

**From:** [Tobin, Jennifer](#)  
**To:** [Grabnar, John J](#)  
**Cc:** [Lashley, Phil H \(EH\)](#)  
**Subject:** Beaver Valley Units 1 and 2 - Request for Additional Information (2nd Round) - Steam Generator Tube Sleeve LAR  
**Date:** Friday, April 09, 2021 4:50:00 PM

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Dear Mr. Grabnar,

By letter dated June 25, 2020 (ADAMS Accession No. ML20177A272), Energy Harbor Nuclear Corporation (the licensee) requested a license amendment related to methods of inspection and service life for Alloy 800 steam generator tube repair sleeves. By email dated October 22, 2020 (ML20297A322), the NRC staff requested additional information. The licensee responded by letters dated January 22, 2021 (ML21022A133) and February 16, 2021 (ML21048A082). At the staff's request, a public meeting was conducted on April 6, 2021 (ML21095A138) for clarification of certain responses. The staff determined that additional information is needed to complete its evaluation of the licensee's request.

The NRC staff has determined that additional information is needed to complete its review of the request. A response to these questions is requested by **May 10, 2021**. This email will be made public in ADAMS.

NOTE: The proprietary version will be sent under secure BOX system later today, the nonproprietary (public) version is below.

Please let me know if you have questions or concerns.

Thanks!  
-Jenny

**Beaver Valley Unit 2**  
**Steam Generator Tube Sleeve License Amendment Request**  
**Second Request for Additional Information from DNRL/NCSG**

Regulatory Analysis Basis

Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.36(b) requires each license authorizing operation of a production or utilization facility of a type described in § 50.21 or § 50.22 will include technical specifications. The technical specification will be derived from the analyses and evaluation included in the safety analysis report, and amendments thereto, submitted pursuant to § 50.34.

Pressurized water reactor (PWR) steam generator (SG) tubes form part of the reactor coolant pressure boundary (RCPB). In Appendix A of 10 CFR 50, General design criteria (GDC) 14, 15, 30, 31, and 32, define requirements for the structural and leakage integrity of the RCPB. As part of the RCPB, the SG tubes must also meet the requirements of 10 CFR 50.55a with respect to inspection and repair requirements of the ASME Code. For SG tubes repaired with sleeves, the sleeve and the sleeve/tube joint also form part of the RCPB. All PWRs have Technical Specifications according to 10 CFR 50.36 that include a Steam Generator Program with specific criteria for the structural and leakage integrity, repair, and inspection of SG tubes.

In order to complete the review of the LAR, the staff requests the following information to clarify the January 22, 2021, and February 16, 2021, responses to the staff's October 22, 2020, request for additional information (RAI):

1. Reference: RAI question 1a response, related to Revision 2 of the probability of detection (POD) report and the detection of circumferential flaws.

Figure 1-1 of the RAI response shows a 0.83 volt signal from a 50% through-wall (TW) electrical discharge machined (EDM) circumferential notch that was judged as difficult to detect due to a low signal-to-noise ratio in the eddy current response. Table 3-1 in the POD report shows axial outside diameter stress corrosion cracking (ODSCC) signals of much lower amplitude (0.23 to 0.39 volts peak-to-peak) that were detected in sleeve test samples. Discuss the reason for these differences, including any noise differences between the EDM notch samples and ODSCC samples.

2. Reference: RAI question 1c response, page 3 of 13, regarding the nickel band thickness effects testing program.

The response states that the feasibility study resulted in a peak-to-peak voltage of 2.65 volts using the axial coil on the [[ ]] of the same [[ ]] nickel thickness.

Please clarify the following:

- a. Based on Table 1 of the response (page 5 of 13), should the peak-to-peak voltage be [[ ]] volts for the [[ ]] described and the same nickel thickness, rather than 2.65 volts?
  - b. Is the circumferential [[ ]] located in the [[ ]], rather than the [[ ]]
3. Reference: RAI question 1c response, regarding detection of circumferential flaws with the [[ ]] Ghent probe channel.

Considering the [[ ]] produced a [[ ]] volt response to a 100% TW circumferential EDM notch:

- a. Please discuss the capability of the [[ ]] channel to detect partial through-wall circumferential SCC cracks.
- b. Please discuss if the [[ ]] channel will be the primary channel for circumferential flaw detection in the tubesheet sleeve joint.
- c. Given the difference in detectability between cracks and EDM notches, please discuss the expected probability of detection as a function for crack depths ranging from 60 to 100% TW located in the middle of the nickel band.

4. Reference: RAI question 1c response, Table 2

Table 2 presents the EPRI ODSCC samples with voltage adjustments calculated based on the nickel thickness study. What is the basis for expecting that the same relationship between voltage response and nickel band thickness will hold for part through-wall SCC cracks as for 100% TW [[ ]]? The staff notes that stress corrosion crack signals can be much lower amplitude and more variable as compared to EDM notches.

5. Reference: RAI question 2 response, Table 2-1

The ODSCC specimens have a 50 mil nominal tube wall thickness; however, for sample J-3 Flaw #3, Table 2-1 shows a [[ ]]% destructive examination (DE) flaw depth at [[ ]] mils. Please explain this possible discrepancy.

6. Reference: RAI question 7 response

As stated in the January 22, 2021 RAI response, the Ghent Probe will be used for the eddy current “call of record” when inspecting the nickel band portion of the tubesheet sleeve. Given that the +Point probe data will also be available, and given the experience from the test program and field data (e.g., scratches), please discuss how:

- a. Supplemental data from the +Point may be used in conjunction with the Ghent probe data.
- b. An indication in the nickel band region from the +Point probe would be dispositioned in the absence of a corresponding Ghent probe indication.