

January 13, 2006

Mr. Karl W. Singer
Chief Nuclear Officer and
Executive Vice President
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6A Lookout Place
1101 Market Street
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SUBJECT: WATTS BAR NUCLEAR PLANT, UNIT 1 - SUMMARY OF THE NUCLEAR
REGULATORY COMMISSION STAFF'S REVIEW OF THE 12-MONTH STEAM
GENERATOR TUBE INSERVICE INSPECTION REPORT FOR THE
END-OF-CYCLE 5 REFUELING OUTAGE IN FALL 2003 (TAC NO. MC4955)

Dear Mr. Singer:

In a letter dated September 24, 2004 (ADAMS No. ML042740432), Tennessee Valley Authority submitted the 12-month steam generator (SG) tube inspection report for the Fall 2003 refueling outage at Watts Bar Unit 1, in accordance with Technical Specification (TS) Section 5.9.9. This document was supplemented by letter dated September 30, 2005 (ADAMS No. ML052780198). The 15-day and 90-day reports for Cycle 5 were reviewed by the Nuclear Regulatory Commission (NRC) staff as documented in a letter dated November 8, 2004 (ADAMS No. ML042890259).

The NRC staff has completed its review of the 12-month SG tube inspection report dated September 24, 2004, and the supplemental letter dated September 30, 2005, and concludes that the licensee provided the information required by Watts Bar Unit 1 TSs and that no additional followup is required at this time. The NRC staff's review of the report is enclosed.

Sincerely,

/RA/

Douglas V. Pickett, Senior Project Manager
Plant Licensing Branch II-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-390

Enclosure: As stated

cc: See next page

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SUMMARY OF THE NUCLEAR REGULATORY COMMISSION STAFF'S REVIEW

TENNESSEE VALLEY AUTHORITY

STEAM GENERATOR TUBE INSPECTION REPORT

FOR THE END-OF-CYCLE 5 REFUELING OUTAGE

WATTS BAR NUCLEAR PLANT, UNIT 1

TAC NO. MC4955

By letter dated September 24, 2004 (ADAMS No. ML042740432), Tennessee Valley Authority (the licensee) submitted the 12-month steam generator (SG) tube inspection report for the Fall 2003 Refueling Outage (RFO) 5 at Watts Bar Unit 1, in accordance with Technical Specification (TS) Section 5.9.9. This document was supplemented by letter dated September 30, 2005 (ADAMS No. ML052780198). The 15-day and 90-day reports for Cycle 5 were reviewed by the Nuclear Regulatory Commission (NRC) staff as documented in a letter dated November 8, 2004 (ADAMS No. ML042890259).

Watts Bar Unit 1 has Westinghouse Model D3 SGs, which are designated SG1, SG2, SG3, and SG4. All four SGs were inspected during the Fall 2003 RFO 5. The Westinghouse Model D3 SG contains approximately 4700 tubes that have an outside diameter of 3/4-inch and a wall thickness of 0.043-inch. The tubes have been hard roll expanded for the full-length of the tubesheet and the 3/4-inch carbon steel tube support plates contain drilled holes. The Watts Bar Unit 1 SGs began operation in 1996 and have mill-annealed Alloy 600 tubing.

The licensee provided the scope, extent, methods, and results of Watts Bar Unit 1 SG tube inspections in the document referenced above. In addition, the licensee described corrective actions (i.e., tube plugging or repair) taken in response to the inspection findings.

A total of 148 tubes were repaired by installing Alloy 800 sleeves during the Fall 2003 RFO 5. The licensee identified that 5 tubes out of the 148 tubes repaired by sleeving had a single indication below the lower joint of the sleeve. The lower joint of these sleeves was located within the tubesheet. Since flaws below the sleeve joint should not be left in service per TS Section 5.7.2.12.g.1.f, the licensee performed a functional evaluation and concluded that these tubes were fully capable of performing their intended function. These tubes were subsequently plugged during the Spring 2005 RFO 6.

Several tubes with potential loose-part indications, or with wear indications attributed to loose parts, were plugged during the Fall 2003 RFO 5. Since some of the areas could not be accessed for visual inspection and removal of the part, the affected tubes (i.e., tubes with wear or with a possible loose-part indication) were plugged and several surrounding tubes were

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plugged; however, no engineering analysis was performed to confirm that tube integrity (of adjacent tubes) would be maintained as a result of leaving these parts in service. The NRC staff notes that loose parts can result in continued wearing of a plugged tube. If enough wear occurs, the tube could sever and could impact other adjacent (and non-plugged) tubes. This has led some licensees to plug and stabilize tubes affected by loose parts (or tubes near loose parts). The licensee did not indicate whether the plugged tubes were stabilized. Nonetheless, given that not only the tubes with wear but also several surrounding tubes were plugged, the staff does not see an immediate issue associated with this potential condition. The licensee performed an additional inspection during the Spring 2005 RFO 6 and confirmed that the active SG tubing had adequate integrity.

Based on a review of the information provided, the NRC staff concludes that the licensee provided the information required by their TSs. In addition, the NRC staff concludes that there are no technical issues that warrant followup action at this time since the inspections appear to be consistent with the objective of detecting potential tube degradation and the inspection results appear to be consistent with industry operating experience at similarly designed and operated units.