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

October 21, 2015

Mr. Brian Boles
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 05000346/2015003

Dear Mr. Boles:

On September 30, 2015, the U.S. Nuclear Regulatory Commission (NRC) completed an integrated inspection at your Davis-Besse Nuclear Power Station. The enclosed report documents the results of this inspection, which were discussed on October 6, 2015, with you and other members of your staff.

Based on the results of this inspection, one self-revealed finding of very low safety significance was identified. The finding did not involve any violation of NRC requirements.

If you contest the subject or severity of this finding, 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 a copy to the Regional Administrator, U.S. Nuclear Regulatory Commission–Region III, 2443 Warrenville Road, Suite 210, Lisle, IL 60532–4352; the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, DC 20555–0001; and the Resident Inspectors' Office at the Davis-Besse Nuclear Power Station.

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

Sincerely,

/RA/

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

Docket No. 50–346
License No. NPF–3

Enclosure:
Inspection Report 05000346/2015003
w/Attachment: Supplemental Information

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U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket No:	50–346
License No:	NPF–3
Report No:	05000346/2015003
Licensee:	FirstEnergy Nuclear Operating Company (FENOC)
Facility:	Davis-Besse Nuclear Power Station
Location:	Oak Harbor, OH
Dates:	July 1, 2015, through September 30, 2015
Inspectors:	D. Kimble, Senior Resident Inspector T. Briley, Resident Inspector D. Passehl, Senior Reactor Analyst J. Rutkowski, Project Engineer P. Smagacz, Resident Inspector – Fermi Station J. Wojewoda, Acting Resident Inspector
Approved by:	J. Cameron, Chief Branch 4 Division of Reactor Projects

Enclosure

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SUMMARY OF FINDINGS

Inspection Report (IR) 05000346/2015003; 07/01/2015 – 09/30/2015; Davis-Besse Nuclear Power Station; Follow-Up of Events and Notices of Enforcement Discretion.

This report covers a 3-month period of inspection by resident inspectors. One self-revealed Green finding was identified. The finding was not considered a violation of U.S. Nuclear Regulatory Commission (NRC) regulations. The significance of inspection findings is indicated by their color (i.e., greater than Green, or Green, White, Yellow, Red) and determined using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process" dated June 2, 2011. Cross-cutting aspects are determined using IMC 0310, "Aspects Within the Cross-Cutting Areas" effective date December 4, 2014. All violations of NRC requirements are dispositioned in accordance with the NRC's Enforcement Policy dated February 4, 2015. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG–1649, "Reactor Oversight Process" Revision 5, dated February 2014.

Cornerstone: Initiating Events

- Green. A self-revealed finding of very low safety significance was identified for the licensee's failure to maintain an adequate flow accelerated corrosion (FAC) program in accordance with station procedures and applicable industry guidance. Specifically, an incorrect restriction orifice size entered into the FAC program software in the late 1980s significantly underestimated the wear rate of a section of moisture separator reheater (MSR) piping that ultimately failed causing control room operators to conduct a rapid power reduction and manual reactor trip and declare an unusual event in accordance with the station's emergency plan. The failed section of piping had not been previously inspected in accordance with industry guidance and station procedures, and the incorrect FAC program software inputs had never been validated.

  This finding was associated with the Initiating Events Cornerstone of reactor safety and was of more than minor significance because it directly impacted the cornerstone objective to limit the likelihood of events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. The inspectors evaluated the finding using IMC 0609, Appendix A, "The Significance Determination Process for Findings At-Power." Using Exhibit 1, which contains the screening questions for the Initiating Events Cornerstone of Reactor Safety, the inspectors determined a detailed risk evaluation was required because the finding was a transient initiator that resulted in both a reactor trip and the loss of mitigation equipment relied upon to transition the plant from the onset of the trip to a stable shutdown condition (i.e., the loss of the main condenser as a heat sink and the loss of main feedwater). The inspectors contacted the NRC Region III Senior Reactor Analyst (SRA) to perform a detailed risk evaluation. The assumed core damage sequence used by the SRA was that the MSR pipe break occurs, followed by either main steam isolation valve (MSIV) failing to close, followed by any of four in-series main turbine stop valves (SVs) and control valves (CVs) failing to close. Mathematically, the change in core damage frequency (ΔCDF) was estimated at:

  ΔCDF = 1 (event occurs) x (9.51E-4 + 9.51E-4) x 4 x 1.5E-3 x 1.5E-3 = 1.71E-8/yr

  The SRA concluded the risk associated with this performance deficiency was, therefore, of very low safety significance (Green). Because the causes for the finding stemmed from deficiencies going back several years or more, the inspectors concluded that the

finding represented a latent issue not necessarily indicative of present licensee performance. As a result, no cross cutting aspect was assigned to this finding. (Section 4OA3.2)

REPORT DETAILS

Summary of Plant Status

The unit began the inspection period operating at full power. On September 20, 2015, plant power was reduced and ultimately stabilized at approximately 92 percent to facilitate repairs to a tube leak on the No. 2-4 High Pressure Feedwater Heater. Following completion of the repair activities, plant operators returned the unit to full power operation on September 25, 2015. The unit then continued to operate at or near full power for the remainder of the inspection period.

1. REACTOR SAFETY

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

1R04 Equipment Alignment (71111.04)

.1 Quarterly Partial System Alignment Verifications

a. Inspection Scope

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

- Emergency Diesel Generator (EDG) No. 1 and No. 2 while the Station Blackout Diesel Generator (SBODG) was out of service for planned maintenance during the week ending July 18, 2015;
- The station's Diesel Fire Pump and auxiliaries while the Electric Fire Pump was out of service for planned maintenance during the week ending August 1, 2015;
- The station's Electric Fire Pump and auxiliaries while the Diesel Fire Pump was out of service for planned maintenance during the week ending August 15, 2015; and
- The SBODG while No. 1 EDG was out of service for planned surveillance testing during the week ending September 26, 2015.

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, Updated Safety Analysis Report (USAR), technical specification (TS) requirements, outstanding work orders (WOs), condition reports (CRs), and the impact of ongoing work activities on redundant trains of equipment in order to identify conditions that could have rendered the systems incapable of performing their intended functions. The inspectors also walked down accessible portions of the systems to verify system components and support equipment were aligned correctly and operable. The inspectors examined the material condition of the components and observed operating parameters of equipment to verify that there were no obvious deficiencies. The inspectors also verified that the licensee had properly identified and resolved equipment alignment problems that could cause initiating events or impact the capability of mitigating systems or barriers and entered them into the Corrective Action Program (CAP) with the appropriate significance characterization. Documents reviewed are listed in the Attachment to this report.

These activities by the inspectors constituted four partial system alignment verification inspection samples as defined in Inspection Procedure (IP) 71111.04–05.

b. Findings

No findings were identified.

.2 Semi-Annual Complete System Alignment Verification

a. Inspection Scope

During the week ending July 25, 2015, the inspectors performed a complete system alignment inspection of the station's service water (SW) system to verify the functional capabilities of the system. This system was selected because SW is considered both important to safety and risk-significant in the licensee's probabilistic risk assessment. The inspectors physically inspected accessible system components and piping to verify 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 WOs was performed to determine whether any deficiencies significantly affected the system function. In addition, the inspectors reviewed the licensee's CAP 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 a single annual complete system alignment verification inspection sample as defined in IP 71111.04–05.

b. Findings

No findings were identified.

1R05 Fire Protection (71111.05)

.1 Quarterly Fire Protection Zone Inspections

a. Inspection Scope

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

- Air Conditioning Equipment Room, Records and Storage Area, and Air Conditioning Equipment Room Vestibule (Rooms 603, 603A, and 603B – Fire Area HH) during the weeks ending July 11, 2015, and July 18, 2015;
- High Voltage Switchgear Room B (Room 323 – Fire Area Q), with emphasis on the large amount of scaffolding being used in the room for planned maintenance activities, during the week ending July 25, 2015;
- Electrical Penetration Room No. 1 (Room 402 – Fire Area DG) during the week ending July 25, 2015;

- Electrical Penetration Room No. 2 (Room 427 – Fire Area DF) during the week ending July 25, 2015; and
- Service Building No. 6, with emphasis on the SBODG and its auxiliaries, during the week ending July 25, 2015.

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

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

b. Findings

No findings were identified.

1R06 Flood Protection Measures (71111.06)

.1 Internal Flooding

a. Inspection Scope

The inspectors conducted internal flooding reviews for:

- Auxiliary Feedwater (AFW) Pump Room No. 1 (Room 237) during the weeks ending August 15, 2015, and August 22, 2015; and
- AFW Pump Room No. 2 (Room 238) during the weeks ending August 15, 2015, and August 22, 2015.

The inspectors reviewed flood analyses and design documents, including the USAR, engineering calculations, and abnormal operating procedures to identify licensee commitments. In addition, the inspectors reviewed licensee drawings to identify areas and equipment that may be affected by internal flooding caused by the failure or misalignment of nearby sources of water, such as the fire suppression or cooling tower makeup systems. The inspectors also reviewed the licensee's corrective action documents with respect to past flood-related items identified in the CAP to verify the adequacy of the corrective actions. The inspectors performed physical walkdowns of the above noted plant areas to assess the adequacy of watertight boundaries/barriers and verify drains and sumps were clear of debris and were operable, and that the licensee

had complied with applicable commitments. Specific documents reviewed during this inspection are listed in the Attachment to this report.

The inspectors' reviews constituted two internal flooding inspection samples 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 Simulator Training

a. Inspection Scope

On the dates indicated, the inspectors observed separate crews of licensed operators in the plant's simulator during the performance of unannounced graded crew simulator casualty drill scenarios:

- September 1, 2015; and
- September 15, 2015.

The inspectors verified that operator performance was adequate, evaluators were identifying and documenting crew performance problems, and that training was being conducted in accordance with licensee procedures. In addition, the inspectors verified that the licensee's personnel were observing NRC examination security protocols to ensure that the integrity of the scenarios was being protected from being compromised. The inspectors evaluated the following areas:

- Licensed operator performance;
- The clarity and formality of communications;
- The ability of the crews to take timely and conservative actions;
- The crews' prioritization, interpretation, and verification of annunciator alarms;
- The correct use and implementation of abnormal and emergency procedures by the crews;
- Control board manipulations;
- The oversight and direction provided by licensed Senior Reactor Operators (SROs); and
- The ability of the crews to identify and implement appropriate TS actions and Emergency Plan actions and notifications.

The crews' 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.

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

b. Findings

No findings were identified.

.2 Resident Inspector Quarterly Observation of Operator Activities in the Control Room and in the Plant

a. Inspection Scope

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

- Scheduled reactor protection system (RPS) control rod drive (CRD) trip breaker testing and associated unit power maneuvers during the week ending July 11, 2015;
- AFW Pump No. 1 monthly functional testing during the week ending July 25, 2015;
- Swap of component cooling water (CCW) auxiliary / nonessential loads from CCW Loop No. 2 to CCW Loop No. 1 during the week ending August 1, 2015;
- Entry into the station's abnormal operating procedure for the instrument air system following the unexpected trip of Station Air Compressor (SAC) No. 2 during the week ending August 15, 2015;
- Periodic CRD mechanism testing and associated unit power maneuvers during the week ending September 12, 2015;
- Periodic main turbine valve testing during the week ending September 12, 2015; and
- Power maneuvers and associated feedwater heater isolation to facilitate emergent maintenance on High Pressure Feedwater Heater E4-2 during the week ending September 26, 2015.

The inspectors evaluated the following areas during the course of the control room and in-plant observations:

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

The crew's performance in these areas was compared to pre-established operator action expectations and successful critical task completion requirements. Documents reviewed are listed in the Attachment to this report.

