



Tennessee Valley Authority, Post Office Box 2000, Soddy-Daisy, Tennessee 37379-2000

March 12, 1997

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555

Gentlemen:

| | | |
|----------------------------|---|-------------------|
| In the Matter of |) | Docket No. 50-327 |
| Tennessee Valley Authority |) | 50-328 |

SEQUOYAH NUCLEAR PLANT (SQN) - NRC REQUEST FOR ADDITIONAL INFORMATION - REVIEW OF TECHNICAL SPECIFICATION CHANGE 96-05 REGARDING VOLTAGE-BASED ALTERNATE REPAIR CRITERIA FOR STEAM GENERATOR TUBES SEQUOYAH UNITS 1 AND 2

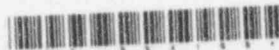
- Reference:
1. NRC letter to TVA dated February 19, 1997, "Request for Additional Information - Technical Specification change Request TS 96-05 for Sequoyah Nuclear Plant Units 1 and 2 (TAC NOS. M96998 and M96999)
 2. TVA letter to NRC dated October 18, 1996, "Sequoyah Nuclear Plant (SQN) - Technical Specification (TS) Change 96-05, 'Elimination of Cycle 8 Limitation For Steam Generator (S/G) Alternate Plugging Criteria (APC)'"

Enclosed is TVA's response to NRC's request for additional information (reference 1) on the above subject. The response is associated with SQN's proposed TS Change 96-05 (reference 2) that implements steam generator alternate plugging criteria (APC).

Enclosure 1 provides the requested information. Enclosure 2 provides the TVA commitments.

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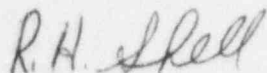
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Please direct questions concerning this issue to Don Goodin at (423) 843-7734.

Sincerely,



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ENCLOSURE 1

TVA Responses to NRC Request for Information

Item 1: NRC Request: TVA referenced the Westinghouse report, "SLB Leak Rate and Tube Burst Probability Analysis Methods for ODSCC at TSP Intersections," WCAP-14277, as a source for performing calculation for burst probability, end of cycle voltage distribution, and leak rate. Westinghouse published revision 1 of WCAP-14277 in December 1996 because the staff did not find the original report to be acceptable for referencing in safety evaluations. TVA needs to update its commitment to use Revision 1 of the report.

TVA Response: TVA will utilize Revision 1 of WCAP-14277 for performing calculations for burst probability, end of cycle voltage distribution, and leak rate.

Item 2: NRC Request: TVA needs to update its commitment to the latest database it intends to use in performing the calculations specified in Generic Letter (GL) 95-05 for the upcoming Unit 1 steam generator inspection. On a permanent basis, TVA needs to commit to the protocols for the use of the NRC-approved steam generator database.

TVA Response: TVA is committing to use the latest NRC approved database for the Cycle 8 and all future steam generator inspections. TVA is cognizant of the Request For Additional Information regarding NP 7480-L, Addendum 1, "Steam Generator Tubing Outside Diameter Stress Corrosion Cracking At Tube Support Plates, Database For Alternate Repair Limits," 1996 Database Update, November 1996, in Stewart L. Magruder's letter to David Modeen, Nuclear Energy Institute dated January 24, 1997. If this database is approved by NRC, before the start of the Unit 1 Cycle 8 Steam Generator inspection, TVA will utilize it for burst and leakage calculations. If this database is not approved, TVA will utilize the one previously approved by the staff in the April 6, 1996 Safety Evaluation Report for SQN TS change 95-23 including data from any additional pulled tubes in accordance with exclusion criteria protocol in GL 95-05. TVA will follow the industry database protocol when agreement is reached with the staff.

Enclosure 1 (continued)

Item 3: NRC Request: TVA submitted plans for inspecting dents at tube support plates for both units in its previous TS amendment requests. However, for the current amendment request, TVA needs to clarify its dent inspection criteria in light of revisions to the inspection criteria that may be needed due to the results of inspecting dents less than 5 volts, either in the past or in the future.

TVA Response: TVA has reviewed Unit 1 Cycle 7 refueling outage data and recent industry information on dented tube support plate inspections in dented TSP intersections less than 5 volts. TVA's inspection plans for Unit 1 are identified in Attachment 1. TVA's dent inspection plan for Unit 2 will continue to follow the guidance of Section 3.b.3 of Attachment 1 to GL 95-05.

Item 4: NRC Request: TVA committed to various industry criteria for probe wear and variability in previous amendment requests; however, there have been new probe wear and variability criteria developed since 1995. Therefore, TVA needs to update its commitment to comply with the criteria proposed, finalized, and agreed upon in the following letters:

- (1) Nuclear Energy Institute (NEI) letter to NRC, subject: "Eddy current probe replacement Criteria for Use in ODSCC Alternate Repair Criteria," January 23, 1996;
- (2) NEI letter to NRC, subject: "New Probe Variability for Use in the SCC Alternate Repair Criteria," January 23, 1996;
- (3) NEI letter to NRC subject: "Eddy Current Probe Replacement Criteria for Use in ODSCC Alternate Repair Criteria (Project No. 689), " February 23, 1996;
- (4) NRC letter from B. Sheron to A. Marion of NEI dated February 9, 1996; and
- (5) NRC letter from B. Sheron of NRC to A. Marion of NEI dated March 18, 1996.

