

September 20, 2007

Mr. William R. Campbell, Jr.
Chief Nuclear Officer and
Executive Vice President
Tennessee Valley Authority
6A Lookout Place
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SUBJECT: SEQUOYAH NUCLEAR PLANT, UNITS 1 AND 2 - ISSUANCE OF
AMENDMENTS REGARDING ALLOWABLE VALUE FOR TURBINE TRIP
ON LOW TRIP SYSTEM PRESSURE (TS-07-01) (TAC NOS. MD4680 AND
MD4681)

Dear Mr. Campbell:

The Commission has issued the enclosed Amendment No. 316 to Facility Operating License No. DPR-77 and Amendment No.306 to Facility Operating License No. DPR-79 for the Sequoyah Nuclear Plant, Units 1 and 2. These amendments are in response to your application dated February 26, 2007, as supplemented on July 26, 2007.

The amendments revise the allowable value for Functional Unit 17.A in Technical Specification Table 2.2-1, "Reactor Trip System Instrumentation Trip Setpoints," from greater than or equal to 43 pounds per square inch gauge (psig) to 39.5 psig.

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

Sincerely,

/RA/

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

Docket No. 50-327 and 50-328

Enclosures: 1. Amendment No. 316 to
License No. DPR-77
2. Amendment No. 306 to
License No. DPR-79
3. Safety Evaluation

cc w/enclosures: See next page

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cc w/enclosures: See next page

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TENNESSEE VALLEY AUTHORITY

DOCKET NO. 50-327

SEQUOYAH NUCLEAR PLANT, UNIT 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 316
License No. DPR-77

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by the Tennessee Valley Authority (the licensee) dated February 26, 2007, as supplemented on July 26, 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 Title 10 of the *Code of Federal Regulations* (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 and Environmental Protection Plan

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 316, 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. This license amendment is effective as of the date of its issuance, and shall be implemented no later than 45 days from the date of its issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

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

Attachment: Change to License No. DPR-77
and the Technical Specifications

Date of Issuance: September 20, 2007

ATTACHMENT TO LICENSE AMENDMENT NO. 316

FACILITY OPERATING LICENSE NO. DPR-77

DOCKET NO. 50-327

Replace page 3 of Operating License No. DPR-77 with the attached page 3.

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

2-6a

INSERT

2-6a

- (4) Pursuant to the Act and 10 CFR Parts 30, 40 and 70, to receive, possess, and use in amounts as required, any byproduct, source or special nuclear material without restriction to chemical or physical form, for sample analysis, instrument calibration or associated with radioactive apparatus or components; and
 - (5) Pursuant to the Act and 10 CFR Parts 30, 40 and 70, to possess, but not separate, such byproduct and special nuclear materials as may be produced by the operation of the Sequoyah and Watts Bar Unit 1 Nuclear Plants.
- C. This license shall be deemed to contain and is subject to the conditions specified in the Commission's regulations set forth in 10 CFR Chapter I and is subject to all applicable provisions of the Act and to the rules, regulations, and orders of the Commission now or hereafter in effect; and is subject to the additional conditions specified or incorporated below:
- (1) Maximum Power Level

The Tennessee Valley Authority is authorized to operate the facility at reactor core power levels not in excess of 3455 megawatts thermal.
 - (2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 316, are hereby incorporated into this license. The licensee shall operate the facility in accordance with the Technical Specifications.
 - (3) Initial Test Program

The Tennessee Valley Authority shall conduct the post-fuel-loading initial test program (set forth in Section 14 of Tennessee Valley Authority's Final Safety Analysis Report, as amended), without making any major modifications of this program unless modifications have been identified and have received prior NRC approval. Major modifications are defined as:
 - a. Elimination of any test identified in Section 14 of TVA's Final Safety Analysis Report as amended as being essential;
 - b. Modification of test objectives, methods or acceptance criteria for any test identified in Section 14 of TVA's Final Safety Analysis Report as amended as being essential;
 - c. Performance of any test at power level different from there described; and

TENNESSEE VALLEY AUTHORITY
DOCKET NO. 50-328
SEQUOYAH NUCLEAR PLANT, UNIT 2
AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 306
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 26, 2007, as supplemented on July 26, 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 Title 10 of the *Code of Federal Regulations* (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. 306, 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. This license amendment is effective as of the date of its issuance, and shall be implemented no later than 45 days from the date of its issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

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

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

Date of Issuance: September 20, 2007

ATTACHMENT TO LICENSE AMENDMENT NO. 306

FACILITY OPERATING LICENSE NO. DPR-79

DOCKET NO. 50-328

Replace page 3 of Operating License No. DPR-79 with the attached page 3.

