Mr. Oliver D. Kingsley, Jr.
President, TVA Nuclear and
Chief Nuclear Officer
Tennessee Valley Authority
6A Lookout Place
1101 Market Street
Chattanooga, TN 37402-2801

Aril 4, 1995

SUBJECT: ISSUANCE OF AMENDMENTS (TAC NOS. M91219 AND M91220) (TS 94-07)

Dear Mr. Kingsley:

The Commission has issued the enclosed Amendment No. 196 to Facility Operating License No. DPR-77 and Amendment No. 187 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 December 16, 1994, and supplemental information supplied by letter dated February 10, 1995.

The amendments revise the technical specifications to reduce the high reactor power level setpoints when one or more main steam safety valves are inoperable and incorporate related changes.

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/I
Office of Nuclear Reactor Regulation

Docket Nos. 50-327 and 50-328

Enclosures:
1. Amendment No. 196 to License No. DPR-77
2. Amendment No. 187 to License No.197 DPR-79
3. Safety Evaluation

cc w/enclosures: See next page

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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. 196
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 December 16, 1994, and supplemented February 10, 1995, 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.196 , 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: April 4, 1995

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. , 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: April 4, 1995

ATTACHMENT TO LICENSE AMENDMENT NO. 187

FACILITY OPERATING LICENSE NO. DPR-79

DOCKET NO. 50-328

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. Spillover page* is provided to maintain document completeness.

| REMOVE | INSERT |
|---|---|
| 3/4 7-1 | 3/4 7-1 |
| 3/4 7-2 | 3/4 7-2 |
| 3/4 7-3 | 3/4 7-3 |
| 3/4 7-4 | 3/4 7-4 |
| B3/4 7-1 | B3/4 7-1 |
| B3/4 7-2 | B3/4 7-2 |
| B3/4 7-2a | B3/4 7-2a* |

## 3/4.7 PLANT SYSTEMS

### 3/4.7.1 TURBINE CYCLE

### SAFETY VALVES

#### LIMITING CONDITION FOR OPERATION

3.7.1.1 Main steam safety valves (MSSVs) shall be OPERABLE with lift settings as specified in Table 3.7-2.

APPLICABILITY: MODES 1, 2 and 3*.

ACTION:

a. With one or more MSSVs inoperable, operation may proceed provided, that within 4 hours, either the inoperable valve is restored to OPERABLE status or the Power Range Neutron Flux High Setpoint trip is reduced per Table 3.7-1. The provisions of Specification 3.0.4 are not applicable.

b. With the requirements of ACTION a., not met or with one or more steam generators with less than two MSSVs OPERABLE be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN in the following 6 hours.

#### SURVEILLANCE REQUIREMENTS

4.7.1.1 No additional Surveillance Requirements other than those required by Specification 4.0.5.

*With the reactor trip system breakers in the closed position.

TABLE 3.7-1
MAXIMUM ALLOWABLE POWER RANGE NEUTRON FLUX HIGH SETPOINT WITH INOPERABLE STEAM LINE SAFETY VALVES

| Maximum Number of Inoperable Safety Valves on Any Operating Steam Generator | Maximum Allowable Power Range Neutron Flux High Setpoint (Percent of RATED THERMAL POWER) |
|---|---|
| 1 | 63 |
| 2 | 45 |
| 3 | 28 |

TABLE 3.7-2

STEAM LINE SAFETY VALVES PER LOOP

| VALVE NUMBER | | | | LIFT SETTING (± 1%)* | NOZZLE SIZE |
|---|---|---|---|---|---|
| Loop 1 | Loop 2 | Loop 3 | Loop 4 | | |
| 2-1-522 | 2-1-517 | 2-1-512 | 2-1-527 | 1064 psig | 16 sq. in. |
| 2-1-523 | 2-1-518 | 2-1-513 | 2-1-528 | 1077 psig | 16 sq. in. |
| 2-1-524 | 2-1-519 | 2-1-514 | 2-1-529 | 1090 psig | 16 sq. in. |
| 2-1-525 | 2-1-520 | 2-1-515 | 2-1-530 | 1103 psig | 16 sq. in. |
| 2-1-526 | 2-1-521 | 2-1-516 | 2-1-531 | 1117 psig | 16 sq. in. |

*The lift setting pressure shall correspond to ambient conditions of the valve at nominal operating temperature and pressure.