These observation activities by the inspectors of operator performance in the station's control room and in the plant constituted a single quarterly inspection sample as defined in IP 71111.11–05.

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness (71111.12)

.1 Routine Quarterly Evaluations

a. Inspection Scope

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

- The station's SW system, with particular emphasis on the system's pumps and motors.

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

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

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

These maintenance effectiveness review activities conducted by the inspectors constituted a single inspection sample as defined in IP 71111.12–05.

b. Findings

No findings were identified.

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

.1 Maintenance Risk Assessments and Emergent Work Control

a. Inspection Scope

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

- Corrective maintenance to troubleshoot and re-calibrate the hot leg (T-Hot) resistance temperature detector (RTD) associated with RPS Channel 1 following instrument drift during the week ending July 18, 2015;
- Emergent maintenance activities to troubleshoot and repair the -24 Vdc Non-Nuclear Instrumentation (NNI) X Power Supply No. 4 during the week ending August 1, 2015;
- Diagnostic testing, consisting of vendor supported cable characterization (CHAR) testing, for the RPS Channel 1 T-Hot RTD and the Safety Features Actuation System (SFAS) Channel 4 borated water storage tank (BWST) level transmitter during the week ending August 15, 2015;
- Inspection of the reactor containment at-power (high radiological risk) during the week ending September 19, 2015; and
- Planned emergent repairs to tube leaks identified on the No. 2-4 High Pressure Feedwater Heater.

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. Specific documents reviewed during this inspection are listed in the Attachment to this report.

The inspectors' review of these maintenance risk assessments and emergent work control activities constituted five inspection samples as defined in IP 71111.13-05.

b. Findings

No findings were identified.

1R15 Operability Determinations and Functionality Assessments (71111.15)

.1 Operability Evaluations

a. Inspection Scope

The inspectors reviewed the following issues:

- The operability of the T-Hot RTD associated with RPS Channel 1, as discussed in CR 2015-08171;
- The operability and seismic qualifications associated with the CCW surge tank, as discussed in CR 2015-09399;
- The functional capabilities of Door No. 105 and the operability of associated systems when the door was found ajar and unlatched, as discussed in CR 2015-08359;
- The operability and functionality of AFW Train 2 when the capabilities of the associated safety-related SW supply was degraded by the inadvertent inoperability of the SW Train No. 2 Nonessential Header Isolation Valve, SW1395, as discussed in CR 2015-08774;
- The operability and functionality of several plant structures and associated safety-related equipment following notification by an offsite engineering vendor of issues with the response spectrum for seismic loading when using Bentley software STAAD.PRO, as discussed in CRs 2015-10400 and 2015-10482; and
- The operability and functionality of Decay Heat Pump No. 2 following the identification of a high oil level in the pump outboard bearing reservoir, as discussed in CR 2015-09561.

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

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

b. Findings

No findings were identified.

1R18 Plant Modifications (71111.18)

.1 Temporary Plant Modification

a. Inspection Scope

The inspectors reviewed the following temporary change to the facility:

- Engineering Change Package (ECP) No. 15-0353: "Modify T-Hot RTD Instrumentation Wiring Associated with RPS Channel 1 to Reduce Instrument Drift."

The inspectors reviewed the temporary configuration changes and associated 10 CFR 50.59 safety evaluation documents against the design basis, the USAR, and the TS to verify that the temporary change to the facility did not affect the operability or availability of any safety-related systems, or systems important to safety. The inspectors observed ongoing and completed work activities to ensure that the modification was installed as directed and consistent with the design control documents; that the modification operated as expected; and that operation of the modification did not impact the operability of any interfacing systems. The inspectors verified that relevant procedure, design, and licensing documents were properly updated. For this temporary facility change, the inspectors also reviewed the licensee's plans for removal and the long-term solutions to the issue. Finally, the inspectors discussed the plant modification with operations, engineering, and training department personnel to ensure that the individuals were aware of how the operation with the modification in place could impact overall plant performance. Documents reviewed in the course of this inspection are listed in the Attachment to this report.

The inspectors' review of this temporary plant modification constituted a single inspection sample as defined in IP 71111.18–05.

b. Findings

No findings were identified.

.2 Permanent Plant Modification

a. Inspection Scope

The inspectors reviewed the following permanent change to the facility:

- ECP No. 13–0464: "FLEX Service Water Modification."

The inspectors reviewed the configuration changes and associated 10 CFR 50.59 safety evaluation documents against the design basis, the USAR, and the TS, as applicable, to verify that the permanent change to the facility did not affect the operability or availability of any safety-related systems, or systems important to safety. The inspectors observed ongoing and completed work activities to ensure that the modification was installed as directed and consistent with the design control documents; that the modification operated as expected; and that operation of the modification did not impact the operability of any interfacing systems. The inspectors verified that relevant procedure, design, and licensing documents were properly updated. Finally, the inspectors discussed the plant modification with operations, engineering, and training department personnel to ensure that the individuals were aware of how the operation with the modification in place could impact overall plant performance. Documents reviewed in the course of this inspection are listed in the Attachment to this report.

The inspectors' review of this permanent plant modification constituted a single inspection sample as defined in IP 71111.18–05.

b. Findings

No findings were identified.

1R19 Post-Maintenance Testing (71111.19)

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

a. Inspection Scope

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

- Operational and functional testing of the No. 1 Make Up Pump following planned maintenance during the week ending July 4, 2015;
- Operational and functional testing of the No. 1 SW Pump and establishment of baseline inservice testing (IST) parameters following replacement of the pump and motor during the week ending July 4, 2015;
- Operational and functional testing of 345 KV Circuit Breaker No. 34564 following planned replacement during the week ending July 11, 2015;
- Operational and functional testing of MU23, Boric Acid Pumps Pneumatic Discharge CV, following planned maintenance during the weeks ending July 11, 2015, and July 18, 2015; and
- Operational and functional testing of No. 1 EDG following scheduled preventative maintenance on the DA30 air starting motors during the week ending August 1, 2015.

These activities were selected based upon the SSC's ability to impact risk. The inspectors evaluated these activities for the following (as applicable): the effect of testing on the plant had been adequately addressed; testing was adequate for the maintenance performed; acceptance criteria were clear and demonstrated operational readiness; test instrumentation was appropriate; tests were performed as written in accordance with properly reviewed and approved procedures; equipment was returned to its operational status following testing (temporary modifications or jumpers required for test performance were properly removed after test completion); and test documentation was properly evaluated. The inspectors evaluated the activities against TSs, the 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 the PMTs to determine whether the licensee was identifying problems and entering them in the CAP and that the problems were being corrected commensurate with their importance to safety. Documents reviewed are listed in the Attachment to this report.

The inspectors' reviews of these activities constituted five PMT inspection 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 results for the following testing 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:

- Baseline functional and operability testing of No. 1 SW Pump following replacement of the pump and motor during the weeks ending July 4, 2015, and July 11, 2015 (inservice test);
- Monthly leakage testing of the spent fuel pool (SFP) utilizing the pool's leakage collection system during the week ending July 17, 2015 (routine); and
- Periodic main turbine valve exercise testing during the week ending September 12, 2015 (routine).

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;
- That measuring and test equipment calibration was current;
- That test equipment was used within the required range and accuracy;
- That applicable prerequisites described in the test procedures were satisfied;
- That 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;
- That test data and results were accurate, complete, within limits, and valid;
- That test equipment was removed after testing;
- Where applicable for IST 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, that test results not meeting acceptance criteria were addressed with an adequate operability evaluation or the system or component was declared inoperable;
- Where applicable for safety-related instrument control surveillance tests, that reference setting data were accurately incorporated in the test procedure;
- Where applicable, that actual conditions encountering high resistance electrical contacts were such that the intended safety function could still be accomplished;

- That prior procedure changes had not provided an opportunity to identify problems encountered during the performance of the surveillance or calibration test;
- That equipment was returned to a position or status required to support the performance of its safety functions; and
- That all problems identified during the testing were appropriately documented and dispositioned in the CAP.

As discussed in IP 71111.22, Section -03, the IST inspection sample for the baseline testing of No. 1 SW Pump was combined with inspection samples for equipment alignment (see Section 1R04.2), maintenance effectiveness (see Section 1R12.1), and PMT (see Section 1R19.1) to constitute a vertical slice review of the licensee's SW system.

Documents reviewed are listed in the Attachment to this report.

These activities conducted by the inspectors constituted two routine surveillance testing inspection samples and a single IST 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 Observations

a. Inspection Scope

The inspectors evaluated the conduct of the following planned licensee emergency drill:

- A full scale integrated emergency preparedness (EP) drill conducted on September 29, 2015.

The inspectors observed emergency response operations in the Technical Support Center to determine whether the event classification, notifications, and protective action recommendations were performed in accordance with procedures, and to identify any weaknesses or deficiencies in classification, notification, or protective action recommendation development activities. The inspectors also attended the licensee drill critique to compare any inspector-observed weaknesses with those identified by the licensee staff in order to evaluate the critique and to verify whether the licensee staff was properly identifying weaknesses and entering them into the CAP. As part of their inspection activities, the inspectors reviewed the drill packages for each scenario and other documents listed in the Attachment to this report.

The inspectors' review of this EP drill scenario and other related activities constituted a single inspection sample as defined in IP 71114.06–06.

b. Findings

No findings were identified.

4. OTHER ACTIVITIES

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

4OA1 Performance Indicator Verification (71151)

.1 Mitigating Systems Performance Index - Heat Removal System

a. Inspection Scope

The inspectors sampled licensee submittals for the Mitigating Systems Performance Index (MSPI) - Heat Removal System performance indicator (PI) for the period from the third quarter 2014 through the second quarter 2015. To determine the accuracy of the PI data reported during those periods, PI definitions and guidance contained in the Nuclear Energy Institute (NEI) Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 7, dated August 31, 2013, were used. The inspectors reviewed the licensee's operator narrative logs, issue reports, event reports, MSPI derivation reports, and NRC Integrated IRs for the period of July 2014 through June 2015 to validate the accuracy of the submittals. The inspectors reviewed the MSPI component risk coefficient to determine if it had changed by more than 25 percent in value since the previous inspection, and if so, that the change was in accordance with applicable NEI guidance. The inspectors also reviewed the licensee's issue report database to determine if any problems had been identified with the PI data collected or transmitted for this indicator, and none were identified. Documents reviewed are listed in the Attachment to this report.

The inspectors' reviews constituted a single MSPI - Heat Removal System PI inspection sample as defined in IP 71151-05.

b. Findings

No findings were identified.

.2 Mitigating Systems Performance Index - Residual Heat Removal System

a. Inspection Scope

The inspectors sampled licensee submittals for the MSPI - Residual Heat Removal System PI for the period from the third quarter 2014 through the second quarter 2015. To determine the accuracy of the PI data reported during those periods, PI definitions and guidance contained in the NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 7, dated August 31, 2013, were used. The inspectors reviewed the licensee's operator narrative logs, issue reports, MSPI derivation reports, event reports and NRC Integrated IRs for the period of July 2014 through June 2015 to validate the accuracy of the submittals. The inspectors reviewed the MSPI component risk coefficient to determine if it had changed by more than 25 percent in value since the previous inspection, and if so, that the change was in accordance with applicable NEI guidance. The inspectors also reviewed the licensee's issue report database to determine if any problems had been identified with the PI data

collected or transmitted for this indicator, and none were identified. Documents reviewed are listed in the Attachment to this report.

The inspectors' reviews constituted a single MSPI – Residual Heat Removal System PI inspection sample as defined in IP 71151-05.

b. Findings

No findings were identified.

