September 23, 2003

Mr. Lew W. Myers
Chief Operating Officer
FirstEnergy Nuclear Operating Company
Davis-Besse Nuclear Power Station
5501 North State Route 2
Oak Harbor, OH 43449-9760

SUBJECT: DAVIS-BESSE NUCLEAR POWER STATION, UNIT 1 - REQUEST FOR ADDITIONAL INFORMATION RE: 2002 STEAM GENERATOR TUBE INSERVICE INSPECTION RESULTS (TAC NO. MB9541)

Dear Mr. Myers:

By letters dated March 22, 2002, and March 31, 2003, FirstEnergy Nuclear Operating Company provided a summary of your 2002 steam generator tube inservice inspection. Based on the staff's review of your summary report, the staff requests that you provide additional information as discussed in the enclosure to this letter.

The enclosed questions were provided by email to your staff on July 28, 2003. The questions were discussed with Mr. Dale Wuokko of your staff on September 9, 2003, and a mutually agreeable target date of September 26, 2003, for your responses was established. If circumstances result in the need to revise the target date, please contact me at (301) 415-3027 at the earliest opportunity.

Sincerely,

***/RA/***

Jon B. Hopkins, Sr. Project Manager, Section 2
Project Directorate III
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-346

Enclosure: Request for Additional Information

cc w/enclosure: See next page

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REQUEST FOR ADDITIONAL INFORMATION

DAVIS-BESSE NUCLEAR POWER STATION 2002 STEAM GENERATOR TUBE

INSERVICE INSPECTION

TAC NO. MB9541

1. In your letters dated March 22, 2002, and March 31, 2003, the inspections for steam generators (SGs) 1 and 2 in Tables 1 and 4, respectively, were summarized. Please summarize the inspection results for each inspection category. For example, for each inspection category (dents, dings, sleeves, lane/wedge region, upper tubesheet expansion transition, sludge zone, bobbin indications, etc.), discuss the results of the inspection including the nature (axial primary water stress corrosion cracking (PWSCC), groove intergranular attack (IGA), circumferential PWSCC, etc.) and severity (length, depth, voltage) of each indication detected. If indications were found, discuss the technical basis for the scope of the inspections (i.e., if a flaw was located in a 2 volt dent discuss the basis for not expanding the scope of the rotating probe examination to include all dents). In your response, address how the indications were detected (e.g., bobbin coil, rotating probe, bobbin and rotating probe, etc.).

2. During a pre-inspection conference call between the Nuclear Regulatory Commission (NRC) and Davis-Besse staff (refer to ML021410043), it was indicated that Davis-Besse would perform in-situ pressure testing of the tube in row 22, and tube 93 in SG 2A. Discuss the criteria you used to determine which indications were in-situ pressure tested and the results of all in-situ pressure tests performed during the outage.

3. With respect to the inspections at dented locations, please address the following:

   a. Clarify whether the classification of “dents” in your report includes dents/dings at tube supports (including the tubesheets) and in the free span.

   b. The number, location, and severity of your dents/dings.

   c. Confirm that your voltage normalization scheme for determining the size of dents is consistent with the standard industry approach.

   d. Clarify your statement that “all dent locations” above the 14$^{th}$ tube support plate were inspected. What is considered a dent (i.e., is a voltage amplitude criteria used such that dents are reported when they exceed a certain voltage threshold)?

   e. For each flaw (if any) detected during the outage at a dented location, please indicate whether the flaw: (1) was initially found during the bobbin screening, (2) was only identified with a rotating probe, (3) was identified during the initial bobbin screening and confirmed with a rotating probe, or (4) was only identified with the bobbin after the rotating probe results were available.

ENCLOSURE

f. Discuss how the 60 percent sample of dents below the 14th tube support was determined. For example, was it a random sample or were all dents above 5 volts examined with a rotating probe and the remaining sample was random? Discuss whether the original scope of the rotating probe examinations at the dents/dings was expanded based on the results. The staff notes that both stress and temperature affect a tube's susceptibility to stress corrosion cracking. As a result, a larger dent at a lower temperature may be as severe (from a stress corrosion cracking standpoint) as a smaller dent at a higher temperature (material properties being equal). Discuss how the inspection scope accounted for this.

g. Discuss the extent to which the bobbin probe is qualified to inspect dented/dinged regions exceeding a specific voltage threshold (e.g., 5 volts).

4. Discuss whether any exceptions were taken to the Electric Power Research Institute guidelines during the 2002 inspection and summarize the technical basis for each of these exceptions/deviations.

5. During a pre-inspection conference call between NRC and the Davis-Besse staff (refer to ML021410043), it was indicated that cracks were located in two construction-era welded plugs. Discuss the results of the inspection you performed on the plugs, including any additional information on the cause of the cracks identified in the construction-era welded plugs.

6. Discuss whether any loose part signals and/or wear due to loose parts was discovered during the outage. If a loose part was detected by eddy current, discuss whether the presence of the parts were visually confirmed and whether the parts were removed from the SG. If the parts were not removed, summarize the technical basis for leaving these parts in service.

7. In Tables 1 and 4, it was indicated that "all tubes with flaw-like indications" were inspected with a rotating probe. Clarify what is meant by "all tubes with flaw-like indications." For example, were all tubes with indications at support structures inspected with a rotating probe? How were bobbin indications determined to be non flaw-like? For manufacturing indications (frequently called burnishing marks) and freespan differential signals (if any) discuss the scope and results of any rotating probe examinations at these locations. How is an indication determined to be manufacturing-related (e.g., traceable back to baseline)? If a manufacturing indication changes over time (since the baseline inspection), discuss whether any rotating probe examinations are performed and the criteria used to determine whether or not a change in the bobbin signal occurs (e.g., 0.1 volt change, phase angle change of 3 degrees, etc.). For any criteria used to determine if a signal exhibits little or no change, discuss how the criteria was determined (e.g., was test repeatability evaluated for these types of indications such that the criteria would identify a signal change when the change was greater than normal test repeatability).

8. In Tables 2 and 5, the location of flaws detected are listed. Discuss the point of reference for the measurements. For example, does 14S -0.73 indicate the indication is 0.73-inch below the bottom, top, or center of tube support 14S? If from the middle of a tube support, please indicate the thickness of the support.

9. Address the criteria used to plug/repair defects. For example, were all crack-like indications plugged/repaired upon detection? Were wear indications sized and left in service, etc.?

10. Address whether the performance criteria were met for the previous cycle of operation. Discuss whether any new damage mechanisms were detected during this outage other than IGA associated with grooves (i.e., groove IGA).

11. Define a “tube end anomaly.”

12. Several of the volumetric indications are approximately 60 percent through-wall. Were these indications left in service during the prior inspection? If not, discuss the reason for the apparent high growth rate of the indications (i.e., from non-detected to 60 percent through-wall in one cycle). Discuss any implications of these findings to your operational assessment.

cc:

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