Enclosure 1 (continued)

TVA Response: TVA will comply with the criteria proposed, finalized and agreed upon in the aforementioned letters. In addition, TVA will comply with the probe variability criteria in the NEI letter to NRC dated October 15, 1996, "Response to NRC letter Dated February 9, 1996, Regarding New Probe Variability Criteria (Project 689)."

Item 5: NRC Request: TVA has incorporated the model TSs specified in GL 95-05 into the existing Units 1 and 2 technical specifications and has committed to certain sections in Attachment 1 of GL 95-05. To clarify, TVA needs to commit to comply with GL 95-05 in its entirety. Alternatively, TVA needs to provide exceptions to GL 95-05, should there be any.

TVA Response: TVA commits to comply with the sections in Attachment 1 of GL 95-05 with the following exceptions;

- 2.a.3 SQN steam generators do not contain flow distribution baffle plates.
- 3.b.3 SQN Unit 1 takes exception to inspecting all dented TSP intersections and proposes Attachment 1 as an alternative. SQN Unit 2 will comply with the requirements of this section.
- 3.c.2 TVA will comply with probe variability as defined in letters referenced in item 3 of this response.
- 3.c.3 TVA will comply with probe wear as defined in the letters referenced in item 3 of this response.

Attachment 1

Unit 1 Dent Sampling Plan for dents greater than or equal to 5 volts

The initial sample in S/Gs 1 and 2 shall be 100 percent of the total hot-leg (HL) dented tube support plate (TSP) population in S/Gs 1 and 2.

The initial sample in S/Gs 3 and 4 will be 20 percent of the total HL dented TSP population in S/Gs 3 and 4.

The dent examinations will be performed with a technique qualified to Appendix H of the Electric Power Research Institute (EPRI) Steam Generator Examination Guidelines. An RPC inspection will be performed. Alternate probes, that have demonstrated detection capability for axial and circumferential indications comparable to or better than the RPC probes, can be used for these inspections. RPC is used as a general term to reflect an acceptable technique.

The dented TSP intersections selection for S/Gs 3 and 4 will begin at the lowest HL TSP elevations, which has the highest probability that stress corrosion cracking will occur. The initial sample will be 20 percent of the total HL dents in the respective S/G and systematically distributed at the first HL TSP.

If the RPC inspection of dented intersections identifies circumferential ODSCC or PWSCC indications not detected by bobbin, the RPC inspection shall be expanded consistent with Table 1. Any indications identified that exceed the plugging limit shall be repaired. The result classification as defined in TS Section 4.4.5.2 shall be utilized.

Expansion samples would be selected from the lowest HL dented TSP intersections and continue to higher TSP elevations.

The dent inspection frequency shall be performed coinciding with the S/G surveillance requirements. If an unscheduled mid-cycle S/G surveillance is required, the dented TSP inspection shall be performed.

Attachment 1 (continued)

Table 1 : SQN Unit 1 SGs 3 and 4 Expansion of the greater than or equal to 5 volt HL dented TSP Sample

| Initial Sample | | First Expansion | | Second Expansion | |
|----------------|--|-----------------------------|---|------------------|--|
| Result | Action Required | Result | Action Required | Result | Action Required |
| C-1 | None | N/A | N/A | N/A | N/A |
| C-2 | Inspect an additional 20% sample of TSP intersections in this SG | C-1 | None | N/A | N/A |
| | | C-2 | Inspect an additional 20% sample of TSP intersections in this SG | C-1 | None |
| | | | | C-2 | Inspect all remaining TSP intersections in this SG |
| | | | | C-3 | Inspect all remaining TSP intersections in this SG and a 20% sample in other SGs |
| C-3 | Inspect all remaining TSP intersections in this SG and a 20% sample in other SGs | N/A | N/A | N/A | N/A |
| C-3 | Inspect all remaining TSP intersections in this SG and a 20% sample in other SGs | C-1 in other SG | None | N/A | N/A |
| | | C-2 but not C-3 in other SG | Inspect an additional 20% sample of TSP intersections in other SG | N/A | N/A |
| | | C-3 in other SG | Inspect all remaining TSP intersections in other SGs | N/A | N/A |

TSP = dented hot-leg tube support plate

Attachment 1 (continued)

Unit 1 Dent Sampling Plan for dents less than 5 volts;

TVA will sample with RPC in a SG all dents less than 5 volts at all TSP elevations (and lower TSPs) where, based on past inspections, degradation has occurred (defining a critical area) and perform a 20% sample of the next higher TSP elevation (a buffer zone) to bound the affected area. The buffer zone, in this application, is the next higher tube support plate elevation where no degradation has been observed. This buffer zone area is to ensure that the critical area is bounded. The degradation (circumferential ODS or PWSCC not detected by bobbin coil) identified from the past dented TSP inspection would determine the initial sample.

