UNITED STATES
NUCLEAR REGULATORY COMMISSION
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April 19, 2021

Mr. John J. Grabnar
Site Vice President
Energy Harbor Nuclear Corp.
Beaver Valley Power Station
Mail Stop P-BV-SSEB
P.O. Box 4, Route 168
Shippingport, PA 15077

SUBJECT: BEAVER VALLEY POWER STATION, UNIT 2 - REVIEW OF STEAM GENERATOR TUBE INSPECTION REPORT FOR THE SPRING 2020 REFUELING OUTAGE (EPID L-2020-LRO-0063)

Dear Mr. Grabnar:

By letters dated October 13, 2020, and February 4, 2021 (Agencywide Documents Access and Management System (ADAMS) Accession Nos. ML20287A373 and ML21055A886, respectively), Energy Harbor Nuclear Corp. submitted information summarizing the results of the spring 2020 steam generator (SG) tube inspections performed at Beaver Valley Power Station, Unit 2 (Beaver Valley). The inspections were performed during Refueling Outage 21. The information was submitted in accordance with Beaver Valley Technical Specification 5.6.6.2, “Unit 2 SG Tube Inspection Report.”

The NRC staff has completed its review of Energy Harbor’s submittals, as documented in the enclosed evaluation. The NRC staff concludes that Energy Harbor has provided the information required by the technical specifications and that no additional follow-up is required at this time. This completes the NRC staff’s efforts for EPID L-2020-LRO-0063.

If you have any questions, please contact me at 301-415-2328 or Jennifer.Tobin@nrc.gov.

Sincerely,

/RA/

Jennifer C. Tobin, Project Manager
Plant Licensing Branch I
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-412

Enclosure:
Review of Spring 2020 SG Tube
Inspection Report

cc: Listserv

OFFICE OF NUCLEAR REACTOR REGULATION

REVIEW OF THE SPRING 2020 STEAM GENERATOR TUBE INSPECTION REPORT

ENERGY HARBOR NUCLEAR CORP.

BEAVER VALLEY POWER STATION, UNIT 2

DOCKET NO. 50-412

By letters dated October 13, 2020, and February 24, 2021 (Agencywide Documents Access and Management System (ADAMS) Accession Nos. ML20287A373 and ML21055A886, respectively), Energy Harbor Nuclear Corp. (the licensee) submitted information summarizing the results of the spring 2020 steam generator (SG) tube inspections performed at Beaver Valley Power Station (Beaver Valley), Unit 2, during Refueling Outage 21 (RFO 21). The U.S. Nuclear Regulatory Commission (NRC) staff summarized a conference call regarding the spring 2020 SG tube inspections at Beaver Valley, Unit 2, in a letter dated May 19, 2020 (ADAMS Accession No. ML20122A003). In addition, on March 9, 2021 (ADAMS Accession No. ML21055A058), the NRC staff issued a review of the licensee's reports for alternate tube repair criteria applied during the spring 2020 tube inspections.

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 a number of 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 was in-situ stress relieved prior to operation.

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

After reviewing the information provided by the licensee, the NRC staff has the following comments and observations:

- In total, 17 tubes were plugged in the three SGs (13 in SG A, two in SG B, and two in SG C), and 88 tubes were returned to service after installing sleeves in the hot-leg tubesheet (45 in SG A, 21 in SG B, and 22 in SG C). The causes of tube plugging and sleeving were circumferential and axial outside diameter stress corrosion cracking (ODSCC).

- Two of the tubes plugged in RFO 21 had been repaired by installing sleeves in RFO 20 (tubes Row 17, Column 46 in SG A and Row 30, Column 55 in SG B). Both were removed from service in RFO 21 due to an axial eddy current indication attributed to a scratch on either the outside surface of the nickel band at the lower tubesheet joint, or on the inside surface of the parent tube.

- Three tubes required in-situ pressure testing due to circumferential ODSCC in the hot-leg top-of-tubesheet region (two tubes in SG A) and at a freespan ding (one tube in SG B). All three tubes satisfied the structural and leakage performance criteria and were removed from service by plugging.

- Cold leg thinning was observed for the first time in the Beaver Valley, Unit 2, SGs. It was detected at one location in one tube in SG A, and the measured through-wall depth was 25 percent. The tube was returned to service after assessment of the structural and leakage integrity.

Based on the 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 technical issues that warrant additional follow-up action at this time since 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 - REVIEW OF STEAM GENERATOR TUBE INSPECTION REPORT FOR THE SPRING 2020 REFUELING OUTAGE (EPID L-2020-LRO-0063) DATED APRIL 19, 2021

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ADAMS Accession No.: ML21097A114 *by memo dated

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