC 072–01004, Amendment 13, Revision 1, loading and unloading of dummy fuel assemblies was performed by the licensee prior to the initial dry cask loading campaign in 1996, as documented in NRC Inspection Report 05000346/95009.

The inspectors observed the licensee's oversight process, use of command and control, and control of both simulated and actual radiological hazards during dry run activities.

(2) Fuel Selection

The inspectors reviewed the licensee's program associated with fuel characterization and selection for storage. The inspectors reviewed cask fuel selection packages to verify that the licensee was loading fuel in accordance with TS 2.1, "Fuel to be Stored in the Standardized NUHOMS System."

(3) Radiation Protection

The inspectors evaluated the licensee's radiation protection (RP) program pertaining to the operation of the ISFSI. The inspectors observed licensee RP technicians simulate dry run activities and interviewed both RP and other licensee personnel to verify their knowledge regarding the scope of the work and the radiological hazards associated with transfer and storage of spent fuel. The inspectors reviewed radiological surveys, both actual and simulated.

(4) Training

The inspectors reviewed the licensee's training program which ensures that involved staff were adequately trained for the job they were responsible to perform. The inspectors interviewed licensee personnel to verify that they were knowledgeable of the scope of work that was being performed.

(5) Emergency Preparedness, Surveillance, Fire Protection, and Quality Assurance Activities

The inspectors reviewed selected licensee procedures to ensure that responsibilities for specific ISFSI activities have been defined and that these responsibilities have been integrated into the appropriate plant programs. The inspectors reviewed station emergency preparedness, surveillance, fire protection, and quality assurance procedures to ensure that they meet the commitments and requirements as specified in the cask FSAR, the cask CoC, 10 CFR Part 72, and the cask TSs.

b. Findings

Introduction: A Severity Level IV NCV of 10 CFR 72.174, "Quality Assurance Records," was identified by the inspectors for the licensee's failure to maintain sufficient records to furnish evidence of activities affecting quality. Specifically, the licensee was not maintaining ultrasonic testing (UT) records that were being relied upon for the selection of intact spent fuel assemblies for loading into dry cask storage canisters during the 2017 loading campaign.

Description: The licensee planned to load four TN NUHOMS 32–PTH1 (CoC 072–01004, Amendment 13, Revision 1) dry cask canisters with spent nuclear fuel during the summer of 2017. TS 2.1, "Fuel to be Stored in the Standardized NUHOMS System," describes the allowed fuel assembly parameters for loading, which for the 32–PTH1 canister, is described in Table 1–1aa. While Table 1–1aa does specify certain conditions under which damaged fuel assemblies can be loaded into dry storage, the licensee planned to load 32 intact spent fuel assemblies into each of the four casks to meet the requirement of TS 2.1.

The selection of spent fuel assemblies for loading into spent fuel storage casks, such that the fuel specification requirements are met, affects the operation of structures, systems, and components important to safety, and therefore the quality assurance requirements of 10 CFR 72 Subpart G are applicable.

Calculation C–NF–062.02–055, Revision 0, "Davis-Besse Fuel Assembly Selection for the 2017 Dry Cask Loading Campaign," which selected the particular fuel assemblies to be loaded into dry cask storage was approved by the licensee on June 22, 2017. Approximately three-quarters of the selected fuel assemblies for loading were considered by the licensee to be intact as a result of UT. This is in accordance with the guidance in SFST–ISG–1, Revision 2, "Damaged Fuel," which states that, "A review of reactor operating records, ultrasonic testing, and sipping (if done in a timely fashion) can be used to classify rods as unbreached or breached."

To classify fuel assemblies as intact, the licensee utilized high-level reports from its UT vendor, who performed UT on the fuel assemblies after the assemblies were discharged from the reactor core. However, these high-level reports used to perform fuel selection, such as Report No. 96–06, "Echo-330 Ultrasonic Fuel Inspection at Davis-Besse Nuclear Power Station," dated April 1996, and Report No. 00–04, "Echo-330 Ultrasonic Fuel Inspection at Davis-Besse Unit–1," dated April 2000, were not being maintained by the licensee as safety records.

For the fuel assemblies for which the reports were used to support an intact classification, the reports did not contain inspection records specific to those intact assemblies. Specifically, the high-level reports did not identify either the inspector or data recorder for the UT measurement on a fuel assembly classified as intact or the specific (individual fuel rod level) UT results for a fuel assembly classified as intact. Additionally, the licensee was not maintaining closely related data; such as qualifications of personnel, procedures and equipment, for the UT measurements for a fuel assembly classified as intact.

The licensee entered this issue into the corrective action program as condition report CR–2017–06976, "Identified need for additional information supporting Davis-Besse UT campaigns." Although the pertinent UT records were not being maintained by the licensee, there is no evidence at this point to suggest that any of the fuel assemblies classified by the licensee as intact for loading into dry cask storage have been incorrectly classified.

Analysis: The inspectors determined that the licensee's failure to maintain UT records and closely related data which support the classification of fuel assemblies as intact for loading into dry cask storage is contrary 10 CFR 72.174 and is a performance deficiency. In accordance with Section 2.2 of the NRC Enforcement Policy and IMC 0612, Appendix B, "Issue Screening," ISFSI facilities are not subject to the SDP and

are not subject to the Reactor Oversight Process, so violations identified at ISFSIs are assessed using traditional enforcement. Traditional enforcement violations are not assessed for cross-cutting aspects.

The inspectors determined that the violation was of more than minor significance using IMC 0612, "Power Reactor Inspection Reports", Appendix E, "Examples of Minor Issues." Example 9a is applicable to this issue in that the licensee failed to maintain UT records for many fuel assemblies classified as intact for loading, and this failure to maintain records was not an isolated incident of one or two instances.

Consistent with the guidance in Section 1.2.6.D of the NRC Enforcement Manual, if a violation does not fit an example in the enforcement policy violation examples, it should be assigned a severity level: (1) commensurate with its safety significance, and (2) informed by similar violations addressed in the violation examples. The inspectors determined that the violation could be classified as a Severity Level IV, informed by NRC Enforcement Policy example 6.5.d.4, in that the licensee failed to maintain Quality Assurance records to demonstrate the adequacy of the specific fuel assemblies selected for loading as intact.

Enforcement: Title 10 CFR 72.174 requires, in part, that a licensee maintain sufficient records to furnish evidence of activities affecting quality. The records must include the results of inspections and tests. The records must also include closely related data such as qualifications of personnel, procedures, and equipment. Inspection and test records must, at a minimum, identify the inspector or data recorder, the type of observation, the results, and the acceptability. Records must be identifiable and retrievable. Records pertaining to the use of structures, systems, and components important to safety must be maintained by or under the control of the licensee until the NRC terminates the license.

Contrary to the above, beginning on June 22, 2017, when the licensee selected fuel assemblies for loading into dry cask storage, the licensee failed to maintain sufficient records to furnish evidence of activities affecting quality. Specifically, the licensee was not maintaining UT records that were being relied upon to demonstrate that the spent fuel selected for loading was accurately classified as intact.

