

September 23, 2002

Mr. Mark B. Bezilla  
Vice President  
FirstEnergy Nuclear Operating Company  
Beaver Valley Power Station  
Post Office Box 4  
Shippingport, PA 15077

SUBJECT: BEAVER VALLEY POWER STATION, UNIT NO. 2 - SUMMARY OF  
TELEPHONE CONFERENCE WITH FIRSTENERGY NUCLEAR OPERATING  
COMPANY REGARDING CURRENT STEAM GENERATOR INSPECTION  
RESULTS (TAC NO. MB3906)

Dear Mr. Bezilla:

The Nuclear Regulatory Commission (NRC) staff participated in a conference call with FirstEnergy Nuclear Operating Company (FENOC) on February 15, 2002, to discuss the results of the steam generator (SG) tube inspections that were being performed during the ninth refueling outage (RF09) at Beaver Valley Power Station, Unit No. 2 (BVPS-2). The NRC staff documented its request and suggested agenda for the telephone conference in a letter to FENOC dated February 8, 2002 (Agencywide Documents Access and Management System Accession No. ML012530154).

Topics discussed during this call included the inspection scope, the eddy current data analysis results, new degradation mechanisms, plugging and repair plans, in-situ pressure testing and actions taken in response to the Indian Point Unit 2 (IP2) tube rupture event and NRC Information Notice 2000-02 (IN 2002-02), "Recent Experience with Plugged Steam Generator Tubes." Many of these details are contained in the enclosed inspection summary FENOC provided in support of this call. During the call, FENOC updated the number and depth of some flaw indications. These changes are noted below.

The inspection scope included both bobbin and rotating pancake coil (RPC) examinations of bobbin distorted signal indications (DSI) and hot leg Alloy 690 rolled plugs. During the call, FENOC updated the number of bobbin DSIs from 316 to 329 and confirmed four of these indications as Tube Support Plate (TSP) axial outer-diameter stress corrosion cracking (ODSCC). The maximum DSI voltage was 1.71; however, FENOC stated that this voltage may be higher after they completed the data evaluation. Although the BVPS-2 technical specifications allow use of the Generic Letter (GL) 95-05 alternate repair criteria (ARC), FENOC chose not to formally use the ARC because only 4 DSIs were confirmed as flaw-like. The NRC staff inquired about the nature of these indications with respect to their presence in previous outages and their confirmation with RPC probes. FENOC stated that these indications appear to be the same indications from previous outages with a slight increase in the voltages. In addition, FENOC theorized that the RPC probes have not been confirming most of the bobbin data because many of the DSIs may be shallow ODSCC indications that are more difficult to

M. Bezilla

detect with RPC. Although the NRC staff is aware that RPC probes will not confirm all bobbin indications, the NRC staff questioned the quantity of unconfirmed DSIs. With respect to plugged tubes at BVPS-2, FENOC reported that, in addition to Alloy 690 rolled plugs, BVPS-2 SGs also contain Alloy 600 rolled plugs that have been repaired with a "plug-in-plug" technique. FENOC has visually inspected these plugs.

The NRC staff and FENOC discussed in detail the results of the bobbin and RPC inspections, including new degradation mechanisms such as axial primary water stress corrosion cracking (PWSCC) and axial ODSCC within freespan dings. During the examination of the bobbin mixed residual signals, FENOC identified a ½-inch, 2.7 volt, 51% maximum depth axial PWSCC indication at the 05H TSP in SG B. When FENOC identified this flaw, the analysts expanded the scope of the mixed residual analysis by increasing the phase angle from  $\leq 45^\circ$  to  $\leq 50^\circ$ . Upon expanding the scope, another 2.2 volt, 25% through-wall, 0.3-inch axial PWSCC indication was identified at the 04H TSP in SG C. At the intersections with the axial PWSCC indications there were dents approximately one volt in magnitude. A third axial PWSCC indication was identified at the top of the tubesheet. These inspection findings are discussed in the enclosed material provided by FENOC.

During the call, FENOC reported that there were no tubes exceeding the screening criteria for in-situ pressure testing. The NRC staff asked if the Electric Power Research Institute (EPRI) guidelines address the performance of in-situ pressure testing upon discovering a new degradation mechanism. FENOC stated that EPRI guidelines do not suggest in-situ pressure testing tubes with new degradation mechanisms and did not express any plans to perform pressure testing. After the call, FENOC conducted in-situ pressure tests on the tubes with axial PWSCC and found that the in-situ leakage and  $3\Delta P$  pressure tests were satisfactory. FENOC did not further increase the phase angle criteria because all tubes with phase angle indications  $\leq 50^\circ$  were inspected with no additional findings.

The second new degradation mechanism was one hot leg ODSCC indication within a ding located in SG A between the 02H and 03H TSPs. The licensee identified this flaw within a 20% hot leg sample of >5 volt dings. As a result of this finding, the licensee expanded the sample to all hot leg dings greater than five volts in SG A. The licensee did not identify additional axial ODSCC indications within this expanded sample. The licensee indicated that new degradation mechanisms are tracked in the BVPS-2 corrective action program. Prior to the phone call, FENOC generated a condition report (CR) for the axial PWSCC indications. In addition, FENOC stated the intention to generate a CR for the axial ODSCC finding.