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

2-7

INSERT

2-7

- (4) Pursuant to the Act and 10 CFR Parts 30, 40 and 70, to receive, possess, and use in amounts as required any byproduct, source or special nuclear material without restriction to chemical or physical form, for sample analysis or instrument calibration or associated with radioactive apparatus or components; and
- (5) Pursuant to the Act and 10 CFR Parts 30, 40 and 70, to possess, but not separate, such byproduct and special nuclear materials as may be produced by the operation of the Sequoyah and Watts Bar Unit 1 Nuclear Plants.

C. This license shall be deemed to contain and is subject to the conditions specified in the Commission's regulations set forth in 10 CFR Chapter I and is subject to all applicable provisions of the Act and to the rules, regulations, and orders of the Commission now or hereafter in effect; and is subject to the additional conditions specified or incorporated below:

(1) Maximum Power Level

The Tennessee Valley Authority is authorized to operate the facility at reactor core power levels not in excess of 3455 megawatts thermal.

(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 306, are hereby incorporated into this license. The licensee shall operate the facility in accordance with the Technical Specifications.

(3) Initial Test Program

The Tennessee Valley Authority shall conduct the post-fuel-loading initial test program (set forth in Section 14 of Tennessee Valley Authority's Final Safety Analysis Report, as amended), without making any major modifications of this program unless modifications have been identified and have received prior NRC approval. Major modifications are defined as:

- a. Elimination of any test identified in Section 14 of TVA's Final Safety Analysis Report as amended as being essential;
- b. Modification of test objectives, methods or acceptance criteria for any test identified in Section 14 of TVA's Final Safety Analysis Report as amended as being essential;
- c. Performance of any test at power level different from there described; and

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NO. 316 TO FACILITY OPERATING LICENSE NO. DPR-77
AND AMENDMENT NO. 306 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 letter dated February 26, 2007, as supplemented by letter dated July 26, 2007, the Tennessee Valley Authority (TVA, licensee) requested a license amendment for Sequoyah Nuclear Plant (SQN), Units 1 and 2, relating to the reactor protection system turbine trip from low trip system pressure. The proposed amendment would revise the allowable value (AV) for Functional Unit 17.A in Technical Specification (TS) Table 2.2-1, "Reactor Trip System Instrumentation Trip Setpoints," from greater than or equal to 43 pounds per square inch gauge (psig) to 39.5 psig.

TVA has evaluated historical calibration data for the autostop oil pressure sensors at the SQN facility. This data indicates an unacceptable number of occurrences where the as-found instrument values were outside the AV limits. TVA has utilized the Corrective Action Program to investigate these occurrences and determine a resolution to minimize these events. The licensee concluded that the AV for this function was too limiting for the accuracy and repeatability of the switches and, therefore, it is not adequately based on the design capabilities of the instrumentation. The proposed amendments would make permanent the change that was previously approved for the Cycle 15 Operating Cycle only (Amendments 307 and 296, dated April 6, 2006 (Agencywide Documents Access and Management System Accession No. ML061010258)).

Notice of these amendments was given in the *Federal Register* on April 24, 2007 (72 FR 20385). The July 26, 2007, letter provided additional information that clarified the application, did not expand the scope of the application as originally noticed, and did not change the staff's original proposed no significant hazards consideration determination .

3.0 REGULATORY EVALUATION

The following regulatory bases and guidance documents pertain to the proposed TS change:

10 CFR 50.36 (c)(1)(ii)(A) states: "Limiting safety system settings for nuclear reactors are settings for automatic protective devices related to those variables having significant safety functions. Where a limiting safety system setting is specified for a variable on which a safety limit has been placed, the setting must be so chosen that automatic protective action will correct the abnormal situation before a safety limit is exceeded. If,

during operation, it is determined that the automatic safety function does not function as required, the licensee shall take corrective action, which may include shutting down the reactor.”

General Design Criterion (GDC) 13, "Instrumentation and Control," of Appendix A, "General Design Criteria for Nuclear Power Plants," to 10 CFR Part 50, "Domestic Licensing of Production and Utilization Facilities," requires, among other things, that instrumentation be provided to monitor variables and systems and that controls be provided to maintain these variables and systems within prescribed operating ranges.