The licensee has entered this issue into its corrective action program as CR–2017–06976. The licensee was able to request additional documentation from the vendor who originally performed the UT to resolve these safety concerns before loading operations had begun. Because this matter was of very low safety significance (Severity Level IV) and has been entered into the corrective action program, this violation is being treated as an NCV, consistent with Section 2.3.2 of the Enforcement Policy. **(NCV 05000346/2017003–05 Ultrasonic Testing Records to Support Fuel Selection Were Not Being Maintained)**

.4 Operation of an Independent Spent Fuel Storage Installation at Operating Plants (60855.1)

a. Inspection Scope

The inspectors reviewed documents, interviewed plant personnel, and performed in-field observations to assess the licensee's performance as it relates to the operation of the ISFSI. The inspectors evaluated whether changes made to the programs and

procedures since the last inspection were consistent with the license or CoC, and did not reduce the effectiveness of the program. The inspectors also reviewed whether changes were evaluated in accordance with the requirements stated in 10 CFR 72.212(b), 10 CFR 50.59, and 10 CFR 72.48. The inspectors independently assessed whether dry cask storage activities were performed in a safe manner and in compliance with approved procedures. The inspectors verified that the licensee had identified each fuel assembly placed in the ISFSI, had recorded the parameters and characteristics of each fuel assembly, and had maintained a record of each fuel assembly as a controlled document.

Specifically, the inspectors observed the licensee perform the following activities: briefing for infrequently performed tests or evolutions; moving spent fuel into the DSC; verifying the correct placement of spent fuel in the DSC; performing a pre-job brief; briefing during management turnover; performing welding and PT of the inner top cover plate-to-shell weld; drying the DSC using vacuum drying; using helium to pressure test the DSC; backfilling the DSC with helium; performing PT of the outer top cover plate-to-shell weld; and transporting the transfer cask from the auxiliary building to the ISFSI pad. The inspectors performed a walkdown of the ISFSI pad, the ISFSI haul path, and the transporter when staged in the auxiliary building. The inspectors also reviewed the following documents: radiological surveys, selected 72.48 reviews, and records of fuel assemblies and physical inventories.

A review of corrective action reports written since the last ISFSI inspection indicated that the licensee was effectively identifying and correcting conditions adverse to quality.

b. Findings

No violations were identified.

.5 Licensee Event Report 05000346/2017–001–00: Emergency Diesel Generator Fuel Oil Storage Tank Vents Not Adequately Protected From Tornado-Generated Missiles and Enforcement Discretion per EGM 15–002

a. Inspection Scope

On July 20, 2017, the licensee determined that the emergency diesel generator (EDG) fuel oil storage tank vents are not protected and are vulnerable to a potential tornado-generated missile impact. If a missile crimped the vents, a vacuum could develop in the tank as fuel is pumped out, which could disable the transfer pump or tank, potentially impacting the seven-day fuel supply for the affected train(s) of EDG. While the storage tanks were protected from tornado missiles when installed, the vents were not provided with any such protection. As a result of the non-conforming condition both EDGs were declared inoperable. Compensatory measures were put in place and, in accordance with NRC guidance contained in Enforcement Guidance Memorandum 15–002, the EDGs were returned to an operable but non-conforming status. There are no actual consequences as a result of the non-conforming condition. This LER will be closed when all licensee activities are completed.

b. Findings

A finding and an associated violation of 10 CFR, Part 50, Appendix B, Criterion III, "Design Control," was identified based upon the lack of adequate tornado missile

protection to the safety-related equipment listed above. The finding was determined to be less than red (i.e., high safety significance) based on a generic and bounding risk evaluation performed by the NRC in support of the resolution of tornado-generated missile non-compliances. The bounding risk evaluation is discussed in Enforcement Guidance Memorandum 15-002, Revision 1, "Enforcement Discretion for Tornado-Generated Missile Protection Non-Compliance," and can be found in ADAMS Accession No. ML1 63554286.

Because this finding and violation was identified during the discretionary period covered by Enforcement Guidance Memorandum 15-002, Revision 1, "Enforcement Discretion for Tornado Missile Protection Non-Compliance" and because the licensee, prior to the expiration of the associated LCO, took initial compensatory measures that provided additional protection such that the likelihood of tornado missile effects were lessoned, followed by more comprehensive compensatory measures that were completed within approximately 60 days of issue discovery, and has final corrective actions planned, the NRC is exercising enforcement discretion by not issuing an enforcement action.

## 4OA6 Management Meetings

### .1 Exit Meeting Summary

On October 3, 2017, the inspectors presented the inspection results to Mr. M. Bezilla and other members of the licensee staff. The licensee acknowledged the issues presented. The inspectors confirmed that none of the potential report input discussed was considered proprietary.

### .2 Interim Exit Meetings

Interim exits were conducted for:

- The results of the ISFSI pre-operational and initial loading inspections were presented on September 12, 2017, to members of the licensee management and staff via conference call. The licensee acknowledged the information presented.

The inspectors confirmed that none of the potential report input discussed was considered proprietary. Proprietary material reviewed by the inspectors was controlled in accordance with appropriate NRC policies regarding sensitive unclassified information.

ATTACHMENT: SUPPLEMENTAL INFORMATION

**SUPPLEMENTAL INFORMATION**

**KEY POINTS OF CONTACT**

Licensee

M. Bezilla, Site Vice President
R. Borland, Director, Fleet Nuclear Fuel and Analysis
D. Brown, Supervisor, Core Design and Physics Support
K. Byrd, Director, Site Engineering
D. Blakely, Supervisor, Nuclear Engineering Analysis
J. Cuff, Manager, Site Training
J. Cunnings, Manager, Plant Engineering
A. Dawson, Manager, Site Chemistry
C. Glass, ISFSI Program Owner, Fleet Fuel Planning and Performance
D. Hartnett, Superintendent, Nuclear Operations
T. Henline, Manager, Site Projects
J. Hofelich, Supervisor Nuclear Supply Systems Engineering
D. Huey, Director, Site Performance Improvement
D. Imlay, General Plant Manager
R. Karr, Project Manager, Davis-Besse Site Projects
K. Koski, Supervisor, Fleet Fuel Planning and Performance
G. Laird, Manager, Site Operations
B. Matty, Manager, Site Maintenance
P. McCloskey, Manager, Site Regulatory Compliance
K. McIntyre, Supervisor, Fleet Project Management
G. Michael, Manager, Design Engineering
D. Noble, Manager, Site Radiation Protection
G. Nordlund, Superintendent, Radiation Protection
R. Oesterle, Superintendent, Nuclear Operations Services
M. Ogrinc, Dry Cask Storage Pool to Pad Manager, Fleet Project Management
R. Patrick, Manager, Site Work Management
B. Pollauf, Supervisor, Nuclear Plant Systems Engineering
B. Reineck, Davis-Besse Site Design Engineering
M. Rohde, Davis-Besse Site Projects
B. Spiesman, Fleet Licensing
J. Sturdavant, Regulatory Compliance
J. Tufts, Manager, Fleet Oversight
J. Vetter, Manager, Emergency Response
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

| | | |
|---|---|---|
| 05000346/2017003–01 | URI | Pinched Wiring Causing the Failure of Fuses Y210 and Y214 |
| 050003462017003–02 | URI | Auxiliary Feedwater Pump 1 Bearing Failure |
| 05000346/2017003–03 | NCV | Failure to Perform Adequate Evaluation of Cask Crane Components and Crane Support Structure (4OA5.1) |
| 05000346/2017003–04 | NCV | Failure to Perform 10 CFR 50.59 Evaluation (4OA5.1) |
| 05000346/2017003–05 | NCV | Ultrasonic Testing Records to Support Fuel Selection Were Not Being Maintained (4OA5.3) |

