



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

January 5, 2022

Mr. James Barstow
Vice President, Nuclear Regulatory Affairs
and Support Services
Tennessee Valley Authority
1101 Market Street, LP 4A-C
Chattanooga, TN 37402-2801

SUBJECT: WATTS BAR NUCLEAR PLANT, UNIT 2 – REVIEW OF THE FALL 2020
GENERIC LETTER 95-05 VOLTAGE-BASED ALTERNATE REPAIR CRITERIA
REPORT (EPID L-2021-LRO-0003)

Dear Mr. Barstow:

By letter dated July 20, 2021, Tennessee Valley Authority (TVA) submitted Revision 1 of the fall 2020 Generic Letter (GL) 95-05 Voltage-Based Alternate Repair Criteria Report for Watts Bar Nuclear Plant, Unit 2. Revision 1 of the report reflects TVA's response to a request for additional information based on Revision 0 of the report, as well as an NRC-approved license amendment for using site-specific GL 95-05 probability of detection values, and an NRC-approved license amendment for applying a reduced operating temperature to the GL 95-05 methodology.

The NRC staff has completed its review of the information provided and concludes that TVA provided the information required by the Watts Bar Nuclear Plant, Unit 2 technical specifications and that no follow-up is needed at this time. The staff's review summary is enclosed.

If you have any questions, please contact me at 301-415-1627 or via e-mail at Kimberly.Green@nrc.gov.

Sincerely,

/RA/

Kimberly J. Green, Senior Project Manager
Plant Licensing Branch II-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-391

Enclosure:
As stated

cc: Listserv

REVIEW OF THE FALL 2020 GENERIC LETTER 95-05
VOLTAGE-BASED ALTERNATE REPAIR CRITERIA REPORT
TENNESSEE VALLEY AUTHORITY
WATTS BAR NUCLEAR PLANT, UNIT 2
DOCKET NO. 50-391

By letter dated July 20, 2021 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML21202A062), Tennessee Valley Authority (the licensee) submitted Revision 1 of the fall 2020 Generic Letter (GL) 95-05 Voltage-Based Alternate Repair Criteria Report for Watts Bar Nuclear Plant (Watts Bar), Unit 2. The corresponding steam generator tube inspections were performed during the third refueling outage (RFO 3) in fall 2020. Revision 1 of the report reflects the licensee's response to a request for additional information based on Revision 0 of the report (ADAMS Accession No. ML21134A225), as well as NRC approval of a license amendment request for using site-specific GL 95-05 probability of detection (POD) values (ADAMS Accession No. ML21027A167), and NRC approval of a license amendment request for applying a reduced operating temperature to the GL 95-05 methodology (ADAMS Accession No. ML21161A239). This report also serves as the licensee's operational assessment (OA) for the indications of axial outside diameter stress corrosion cracking (ODSCC) at tube support plate (TSP) intersections evaluated under GL 95-05.

The licensee submitted the report in accordance with Technical Specifications (TS) 5.9.9, "Steam Generator Tube Inspection Report," which requires that a report be submitted within 90 days after the initial entry into hot shutdown (MODE 4) following completion of an inspection of the steam generators (SGs) performed in accordance with TS 5.7.2.12, "Steam Generator Program." The SG Program, required by TS 5.7.2.12, is to be established and implemented to ensure SG tube integrity is maintained.

This is the first GL 95-05 report submitted for Watts Bar, Unit 2, because these alternate repair criteria were implemented for the first time during RFO 3. The second inspection implementing the GL 95-05 criteria was a mid-cycle inspection (following Cycle 4a), performed in September 2021; a separate GL 95-05 report will be submitted for that inspection.

Based on the review of the information provided, the U.S. Nuclear Regulatory Commission (NRC) staff has the following observations:

- The number of distorted support indications (DSIs), which are the bobbin probe indications associated with axial ODSCC at TSP intersections, increased from 155 in the RFO 2 inspection to 1,240 in the RFO 3 inspection. The number of DSIs in RFO 3 were 200, 314, 400, and 326 for SGs 1, 2, 3, and 4, respectively.

Enclosure

- Some DSIs detected in RFO 3 had large eddy current voltages. Based on the licensee's correlation between DSI voltage and conditional probability of burst (POB), the indication with the largest voltage caused the conditional POB for SG 3 to exceed the GL 95-05 condition monitoring (CM) acceptance criterion. This was reported as NRC Event Notification No. 54994 on November 11, 2020 (<https://www.nrc.gov/reading-rm/doc-collections/event-status/event/2020/20201111en.html>). The conditional POB and steam line break (SLB) leakage CM acceptance criteria were met for SGs 1, 2, and 4.
- Based on the Cycle 4a conditional POB and SLB leakage projections using the site-specific POD values and temperature reduction factor for a planned operating temperature reduction of four degrees Fahrenheit, the licensee concluded the acceptance criteria would be met until the planned start of the mid-cycle inspection outage, with a margin of at least 13 calendar days in the limiting case (POB for SG 3).
- The licensee determined voltage growth rates for the Cycle 4a OA projections from DSIs detected in both RFO 2 and RFO 3, precursor signals from lookbacks to the RFO 2 inspection data, and RFO 3 DSIs without prior DSI or precursor signals. The licensee applied the bounding growth rate (SG 3) to all SGs for the OA projections.

The NRC staff also notes that the preliminary mid-cycle inspection results at the end of Cycle 4a, which the licensee described in outage calls with the NRC staff (ADAMS Accession No. ML21279A090), suggest the operating temperature reduction was effective in reducing the growth of axial ODSs at TSPs. At the time of the outage calls, the licensee reported a total of 1,581 DSIs in the four SGs, compared to the projection of a total of 1,854 DSIs in the Cycle 4a OA (ADAMS Accession No. ML21042B342, Table 7-2). The licensee is required to submit a GL 95-05 report for the Cycle 4a inspection. The SGs are scheduled to be replaced during RFO 4, scheduled to begin in March 2022.

Based on a review of the information provided, the NRC staff concludes that the licensee provided the information required by the Watts Bar, Unit 2 TSs. In addition, the staff concludes that there are no technical issues that warrant additional follow-up action at this time, since the licensee implemented the GL 95-05 voltage-based repair criteria in accordance with the methodology approved in the plant TSs.

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