



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

June 9, 2014

Mr. Eric A. Larson, Site Vice President
FirstEnergy Nuclear Operating Company
Beaver Valley Power Station
Mail Stop A-BV-SEB1
P.O. Box 4, Route 168
Shippingport, PA 15077

SUBJECT: BEAVER VALLEY POWER STATION, UNIT 2 - SUMMARY OF CONFERENCE
CALL REGARDING THE SPRING 2014 STEAM GENERATOR INSPECTIONS
(TAC NO. MF3862)

Dear Mr. Larson:

On May 1, 2014, the Nuclear Regulatory Commission (NRC) staff participated in a conference call with FirstEnergy Nuclear Operating Company (the licensee) to discuss the steam generator tube inspections performed during refueling outage 2R17 (spring 2014) at Beaver Valley Power Station, Unit 2. A summary of the conference call is enclosed. Information provided by the licensee to facilitate the discussion can be found in the Agencywide Documents Access and Management System under Accession No. ML14125A145.

This completes the NRC staff efforts for TAC No. MF3862. If you have any questions, please contact me at (301) 415-4090.

Sincerely,

A handwritten signature in black ink that reads "Jeffrey A. Whited".

Jeffrey A. Whited, Project Manager
Plant Licensing Branch I-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-412

Enclosure:
Conference Call Summary

cc w/encl: Distribution via Listserv

SUMMARY OF CONFERENCE CALL WITH FENOC
SPRING 2014 STEAM GENERATOR TUBE INSPECTIONS
BEAVER VALLEY POWER STATION, UNIT 2
DOCKET NUMBER 50-412

On May 1, 2014, the Nuclear Regulatory Commission (NRC) staff participated in a conference call with FirstEnergy Nuclear Operating Company (the licensee), and other representatives, regarding the ongoing steam generator (SG) tube inspection activities at Beaver Valley Power Station, Unit 2 (BVPS-2). Information provided by the licensee in support of the conference call is located in the Agencywide Documents Access and Management System under Accession No. ML14125A145.

BVPS-2 is a 3-loop plant with Westinghouse Model 51M SGs. Each SG contains 3376 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 entire length of tube within the tubesheet was shot-peened on both the hot-leg and cold-leg sides of the SG, prior to operation. In addition, the U-bend region of the small radius tubes were in-situ stress relieved prior to operation.

In addition to the depth-based tube repair criteria, the licensee is also authorized to apply the voltage-based tube repair criteria for predominantly axially-oriented outside diameter stress-corrosion cracking (ODSCC) at the tube support plate elevations. In addition, the licensee is authorized to leave flaws within the tubesheet region in service, provided they satisfy the F* repair criterion.

Additional information discussed during the conference call and not included in the document provided by the licensee is summarized below:

- Regarding their response to question 5, the licensee clarified that the section on circumferential ODSCC refers to two different indications. Specifically, the indication with a maximum arc length of 321 degrees is associated with a percent degraded area (PDA) of 23 percent, while the largest circumferential ODSCC PDA from profiling was 34 percent and associated with a 70 percent through-wall indication.
- The licensee clarified that 100 percent of DNI (Dent or Ding with a possible Indication) signals are inspected with a rotating pancake coil, and that only DSI (Distorted Tube Support Plate Signal with possible indication) signals are used in the Monte Carlo simulations for assessing tube integrity. A DNI is a bobbin signal with a phase angle less than 55 degrees, and is used to screen bobbin indications that may be primary water stress-corrosion cracking (PWSCC) indications. Additionally, the licensee stated that the maximum DSI bobbin coil signal found in the outage was 1.41 volts, and that a flaw signal was not identified during the rotating probe examination of this area.

- Because the sum of the DSI, DNI, and support plate mix residual (SPR) signals for SG A does not equal the total provided by the licensee (difference of one), the licensee indicated that there may be a typographical error in the numbers.
- The three tubes with anti-vibration bar wear indications that exceeded the technical specification plugging limit were in SG A (one tube) and SG B (two tubes).
- There was no PWSCC in any freespan dings. The licensee clarified that due to the residual stress state on the primary side of a tube with a freespan ding, PWSCC is not a possibility.
- No indications had been identified associated with dents this outage.
- No cracks had been found in the U-bends of the low row tubes at the time of the call.
- All historical possible loose part (PLP) indications were inspected and showed no change. There were a few new PLP indications found in the middle of the tube bundle, but no loose parts were found.
- The foreign object search and retrieval inspection had been completed in all SGs at the time of the call. No loose parts were detected during these inspections.
- At the time of the call, visual inspections of the SG C steam drums were about to commence.
- The licensee stated that they were planning to pull tubes to meet the guidance of Generic Letter 95-05, "Voltage Based Repair Criteria for Westinghouse Steam Generator Tubes Affected by Outside Diameter Stress Corrosion Cracking".
- A primary channel head inspection is planned, to meet the requirements of Nuclear Safety Advisory Letter 12-1, but had not been conducted at the time of the call.