.3 Mitigating Systems Performance Index - Cooling Water Systems

a. Inspection Scope

The inspectors sampled licensee submittals for the MSPI - Cooling Water Systems performance for the period from the third quarter 2014 through the second quarter 2015. To determine the accuracy of the PI data reported during those periods, PI definitions and guidance contained in the NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 7, dated August 31, 2013, were used. The inspectors reviewed the licensee's operator narrative logs, issue reports, MSPI derivation reports, event reports and NRC Integrated IRs for the period of July 2014 through June 2015 to validate the accuracy of the submittals. The inspectors reviewed the MSPI component risk coefficient to determine if it had changed by more than 25 percent in value since the previous inspection, and if so, that the change was in accordance with applicable NEI guidance. The inspectors also reviewed the licensee's issue report database to determine if any problems had been identified with the PI data collected or transmitted for this indicator, and none were identified. Documents reviewed are listed in the Attachment to this report.

The inspectors' reviews constituted a single MSPI – Cooling Water Systems PI inspection sample as defined in IP 71151-05.

b. Findings

No findings were identified.

4OA2 Identification and Resolution of Problems (71152)

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

a. Inspection Scope

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

actions were commensurate with safety and sufficient to prevent recurrence of the issue. Minor issues entered into the licensee's CAP as a result of the inspectors' observations are included in the Attachment to 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 and documented in Section 1 of this report.

b. Findings

No findings were identified.

.2 Daily Corrective Action Program Reviews

a. Inspection Scope

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

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

b. Findings

No findings were identified.

.3 Follow-Up Sample for In-Depth Review: Review of Long-Term Corrective Actions Related to Spent Fuel Pool Leakage

a. Inspection Scope

The inspectors performed a review of the licensee's CAP and associated documents to assess the adequacy of long-term corrective actions taken in response to the ongoing collection of minor seepage from the SFP by the pool's leakage collection system.

The inspectors' review was predominantly focused on:

- The adequacy of the licensee's engineering evaluations and assessment of the safety significance of the leakage, given its ongoing condition;
- The adequacy of the licensee's actions to collect and contain the leakage within applicable plant SSCs to preclude migration outside the auxiliary building; and
- The long-term adequacy and effectiveness of the licensee's CAP actions to resolve ancillary issues from the ongoing leakage, or specifically: 1) The potential for blockages within the SFP leakage detection system due to the crystallization of boron; and 2) The impact on the SFP concrete from borated water that was forced from the leakage detection system due to such blockages in the past.

This review constituted a single follow-up inspection sample for in-depth review as defined in IP 71152-05. This review was conducted in conjunction with the inspectors' observation of the licensee's monthly SFP leakage surveillance test on July 17, 2015, as discussed in Section 1R22.1 of this report.

b. Background

The SFP is located within the fuel handling area of the station's auxiliary building. The SFP divided into sections consisting of an area for spent fuel storage in racks, an area for the equipment used to transfer fuel assemblies in and out of the reactor containment building, and an area for loading/unloading a fuel storage/transfer cask. The sections can be isolated from one another via installation of watertight gates; when installed, a leak developing in one of the sections during an evolution would only impact the water level in that section. The pool is permanently flooded to provide a minimum of 9.5 feet of water above the top of a fuel assembly when being withdrawn from the fuel transfer tube or storage racks. The SFP volume is approximately 300,000 gallons of borated water at the normal pool surface level elevation of 601.5 feet, and a one inch change in pool level equates to roughly 660 gallons of water. Level indication and alarms are provided in the control room and are available to alert plant operators in the event any type of sizeable leak from the pool.

The SFP is a seismically-qualified reinforced concrete structure that has 5.5 foot thick concrete walls to shield personnel working in the area and is lined with 0.25 inch stainless steel plates. The plates are welded together to form the pool liner, and all of the plate-welded seams back up to leak detection channels. These channels were tack welded to the back side of the liner welded joints before the SFP concrete walls were poured. The leak detection channels drain to 21 zone drain valves and serve as indicators of seepage through any part of the welded joints used to connect the stainless steel liner plates. On a monthly basis, the licensee performs a written test procedure to quantify the leak rate through each of the 21 SFP zone leakage detection channels.

The development of minor seepage of SFP water through a welded seam and collection within the leak detection system is not an exceptional condition within the nuclear industry. Issues with welding processes during construction, for example, can cause such seepage to develop over time. During the 2000 – 2001 timeframe, the licensee noted signs of leakage outside the SFP leak detection channels. The most extensive visible evidence of leakage was on the wall and ceiling of the No. 1 Emergency Core Cooling System (ECCS) Pump Room (Room No. 105). In February 2001, results from the licensee's investigation revealed that several of the 21 SFP zone leakage detection channels had become blocked by boric acid residue, causing the entrapped fluid to be pushed out of the channels and into the surrounding concrete. The licensee cleaned the channels and altered the operational valve lineup for the SFP zone leakage detection system to limit the future probability of blockages due to the crystallization of boric acid. The licensee also evaluated the seepage being collected by the leakage detection channels as inconsequential and began trending the leakage data.

In 2002, an issue was identified at the Salem Generating Station in New Jersey where boric acid residue and minerals had accumulated within the leak collection and detection system for the SFP and, over time, restricted the normal drainage of liquid. The accumulated water, containing tritium, subsequently migrated to other locations through penetrations, concrete construction joints, and cracks and eventually made its way

outside the plant's auxiliary building and into the groundwater around the facility. The NRC issued Information Notice (IN) 2004-05, "Spent Fuel Pool Leakage to Onsite," in response to that event (ADAMS Accession No. ML040580454). At Davis-Besse, the licensee evaluated the external operating experience with respect to their own issues with the SFP. The licensee determined that it was highly unlikely that any SFP leakage could escape from the confines of the auxiliary building. The north, east, and west walls of the SFP, as well as the SFP floor, all are within the interior of the building. The SFP south wall is along an exterior building wall, but it is protected by a waterproof membrane to prevent groundwater from entering the building. Nonetheless, the licensee took soil samples outside the auxiliary building along this wall and analyzed them for various contaminants to ensure that no contamination was present. None was identified.

c. Observations

As discussed in the "Inspection Scope" section above, the inspectors' reviews were focused on several specific areas related to this issue. With respect to the licensee's assessment and evaluation of the safety significance of the leakage and its ongoing nature, the inspectors' reviews verified that the issue is of very minor safety significance and being adequately addressed by the licensee. Through review of the licensee's monthly SFP leakage collection test data going back to 2001, the inspectors determined that the leakage being collected is inconsequential in terms of SFP fluid volume, and indicative of a stable condition. Monthly test data since January 2013 shows a highly stable leakage collection rate between approximately 0.1 gallons/day (gpd) and 0.5 gpd, with an average value of about 0.26 gpd. By comparison, evaporative losses from the SFP require the licensee to make up considerably more inventory on a regular basis. Depending on the environment within the auxiliary building, which varies somewhat with the seasons of the year, plant operators might typically add from 1,000 to 2,000 gallons of demineralized water to the SFP approximately every five to ten days.

The monthly test data examined by the inspectors indicated that the vast majority of the leakage collected (90 percent or more over the past year) came from a single zone within the SFP leakage detection system. The zone, SF-99L, is a SFP floor leakage collection zone located at the southernmost end of the fuel transfer area of the pool. Coincident with a licensee campaign to replace some of their spent fuel storage racks to increase the capacity of the SFP, in 2002 the licensee had divers perform extensive testing of the welded liner seams in the fuel storage rack area, the fuel transfer area, and the storage/transfer cask area of the SFP using vacuum boxes. The results of this testing did not indicate any leaking welded joints, either from the SF-99L zone or any other zone. Based on the review of this information, the inspectors concluded that the ongoing leakage is of very minor significance and is being monitored by the licensee's technical staff at an appropriate frequency and with appropriate thresholds for action should it change.

The inspectors verified that the leakage from the SFP has been and continues to be contained within the auxiliary building. Leakage collected by the SFP zone leakage collection system is ultimately sent to the station's liquid radiological waste system for processing. During the 2000 – 2001 timeframe when some of the leakage detection system lines had become clogged with boric acid deposits and forced leakage to migrate out beyond the leakage collection channels, the inspectors verified that none of the zones involved were along the south SFP wall that is part of the auxiliary building exterior. Additionally, while issues with tritium being detected in groundwater samples

have and continue to occur at the site (see Section 4OA5.2 of this report for the status of the present groundwater tritium issue), none have been or currently are indicative of SFP leakage.

As discussed in the "Background" section above, the licensee responded to the blocked leakage detection channels in 2001 by cleaning them to remove boric acid and other mineral deposits. At that time, the licensee also changed the normal valve lineup for the leakage detection system to minimize the possibility of future blockages. The inspectors reviewed the present methodology for operation of the leakage detection system and found no issues with the licensee's current operational practices. Additionally, the inspectors also reviewed the licensee's periodic planned maintenance for maintaining the leakage detection channels open. The last channel cleaning was performed in July 2014, with the next scheduled for January 2016. The inspectors did not identify any issues with either the maintenance plan or the performance frequency.

As discussed in the NRC's Safety Evaluation Report Related to the License Renewal of Davis-Besse Nuclear Power Station (ADAMS Accession No. ML13248A267), Section 3.0.3, "Aging Management Programs," the licensee committed to the performance of concrete core bores and related testing to determine if the leakage from the SFP had resulted in any adverse impact to the concrete and reinforcing steel for the walls and ceiling of the No. 1 ECCS Pump Room, and other similarly impacted locations. The inspectors reviewed the results of the applicable testing that was performed in November and December 2014 to meet the license renewal application commitments. The testing, which consisted of compression testing of concrete samples for overall strength, petrographic examination (ASTM C856) of the concrete properties, and metallurgical examination of reinforcing bar corrosion products extracted from the samples, revealed no signs of concrete or reinforcing steel degradation.

d. Findings

No findings were identified.

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

.1 (Closed) Licensee Event Report 05000346/2014–004–00: Deficiency in Loss of Coolant Accident Analysis Adversely Affected Predicted Peak Cladding Temperature

On November 25, 2014, the licensee received letters from their nuclear fuel supplier, AREVA, regarding a required notification under the provisions of 10 CFR 50.46, "Acceptance Criteria for ECCSs for Light-Water Nuclear Power Reactors." These documents indicated that certain non-conservatisms were discovered in the methodology application and inputs used by AREVA for nuclear fuel core configurations with the Mark-B-HTP fuel supplied by AREVA and currently in use by the licensee. These non-conservatisms increased the fuel peak cladding temperature (PCT) to a value in excess of the value prescribed in 10 CFR 50.46(b)(1) under certain loss of coolant accident (LOCA) conditions. As discussed in Section 4OA3.1 of NRC Inspection Report 05000346/2014005 (ADAMS Accession No. ML15208A034), the licensee formally reported this issue to the NRC as an unanalyzed condition meeting the requirements for an eight-hour non-emergency report to the NRC under 10 CFR 50.72(b)(3)(ii)(B).

In earlier dialogue with the licensee's staff, AREVA had provided compensatory measures in terms of plant axial imbalance limits and Fq linear heat rate limits associated with reductions in LOCA linear heat rates so that the unit would be operated within the limits set forth in 10 CFR 50.46. The licensee implemented these compensatory measures on October 23, 2014. An analysis of past operating conditions by the licensee's staff indicated that the unit had not exceeded the value prescribed in 10 CFR 50.46(b)(1) for PCT prior to the identification of this issue.

In accordance with the requirements of 10 CFR 50.46(a)(3)(ii), the licensee submitted a written report within 30 days to the NRC regarding this issue (ADAMS Accession No. ML14353A228). The licensee had entered this issue into their CAP as CRs 2014-15953, 2014-16024, and 2014-17576. Corrective actions planned and completed by the licensee included:

- A LOCA reanalysis;
- A LOCA evaluation model reanalysis, recommended by AREVA, which is planned for completion in April 2016, and which will be submitted to the NRC in accordance with the provisions of 10 CFR 50.46; and
- A revision to the unit's cycle-specific core operating limits report to reflect the new plant axial imbalance limits and Fq linear heat rate limits.