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## 3/4.7.1 TURBINE CYCLE

### 3/4.7.1.1 SAFETY VALVES

The OPERABILITY of the main steam line code safety valves ensures that the secondary system pressure will be limited to within 110% (1194 psig) of the system design pressure during the most severe anticipated system operational transient. The maximum relieving capacity is associated with a turbine trip from 100% RATED THERMAL POWER coincident with an assumed loss of condenser heat sink (i.e., no steam bypass to the condenser).

In Mode 1 above 28% RTP, the number of MSSVs per steam generator required to be operable must be according to Table 3.7-1 in the accompanying LCO. At or below 28% RTP in Modes 1, 2, and 3, only two MSSVs per steam generator are required to be operable.

In Modes 4 and 5, there are no credible transients requiring the MSSVs. The steam generators are not normally used for heat removal in Modes 5 and 6, and thus cannot be overpressurized; there is no requirement for the MSSVs to be operable in these modes.

The specified valve lift settings and relieving capacities are in accordance with the requirements of Section III of the ASME Boiler and Pressure Code, 1971 Edition. The total relieving capacity for all valves on all of the steam lines is $1.9 \times 10^7$ lbs/hr at 1170 psig which is 127 percent of the total secondary steam flow of $1.493 \times 10^7$ lbs/hr at 100% RATED THERMAL POWER. A minimum of 2 OPERABLE safety valves per steam generator ensures that sufficient relieving capacity is available for the allowable THERMAL POWER restriction in Table 3.7-1.

STARTUP and/or POWER OPERATION is allowable with safety valves inoperable within the limitations of the ACTION requirements on the basis of the reduction in secondary system steam flow and THERMAL POWER required by the reduced reactor trip settings of the Power Range Neutron Flux channels. The reactor trip setpoint reductions are derived on the following bases:

To calculate this setpoint, the governing equation is the relationship $q = m\Delta h$, where q is the heat input from the primary side, m is the steam flow rate and $\Delta h$ is the heat of vaporization at the steam relief pressure (assuming no subcooled feedwater). Thus, an algorithm for use in defining the revised Technical Specification table setpoint values would be:

$$\text{Hi } \phi = (100/Q)\frac{(w_s h_{fg} N)}{K}$$

where:

Hi $\phi$ = Safety Analysis power range high neutron flux setpoint, percent

Q = Nominal NSSS power rating of the plant (including reactor coolant pump heat), Mwt

K = Conversion factor, 947.82 $\frac{(Btu/sec)}{Mwt}$

$w_s$ = Minimum total steam flow rate capability of the operable MSSVs on any one steam generator at the highest MSSV opening pressure including tolerance and accumulation, as appropriate, in lb/sec. For example, if the maximum number of inoperable MSSVs on any one steam generator is one, then $w_s$ should be a summation of the capacity of the operable MSSVs at the highest operable MSSV operating pressure, excluding the highest capacity MSSV. If the maximum number of inoperable MSSVs per steam generator is three then $w_s$ should be a summation of the capacity of the operable MSSVs at the highest operable MSSV operating pressure, excluding the three highest capacity MSSVs.

$h_{fg}$ = heat of vaporization for steam at the highest MSSV opening pressure including tolerance and accumulation, as appropriate, Btu/lbm

N = Number of loops in plant

The values calculated from this algorithm must then be adjusted lower to account for instrument and channel uncertainties.

3/4.7.1.2 AUXILIARY FEEDWATER SYSTEM

The OPERABILITY of the auxiliary feedwater system ensures that the Reactor Coolant System can be cooled down to less than 350°F from normal operating conditions in the event of a total loss of off-site power.

