



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**

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

May 2, 2016

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

**SUBJECT: DAVIS-BESSE NUCLEAR POWER STATION - POST-APPROVAL SITE
INSPECTION FOR LICENSE RENEWAL REPORT 05000346/2016007**

Dear Mr. Boles:

On April 8, 2016, the U.S. Nuclear Regulatory Commission (NRC) completed the outage segment of the Post-Approval Site Inspection for License Renewal at your Davis-Besse Nuclear Power Station. The enclosed report documents the results of this inspection, which were discussed on April 8, 2016, with Mr. B. Kremer and other members of your staff.

This inspection was an examination of activities conducted under your renewed license as they relate to the completion of commitments made during the renewed license application process and compliance with the Commission's rules and regulations and the conditions of your operating license. Within these areas, the inspection involved examination of selected procedures and representative records, observations of activities, and interviews with personnel. On the basis of the sample selected for review, there were no findings of significance identified during this inspection.

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/

David E. Hills, Chief
Engineering Branch 1
Division of Reactor Safety

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

Enclosure:
IR 05000346/2016007

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U.S. NUCLEAR REGULATORY COMMISSION

REGION III

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

Report No: 05000346/2016007

Licensee: FirstEnergy Nuclear Operating Company

Facility: Davis-Besse Nuclear Power Station

Location: Oak Harbor, OH

Dates: March 28 – April 8, 2016

Inspectors: S. Sheldon, Senior Reactor Engineer (Lead)
T. Bilik, Senior Reactor Engineer

Approved by: D. Hills, Chief
Engineering Branch 1
Division of Reactor Safety

Enclosure

SUMMARY

Inspection Report 05000346/2016007, 03/28/2016 – 04/08/2016; Davis-Besse Nuclear Power Station; Post-Approval Site Inspection for License

The inspection was conducted by two regional based inspectors. No instances were noted of incomplete license renewal commitments with respect to timeliness or adequacy. No findings were identified by the inspectors. 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 0609, "Significance Determination Process," dated April 29, 2015. Cross-cutting aspects are determined using Inspection Manual Chapter 0310, "Aspects Within the Cross-Cutting Areas," dated December 4, 2014. All violations of U.S. Nuclear Regulatory Commission (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," dated February 2014.

No findings were identified.

REPORT DETAILS

Summary of Plant Status

The unit was in a refueling outage during the period of this inspection.

4. OTHER ACTIVITIES

4OA5 Other Activities

.1 Post-Approval Site Inspection for License Renewal (Phase I) – Inspection Procedure 71003

a. Inspection Scope

(1) Review of Newly Identified Systems, Structures and Components

The inspectors discussed the identification of new systems, structures, and components, under the purview of Title 10 of the *Code of Federal Regulations* (CFR), Part 54.37(b), with the licensee's license renewal staff. The licensee personnel indicated that no new components have been identified to date that should have been within the scope of the License Renewal Program.

(2) Review of Revised Commitments

Based on discussion the inspectors had with licensee staff, at the time of the inspection there were no revised commitments.

(3) Review of Commitments

The inspectors reviewed supporting documents including completed surveillance records, conducted interviews, observed non-destructive examination activities, performed visual inspection of structures and components, including those not accessible during power operation, and observed the activities described below that the licensee completed to comply with the license conditions associated with the renewed operating license. The inspectors verified the licensee implemented the "outage-related" Aging Management Programs included in, "Safety Evaluation Report Related to the License Renewal of Davis-Besse Nuclear Power Station," dated September 2013 (ML13248A267) in accordance with 10 CFR Part 54, "Requirements for the Renewal of Operating Licenses for Nuclear Power Plants."

b. Findings and Observations

The inspectors reviewed portions of the activities listed below, which are referenced to the Aging Management Programs from the licensee's License Renewal Application (LRA) and the commitments noted in Appendix A of the Safety Evaluation Report where applicable. Activities observed related to these commitments are also listed.