On August 6, 2015, the NRC Headquarters Staff completed a technical evaluation of the issue (ADAMS Accession No. ML15190A414) and determined that the licensee's actions, both completed and planned, were in compliance with the regulatory requirements set forth in 10 CFR 50.46. As a result, this Licensee Event Report (LER) is closed.

Documents reviewed as part of this inspection are listed in the Attachment. This event follow-up review by the inspectors constituted a single inspection sample as defined in IP 71153-05.

.2 (Closed) Licensee Event Report 05000346/2015–002–00: Improper Flow Accelerated Corrosion Model Results in 4-Inch Steam Line Failure and Manual Reactor Trip

a. Inspection Scope

On May 9, 2015, at approximately 6:56 p.m. with the plant operating at full power, control room operators heard loud anomalous sounds within the turbine building, and plant personnel visually observed steam in the turbine building in the vicinity of the No. 1 MSR. Control room operators performed a controlled rapid power reduction to approximately 30 percent reactor power and manually tripped the reactor at approximately 7:09 p.m., in accordance with plant procedures. The operators then manually initiated the steam feedwater rupture control system (SFRCS) to isolate the steam leak and start AFW. At approximately 7:10 p.m., a notice of unusual event (NOUE) was declared in accordance with the station's emergency plan based on the conservative judgment of senior operators in the control room that the anomalous noise in the turbine building might have stemmed from an explosion of some type within the protected area of the plant. The NOUE was terminated at approximately 9:21 p.m., after the steam leak was isolated and the plant was stabilized in Mode 3, Hot Standby, with decay heat removal being provided by the steam generators via AFW and the atmospheric vent valves. The steam line rupture occurred at an elbow of a four-inch

vent line between the No. 1 MSR Second Stage Reheat Drain Tank and the No. 1 MSR. The steam line failed as a result of pipe wall thinning from two-phase FAC.

The inspectors responded to the site immediately following the manual reactor trip and verified that the trip was uncomplicated by any significant equipment or human performance issues, and the reactor was stable with fission product decay heat being adequately removed by AFW and by steam release to atmosphere. The inspectors observed and reviewed the licensee's response to the event, operator logs, computer and recorder data, and procedural requirements. Specific items associated with this event that were reviewed included, but were not limited to:

- Mitigating systems and fission product barriers performance and integrity;
- The realignment of plant equipment in response to the trip;
- The performance of plant operators in the Control Room and in the field;
- Event notifications made pursuant to 10 CFR 50.72;
- The potential for any generic issues, including those potentially requiring reporting under 10 CFR Part 21;
- The licensee's termination from their trip response procedures and transition to normal shutdown plant operations;
- The licensee's completed root cause report associated with the event; and
- The accuracy of the information provided by the licensee in the LER.

Documents reviewed as part of this inspection are listed in the Attachment. This event follow-up review by the inspectors constituted a single inspection sample as defined in IP 71153-05. This LER is closed.

b. Findings

Introduction

A self-revealed finding of very low safety significance (Green) was identified for the licensee's failure to maintain an adequate FAC program in accordance with station procedures and applicable industry guidance. Specifically, an incorrect restriction orifice size entered into the FAC program software in the late 1980s significantly underestimated the wear rate of a section of MSR piping that ultimately failed causing control room operators to conduct a rapid power reduction, initiate a manual reactor trip, actuate the SFRCS, and declare a NOUE in accordance with the station's emergency plan. The failed section of piping had not been previously inspected in accordance with industry guidance and station procedures, and the incorrect FAC program software inputs had never been validated.

Description

Following the initial stages of the event as discussed in the "Inspection Scope" section above, plant personnel conducted an assessment of the damage caused by the steam line failure. Station Air Compressor (SAC) No. 2 tripped at the onset of the event due to a cable junction box being damaged from the force of the high pressure steam. SAC No. 1 automatically started as designed to maintain plant system air pressure. Several non safety-related, low-voltage cables were also partially displaced from a nearby cable tray. Additionally, a single fire protection sprinkler head actuated in the turbine building and wetted some non safety-related plant equipment and electrical switchgear. No

significant damage was noted to any cables that were displaced or any equipment that was wetted. SAC No. 2 was subsequently repaired and returned to service. The plant remained in Mode 3, Hot Standby, while repairs were made to the ruptured steam line elbow. Additional ultrasonic testing performed by the licensee did identify significant pipe wall thinning on a similar elbow location (on the opposite train) between the No. 2 MSR Second Stage Reheat Drain Tank and the No. 2 MSR. This elbow was also replaced prior to restarting the unit on May 11, 2015.

In response to the event, the licensee performed a full root cause investigation. Three causes were identified:

- An incorrect restriction orifice size was entered into the licensee's FAC program software during initial database development in the late 1980s;
- A means was not established to ensure industry guidance for performing inspections in areas susceptible to FAC downstream of restriction orifices was systematically followed; and
- Corrective actions from a 2006 FAC program failure were not fully implemented.

Within the licensee's FAC program software, *Checworks*, the orifice located immediately upstream of the failed piping elbow had a value of three inches entered for the bore size versus the actual field size of 0.859 inches. As a result, the software significantly underestimated the predicted wear rate, which caused the program to not flag the impacted area for additional review and inspection. No inspections were previously performed on the failed section of piping. An extent of condition was performed to determine if other incorrect information regarding existing restricting orifices or flow elements was contained in the *Checworks* database. Of the 70 components reviewed, 29 did not explicitly match. Twenty components were non-conservative with model sizes larger than actual. The remaining components had been either previously examined with acceptable non-destructive testing data or were determined to not be susceptible to FAC due to lower temperatures. Each non-conservative modeled orifice was reviewed for potential impacts. Four locations were identified that were not previously inspected and were in FAC susceptible environments. Two locations were the failed elbow and its opposite train elbow. Both of these areas were replaced during the forced outage prior to unit restart on May 11, 2015. The other two locations were associated with first stage MSR vent lines and were ultrasonically examined during the forced outage with satisfactory results.

On September 13, 2006, a steam leak was discovered on the No. 1 MSR first stage reheat drain line to High Pressure Feedwater Heater 1-5 that resulted in a power reduction to facilitate repairs. The cause of the steam leak was determined to be FAC as a result of a thermal hydraulic modeling error in *Checworks*. The modeling error, which consisted of not including appropriate pressure drops downstream of the feedwater heater level CVs, was corrected. The licensee performed a root cause investigation focused on why the FAC program failed to adequately model the line where the leak occurred. The root cause investigation determined that the modeling error in *Checworks* was due to the organization failing to establish a proper level of verification to ensure quality of an engineering tool. One of the corrective actions included a model validation and data verification of all inputs to *Checworks* by a vendor that the licensee had already pre-arranged to update *Checworks* to a newer version. The root cause investigation focused on the organizational and programmatic issues and did not identify that the scope of the pre-arranged vendor review was limited such that it did not include

orifices, flow elements, and valves. As a result, the corrective action was completed with the perception that all *Checworks* data inputs had been validated, when in fact they were not.

The licensee's corrective actions for this most recent event included, but were not limited to:

- Improvements in the fidelity of the data in the FAC program software through data input validation;
- Creation of a bases document indicating which inputs to the software are critical to determining fitness of service;
- Correcting identified software program data errors; and
- Improvements in the CAP with respect to root cause evaluations such that the cause is focused on the terminal event and not a perceived cause.

The licensee had entered this issue into their CAP as CR 2015-06691.

Analysis

The inspectors reviewed the information from this event using the guidance contained in Appendix B, "Issue Screening," of IMC 0612, "Power Reactor Inspection Reports." The inspectors determined that the licensee's failure to maintain an adequate FAC program in accordance with station procedures and industry guidance represented a performance deficiency that was reasonably within the licensee's ability to foresee and correct and that should have been prevented. The subsequent finding was associated with the Initiating Events Cornerstone of Reactor Safety and was of more than minor significance because it directly impacted the cornerstone objective to limit the likelihood of events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. Specifically, the licensee's failure to adequately maintain their FAC program resulted in a significant plant transient and the declaration of a NOUE on May 9, 2015.

The inspectors evaluated the finding using IMC 0609, Appendix A, "The Significance Determination Process for Findings At-Power." Using Exhibit 1, which contains the screening questions for the Initiating Events Cornerstone of Reactor Safety, the inspectors determined a detailed risk evaluation was required because the finding was a transient initiator that resulted in both a reactor trip and the loss of mitigation equipment relied upon to transition the plant from the onset of the trip to a stable shutdown condition (i.e., the loss of the main condenser as a heat sink and the loss of main feedwater). The inspectors contacted the NRC Region III SRA to perform a detailed risk evaluation. For this evaluation, the performance deficiency was the cause of the initiating event. Absent the performance deficiency, the SRA assumed that the four-inch moisture separator line break would not have occurred, and the plant trip and SFRCS initiation would not have been required. Current SRA guidance for estimating the risk for this type of scenario involves the calculation of a conditional core damage probability (CCDP) since the event actually did occur, and then using the result as representative of a change in core damage risk on an annual basis. In this case, the performance deficiency had an exposure time starting with development of the FAC program in the late 1980s; thus, using the CCDP to estimate an annual change in risk was deemed too conservative.

The SRA subsequently determined that a more appropriate method to estimate the change in risk for this issue would be an evaluation considering the break on the MSR piping that actually occurred, combined with a probabilistic analysis of equipment failures that must occur to lead to an unisolable steam line break and core damage. Assuming that the failure to isolate the break always leads to core damage, which is in and of itself a conservative assumption, the SRA estimated the change in risk as follows:

For an unisolable steam line break on the MSR line to occur, there must be failure of the MSIVs, the main turbine SVs, and the main turbine CVs all to close as required. From the Davis-Besse Standard Plant Analysis Risk model, the probability of an MSIV failure to close is 9.51E-4. From NRC NUREG/CR-6928, "Industry-Average Performance for Components and Initiating Events at U.S. Commercial Nuclear Plants," Section A.2.22, "Hydraulic-Operated Valve Data Sheet," the probability of the SVs and CVs failure to close is 1.5E-3 each.

The assumed core damage sequence used by the SRA was that the MSR pipe break occurs, followed by either MSIV failing to close, followed by any of four in-series SVs and CVs failing to close. Mathematically, the change in ΔCDF was estimated at:

ΔCDF = 1 (event occurs) x (9.51E-4 + 9.51E-4) x 4 x 1.5E-3 x 1.5E-3 = 1.71E-8/yr

The SRA concluded the risk associated with this performance deficiency was, therefore, of very low safety significance (Green).

Because the causes for the finding stemmed from deficiencies going back several years or more, the inspectors concluded that the finding represented a latent issue not necessarily indicative of present licensee performance. As a result, no cross-cutting aspect was assigned to this finding.

Enforcement

The FAC program, its requirements, and its implementation are governed by nuclear industry standards and initiatives. There are no applicable regulatory requirements. Consequently, the inspectors determined that the issue constituted a finding of very low safety significance without a corresponding violation of any NRC requirements. (FIN 05000346/2015003–01)

4OA5 Other Activities

.1 Review of the Plant Evaluation Report From the Institute of Nuclear Power Operations

As discussed in IMC 0612, Section 15.01, the inspectors completed a review of the report issued by the Institute of Nuclear Power Operations (INPO) for the most recent periodic plant evaluation performed at the Davis-Besse Nuclear Power Station during April 2015.