The steam driven auxiliary feedwater pump is capable of delivering 880 gpm (total feedwater flow) and each of the electric driven auxiliary feedwater pumps are capable of delivering 440 gpm (total feedwater flow) to the entrance of the steam generators at steam generator pressures of 1100 psia. At 1100 psia the open steam generator safety valve(s) are capable of relieving at least 11% of nominal steam flow. A total feedwater flow of 440 gpm at pressures of 1100 psia is sufficient to ensure that adequate feedwater flow is available to remove decay heat and reduce the Reactor Coolant System temperature to less than 350°F where the Residual Heat Removal System may be placed into operation. The surveillance test values ensure that each pump will provide at least 440 gpm plus pump recirculation flow against a steam generator pressure of 1100 psia.

Each motor-driven auxiliary feedwater pump (one Train A and one Train B) supplies flow paths to two steam generators. Each flow path contains an automatic air-operated level control valve (LCV). The LCVs have the same train designation as the associated pump and are provided trained air. The turbine-driven auxiliary feedwater pump supplies flow paths to all four steam generators. Each of these flow paths contains an automatic air-operated LCV, two of

which are designated as Train A, receive A-train air, and provide flow to the same steam generators that are supplied by the B-train motor-driven auxiliary feedwater pump. The remaining two LCVs are designated as Train B, receive B-train air, and provide flow to the same steam generators that are supplied by the A-train motor-driven pump. This design provides the required redundancy to ensure that at least two steam generators receive the necessary flow assuming any single failure. It can be seen from the description provided above that the loss of a single train of air (A or B) will not prevent the auxiliary feedwater system from performing its intended safety function and is no more severe than the loss of a single auxiliary feedwater pump. Therefore, the loss of a single train of auxiliary air only affects the capability of a single motor-driven auxiliary feedwater pump because the turbine-driven pump is still capable of providing flow to two steam generators that are separate from the other motor-driven pump.

Two redundant steam sources are required to be operable to ensure that at least one source is available for the steam-driven auxiliary feedwater (AFW) pump operation following a feedwater or main steam line break. This requirement ensures that the plant remains within its design basis (i.e., AFW to two intact steam generators) given the event of a loss of the No. 1 steam generator because of a main steam line or feedwater line break and a single failure of the B-train motor driven AFW pump. The two redundant sources must be aligned such that No. 1 steam generator source is open and operable and the No. 4 steam generator source is closed and operable.

For instances where one train of emergency raw cooling water (ERCW) is declared inoperable in accordance with technical specifications, the AFW turbine-driven pump is considered operable since it is supplied by both trains of ERCW. Similarly, the AFW turbine-driven pump is considered operable when one train of the AFW loss of power start function is declared inoperable in accordance with technical specifications because both 6.9 kilovolt shutdown board logic trains supply this function. This position is consistent with American National Standards Institute/ANS 58.9 requirements (i.e., postulation of the failure of the opposite train is not required while relying on the TS limiting condition for operation).

## 3/4.7.1.3 CONDENSATE STORAGE TANK

The OPERABILITY of the condensate storage tank with the minimum water volume ensures that sufficient water is available to maintain the RCS at HOT STANDBY conditions for 2 hours with steam discharge to the atmosphere concurrent with total loss of off-site power. The contained water volume limit includes an allowance for water not useable because of tank discharge line location or other physical characteristics.

AMENDMENT NO. 196 FOR SEQUOYAH UNIT NO. 1 - DOCKET NO. 50-327 and
AMENDMENT NO. 187 FOR SEQUOYAH UNIT NO. 2 - DOCKET NO. 50-328
DATED: April 4, 1995

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| Docket Files | |
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| S. Varga | O-14-E-4 |
| J. Zwolinski | |
| G. Hill | T-5-C-3(2 per docket) |
| C. Grimes | O-11-E-22 |
| ACRS(4) | |
| OPA | O-2-G-5 |
| OC/LFDCB | T9-E10 |
| E. Merschoff | RII |
| M. Lesser | RII |

