

Template, NRR-058

Mr. J. A. Scalice
Chief Nuclear Officer and
Executive Vice President
Tennessee Valley Authority
6A Lookout Place
1101 Market Street
Chattanooga, TN 37402-2801

March 29, 2000

SUBJECT: SEQUOYAH NUCLEAR PLANT, UNITS 1 AND 2 - ISSUANCE OF
AMENDMENTS REGARDING DELETION OF THE MONTHLY AUXILIARY
FEEDWATER PUMP SUCTION PRESSURE SURVEILLANCE TEST
(TAC NOS. MA5380 AND MA5381) (TS 99-04)

Dear Mr. Scalice:

The Commission has issued the enclosed Amendment No. 253 to Facility Operating License No. DPR-77 and Amendment No. 244 to Facility Operating License No. DPR-79 for the Sequoyah Nuclear Plant (SQN), Units 1 and 2, respectively. These amendments are in response to your application dated April 29, 1999, which requested approval to remove the Auxiliary Feedwater pump suction low pressure switch monthly channel functional surveillance test requirement from the Technical Specification (TS) for SQN Units 1 and 2. The U.S. Nuclear Regulatory Commission staff has reviewed and approved your request on the basis that the TS does not enhance the safety of plant operation and represents an unnecessary burden.

A copy of the Safety Evaluation is also enclosed. Notice of Issuance will be included in the Commission's next biweekly Federal Register notice.

Sincerely,

/RA/

Ronald W. Hernan, Sr. Project Manager, Section 2
Project Directorate II
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket Nos. 50-327 and 50-328
Enclosures: 1. Amendment No. 253 to License No. DPR-77
2. Amendment No. 244 to License No. DPR-79
3. Safety Evaluation

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UNITED STATES
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

March 29, 2000

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The Commission has issued the enclosed Amendment No. 253 to Facility Operating License No. DPR-77 and Amendment No. 244 to Facility Operating License No. DPR-79 for the Sequoyah Nuclear Plant (SQN), Units 1 and 2, respectively. These amendments are in response to your application dated April 29, 1999, which requested approval to remove the Auxiliary Feedwater pump suction low pressure switch monthly channel functional surveillance test requirement from the Technical Specification (TS) for SQN Units 1 and 2. The U.S. Nuclear Regulatory Commission staff has reviewed and approved your request on the basis that the TS does not enhance the safety of plant operation and represents an unnecessary burden.

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cc w/enclosures: See next page



UNITED STATES
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

TENNESSEE VALLEY AUTHORITY

DOCKET NO. 50-327

SEQUOYAH NUCLEAR PLANT, UNIT 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 253
License No. DPR-77

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by Tennessee Valley Authority (the licensee) dated April 29, 1999, 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-77 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 253 , are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of its date of issuance, to be implemented no later than 45 days after issuance.

FOR THE NUCLEAR REGULATORY COMMISSION



Richard P. Correia, Chief, Section 2
Project Directorate II
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical
Specifications

Date of Issuance: **March 29, 2000**

ATTACHMENT TO LICENSE AMENDMENT NO. 253

FACILITY OPERATING LICENSE NO. DPR-77

DOCKET NO. 50-327

Replace the following page of the Appendix A Technical Specifications with the attached revised page. The revised page is identified by amendment number and contains marginal lines indicating the area of change.