.2 Summer 2015 Groundwater Sampling Results

a. Inspection Scope

The inspectors reviewed the results of a series of expanded groundwater samples taken from wells in the plant owner-controlled area. The sampling of wells was completed as

part of the licensee's voluntary groundwater monitoring initiative and in response to the results obtained earlier, as discussed in Section 4OA5 of NRC Inspection Reports 05000346/2015001 (ADAMS Accession No. ML15113B387) and 05000346/2015002 (ADAMS Accession No. ML15202A203). Several of the monitoring well locations sampled as part of the licensee's ongoing investigations indicated tritium levels above the 2,000 picocuries per liter (pCi/L) groundwater monitoring program threshold requiring courtesy notifications to state and local government officials and the NRC resident inspectors. The highest tritium concentration, approximately 10,527 pCi/L from a sample obtained on February 10, 2015, was located in a monitoring well, designated MW–22S, on the west side of the plant near the BWST. The formal reporting limit threshold for tritium in groundwater samples is 30,000 pCi/L, as documented in the licensee's Offsite Dose Calculation Manual.

The licensee continues to investigate and monitor wells in accordance with their groundwater monitoring program, and has established a formal problem solving team to address this ongoing issue. The inspectors have reviewed the licensee's compliance with their stated offsite agency reporting requirements, and continue to track the licensee's corrective actions.

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

b. Findings

No findings were identified.

4OA6 Management Meetings

.1 Exit Meeting Summary

On October 6, 2015, the inspectors presented the inspection results to the Site Vice President, Mr. Brian Boles, and other members of the licensee's staff. The licensee acknowledged the issues presented. The inspectors confirmed with the licensee the scope of material reviewed that was considered to be proprietary. Proprietary information reviewed by the inspectors was controlled in accordance with appropriate NRC policies regarding sensitive unclassified information, and has been denoted as "proprietary" in the Attachment.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee

B. Boles, Site Vice President
K. Byrd, Director, Site Engineering
D. Blakely, Supervisor, Reactor Engineering
G. Cramer, Manager, Site Protection
J. Cuff, Manager, Training
J. Cunnings, Manager, Site Maintenance
A. Dawson, Manager, Chemistry
D. Hartnett, Superintendent, Operations Training
T. Henline, Manager, Site Projects
J. Hook, Manager, Design Engineering
B. Howard, Manager, Site Outage Management
D. Imlay, Director, Site Performance Improvement
B. Kremer, Manager, Site Operations
G. Laird, Manager, Technical Services Engineering
B. Matty, Manager, Plant Engineering
P. McCloskey, Manager, Site Regulatory Compliance
D. Noble, Manager, Radiation Protection
G. Nordlund, Superintendent, Radiation Protection
W. O'Malley, Manager, Nuclear Oversight
R. Oesterle, Superintendent, Nuclear Operations
R. Patrick, Manager, Site Work Management
D. Saltz, Director, Site Operations
J. Sturdavant, Regulatory Compliance
L. Thomas, Manager, Nuclear Supply Chain
J. Vetter, Manager, Emergency Response
G. Wolf, Supervisor, Regulatory Compliance

LIST OF ITEMS OPENED, CLOSED AND DISCUSSED

Opened

05000346/2015003-01	FIN	Flow Accelerated Corrosion Model Not Maintained In Accordance with Industry Standards and Guidance (Section 4OA3.2)

Closed

05000346/2014-004-00	LER	Deficiency in Loss of Coolant Accident Analysis Adversely Affected Predicted Peak Cladding Temperature (Section 4OA3.1)
05000346/2015003-01	FIN	Flow Accelerated Corrosion Model Not Maintained In Accordance with Industry Standards and Guidance (Section 4OA3.2)
05000346/2015-002-00	LER	Improper Flow Accelerated Corrosion Model Results in 4-Inch Steam Line Failure and Manual Reactor Trip (Section 4OA3.2)

Discussed

None

LIST OF DOCUMENTS REVIEWED

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

1R04 Equipment Alignment

Condition Reports
- 2015-02925; Service Water Pump 1 Strainer D/P Switch PDIS1379 Requires Calibration
- 2015-07943; Service Water Lineup Required Unplanned LCO Entry
- 2015-09666; Service Water Train 2 Unavailability Not Reflected from SW1395 (BF1277) Misposition
- 2015-11105; Room 52 - Service Water Pump Area - Baseplate Grout and Bolt Rework

Drawings:
- M-0016A; Station Fire Protection System; Revision 55
- M-0016B; Station Fire Protection System; Revision 52
- M-0017A; Diesel Generators; Revision 19
- M-0017B; Diesel Generators Air Start; Revision 47
- M-0017C; Fuel Oil; Revision 30
- M-0036B; Component Cooling Water System; Revision 40
- M-0041A; Service Water Pumps and Secondary Service Water Systems; Revision 30
- M-0041B; Primary Service Water System; Revision 72
- M-0041C; Service Water System For Containment Air Coolers; Revision 47
- OS-0020, Sheet 1; Service Water System; Revision 95
- OS-0041A, Sheet 1; Emergency Diesel Generator Systems; Revision 32
- OS-0041A, Sheet 2; Emergency Diesel Generator Systems; Revision 32
- OS-0041B; Emergency Diesel Generator Air Start / Engine Air System; Revision 42
- OS-0041C; Emergency Diesel Generator Diesel Oil System; Revision 16
- OS-0041D; Station Blackout Diesel Generator Lube Oil and Jacket Water; Revision 14
- OS-0041E; Station Blackout Diesel Generator Air Start / Engine Air System; Revision 17
- OS-0041F; Station Blackout Diesel Generator Electrical Control and Fuel Oil Systems; Revision 5
- OS-0047A, Sheet 1; Station Fire Protection System; Revision 25
- OS-0047A, Sheet 2; Station Fire Protection System; Revision 19
- OS-0050, Sheet 1; Auxiliary Boiler & Fire Pump Diesel Fuel Oil System; Revision 27
- OS-0050, Sheet 2; Auxiliary Boiler & Fire Pump Diesel Fuel Oil System; Revision 11

Procedures:
- DB-FP-04031; Quarterly Fire Valve Alignment Verification; Revision 10
- DB-OP-06261; Service Water System Operating Procedure; Revision 63
- DB-OP-06316; Diesel Generator Operating Procedure; Revision 57
- DB-OP-06334; Station Blackout Diesel Generator Operating Procedure; Revision 22
- DB-OP-06610; Station Fire Suppression Water System; Revision 33

Notifications:
- 600828707; Oil Leak on Electric Fire Pump Outboard Motor Bearing Thermocouple; 4/12/2013

- 600912509; FP2984, Electric Fire Pump Discharge Relief Valve, Has Solid Stream Leak By; 8/7/2014

Work Orders:
- 200610365; Install FLEX Connection Spool Piece to Service Water Train 3; 7/20/2015

Other:
- Tagging Clearance ODB-SUB011-01-055; Install FLEX Connection Spool Piece to Service Water Train 3; 7/21/2015

1R05 Fire Protection

Condition Reports:
- 2013-15004; Paint In Room 323 Is Asbestos Containing Material
- 2014-04194; Compensatory Measures for Higher Risk Fire Compartments
- 2015-09847; Fireproofing
- 2015-10679; Additions to Scaffold in B High Voltage Switchgear Room Has Caused an Impairment to Fire Detection

Procedures:
- DB-FP-00003; Pre-Fire Plan Guidelines; Revision 8
- DB-FP-00005; Fire Brigade; Revision 8
- DB-FP-00007; Control of Transient Combustibles; Revision 13
- DB-FP-00009; Fire Protection Impairment and Fire Watch; Revision 20
- DB-FP-00018; Control of Ignition Sources; Revision 12
- DB-MS-01637; Scaffolding Erection and Removal; Revision 15

Pre-Fire Plans:
- PFP-AB-323; High Voltage Switchgear Room B – Room 323, Fire Area Q; Revision 5
- PFP-AB-402; No. 1 Electrical Penetration Room – Room 402, Fire Area DG; Revision 5
- PFP-AB-427; No. 2 Electrical Penetration Room – Room 427, Fire Area DF; Revision 4
- PFP-AB-603; A/C Equipment Room and Records and Storage Area - Rooms 603 and 603A, Fire Area HH; Revision 4
- PFP-AB-603B; Air Conditioning Equipment Room Vestibule – Room 603B, Fire Area HH; Revision 4
- PFP-S6-0000; Service Building 6, Laydown Area, Station Blackout Diesel; Revision 4

Drawings:
- A-223F; Fire Protection General Floor Plan Elevation 585’-0”; Revision 24
- A-226F; Fire Protection General Floor Plan Elevation 643’-0”; Revision 13

Work Orders:
- 200578097; Encapsulate Ceiling in Room 323, High Voltage Switchgear Room B; 6/2/2015

Other:
- GEN-SAF-0001; Generation Personal Safety Manual; Revision 2
- Fire Hazard Analysis Report; Revision 26

1R06 Flood Protection Measures

Condition Reports:
- 2015-05348; Auxiliary Feed Pump Room Level Switch LSH789 As Found Did Not Actuate
- 2015-11025; Condition Report Review Appears to not Have Evaluated USAR Statements
- 2015-11027; Loose Items in Auxiliary Feed Pump Room

Procedures:
- RA-EP-02830; Flooding; Revision 3
- RA-EP-02880; Internal Flooding; Revision 3

Work Orders:
- 200417539; PM 5288 Level Switch 789 – Calibrate AFW Room 2 Level Instrument; 4/13/2015

Prints and Drawings:
- M-024G; No. 1 Main and Auxiliary Turbine Driven Feed Pumps; Revision 13
- M-024H; No. 2 Main and Auxiliary Turbine Drive Feed Pumps; Revision 14
- M-026A; Turbine Building and Auxiliary Feed Pump Room; Revision 51
- M-060A; Auxiliary Feedwater System; Revision 59

Environmental Qualification Packages:
- DB1-084; Davis-Besse Nuclear Power Station Unit Number 1 Environmental Qualification of Electrical Equipment, EQP: DB1-084 (Target Rock); Revision 1
- DB1-100; Environmental Conditions; Revision 13
- DB1-101; EQ Master List (EQML); Revision 4

1R11 Licensed Operator Requalification Program and Licensed Operator Performance

Condition Reports:
- 2015-10649; Station Air Compressor 2 Tripped
- 2015-12157; Crew Failed Weekly Simulator Evaluation
- 2015-12401; Delta Tc Change While Isolating Heater String
- 2015-12468; Generated Megawatts Oscillations While Control Valve 4 Going to Closed Position

Procedures:
- DB-OP-02528; Instrument Air System Malfunctions; Revision 22
- DB-OP-06521; Station and Instrument Air System Operating Procedure; Revision 42
- DB-OP-06229; High Pressure Feedwater Heater System Operation; Revision 17
- DB-OP-06262; Component Cooling Water System Procedure; Revision 36
- DB-OP-06401; Integrated Control System Operating Procedure; Revision 23
- DB-OP-06402; CRD Operating Procedure; Revision 25
- DB-OP-06902; Power Operations; Revision 50
- DB-SC-03272; Control Rod Exercising Test; Revision 4
- DB-SP-04150; Auxiliary Feedwater Pump 1 Monthly Test; Revision 16
- DB-SS-04150; Main Turbine Stop Valve Test; Revision 13
- DB-SS-04151; Main Turbine Control Valve Test; Revision 15
- DB-SS-04152; Main Turbine Combined Intermediate Valve Test; Revision 10
- NOP-OP-1002; Conduct of Operations; Revision 10
- NT-OT-7001; Training and Qualification of Operations Personnel; Revision 14
- NOP-TR-1200; Conduct of Training; Revision 1