ATTACHMENT TO LICENSE AMENDMENT NO. 196

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. Spillover page* is provided to maintain document completeness.

| REMOVE | INSERT |
|---|---|
| 3/4 7-1 | 3/4 7-1 |
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| 3/4 7-3 | 3/4 7-3 |
| 3/4 7-4 | 3/4 7-4 |
| B3/4 7-1 | B3/4 7-1 |
| B3/4 7-2 | B3/4 7-2 |
| B3/4 7-2a | B3/4 7-2a* |

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## 3/4.7.1 TURBINE CYCLE

### 3/4.7.1.1 SAFETY VALVES

The OPERABILITY of the main steam line code safety valves ensures that the secondary system pressure will be limited to within 110% (1194 psig) of the system design pressure during the most severe anticipated system operational transient. The maximum relieving capacity is associated with a turbine trip from 100% RATED THERMAL POWER coincident with an assumed loss of condenser heat sink (i.e., no steam bypass to the condenser).

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The specified valve lift settings and relieving capacities are in accordance with the requirements of Section III of the ASME Boiler and Pressure Code, 1971 Edition. The total relieving capacity for all valves on all of the steam lines is $1.9 \times 10^7$ lbs/hr at 1170 psig which is 127 percent of the total secondary steam flow of $1.493 \times 10^7$ lbs/hr at 100% RATED THERMAL POWER. A minimum of 2 OPERABLE safety valves per steam generator ensures that sufficient relieving capacity is available for the allowable THERMAL POWER restriction in Table 3.7-1.

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To calculate this setpoint, the governing equation is the relationship $q = m\Delta h$, where q is the heat input from the primary side, m is the steam flow rate and $\Delta h$ is the heat of vaporization at the steam relief pressure (assuming no subcooled feedwater). Thus, an algorithm for use in defining the revised Technical Specification table setpoint values would be:

$$\text{Hi } \phi = (100/Q)\frac{(w_s h_{fg} N)}{K}$$

where:

Hi $\phi$ = Safety Analysis power range high neutron flux setpoint, percent

Q = Nominal NSSS power rating of the plant (including reactor coolant pump heat), Mwt

K = Conversion factor, 947.82 $\frac{(Btu/sec)}{Mwt}$

$w_s$ = Minimum total steam flow rate capability of the operable MSSVs on any one steam generator at the highest MSSV opening pressure including tolerance and accumulation, as appropriate, in lb/sec. For example, if the maximum number of inoperable MSSVs on any one steam generator is one, then $w_s$ should be a summation of the capacity of the operable MSSVs at the highest operable MSSV operating pressure, excluding the highest capacity MSSV. If the maximum number of inoperable MSSVs per steam generator is three then $w_s$ should be a summation of the capacity of the operable MSSVs at the highest operable MSSV operating pressure, excluding the three highest capacity MSSVs.

$h_{fg}$ = heat of vaporization for steam at the highest MSSV opening pressure including tolerance and accumulation, as appropriate, Btu/lbm

N = Number of loops in plant

The values calculated from this algorithm must then be adjusted lower to account for instrument and channel uncertainties.

3/4.7.1.2 AUXILIARY FEEDWATER SYSTEM

The OPERABILITY of the auxiliary feedwater system ensures that the Reactor Coolant System can be cooled down to less than 350°F from normal operating conditions in the event of a total loss of off-site power.

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Each motor-driven auxiliary feedwater pump (one Train A and one Train B) supplies flow paths to two steam generators. Each flow path contains an automatic air-operated level control valve (LCV). The LCVs have the same train designation as the associated pump and are provided trained air. The turbine-driven auxiliary feedwater pump supplies flow paths to all four steam generators. Each of these flow paths contains an automatic air-operated LCV, two of

which are designated as Train A, receive A-train air, and provide flow to the same steam generators that are supplied by the B-train motor-driven auxiliary feedwater pump. The remaining two LCVs are designated as Train B, receive B-train air, and provide flow to the same steam generators that are supplied by the A-train motor-driven pump. This design provides the required redundancy to ensure that at least two steam generators receive the necessary flow assuming any single failure. It can be seen from the description provided above that the loss of a single train of air (A or B) will not prevent the auxiliary feedwater system from performing its intended safety function and is no more severe than the loss of a single auxiliary feedwater pump. Therefore, the loss of a single train of auxiliary air only affects the capability of a single motor-driven auxiliary feedwater pump because the turbine-driven pump is still capable of providing flow to two steam generators that are separate from the other motor-driven pump.

