

November 7, 2006

Mr. Karl W. Singer  
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Chattanooga, TN 37402-2801

SUBJECT: SEQUOYAH NUCLEAR PLANT, UNIT 2 — REQUEST FOR ADDITIONAL  
INFORMATION ABOUT THE STEAM GENERATOR TUBE INTEGRITY  
TECHNICAL SPECIFICATION AMENDMENT (TAC NO. MD0145)

Dear Mr. Singer:

By letter dated February 15, 2006 (ML060600405 [Agencywide Document Access and Management System Accession Number]), Tennessee Valley Authority (TVA, the licensee), requested a license amendment for Sequoyah Nuclear Plant, Unit 2, concerning steam generator tube integrity. The licensee's proposed revisions are based on the Nuclear Regulatory Commission (NRC)-approved Revision 4 to Technical Specification Task Force (TSTF) Standard Technical Specification Change Traveler 449 (TSTF-449), "Steam Generator Tube Integrity" (ML051090200). The amendment would also remove an operating license condition associated with use of the voltage-based alternate repair criteria. In letters dated August 7, 2006 (ML062280054), and August 30, 2006 (ML062500211), the licensee responded to a June 6, 2006 (ML061370201), request for additional information (RAI) from the NRC staff.

In order for the staff to complete its review of the information provided by the licensee, we request that TVA provide responses to the enclosed RAI. Based on discussions with your staff, we understand that you plan to respond to the enclosed RAI within 60 days of receipt of this letter. If you have any questions about this material, please contact me at (301) 415-1364.

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: 50-328

Enclosure: As stated

cc w/enclosure: See next page

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REQUEST FOR ADDITIONAL INFORMATION

STEAM GENERATOR TUBE INTEGRITY TECHNICAL SPECIFICATION AMENDMENT

TENNESSEE VALLEY AUTHORITY

SEQUOYAH NUCLEAR PLANT, UNIT 2

DOCKET NO. 50-328

In order to complete the review, the staff needs the additional information requested below:

1. In definition 1.16 for IDENTIFIED LEAKAGE on page E2-3 of the TS proposed August 30, 2006, the third part of the definition is as follows:

- c. Reactor coolant system leakage through a steam generator to the secondary system.

The proposal indicates the phrase "(primary to secondary)" will be added to the end of the definition (i.e., "to the secondary system (primary to secondary).") In the TS originally proposed (February 15, 2006), the term "(primary to secondary leakage)", which is consistent with TSTF-449, was to be added to this definition. Please discuss why the word "leakage" was deleted from the proposal, or discuss your plans for making the proposal consistent with TSTF-449.

2. The staff's review depends in part on the revisions in your proposal that are enclosed by a bold rectangle ("comment box"). In some cases, it is unclear whether the entire comment is printed in the comment box. Two examples follow:

For proposed TS 3.4.6.2, Reactor Coolant System, ACTION b, page E2-17, the comment to be inserted is, "or primary-to-secondary." The corresponding statement in TSTF-449 is, "or primary-to-secondary leakage." Your original proposal included the work "leakage," and it appears that it may still be in the comment box but mostly out of view.

Following proposed TS Surveillance Requirement 4.4.6.2.1, there is a comment that, "The above surveillance requirement is not applicable." The original proposal, which is consistent with TSTF-449, was, "The above surveillance requirement is not applicable to primary to secondary leakage." The final part of this sentence is clearly necessary.

For these two cases, please confirm that the words which appear to have been dropped from your original proposal are simply not visible on the printed page you submitted. If this is not the case, and you are proposing to delete these words, please discuss the basis for doing so or discuss your plans for making these items consistent with TSTF-449. If any comments not identified above were omitted from the pages in your August 7, 2006, and August 30, 2006, letters, please identify and discuss the missing information.

