

May 22, 2007

Mr. William R. Campbell, Jr.
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and Executive Vice President
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6A Lookout Place
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SUBJECT: SEQUOYAH NUCLEAR PLANT, UNIT 2 - ISSUANCE OF AMENDMENT
REGARDING STEAM GENERATOR TUBE INTEGRITY (TAC NO. MD0145)

Dear Mr. Campbell:

The Commission has issued the enclosed Amendment No. 305 to Facility Operating License No. DPR-79 for the Sequoyah Nuclear Plant, Unit 2. This amendment is in response to your application (TS-05-09) dated February 15, 2006, as supplemented by letters dated August 7, 2006, August 30, 2006, November 30, 2006, and April 2, 2007.

The amendment revises the existing steam generator (SG) tube surveillance program through technical specification (TS) changes modeled after TS Task Force traveler TSTF-449, Revision 4, "Steam Generator Tube Integrity," and the model safety evaluation prepared by the NRC and published in the *Federal Register* on March 2, 2005 (70 FR 10298). The amendment includes changes to the definition of leakage, changes to the primary-to-secondary leakage requirements, changes to the SG tube surveillance program, changes to the SG reporting requirements, and associated changes to the TS Bases.

A copy of the safety evaluation is also enclosed. A notice of issuance will be included in the Commission's biweekly *Federal Register* notice.

Sincerely,

/RA/

Brendan T. Moroney, Project Manager
Plant Licensing Branch II-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-328

Enclosures: 1. Amendment No. 305 to DPR-79
2. Safety Evaluation

cc w/enclosures: See next page

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TENNESSEE VALLEY AUTHORITY

DOCKET NO. 50-328

SEQUOYAH NUCLEAR PLANT, UNIT 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 305
License No. DPR-79

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by the Tennessee Valley Authority (the licensee) dated February 15, 2006, as supplemented by letters dated August 7, 2006, August 30, 2006, November 30, 2006, and April 2, 2007, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;
 - B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;
 - C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;
 - D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and
 - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.
2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C.(2) of Facility Operating License No. DPR-79 is hereby amended to read as follows:

(2) Technical Specifications and Environmental Protection Plan

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 305, and the Environmental Protection Plan contained in Appendix B, both of which are attached hereto, are hereby incorporated into

this license. TVA shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

3. The license is also amended to delete paragraph 2.C.(8)(b) regarding steam generator inspection.
4. This license amendment is effective as of the date of its issuance, and shall be implemented no later than during the Cycle 15 refueling outage, which is scheduled to begin in April 2008.

FOR THE NUCLEAR REGULATORY COMMISSION

Thomas H. Boyce, Branch Chief
Plant Licensing Branch II-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Attachment: Changes to License No. DPR-79 and
the Technical Specifications

Date of Issuance:

ATTACHMENT TO LICENSE AMENDMENT NO. 305

FACILITY OPERATING LICENSE NO. DPR-79

DOCKET NO. 50-328

Replace pages 3 and 4 of Operating License No. DPR-79 with the attached pages 3 and 4.

Replace the following pages of the Appendix A Technical Specifications with the attached revised pages. The revised pages are identified by amendment number and contain marginal lines indicating the area of change.

REMOVE

1-4
1-5
3/4 4-10
3/4 4-11
3/4 4-11a
3/4 4-12
3/4 4-13
3/4 4-14
3/4 4-14a
3/4 4-14b
3/4 4-14c
3/4 4-15
3/4 4-16
3/4 4-18
6-10

6-11
6-14

6-15

INSERT

1-4
1-5
3/4 4-10

3/4 4-18
6-10
6-10a
6-10b
6-10c
6-10d
6-11
6-14
6-14a
6-15

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NO. 305 TO FACILITY OPERATING LICENSE NO. DPR-79

TENNESSEE VALLEY AUTHORITY
SEQUOYAH NUCLEAR PLANT, UNIT 2

DOCKET NO. 50-328

1.0 INTRODUCTION

By application dated February 15, 2006 (ML060600405 [Agencywide Document Access and Management System Accession Number]), as supplemented by letters dated August 7, 2006 (ML062280054), August 30, 2006 (ML062500211), November 30, 2006 (ML063390665), and April 2, 2007 (ML071010153), Tennessee Valley Authority (TVA, the licensee) requested changes to the technical specifications (TSs) for Sequoyah Nuclear Plant, Unit 2 (SQN-2).