- NOP-TR-1008; FENOC Simulator Configuration Management; Revision 0
- NOP-TR-1010; Licensed Operator Requalification Exam Development; Revision 2
- NOP-OP-1013, Control of Time Critical Operator Actions, Revision 1
- NOP-LP-2001; Corrective Action Program; Revision 36
- NG-NT-00600; Training and Qualification; Revision 6
- NG-NT-00601; Control of the Plant-Referenced Simulator; Revision 3
- NG-DB-00319; Control of the Emergency Operating Procedure and Technical Bases; Revision 3

FENOC Business Practices and Reference Manuals:
- DBBP-TRAN-0014; License Requirements for Licensed Individuals; Revision 10
- DBBP-TRAN-0021; Simulator Configuration Control; Revision 4
- DBBP-TRAN-0502; Continuing Training Simulator Evaluations; Revision 11
- NOBP-TR-1112; FENOC Conduct of Simulator Training and Evaluation; Revision 2
- NOBP-TR-1123; Operator Fundamentals; Revision 2
- NOBP-TR-1151; Operating Crew Performance Critique; Revision 0
- DBBP-OPS-1013; Control of Time Critical Actions; Revision 2
- NORM-OP-1002; Conduct of Operations Handbook; Revision 4

1R12 Maintenance Effectiveness

Condition Reports:
- 2015-08968; Evaluation of Service Water Pump P3-1 Baseline Data
- 2015-09124; Uninsulated Section of Service Water Piping
- 2015-09180; Brake Horse Power (BHP) of the Replaced Service Water Pump 1 (MP3-1) Exceeds BHP in Calculation C-EE-015.03-007
- 2015-09421; Service Water Pump 1 Work Order Steps Found Not Signed During Operability Evaluation
- 2015-10257; Yellow Material Condition Window for Service Water System Health Report
- 2015-11105; Room 52 - Service Water Pump Area - Baseplate Grout and Bolt Rework

Drawings:
- M-0041A; Service Water Pumps and Secondary Service Water Systems; Revision 30
- M-0041B; Primary Service Water System; Revision 72
- M-0041C; Service Water System For Containment Air Coolers; Revision 47
- OS-0020, Sheet 1; Service Water System; Revision 95

Procedures:
- DB-PF-03214; Baseline Testing of Service Water Pump 1 in Modes 1-4; Revision 5
- DB-OP-06261; Service Water System Operating Procedure; Revision 63

Work Orders:
- 200504900; DB-PF-03214: Baseline Testing of Service Water Pump 1; 7/1/2015
- 200532539; PM 0922: P3-1/MP3-1 – Rebuild Service Water Pump 1; 6/15/2015
- 200625419; PM 5885: MP3-1 – Refurbish Service Water Pump 1 Motor; 6/30/2015

Other:
- Davis-Besse Plant Health Report 2015 First Half
- MRPM; Maintenance Rule Program Manual; Revision 34
- SWRPM; NRC Generic Letter 89-13 Service Water Reliability Program Manual; Revision 1

1R13 Maintenance Risk Assessments and Emergent Work Control

Condition Reports:
- 2015-09237; RPS Channel 1 Hot Leg Narrow Range Temperature Indication Lower Following Checks in Order 200647179
- 2015-08171; ODMI: TERC3B2, RC Loop 1 Hot Leg Narrow Range Temperature Element Indication Drifting – Rev 0
- 2015-09584; System Monitoring Identified a Step Change in Drain Flow from the E4-2 HPFW Heater
- 2015-09701; NNI -24 Vdc Power Supply 4 Failure
- 2015-09716; NNI X PS4, NNIPD3203 Found Degraded
- 2015-10969; System Monitoring Identified a Step Change in Drain Flow from the E4-2 High Pressure Feedwater Heater
- 2015-10750; DB-TERC3B2 Reading Erratic
- 2015-11881; System Monitoring Identified a Step Change in Drain Flow from the E4-2 High Pressure Feedwater Heater
- 2015-12090; ODMI to Address the Elevated Normal Drain Flow from the E4-2 HPFW Heater
- 2015-12194; Black Oil Under MOV CV5011B (in Containment)
- 2015-12373; REACTIVITY MANAGEMENT: Downpower to Repair E4-2 High Pressure Feedwater (HPFW) Heater
- 2015-12468; Generated Megawatts Oscillations While Control Valve 4 Going to Closed Position
- 2015-12511; Four Damaged Tubes Identified in E4-2 High Pressure Feedwater Heater
- 2015-12467; While Removing Partition Cover Plate Nuts Stud Stripped

Engineering Change Packages:
- 15-0353-000; TERC3B2 Temporary Re-Wire; Revision 0
- 15-0353-001; TERC3B2 Drift Temp Mod; Revision 0
- 15-0353-002; TERC3B2 Drift Temp Mod Restoration; Revision 1

Procedures:
- DB-OP-01101; Containment Entry; Revision 13
- DB-OP-03006; Miscellaneous Instrument Shift Checks; Revision 50
- DB-OP-03013; Containment Daily Inspection and Containment Closeout Inspection; Revision 10
- DB-OP-06229; High Pressure Feedwater Heater System Operation; Revision 17
- DB-OP-06403; Reactor Protection System (RPS) and Nuclear Instrumentation (NI) Operating Procedure; Revision 20
- DB-OP-06405; Safety Features Actuation System Procedure; Revision 13
- DB-MI-03051; Channel Calibration of 58A-ISP/TRC02B2/3B2 Reactor Coolant System Pressure and Temperature to RPS Channel 1 and Pressurizer Power Relief Valve; Revision 17
- DB-MM-09243; High Pressure Feedwater Heater Maintenance; Revision 6

Work Orders:
- 200648182; Perform Cable Characterization (CHAR) Testing of TERC3B2 – Reactor Coolant Loop 1 Hot Leg Narrow Range; 8/11/2015
- 200648496; Simple Troubleshooting Plan for TERC3B2 Indication; 7/15/2015
- 200648539; Perform Cable Characterization (CHAR) Testing of SFAS Channel 4 BWST Level – LT1525D; 8/11/2015

- 200648577; Restore TM 15-0353 and Recalibrate Instrument String Associated with TERCB2; 7/17/2015
- 200649136; Troubleshoot and Repair NNI-X Power Supply DB-NNIPD3202; 7/31/2015
- 200652336; Repair Degraded Tubes in High Pressure Feedwater Heater E4-2; 9/21/2015

Drawings:
- OS-0013, Sheet 1; Extraction Steam System; Revision 15
- OS-0013, Sheet 2; Extraction Steam System; Revision 17
- OS-0013, Sheet 3; Extraction Steam System; Revision 19

Other:
- Davis-Besse Plant Health Report 2015 First Half
- Analysis and Measurement Services Corporation (AMS) Report No. DBV150902R0-F; CHAR Testing of RTD and XMTR Circuits at Davis-Besse Nuclear Power Station; September 2015 [PROPRIETARY]
- Radiation Work Permit 2015-2008 and Associated ALARA Plan for At-Power Containment Entry; Revision 0

1R15 Operability Determinations and Functionality Assessments

Condition Reports:
- 2015-07574; Interim 10 CFR Part 21 Report, “Deviations While Utilizing Bentley Software STAAD.PRO on Safety Related Calculations”
- 2015-08171; ODMI: TERC3B2, RC Loop 1 Hot Leg Narrow Range Temperature Element Indication Drifting – Rev 0
- 2015-08359; Door 105 Was Found Unsecure at 0819
- 2015-08549; System Monitoring Identified Increasing Trend in Indication for TERC3B2: Reactor Coolant Loop 1 Hot Leg Narrow Range Temperature Element
- 2015-08774; BF1277 for SW1395 Tripped Open
- 2015-09237; RPS Channel 1 Hot Leg Narrow Range Temperature Indication Lower Following Checks in Order 200647179
- 2015-09399; Non-Seismic Demineralized Water Alignment to the Seismic Portion of the Component Cooling Water System
- 2015-09561; High Oil Level in Decay Heat Pump 2 Outboard Reservoir
- 2015-10173; Clarification on Maintenance Rule Functional Failure Cause Analysis
- 2015-10400; 2015 NRC PI&R Inspection: Interim 10 CFR Part 21 Report – Deviations While Utilizing Bentley Software STAAD.PRO on Safety Related Calculations
- 2015-10482; Part 21 – Deviations While Utilizing Bentley Software STAAD.PRO on Safety Related Calculations – Extent of Condition
- 2015-10711; NRC Question on Door 105 Functional Failure
- 2015-10750; DB-TERC3B2 Reading Erratic
- 2015-11105; Room 52 - Service Water Pump Area - Baseplate Grout and Bolt Rework
- 2015-11148; Untimely Initiation of a CR 2015-10482 Pertaining to Calculations Performed by S&L Utilizing STAAD.PRO (Subject of a Part 21)

Drawings:
- M-0031A; Component Cooling Water System; Revision 31
- M-0041A; Service Water Pumps and Secondary Service Water Systems; Revision 30
- M-0041B; Primary Service Water System; Revision 72
- M-0041C; Service Water System For Containment Air Coolers; Revision 47

- OS-0020, Sheet 1; Service Water System; Revision 95
- OS-0021, Sheet 3; Component Cooling Water System; Revision 12

Calculations:
- C-NSA-011.01-024; Past Operability Review of AFW System with SW1395 Open; Revision 0

Procedures:
- NOP-LP-2001; Corrective Action Program; Revision 36

Work Orders:
- 200647179; Check TERC3B2 Linear Bridge and Wiring at C5762, RPS Channel 1; 7/7/2015

1R18 Plant Modifications

Condition Reports:
- 2015-04686; Reactor Protection System Channel 1 Declared Inoperable Due to Erroneous Loop 1 Hot Leg Temperature Indication
- 2015-05053; Step Change in T721 Narrow Range Hot Leg Temp, RPS Channel 1
- 2015-07652; System Monitoring Identified Decreasing Trend in Indication for TERC3B2
- 2015-08171; ODMI: TERC3B2, RC Loop 1 Hot Leg Narrow Range Temp Element Indication Drifting Rev 0
- 2015-08549; System Monitoring Identified Increasing Trend in Indication for TERC3B2 “RC Loop 1 NR Temp Element”
- 2015-09237; RPS CH1 Hot Leg NR Temp Indication Lower Following Checks in Order 200647179
- 2015-09765; ODMI: TERC3B2, RC Loop 1 Hot Leg Narrow Range Temp Element, Indication Drifting Rev 1
- 2015-10213; While Performing FLEX WO No. 200610365 to Replace the Service Water Pump No. 3 Spool Piece with a Modified Spool Piece, an Unexpected Annunciator for the Service Water No. 3 Strainer Occurred
- 2015-10312; Leak at Bolted Connection
- 2015-10387; Broken Anchor Bolts on Support Stand

Drawings:
- D8047572E; R.C. Outlet Temperature Channel Subassembly “B”; Revision T4 [PROPRIETARY]
- E-592A, Sheet 55; RCS Hot Leg Dual Element RTDs; Revision 1
- E-592A, Sheet 56; RCS Hot Leg Dual Element RTDs; Revision 2
- E-730A, Sheet 7; R.C. Outlet Temperature; Revision 1
- J-107, Sheet 5; Reactor Coolant Temp Monitor Channel 1 T-SAT Channel 1 RPS; Revision 10
- M-530-437-3, Sheet 1 of 2; SASS Wiring Loop 1 T Hot; Revision T3

Procedures:
- DB-MI-03051; Channel Calibration of 58A-ISP/TRC02B2/3B2 Reactor Coolant System Pressure and Temperature to RPS Channel 1 and Pressurizer Power Relief Valve; Revision 17

