



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

July 15, 2009

Mr. Preston D. Swafford
Chief Nuclear Officer and
Executive Vice President
Tennessee Valley Authority
3R Lookout Place
1101 Market Street
Chattanooga, TN 37402-2801

SUBJECT: SEQUOYAH NUCLEAR PLANT, UNIT 2 - REQUEST FOR ADDITIONAL
INFORMATION (RAI) REGARDING THE PROPOSAL TO CHANGE THE
SCOPE OF THE STEAM GENERATOR TUBE INSPECTIONS
(TAC NO. ME1343)

Dear Mr. Swafford:

By letter dated May 21, 2009, you submitted an application for license amendment to revise the Sequoyah Nuclear Plant, Unit 2 Technical Specifications (TSs). Specifically, TS 6.8.4.k, "Steam Generator (SG) Program," including associated Bases 3/4.4/5, "Steam Generator (SG) Tube Integrity," would be revised to allow the implementation of SG tubing alternate repair criteria for axial indications in the Westinghouse Electric Company explosive tube expansion region below the top of the tubesheet and specify the W* distance for the SG cold legs.

The Nuclear Regulatory Commission (NRC) staff is reviewing the submittal and has determined that additional information is required to complete its evaluation. The NRC staff's RAI is enclosed. This request was discussed with Mr. Rusty Proffitt of your staff on July 15, 2009, and it was agreed that a response would be provided within 30 days from the date of this letter.

If you have any questions regarding this matter, I can be reached at 301-415-1564.

Sincerely,

A handwritten signature in cursive script that reads "Siva P. Lingam".

Siva P. Lingam, Project Manager
Plant Licensing Branch II-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-328

Enclosure: RAI

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REQUEST FOR ADDITIONAL INFORMATION
REGARDING TECHNICAL SPECIFICATION CHANGES
TO ALLOW THE IMPLEMENTATION OF STEAM GENERATOR
TUBING ALTERNATE REPAIR CRITERIA
SEQUOYAH NUCLEAR PLANT, UNIT 2
DOCKET NO. 50-328

By letter dated May 21, 2009 (Agencywide Documents Access and Management System Accession no. ML091530346), the Tennessee Valley Authority (the licensee), submitted a license amendment request (LAR) to revise the steam generator (SG) tube inspection portion of the Sequoyah Nuclear Plant, Unit 2 (Sequoyah 2) Technical Specifications (TSs). In order to complete its review of the above document, the Nuclear Regulatory Commission staff needs the following additional information:

1. Page E1-2 of the May 21, 2009, letter indicates that the inspection scope for refueling outage (RFO) 17 will be based on the results of the cold-leg sample inspection performed during RFO 16, and that if no degradation is reported in RFO 16, no inspections will be performed during RFO 17. The Sequoyah 2 TSs are performance based specifications that require inspections to be performed with the objective of detecting flaws of any type that may be present and that may satisfy the applicable tube repair criteria. Because a degradation assessment is required prior to each SG tube inspection and there could be additional operating experience that could influence the scope of inspections during RFO 17, please discuss your plans to base the scope of your RFO 17 inspection on the degradation assessment and your operational assessment, which justifies the time interval between inspections.
2. Page A1-3 of the May 21, 2009, letter proposes a revision to TS 6.8.4.k.d.5 whereby 20 percent of the inservice tubes in the cold leg tubesheet region would be inspected. The current TSs are largely performance-based and generally do not specify a sample size, except for alternate repair criterion where the potential for cracking is known to exist and a 100 percent sample is specified. Please discuss your plans for removing the sampling strategy from your TSs since the sample size should be based on providing reasonable assurance that tube integrity will be maintained.
3. Page E1-2 of the May 21, 2009, letter indicates that a 20 percent sample of the cold-leg tubesheet region will be performed during the end-of-cycle (EOC) RFO 16 in the fall of 2009. This is consistent with the proposed wording of TS 6.8.4.k.d.5. However, page E1-2 also indicates that if no flaws are found during the EOC RFO 16 inspection of the cold-leg tubesheet region, that no cold-leg inspections will be performed at EOC RFO 17 (spring 2011). These plans appear contradictory to the proposed wording in TS 6.8.4.k.d.5. Please clarify.

