Docket Nos. 50-327
and 50-328

August 27, 1993

Tennessee Valley Authority
ATTN: Dr. Mark O. Medford, Vice President
Technical Support
3B Lookout Place
1101 Market Street
Chattanooga, Tennessee 37402-2801

Dear Dr. Medford:

SUBJECT: ISSUANCE OF AMENDMENTS (TAC NOS. M85950 AND M85951) (TS 93-03)

The Commission has issued the enclosed Amendment No. 170 to Facility Operating License No. DPR-77 and Amendment No. 160 to Facility Operating License No. DPR-79 for the Sequoyah Nuclear Plant, Units 1 and 2, respectively. These amendments are in response to your application dated March 1, 1993.

The amendments increase the maximum voltage limit specified in the Technical Specifications resulting from a full-load rejection surveillance test of the emergency diesel generators.

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

Sincerely,

Original signed by

David E. LaBarge, Sr. Project Manager
Project Directorate II-4
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Enclosures:
1. Amendment No. 170 to License No. DPR-77
2. Amendment No. 160 to License No. DPR-79
3. Safety Evaluation

cc w/enclosures:
See next page

NAME:	PDII-4/LA	PDII-4/PM	EELB	OGC	PDII-4/D
OFFICE:	BClayton	DLaBarge	CBerlinger		FHebdon
DATE:	8/16/93	8/16/93	8/11/93	8/18/93	8/27/93

DOCUMENT NAME: G:\SQN\85950.AMM

1/1

Tennessee Valley Authority
ATTN: Dr. Mark O. Medford

cc:
Mr. W. H. Kennoy, Director
Tennessee Valley Authority
ET 12A
400 West Summit Hill Drive
Knoxville, Tennessee 37902

Mr. R. M. Eytchison, Vice President
Nuclear Operations
Tennessee Valley Authority
3B Lookout Place
1101 Market Street
Chattanooga, Tennessee 37402-2801

Mr. B. S. Schofield, Manager
Nuclear Licensing and Regulatory Affairs
Tennessee Valley Authority
5B Lookout Place
1101 Market Street
Chattanooga, Tennessee 37402-2801

Mr. Robert Fenech, Vice President
Sequoyah Nuclear Plant
Tennessee Valley Authority
P.O. Box 2000
Soddy Daisy, Tennessee 37379

TVA Representative
Tennessee Valley Authority
11921 Rockville Pike
Suite 402
Rockville, Maryland 20852

Mr. Ralph Shell, Site Licensing Manager
Sequoyah Nuclear Plant
Tennessee Valley Authority
P.O. Box 2000
Soddy Daisy, Tennessee 37379

Mr. Michael H. Mobley, Director
Division of Radiological Health
3rd Floor, L and C Annex
401 Church Street
Nashville, Tennessee 37243-1532

General Counsel
Tennessee Valley Authority
ET 11H
400 West Summit Hill Drive
Knoxville, Tennessee 37902

Sequoyah Nuclear Plant

County Judge
Hamilton County Courthouse
Chattanooga, Tennessee 37402

Regional Administrator
U.S.N.R.C. Region II
101 Marietta Street, N.W.
Suite 2900
Atlanta, Georgia 30323

Mr. William E. Holland
Senior Resident Inspector
Sequoyah Nuclear Plant
U.S.N.R.C.
2600 Igou Ferry Road
Soddy Daisy, Tennessee 37379

AMENDMENT NO. 170 FOR SEQUOYAH UNIT NO. 1 - DOCKET NO. 50-327 and
AMENDMENT NO. 160 FOR SEQUOYAH UNIT NO. 2 - DOCKET NO. 50-328
DATED: August 27, 1993

DISTRIBUTION:

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NRC & Local PDRs	
SQN Reading File	
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OPA	2-G-5
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P. Kang	

cc: Plant Service List

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

TENNESSEE VALLEY AUTHORITY

DOCKET NO. 50-327

SEQUOYAH NUCLEAR PLANT, UNIT 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 170
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 March 1, 1993, 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. 170, 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 within 45 days.

