



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

June 8, 2021

Mr. Terry J. Brown
Site Vice President
Energy Harbor Nuclear Corp.
Mail Stop P-DB-3080
5501 North State Route 2
Oak Harbor, OH 43449-9760

SUBJECT: DAVIS-BESSE NUCLEAR POWER STATION, UNIT NO. 1 – REVIEW OF THE
2016, 2018, AND 2020 STEAM GENERATOR TUBE INSPECTION REPORTS
(EPIDS L-2020-LRO-0055, L-2020-LRO-0082, AND L-2020-LRO-0083)

Dear Mr. Brown:

By letters dated October 31, 2016, and August 21, 2018 (Agencywide Documents Access and Management System (ADAMS) Accession Nos. ML16306A262 and ML18233A451, respectively), FirstEnergy Nuclear Operating Company submitted the reports for the steam generator (SG) tube inspections performed at Davis-Besse Nuclear Power Station, Unit No. 1 (Davis-Besse), during the spring 2016 and 2018 refueling outages, respectively. By letter dated September 15, 2020 (ADAMS Accession No. ML20260H057), Energy Harbor Nuclear Corp. (EHNC) submitted the report for the SG tube inspection performed at Davis-Besse during the spring 2020 refueling outage. These reports were submitted in accordance with Technical Specification (TS) 5.6.6, "Steam Generator Tube Inspection Report." On May 10, 2021 (ADAMS Accession No. ML21130A219), EHNC provided supplemental information in response to a U.S. Nuclear Regulatory Commission (NRC) staff request for additional information issued on February 10, 2021 (ADAMS Accession No. ML21041A545).

The NRC staff has completed its review of the 2016, 2018, and 2020 SG tube inspection reports for Davis-Besse and the supplemental information provided on May 10, 2021. Based on this review, the NRC staff concludes that the information required by TS 5.6.6 has been provided and no additional follow-up action is required at this time. A summary of the NRC staff's review is enclosed.

T. Brown

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If you have any questions, please contact me at 301-415-1380 or via e-mail at Blake.Purnell@nrc.gov.

Sincerely,

/RA/

Blake Purnell, Project Manager
Plant Licensing Branch III
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-346

Enclosure:
Review Summary

cc: Listserv

REVIEW SUMMARY BY THE OFFICE OF NUCLEAR REACTOR REGULATION

2016, 2018, AND 2020 STEAM GENERATOR TUBE INSPECTION REPORTS

ENERGY HARBOR NUCLEAR GENERATION LLC

ENERGY HARBOR NUCLEAR CORP.

DAVIS-BESSE NUCLEAR POWER STATION, UNIT NO. 1

DOCKET NO. 50-346

By letters dated October 31, 2016, and August 21, 2018 (Agencywide Documents Access and Management System (ADAMS) Accession Nos. ML16306A262 and ML18233A451, respectively), FirstEnergy Nuclear Operating Company (FENOC) submitted the reports for the steam generator (SG) tube inspections performed at Davis-Besse Nuclear Power Station, Unit No. 1 (Davis-Besse) during the spring 2016 refueling outage (1R19) and spring 2018 refueling outage (1R20), respectively. Effective February 27, 2020, the facility operating license for Davis-Besse was transferred from FirstEnergy Nuclear Generation, LLC and FENOC to Energy Harbor Nuclear Generation LLC and Energy Harbor Nuclear Corp. (EHNC) (ADAMS Accession No. ML20030A440). By letter dated September 15, 2020 (ADAMS Accession No. ML20260H057), EHNC submitted the report for the SG tube inspection performed at Davis-Besse during the spring 2020 refueling outage (1R21). These reports were submitted in accordance with Technical Specification (TS) 5.6.6, "Steam Generator Tube Inspection Report." On May 10, 2021 (ADAMS Accession No. ML21130A219), EHNC provided supplemental information in response to a U.S. Nuclear Regulatory Commission (NRC) staff request for additional information issued on February 10, 2021 (ADAMS Accession No. ML21041A545).

Davis-Besse has two once-through SGs designed by Babcock and Wilcox that were installed in 2014. Each SG contains 15,607 thermally treated Alloy 690 tubes. The tubes were hydraulically expanded for part of the length of the tubesheet and are supported by 16 carbon steel tube support plates (TSPs). There are 66 Type 410 stainless-steel tie rods between each TSP. Tube support plate 15S is below the auxiliary feedwater nozzle and has drilled holes in the periphery through which the tubes pass. The remaining portion of TSP 15S and the other TSPs in the SGs have trefoil broached holes. The trefoil holes of the even numbered TSPs are offset from centerline to minimize tube wear at the TSP elevations. The 2016 SG tube inspections were the first inspections following the SG replacement in 2014. On April 12, 2016, the NRC staff participated in a conference call with the licensee regarding the spring 2016 SG inspections at Davis-Besse (summary at ADAMS Accession No. ML16130A750).

In the 2016, 2018, and 2020 SG reports, as supplemented, the licensee provided the scope, extent, methods, and results of the SG tube inspections. In addition, the licensee described corrective actions (e.g., tube plugging), if any, taken in response to the inspection findings. Based on the review of the information provided, the NRC staff has the following observations:

- The SG tube inspection reports for 1R19 and 1R20 reported the tube plug examinations as one examination for each installed plug. Therefore, two tube plug examinations were reported for each plugged tube because there is a plug installed in both ends of the tube. However, the SG tube inspection report for 1R21 reported the tube plug examinations as one examination for each plugged tube.

Enclosure

- For 1R20, a foreign object wear indication was reported in Row 147, Tube 12, of SG 2A. Based on the 1R21 tube inspection, was determined that this indication was not associated with foreign object wear and was reclassified as tube wear at a drilled TSP location.
- No degradation was identified during the channel head visual inspections performed in each SG during 1R21.
- A total of 2,615 (1,912 in SG 2A and 703 in SG 1B) broached TSP wear indications were reported during 1R21. The licensee stated that the broached TSP wear indications in both SGs are primarily located in the periphery of the upper bundle and that this is expected due to the high crossflow conditions and the reduced damping due to superheated steam at this location. The licensee stated that the upper 95th percentile growth rate of broached TSP wear indications in both SGs decreased from 1R20 to 1R21. The licensee attributed the higher number of broached TSP wear indications in SG 1B reported during 1R21 compared to the number reported during 1R20 (194) to small indications (less than 15 percent through-wall) being detected for the first time during 1R21.
- Secondary side visual inspections were performed in SG 2A during 1R21 to verify the cause of the proximity indications identified during electromagnetic testing examinations. The licensee stated that the visual inspections confirmed tie rod bowing. The licensee reported that there was no tube-to-tube wear or tube-to-tie rod wear indications associated with the tie rod bowing. Because tube-to-tube wear and tube-to-tie rod wear are considered as potential degradation mechanisms, the licensee performs examinations to detect them. The licensee preventatively plugged 77 tubes in SG 2A and 66 tubes in SG 1B during 1R21 due to tie rod bowing.
- No secondary side visual inspections were performed in SG 1B during 1R21.

Based on a review of the information provided, the NRC staff concludes that the licensee provided the information required by Davis-Besse TS 5.6.6. In addition, the staff concludes that there are no technical issues that warrant additional follow-up action at this time because the SG tube inspections appear to be consistent with the objective of detecting potential tube degradation and the inspection results appear to be consistent with industry operating experience at similarly designed and operated units.

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