The following abbreviations are used in the document provided by the licensee:

2R17 = Unit 2 Refueling Outage 17

+Pt = Plus Point Probe

AVB = Anti-vibration Bars

BLG = (Tubesheet) Bulge

DSI = Distorted Tube Support Plate Signal with Possible Indication

DNG = Ding

DNI = Dent or Ding with Possible Indication

EPRI = Electric Power Research Institute

ETSS = Examination Technique Specification Sheet

FOSAR = Foreign Object Search and Retrieval

FSI = Free Span Indication

GL = Generic Letter

ID = Inside Diameter

kHz = Kilohertz

NQI = Non-quantifiable Indication

OD = Outside Diameter

ODSCC = Outside Diameter Stress Corrosion Cracking
OXP = (Tubesheet) Over-expansion
PLP = Possible Loose Part
PWSCC = Primary Water Stress Corrosion Cracking
SCC = Stress Corrosion Cracking
SG = Steam Generator
SPR = (Tube) Support Plate Mix Residual Signal
TSP = Tube Support Plate
TTS = Top of Tubesheet
TW = Through Wall
UT = Ultrasonic Testing
V = Volts

The NRC staff did not identify any issues that required follow-up action at this time, however, the NRC staff asked to be notified in the event that any unusual conditions were detected during the remainder of the outage.

Subsequent to the outage call, the licensee informed the NRC staff that an indication had been identified in a tube in row 25, column 45 of SG B. The indication was in the free-span area of the U-bend, approximately 3.70 inches away from the number one anti-vibration bar. The indication was an axial crack associated with a 6.0 volt ding, and was believed to be axial outside diameter stress-corrosion cracking. The mean estimated maximum depth was approximately 70 percent through-wall. The tube was in-situ pressure tested for its full length because the indication was located in the U-bend region of the tube. The tube satisfactorily passed in-situ pressure testing.

June 9, 2014

Mr. Eric A. Larson, Site Vice President
FirstEnergy Nuclear Operating Company
Beaver Valley Power Station
Mail Stop A-BV-SEB1
P.O. Box 4, Route 168
Shippingport, PA 15077

SUBJECT: BEAVER VALLEY POWER STATION, UNIT 2 - SUMMARY OF CONFERENCE
CALL REGARDING THE SPRING 2014 STEAM GENERATOR INSPECTIONS
(TAC NO. MF3862)

Dear Mr. Larson:

On May 1, 2014, the Nuclear Regulatory Commission (NRC) staff participated in a conference call with FirstEnergy Nuclear Operating Company (the licensee) to discuss the steam generator tube inspections performed during refueling outage 2R17 (spring 2014) at Beaver Valley Power Station, Unit 2. A summary of the conference call is enclosed. Information provided by the licensee to facilitate the discussion can be found in the Agencywide Documents Access and Management System under Accession No. ML14125A145.

This completes the NRC staff efforts for TAC No. MF3862. If you have any questions, please contact me at (301) 415-4090.

Sincerely,

/RA/

Jeffrey A. Whited, Project Manager
Plant Licensing Branch I-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-412

Enclosure:
Conference Call Summary

cc w/encl: Distribution via Listserv

DISTRIBUTION:

Public	K. Karwoski, NRR	
LPL1-2 R/F	RidsRgn1MailCenter Resource	G. Kulesa, NRR
RidsNrrDorLpl1-2 Resource	RidsAcrsAcnw_MailCTR Resource	A. Johnson, NRR
RidsNrrLAABaxter Resource	RidsNrrDeEsgb Resource	RidsNrrPMSusquehanna Resource

Accession No.: ML14142A087		* via memo	**via e-mail		
OFFICE	LPL1-2/PM	LPL1-2/LA	ESGB/BC*	LPL1-2/BC	LPL1-2/PM
NAME	JWhited	ABaxter **	GKulesa*	MKhanna	JWhited
DATE	05/21/2014	06/02/2014	05/13/2014	06/06/2014	06/09/2014

OFFICIAL RECORD COPY