REMOVE

3/4 3-37

INSERT

3/4 3-37

TABLE 4.3-2 (Continued)
ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS

<u>FUNCTIONAL UNIT</u>	<u>CHANNEL CHECK</u>	<u>CHANNEL CALIBRATION</u>	<u>CHANNEL FUNCTIONAL TEST</u>	<u>MODES FOR WHICH SURVEILLANCE REQUIRED</u>	
c. Main Steam Generator Water Level--Low-Low					
1. Steam Generator Water Level--Low-Low (Adverse)	S	R	Q	1, 2, 3	R145
2. Steam Generator Water Level--Low-Low (EAM)	S	R	Q	1, 2, 3	
3. RCS Loop ΔT	S	R	Q	1, 2, 3	
4. Containment Pressure (EAM)	S	R	Q	1, 2, 3	
d. S.I.	See 1 above (all SI surveillance requirements)				
e. Loss of Power Start					
1. Voltage Sensors	N.A.	R	M	1, 2, 3	R211
2. Load Shed Timer	N.A.	R	N.A.	1, 2, 3	
f. Trip of Main Feedwater Pumps	N.A.	N.A.	R	1, 2	
g. Auxiliary Feedwater Suction Pressure-Low	N.A.	R	N.A.	1, 2, 3	
h. Auxiliary Feedwater Suction Transfer Time Delays	N.A.	R	N.A.	1, 2, 3	R145
7. LOSS OF POWER					
a. 6.9 kv Shutdown Board - Loss of Voltage					
1. Voltage Sensors	N.A.	R	M	1, 2, 3, 4, 5#, 6#	R211
2. Diesel Generator Start and Load Shed Timer	N.A.	R	N.A.	1, 2, 3, 4, 5#, 6#	



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

TENNESSEE VALLEY AUTHORITY

DOCKET NO. 50-328

SEQUOYAH NUCLEAR PLANT, UNIT 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. **244**
License No. DPR-79

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by Tennessee Valley Authority (the licensee) dated April 29, 1999, 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

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. **244**, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of its date of issuance, to be implemented no later than 45 days after issuance.

FOR THE NUCLEAR REGULATORY COMMISSION



Richard P. Correia, Chief, Section 2
Project Directorate II
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical
Specifications

Date of Issuance: **March 29, 2000**

ATTACHMENT TO LICENSE AMENDMENT NO. 244

FACILITY OPERATING LICENSE NO. DPR-79

DOCKET NO. 50-328

Replace the following page of the Appendix A Technical Specifications with the attached revised page. The revised page is identified by amendment number and contains marginal lines indicating the area of change.

REMOVE

3/4 3-37

INSERT

3/4 3-37

TABLE 4.3-2 (Continued)
ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS

<u>FUNCTIONAL UNIT</u>	<u>CHANNEL CHECK</u>	<u>CHANNEL CALIBRATION</u>	<u>CHANNEL FUNCTIONAL TEST</u>	<u>MODES FOR WHICH SURVEILLANCE REQUIRED</u>	
c. Main Steam Generator Water Level--Low-Low					
1. Steam Generator Water Level--Low-Low (Adverse)	S	R	Q	1, 2, 3	R132
2. Steam Generator Water Level--Low-Low (EAM)	S	R	Q	1, 2, 3	
3. RCS Loop ΔT	S	R	Q	1, 2, 3	
4. Containment Pressure (EAM)	S	R	Q	1, 2, 3	
d. S.I.	See 1 above (all SI surveillance requirements)				
e. Loss of Power Start					
1. Voltage Sensors	N.A.	R	M	1, 2, 3	R197
2. Load Shed Timer	N.A.	R	N.A.	1, 2, 3	
f. Trip of Main Feedwater Pumps	N.A.	N.A.	R	1, 2	
g. Auxiliary Feedwater Suction Pressure-Low	N.A.	R	N.A.	1, 2, 3	
h. Auxiliary Feedwater Suction Transfer Time Delays	N.A.	R	N.A.	1, 2, 3	R116
7. LOSS OF POWER					R132
a. 6.9 kv Shutdown Board - Loss of Voltage					
1. Voltage Sensors	N.A.	R	M	1, 2, 3, 4, 5#, 6#	R197
2. Diesel Generator Start and Load Shed Timer	N.A.	R	N.A.	1, 2, 3, 4, 5#, 6#	



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 253 TO FACILITY OPERATING LICENSE NO. DPR-77

AND AMENDMENT NO. 244 TO FACILITY OPERATING LICENSE NO. DPR-79

TENNESSEE VALLEY AUTHORITY

SEQUOYAH NUCLEAR PLANT, UNITS 1 AND 2

DOCKET NOS. 50-327 AND 50-328

1.0 INTRODUCTION

By application dated April 29, 1999, the Tennessee Valley Authority (TVA, the licensee) proposed amendments to the Technical Specifications (TS) for Sequoyah Nuclear Plant (SQN) Units 1 and 2. The requested changes would modify the TS for SQN Units 1 and 2 by deleting the monthly surveillance requirement (SR) for a monthly channel functional test in Table 4.3-2 (SR 4.3.2.1.1.6.g) for low auxiliary feedwater (AFW) pump suction pressure. The U.S. Nuclear Regulatory Commission (NRC) staff has completed its review of this application and has found it to meet NRC regulations as discussed below.