The proposed changes would revise the existing steam generator (SG) tube surveillance program. The changes are modeled after TS Task Force (TSTF) traveler TSTF-449, Revision 4, "Steam Generator Tube Integrity," and the model safety evaluation prepared by the NRC and published in the *Federal Register* on March 2, 2005 (70 FR 10298). In this regard, the scope of the application includes changes to the definition of leakage, changes to the primary-to-secondary leakage requirements, changes to the SG tube surveillance program (SG tube integrity), changes to the SG reporting requirements, and associated changes to the TS Bases.

The proposed amendment also removes Condition 2.C.(8)(b) of Facility Operating License No. DPR-79, which contains SG inspection program requirements that are superseded by the current changes.

The supplements dated August 7, 2006, August 30, 2006, November 30, 2006, and April 2, 2007 provided additional information that clarified the application, did not expand the scope of the application as originally noticed, and did not change the Nuclear Regulatory Commission (NRC) staff's original proposed no significant hazards consideration determination as published in the *Federal Register* on March 28, 2006 (71 FR 15488).

2.0 REGULATORY EVALUATION

The background, description, and applicability of the proposed changes associated with the SG tube integrity issue and the applicable regulatory requirements were included in the NRC staff's model safety evaluation (SE) published in the *Federal Register* on March 2, 2005 (70 FR 10298). The "Notice of Availability of Model Application Concerning Technical Specification; Improvement to Modify Requirements Regarding Steam Generator Tube Integrity; Using the Consolidated Line Item Improvement Process," which was published in the *Federal Register* on May 6, 2005 (70 FR 24126), made the model SE available for licensees to reference.

3.0 TECHNICAL EVALUATION

3.1 TSTF-449

3.1.1 Overview

In its February 15, 2006, application and supplemental letters referenced above, the licensee proposed changes to the TSs that are modeled after TSTF-449. There were minor differences between TSTF-449 and the licensee's application. These included differences in the facility licensing basis (compared to those discussed in TSTF-449) and differences in TS format and numbering. These differences are discussed below.

With respect to the differences in the facility licensing basis, the differences did not invalidate the technical evaluation of TSTF-449; rather, they resulted in the licensee having to deviate from some of the modifications discussed in TSTF-449, or they resulted in slight differences in the requirements. For example, in the proposed TS changes, the licensee proposed to enter cold shutdown "within the next 30 hours" after achieving hot standby (with hot standby being entered within 6 hours) when tube integrity is not maintained for a tube that is inadvertently not plugged. This proposal, although consistent with other portions of their TSs, is slightly different than TSTF-449, which indicates that cold shutdown should be entered within 36 hours. Another example is the analyses for design bases accidents at SQN-2, in which the amount of steam assumed to discharge to the atmosphere depends on the accident and whether there are faulted SGs associated with the accident. Since the assumptions at SQN-2 differ from the assumptions discussed in the standard TSs, the licensee replaced the discussion in the standard TSs with a discussion that reflects the SQN-2 licensing basis.

Another difference in the facility licensing basis compared to TSTF-449 is contained in the Bases section for SG Tube Integrity. TSTF-449 indicated the accident analysis for a SG tube rupture assumed the contaminated secondary fluid was only briefly released to the atmosphere via safety valves and the majority is discharged to the main condenser. Since the licensee has a different licensing basis than the one described in the standard TSs (i.e., TSTF-449), they did not include this sentence. Instead, they indicated the analysis assumes contaminated secondary fluid is released to the atmosphere via safety valves and the main condenser isolates based on an assumed concurrent loss of offsite power. The NRC staff found these differences in the licensing basis acceptable.

With respect to the differences in the numbering of the TSs, these differences were administrative in nature and did not affect the technical adequacy of the submittal. As a result, the NRC staff determined they were acceptable. With respect to the differences in the format of the TSs, these differences resulted in listing the requirements in sentence format rather than tabular format and using slightly different terminology. In addition, there were some changes in the Bases section of TSTF-449 that were not incorporated into the licensee's submittal, since the licensee did not have the corresponding paragraphs in their Bases. For example, the licensee did not have several references to their SG tube surveillance program in their existing Bases so they did not need to delete these references in order to adopt TSTF-449. Since these differences were administrative in nature and did not affect the technical adequacy of the submittal, the NRC staff determined they were acceptable.