Two redundant steam sources are required to be operable to ensure that at least one source is available for the steam-driven auxiliary feedwater (AFW) pump operation following a feedwater or main steam line break. This requirement ensures that the plant remains within its design basis (i.e., AFW to two intact steam generators) given the event of a loss of the No. 1 steam generator because of a main steam line or feedwater line break and a single failure of the B-train motor driven AFW pump. The two redundant sources must be aligned such that No. 1 steam generator source is open and operable and the No. 4 steam generator source is closed and operable.

For instances where one train of emergency raw cooling water (ERCW) is declared inoperable in accordance with technical specifications, the AFW turbine-driven pump is considered operable since it is supplied by both trains of ERCW. Similarly, the AFW turbine-driven pump is considered operable when one train of the AFW loss of power start function is declared inoperable in accordance with technical specifications because both 6.9 kilovolt shutdown board logic trains supply this function. This position is consistent with American National Standards Institute/ANS 58.9 requirements (i.e., postulation of the failure of the opposite train is not required while relying on the TS limiting condition for operation).

## 3/4.7.1.3 CONDENSATE STORAGE TANK

The OPERABILITY of the condensate storage tank with the minimum water volume ensures that sufficient water is available to maintain the RCS at HOT STANDBY conditions for 2 hours with steam discharge to the atmosphere concurrent with total loss of off-site power. The contained water volume limit includes an allowance for water not useable because of tank discharge line location or other physical characteristics.

## 3/4.7 PLANT SYSTEMS

### 3/4.7.1 TURBINE CYCLE

### SAFETY VALVES

#### LIMITING CONDITION FOR OPERATION

3.7.1.1 Main steam safety valves (MSSVs) shall be OPERABLE with lift settings as specified in Table 3.7-2.

APPLICABILITY: MODES 1, 2 and 3.*

ACTION:

a. With one or more MSSVs inoperable, operation may proceed provided, that within 4 hours, either the inoperable valve is restored to OPERABLE status or the Power Range Neutron Flux High Setpoint trip is reduced per Table 3.7-1. The provisions of Specification 3.0.4 are not applicable.

b. With the requirements of ACTION a., not met or with one or more steam generators with less than two MSSVs OPERABLE be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN in the following 6 hours.

#### SURVEILLANCE REQUIREMENTS

4.7.1.1 No additional Surveillance Requirements other than those required by Specification 4.0.5.

*With the reactor trip system breakers in the closed position.

TABLE 3.7-1

MAXIMUM ALLOWABLE POWER RANGE NEUTRON FLUX HIGH SETPOINT WITH INOPERABLE STEAM LINE SAFETY VALVES

| Maximum Number of Inoperable Safety Valves on Any Operating Steam Generator | Maximum Allowable Power Range Neutron Flux High Setpoint (Percent of RATED THERMAL POWER) |
|---|---|
| 1 | 63 |
| 2 | 45 |
| 3 | 28 |

TABLE 3.7-2

STEAM LINE SAFETY VALVES PER LOOP

| VALVE NUMBER | | | | LIFT SETTING (± 1%)* | NOZZLE SIZE |
|---|---|---|---|---|---|
| Loop 1 | Loop 2 | Loop 3 | Loop 4 | | |
| 1-1-522 | 1-1-517 | 1-1-512 | 1-1-527 | 1064 psig | 16 sq. in. |
| 1-1-523 | 1-1-518 | 1-1-513 | 1-1-528 | 1077 psig | 16 sq. in. |
| 1-1-524 | 1-1-519 | 1-1-514 | 1-1-529 | 1090 psig | 16 sq. in. |
| 1-1-525 | 1-1-520 | 1-1-515 | 1-1-530 | 1103 psig | 16 sq. in. |
| 1-1-526 | 1-1-521 | 1-1-516 | 1-1-531 | 1117 psig | 16 sq. in. |

*The lift setting pressure shall correspond to ambient conditions of the valve at nominal operating temperature and pressure.