Enclosure

4. Page E1-2 of the May 21, 2009 LAR indicates that if no primary water stress corrosion cracking (PWSCC) indications are identified in the cold-leg top of tubesheet region (i.e., the upper 10.5 inches) that the leakage allowance for the operational assessment will be considered to be zero gallons per minute. The technical basis for this assumption is not clear. Operating experience at other plants indicates that cracking can occur near the tube end without observing cracking near the top of the tubesheet. In addition, it is known that cracking has the potential to occur near the tube end at Sequoyah 2. Please discuss your plans for assessing leakage from the lower portion of the tubes within the tubesheet, regardless of the results of the inspection near the top of the tubesheet, which would be a methodology similar to what is applied to the hot-leg. In addition, given that a sampling strategy, rather than a 100 percent inspection, is performed in the inspected region of the tubesheet, the basis for not assuming any potential flaws in the uninspected tubes is not clear. Please discuss your plans to account for the potential that there may be undetected flaws in the cold-leg in your assessment of leakage.
5. For the cold-leg, please confirm that you will determine the number of indications between the W^* distance (10.5 inches) and 12 inches below the top of the tubesheet, using the methodology discussed in Section 5.1.3 of Reference 1 based on the number of indications found (or postulated to be present if a sampling approach is used – refer to question 4), and that a minimum of 25 indications will be assumed, as discussed in section 5.1.4 of Reference 1.
6. In the May 21, 2009, letter it is stated that the proposal is conservative since it requires repair of any service induced degradation within the W^* distance. The proposal may be conservative; however, it is not clear that it is conservative for this reason alone. In the W^* approach originally developed by the vendor, a flaw that was detected and not repaired would generally require that additional tubing be examined in order to ensure some minimum non-degraded length of tubing existed. As a result, please clarify the original statement.
7. In Item 2 of the Significant Hazards Consideration on page E1-10 of the May 21, 2009, letter, it is stated that, "...and allows axial cracks in the WEXTEx region to remain in service if prescribed criteria are met. Removal of the existing PWSCC axial at dented tube support plate ARC [alternate repair criteria] incorporates the more conservative TS limit for SG tube plugging." This text does not appear to be applicable to this amendment. Please confirm that this text is not applicable to your request. If it is applicable, please clarify.
8. On page E1-3 of the May 21, 2009, letter, the proposed TS 6.8.4.k.c.2.c indicates that the W^* distance for the cold-leg tubesheet is 10.5 inches. Since the W^* approach relies on a minimum distance of non-degraded tubing below the bottom of the expansion transition, please either (a) confirm that the bottom of the cold-leg expansion transition for all tubes is below the top of the tubesheet (TTS) and that the bottom of the transition is no more than 3 inches from the TTS, including uncertainty in the measurement, or (b) discuss your plans to modify the definition of the W^* distance for the cold-leg tubesheet region to ensure that 10.5 inches of non-degraded expanded tubing exists below the TTS or the bottom of the expansion transition, whichever is lower.

9. There is extensive discussion regarding the leak rate methodology. Please confirm that for the hot-leg tubesheet region you are not proposing any changes to the previously approved W^* leak rate methodology for determining the number of tubes with indications, as well as the leak rates assigned to those indications. Please also confirm that you have been determining the number of potential indications in the region of the tube from 8 to 12 inches below the TTS on the hot-leg each outage, based on the inspection results.
10. Page 9 of Reference 1 refers to N_P from equation (2) as "The normal force due to the resultant pressure in the tube." The term N_P is then replaced by F_P in equation (3) and P_P in equation (4). On page 10, however, P_P is referred to as the differential pressure term (point 4.) instead of the resultant pressure term (although it is obvious that the primary-to-secondary differential pressure does affect the resultant pressure). Additionally, point 4 on page 10 also indicates that the differential pressure term, P_P , used for the Sequoyah 2 analysis is less than the generic analysis and that this smaller differential pressure results in a specific Sequoyah 2 W^* value that is less than the generic value. This statement is in contrast with information presented in Table 4-1 that shows Sequoyah 2 steam pressure, P_S , as smaller than the generic W^* value, which results in a larger pressure tightening, P_P , term and therefore a smaller W^* value. Please clarify.

REFERENCE 1:

LTR-SGMP-09-35 P-Attachment, "Application of W^* Alternate Repair Criteria to Sequoyah Unit 2 Cold Leg Tubes (Proprietary)," Westinghouse Electric Company LLC, dated March 25, 2009.

July 15, 2009

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Sincerely,

/RA/

Siva P. Lingam, Project Manager
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