(1) (B.2.8) Closed Cooling Water Chemistry Program (Commitment Item 32)

The Closed Cooling Water Chemistry Program is intended to mitigate damage due to loss of material, cracking, and reduction in heat transfer of components that are within the scope of license renewal and contain closed cooling water. The program manages

the relevant conditions that could lead to the onset and propagation of a loss of material, cracking, or reduction in heat transfer through proper monitoring and control of corrosion inhibitor concentrations consistent with the current Electric Power Research Institute water chemistry guideline.

Commitment item 32 states the licensee will make the following enhancements to the Closed Cooling Water Chemistry Program prior to October 22, 2016:

- Document the results of periodic inspections of opportunity, performed when components are opened for maintenance, repair, or surveillance;
- Ensure that a representative sample of piping and components will be inspected on a 10-year interval, with the first inspection taking place prior to entering the period of extended operation; and
- Ensure that component cooling water radiochemistry is sampled on a weekly interval to verify the integrity of the letdown coolers and seal return coolers.

The inspectors reviewed records from a sample of completed inspections. Specific records are listed in the list of documents reviewed. The inspectors identified no concerns with these inspections.

The inspectors also observed the licensee perform a visual examination (VT-1, direct/remote using video probe) of CC-150 valve and adjacent piping, for component cooling water to decay heat pump 2 alternate source, per Work Order (WO) 200638210. The inspectors had no concerns with the observed activities.

(2) (B.2.23) Inservice Inspection Program – IWF (Commitment Item 50)

The Inservice Inspection (ISI) Program - IWF establishes responsibilities and requirements for conducting American Society of Mechanical Engineers (ASME) Code Section XI, Subsection IWF inspections as required by 10 CFR 50.55a. The ISI Program - IWF includes visual examination for supports based on sampling of the total support population. The sample size varies depending on the ASME class.

Commitment item 50 states the licensee will make numerous enhancements to the ISI Program - IWF prior to October 22, 2016.

The inspectors observed the licensee perform VT-3 direct visual examinations of DG-JKY WTR HTXCHR-1-1-AW, diesel generator jacket water heat exchanger E10-1 supports, per WO 2000616036. One of the examiners failed to properly perform the ASME Code required illumination verification check. The exams were concurrently performed by another examiner who found no recordable indications. The licensee captured this issue in CR-2016-04439. Except for the minor issue noted, the inspectors had no concerns with the observed activities.

(3) (B.2.24) Inservice Inspection Program

The ISI Program manages cracking of reactor coolant pressure boundary components and once-through steam generator secondary side components. The program includes periodic visual, surface, or volumetric examination and leakage (pressure) testing of ASME Class 1, 2, or 3 components, and their integral attachments, as well as repair, modification, or replacement of same.

The inspectors observed ultrasonic examination of reactor coolant pump cover to case studs, RC-RCP-1-1-1-STUDS; per WO 200616040, and RC-30-CCA-8-1-SWB through E, per WO 200629210. The inspectors also observed dye penetrant examinations of reactor coolant system (RCS) pipe-to-elbow weld, RC-CCA-23-S-CV030, per WO 20061038, and RCS pipe-to-elbow weld, RC-MK-A-93-SW51, per WO 200616038. The inspectors had no concerns with the observed activities.

(4) (B.2.28) Nickel-Alloy Management Program (Commitment Item 49)

The Nickel-Alloy Management Program manages primary water stress corrosion cracking and stress corrosion cracking/intergranular attack for nickel-alloy pressure boundary components, other than reactor vessel closure head nozzles and steam generator tubes, exposed to reactor coolant. Mitigative actions include replacement of Alloy 600/82/182 components with materials known to be less susceptible to primary water stress corrosion cracking and stress corrosion cracking/intergranular or repair of those components through weld overlay, weld inlay (also known as weld underlay), mechanical stress improvement process or surface conditioning. The condition monitoring portion of the program uses a number of inspection techniques to detect cracking, including volumetric and bare metal visual examinations.