In addition to these minor changes, the licensee proposed to include previously approved alternate repair criteria into the proposed new TSs. The structure of TSTF-449 allows licensees to incorporate alternate repair criteria into the TSTF-449 format. By incorporating the previously approved repair criteria into the TSTF-449 format, there were several additions, deletions, and changes to the requirements. These changes (including additions and deletions), were made as a result of the format, content, and performance-based approach of TSTF-449. The staff verified that (a) the inspection criteria were moved, as appropriate, to the inspection section of the proposed SG TSs, (b) the repair criteria were moved, as appropriate, to the repair criteria section of the proposed SG TSs, and (c) the reporting requirements were moved to the reporting section of the proposed SG TSs. Some pre-existing reporting requirements associated with these previously approved repair criteria were deleted since the reporting requirements are no longer necessary. These requirements are no longer necessary because the licensee incorporated the limits that would require the report to be submitted into the definition of SG tube integrity (and the plant cannot operate when SG tube integrity is not maintained under the proposed new SG TSs). A reporting requirement was also added to the new SG TSs to reflect a commitment to submit the report. In summary, the NRC staff determined that the previously approved repair criteria were appropriately incorporated into the TSs.

The licensee also proposed a few changes that went beyond TSTF-449. For example, one change that went beyond TSTF-449 relates to a limiting condition for operation (LCO). Condition B of LCO 3.4.20 in TSTF-449 requires, in part, a reactor shutdown if SG tube integrity is not maintained. The licensee proposed not to include the portion of Condition B dealing with maintaining SG tube integrity explicitly under the "ACTIONS" section of the relevant SQN-2 TS (i.e., TS 3.4.5). The licensee's position is that because TS 3.4.5 states, "SG Tube Integrity shall be maintained" as an LCO, failure to maintain SG tube integrity would be addressed under TS 3.0.3. TS 3.0.3 states that if an LCO (i.e., maintaining SG tube integrity in this case) is not met, then action must be taken to restore the condition within one hour or to place the unit in HOT STANDBY within the next 6 hours, in HOT SHUTDOWN within the following 6 hours, and in COLD SHUTDOWN within the subsequent 24 hours (36 to 37 hours total). Since the TSTF-449 LCO 3.4.20 action for failing to maintain tube integrity is to be in MODE 3 (HOT STANDBY) within 6 hours and in MODE 5 (COLD SHUTDOWN) within 36 hours total, it has the same result as the corresponding SQN-2 LCO 3.4.5 (i.e., COLD SHUTDOWN within 36 to 37 hours for failure to maintain SG tube integrity for reasons other than failure to plug a tube exceeding the repair criteria, which is addressed as Action A of their submittal). On this basis, the staff concludes that although the action to take if SG tube integrity is not maintained is not explicit in LCO 3.4.5, the licensee's proposal is acceptable since the licensee is still required to shut down the facility as discussed above if tube integrity is not being maintained (for reasons other than failure to plug a tube exceeding the repair criteria, which is addressed as Action A of their submittal).

In proposed TS 3.4.5.b and Surveillance Requirement 4.4.5.1, the licensee's proposed timing requirement (for plugging tubes that were inadvertently not plugged or for verifying tubes were plugged as required) was "prior to startup." The corresponding TSTF-449 requirement is "prior to entering MODE 4," following a SG tube inspection. Since MODE 4 is defined as HOT SHUTDOWN, and STARTUP is defined as MODE 2 in the standard TSs, the licensee's proposal appeared to be inconsistent with TSTF-449. The licensee explained that it was not clear that the TSTF-449 phrase "prior to entering MODE 4 following a SG inspection" referred to starting up the plant following a shutdown. As a result, they proposed to use "prior to

startup.” The licensee indicated that the word “startup” (lower case) does not refer to MODE 2 (or any other operational mode number) in the SQN-2 TSs. Although “startup” is not defined in the SQN-2 TSs, the licensee indicated that “startup” applies to the modes of applicability for the LCO (i.e., MODES 1, 2, 3, and 4); therefore, “prior to startup” is equivalent to prior to MODE 4. Although the staff disagrees with the licensee’s assessment that “prior to entering MODE 4 following a SG tube inspection” could describe a condition where the plant was being shut down (rather than being started up), since the only time a SG tube inspection can be performed is when the plant is shut down (i.e., MODE 5 or 6), the staff concludes that the proposed SR 4.4.5.1 is acceptable. The staff finds it acceptable because the one and only interpretation of the phrase “prior to startup” is “prior to entering MODE 4,” which is consistent with TSTF-449.