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. 187
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 December 16, 1994, and supplemented February 10, 1995, 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.

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 196 TO FACILITY OPERATING LICENSE NO. DPR-77

AND AMENDMENT NO. 187 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 December 16, 1994, which was supplemented by letter dated February 10, 1995, the Tennessee Valley Authority (the licensee) proposed an amendment to the Technical Specifications (TS) for Sequoyah Nuclear Plant (SQN) Units 1 and 2. The requested changes would reduce the maximum allowed power levels and more clearly specify the plant conditions allowed by the TS for operation with one or more main steam safety valves (MSSVs) inoperable. This would be accomplished by lowering the maximum allowable power range neutron flux setpoints corresponding to the number of inoperable MSSVs. In addition, the Bases would be revised to reflect these changes and incorporate the revised methodology used to establish the neutron flux setpoints.

## 2.0 EVALUATION

The MSSVs are located in the steam line between the outlet of the steam generators and the main steam isolation valves. There are five MSSVs per steam generator with a combined capacity, according to the SQN Final Safety Analysis Report, corresponding to the calculated flow capacity of one steam generator. Their purpose is to provide emergency pressure relief for the steam generators in the event that steam generation exceeds steam consumption. They provide 100 percent relieving capacity to ensure that the system pressure in the associated steam generator will be limited to 110 percent of the main steam system design pressure during the most severe anticipated system operational transients.

Westinghouse Electric Corporation has identified a potential problem with the allowable rated thermal power (RTP) levels when one or more of the MSSVs are inoperable. In Nuclear Safety Advisory Letter 94-001 dated January 20, 1994, Westinghouse reported their determination that the relationship between the available MSSV relief capacity and allowable RTP level may not be linear under all plant conditions. Because the current TS assumes linearity, Westinghouse has recommended that either the plant specific loss-of-load turbine trip transient be reanalyzed to determine the maximum allowable power levels (which may validate RTP levels in the current TS), or the TS be revised to reduce the

ENCLOSURE 3

maximum power levels allowed with inoperable MSSVs to a level below the heat removal capability of the operable MSSVs. Westinghouse supplied a calculational method for determining this power level using site-specific information. SQN has chosen the latter approach.

To ensure that the secondary side pressures do not exceed 110 percent of the system design pressure during the most severe anticipated transient, the licensee has proposed new values in TS Table 3.7-1 that will specify power levels that are calculated to be below the heat removal capability of the remaining operable MSSVs. For example, if one MSSV is inoperable for one steam generator, the relief capacity of that steam generator has been reduced. To maintain the ability of the remaining MSSVs to protect the main steam system from overpressure, the energy transfer to that steam generator must be reduced by the same amount. This is accomplished by reducing the thermal power trip setpoint, which has the conservative effect of limiting the energy transfer to all steam generators to a value equal to the relief capacity of the steam generator with the inoperable MSSV. A proposed change to TS Bases 3/4.7.1.1 would reflect the calculation method recommended by Westinghouse to determine the maximum power level. This method, with adjustments for plant-specific instrumentation and channel uncertainties, has been used by SQN to determine the new maximum allowable power range neutron flux high setpoints (percent of rated thermal power) in Table 3.7-1 for operation with one, two, or three inoperable MSSVs on any operating steam generator. As a result, the setpoints have been reduced from 87, 65, and 43 percent to 63, 45, and 28 percent for operation with one, two, and three inoperable MSSVs respectively. Exceeding these setpoints will cause a reactor trip.