Commitment item 49 states the licensee will enhance the Nickel-Alloy Management Program to:

- Provide for inspection of dissimilar metal butt welds in accordance with the requirements of ASME Code Case N-770-1, "Alternative Examination Requirements and Acceptance Standards for Class 1 PWR [Power Water Reactor] Piping and Vessel Nozzle Butt Welds fabricated with UNS N06082 or UNS W86182 Weld Filler Material With or Without Application of Listed Mitigation Activities, Section XI, Division 1," as modified by the 10 CFR 50.55a(g)(6)(ii)(F).

The inspectors observed a manual phased array ultrasonic examination of a RCS 10" branch connection-to-pipe overlay, per WO 200616038. The inspectors had no concerns with the observed activities.

(5) (B.2.30) One-Time Inspection Program (Commitment Item 13)

The One-Time Inspection Program is a new program that is intended to provide assurance that aging which has not yet manifested itself is indeed not occurring, or that the age-related degradation is so insignificant that an Aging Management Program is not warranted.

The inspectors observed the licensee's activities to implement Commitment Item 13, of the license renewal Safety Evaluation Report. This commitment documents the licensee will implement the One-Time Inspection Program, as described in LRA Section B.2.30, prior to October 22, 2016.

The inspectors observed the licensee perform a visual examination of MS891A Steam Generator 2 Drain Line valve per WO 200635583, MS109A, MS109B Main Steam System Pressure Indicator Valves per WO 200631009, the fuel transfer tube 2 isolation valve per WO 200636246, and the FW145 Steam Generator 1 Feedwater Header Vent per WO 200639572. The inspectors had no concerns with the observed activities. The inspectors reviewed a sample of completed inspections. Specific records are listed in the list of documents reviewed.

The licensee stated that overall results will be evaluated once all of the inspections have been completed. This evaluation should be reviewed during the 71003 Phase II inspection.

(6) (B.2.31) Open-Cycle Cooling Water Program

The Open-Cycle Cooling Water Program manages loss of material due to crevice, galvanic, general, pitting, and microbiologically-influenced corrosion, and also due to erosion for components located in the Service Water (SW) System, and for components connected to or cooled by the SW System, and also in the Circulating Water System. The program also manages fouling due to particulates (e.g., corrosion products) and biological material (micro- and macro-organisms) resulting in reduction in heat transfer for heat exchangers within the scope of the program. The program includes of inspections, surveillances, and testing to detect and evaluate fouling, loss of material, combined with chemical treatments and cleaning activities to minimize fouling and loss of material.

The inspectors observed visual inspection of the SW cross tie to auxiliary feedwater per WO 200606738 including records of as found condition and direct observation of as left condition. During a direct visual inspection, an NRC inspector observed a section of pipe that still had a thick layer of silt and tubercles. The inspector conveyed this observation to the licensee, and in response, the licensee initiated CR 2016-04754, "SW261 Clean/Inspect piping – NRC inspector's "post" cleaning piping walkdown observed that the SW piping segment had not yet been cleaned". The licensee subsequently cleaned the pipe before reassembly. Except for the work in progress issue noted, the inspectors had no concerns with the observed activities.

(7) (B.2.37) Small Bore Class 1 Piping Inspection (Commitment Item 19)

The Small Bore Class 1 Piping Inspection is intended to detect and characterize cracking of small bore ASME Code Class 1 piping less than 4 inches nominal pipe size (NPS 4), which includes pipe, fittings, and branch connections. The inspection will consist of volumetric examination of a representative sample of small bore piping locations that are susceptible to cracking. The inspection sample includes both socket welds and butt welds.

Commitment item 19 states the licensee will implement the Small Bore Class 1 Piping Inspection, as described in LRA Section B.2.37, prior to October 22, 2016.

The inspectors observed phased array volumetric inspections of 1" elbow-to-pipe RC welds RC-FSK-M-CCA-19-1-24a and RC-FSK-M-CCA-19-1-29, and pipe-to-elbow weld RC-FSK-M-CCA-19-1-23a, per WO 200629207.

The inspectors had no concerns with the observed activities.

