



UNITED STATES
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

November 2, 2000

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

SUBJECT: SEQUOYAH NUCLEAR PLANT, UNITS 1 AND 2 - ISSUANCE OF
AMENDMENTS REGARDING CHARCOAL FILTER TESTING
(TAC NOS. MA7386 AND MA7387) (TSC 99-02)

Dear Mr. Scalice:

The Commission has issued the enclosed Amendment No. 263 to Facility Operating License No. DPR-77 and Amendment No. 254 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 November 24, 1999, as supplemented on September 21, 2000.

These amendments revise the Technical Specifications to update the industry standard that is used to test the charcoal adsorber efficiency in safety-related ventilation systems.

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

Sincerely,

Ronald W. Hernan, Senior 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. 263 to License No. DPR-77
 2. Amendment No. 254 to License No. DPR-79
 3. Safety Evaluation

cc w/enclosures: See next page

NRR-058

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6A Lookout Place
1101 Market Street
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These amendments revise the Technical Specifications to update the industry standard that is used to test the charcoal adsorber efficiency in safety-related ventilation systems.

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/RA/

Ronald W. Hernan, Senior 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. 263 to
License No. DPR-77
2. Amendment No. 254 to
License No. DPR-79
3. Safety Evaluation

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cc w/enclosures: See next page

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DATE	10/6/00	10/11/00	10/18/00	11/2/00	11/2/00

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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. 263
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 November 24, 1999, as supplemented on September 21, 2000, 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. 263, 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 and shall be implemented within 45 days from the date of 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: ~~November~~ **November 2, 2000**

ATTACHMENT TO LICENSE AMENDMENT NO. 263

FACILITY OPERATING LICENSE NO. DPR-77

DOCKET NO. 50-327

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

REMOVE

INSERT

3/4 6-13
3/4 6-14
3/4 7-18
3/4 7-19
3/4 7-20
3/4 9-12
3/4 9-13

3/4 6-13
3/4 6-14
3/4 7-18
3/4 7-19
3/4 7-20
3/4 9-12
3/4 9-13

CONTAINMENT SYSTEMS

EMERGENCY GAS TREATMENT SYSTEM - EGTS - CLEANUP SUBSYSTEM

LIMITING CONDITION FOR OPERATION

3.6.1.8 Two independent emergency gas treatment system cleanup subsystems (EGTS) shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

With one EGTS cleanup subsystem inoperable, restore the inoperable subsystem to OPERABLE status within 7 days or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS

4.6.1.8 Each EGTS cleanup subsystem shall be demonstrated OPERABLE:

- a. At least once per 31 days on a STAGGERED TEST BASIS by initiating, from the control room, flow through the HEPA filters and charcoal adsorbers and verifying that the system operates for at least 10 hours with the heaters on.
- b. At least once per 18 months or (1) after any structural maintenance on the HEPA filter or charcoal adsorber housings, or (2) following painting, fire or chemical release in any ventilation zone communicating with the system by:
 1. Verifying that the cleanup system satisfies the in-place testing acceptance criteria and uses the test procedures of Regulatory Position C.5.a., C.5.c and C.5.d of Regulatory Guide 1.52, Revision 2, March 1978 (except for the provisions of ANSI N510 Sections 8 and 9), and the system flow rate is 4000 cfm \pm 10%.
 2. Verifying within 31 days after removal that a laboratory analysis of a representative carbon sample obtained in accordance with Regulatory Position C.6.b of Regulatory Guide 1.52, Revision 2, March 1978, shows the methyl iodide penetration less than 2.5% when tested in accordance with ATSM D3803-1989 at a temperature of 30°C (86°F) and a relative humidity of 70%.
 3. Verifying a system flow rate of 4000 cfm \pm 10% during system operation when tested in accordance with ANSI N510-1975.