The staff has found that the revised method of determining the maximum power level setpoints ensures that operation with inoperable MSSVs will be below the heat-removing capability of the operable MSSVs. This will ensure that the secondary system steam pressure will not exceed 100 percent of its design valve. In addition, the new setpoints are more conservative than the existing setpoints. Therefore, the staff finds the proposed changes to TS Table 3.7-1 and the Bases changes that describe this method acceptable.

The licensee has also proposed combining the action statements in TS 3.7.1.1.a and TS 3.7.1.1.b. TS 3.7.1.1.a allows 4-loop operation in Modes 1, 2, or 3 with one or more MSSVs inoperable provided that the neutron high flux setpoint is reduced per Table 3.7-1 within 4 hours. Otherwise, the unit must be placed in hot standby within the next 6 hours and in cold shutdown in the following 30 hours. TS 3.7.1.1.b allows 3-loop operation in Mode 3 with one or more MSSVs inoperable in the operable loop, with the same restrictions. However, TS 3.4.1 already requires that all reactor coolant loops be in operation for Modes 1 and 2, or the unit be in at least hot standby (Mode 3) within 1 hour. The purpose of the proposed change, then, is to simplify the specifications by eliminating this conflict and separating the reactor coolant loop operating requirements and the MSSV requirements. The proposed change would allow operation with one or more MSSVs inoperable for 4 hours provided that the neutron flux high setpoint is reduced per Table 3.7-1. If this cannot be accomplished, or if one or more steam generators have less than two MSSVs operable, the unit must be in hot standby within the next 6 hours and in hot shutdown in the following 6 hours. These, and the administrative changes

proposed by the licensee to TS 3.7.1.1, are consistent with NUREG-1431, Westinghouse Standard Technical Specifications. The staff has reviewed the proposed changes and finds them acceptable.

The licensee has also proposed removal of the present Table 3.7-2, "Maximum Allowable Power Range Neutron Flux High Setpoint with Inoperable Steam Line Safety Valves During 3 Loop Operation." The table specifies that for 1, 2, and 3 inoperable MSSVs on any operating steam generator, the power level setpoints must be less than 60, 45, and 30 percent. However, as pointed out above, TS 3.4.1 already requires that all 4 reactor coolant loops be in operation for Modes 1 and 2, or the unit be in at least hot standby (Mode 3) within 1 hour. Therefore, 3-loop operation is severely limited, making it unnecessary to specify a maximum power level if MSSVs are inoperable when the unit would be required to be in Mode 3 within 1 hour. In addition, the licensee has proposed changing the title of Table 3.7-1 to remove its applicability to 4-loop operation. As a result, the maximum power level setpoints specified for the number of inoperable MSSVs will be applicable for 3- (as well as 4-) loop operation. The proposed change is, therefore, acceptable. As a result of this change, the existing Table 3.7-3 (TS page 3/4 7-4) will be redesignated Table 3.7-2 (page 3/4 7-3).

The licensee has proposed administrative and Bases changes corresponding to these changes. The staff finds them acceptable.

The supplemental information supplied by letter dated February 10, 1995, proposed modifying the original submittal regarding TS 3.7.1.1. This proposed TS change would add an asterisk to Mode 3 Applicability that would reference a note that would state: "With the reactor trip system breakers in the closed position." As a result, when in Mode 3 with inoperable MSSVs, the maximum high neutron flux setpoints would be limited to the values shown in Table 3.7-2 only when the reactor trip breakers (RTBs) are closed. The staff finds this change acceptable since it is the purpose of the high flux trip to open the RTBs if the setpoint is reached. Therefore, reducing the trip setpoint with the RTBs already open (as they would be under certain conditions in Mode 3), provides no safety benefit.

## 3.0 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.

## 4.0 ENVIRONMENTAL CONSIDERATION

The amendment changes a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. 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 amendment involves no significant hazards consideration, and there has been no

public comment on such finding (60 FR 11140). 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 amendment.

## 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 amendment will not be inimical to the common defense and security or to the health and safety of the public.

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Dated: April 4, 1995

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