Each SG initial sample will be determined independently. If no degradation was identified in the past inspection, a minimum 20% sample of the dents (less than 5 volts) at the first TSP will be examined. During future outages a different 20% sample would be inspected, such that over five outages 100% of the dents at this elevation would be inspected.

If indications are identified in the buffer zone, this sample will be expanded in accordance with Table 2. Any indication identified that exceeds the plugging limit shall be repaired. The buffer zone result classification as defined in TS Section 4.4.5.2 shall be utilized, except when a sample size is less than 200, then only C-2 results apply.

Alternative Dented TSP Inspection Program (greater than or equal to 5 volts);

TVA proposes an alternative inspection program for SGs 3 and 4, for the greater than 5 volt dents which is the same methodology as the proposed program for less than 5 volt dented tube support plate inspection with one additional requirement. If a TSP elevation has less than 50 dented intersections when selecting a buffer zone, then additional intersections at the next higher elevation shall be inspected to make the total number of intersections to be inspected equal to 50. TVA would like the option to employ either method to the greater than or equal to 5 volt dent population.

Attachment 1 (continued)

Table 2 : SQN Unit 1 Expansion of the greater than or equal to and less than 5 volt HL dented TSP Sample

| Initial Sample | | First Expansion | | Second Expansion | |
|-----------------|---|-----------------|---|------------------|--|
| Result | Action Required | Result | Action Required | Result | Action Required |
| C-1 Buffer Zone | None | N/A | N/A | N/A | N/A |
| C-2 Buffer Zone | Inspect all remaining TSP intersections at this elevation and a 20% Buffer Zone of the next elevation | C-1 Buffer Zone | None | N/A | N/A |
| | | C-2 Buffer Zone | Inspect all remaining TSP intersections at this elevation and a 20% of the next elevation | C-1 Buffer Zone | None |
| | | | | C-2 Buffer Zone | Inspect all remaining TSP intersections in this SG |
| | | C-3 Buffer Zone | Inspect all remaining TSP intersections in this SG and an additional 20% sample of the lowest TSP not yet 100% inspected in other SGs | | |
| C-3 Buffer Zone | Inspect all remaining TSP intersections at this elevation and a 100% Buffer Zone of the next elevation | C-3 Buffer Zone | Inspect all remaining TSP intersections at this elevation and a 100% of the next elevation. | N/A | N/A |
| | | C-1 Buffer Zone | None | C-1 Buffer Zone | None |
| | | | | C-2 Buffer Zone | Inspect all remaining TSP intersections in this SG |
| C-3 Buffer Zone | inspect all remaining TSP intersections in this SG and an additional 20% sample of the lowest TSP not yet 100% inspected in other SGs | | | | |

TSP = dented hot-leg tube support plate

Enclosure 2

TVA Commitments

TVA will revise SQN's steam generator inspection program (0-SI-SXI-068-114.2) prior to unit restart from the Unit 1 Cycle 8 Refueling outage. The program will be revised to:

- 1) utilize revision 1 of WCAP-14277, "SLB Leak Rate and Tube Burst Probability Analysis Methods for ODSCC at TSP Intersections."
- 2) utilize the database previously approved by the staff in April 6, 1996 Safety Evaluation Report for SQN TS Change 95-23 including data from any additional pulled tubes in accordance with exclusion criteria protocol in GL 95-05. TVA will follow the industry protocol when agreement is reached with the staff.
- 3) for Unit 1, adopt the inspection plans contained in Attachment 1 of Enclosure 1 of this letter for dents less than 5 volts and greater than or equal to 5 volts.
- 4) comply with the probe wear and probe variability criteria contained in the following letters:
 - (a) Nuclear Energy Institute (NEI) letter to NRC dated January 23, 1996, "Eddy current probe replacement Criteria for Use in ODSCC Alternate Repair Criteria."
 - (b) NEI letter to NRC dated January 23, 1996, "New Probe Variability for Use in the SCC Alternate Repair Criteria."
 - (c) NEI letter to NRC dated February 23, 1996, "Eddy Current Probe Replacement Criteria for Use in ODSCC Alternate Repair Criteria (Project No. 689)."
 - (d) NRC letter dated February 9, 1996, from B. Sheron of NRC to A. Marion of NEI.
 - (e) NRC letter dated March 18, 1996, from B. Sheron of NRC to A. Marion of NEI.
 - (f) NEI letter to NRC dated October 15, 1996, entitled, "Response to NRC letter dated February 9, 1996, Regarding New Probe Variability Criteria (Project 689)."

Enclosure 2

TVA commitments (continued)

5) comply with the sections in Attachment 1 of GL 95-05 with the following exceptions:

- 2.a.3 SQN steam generators do not contain flow distribution baffle plates.
- 3.b.3 SQN Unit 1 takes exception to inspecting all dented TSP intersections and proposes Attachment 1 of Enclosure 1 of this letter as an alternative.
- 3.c.2 TVA will comply with probe variability as defined in letters referenced in item 3 of this response.
- 3.c.3 TVA will comply with probe wear as defined in the letters referenced in item 3 of this response.