Closed

| | | |
|---|---|---|
| 05000346/2017003–03 | NCV | Failure to Perform Adequate Evaluation of Cask Crane Components and Crane Support Structure (4OA5.1) |
| 05000346/2017003–04 | NCV | Failure to Perform 10 CFR 50.59 Evaluation (4OA5.1) |
| 05000346/2017003–05 | NCV | Ultrasonic Testing Records to Support Fuel Selection Were Not Being Maintained (4OA5.3) |

Discussed

| | | |
|---|---|---|
| 05000346/2017–001–00 | LER | Emergency Diesel Generator Fuel Oil Storage Tank Vents Not Adequately Protected From Tornado-Generated Missiles |

## LIST OF DOCUMENTS REVIEWED

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

1R04 Equipment Alignment

Condition Reports:
- 2017-05223; Motor Driven Feed Pump Missing Dowel Pins and Has Nylon Shims Installed for Alignment
- 2017-08711; Higher Ambient Temperature Noted Around the Station Vent Stack Radiation Monitors (Turbine Building Elevation 623')
- 2017-08730; HP12 (High Pressure Injection Pump 1 Suction) Difficult to Operate

Procedures:
- DB-CN-03009; Station Vent Releases, Weekly Radiological Monitoring, Sampling and Analysis of RE4598BA; Revision 10
- DB-MI-04510; Channel Calibration of RE4598AB and RE4598BB Station Vent Accident Range Radiation Monitors; Revision 19
- DB-MM-09177; Containment Spray Pump Maintenance; Revision 10
- DB-OP-06013; Containment Spray System; Revision 26
- DB-OP-06225; MDFP Operating Procedure; Revision 22
- DB-OP-06233; Auxiliary Feedwater System; Revision 40
- DB-OP-06262; Component Cooling Water System Procedure; Revision 37
- DB-OP-06316; Diesel Generator Operating Procedure; Revision 59
- DB-OP-06412; Process and Area Radiation Monitor; Revision 46
- DB-PF-03154; AFW Train 1 Valve Testing; Revision 16
- DB-SC-03071; Emergency Diesel Generator 2 Monthly Test; Revision 35
- DB-SC-03216; Quarterly Functional Test of RE4598AA, Station Vent Normal Range Radiation Monitor; Revision 22
- DB-SC-03230; Monthly Check Source Test of RE 4598BA, Station Vent Normal Range Radiation Monitor (Noble Gas Activity Channel); Revision 07
- DB-SP-03155; AFW Train 1 Flow Path to SG Verification; Revision 12
- DB-SP-03158; AFW Train 1 Flow Path to CST Verification; Revision 07

Drawings:
- J-118, Sheet 1; Revision 6
- M-006D; Auxiliary Feedwater System; Revision 59
- M-006E; Piping & Instrument Diagram Condensate System; Revision 31
- M-034; Emergency Core Cooling System Containment Spray and Core Flooding Systems; Revision 71
- OS-005; Containment Spray System; Revision 14
- OS-012A, Sheet 1; Main Feedwater System; Revision 26
- OS-017A, Sheet 1; Operational Schematic Auxiliary Feedwater System; Revision 34
- OS-017B, Sheet 1; Operational Schematic Auxiliary Feedwater Pumps and Turbines; Revision 25
- OS-033E, Sheet 2; Radiation Monitoring Systems; Revision 17
- OS-041A, Sheet 2; Emergency Diesel Generator Systems; Revision 34

- OS-041B; Emergency Diesel Generator Air Start / Engine Air System; Revision 42
- OS-041C; Emergency Diesel Generator Diesel Oil System; Revision 16

Other:
- ED 6864-2; ECP 04-0006 Kaman Radiation Monitor Upgrade; 3/8/2013
- M-340DQ-00353; LDU3 and RDU3 User's Manual; Revision 1 [Proprietary]
- M-340DQ-00359; Davis-Besse Vent Monitor User's Manual; Revision 1 [Proprietary]
- Site Safety Turbine Building Temperatures 2010-2017; 8/22/2017

1R05 Fire Protection

Condition Reports:
- 2017-02454; Door 323 (A High Voltage Switchgear Room-325) will not Secure

Procedures:
- DB-FP-00003; Pre-Fire Plan Guidelines; Revision 09
- DB-FP-00005; Fire Brigade; Revision 08
- DB-FP-00005; Fire Brigade; Revision 08
- DB-FP-00007; Control of Transient Combustibles; Revision 13
- DB-FP-00009; Fire Protection Impairment and Fire Watch; Revision 22
- DB-FP-00009; Fire Protection Impairment And Fire Watch; Revision 22
- DB-FP-00018; Control of Ignition Sources; Revision 12
- DB-FP-04006; Fire Brigade Equipment Quarterly Functional Test; Revision 09
- DB-FP-04014; Fire Hose Station Inspections; Revision 10
- DB-FP-04023; Fire Rated Barrier Visual Inspection; Revision 19
- DB-MS-01637; Maintenance Services Procedure, Scaffolding Erection and Removal; Rev. 16
- NOP-TR-1240-04; 2nd Qtr. Fire Drill for Crew 4, Revision 00
- NT-OT-07007; Fire Brigade Training; Revision 08

Pre-Fire Plans:
- PFP-AB-323; High Voltage Switchgear Room B, Room 323, Fire Area Q; Revision 05
- PFP-AB-324; Auxiliary Shutdown Panel and Transfer Switch Room, Rooms 324 and 324DC, Fire Area R; Revision 05
- PFP-AB-328; Component cooling Water Heat Exchanger and Pump Room, Room 328, Fire Area T, Revision 04
- PFP-AB-427; No. 2 Electrical Penetration Room, Room 427, Fire Area DF, Revision 04
- PFP-AB-428; Low Voltage Switchgear Room F-Bus, Room 428, Fire Area X, Revision 04
- PFP-AB-428A; Battery Room B, Room 428A, Fire Area X, Revision 04

Drawings:
- A-0221F; Fire Protection General Floor Plan El.545'-0" & 555'-0"; Revision 09
- A-0222F; Fire Protection General Floor Plan El. 565'-0"; Revision 19
- A-0223F; Fire Protection General Floor Plan El. 585'-0"; Revision 26
- A-0224F; Fire Protection General Floor Plan El. 603'-0"; Revision 23
- Fire Hazard Analysis Report
- Fire Hazards Analysis; Fire Area Evaluation, Fire Area: DF
- Fire Hazards Analysis; Fire Area Evaluation, Fire Area: Q
- Fire Hazards Analysis; Fire Area Evaluation, Fire Area: R
- Fire Hazards Analysis; Fire Area Evaluation, Fire Area: T
- Fire Hazards Analysis; Fire Area Evaluation, Fire Area: X

1R06 Flood Protection Measures

Condition Reports:
- 2017-07352; Manhole Inspections
- 2017-07838; Submerged Cables in Manholes

1R11 Licensed Operator Requalification Program and Licensed Operator Performance

Condition Reports:
- 2017-03535; Potential Issue Identified with a Licensed Operator's Medical Condition
- 2017-08480; Inadvertent Tripping of Train 1 Control Room Normal Ventilation during Station Vent Normal Radiation Monitor Maintenance
- 2017-08864; F15-3 Service Water Pump 3 Strainer has a Pinhole Leak on the Piping Just Below the Discharge Elbow
- 2017-09443; AFPT 1 P/E BRG MT Came into Alarm, AFPT 1 Tripped Locally

Procedures:
- DB-OP-06261; Service Water System Operating Procedure; Revision 66
- DB-OP-06511; Control Room Heating, Ventilation, and Air Conditioning System Procedure; Revision 17