(8) B.2.39 Structures Monitoring Program (Commitment Item 20)

The Structures Monitoring Program is part of the Maintenance Rule Program. It is an existing program that is designed to ensure age-related degradation of the plant structures and structural components within its scope are managed such that each structure and structural component retains the ability to perform its intended function. The program includes period inspections of structures.

Commitment item 20 states the licensee will make numerous enhancements to the Structures Monitoring Program prior to October 22, 2016.

The inspectors observed visual inspection of the auxiliary building, 643' elevation main steam pipe rooms 601 and 602 in accordance with EN-DP-01511, "Structures Monitoring". The inspectors had no concerns with the observed activities.

(9) Service Level III Coatings and Linings Monitoring Program (Commitment Item 51)

The Service Level III Coatings and Linings Monitoring Program is a plant-specific condition monitoring program for Davis-Besse. The program consists of periodic visual inspections of all Service Level III coatings and linings on the internal surfaces of piping, piping components, and tanks in mechanical fluid systems that are within the scope of license renewal. The program includes organic (e.g., elastomeric or polymeric) and inorganic (e.g., zinc-based) coatings and linings (e.g., rubber, cementitious).

The program is intended to manage loss of coating integrity due to blistering, cracking, flaking, peeling, delamination, or physical damage of coatings and linings to ensure that degradation does not result in loss of intended function due to unanticipated or accelerated corrosion or flow blockage of in-scope mechanical components.

Commitment item 32 states the licensee will implement the Service Level III Coatings and Linings Monitoring Program prior to October 22, 2016.

The inspectors observed visual inspection of the SW60 containment air cooler service water header cross connect butterfly valve (WO 200423706). The inspectors had no concerns with the observed activities.

4OA6 Management Meetings

.1 Exit Meeting Summary

April 8, 2016 the inspectors presented the inspection results to Mr. B. Kremer and other members of your staff. The licensee acknowledged the issues presented.

The inspectors confirmed that none of the potential report input discussed was considered proprietary.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee

B. Boles, Site Vice President
D. Saltz, Plant Manager
K. Zellers, License Renewal Project Manager
S. Dort, Aging Management Coordinator
G. Clark, License Renewal
C. Daft, License Renewal
D. Munson, License Renewal
A. Scheanwald, ISI Program Owner
G. Wolf, Regulatory Affairs

LIST OF ITEMS OPENED, CLOSED AND DISCUSSED

Opened, Closed and Discussed

None

LIST OF ACRONYMS USED

ADAMS	Agencywide Documents Access and Management System
ASME	American Society of Mechanical Engineers
CFR	<i>Code of Federal Regulations</i>
ISI	Inservice Inspection
LRA	License Renewal Application
NRC	U.S. Nuclear Regulatory Commission
PARS	Publicly Available Records System
RCS	Reactor Coolant System
SW	Service Water
WO	Work Order

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.

Condition Reports Initiated During the Inspection

- CR 2016-04754; SW261 Clean/Inspect piping – NRC inspector's "post" cleaning piping walkdown observed that the SW piping segment had not yet been cleaned; dated 04/06/16
- CR-2016-04439; NRC Observation of Visual Examination Acuity Verification; dated 04/02/16