GDC 20, "Protection System Functions," of Appendix A to 10 CFR Part 50 requires, among other things, that the protection system be designed to initiate operation of appropriate systems to ensure that specified acceptable fuel design limits are not exceeded.

Regulatory Guide 1.105, "Setpoints for Safety-Related Instrumentation," describes a method acceptable to the Nuclear Regulatory Commission (NRC) staff for complying with the NRC's regulations for ensuring that setpoints for safety-related instrumentation are initially within and remain within the technical specification limits.

Regulatory Issue Summary (RIS) 2006-17, "NRC Staff Position on the Requirements of 10 CFR 50.36, 'Technical Specifications,' Regarding Limiting Safety System Settings during Periodic Testing and Calibration of Instrument Channels”.

3.0 TECHNICAL EVALUATION

The turbine autostop oil system is designed to operate at approximately 90 psig. The autostop oil pressure signal dumps the autostop emergency trip fluid, closing all of the turbine steam stop valves. When the autostop emergency trip fluid is dumped, oil pressure immediately drops from its normal operating pressure of approximately 90 psig to 0 psig. The system trip setpoint (45 psig) and allowable value (43 psig) were supplied by the nuclear steam system supplier (Westinghouse). These values were system generic values and not specifically designed for application at the SQN facility. As discussed above, the licensee has concluded that the allowable value for this function is too limiting for the accuracy and repeatability of the switches and, therefore, it is not adequately based on the design capabilities of the instrumentation.

The licensee has prepared a calculation to define a plant-specific AV for the switch setpoint of 45 psig. The difference between the AV and the trip setpoint accounts for instrument drift, calibration uncertainties for the channel tested, and instrument uncertainties during normal operation that are measured during testing.

The AV, as calculated by the licensee, is simply the normal setpoint (45 psig) minus a term referred to as the Normal Measurable Accuracy. The Normal Measurable Accuracy is the square root of the summation of squares of the unknowns that are measured during testing. The unknowns include instrument drift, temperature effects, switch repeatability, as-left calibration tolerance, input calibration test equipment accuracy, and reading error allowance.

The licensee's calculation identifies the Normal Measurable Accuracy as 5.5 psig. This results in a plant-specific AV of 39.5 psig (i.e., 45 psig - 5.5 psig).

The staff has reviewed the licensee's setpoint methodology and calculation and concludes that the methodology demonstrates that the proposed AV is reasonable. The licensee has defined the as-left calibration tolerance equivalent to instrument repeatability. The licensee has also defined the as-found tolerance equivalent to the AV, which is determined by taking the square root of the sum of the squares of instrument uncertainties measured during testing. The staff has determined that the licensee's setpoint calculation meets the guidance provided in RIS 2006-17. In response to the staff's question regarding the operability determination of the instrument, the licensee stated, in its letter of July 26, 2007, that the surveillance procedure requires the setpoint be returned to within the specified acceptable as-left calibration tolerance if found outside this allowance during performance of the channel functional test. If the setpoint is found outside the as-found tolerance allowance, which is the same as the AV, plant surveillance procedures require an evaluation to be performed per the requirements of the corrective action program. Based on this information, the staff has determined that the licensee's setpoint calibration procedures will maintain the trip setpoint within the established setting tolerance to ensure that the instrument will be capable of performing its specified safety function. Based on its review of the licensee's calculation and justification, the staff finds the proposed TS change acceptable.

In Amendment Nos. 307 and 296, the staff approved a limited duration (Cycle 15 only) TS change to revise the AV for the reactor protection system turbine trip from 43 psig to 39.5 psig. The decision to allow this TS change for a limited duration was a result of the staff's concern that the turbine trip functions might be a Safety Limit-Related Limiting Safety System Setting (SL-LSSS) function. In its letter of July 26, 2007, the licensee stated that the turbine trip on low trip system pressure is an anticipatory trip input signal to the reactor protection system, and that it is not assumed in any of the accident analyses in Chapter 15 of the Updated Facility Safety Analysis Report. This trip is an anticipatory trip for other reactor trip functions to enhance the overall reliability and, therefore, is not a SL-LSSS function. The staff agrees with the licensee's justification. This resolves the staff's concern and, therefore, it is acceptable to make the TS revision permanent.

4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Tennessee State official, Mr. Bruce House of the Tennessee Bureau of Radiological Health, 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 (72 FR 20385). 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.

Principal Contributor: Hukam Garg

Dated: September 20, 2007

William R. Campbell, Jr.
Tennessee Valley Authority

SEQUOYAH NUCLEAR PLANT

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