Other:
- Unit Log 3/25/17-3/26/17, 3/30/17, 9/13/17

1R12 Maintenance Effectiveness

Condition Reports:
- 2014-05146; Dresser-Rand Company Part 21 Letter for AFW Governor Linkage Spherical Bearing; 3/18/14
- 2016-13867; Unable to Obtain Oil Sample due to Lack of New Oil Sample on Site
- 2017-01656; Oil Sample on Decay Heat Pump #2 O.B. Pump Bearing Grayish in Color
- 2017-02788; Improper Storage of Lube Oil
- 2017-02973; Discrepancies Found in Lubrication Program DB-MN-00004
- 2017-03026; Discrepancies on Lubricants Shelf Life
- 2017-07075; CAS and SAS Gai-Tronics Line 1 has Bleed Over from Line 2
- 2017-07141; Missed Emergency Plan Off Normal Occurrence Implementation
- 2017-07154; AFPT 2 Hunting at the HSS
- 2017-07196; AFW Train 2 SG Level Control Unexpectedly Swapped from Low (49 inches) to High (124 inches) and DH11 and CF1A Indication Lost
- 2017-08185; Fuse Blown during Fuse Replacement
- 2017-10398; T002 AFP 1 T/E BRG OT Reading Erratic during AFP 1 Monthly Test
- 2017-10430; Leak from Waste Truck
- 2017-09443; AFPT 1 P/E BRG MT Came into Alarm, AFPT 1 Tripped Locally
- 2001-00012; Confusion Exists Regarding the Location of Oil Addition Points on Various Pumps
- 2017-09527; Incorrect AFPT Inboard Bearing Sight Glass Minimum Levels
- 2017-09415; X994 Caldon PC not Transmitting
- 2017-07281; SFAS CH 3 L513 Upper 1/5 Light Came on during Testing of SFAS CH 4
- 2002-06767; LIR-AFW-JCO Inputs not Bounding
- 2017-09817; AFPT 1 O/B Bearing Elevated Temperature
- 2017-09853; CCW Pump 1 Inboard Pump Bearing Oil Level at Low Mark

- 2017-09671; SBODG A/C 2 Oil is Cloudy in Sightglass
- 2017-09685;Evaluate Operator Performance in Response to AFPT #1 Pump End Bearing High Temperature
- 2017-09688; Aux Feed Pump Turbine #1 Elevated Particulate Levels in All Samples from inbd and outb Bearing Reservoirs
- 2017-09536; Aux Feedwater Pump 1 Outboard Vib Probe Mounting Bracket Found Loose
- 2008-33914; SFAS Channel 3 Logic Module L513 1/5 Trip Light
- 2017-09857; #1 Auxiliary Feedwater Pump Exceeded its Allowed Unavailability
- 2017-08185; Fuse Blown during Fuse Replacement

Procedures:
- DB-MM-09098; 040 Spherical Bearing; Revision 14
- DB-MM-09098; AFPT Governor Maintenance; Revision 14
- DB-SP-04159; AFP 2 Monthly Test; Revision 19
- DB-SP-03151; AFP 1 Quarterly Test; Revision 25

Work Orders:
- 200726979; Y210/Y214 Fuse Replacement
- 200653401; Auxiliary Feed Pump 1 Oil Maintenance
- 200679819; Auxiliary Feed Pump 1 Bearing Maintenance
- 200690770; DB-SUB050-01 Auxiliary Feedwater Pump Turbines
- 200000249; Auxiliary Feed Pump Turbine 1-1

Drawings:
- M-036-00021; Vendor Manual Page 196
- M-36-66-1; Section - Turbine

Other:
- NRC EN 49923; 10 CFR Part 21 Letter; Dresser-Rand Company
- RBC Vendor Catalog; Precision Special Purpose Series; Four-Piece – Metal-to-Metal
- Unit Logs; 7/4/17; 7/6/17; 8/8/17; 8/9/17, 9/12/17-9/20/17
- Woodward Governor Vendor Manual 36627

1R13 Maintenance Risk Assessments and Emergent Work Control

Condition Reports:
- 2017-07075; CAS and SAS Gai-Tronics Line 1 has Bleed Over from Line 2
- 2014-05146; Dresser-Rand Company Part 21 Letter for AFW Governor Linkage Spherical Bearing
- 2017-07141; Missed Emergency Plan Off Normal Occurrence Implementation
- 2017-07281; SFAS Ch 3 L513 Upper 1/5 Light Came on during Testing of SFAS Ch 4
- 2017-07154; AFPT 2 Hunting at the HSS
- 2017-10398; T002 AFP 1 T/E BRG OT Reading Erratic during AFP 1 Monthly Test
- 2017-10430; Leak from Waste Truck
- 2017-09443; AFPT 1 P/E BRG MT Came into Alarm, AFPT 1 Tripped Locally
- 2001-00012; Confusion Exists Regarding the Location of Oil Addition Points on Various Pumps
- 2017-09527; Incorrect AFPT Inboard Bearing Sight Glass Minimum Levels
- 2017-09415; X994 Caldon PC Not Transmitting
- 2017-07281; SFAS CH 3 L513 Upper 1/5 Light Came on During Testing of SFAS CH 4
- 2002-06767; LIR-AFW-JCO Inputs Not Bounding

- 2017-09817; AFPT 1 O/B Bearing Elevated Temperature
- 2017-09853; CCW Pump 1 Inboard Pump Bearing Oil Level at Low Mark
- 2017-09671; SBODG A/C 2 Oil is Cloudy in Sightglass
- 2017-09685;Evaluate Operator Performance in Response to AFPT #1 Pump End Bearing High Temperature
- 2017-09688; Aux Feed Pump Turbine #1 Elevated Particulate Levels in All Samples from inbd and outb Bearing Reservoirs
- 2017-09536; Aux feedwater Pump 1 Outboard Vib Probe Mounting Bracket Found Loose
- 2008-33914; SFAS Channel 3 Logic Module L513 1/5 Trip Light
- 2017-09857; #1 Auxiliary Feedwater Pump Exceeded its Allowed Unavailability

Procedures:
- DB-MI-09072; SFAS Documentation for Module Testing; Revision 05
- DB-MM-09098; 040 Spherical Bearing; Revision 14
- DB-MM-09098; AFPT Governor Maintenance; Revision 14
- DB-OP-06405; Safety Features Actuation Procedure; Revision 14
- DB-SC-03112; SFAS Channel 3 Functional Test; Revision 15
- DB-SC-03113; SFAS Channel 4 Functional Test; Revision 16
- DB-SC-03115; SFAS Output Logic Test for Actuation Channel 1; Revision 7
- DB-SP-04159; AFP 2 Monthly Test; Revision 19
- NG-DB-00001; On-Line Risk Management; Revisions 14-15
- NOP-OP-1007; Risk Management; Revision 23
- DB-SP-03151; AFP 1 Quarterly Test; Revision 25

Work Orders:
- 200724601; SFAS Channel 3 L513 Upper 1/5 Light Is On
- 20063401; Auxiliary Feed Pump 1 Maintenance
- 20063401; Auxiliary Feed Pump 1 Oil Maintenance
- 200679819; Auxiliary Feed Pump 1 Bearing Maintenance
- 200690770; DB-SUB050-01 Auxiliary Feedwater Pump Turbines
- 200000249; Auxiliary Feed Pump Turbine 1-1

Drawings:
- M-036-00021; Vendor Manual Page 196
- M-36-66-1; Section - Turbine

Notifications:
- 601117142; SFAS Channel 3 L513 Upper 1/5 Light Is On
- 601127991; SFAS Channel 3 Output Module L513 1/5 Light Is On