FOR THE NUCLEAR REGULATORY COMMISSION

Frederick J. Hebdon, Director
Project Directorate II-4
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical
Specifications

Date of Issuance:
August 27, 1993

ATTACHMENT TO LICENSE AMENDMENT NO. 170

FACILITY OPERATING LICENSE NO. DPR-77

DOCKET NO. 50-327

Revise the Appendix A Technical Specifications by removing the pages identified below and inserting the enclosed pages. The revised pages are identified by the captioned amendment number and contain marginal lines indicating the area of change.

REMOVE	INSERT
3/4 8-4	3/4 8-4

SURVEILLANCE REQUIREMENTS (Continued)

d. At least once per 18 months during shutdown by:

1. Subjecting the diesel to an inspection in accordance with procedures prepared in conjunction with its manufacturer's recommendations for this class of standby service,

2. Verifying the generator capability to reject a load of greater than or equal to 600 kw while maintaining voltage within ± 10 percent of the initial pretest voltage and frequency at 60 ± 1.2 Hz. At no time shall the transient voltage exceed 8276V.

3. Verifying the generator capability to reject a load of 4400 kw without tripping. The generator voltage shall not exceed 8880V during and following the load rejection.

4. Simulating a loss of offsite power by itself, and:

a) Verifying de-energization of the shutdown boards and load shedding from the shutdown boards.

b) Verifying the diesel starts on the auto-start signal, energizes the shutdown boards with permanently connected loads within 10 seconds, energizes the auto-connected shutdown loads through the load sequencers and operates for greater than or equal to 5 minutes while its generator is loaded with the shutdown loads. After energization, the steady state voltage and frequency of the shutdown boards shall be maintained at 6900 ± 690 volts and 60 ± 1.2 Hz during this test.

5. Verifying that on a ESF actuation test signal (without loss of offsite power) the diesel generator starts on the auto-start signal and operates on standby for greater than or equal to 5 minutes. The generator voltage and frequency shall be 6900 ± 690 volts and 60 ± 1.2 Hz within 10 seconds after the auto-start signal; the steady state generator voltage and frequency shall be maintained within these limits during this test.

6. Simulating a loss of offsite power in conjunction with an ESF actuation test signal, and

a) Verifying de-energization of the shutdown boards and load shedding from the shutdown boards.

b) Verifying the diesel starts on the auto-start signal, energizes the shutdown boards with permanently connected loads within 10 seconds, energizes the auto-connected emergency (accident) loads through the load sequencers and operates for greater than or equal to 5 minutes while its generator is loaded with the emergency loads. After energization, the steady state voltage and frequency of the emergency busses shall be maintained at 6900 ± 690 volts and 60 ± 1.2 Hz during this test.

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

TENNESSEE VALLEY AUTHORITY

DOCKET NO. 50-328

SEQUOYAH NUCLEAR PLANT, UNIT 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 160
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 March 1, 1993, 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. 169 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 with 45 days.

FOR THE NUCLEAR REGULATORY COMMISSION

Frederick J. Hebdon, Director
Project Directorate II-4
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical
Specifications

Date of Issuance:
August 27, 1993

SURVEILLANCE REQUIREMENTS (Continued)

d. At least once per 18 months during shutdown by:

1. Subjecting the diesel to an inspection in accordance with procedures prepared in conjunction with its manufacturer's recommendations for this class of standby service,

2. Verifying the generator capability to reject a load of greater than or equal to 600 kw while maintaining voltage at within ± 10 percent of the initial pretest voltage and frequency at 60 ± 1.2 Hz. At no time shall the transient voltage exceed 8276V.

3. Verifying the generator capability to reject a load of 4400 kw without tripping. The generator voltage shall not exceed 8880V during and following the load rejection.