CONTAINMENT SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

- c. After every 720 hours of charcoal adsorber operation by verifying within 31 days after removal that a laboratory analysis of representative carbon sample obtained in accordance with Regulatory Position C.6.b of Regulatory Guide 1.52, Revision 2, March 1978, shows the methyl iodide penetration less than 2.5% when tested in accordance with ATSM D3803-1989 at a temperature of 30°C (86°F) and a relative humidity of 70%.
- d. At least once per 18 months by:
1. Verifying that the pressure drop across the combined HEPA filters and charcoal adsorber banks is less than 5 inches Water Gauge while operating the filter train at a flow rate of 4000 cfm \pm 10%. | R92
 2. Verifying that the filter train starts on a Phase A containment isolation Test Signal.
 3. Verify the operation of the filter cooling bypass valves.
 4. Verifying that each system produces a negative pressure of greater than or equal to 0.5 inches W. G. in the annulus within 1 minute after a start signal. | R107 | R25
- e. After each complete or partial replacement of a HEPA filter bank by verifying that the HEPA filter banks remove greater than or equal to 99.95% of the DOP when they are tested in-place in accordance with ANSI N510-1975 while operating the system at a flow rate of 4000 cfm \pm 10%.
- f. After each complete or partial replacement of a charcoal adsorber bank by verifying that the charcoal adsorbers remove greater than or equal to 99.95% of a halogenated hydrocarbon refrigerant test gas when they are tested in-place in accordance with ANSI N510-1975 while operating the system at a flow rate of 4000 cfm \pm 10%.

PLANT SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

1. Verifying that the cleanup system satisfies the in-place testing acceptance criteria and uses the test procedures of Regulatory Positions C.5.a, C.5.c and C.5.d of Regulatory Guide 1.52, Revision 2, March 1978 (except for the provisions of ANSI N510 Sections 8 and 9), and the system flow rate is 4000 cfm \pm 10%.
2. Verifying within 31 days after removal that a laboratory analysis of a representative carbon sample obtained in accordance with Regulatory Position C.6.b of Regulatory Guide 1.52, Revision 2, March 1978, shows the methyl iodide penetration less than 2.5% when tested in accordance with ATSM D3803-1989 at a temperature of 30°C (86°F) and a relative humidity of 70%.
3. Verifying a system flow rate of 4000 cfm \pm 10% during system operation when tested in accordance with ANSI N510-1975.
- d. After every 720 hours of charcoal adsorber operation by verifying within 31 days after removal that a laboratory analysis of representative carbon sample obtained in accordance with Regulatory Position C.6.b of Regulatory Guide 1.52, Revision 2, March 1978, shows the methyl iodide penetration less than 2.5% when tested in accordance with ATSM D3803-1989 at a temperature of 30°C (86°F) and a relative humidity of 70%.
- e. At least once per 18 months by:
 1. Verifying that the pressure drop across the combined HEPA filters and charcoal adsorber banks is less than 3 inches Water Gauge while operating the system at a flow rate of 4000 cfm \pm 10%. R92
 2. Verifying that on a safety injection signal or a high radiation signal from the air intake stream, the system automatically diverts its inlet flow through the HEPA filters and charcoal adsorber banks.
 3. Verifying that the system maintains the control room at a positive pressure of greater than or equal to 1/8 inch Water Gauge relative to the outside atmosphere at a system flow rate of 4000 cfm \pm 10% (\geq 3000 cfm recirculation and \leq 1000 cfm fresh air). R72
- f. After each complete or partial replacement of a HEPA filter bank by verifying that the HEPA filter banks remove greater than or equal to 99.95% of the DOP when they are tested in-place in accordance with ANSI N510-1975 while operating the system at a flow rate of 4000 cfm \pm 10%.
- g. After each complete or partial replacement of a charcoal adsorber bank by verifying that the charcoal adsorbers remove greater than or equal to 99.95% of a halogenated hydrocarbon refrigerant test gas when they are tested in-place in accordance with ANSI N510-1975 while operating the system at a flow rate of 4000 cfm \pm 10%.

PLANT SYSTEMS

3/4.7.8 AUXILIARY BUILDING GAS TREATMENT SYSTEM

LIMITING CONDITION FOR OPERATION

3.7.8 Two independent auxiliary building gas treatment filter trains shall be OPERABLE.

R16

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

With one auxiliary building gas treatment filter train inoperable, restore the inoperable train to OPERABLE status within 7 days or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS

4.7.8 Each auxiliary building gas treatment filter train shall be demonstrated OPERABLE:

R16

- a. At least once per 31 days on a STAGGERED TEST BASIS by initiating, from the control room, flow through the HEPA filter and charcoal adsorber train and verifying that the system operates for at least 10 hours with the heaters on.
- b. At least once per 18 months or (1) after any structural maintenance on the HEPA filter or charcoal adsorber housings, or (2) following painting, fire or chemical release in any ventilation zone communicating with the system by:
 1. Verifying that the cleanup system satisfies the in-place testing acceptance criteria and uses the test procedures of Regulatory Positions C.5.a, C.5.c and C.5.d of Regulatory Guide 1.52, Revision 2, March 1978 (except for the provisions of ANSI N510 Sections 8 and 9), and the system flow rate is 9000 cfm \pm 10%.
 2. Verifying within 31 days after removal that a laboratory analysis of a representative carbon sample obtained in accordance with Regulatory Position C.6.b of Regulatory Guide 1.52, Revision 2, March 1978, shows the methyl iodide penetration less than 2.5% when tested in accordance with ATSM D3803-1989 at a temperature of 30°C (86°F) and a relative humidity of 70%.
 3. Verifying a system flow rate of 9000 cfm \pm 10% during system operation when tested in accordance with ANSI N510-1975.

PLANT SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

- c. After every 720 hours of charcoal adsorber operation by verifying within 31 days after removal that a laboratory analysis of representative carbon sample obtained in accordance with Regulatory Position C.6.b of Regulatory Guide 1.52, Revision 2, March 1978, shows the methyl iodide penetration less than 2.5% when tested in accordance with ATSM D3803-1989 at a temperature of 30°C (86°F) and a relative humidity of 70%.
- d. At least once per 18 months by:
1. Verifying that the pressure drop across the combined HEPA filters and charcoal adsorber banks is less than 3 inches Water Gauge while operating the filter train at a flow rate of 9000 cfm \pm 10%. R92
 2. Verifying that the filter trains start on a Containment Phase A Isolation test signal. R126
 3. Verifying that the system maintains the spent fuel storage area and the ESF pump rooms at a pressure equal to or more negative than minus 1/4 inch water gage relative the outside atmosphere while maintaining a vacuum relief flow greater than 2000 cfm and a total system flow of 9000 cfm \pm 10%.
 4. Verifying that the heaters dissipate 32 \pm 3.2 kw when tested in accordance with ANSI N510-1975. R107
- e. After each complete or partial replacement of a HEPA filter bank by verifying that the HEPA filter banks remove greater than or equal to 99.95% of the DOP when they are tested in-place in accordance with ANSI N510-1975 while operating the system at a flow rate of 9000 cfm \pm 10%.
- f. After each complete or partial replacement of a charcoal adsorber bank by verifying that the charcoal adsorbers remove greater than or equal to 99.95% of a halogenated hydrocarbon refrigerant test gas when they are tested in-place in accordance with ANSI N510-1975 while operating the system at a flow rate of 9000 cfm \pm 10%.

REFUELING OPERATIONS

3/4.9.12 AUXILIARY BUILDING GAS TREATMENT SYSTEM

LIMITING CONDITION FOR OPERATION

3.9.12 One auxiliary building gas treatment filter train shall be OPERABLE.

APPLICABILITY: Whenever irradiated fuel is in the storage pool.

ACTION:

- a. With no auxiliary building gas treatment filter train OPERABLE, suspend all operations involving movement of fuel within the spent fuel pit or crane operation with loads over the spent fuel pit until at least one auxiliary building gas treatment filter train is restored to OPERABLE status.
- b. The provisions of Specifications 3.0.3 and 3.0.4 are not applicable.

SURVEILLANCE REQUIREMENTS

4.9.12 The above required auxiliary buildings gas treatment filter train shall be demonstrated OPERABLE:

- a. At least once per 31 days on a STAGGERED TEST BASIS by initiating, from the control room, flow through the HEPA filters and charcoal adsorbers and verifying that the system operates for at least 10 hours with the heaters on.
- b. At least once per 18 months or (1) after any structural maintenance on the HEPA filter or charcoal adsorber housings, or (2) following painting, fire or chemical release in any ventilation zone communicating with the system by:
 1. Verifying that the cleanup system satisfies the in-place testing acceptance criteria and uses the test procedures of Regulatory Positions C.5.a, C.5.c and C.5.d of Regulatory Guide 1.52, Revision 2, March 1978 (except for the provisions of ANSI N510 Sections 8 and 9), and the system flow rate is 9000 cfm \pm 10%.
 2. Verifying within 31 days after removal that a laboratory analysis of a representative carbon sample obtained in accordance with Regulatory Position C.6.b of Regulatory Guide 1.52, Revision 2, March 1978, shows the methyl iodide penetration less than 2.5% when tested in accordance with ATSM D3803-1989 at a temperature of 30°C (86°F) and a relative humidity of 70%.
 3. Verifying a system flow rate of 9000 cfm \pm 10% during system operations when tested in accordance with ANSI N510-1975.