Completed Work Orders and Inspections

- 200499963; Auxiliary Building Room 601 4" Floor Drain (TDF-4-1) A-2356 (601F-95); dated 05/06/15
- 200542646; SBO DG Primary Fuel Filter; dated 02/16/15
- 200630441; MDPF Lube Oil Filter Housing; dated 09/09/15
- 200631602; Boric Acid Evaporator 1 Outlet To Condensate Tank Steam Trap Body; dated 12/02/15
- BOP-VT-15-115; E144-2 (Post-Accident Sample Cooler 1-2); dated 08/18/15
- BOP-VT-15-177; SH289 & HX Tubing (Radwaste Heating Coil Inlet Isolation); dated 09/30/15
- BOP-VT-15-201; P95, SH326 (Secondary Hot Water Fuel Handling Pump); dated 10/08/15
- BOP-VT-15-220; Emergency Diesel Generator 1-2 Lube Oil Heat Exchanger; dated 11/09/15
- BOP-VT-15-227; FE1476 (DG Jacket Cooling Water HX 2 CC Outlet Flow Element); dated 11/10/15
- BOP-VT-15-256; AC302 Computer Room AC Inlet Valve; dated 12/07/15
- BOP-VT-16-031; CC496A (Reactor Coolant Pump 2-2 Pump Seal CCW Return Line Vent); dated 03/31/16
- BOP-VT-16-032; CC496 (Reactor Coolant Pump 2-2 Pump Seal CCW Return Line Vent); dated 03/31/16
- BOP-VT-16-033; CC494 (Reactor Coolant Pump 2-2 Pump Seal CCW Supply Line Drain); dated 03/31/16
- BOP-VT-16-034; CC494A (Reactor Coolant Pump 2-2 Pump Seal CCW Supply Line Drain); dated 03/31/16
- SW256-2016; DB-SW256; dated 03/30/16
- SW60-2016; DB-SW60; dated 03/31/16
- BOP-VT-16-059; FW145 SG 1 Feedwater Header Vent; dated 04/04/16
- BOP-UT-16-019; SW261; dated 04/07/16
- BOP-VT-16-043; Fuel Transfer Tube 2 Isolation Valve; dated 04/01/16

Miscellaneous

- DBRM-ER-0001; One-Time Inspection Program Components; Rev. 00
- Structures Monitoring Inspection Worksheet; auxiliary building, 643' elevation, rooms 601 and 602; dated 04/07/16
- ACI 349.3R-02; Evaluation of Existing Nuclear Safety-Related Concrete Structures

Observed Inspections

- WO 200635583; MS891A Steam Generator 2 Drain Line; dated 03/30/16
- WO 200631009; MS109A, MS109B Main Steam System Pressure Indicator Valves; dated 03/30/16
- WO 200423706; SW60 Containment Air Cooler Service Water Cross Connect Valve; dated 03/31/16
- WO 200636246; Fuel Transfer Tube 2 Isolation Valve; dated 04/01/16
- WO 200639572; FW145 SG 1 Feedwater Header Vent; dated 04/04/16
- WO 200606738; Service Water Cross Tie to AFW; dated 04/05/16

Procedures

- 54-ISI-369-003; VT-1, VT-3, General and Detailed Visual Examinations; Rev. 3
- 54-ISI-615-001; Procedure for Manual and Semi-Automated Phased Array Ultrasonic Examination of Socket Fillet Welds; Rev. 1
- 54-ISI-864-003; Manual Phased Array Ultrasonic Examination of Weld Overlaid Similar and Dissimilar Metal Welds; Rev. 3
- 54-ISI-864-005; Manual Phased Array Procedure for Weld Overlaid Similar and Dissimilar Metal Welds; Rev. 5
- EN-DP-01511; Structures Monitoring; Rev. 04
- EN-DP-01515; Service Level III Coatings and Linings Condition Assessment Inspection; Rev. 00
- NA-QC-05560; Visual Examination Procedure for VT-1, VT-3, and General Visual Examinations; Rev. 11
- NG-EN-00551; Service Level III Coatings and Linings Monitoring Program; Rev. 00
- NG-EN-00552; One-Time Inspection Program; Rev. 00
- NOP-ER-2006; Service Water Reliability Management Program; Rev. 02
- Program Basis Documents
- LRPD-05 Att 2.16; Service Level III Coatings and Linings Monitoring Program; Rev. 1
- LRPD-05 Att 2.11; One-Time Inspection Program; Rev. 7
- LRPD-05 Att 2.6b; Closed Cooling Water Chemistry Program; Rev. 4
- LRPD-05 Att 2.12; Open-Cycle Cooling Water Program; Rev. 3

Mr. Brian D. Boles
Site Vice President
FirstEnergy Nuclear Operating Co.
Davis-Besse Nuclear Power Station
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Oak Harbor, OH 43449-9760

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