2.0 BACKGROUND

Performance of the AFW pressure switch channel functional test at the present monthly interval decreases the availability of the AFW system approximately 7 hours per month per unit. During performance of the surveillance, portions of the essential raw cooling water (ERCW) system are rendered inoperable. Specifically, power is removed to the ERCW valves that supply the AFW pump that is being tested to ensure that raw water will not inadvertently be injected into the steam generators. This requires that a portion of the AFW system also be declared inoperable during the test period. Therefore, TVA has concluded that the proposed change would improve the availability of the AFW system. Additionally, TVA has estimated that this TS surveillance revision would save approximately \$440,000 over the remaining life of the SQN plant.

3.0 EVALUATION

Licensee Safety Analysis

The AFW system supplies, in the event of a loss of the main feedwater supply, sufficient feedwater to the steam generators to remove primary system stored and residual core energy. The AFW system is designed to be an Engineered Safety Feature (ESF), except for the condensate water supply, which is backed up by the ERCW system. The ESF-grade portion of the system is designed for seismic conditions and single failure requirements, including consideration that the rupture of a feedwater line could be the initiating event. In the event of

an accident involving feedwater, AFW is designed to provide the required flow to two or more steam generators regardless of any single active or passive failure in the long term.

The preferred source of water for the AFW pumps are the non-seismic condensate storage tanks (CSTs), one for each unit. As an unlimited backup (Seismic Category I) water supply, a separate ERCW system header feeds each electric motor-driven AFW pump. The turbine-driven AFW pump receives backup (Seismic Category I) water from both Train A and B ERCW headers. The ERCW supply can be remote-manually aligned based on CST level or automatically on a two-out-of-three low-pressure signal in the condensate suction line.

The pressure signal for the automatic AFW system switchover from the CST to the ERCW system is generated from three pressure switches on the suction of each of the three AFW pumps. In other words, there are three switches per pump, or nine per unit, for a total of 18 pressure switches for both units. The pressure switches for the motor-driven AFW pumps are ASCO Tripoint Model SB31AKR/TD30A32R. The switches for the turbine-driven AFW pump are Static-O-Ring Model 12N6-BB45-NX-C1A-JJTTX12.

The switches for the AFW pumps are presently required to be functionally tested every month and a channel calibration is performed once every 18 months. By analysis, the calculation and the setpoint and scaling documents support a calibration frequency of 18 months plus an allowable 25 percent extension or 22.5 months for each of the AFW pressure switches.

A review of the monthly channel functional test data (since 1991) of the motor-driven AFW pump ASCO pressure switches reveals the switches actuated upon demand with no failures. Additionally, a review of the 18-month channel calibration test data (since 1991) was performed on the motor-driven AFW pump pressure switches for Units 1 and 2. Two test deficiencies occurred during a channel calibration performance in 1995 when two different switches drifted out of tolerance low. The switches were recalibrated and returned to service. The pressure switches would have performed their safety function within the safety limits even with the out-of-tolerance condition. Performances since that time have been satisfactory, with no additional deficiencies.

A review of the monthly channel functional test data (since 1991) of the turbine-driven AFW pump pressure switches shows that the pressure switches responded upon demand without any failures. Additionally, a review of the turbine-driven AFW pump suction pressure switches channel calibrations (since 1991) identified two test deficiencies involving two different switches. One switch had drifted out of tolerance in the low direction in 1992 and another in 1994. The switches were recalibrated and returned to service with no subsequent deficiencies. The pressure switches would have performed their safety function within the safety limits even with the out-of-tolerance conditions. Performances since that time have been satisfactory, with no additional deficiencies. In its submittal, TVA points out that these switches are in the scope of the Maintenance Rule Program and as such, any degraded performance will be evaluated and corrective actions established as appropriate.