4. Simulating a loss of offsite power by itself, and:

a) Verifying de-energization of the shutdown boards and load shedding from the shutdown boards.

b) Verifying the diesel starts on the auto-start signal, energizes the shutdown boards with permanently connected loads within 10 seconds, energizes the auto-connected shutdown loads through the load sequencers and operates for greater than or equal to 5 minutes while its generator is loaded with the shutdown loads. After energization, the steady state voltage and frequency of the shutdown boards shall be maintained at 6900 ± 690 volts and 60 ± 1.2 Hz during this test.

5. Verifying that on a ESF actuation test signal, without loss of offsite power, the diesel generator starts on the auto-start signal and operates on standby for greater than or equal to 5 minutes. The generator voltage and frequency shall be 6900 ± 690 volts and 60 ± 1.2 Hz within 10 seconds after the auto-start signal; the steady state generator voltage and frequency shall be maintained within these limits during this test.

6. Simulating a loss of offsite power in conjunction with an ESF actuation test signal, and

a) Verifying de-energization of the shutdown boards and load shedding from the shutdown boards.

b) Verifying the diesel starts on the auto-start signal, energizes the shutdown boards with permanently connected loads within 10 seconds, energizes the auto-connected emergency (accident) loads through the load sequencers and operates for greater than or equal to 5 minutes while its generator is loaded with the emergency loads. After energization, the steady state voltage and frequency of the emergency busses shall be maintained at 6900 ± 690 volts and 60 ± 1.2 Hz during this test.

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

ENCLOSURE 3

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 170 TO FACILITY OPERATING LICENSE NO. DPR-77

AND AMENDMENT NO. 160 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 March 1, 1993, the Tennessee Valley Authority (TVA or the licensee) proposed an amendment to the Technical Specifications (TS) for Sequoyah Nuclear Plant (SQN) Units 1 and 2. Under the TS Surveillance Requirement (SR) 4.8.1.1.2.d.3, SQN is required to perform a full load rejection surveillance test of each emergency diesel generator (EDG) every 18 months during shutdown by verifying that the generator is capable of rejecting a load of 4400kw without tripping. In addition, the acceptance criteria states that the generator voltage cannot exceed 120 percent of the initial pretest voltage or 8712v, whichever is less, during and following the load rejection test.

The proposed amendment would increase the maximum voltage (i.e., the overshoot) limit for an acceptable test to 8880v and remove the 120 percent of the initial pretest voltage requirement. This would be accomplished by removing the phrase "voltage shall not exceed 120 percent of the initial pretest voltage or 8712v, whichever is less" from the SR and replacing it with a new requirement of "voltage shall not exceed 8880v." Thus, the revised SR 4.8.1.1.2.d.3 would read, "Verifying the generator capability to reject a load of 4400kw without tripping. The generator voltage shall not exceed 8880V during and following the load rejection."

2.0 EVALUATION

During the 18 month full load rejection test performed during the Unit 1 Cycle 5 refueling outage, the EDG voltage overshoot exceeded the acceptance criteria for a very brief duration (measured at 13 and 23 cycles for EDGs 1A-A and 1B-B, respectively). To address this voltage overshoot condition, TVA requested an emergency TS amendment and a Waiver of Compliance to change the EDG voltage overshoot limits from 114 percent or 8276v to 120 percent or 8712v. NRC approved this emergency TS amendment on October 18, 1991.

Since then, the licensee has performed a more detailed study of EDG components affected by the voltage overshoot that occurs during the full load rejection test. As a result, TVA determined that the 120 percent of the initial pretest

generator voltage acceptable value requirement for a full load rejection test should be removed entirely from the SR and the 8712v limit for voltage overshoot should be increased to 8880v.

