UNITED STATES
NUCLEAR REGULATORY COMMISSION
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June 10, 2015

Mr. Louis P. Cortopassi
Site Vice President and Chief Nuclear Officer
Omaha Public Power District
Fort Calhoun Station
9610 Power Lane, Mail Stop FC-2-4
Blair, NE 68008

SUBJECT: FORT CALHOUN STATION, UNIT NO. 1 – SUMMARY OF STEAM GENERATOR CONFERENCE CALL FOR REFUELING OUTAGE 27 (TAC NO. MF6165)

Dear Mr. Cortopassi:

On May 1, 2015, the U.S. Nuclear Regulatory Commission staff conducted a conference call with representatives of the Omaha Public Power District and its contractors regarding the licensee's ongoing steam generator tube inspection activities at Fort Calhoun Station, Unit No. 1 during refueling outage 27.

At the time of the conference call, tube inspections were still in progress. A summary of the information that was discussed during the conference call is provided in the Enclosure. If you have any questions, please contact me at 301-415-2296 or via e-mail at fred.lyon@nrc.gov.

Sincerely,

CFLyon

Carl F. Lyon, Project Manager
Plant Licensing Branch IV-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-285

Enclosure
Conference Call Summary

cc w/encl: Distribution via Listserv

SUMMARY OF STEAM GENERATOR CONFERENCE CALL

FOR REFUELING OUTAGE 27

OMAHA PUBLIC POWER DISTRICT

FORT CALHOUN STATION, UNIT NO. 1

DOCKET NO. 50-285

On May 1, 2015, the U.S. Nuclear Regulatory Commission (NRC) staff conducted a conference call with representatives of the Omaha Public Power District (OPPD, the licensee) and its contractors regarding the licensee's ongoing steam generator (SG) tube inspection activities at Fort Calhoun Station, Unit No. 1 (FCS) during refueling outage 27 (27RFO). At the time of the conference call, tube inspections were still in progress.

FCS has two replacement SGs manufactured by Mitsubishi Heavy Industries. The recirculating SGs are model MHI-49TT-1 and were installed in 2006. Each SG contains 5,200 thermally-treated Alloy 690 tubes. Each tube has a nominal outside diameter of 0.750 inches with a nominal wall thickness of 0.043 inches. The tubes were hydraulically expanded at both ends for the full depth of the tubesheet and are supported by five Type 405 stainless steel tube support plates (TSPs) with trefoil shaped holes. The TSPs are 1.375 inches thick. The hot-leg temperature is 592 degrees Fahrenheit.

A summary of the information provided by the licensee during the call is provided below:

- This outage is the second inservice inspection (ISI) since the SGs were replaced in 2006. The first ISI was performed in 2008. One tube is plugged in SG B. This tube was plugged prior to placing the SGs into operation.

- There was no primary-to-secondary leakage observed during the recently completed cycle.

- No secondary-side pressure tests were planned or conducted.

- No exceptions or deviations were taken to the industry guidelines.

- During this inspection, 58 percent of the tubes in SGs A and B were inspected full length using a bobbin probe. This included 100 percent full-length inspections of the periphery tubes (two to three tubes deep) and full-length inspections of the remaining inner tubes to reach 58 percent. A rotating probe equipped with a +Point™ coil was used to inspect 100 percent of all non-quantifiable indications, all I-codes, new potential loose part indications, all tubes near foreign objects not retrieved in the previous refueling outage, all tube-to-tube wear indications, proximity indications, all manufacturing burnish marks whose voltage amplitude has changed by 0.5 Volts, and all Channel 6 indications adjacent to another tube with a Channel 6 indication. In addition, a +Point™ coil

was used to inspect the U-bend region of the first two and last two tubes in row 1, the first and last tube in row 2, and all peripheral tubes from 3 inches above to 3 inches below the top of the tubesheet (TTS).

- As of 8:00 a.m. on May 1, 2015, 97.7 percent and 99.8 percent of inspections in SG A and SG B, respectively, had been completed.

- There was no tube-to-tube wear, anti-vibration bar wear, retainer bar wear, or foreign object wear identified in either SG.

- There were 17 indications of TSP wear in ten tubes in SG A and 18 indications of TSP wear in nine tubes in SG B. Some of the tubes had more than one TSP with wear while some tubes had multiple indications at the same TSP elevation. The criteria for the expansion of the bobbin probe examination scope in the periphery region of the bundle, as established by the degradation assessment, were met. The purpose of the expansion was to examine all remaining untested tubes that were six tubes deep along the diagonal and four tubes deep in any row from the edge of the bundle. This expansion applied to both SGs. The expansion did not identify any degradation and additional expansion was not required.

- Most of the TSP wear indications were located on the periphery of the cold-leg at TSPs 3 and 4. The largest indication was located in a tube in row 1, column 127 (R1C127) in SG A. The indication had a voltage amplitude of 0.31 Volts as measured by bobbin coil and 0.44 Volts as measured by +Point™ coil. From the +Point™ coil, the indication was estimated to be 16 percent through-wall (TW), with a width of 0.18 inches and an axial length of 1.34 inches, which corresponds to the length of the TSP land. None of the TSP wear indications were detected during the first ISI, but there was a small precursor signal detected with hindsight on the tube located in R1C127. The reported TSP wear width of 0.18-inch is based on the physical width of the trefoil land rather than the size reported by the +Point probe which overcalled the width (from 0.25-inch to 0.48-inch). The width of 0.18-inch is believed to be the more accurate representation of the true flaw width.

- All tubes met the condition monitoring limit of 42 percent TW which assumes a flaw that is 1.4 inches long.

- At the time of the call, there were no plans to plug or repair any tubes.

- At the time of the call, there were no in-situ pressure tests or tube pulls planned.

- +Point™ inspections three tubes deep around the periphery and bobbin inspections on rows 91 and greater were performed to detect loose parts. No loose parts have been detected by eddy current in either SG. Foreign object search and retrieval inspections had not been started at the time of the call. No wear attributed to loose parts was detected.

- The scope of secondary side inspections includes sludge lancing followed by in-bundle visual inspections, and visual inspections of the uppermost TSP, steam drum, feedring, and moisture separator.

- There were no unexpected or unusual results found during these inspections.

- At the time of the call there were 106 tubes in the baseline inspection scope and 11 tubes in the special interest inspection scope remaining to be inspected in SG A. In SG B, at the time of the call, there were no tubes in the baseline inspection scope and only four tubes in the special interest inspection scope remaining to be inspected.

The NRC staff did not identify any issues that required follow-up action at this time.

Participants on the call included:

Bill Hansher, Principal Regulatory Assurance Engineer, OPPD
Teddy Hutchinson, Reliability Engineer, OPPD
Mike Edwards, Regulatory Assurance Engineer, OPPD
Harry L. Smith, Exelon
Rick Maurer, Westinghouse
Mike Shields, Exelon
Pat Creegan, Exelon
Lee Friant, Exelon
Kenneth Karwoski, NRC/NRR/DE
Alan Huynh, NRC/NRR/DE/ESGB
Andrew Johnson, NRC/NRR/DE/ESGB
Andrea George, NRC/NRR/DORL/LPL4-1

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