Other inspection findings included tubes in all SGs with volumetric, outer-diameter (OD) axial and OD circumferential degradation in the hot leg near the top of the tubesheet (TTS). SGs A and B each had one tube with volumetric indications that FENOC characterized as loose parts wear; however, no visual confirmation of any loose parts was performed near these tube locations. During the call, FENOC updated the maximum TTS circumferential ODSCC depth from 63% to 67%. A visual inspection of the secondary side revealed no swollen or severed plugged tubes. FENOC stated that although there have been no specific changes made to the SG inspection program in response to IN 2002-02, for the past few cycles (~ 3 cycles)

M. Bezilla

- 3 -

and including RF09, all tubes with circumferential indications meeting the repair criteria were stabilized prior to plugging.

At the conclusion of the call, the NRC staff requested that FENOC contact the NRC project manager (PM) with any additional inspection results significantly different than those discussed. On February 19, 2002, FENOC contacted the PM with the results of the sample expansion in SG A of hot leg dings > 5 volts and the in-situ pressure tests on the tubes with axial PWSCC. These results are captured in the above discussion.

Based on the information provided during the conference call and on February 19, 2002, the staff did not identify any issues requiring further discussion.

Sincerely,

*/RA/*

Daniel S. Collins, Project Manager, Section 1  
Project Directorate I  
Division of Licensing Project Management  
Office of Nuclear Reactor Regulation

Docket No. 50-412

Enclosure: Discussion Points

cc w/encl: See next page

M. Bezilla

- 3 -

and including RF09, all tubes with circumferential indications meeting the repair criteria were stabilized prior to plugging.

At the conclusion of the call, the NRC staff requested that FENOC contact the NRC project manager (PM) with any additional inspection results significantly different than those discussed. On February 19, 2002, FENOC contacted the PM with the results of the sample expansion in SG A of hot leg dings > 5 volts and the in-situ pressure tests on the tubes with axial PWSCC. These results are captured in the above discussion.

Based on the information provided during the conference call and on February 19, 2002, the staff did not identify any issues requiring further discussion.

Sincerely,

*/RA/*

Daniel S. Collins, Project Manager, Section 1  
Project Directorate I  
Division of Licensing Project Management  
Office of Nuclear Reactor Regulation

Docket No. 50-412

Enclosure: Discussion Points

cc w/encl: See next page

DISTRIBUTION:

PUBLIC	MO'Brien	ACRS
PDI-1 Reading	DCollins	BPlatchek, RGN-I
SRichards	OGC	ESullivan
RLaufer	CKhan	ALLund
ASmith	DLew, RGN-I	MModes, RGN-I
KKarwoski		

Accession nos.:

Letter: ML022660611

Enclosure: ML

Package: ML

OFFICE	PDI-1/PM	PDI-1/LA	EMCB/SC	PDI-1/SC
NAME	DCollins	MO'Brien	memo from A. Louise Lund	RLaufer
DATE	09/23/2002	09/23/2002	03/27/02	09/23/2002

**OFFICIAL RECORD COPY**

Beaver Valley Power Station, Units 1 and 2

Mary O'Reilly, Attorney  
FirstEnergy Nuclear Operating Company  
FirstEnergy Corporation  
76 South Main Street  
Akron, OH 44308

FirstEnergy Nuclear Operating Company  
Regulatory Affairs/Corrective Action Section  
Larry R. Freeland, Manager  
Beaver Valley Power Station  
Post Office Box 4, BV-A  
Shippingport, PA 15077

Commissioner James R. Lewis  
West Virginia Division of Labor  
749-B, Building No. 6  
Capitol Complex  
Charleston, WV 25305

Director, Utilities Department  
Public Utilities Commission  
180 East Broad Street  
Columbus, OH 43266-0573

Director, Pennsylvania Emergency  
Management Agency  
2605 Interstate Dr.  
Harrisburg, PA 17110-9364

Ohio EPA-DERR  
ATTN: Zack A. Clayton  
Post Office Box 1049  
Columbus, OH 43266-0149

Dr. Judith Johnsrud  
National Energy Committee  
Sierra Club  
433 Orlando Avenue  
State College, PA 16803

L. W. Pearce, Plant Manager (BV-IPAB)  
FirstEnergy Nuclear Operating Company  
Beaver Valley Power Station  
Post Office Box 4  
Shippingport, PA 15077

Rich Janati, Chief  
Division of Nuclear Safety  
Bureau of Radiation Protection  
Department of Environmental Protection  
Rachel Carson State Office Building  
P.O. Box 8469  
Harrisburg, PA 17105-8469

Mayor of the Borough of  
Shippingport  
P O Box 3  
Shippingport, PA 15077

Regional Administrator, Region I  
U.S. Nuclear Regulatory Commission  
475 Allendale Road  
King of Prussia, PA 19406

Resident Inspector  
U.S. Nuclear Regulatory Commission  
Post Office Box 298  
Shippingport, PA 15077

FirstEnergy Nuclear Operating Company  
Beaver Valley Power Station  
ATTN: M. P. Pearson, Director  
Services and Projects (BV-IPAB)  
Post Office Box 4  
Shippingport, PA 15077

FirstEnergy Nuclear Operating Company  
Beaver Valley Power Station  
Mr. B. F. Sepelak  
Post Office Box 4, BV-A  
Shippingport, PA 15077