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L-10-337

ATTN: Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

SUBJECT:
Beaver Valley Power Station, Unit No. 2
Docket No. 50-412, License No. NPF-73
Response to Request for Additional Information – 2009 Steam Generator Tube Inspection Report (TAC No. ME3998)

By letter dated February 11, 2010 (Accession No. ML100491087), as supplemented by letter dated May 17, 2010 (Accession No. ML101410292), FirstEnergy Nuclear Operating Company (FENOC) submitted a summarization of the 2009 steam generator tube inspection results for Beaver Valley Power Station, Unit No. 2. By correspondence dated December 17, 2010 (Accession No. ML103500490), the Nuclear Regulatory Commission (NRC) requested additional information in order to complete its review of the reports. The FENOC response to the NRC request is attached.

There are no regulatory commitments contained in this letter. If there are any questions or if additional information is required, please contact Mr. Thomas A. Lentz, Manager – Fleet Licensing, at (330) 761-6071.

Sincerely,

Paul A. Harden

Attachment:
Response to December 17, 2010 NRC Request for Additional Information

A001
NRC

cc: NRC Region I Administrator
NRC Resident Inspector
NRR Project Manager
Director BRP/DEP
Site BRP/DEP Representative

ATTACHMENT
L-10-337

Response to December 17, 2010 NRC Request for Additional Information

By correspondence dated December 17, 2010 (Accession No. ML103500490), the Nuclear Regulatory Commission (NRC) staff requested additional information (RAI) regarding the FirstEnergy Nuclear Operating Company (FENOC) Beaver Valley Power Station, Unit No. 2 (BVPS-2) 2009 steam generator tube inspection reports summarized in letter dated February 11, 2010 (Accession No. ML100491087) and supplemented by letter dated May 17, 2010 (Accession No. ML101410292). The NRC's request is provided below in bold text followed by the FENOC response.

1. Discuss the results of the secondary side inspections performed in SGs A, B, and C, including the results of foreign object search and retrieval, possible loose part inspections, and the visual inspections of the annulus and tube lane regions. If all loose parts were not removed, discuss whether an analysis was performed to confirm that tube integrity would be maintained during the next operating cycle. If all locations with potential loose part indications from eddy current exams were not visually inspected, discuss how these tubes were dispositioned.

Response:

A visual inspection of the secondary side tubesheet face, annulus and tube lane was performed during the fall 2009 fourteenth refueling outage (2R14) in all three steam generators (SG's). No structural anomalies were identified as a result of the visual inspection. Foreign object search and retrieval (FOSAR) was also performed. The following table contains the results of the FOSAR effort and lists (a) a description of the foreign material observed in each SG, (b) the location of the foreign material and, (c) whether the foreign material was retrieved or left in the SG.

SG	**Description**	**Location**	**Retrieved**
A	Weld Slag or Sludge Rock	Hot Leg Top-of-Tubesheet	Yes
A	Sludge Rock	Hot Leg Top-of-Tubesheet	Yes
A	Scale	Cold Leg Top-of Tubesheet	No
A	Sludge Rock	Hot Leg Top-of-Tubesheet	No
A	Weld Slag	Cold Leg Top-of Tubesheet	No
A	Weld Slag	Hot Leg Top-of-Tubesheet	Yes
B	Scale	Hot Leg Top-of-Tubesheet	No

SG	Description	Location	Retrieved
B	Sludge Rock	Hot Leg Top-of-Tubesheet	Yes
C	Gasket	Cold Leg Top-of Tubesheet	Yes

Foreign material, including loose parts, that was not removed from the secondary side of the SGs was evaluated and documented. Based on this evaluation, the foreign material that remained in the secondary side of the SGs was determined to be acceptable for continued operation (that is, tube integrity would be maintained for at least two more operating cycles).

For those tube locations where potential loose part indications were reported from the eddy current examinations (reported from either the bobbin coil or plus point probes) and no visual inspection was performed at those particular tube locations, the plus point probe was used to verify that no degradation or tube wall wear was present. These tubes remain in service.

2. Discuss the results of your inspections of the plugs in SGs A, B, and C.

Response:

As part of the normal SG inspection process, a visual examination is performed each time the primary side of the SG is accessed to document the condition of the hot and cold leg channelheads. During 2R14, the examinations verified that the correct number of tube plugs were present and in the proper tube location. No anomalies were reported for 2R14.