The purpose of a full load rejection test as performed under SR 4.8.1.1.2.d.3 is designed to demonstrate that the EDG is capable of rejecting a full load (4400kW) without causing an overspeed trip and exceeding the predetermined voltage limits. TVA has evaluated the EDG components potentially impacted by the voltage overshoot from the initial EDG 6.9kv nominal bus voltage during a full load rejection test and has provided the following rationale for the increased voltage overshoot limits.

The generator "high potential (HyPot)" voltage tests at the factory were performed at 14.8kv and the initial testing (preoperational) after installation were performed at 75 percent (i.e., 11.1kv) of the factory test voltage. The in-service high potential tests are recommended at 60 percent (i.e., 8880v or 8.88kv) of the factory test voltage. The EDG manufacturer has determined that the engine and/or generator controls would not experience detrimental effects for transient voltages up to 9000v. The medium voltage cables from the EDG to 6900v shutdown board switchgear (safety bus) are rated at 8000v and have a recommended high-potential test voltage for maintenance of 30.0-kv dc voltage and 17.6-kv ac voltage.

In addition, a voltage overshoot reduction device (VORD) limits EDG voltage by shunting the field current when the voltage exceeds 103 percent of nominal voltage. This device is active only in the isochronous mode; i.e, when the EDG is paralleled to the bus. Therefore, the maximum voltage applied to the cables would be limited by the VORD to a smaller value should an overspeed occur during actual EDG operation than the voltage that would result from the EDG test when the output breaker is opened to conduct the test.

Based on the EDG manufacturer's information, TVA determined that the proposed limit of 8880v is acceptable based on the ability of components to withstand this transient voltage level without damage. Therefore, the magnitude and duration of the overshoot condition expected during a full load rejection test would not damage the connected EDG, its control system components, or distribution components.

HyPot tests for an EDG are performed during major maintenance or if an event occurs that causes the bus voltage to reach 13kv dc for 3 minutes, since this has the potential for causing electrical insulation damage. By considering a dc to ac conversion factor of 1.7, the 13kv dc (phase-to-ground) is equivalent to 7.647kv ac (i.e., 13kv/1.7). Since the maximum voltage allowed during the full load rejection test (8880v) is measured phase-to-phase, while the HyPot test is measured phase-to-ground, 8880v phase-to-phase is equivalent to 5.127kv (i.e., 8.88kv/1.7321) phase-to-ground value. By comparing the EDG's insulation voltage (7.647kv) with the maximum voltage allowed during load rejection test (5.127kv), the voltage level specified before insulation damage can be expected is significantly higher than the voltage overshoot expected during the full load rejection test. Therefore, no insulation damage is expected to occur at the new test voltage level.

Regarding the concern for EDG control equipment to withstand the proposed Full full load rejection test, the proposed transient voltage (i.e., 8880v) expected during a full load rejection test was determined to be within the equipment voltage rating of 9000v. The 9000v rating is based on considering the potential transformer ratio (60:1) and 150v rating for all the control components on the low side of the transformer (i.e., 150v X 60 = 9000v). Therefore, the proposed 8880v is an acceptable limit for the EDG control equipment during the full load rejection test.

Based on the staff's evaluation of the information provided by the licensee, the staff agrees with the licensee that the proposed voltage overshoot limit during a full load rejection test once every 18-month refueling outage would not adversely affect the EDG equipment or the capability of the EDG to perform its intended safety function. We have also determined that the 120 percent provision is not specified in the current Standard TS (Revision 4A) or improved TS (NUREG-1431, dated September 1992, "Standard Technical Specifications Westinghouse Plants"). Therefore, there are no technical requirements for the 120 percent initial pretest generator voltage overshoot provision during a full load rejection test. Based on this analysis, the staff concludes that the increase of the EDG voltage overshoot limit from 8712v to 8880v, and the removal of the 120 percent provision from the current SR 4.8.1.1.2.d.3 are acceptable.

3.0 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.

4.0 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 (58 FR 19487). 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.

5.0 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: P. Kang

Dated: August 27, 1993