Other:
- NRC EN 49923; 10 CFR Part 21 Letter; Dresser-Rand Company
- RBC Vendor Catalog; Precision Special Purpose Series; Four-Piece – Metal-to-Metal
- Unit Log; 7/4/17
- Woodward Governor Vendor Manual 36627
- Log Entries Report 9/12/17-9/20/17

1R15 Operability Determinations and Functionality Assessments

Condition Reports:
- 2015-00070; Door 512 Unlatched Unexpectedly
- 2015-00079; Door 512 Opened When Challenged On Patrol
- 2015-01681; Door 512 will not Open
- 2016-04685; HIS6244 Pull to Trip Does not Work
- 2016-12920; Door 512 Operational Degradation
- 2016-13113; Door 512 not Securing on First Attempt
- 2017-01330; Calculation Error for Previous Baseline Test Data Evaluation for Service Water Pump Motor 3 Performed for CR 2010-86944
- 2017-03539; Sway Strut AF-6A-HBD-272-H5 Configuration Questioned
- 2017-07996; Door 512 Opened When Challenged on Patrol
- 2017-08068; SW Pump 1 Strainer Piping Through Wall Leak
- 2017-08573; SW Pump 2 Strainer Piping has Below Minimum Allowable Thickness Readings
- 2017-08778; Appendix R Transfer Switches for BCE11 and BCE12 may not have been Adequately Tested during 19RFO
- 2017-08864; F15-3 Service Water Pump 3 Strainer has a Pinhole Leak on the Piping Just Below the Discharge Elbow
- 2017-09107; Door 512 Opened when Challenged on Patrol
- 2017-07557; Bolting Over Torqued on Control Room Emergency Ventilation System Condensers

Procedures:
- DB-FP-00009; Fire Protection Impairment and Fire Watch; Revision 22
- DB-OP-06261; Service Water System Operating Procedure; Revision 66
- DB-PF-05015; Ultrasonic Thickness Examination; Revision 8
- DB-SC-3003; Testing of Appendix R Circuits for AC1CE11, AC1CE12, BCE11, BCE12; Revision 6
- IS-DP-04920; Nuclear Security Weekly Operability Testing; Revision 18
- NOBP-OP-1015; Event Notifications; Revision 7
- NOP-CC-5762; Appendix VII Procedure for Ultrasonic Examination of Ferritic Pipe Welds; Revision 2
- NOP-OP-1009; Operability Determinations and Functionality Assessments; Revision 6

Work Orders:
- 200710427; Operation 0400 Install Pin Retention Clip

Drawings:
- C-1596; Door Functional List; Revision 7

Calculations:
- C-EE-015.03-007; Operating Load Inputs for AC Power System Analysis

Notifications:
- 601033002; HIS6244 Pull to Trip does not Work
- 601122097; Code Case Required Extent of Condition for CR 2017-08068
- 601123099; Evaluate Ultrasonic Testing Exam on F15-2 Blowdown Line

Other:
- Unit Log; Various

- Log Entries Report 9/12/17-9/20/17

1R18 Plant Modifications

Condition Reports:
- 2017-07686; Shield Building Bore S3-650.0-11 Inspection Findings
- 2016-08511; Shield Building Bore S9-666.0-11 Inspection Findings
- 2016-07499; Calculation VS21/B01-01 Spectral Acceleration Values
- 2017-07729; Shield Building Bore S9-785.0-22.5 Findings
- 2017-07788; Shield Building Bore S10-740-35 Findings
- 2017-07787; Shield Building Bore S9-666.0-12 Findings
- 2017-07789; Shield Building Bore S4-650.0-16 Findings
- 2017-07833; Shield Building Bore S10-740-41 Findings
- 2017-07832; Exterior Surface Vertical Crack on Should 10
- 2017-07878; Shield Building Bore S4-650.0-13 Findings
- 2017-07870; Shield Building Bore S7-666.0-7 Findings
- 2017-07873; Shield Building Bore S7-666.0-9 Findings
- 2017-07868; Shield Building Bore S10-780.0-19 Findings

Procedures:
- EN-DP-01511; Structures Monitoring; Revision 7

Engineering Change Package:
- 17-0090-000; Confirm SB Relative Humidity/2017 Crack Monitoring; Revision 0
- 17-0090-001; Confirm SB Relative Humidity/2017 Crack Monitoring; Revision 0
- 17-0105-000; Confirm SB Relative Humidity/2017 Crack Monitoring; Revision 0
- 17-0105-001; Remove Shield Building Coating; Revision 0

Other:
- 50.59 Evaluation No. 17-00824; Shield Building Bores and RH Meters; Revision 1
- 50.59 Screening No. 17-00784; Shield Building Coating Removal; Revision 0
- 50.59 Screening No. 17-00824; Shield Building Bores and RH Meters; Revision 0
- 50.59 Screening No. 17-00824; Shield Building Bores and RH Meters; Revision 1

1R19 Post Maintenance Testing

Condition Reports:
- 2016-13618; Multiple Unexpected Alarms during SFAS Channel 2 Testing
- 2017-07075; CAS and SAS Gai-Tronics Line 1 has Bleed Over from Line 2
- 2014-05146; Dresser-Rand Company Part 21 Letter for AFW Governor Linkage Spherical Bearing
- 2017-07141; Missed Emergency Plan Off Normal Occurrence Implementation
- 2017-08520; AFPT 1 Trip Throttle Valve Concern
- 2017-08483; AFPT 1 Failed to Trip during AFPT 1 Monthly Test
- 2017-08574; AFP Trip Throttle Valve Issues
- 2017-07394; Foreign Material Found in DB-L513 Module that was Removed from Safety Features Actuation System Channel 3 (SFAS 3)
- 2017-09406; SFAS CH 3 Output Module L513 Discovered with the Top 1/5 Light Lit for Unknown Reason
- 2017-07557; Bolting Overtorqued on Control Room Emergency Ventilation System Condensers

- 2017-07281; SFAS CH 3 L513 Upper 1/5 Light Came on during Testing of SFAS CH 4
- 2017-07154; AFPT 2 Hunting at the HSS
- 2017-07493; SBODG July 2017 Post Job Critique
- 2017-10398; T002 AFP 1 T/E BRG OT Reading Erratic during AFP 1 Monthly Test
- 2017-10430; Leak from Waste Truck
- 2017-09443; AFPT 1 P/E BRG MT Came into Alarm, AFPT 1 Tripped Locally
- 2001-00012; Confusion Exists Regarding the Location of Oil Addition Points on Various Pumps
- 2017-09527; Incorrect AFPT Inboard Bearing Sight Glass Minimum Levels
- 2017-09415; X994 Caldon PC not Transmitting
- 2017-07281; SFAS CH 3 L513 Upper 1/5 Light Came on during Testing of SFAS CH 4
- 2002-06767; LIR-AFW-JCO Inputs not Bounding
- 2017-09817; AFPT 1 O/B Bearing Elevated Temperature
- 2017-09853; CCW Pump 1 Inboard Pump Bearing Oil Level at Low Mark
- 2017-09671; SBODG A/C 2 Oil is Cloudy in Sightglass
- 2017-09685;Evaluate Operator Performance in Response to AFPT #1 Pump End Bearing High Temperature
- 2017-09688; Aux Feed Pump Turbine #1 Elevated Particulate Levels in All Samples from inbd and outb Bearing Reservoirs
- 2017-09536; Aux Feedwater Pump 1 Outboard Vib Probe Mounting Bracket Found Loose
- 2008-33914; SFAS Channel 3 Logic Module L513 1/5 Trip Light
- 2017-09857; #1 Auxiliary Feedwater Pump Exceeded its Allowed Unavailability