The above information illustrates that the monthly channel functional surveillances are routinely met and that the 18-month channel calibration surveillances infrequently result in an out-of-tolerance condition. However, due to the potential to inject untreated coolant water (ERCW) into the steam generators, the ERCW supply valves are rendered inoperable during the monthly surveillance test. As previously described, this action results in an increase of approximately

7 hours per month per unit in the unavailability of the AFW system. Given the reliability of the pressure switches and the low probability of a seismic event occurring while relying on AFW, TVA believes that the overall safety of SQN would be improved by eliminating the monthly AFW pressure switch channel functional test and relying on the 18-month channel calibration to ensure safety system performance.

NRC Staff Evaluation

Although TVA did not submit this license application as a risk-informed TS change, the NRC staff reviewed the potential positive and negative effects of the proposed change on calculated core damage frequency (CDF), being that there are minor effects in both directions. Although the proposal is to delete the monthly functional tests of the 18 AFW low suction pressure sensors (performed with the unit at power), a functional test of these switches is performed as part of the 18-month channel calibration with the unit shut down. As stated above, each monthly performance involves 7 hours of unavailability of portions of the AFW and ERCW systems. Therefore, extending the test interval slightly increases CDF, whereas increasing AFW/ERCW availability reduces CDF. An abbreviated review of the net effect of these amendments from a safety-risk standpoint indicated that there would be a slight CDF net decrease (less than 1×10^{-6}) by changing the test frequency. In other words, plant safety would be improved by approval of these amendments.

The NRC staff also reviewed the safety importance of the function provided by the AFW suction low pressure signals generated by the subject pressure switches. In December 1992, the NRC published a report, NUREG-1366, "Improvements to Technical Specifications Surveillance Requirements," to document the results of a task force review of TS SR changes that could improve plant operation. Among the criteria used by the task force was, "the surveillance places an unnecessary burden on plant personnel because the time required is not justified by the safety significance of the surveillance." One of the charters of the task force was as follows:

Recommendation 4

The surveillance test requirements should be reviewed to assure that they do not consume plant personnel time unnecessarily or result in undue radiation exposure to plant personnel without a commensurate safety benefit in terms of minimizing public risk.

NUREG-1366 made recommendations to relax or delete a number of SRs, some on the basis of unnecessary operator burden, including relaxation of certain categories of instrumentation SRs. Because NUREG-1366 did not get down to the level of detail of particular instruments, the AFW suction instruments herein were not addressed. However, the request being considered in this safety evaluation certainly falls within the recommendation cited above. The safety function of these pressure switches is to provide an alternate seismically-qualified source of water to maintain adequate net positive suction head to the AFW pumps. This function is only assumed to be necessary during a seismic event that incapacitates both CSTs, since the CSTs, each with a minimum availability of 190,00 gallons of condensate, are not seismically qualified. Even in this unlikely event, the SQN Final Safety Analysis Report implies that this operation would be performed by plant operators (remote-manual capability based on CST level) well before the CST levels reached the point of tripping the AFW low suction pressure

switches. The time available for operator action during such an event would be well within the operator's capability. Therefore, from a public safety contribution standpoint, monthly function checks of these 18 redundant pressure switches, with the concomitant rendering of a safety-related system inoperable for 7 hours each time, appears not only unnecessary but undesirable. It is on this basis, consistent with the philosophy of NUREG-1366, that the staff finds the proposed TS amendment to be acceptable.

The NRC staff reviewed current TS for this test at other plants having similar design and vintage as SQN Units 1 and 2 and found that the requirements range from 92 days to 18 months (as is being requested by TVA). Staff documents on this subject for other pressurized water reactor vendor designs do not even list this test as a required SR.

Therefore, the NRC staff finds that TVA's proposed changes to the SQN TS would not have a detrimental effect on plant safety.

4.0 STATE CONSULTATION

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

5.0 ENVIRONMENTAL CONSIDERATION

The amendments change a surveillance requirement. The NRC staff has determined that the amendments involve 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 (64 FR 27325). Accordingly, the amendments meet 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 the amendments will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributor: Ronald W. Hernan, NRR

Date: March 29, 2000

Mr. J. A. Scalice
Tennessee Valley Authority

cc:

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SEQUOYAH NUCLEAR PLANT

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