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July 9, 2009

U.S. Nuclear Regulatory Commission
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In the Matter of)
Tennessee Valley Authority (TVA))

Docket No. 50-328

**SEQUOYAH NUCLEAR PLANT (SQN) - UNIT 2 – RESPONSE TO NRC QUESTIONS
CONCERNING THE STEAM GENERATOR (S/G) TUBE INSERVICE INSPECTION
REPORT (TAC No. MD9595)**

- References:
1. NRC letter to TVA dated March 17, 2009, "Sequoyah Nuclear Plant, Unit 2 - Request for Additional Information Regarding Steam Generator Tube Inservice Inspection Report For the Cycle 15 Refueling Outage (TAC No. MD9595)"
 2. TVA letter to NRC dated August 27, 2008, "Sequoyah Nuclear Plant, Unit 2 - Unit 2 Cycle 15 (U2C15) 90-Day Steam Generator (S/G) Report For Voltage-Based Alternate Repair Criteria And W* Alternate Repair Criteria"

The enclosure provides TVA responses to the NRC questions associated with the S/G tube inspections submitted in the Reference 1 letter.

There are no commitments contained in this letter.

If you have any questions about this change, please contact Beth A. Wetzel at (423)-843-7170.

Sincerely,

Timothy P. Cleary

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ENCLOSURE

TENNESSEE VALLEY AUTHORITY (TVA) SEQUOYAH NUCLEAR PLANT (SQN) UNIT 2

RESPONSE TO NRC QUESTIONS CONCERNING THE UNIT 2 CYCLE 15 STEAM GENERATOR (S/G) TUBE INSERVICE INSPECTION REPORT

NRC Question 1

Concerning the tube in row 44, column 58 in steam generator 3, specifically, was this tube inspected with a rotating probe and what were the results?

If the indications in this tube were confirmed as a flaw with the rotating probe (or if it wasn't inspected with a rotating probe), what was the basis for not plugging the tube since the tube had a 2.55 volt indication (when tested with a non-worn probe)?

Discuss how this indication was considered in SQN's flaw growth methodology and SQN's tube integrity assessment since it appears that this flaw may have the largest voltage growth rate. In addition, discuss the adequacy of the "worn-probe" methodology.

TVA Response

Background

Prior to the Cycle 15 outage indications have been identified at the first three hot leg supports (H01, H02, H03) of row 44 Column 58 in S/G 3. Each has had the indications examined and confirmed with rotating pancake coil. The 2.55-volt indication at H03 is the peak-to-peak voltage of the support plate and not that of the indication. The indication was recorded as 1.04 volts from the initial run.

Unit 2 Cycle 15

During the Unit 2 Cycle 15 refueling outage (RFO), indications were again identified at these locations. A 1.75-volt indication was identified by bobbin at the first support (H01). In Cycle 14 this indication had been identified as 1.46 volts. On the initial dataset that this tube was run, Calibration 18, the probe wear was out of tolerance and a retest was required since the outside diameter stress corrosion cracking (ODSCC) type indication was 1.5 volts or greater. The tube was retested and the 1.75-volt indication was correctly called at 1.32 volts.

In order to reduce redundant information in the database, the indication code PBC (Previous Bobbin Call) is used. When indications are confirmed this helps ensure the correct tube is being tested. The voltages from these PBC calls are not reviewed since they are there to ensure the correct identity of the tube. PBC was used in the subsequent examination of the tube on all of the prior calls except the 1.75-volt indication. This indication on the initial dataset had been changed from DSI (Distorted Support Indication) to RPW (Retest Probe Wear). On the subsequent test the RPW indication was recorded as DSI (1.32 volts). The 2.55-volt indication at H03 is the peak-to-peak voltage of the support plate and not that of the indication. The indication was recorded as 1.04 volts from the initial run.

NRC Question 2

In TVA's response to RAI 8 for the subject report, TVA indicated that there was no reason to believe the tube was defective, but plugged it anyway. Since this tube was in row 1, and degradation has been observed in the U-bend region of row 1 tubes in other plants, it is not clear why TVA did not have reason to believe the tube could have a flaw (e.g., was the location of the obstruction away from a region where flaws have been found; was the extent of tubing not examined, small; has no degradation been found in the row 1 U-bends at Sequoyah; etc.). Can you please answer this?

TVA Response

Prior to shutdown for the SQN Unit 2 Cycle 15 RFO there was no detectable leakage. After removing manways no water leakage was identified emanating from any of the tubes.

The tube in question from S/G 4, Row 1, Column 32 was inspected with difficulty during the Cycle 14 RFO. It had a small dent, which stopped the rotating probe from rotating in two inspection attempts. On the third attempt the probe rotated through the U-bend with no degradation or loose parts identified.

One Row 1 tube was plugged in S/G 1 during the Cycle 14 RFO.

No Row 1 tubes were plugged during the Cycle 15 RFO because of degradation in the U-bend. Four attempts were made to inspect Row 1, Column 32 with the rotating probe. Two of the inspections were able to traverse the entire U-bend, but did not spin the entire length of the U-bend. The rotation stopped briefly at approximately the same location as had been experienced in the previous cycle, but during Cycle 15 RFO we were unable to obtain acceptable data throughout the U-bend. Additional attempts were not made and the decision was made to plug the tube.

There was no evidence to suggest the tube was degraded, but since there were difficulties with performing the inspections in the past which had resulted in additional dose and schedule time, it was determined to discontinue attempts to inspect the tube and remove the tube from service. TVA has not experienced any tube progressing from a no detection state to one which fails structural integrity. In-situ testing has been performed on U-bend tubes at SQN in the past with no failures. Our U-bends are inspected 100 percent each outage. Utilizing the principles of as low as reasonably achievable and the evidence stated, no in-situ was performed on Row 1, Column 32.