Procedures:
- DB-MI-09072; SFAS Documentation for Module Testing; Revision 5
- DB-MM-09014; AFPT Trip Throttle Valve Maintenance; Revision 11
- DB-MM-09098; 040 Spherical Bearing; Revision 14
- DB-MM-09098; AFPT Governor Maintenance; Revision 14
- DB-MM-09150; AFPT Maintenance; Revision 15
- DB-OP-06334; Station Blackout Diesel Generator Operating Procedure; Revision 24
- DB-OP-06405; Safety Features Actuation System Procedure; Revision 14
- DB-SC-03112; SFAS Channel 3 Functional Test; Revision 15
- DB-SC-03113; SFAS Channel 4 Functional Test; Revision 16
- DB-SC-03115; SFAS Output Logic Test for Actuation Channel 1; Revision 07 (Total Rewrite)
- DB-SC-03115; SFAS Output Logic Test for Actuation Channel 1; Revision 7
- DB-SC-04273; SBODG Overspeed Trip Test; Revision 09
- DB-SP-03160; AFP 2 Quarterly Test; Revision 29
- DB-SP-04150; AFP 1 Monthly Test; Revisions 17-18
- DB-SP-04159; AFP 2 Monthly Test; Revision 19
- DB-SP-03151; AFP 1 Quarterly Test; Revision 25

Work Orders:
- 200607211; PM 6572 ISC38C Inspect / Overhaul
- 200727504; Troubleshoot AFPT 1 Trip Throttle Valve
- 200724601; SFAS Channel 3 L513 Upper 1/5 Light Is On
- 20063401; Auxiliary Feed Pump 1 Maintenance
- 20063401; Auxiliary Feed Pump 1 Oil Maintenance
- 200679819; Auxiliary Feed Pump 1 Bearing Maintenance
- 200690770; DB-SUB050-01 Auxiliary Feedwater Pump Turbines
- 200000249; Auxiliary Feed Pump Turbine 1-1

Drawings:
- M-036-00021; Vendor Manual Page 196
- M-36-66-1; Section - Turbine

Notifications:
- 601034681; Evaluation AFPT TTV 1
- 601035258; DB-SP-04150 TTV Steps
- 601117142; SFAS Channel 3 L513 Upper 1/5 Light is on
- 601127991; SFAS Channel 3 Output Module L513 1/5 Light is on

Other:
- NRC EN 49923; 10 CFR Part 21 Letter; Dresser-Rand Company
- RBC Vendor Catalog; Precision Special Purpose Series; Four-Piece – Metal-to-Metal
- Unit Log; Various
- Woodward Governor Vendor Manual 36627

1R22 Surveillance Testing

Condition Reports:
- 2016-06927; Consistent Negative Values Observed on RCS Unidentified Leakage
- 2016-09064; System Monitoring - Exceedance of Normal Monitoring Criteria for Rate of Change of Identified Leak Rate
- 2017-03375; RCS Integrated Leakage Program Action Level Tier III Criteria Exceeded
- 2017-06819; DB-SP-03357, RCS Water Inventory Balance, Elevated Calculated Unidentified Value
- 2017-07358; Potential Over Stressed Piping Due to Isolated Flow Path - Near Miss
- 2017-07701; System Monitoring - Slight Increasing Trend in Unidentified Leakage Rate
- 2017-07804; RCS Integrated Leakage Program Tier I Standard Action Level Exceedance
- 2017-08127; HP1556 Will not Close due to Damaged Threads
- 2017-08160; DB-SP-03357, RCS Water Inventory Balance, Elevated Calculated Unidentified Value
- 2017-08338; System Monitoring – DB-SP-03357, RCS Water Inventory Balance, Leakage Values Impacted by Change in Pressurizer Operation
- 2017-08569; RCS Integrated Leakage Program Tier II Standard Action Level Exceedance
- 2017-08723; Add FLEX Valves to Visual Inspection During DB-SP-03218 HPI Train 1 Pump and Valve Test
- 2017-08724; Add FLEX Valves to Visual Inspection During DB-SP-03219 HPI Train 2 Pump and Valve Test
- 2017-08730; HP12 Difficult to Operate
- 2017-08737; NRC Preconditioning Concern - Test Sequencing of HP32 in DB-SP-03218
- 2017-08801; BACC – A Packing Leak was Found On DB-MU6
- 2017-08803; BACC – Packing Leak On DB-MU86
- 2017-08806; BACC MU235 Packing Bonnet Pusher
- 2017-08807; BACC MU30D
- 2017-08812; BACC MU232 Inactive Leak on Packing Bonnet Pusher
- 2017-08816; BACC - Dry/White Packing Leak at MU209
- 2017-08974; BACC Inactive Leak on MU222 Packing
- 2017-08975; BACC MU228 Inactive Boric Acid Leak on Packing
- 2017-08978; BACC MU229 Inactive Leak in Packing Pusher
- 2017-09369; Abnormal RCS Leak Rate Coincident With Abnormal CTMT Sump Pump Out Rate

Procedures:
- DB-CH-03031; Primary-to-Secondary Leakage Determination; Revision 13
- DB-CH-06901; Radiochemistry Test Requirements; Revision 13
- DB-OP-01200; Reactor Coolant System Leakage Management; Revision 13
- DB-PF-03011; ECCS Integrated Train 1 Leakage Test; Revision 18
- DB-SP-03218; HPI Train 1 Pump and Valve Test; Revision 28
- DB-SP-03357; RCS Water Inventory Balance; Revision 19
- EN-DP-01171; Engineering Implementation of the RCS Integrated Leakage Program; Revision 3
- NG-EN-00327; RCS Integrated Leakage Program; Revision 2
- NOP-ER-2001; Boric Acid Corrosion Control Program; Revision 12

Work Orders:
- 200709426; MU171 Simple Troubleshooting Plan

Drawings:
- M-0030A; Reactor Coolant System; Revision 72
- M-033A; High Pressure Injection; Revision 48
- OS-003; High Pressure Injection; Revision 39

Calculations:
- C-ME-052.01-103; MOV Thrust / Torque Calculation for HP31; Revision 5
- C-ME-052.01-108; MOV Thrust / Torque Calculation for HP32; Revision 2
- C-ME-099.16.010; Check Valve Design Basis Analysis; Revision 2

1EP6 Drill Evaluation

Condition Reports:
- 2017-08290; EP Drill: Emergency Operations Facility Performance Summary
- 2017-08221; EP Drill: Improvement Opportunity for Clarification on NOP-LP-1103 Attachment 2: Item 17a, 10 CFR 73.55(p) 50.54(x), and 50.54(y)
- 2017-08351; EP Drill: 8-8-17 OSC Performance Summary
- 2017-08256; EP Drill: Joint Information Center-8/8/2017 Drill Improvement Opportunities
- 2017-08300; EP Drill: 8-8-17 Simulator Debrief Comments
- 2017-08381; EP Drill: 8/8/17 TSC Summary