In addition, there are 9 hot leg and 9 cold leg tube locations (SG A - 4; SG B - 2; SG C - 3) which contain Alloy 600 plugs repaired with the Westinghouse plug-in-plug (PIP) technique. These locations are visually examined each outage to assess the condition of the tack weld which holds the PIP in place. No anomalous conditions were reported for 2R14.

3. During your 2009 outage, some preliminary information was provided to the NRC staff that there was an indication of outside diameter stress corrosion cracking associated with a free span ding in SG A, approximately 44.6-inches above the sixth hot-leg tube support plate in the tube in row 41, column 36 (R41C36). In the May 17, 2010, report, the tube in R41C36 is not included in the SG A table for tubes with service-induced indications. This indication is also not referenced in the February 11, 2010, report. Discuss how this indication was dispositioned.

Response:

The data provided to the NRC during the outage was considered preliminary as the 2R14 SG examinations were still on-going at the time the aforementioned indication was discussed. FENOC understands the intent of the mid-inspection telephone call is to provide the NRC with the latest up-to-date SG inspection information. However, until a final comprehensive review of the primary and secondary data management databases is completed and all required signatures are obtained, the data is not considered final and is subject to change.

Eddy current data that is acquired during a given SG examination undergoes an extensive analysis process that follows a very strict protocol. As a minimum, data receives a primary and independent second party review. In addition, per paragraph 2.7.3 of procedure ISIE1-8, Revision 12, "Unit #2 Steam Generator Examination Guidelines," the Independent Qualified Data Analyst (IQDA) reviews indication codes (I-Codes), percent through-wall calls and repairable indications that have been resolved as no detectable degradation (NDD), no detectable degradation found (NDF) or rejected during the resolution process.

Also, per paragraph 15.14 of procedure ISIE1-8, Revision 12, resolution analysts review NDF calls that resulted from a re-test of a current outage I-Code to verify the NDF is the correct disposition for that indication.

During 2R14, a preliminary indication was reported in SG A. Row 41 Column 36 had a bobbin coil indication (4.52 volt ding) reported approximately 44.6" above the sixth hot leg tube support plate. Analysis of the subsequent plus point testing of this indication was inconclusive as the primary production analyst assigned a NDF report and the secondary production analyst assigned a single circumferential indication (SCI). The indication was then re-evaluated by at least two resolution analysts and finally by the IQDA. Review of the thirteenth refueling outage (2R13) data for this ding indication versus the 2R14 data showed little or no change in signal characteristics. A final disposition of NDF was assigned to this indication.

Therefore, the tube has remained inservice and was not included in any tables that listed service-induced indications.

4. Page 3, Section d.3 of the May 17, 2010, report states that if the plus point probe indicated no "flaws" were present within the wear scar, a wear call was assigned to the plus point report. Clarify if "flaw" should have actually said "crack-like flaws."

Response:

Section d.3 of the May 17, 2010 report discusses the approach utilized for new anti-vibration bar (AVB) wear scar indications reported with a percent through wall from the bobbin coil probe. As a wear scar is considered a flaw, the sentence that discusses the subsequent plus point examination could have been more definitive by stating that if no "crack-like flaws" were present within the wear scar, a wear call was assigned to the plus point report. The intent of the supplemental plus point inspection is to ensure that only a wear scar is present at the AVB location and that potential stresses within the wear scar have not initiated cracking.

5. When the tables for service-induced indications in the February 11, 2010, and May 17, 2010, reports are compared, many of the indications are shown to have different arc lengths. Explain the difference between the reports.

Response:

The variance in the reported arc lengths is due to the use of different frequencies (200 kHz versus 300 kHz) when performing the examinations as explained below.

The February 11, 2010 report provided the inspection results from the application of the F* (F Star) methodology to the hot leg top-of-tubesheet. As stated at the bottom of each table contained in the February 11, 2010 letter, the 300 kHz channel of the plus point probe was used for sizing of the indications. The sizing technique utilizing the 300 kHz channel is performed off-line (not part of the production analysis) by a separate analyst and provides a more accurate assessment of the severity of the indications. The May 17, 2010 letter provided the inspection results for the entire steam generator examination including the F* results. The data included in the May 17, 2010 letter uses the 200 kHz channel of the plus point probe, which is the channel used during production analysis. Use of the 200 kHz channel to report the indications during the production analysis is in accordane with the site specific examination technique specification sheets (ETSSs), which are consistent with the Electric Power Research Institute ETSSs.