Work Orders:
- 200610364; Prefab Service Water Spool Piece for FLEX Connection to Service Water Train 3; 6/30/2015
- 200610365; Install FLEX Connection Spool Piece to Service Water Train 3; 7/20/2015

- 200610366; Prefab Service Water Spool Piece for FLEX Connection to Service Water Train 2; 5/11/2015
- 200610367; Install FLEX Connection Spool Piece to Service Water Train 2; 8/3/2015
- 200647230; Use TERC3B2 as a Three Wire RTD and Calibrate Linear Bridge TTRC3B2; 7/10/2015
- 200648496; Simple Troubleshooting Plan for TERC3B2 Indication; 7/15/2015
- 200648577; Restore TM 15-0353 and Recalibrate Instrument String Associated with TERCB2; 7/17/2015

Vendor Manuals:
- Vendor Manual M-397Q-00001-04; RCS Hot Leg RTD and Thermowell Manual; Revision A [PROPRIETARY]

Engineering Change Packages:
- 13-0464-000; FLEX Service Water Modification; Revision 0
- 13-0464-001; Install FLEX Service Water Connection to Service Water Train 3; Revision 1
- 13-0464-002; Install FLEX Service Water Connection to Service Water Train 2; Revision 1
- 15-0353-000; TERC3B2 Temporary Re-Wire; Revision 0
- 15-0353-001; TERC3B2 Drift Temp Mod; Revision 0
- 15-0353-002; TERC3B2 Drift Temp Mod Restoration; Revision 1

Other:
- NEI 12-06; Diverse and Flexible Coping Strategies (FLEX) Implementation Guide; Revision 0

1R19 Post-Maintenance Testing

Condition Reports:
- 2012-15585; BACC - MU34 possibly leaking by at 15 DPM
- 2012-15586; BACC - MU35 possibly leaking by at 15 DPM
- 2012-18934; HC MU23 is Performing Sluggishly
- 2012-19754; MU23 Not Responding as Expected
- 2014-04960; BACC – A packing stem/flange and a Packing Bonnet/Pusher Leak Was Found on MU23
- 2015-08126; Loose Material Found in Switchyard
- 2015-08578; MU23 Does Not Stroke Full Open with a 100% Open Demand
- 2015-08968; Evaluation of Service Water Pump P3-1 Baseline Data
- 2015-09180; Brake Horse Power (BHP) of the Replaced Service Water Pump 1 (MP3-1) Exceeds BHP in Calculation C-EE-015.03-007
- 2015-09421; Service Water Pump 1 Work Order Steps Found Not Signed During Operability Evaluation
- 2015-09783; Incorrect Vibration Required Action Documented in ISTB2 for Makeup Pump No. 1 G-V Point
- 2015-11105; Room 52 - Service Water Pump Area - Baseplate Grout and Bolt Rework

Drawings:
- OS-0002, Sheet 4; Makeup and Purification System; Revision 24
- OS-0020, Sheet 1; Service Water System; Revision 95
- OS-0041A, Sheet 1; Emergency Diesel Generator Systems; Revision 32
- OS-0041A, Sheet 2; Emergency Diesel Generator Systems; Revision 32
- OS-0041B; Emergency Diesel Generator Air Start / Engine Air System; Revision 42
- OS-0056, Sheet 1; 345 KV System; Revision 18

- OS-0056, Sheet 2; 345 KV System; Revision 18
- OS-0056, Sheet 3; 345 KV System; Revision 5
- M-0017A; Diesel Generators; Revision 19
- M-0017B; Diesel Generators Air Start; Revision 47
- M-0031C; Make Up and Purification System; Revision 41
- M-0041A; Service Water Pumps and Secondary Service Water Systems; Revision 30
- M-0041B; Primary Service Water System; Revision 72
- M-0041C; Service Water System For Containment Air Coolers; Revision 47
- M-0045; Chemical Addition Systems; Revision 60

Engineering Change Packages
- 14-0496-000; Boric Acid Flow Control Valve Bailey RP1212 Converter Replacement; Revision 0
- 14-0496-001; Boric Acid Flow Control Valve Bailey RP1212 Converter Replacement (FYMU23); Revision 0
- 14-0725-001; Switchyard Breaker Replacement – 34564; Revision1

Procedures:
- DB-MI-05023; Pneumatic Control Valves and Accessories Calibration; Revision 10
- DB-OP-01300; Switchyard Management; Revision 11
- DB-OP-02025; Davis-Besse 345 KV Switchyard Alarm Panel 25 Annunciators; Revision13
- DB-OP-06006; Makeup and Purification System; Revision 35
- DB-OP-06311; 345 KV Switchyard No. 1 (Main) Transformer, No. 11 (Auxiliary) Transformer, and Startup Transformers (01 and 02); Revision 41
- DB-SC-03076; Emergency Diesel Generator 1 184 Day Test; Revision 33
- DB-SP-03371; Quarterly Makeup Pump 1 Inservice Test and Inspection; Revision 16
- DB-SP-03450; Boron Injection Flowpath Boric Acid Pump 1 Test; Revision 18
- DB-PF-03214; Baseline Testing of Service Water Pump 1 in Modes 1-4; Revision 5
- DB-PF-05000; Motor Testing; Revision 5
- DB-PF-05064; Electrical Machine Testing Using PdMA Motor Tester; Revision 14
- DB-PF-06703: CC 13.5; Miscellaneous Operations Curves: EDG Reactive Capability Curve; Revision 22
- DB-MM-05003; Vibration Monitoring; Revision 11

Work Orders:
- 200469379; S424 – Replace Obsolete Strainer; 7/1/2015
- 200504900; DB-PF-03214: Baseline Testing of Service Water Pump 1; 7/1/2015
- 200532539; PM 0922: P3-1/MP3-1 – Rebuild Service Water Pump 1; 6/15/2015
- 200539549; MU34 Replace Valve; 7/1/2015
- 200568330; SP3371-001 05.000 P37-1 MU Pump 1 Quarterly; 7/1/2015
- 200612896; ECP 12-0496-001 Replace E/P Converter FYMU23; 7/17/2015
- 200615486; Replace ACB34564 with an SF6 Puffer Breaker or Equivalent; 7/13/2015
- 200625419; PM 5885: MP3-1 – Refurbish Service Water Pump 1 Motor; 6/30/2015
- 200620686; PM 11333: Replace Air Hoses on P206-01 and P206-02 for EDG 1 DA30 Air Start Side; 7/27/2015

Notifications:
- 600977437; MU23 Does Not Stroke Full Open; 6/23/2015

Other:
- ISTB2; Pump and Valve Basis Document, Volume II – Pump Basis; Revision 15
- WC-15-10266-SC; Wadsworth Switching Control – Switching Order; 7/10/2015
- EDG 1 Log Book; April 2014 through July 2015

1R22 Surveillance Testing

Condition Reports:
- 2015-08968; Evaluation of Service Water Pump P3-1 Baseline Data
- 2015-09180; Brake Horse Power (BHP) of the Replaced Service Water Pump 1 (MP3-1) Exceeds BHP in Calculation C-EE-015.03-007
- 2015-09421; Service Water Pump 1 Work Order Steps Found Not Signed During Operability Evaluation
- 2015-11105; Room 52 - Service Water Pump Area - Baseplate Grout and Bolt Rework

Drawings:
- FSK-M-101; Fuel Transfer Pit, Spent Fuel Pool, Cask Pit, Leak Chase Channel Drains to Open Funnels Monitoring System; Revision 1
- JN-D-36504; Floor Monitoring System; Revision 1
- JN-D-36524; Schematic Drawing of Wall Monitoring System; Revision 2
- OS-0020, Sheet 1; Service Water System; Revision 95
- M-0041A; Service Water Pumps and Secondary Service Water Systems; Revision 30
- M-0041B; Primary Service Water System; Revision 72
- M-0041C; Service Water System For Containment Air Coolers; Revision 47

Procedures:
- DB-PF-03214; Baseline Testing of Service Water Pump 1 in Modes 1-4; Revision 5
- DB-SP-04400; Spent Fuel Pool, Fuel Transfer Pit and Cask Pit Leak Detection System Test; Revision 2
- DB-OP-06401; Integrated Control System Operating Procedure; Revision 23
- DB-OP-06402; CRD Operating Procedure; Revision 25
- DB-OP-06902; Power Operations; Revision 50
- DB-SS-04150; Main Turbine Stop Valve Test; Revision 13
- DB-SS-04151; Main Turbine Control Valve Test; Revision 15
- DB-SS-04152; Main Turbine Combined Intermediate Valve Test; Revision 10
- NOP-OP-1002; Conduct of Operations; Revision 10

Work Orders:
- 200504900; DB-PF-03214: Baseline Testing of Service Water Pump 1; 7/1/2015
- 200532539; PM 0922: P3-1/MP3-1 – Rebuild Service Water Pump 1; 6/15/2015
- 200552559; DB-SP-04400: Spent Fuel Pool Transfer Pit and Cask Pit Leak Detection System Test; 2/27/2015
- 200558128; DB-SP-04400: Spent Fuel Pool Transfer Pit and Cask Pit Leak Detection System Test; 3/28/2015
- 200560921; DB-SP-04400: Spent Fuel Pool Transfer Pit and Cask Pit Leak Detection System Test; 4/25/2015
- 200564921; DB-SP-04400: Spent Fuel Pool Transfer Pit and Cask Pit Leak Detection System Test; 5/20/2015
- 200567698; DB-SP-04400: Spent Fuel Pool Transfer Pit and Cask Pit Leak Detection System Test; 6/20/2015

- 200570864; DB-SP-04400: Spent Fuel Pool Transfer Pit and Cask Pit Leak Detection System Test; 7/17/2015
- 200575478; Perform DB-SS-4150 for Main Turbine Stop Valves; 9/6/2015
- 200575479; Perform DB-SS-4151 for Main Turbine Control Valves; 9/6/2015
- 200575480; Perform DB-SS-4152 for Main Turbine Combined Intermediate Valves; 9/6/2015
- 200625419; PM 5885: MP3-1 – Refurbish Service Water Pump 1 Motor; 6/30/2015

1EP6 Drill Evaluation

Condition Reports:
- 2015-12991; EP Drill 9-29-15 Integrated Drill, Missed Classification Resulting in Failed DEP
- 2015-13051; PA-DB-15-02: ERO Radiation Testing Laboratory Drill Performance Gaps
- 2015-13005; Dose Assessment Staff Lacks Proficiency with MIDAS Dose Assessment Software
- 2015-13061; Title: PA-DB-2015-0024-001: TSC Controller and Observer Interaction with Players During September 2015 Integrated Drill
- 2015-13031; INPO Notification During the September 29th Integrated Drill
- 2015-12995; MIDAS Dose Assessment Software (DRILL MODE ONLY) Not Reading Simulator Data
- 2015-12994; ERO Drill Conditions in SAS/CAS Create Error Likely Situation
- 2015-13098; Conduct of a Mentor During EP Drill/Exercise PI Opportunities
- 2015-13069; ERO Drill: Failed to Meet Objective for Periodic Updates

Procedures:
- RA-EP-01500; Emergency Classification; Revision 15
- RA-EP-02010; Emergency Management; Revision 17
- RA-EP-02310; Technical Support Center Activation and Response; Revisions 12 – 13

Other:
- Davis-Besse Emergency Preparedness 2015 Integrated Drill Manual; 9/29/2015
- DBRM-EMER-1500B; Hot EAL Wall Board, Revision 1
- DBRM-EMER-1500B; Cold EAL Wall Board, Revision 1

4OA1 Performance Indicator Verification

Condition Reports:
- 2015-09666; Service Water Train 2 Unavailability Not Reflected From SW1395 (BF1277) Misposition
- 2015-10406; EDG 1 MSPI and INPO Data for June 2015 Inaccurate