Other:
- Emergency Preparedness Integrated Drill Scenario; August 8, 2017

4OA5 Other Activities

Condition Reports:
- 2016-12826; DB's Recently Procured Dry Cask Canisters Cannot be Used Due to an NRC Apparent Violation Against a 72.48 Performed by TN
- 2016-11836; Assumptions Made during the Fuel Selection of the 2017 Davis-Besse Dry Cask Loading Are Not Valid
- 2017-08876; Calculation VA03/B001-007
- 2017-08874; Cask Crane Trolley Mechanical Stops
- 2017-07500; Cask Crane Equilizer Hydraulic Shocks
- 2017-07256; HSM #5 Concrete Temperature Indicating Less Than Ambient Temperature

- 2017-07207; Dry Cask Storage Project: DSC #5: Annulus Shielding Degraded During Welding Activities
- 2017-07159; Dry Cask Storage Penetrant Testing Procedure
- 2017-07148; As Found Condition of Equipment, Dry Fuel Project
- 2017-07144; Foreign Material Found During Fuel Validation
- 2017-07140; Dry Cask Storage Wrong Calculation Revision Referenced
- 2017-07114; Cask Crane Concrete Corbel Seismic Load Discrepancy
- 2017-07084; Cask Crane Auxiliary Building Seismic Analysis
- 2017-06976; Identified Need for Additional Information Supporting Davis-Besse UT Campaigns
- 2017-06750; Procedure Use and Adherence During Dry Fuel Dry Run
- 2017-06741; Dry Shielded Canister #4 Serial Number Discrepancy
- 2017-06124; Dry Cask Storage Procedure Validation
- 2017-05433; Incorrect Concrete Load Combinations for Cask Crane Upgrade
- 2017-04465; Dry Cask Storage Procedure Could Not Be Performed as Written
- 2017-03025; Concrete Design Load Factor Discrepancy Between USAR and DCM
- 2017-06102; Calculation 155170-C-C-00004 Evaluation Methodology Change
- 2017-07588; Tornado Missile Protection for EDG Week Tank Vents

Procedures:
- DB-HP-10000; Radiation Monitor Set Point Control; Revision 9
- DB-MM-06004; Spent Fuel Cask Crane Operation; Revision 10
- DB-MM-12001; Dry Shielded Canister (DSC) Receipt; Revision 1
- DB-MM-12002; Transfer Cask Lift Yoke Receipt; Revision 0
- DB-MM-12003; Transfer Cask Receipt; Revision 0
- DB-MM-12100; Dry Shielded Canister Preparations for Loading; Revision 1
- DB-MM-12150; Transfer Cask Handling for Fuel Loading; Revision 1
- DB-MM-12151; Transfer Cask Handling for Fuel Unloading; Revision 0
- DB-MM-12200; Dry Shielded Canister Processing; Revision 0, Draft C
- DB-MM-12200; Dry Shielded Canister Processing; Revision 0, Draft D
- DB-MM-12200; Dry Shielded Canister Processing; Revision 1
- DB-MM-12201; Dry Shielded Canister Insertion into HSM-H; Revision 1, 3
- DB-MM-12202; Dry Shielded Canister Extraction from HSM-H; Revision 1
- DB-MM-12203; HSM-H Equilibrium Temperature Monitoring; Revision 0
- DB-MM-12300; Guidance for ISFSI Equipment Malfunctions; Revision 0
- DB-MM-12301; Dry Shielded Canister Removal of Field Welds; Revision 0, Draft C
- DB-MM-12301; Dry Shielded Canister Removal of Field Welds; Revision 0, Draft E
- DB-MM-12301; Dry Shielded Canister Removal of Field Welds; Revision 0
- DB-MN-00006; Control of Lifting and Handling Heavy Loads; Revision 17
- EN-DP-01511; Structures Monitoring; Revision 07
- HTPT-DSC-AREVA; High Temperature Liquid Penetrant (PT) Examination Using the Color Contrast Solvent-Removable Method; Revision AREVA TN-04, AREVA TN-00
- MSLT-DSC-AREVA; Helium Mass Spectrometer Leak Test Procedure Dry Fuel Storage Container; Revision AREVA TN-01
- NOBP-OP-0007; Conduct of Infrequently Performed Tests or Evolutions; Revision 05
- NOBP-OP-1015; Event Notifications; Revision 7
- NOP-LP-2601; Procedure/Work Instruction Use and Adherence; Revision 05
- NOP-LP-4013; Evaluations of Changes, Tests and Experiments For Independent Spent Fuel Storage Installations; Revision 02
- NOP-OP-1015; Event Notifications; Revision 5
- NOP-OP-4107; Radiation Work Permit; Revision 16

- NUH-06-106M; Maintenance & Modification Procedure for the NUHOMS OS197-1 Transfer Cask Lifting Yoke and Other TN-owned Lifting Yokes; Revision 4
- NUH-07-138; NUHOMS DSC Mechanical Cutting System Operations Manual; Revision 0
- NUH-08-132; NUHOMS DSC Cover Removal Procedure; Revision 0, Draft
- RA-EP-01500; Emergency Classification; Revision 15
- SPM 5.5; RKI Eagle Model 101-TRB Hydrogen Monitor Operating Procedure; Revision 3
- SPM 9.10; NUHOMS – 32PTH1 DSC Closure Procedure; Revision 0
- SPM 9.1c; Filler Metal Control; Revision 4

Work Orders:
- 200705679; Perform Internal & NRC Observation for Welding, Drying, and Backfill Activities at the Satellite & Onsite Locations
- 200713731; DSC Welding Dry Run Welding Exercise at AREVA-TN Aiken, SC

Drawings:
- 61599-200; OS200 Cask Lifting Yoke Assembly; Revision 1
- D-21416-0300 61; 130T Top Running SFP Trolley, Main Hoist Equalizer Shock Assembly, Revision 0
- D-21416-0300 63; 130T Top Running SFP Trolley, Main Hoist Reeving Diagram, Revision 0
- NUH32PTH1-4015; NUHOMS 32PTH1 & 32PTH1 Type 2-W (Wide) Transportable Canister for PWR Fuel Closure Installation; Revision 1

Calculations:
- 13410-0208; HSM Missile Impact Analysis of 100 ft High-Mast Lighting Pole Collapse; Revision 0
- 13410-0209; Seismic Reevaluation of HSM 80 Loaded with a 24P DSC at the Davis-Besse Site; Revision 0
- 13410-0210; Seismic Reevaluation of HSM H Loaded with a 32PTH1 DSC at the Davis-Besse Site; Revision 0
- 13410-EE-008; Determination of HSM Dose Rate Limits to Meet CoC 1004 Amendment 13 Technical Specification 5.4.1; Revision 0
- 14Q3274-CAL-001; Dynamic Finite Element Analysis of Rope Break Event on 130 Ton Crane at Davis-Besse Nuclear Power Plant; Revisions 0, 1, and 2
- 155170-C-C-00001; Evaluation of Underground Utilities Under Haul Path for the Dry Cask Storage; Revision 2
- 155170-C-C-00003; ISFSI Pad Structural Capacity Qualification; Revision 2
- 155170-C-C-00004; Auxiliary Building Structural Qualification; Revisions 3, 4, and 5
- 155170-C-C-00005; Nitrogen Cylinder Missile Analysis and Barrier Wall Design; Revision 1
- 155170-R-M-000002; Hazards Evaluation for Dry Fuel Storage During Transport, Loading and Storage; Revision 0, 2, 3
- 61599-02; OS200 Lifting Yoke Structural Analysis; Revision 7
- CAL-21416-ME-001; Trolley Wheel Loads; Revision 1
- CAL-21416-ME-002; Bridge Wheel Loads; Revision 0
- CAL-21416-ME-300; Trolley Bumpers; Revision 0
- CAL-21416-ME-320; Main Hoist Drive System; Revision 1
- CAL-21416-ME-340; Main Hoist Wire Rope Drum; Revision 3
- CAL-21416-ME-360; Main Hoist Upper Block & Equalizer Assembly; Revision 1
- CAL-21416-ME-750; Main Hoist Lower Block; Revision 1
- CAL-21416-SE-001; Crane Structural Analysis & Evaluation; Revision 2
- CAL-21416-SE-016; Vertical Deflection and Broken Rope Displacement; Revision 0
- C-NF-062.02-054; Davis-Besse Nuclear Fuel Characterization; Revision 0

