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

May 29, 2024

Barry N. Blair
Vistra Operations Company LLC
Beaver Valley Power Station
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SUBJECT: BEAVER VALLEY POWER STATION, UNIT 2 – STEAM GENERATOR TUBE INSPECTION - REVIEW OF THE SPRING 2023 TUBE INSPECTION REPORTS (EPID L-2024-LRO-0006)

Dear Barry Blair:

By letter dated October 31, 2023 (Agencywide Documents Access and Management System Accession No. ML23305A095), Energy Harbor Nuclear Corp. submitted the spring 2023 Tube inspection report for Beaver Valley Power Station, Unit 2. The Steam Generator tube inspections were performed during refueling outage 23. The Vistra Operations Company LLC (VistraOps) provided additional information in a letter dated April 10, 2024, and an enclosure to that letter dated March 31, 2024 (ML24101A275 and ML24101A277, respectively).

Effective March 1, 2024, the facility operating license for Beaver Valley was transferred from Energy Harbor Nuclear Generation LLC (owner) and Energy Harbor Nuclear Corp. (operator) to Energy Harbor Nuclear Generation LLC (owner) and Vistra Operations Company LLC (operator) (ML24057A092). Upon completion of this license transfer, it was reported by the licensee that VistraOps assumed the responsibility for all licensing actions under the U.S. Nuclear Regulatory Commission (NRC) review at the time of the transfer and requested that the NRC continue its review of these actions (ML24054A498).

The NRC staff has completed its review of the information provided and concludes that the licensee provided the information required by its technical specifications. The staff's review summary is enclosed.

If you have any questions, please contact me at 301-415-2597 or by email to V.Sreenivas@nrc.gov.

Sincerely,

/RA/

V. Sreenivas, Project Manager
Plant Licensing Branch I
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-412

Enclosure:
Steam Generator Inspection
Report Summary

cc: Listserv

BEAVER VALLEY POWER STATION, UNIT 2

REVIEW OF THE SPRING 2023 STEAM GENERATOR TUBE INSPECTION REPORT

DOCKET NO. 50-412

By letter dated October 31, 2023 (Agencywide Documents Access and Management System Accession No. ML23305A095), Energy Harbor Nuclear Corp. submitted the spring 2023 Tube inspection report for Beaver Valley Power Station, Unit 2. The Steam Generator (SG) tube inspections were performed during refueling outage 23. The licensee provided additional information in a letter dated April 10, 2024, and an enclosure to that letter dated March 31, 2024 (ML24101A275 and ML24101A277, respectively).

Beaver Valley, Unit 2, is a 3-loop plant with Westinghouse Model 51M SGs. Each SG contains 3,376 mill-annealed Alloy 600 tubes with a nominal outside diameter of 0.875 inches and a nominal wall thickness of 0.050 inches. The tubes are supported by drilled hole carbon steel tube support plates and Alloy 600 anti-vibration bars. The tubes were roll expanded at both ends for the full depth of the tubesheet. The portion of tubes from about 3 inches above the top of the tubesheet to about 1 inch above the tube ends was shot-peened on both the hot-leg and cold-leg side of the SG, prior to operation. In addition, the U-bend region of the small radius tubes received in-situ thermal stress relief prior to operation. The SGs had been in service for 30.6 effective full power years entering refueling outage 23.

The licensee provided the scope, extent, methods, and results of their SG tube inspections in the documents referenced above. In addition, the licensee described corrective actions, such as tube plugging taken in response to the inspection findings.

Based on the review of the information provided, the U.S. Nuclear Regulatory Commission (NRC) staff has the following observations:

- The NRC staff requested more information about eddy current indications that were reported in the lower joint of some tubes with nickel-plated sleeves that were rolled into the parent tube within the tubesheet. The licensee had performed additional investigations after initially detecting circumferential indications in four sleeved tubes during RFO 22. The investigations determined that the nickel band hardness after installation is higher than the parent tube hardness, which can result in a circumferential indentation in the parent tube at the edge of the nickel band. This type of indication was detected during the development of the Ghent Version 2 probe qualification for sleeve inspection. The qualification sleeve mock-ups, however, had not been rolled to as high a torque as the field sleeves, in an attempt to minimize distortion of the electrical discharge machining calibration notches. The licensee response also provided an example of the eddy current indications from sleeve installation and how changes to the eddy current signal during subsequent inspections would result in tube plugging.

- A total of 126 hot leg tubesheet leak limiting sleeves were installed during RFO 23. Of the 126 sleeves, 77 were installed in tubes that had previously been removed from service by plugging. The 77 tubes were deplugged and inspected prior to sleeve installation. Following RFO 23, Unit 2 has a total of 805 sleeved tubes in service.

- The RFO 23 steam generator tube inspection report was the first report to be submitted after implementing TSTF-577, “Revised Frequencies for Steam Generator Tube Inspections.” This amendment resulted in additional reporting requirements in TS 5.6.6.2.1. The inspection frequency for Beaver Valley Unit 2 will not change since the SG tubing material is Mill Annealed Alloy 600.

Based on a review of the information provided, the NRC staff concludes that the licensee provided the information required by their technical specifications. In addition, the staff concludes that there are no current technical issues that warrant additional follow-up action. The 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.

SUBJECT: BEAVER VALLEY POWER STATION, UNIT 2 – STEAM GENERATOR TUBE INSPECTION - REVIEW OF THE SPRING 2023 TUBE INSPECTION REPORTS (EPID L-2024-LRO-0006) DATED MAY 29, 2024

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