Forms:
- NOBP-LP-4012-48; MSPI Heat Removal System (AFW); Completed Forms for July 2014 through June 2015
- NOBP-LP-4012-49; MSPI Residual Heat Removal System (LPI); Completed Forms for July 2014 through June 2015
- NOBP-LP-4012-50; MSPI Support Cooling System, Component Cooling Water; Completed Forms for July 2014 through June 2015
- NOBP-LP-4012-51; MSPI Support Cooling System, Service Water; Completed Forms for July 2014 through June 2015

FENOC Business Practices:
- NOBP-LP-4012; NRC Performance Indicators; Revision 5

Other:
- Select Operator Logs covering the period of July 2014 through June 2015

4OA2 Problem Identification and Resolution

Condition Reports:
- 2001-00253; Spent Fuel Pool and Fuel Transfer Pool Leak Collection Zones Showing Excessive Leakage
- 2001-02309; Leakage in Spent Fuel Pool Floor Zone 6
- 2002-01364; Spent Fuel Pool Leak Detection System Showing Leak Trend
- 2003-02360; Evaluate Operating Experience 15788 for Relevance to Davis-Besse
- 2004-01719; IN 2004-05: Spent Fuel Pool Leakage to Onsite Groundwater
- 2008-43923; High Leak Rate Value for DB-SF99-L During Performance of DB-SP-04400
- 2008-46718; DB-SP-04400 Inconsistent for Boron Concentration SF99-L
- 2015-10260; MI3044 and MI3002 Staggered Test Drop Dead Date Miscalculated and MI3044 Went Past Overdue Date
- 2015-10782; CR 2015-08774, BF1277 for SW1395 Found Open, Downgraded Prematurely
- 2015-10827; During CYCLE 18 the Axial Power Shaping Rod (APSR) in Core Location F12 Appears to have been Uncoupled from the Lead Screw for the Entire Cycle
- 2015-10929; Nuclear Fuel: FENOC Core Follow Activities did not discover the Uncoupled APSR in F12 during Cycle 18
- 2015-11068; Required License Renewal Inspections as a Result of the Loss of EDG Fuel Oil Cathodic Protection

Procedures:
- NOP-LP-2001; Corrective Action Program; Revision 36
- DB-OP-06021; Spent Fuel Pool Operating Procedure; Revision 26
- DB-SP-04400; Spent Fuel Pool, Fuel Transfer Pit and Cask Pit Leak Detection System Test; Revision 2

Work Orders:
- 200514247; Perform PM 10982 – Check / Unclog SF99-A Through SF99-U; 7/21/2014
- 200552559; DB-SP-04400: Spent Fuel Pool Transfer Pit and Cask Pit Leak Detection System Test; 2/27/2015
- 200558128; DB-SP-04400: Spent Fuel Pool Transfer Pit and Cask Pit Leak Detection System Test; 3/28/2015
- 200560921; DB-SP-04400: Spent Fuel Pool Transfer Pit and Cask Pit Leak Detection System Test; 4/25/2015
- 200564921; DB-SP-04400: Spent Fuel Pool Transfer Pit and Cask Pit Leak Detection System Test; 5/20/2015
- 200567698; DB-SP-04400: Spent Fuel Pool Transfer Pit and Cask Pit Leak Detection System Test; 6/20/2015
- 200570864; DB-SP-04400: Spent Fuel Pool Transfer Pit and Cask Pit Leak Detection System Test; 7/17/2015
- 200646441; Perform PM 10982 – Check / Unclog SF99-A Through SF99-U; 1/15/2016

Drawings:
- FSK-M-101; Fuel Transfer Pit, Spent Fuel Pool, Cask Pit, Leak Chase Channel Drains to Open Funnels Monitoring System; Revision 1
- JN-D-36504; Floor Monitoring System; Revision 1
- JN-D-36524; Schematic Drawing of Wall Monitoring System; Revision 2

Concrete and Reinforcing Steel Test Results (CTL Group Project No. 262713):
- Examination of Reinforcing Bar Corrosion Product Extracted from Core Drill/Cut Out No. 1-4566 (CTL Group Sample 1B), License Renewal Project, Davis-Besse Nuclear Plant, Oak Harbor, Ohio; 12/10/2014
- Examination of Reinforcing Bar Corrosion Product Extracted from Core Drill/Cut Out No. 1-4567 (CTL Group Sample 3B), License Renewal Project, Davis-Besse Nuclear Plant, Oak Harbor, Ohio; 12/10/2014
- Petrographic Examination of Concrete Core Product Extracted from Core Drill/Cut Out No. 1-4553 (CTL Group Sample 3A), License Renewal Project, Davis-Besse Nuclear Plant, Oak Harbor, Ohio; 12/15/2014
- Petrographic Examination of Concrete Core Product Extracted from Core Drill/Cut Out No. 1-4568 (CTL Group Sample 1A), License Renewal Project, Davis-Besse Nuclear Plant, Oak Harbor, Ohio; 12/15/2014
- ASTM C42 Standard Test Method for Obtaining and Testing Drilled Cores and Sawed Beams of Concrete, Section 7: Cores for Compressive Strength – Core Drill/Cut Out No. 1-4568 (CTL Group Sample 1A); 11/24/2014
- ASTM C42 Standard Test Method for Obtaining and Testing Drilled Cores and Sawed Beams of Concrete, Section 7: Cores for Compressive Strength – Core Drill/Cut Out No. 1-4553 (CTL Group Sample 3A); 11/24/2014

Other:
- SD-024; System Description for Spent Fuel Pool Cooling and Cleanup System; Revision 4

4OA3 Followup of Events and Notices of Enforcement Discretion

Condition Reports:
- 2006-06322; Reheat Steam Leak on 8” GBD-55 Train 1
- 2006-08128; FAC Program Deficiency Evaluation
- 2014-15953; Pellet Thermal Conductivity Degradation Modeling: Non-Conservative
- 2014-16024; F_q and Imbalance Temporary Limitations Due to Pellet Thermal Conductivity Analyses
- 2014-16608; Core Operating Limits Report Update Required Prior to EOC 19 Withdrawal of APSRs
- 2014-17576; Deficiency In Methodology Used for Emergency Core Cooling System Performance Requirements
- 2015-06691; Manual Reactor Trip Due to Steam Leak
- 2015-07034; Orifice Extent of Cause Review of Root Cause 2015-06691, Steam Leak
- 2015-07339; Operating Crew Performance Critique of the 5/9/2015 Reactor Trip
- 2015-08033; Self-Assessment Process Was Ineffective in Preventing the DB Steam Rupture
- 2015-08774; BF1277 for SW1395 Tripped Open
- 2015-09138; FAC Program Health Report Overall Color Yellow with a Red Program Implementation Cornerstone

Drawings:
- M-004B; High Pressure Extraction Steam System; Revision 49
- M-005; Moisture Separator Reheater Drains; Revision 55
- M-204K; Scavenging Steam, 1st Stage to Feedwater Heater and Condenser, Turbine Building; Revision 2
- M-204L; Scavenging Steam, 1st Stage to Feedwater Heater and Condenser, Turbine Building; Revision 5
- M-205C; Scavenging Steam, 2nd Stage to Feedwater Heater and Condenser, Turbine Building; Revision 2
- OS-0014A; Moisture Separator Reheater Drains System; Revision 20

NRC Event Notification System (ENS) Forms:
- 50639; Non-Conservatisms In Methodology Used for Emergency Core Cooling System Performance Requirements; 11/25/2014
- 51061; Unusual Event Declared Due to Steam Leak in the Turbine Building; 5/9/2015

Business Practices:
- NOBP-LP-2008; FENOC Corrective Action Review Board; Revision 16
- NOBP-LP-2001; FENOC Self-Assessment and Benchmarking; Revision 21

Procedures:
- EN-DP-01301; Flow-Accelerated Corrosion Program (FAC); Revision 9
- NOP-ER-2005; Flow Accelerated Corrosion Management Program; Revision 4
- NOP-ER-2101; Engineering Program Management; Revision 8

Other:
- 2013 EPRI Technical Report: NSAC-202L-R4; Recommendations for an Effective Flow-Accelerated Corrosion Program

4OA5 Other Activities

Condition Reports:
- 2015-00214; Groundwater Tritium Concentration in Monitoring Well (MW-37S) Above 2,000 pCi/liter
- 2015-01455; Elevated Tritium Concentrations in Seven Groundwater Monitoring Wells
- 2015-01639; Water Containing 1 Million pCi/L Tritium on the Floor in the Borated Water Storage Tank Pit
- 2015-02108; Groundwater Tritium Results Greater Than Courtesy Notification Level of 2000 pCi/l
- 2015-03642; Several Davis-Besse March Groundwater Well Tritium Samples Over 2,000 pCi/liter
- 2015-07189; Fourteen of Thirty-One Groundwater Samples Over 2,000 PicoCuries/Liter (pCi/L) Tritium
- 2015-08570; BWST Decreasing Long Term Level Trend
- 2015-12043; Review Impact of Elimination of Monitoring Well (MW) 22 S/D

Procedures:
- NOP-OP-1015; Event Notifications; Revision 2
- NOP-OP-2012; Groundwater Monitoring; Revision 8
- NOP-OP-4705; Response to Contaminated Spills/Leaks; Revision 7

Business Practices:
- NOBP-OP-1015; Event Notifications; Revision 2

Other:
- Groundwater Monitoring Well Data covering the period of June 2014 through September 2015

LIST OF ACRONYMS USED

ADAMS	Agencywide Document Access Management System
AFW	Auxiliary FeedwaterALARA
ALARA	As-Low-As-Is-Reasonably-Achievable
AMS	Analysis and Measurement Services
BHP	Brake Horse Power
BWST	Borated Water Storage Tank
CAP	Corrective Action Program
CCW	Component Cooling Water
CCDP	Conditional Core Damage Probability
CDF	Core Damage Frequency
CFR	Code of Federal Regulations
CHAR	Cable Characterization
CR	Condition Report
CRD	Control Rod Drive
CV	Control Valve
DRP	Division of Reactor Projects
ECCS	Emergency Core Cooling System
ECP	Engineering Change Package
EDG	Emergency Diesel Generator
ENS	Event Notification System
EP	Emergency Preparedness
FAC	Flow Accelerated Corrosion
gpd	Gallons per Day
IMC	Inspection Manual Chapter
IN	Information Notice
INPO	Institute of Nuclear Power Operations
IP	Inspection Procedure
IST	Inservice Testing
KV	Kilovolt
LCO	Limiting Condition for Operation
LER	Licensee Event Report
LOCA	Loss of Coolant Accident
MSIV	Main Steam Isolation Valve
MSPI	Mitigating Systems Performance Index
MSR	Moisture Separator Reheater
NEI	Nuclear Energy Institute
NI	Nuclear Instrumentation
NNI	Non-Nuclear Instrumentation
NOUE	Notice of Unusual Event
NRC	U.S. Nuclear Regulatory Commission
PARS	Publicly Available Records System
pCi/L	Picocuries Per Liter
PCT	Peak Cladding Temperature
PI	Performance Indicator
PMT	Post-Maintenance Testing
RPS	Reactor Protection System
RTD	Resistance Temperature Detector

SAC	Station Air Compressor
SBODG	Station Blackout Diesel Generator
SFAS	Safety Features Actuation System
SFP	Spent Fuel Pool
SFRCS	Steam Feedwater Rupture Control System
SRA	Senior Reactor Analyst
SSC	Systems, Structures, and Components
SV	Stop Valve
SW	Service Water
TS	Technical Specification
USAR	Updated Safety Analysis Report
Vdc	Volts Direct Current
WO	Work Order

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Sincerely,

/RA/

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

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