- C-NF-062.02-055; Davis-Besse Fuel Assembly Selection for the 2017 Dry Cask Loading Campaign; Revision 0, 1
- NUH32PTH1-0422; NUHOMS HSM-H Air Temperature Rise vs. Decay Heat Loads; Revision 0
- VA03/B01-006; Analysis & Design of Fuel Handling Wall – Area 8; Revision 0
- VA03/B01-007; 140T Cask Crane Bracket; Revision 0

Other:
- 10 CFR 50.59 Screening No. 15-03796; ECP 15-0089, ISFSI Haul Path; Revision 0
- 10 CFR 50.59 Screening No. 16-00458; Aux Bldg Upgrades for Support of Spent Fuel Dry Storage; Revision 2
- 10 CFR 50.59 Screening No. 16-01463; Cask Crane H4_MC Single Failure Proof Upgrade; Revision 0, 1
- 10 CFR 50.59 Screening No. 16-02416; ECP 15-0089-002, ISFSI Haul Path and Underground Mitigation – Electrical Interference; Revision 0
- 10 CFR 72.48 Screening No. 16-03130; Dry Cask Storage, Independent Spent Fuel Storage Installation (ISFSI Parent); Revision 1
- 13410-EE-011; Engineering Evaluation Document: Davis-Besse Nuclear Power Station (DBNPS), Heavy Loads Summary for Pool-to-Pad Operational Evolutions; 01/19/16
- 13410-ER-002; Engineering Records Document: Davis-Besse Nuclear Power Station (DBNPS), Cask Handling Crane Interface with ISFSI Equipment Design Inputs; 05/03/16
- 13410-ER-010; Engineering Records Document: Davis-Besse Nuclear Power Station (DBNPS), AREVA-TN Input to the FENOC 72.212 Report; Revision 0
- ALARA Plan 2017-1051; Independent Spent Fuel Storage Installation (ISFSI) Loading Campaign; Revision 0
- Davis-Besse ISFSI Loading Contingency Plan
- Davis-Besse Nuclear Power Station Emergency Plan; Revision 31
- Davis-Besse Nuclear Power Station ISFSI 10 CFR 72.212 Evaluation Report; Revision 0
- Davis-Besse Nuclear Power Station, Unit No. 1 ISFSI 10 CFR Part 72 Regulatory Compliance Matrix
- Davis-Besse USAR Change Notice 16-069
- Davis-Besse USAR Change Notice 16-105
- DBRM-EMER-1500A; Davis-Besse Emergency Action Level Basis Document; Revision 07
- DIR-21416-ME-001; Design Input: Basic Functional / Performance Requirements; Revision 1
- DIR-21416-ME-002; Design Input: Mechanical Component Design Basis–Main Hoist; Revision 1
- DIR-21416-ME-004; Design Input: Mechanical Component Design Basis–Trolley; Revision 1
- ECP 15-0089; ISFSI Haul Path and Underground Mitigation; Revision 1
- ECP 15-0090-000; Auxiliary Building Modifications; Revision 0
- ECP 15-0094; Cask Crane H4_MC Single Failure Proof Upgrade; Revision 0, 1
- EER 601107913; Mobile Crane to support HSM Loading; 06/02/2017
- Evaluation of the NUHOMS Dry Fuel Storage System for Use at the Davis-Besse Nuclear Power Station As Required by 10 CFR Part 72, Subpart K; Revision 0
- FENOC Quality Assurance Program Manual; Revision 21
- First Energy Davis-Besse Nuclear Power Station 2017 ISFSI Dry Run Training Exercise; Revision 0
- First Energy Davis-Besse Nuclear Power Station April 18 – 21, 2017 NRC Welding Demonstration in Aiken, SC; 06/15/17
- M-084Q; Specification for Spent Fuel Cask Crane Upgrade; Revision 3
- MS-C-15-03-30; Fleet Oversight Audit Report
- MS-C-17-03-30; Fleet Oversight Audit Report

- NUH-08-113.13; Equipment Use Certificate; 05/17/2017
- NUH32PTH1-10100; Specification for Generic Temperature Monitoring of NUHOMS HSM-H Loaded with 32PTH1 DSC with 31.2 kW and 40.8 kW Decay Heat Loads; Revision 0
- Regulatory Applicability Determination 15-03796; ECP 15-0089, ISFSI Haul Path; Revision 0
- Regulatory Applicability Determination 16-01463; Cask Crane H4_MC Single Failure Proof Upgrade; Revision 0
- Regulatory Applicability Determination 16-02416; ECP 15-0089-002, ISFSI Haul Path and Underground Mitigation – Electrical Interference; Revision 0
- REP-21416-003; NUREG-0554-0612 Matrix; Revision 1
- REP-21416-005; List of Critical Components; Revision 1
- REP-21416-009; Factory Load Test Procedure for 130/20/1T Spent Fuel Cask Crane; Revision 1
- TN Corrective Action Report 2017-127; Revision 0
- TN Corrective Action Report 2017-138; Revision 0
- TN Corrective Action Report 2017-216; Revision 0
- TN Training Matrix; 05/22/2017
- NRC Event Notification 52865; Potential tornado Missile Vulnerabilities
- Davis Besse Licensee Event Report 2017-001-00, “Emergency Diesel Generator Fuel Oil Storage Tank Vents not Adequately Protected from Tornado-Generated Missiles”
- NRC Memorandum EGM 15-002; Enforcement Guidance Memorandum 15-002, Enforcement Discretion for Tornado-Generated Missile Protection Noncompliance

## LIST OF ACRONYMS USED

| | |
|---|---|
| ACI | American Concrete Institute |
| ADAMS | Agencywide Document Access Management System |
| AFP | Auxiliary Feedwater Pump |
| AISC | American Institute of Steel Construction |
| ASME | American Society of Mechanical Engineers |
| CAP | Corrective Action Program |
| CFR | *Code of Federal Regulations* |
| CoC | Certificate of Compliance |
| CR | Condition Report |
| DCM | Design Criteria Manual |
| DRP | Division of Reactor Projects |
| DSC | Dry Shielded Canister |
| ECP | Engineering Change Package |
| EDG | Emergency Diesel Generator |
| FSAR | Final Safety Analysis Report |
| HSM | Horizontal Storage Module |
| IMC | Inspection Manual Chapter |
| IP | Inspection Procedure |
| ISFSI | Independent Spent Fuel Storage Installation |
| kips | kilo-pounds |
| LER | Licensee Event Report |
| NCV | Non-Cited Violation |
| NEI | Nuclear Energy Institute |
| NRC | U.S. Nuclear Regulatory Commission |
| PT | Dye Penetrant Testing |
| RP | Radiation Protection |
| SDP | Significance Determination Process |
| SSC | Systems, Structures, and Components |
| TC | Transfer Cask |
| TN | Transnuclear |
| TS | Technical Specification |
| USAR | Updated Safety Analysis Report |
| URI | Unresolved Item |
| UT | Ultrasonic Testing |