Enclosure

3. For the structural integrity performance criterion defined in proposed TS 6.8.4.k.b.1 (page E2-19), in the sentence on safety factors, you are proposing to insert the phrase, “except as permitted through application of the alternative repair criteria discussed in TS 6.8.4.k.c.1.” The staff notes that the proposed statement could be misinterpreted to mean that TS 6.8.4.k.c.1 contains guidance concerning when an exception to the safety-factor requirement is permitted. Please discuss your plans to revise this proposed insert, for example, “except for flaws addressed through application of the alternate repair criteria discussed in TS 6.8.4.k.c.1.”
4. The insert regarding the required probability of burst, proposed at the end of TS 6.8.4.k.b.1 (page E2-19), uses the abbreviations, “ODSCC” and “TSP.” Please discuss your plans to define these abbreviations within the insert. For example, “outside diameter stress corrosion cracking (ODSCC).”
5. For the accident induced leakage performance criterion defined in proposed TS 6.8.4.k.b.2 (page E2-19), the first sentence of the criteria states that leakage is “not to exceed 1.0 gpm for the faulted SG.” Since the corresponding statement in TSTF-449 is, “not to exceed 1.0 gpm per SG,” and the proposal for Sequoyah Nuclear Plant, Unit 2 (SQN2), does not address the non-faulted steam generators, please discuss your plans to revise the proposal to make it consistent with TSTF-449.
6. The first paragraph of proposed TS 6.8.4.k.c.1 (page E2-20), the GL 95-05 voltage-based alternate repair criteria, states, “the plugging (repair) limit is based on maintaining SG tube integrity as described below.” The staff notes this statement may imply that this repair criteria prescribes methods to ensure tube integrity. Since this is not the intent of the repair criteria, please discuss your plans to revise this statement. For example: “At TSP intersections, the plugging (repair) limit is described below:”
7. Paragraph (c) of proposed TS 6.8.4.k.c.1 (page E2-20) refers to “Note 2.” Since this is now the only note following deletion of the original Note 1, changing the name of the original Note 2 to Note 1 may avoid potential confusion. In addition, since there is no flow distribution baffle at SQN2, Note 2 could be shortened to one sentence. The staff notes that it may improve readability to eliminate Note 2 as a separate item and instead include the relevant information within parentheses in TS 6.8.4.k.c.1.c. For example:

“SG tubes, with indications of potential flaws attributed to ODSCC within the bounds of the TSP with a bobbin voltage greater than 2.0 volts but less than or equal to the upper voltage repair limit (calculated according to the methodology in GL 95-05 as supplemented) may remain ...”
8. In order to be consistent with the TSTF-449 wording used elsewhere in your proposal, please discuss your plans to replace the term “degradation” with “flaws” in your proposed TS in 6.8.4.k.c.2 (W\* Methodology).
9. Paragraph (c) of proposed TS 6.8.4.k.c.1 (page E2-20) addresses two different conditions of bobbin coil voltage for ODSCC flaw indications. The staff notes that it may improve the clarity of the repair criteria to start a new paragraph (i.e., 6.8.4.k.c.1.d) for the case where

bobbin indication voltage is greater than the upper voltage limit, since the second sentence of this paragraph is not an exception as discussed in Item b. For example:

- d) SG tubes with indications of ODSCC flaws with a bobbin coil voltage greater than the upper voltage repair limit (calculated according to the methodology in GL 95-05 as supplemented) will be plugged.
- e) If an unscheduled mid-cycle inspection is performed, the following repair limits apply instead of the limits identified in Items 6.8.k.c.1.a), .b), .c), and .d).

As a result of this change, references to these specifications on page E2-20 and E2-21 will also need to be modified. For example,

Implementation of these mid-cycle repair limits should follow the same approach as in TS items 6.8.k.c.1.a), .b), .c), and .d).

- 10. In proposed TS 6.8.4.k.c.2, the W\* methodology, the staff notes that the initial statement about inspecting 100 percent of the tubes is an inspection criteria rather than a repair criteria. Please discuss your plans to move the inspection discussion to TS 6.8.4.k.d (Provisions for SG Tube Inspections.) For example, consider adding a TS 6.8.4.k.d.5:

- 5. When the W\* methodology has been implemented, inspect 100 percent of the inservice tubes in the hot-leg tubesheet region with the objective of detecting flaws that may satisfy the applicable tube repair criteria of TS 6.8.4.k.c.2.

In addition, since this section of the TS is a repair criteria, and since TS 6.8.4.d) defines the part of the tube requiring inspection (from the tube-to-tubesheet weld at the tube inlet to the tube-to-tubesheet weld at the tube outlet, and that may satisfy the applicable tube repair criteria), the proposed insert on page E2-21 is unnecessary (“The inspection of SG tubes is from the point of entry ...”).

Finally, TS 6.8.4.k.c.2 should have a statement that, “Flaws located below the W\* distance may remain in service regardless of size.”

- 11. Proposed TS 6.8.4.c.2 on page E2-21 uses the term “W\* distance” before defining it. Please discuss your plans to move the terms/definitions to the beginning of the W\* methodology section. In addition, since the W\* length is not part of the specifications, please discuss the reason for including it in the TS definitions, or discuss your plans for removing it from the TS.
- 12. Proposed TS 6.8.4.d.4, the SG tube inspection provision related to the GL 95-05 alternate repair criteria (page E2-22) states the following in the first paragraph:

Indications left in service as a result of application of the TSP voltage-based repair criteria shall be inspected by bobbin coil probe during all future refueling outages.