The licensee also made minor wording changes. For example, the licensee introduced the acronym “DBA” for design basis accidents. Since these differences were administrative in nature and did not affect the technical adequacy of the submittal, the NRC staff determined they were acceptable. The remainder of the application was generally consistent with or more limiting than TSTF-449.

In summary, the staff determined that the model SE is applicable to this review and finds the proposed changes acceptable.

Consistent with TSTF-449, the proposed TS changes include: (1) revised definitions of LEAKAGE in TSs 1.16 and 1.22, (2) a revised TS 3/4.4.5, “Steam Generator (SG) Tube Integrity,” (3) a revised TS 3.4.6.2, “Reactor Coolant System Operational Leakage,” (4) a new TS 6.8.4.k, “Steam Generator (SG) Program,” and (5) a new TS 6.9.1.16, “Steam Generator (SG) Tube Inspection Report.”

3.1.2 Evaluation

The proposed TS changes establish a programmatic, largely performance-based regulatory framework for ensuring SG tube integrity is maintained. The NRC staff finds that it addresses key shortcomings of the current framework by ensuring that SG programs are focused on accomplishing the overall objective of maintaining tube integrity. It incorporates performance criteria for evaluating tube integrity that the NRC staff finds consistent with the structural margins and the degree of leak tightness assumed in the current plant licensing basis. The NRC staff finds that maintaining these performance criteria provides reasonable assurance that the SGs can be operated safely without increase in risk.

The revised TSs will contain limited specific details concerning how the SG Program is to achieve the required objective of maintaining tube integrity, the intent being that the licensee will have the flexibility to determine the specific strategy for meeting this objective. However, the NRC staff finds that the revised TSs include sufficient regulatory constraints on the establishment and implementation of the SG Program to provide reasonable assurance that tube integrity will be maintained.

Failure to meet the performance criteria will be reportable pursuant to the requirements in Title 10 of the *Code of Federal Regulations* (10 CFR), Parts 50.72 and 50.73. The NRC Reactor Oversight Process provides a process by which the NRC staff can verify that the

licensee has identified any SG Program deficiencies that may have contributed to such an occurrence and that appropriate corrective actions have been implemented.

In conclusion, the NRC staff finds that the TS changes proposed by the licensee in the letters referenced above conform to the requirements of 10 CFR Part 50.36 and establish a TS framework that will provide reasonable assurance that tube integrity is maintained without undue risk to public health and safety.

The licensee included in its application the revised TS Bases to be implemented with the TS changes. These will be updated in accordance with the licensee's TS Bases Control Program. The NRC staff finds that the TS Bases Control Program is the appropriate process for updating the affected TS Bases pages and, therefore, has not included the affected Bases pages with this amendment.

3.2 License Condition

In conjunction with adopting the revised SG surveillance program, the licensee proposed to delete license condition 2.C.(8)(b), which required TVA to establish a SG inspection program by May 20, 1997, in accordance with specific commitments (as indicated in the license condition). The background for the license condition is in an NRC letter to TVA dated April 9, 1997, which contained NRC staff acceptance of commitments made by TVA for application of the voltage-based alternate repair criteria to the SQN-2 SGs. The commitments made by TVA are described in TVA letters dated March 12, 1997, and March 17, 1997. The licensee asserts that all aspects of the commitments of TVA's March 12, 1997, and March 17, 1997, letters are bounded by the proposed TSs.

The NRC staff found that while the proposed TSs are less prescriptive than the previous commitments, they provide assurance that SG tube integrity will be maintained and include the application of voltage-based alternate repair criteria. Therefore, the NRC staff concluded that deletion of the license condition is acceptable since the new TSs require tube integrity to be maintained throughout the operating interval between inspections and the staff can review the adequacy of the licensee's program as it relates to the commitments referenced in the license condition (e.g., through review of the TS-required reports).

4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Tennessee State official was notified of the proposed issuance of the amendment . The State official had no comments.

5.0 ENVIRONMENTAL CONSIDERATION

The amendments change a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 and changes surveillance requirements. The NRC staff has determined that the amendment involves no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendments involve no significant hazards consideration, and there has been no public comment on such finding (71 FR 15488 dated March 28, 2006). Accordingly, the

amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b) no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendments.

6.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of these amendments will not be inimical to the common defense and security or to the health and safety of the public.

7.0 REFERENCES

A complete list of references used to perform this review can be found in the NRC's model SE published in the *Federal Register* on March 2, 2005 (70 FR 10298).

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Date: May 22, 2007

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