The staff notes that a requirement of every 24 effective full-power months or one refueling outage, whichever is less, would provide the intended minimum inspection frequency,

without requiring an additional inspection in the event that SG tubes are inspected during an outage other than a refueling outage. Please discuss any plans you have to change the wording in this requirement and reference the TS section for the repair criteria, for example:

Indications left in service as a result of application of the TSP voltage-based repair criteria (6.8.4.k.c.1) shall be inspected by bobbin coil probe every 24 effective full-power months or one refueling outage, whichever is less.

13. In the proposed reporting requirement TS 6.9.1.16.2, the wording of the first sentence is somewhat awkward and the second sentence contains a typographical error (“shll”). A suggestion for alternative wording is provided below.

A report shall be submitted within 90 days ... performed in accordance with the steam generator program (6.8.4.k) ~~and when~~ voltage based alternate repair criteria is have been applied. The report shall include ...

Please discuss your plans to modify this paragraph using the wording suggested above or comparable wording.

14. Proposed TS 6.9.1.16 has been revised, with a separate section for each of the required reports. The content of these sections is generally acceptable; however, the wording about returning the steam generators to service following a tube inspection is different for each of the sections. For example, in 6.9.1.16.3 and 6.9.1.16.4, the phrase, “following completion of an inspection performed in accordance with the steam generator program (6.8.4.k)” (or a comparable phrase), was not included. Please discuss your plans to make this wording consistent throughout the reporting requirements section and consistent with the TSTF-449 wording, such as the wording used in proposed TS 6.9.1.16.1 below.

... after the initial entry into MODE 4 following completion of an inspection performed in accordance with Specification 6.8.4.k, “Steam Generator (SG) Program.”

15. On page E3-6 of the proposed bases, there is a statement that “this limit is approved for use for alternate repair criteria (ARC) and W\* leakage calculations.” This statement appears incomplete. The leakage from all sources must be limited to 3.7 gpm in the faulted SG with no more than 1.0 gpm coming from non-alternate repair criteria. A similar comment applies to the statements on page E3-8.
16. The staff notes that on proposed bases page B 3/4 4-3c, page E3-8 in the submittal, the current wording (“0.1 gpm for the non-faulted SGs”) could be misinterpreted to mean 0.1 gpm total in the three non-faulted SGs. Please discuss your plans to clarify the wording to indicate “0.1 gpm for each of the non-faulted SGs.”
17. On page E3-9 you indicate that “If at any time, evaluation determines SG tube integrity is not being maintained, ...” The reason for adding the underlined text is not clear. Please discuss your plans for removing this text (and making your submittal consistent with TSTF-449).

18. The proposed Insert E for the Bases (page E3-12) refers to the “mid-cycle equation of TS 6.8.4.k.c.1.c.” The staff notes this equation is currently in 6.8.4.k.c.1.d in the proposed TS (page E2-20). As indicated in #9 above, it may be appropriate to make it 6.8.4.k.c.1.e.
19. The paragraph that starts near the bottom of page E3-12 and begins with “Wastage-type defects ...” was essentially replaced with TSTF-449. Please discuss your plans to remove this paragraph.
20. On page E3-13 there is an equation for calculating postulated steam line break leakage. It appears that this equation is incomplete, since it does not include the leakage from non-alternate repair criteria sources. Please discuss your plans to modify this equation to add “leakage from other sources” or to indicate that this equation only includes leakage from the alternate repair criteria.
21. Please discuss your plans to remove the first sentence in the last paragraph on page E3-14, since reporting the aggregate calculated steam line break leakage is no longer a requirement.
22. On page E3-16, you indicated that the safety analysis for events resulting in steam discharge to the atmosphere accounts for a maximum normal operational leakage of 0.4 gpm. This wording is not consistent with TSTF-449. Please clarify whether the safety analysis actually accounts for 0.4 gpm normal operating leakage (i.e., the safety analysis accounts for the equivalent accident induced leakage from a 0.4 gpm normal operating leak which would be something greater than 0.4 gpm) or whether the analysis simply assumes that there is 0.4 gpm or increases to 0.4 gpm as a result of accident-induced conditions. If the analysis accounts for 0.4 gpm operating leakage, please discuss the technical basis for determining the equivalent accident-induced leak rate from the normal operating leak rate. In addition, please clarify whether your accident analysis assumes 1 gpm leakage from all steam generators or 0.4 gpm.
23. Please discuss your plans to indicate in the Applicable Safety Analyses for B3/4.4.6.2 (Operational Leakage), on page E3-17, that the “primary to secondary leakage safety analysis assumption is relatively inconsequential.” The staff notes that this is consistent with TSTF-449.

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Tennessee Valley Authority

**SEQUOYAH NUCLEAR PLANT**

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