SURVEILLANCE REQUIREMENTS (Continued)

- c. After every 720 hours of charcoal adsorber operation by verifying within 31 days after removal that a laboratory analysis of representative carbon sample obtained in accordance with Regulatory Position C.6.b of Regulatory Guide 1.52, Revision 2, March 1978, shows the methyl iodide penetration less than 2.5% when tested in accordance with ATSM D3803-1989 at a temperature of 30°C (86°F) and a relative humidity of 70%.

- d. At least once per 18 months by:
 - 1. Verifying that the pressure drop across the combined HEPA filters and charcoal adsorber banks is less than 3 inches Water Gauge while operating the filter train at a flow rate of 9000 cfm \pm 10%. | R92

 - 2. Verifying that the filter train starts on a high radiation signal from the fuel pool radiation monitoring system. | R126

 - 3. Verifying that the heaters dissipate 32 ± 3.2 kw when tested in accordance with ANSI N510-1975.

- e. After each complete or partial replacement of a HEPA filter bank by verifying that the HEPA filter banks remove greater than or equal to 99.95% of the DOP when they are tested in-place in accordance with ANSI N510-1975 while operating the system at a flow rate of 9000 cfm \pm 10%.

- f. After each complete or partial replacement of a charcoal adsorber bank by verifying that the charcoal adsorbers remove greater than or equal to 99.95% of a halogenated hydrocarbon refrigerant test gas when they are tested in-place in accordance with ANSI N510-1975 while operating the system at a flow rate of 9000 cfm \pm 10%.



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. 254
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 November 24, 1999, as supplemented on September 21, 2000, 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. 254 , 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 and shall be implemented within 45 days from the date of 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: ~~November~~ 2, 2000

ATTACHMENT TO LICENSE AMENDMENT NO. 254

FACILITY OPERATING LICENSE NO. DPR-79

DOCKET NO. 50-328

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

REMOVE

INSERT

3/4 6-13
3/4 6-14
3/4 7-18
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3/4 9-14
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3/4 7-18
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3/4 9-14
3/4 9-15

CONTAINMENT SYSTEMS

EMERGENCY GAS TREATMENT SYSTEM - EGTS - CLEANUP SUBSYSTEM

LIMITING CONDITION FOR OPERATION

3.6.1.8 Two independent emergency gas treatment system cleanup subsystems (EGTS) shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

With one EGTS cleanup subsystem inoperable, restore the inoperable subsystem to OPERABLE status within 7 days or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS

4.6.1.8 Each EGTS cleanup subsystem shall be demonstrated OPERABLE:

- a. At least once per 31 days on a STAGGERED TEST BASIS by initiating, from the control room, flow through the HEPA filters and charcoal adsorbers and verifying that the system operates for at least 10 hours with the heaters on.
- b. At least once per 18 months or (1) after any structural maintenance on the HEPA filter or charcoal adsorber housings, or (2) following painting, fire or chemical release in any ventilation zone communicating with the system by:
 1. Verifying that the cleanup system satisfies the in-place testing acceptance criteria and uses the test procedures of Regulatory Position C.5.a., C.5.c and C.5.d of Regulatory Guide 1.52, Revision 2, March 1978 (except for the provisions of ANSI N510 Sections 8 and 9), and the system flow rate is 4000 cfm + 10%.
 2. Verifying within 31 days after removal that a laboratory analysis of a representative carbon sample obtained in accordance with Regulatory Position C.6.b of Regulatory Guide 1.52 Revision 2, March 1978, shows the methyl iodide penetration less than 2.5% when tested in accordance with ATSM D3803-1989 at a temperature of 30°C (86°F) and a relative humidity of 70%.
 3. Verifying a system flow rate of 4000 cfm + 10% during system operation when tested in accordance with ANSI N510-1975.

CONTAINMENT SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

- c. After every 720 hours of charcoal adsorber operation by verifying within 31 days after removal that a laboratory analysis of representative carbon sample obtained in accordance with Regulatory Position C.6.b of Regulatory Guide 1.52. Revision 2, March 1978, shows the methyl iodide penetration less than 2.5% when tested in accordance with ATSM D3803-1989 at a temperature of 30°C (86°F) and a relative humidity of 70%.
- d. At least once per 18 months by:
1. Verifying that the pressure drop across the combined HEPA filters and charcoal adsorber banks is less than 5 inches Water Gauge while operating the filter train at a flow rate of 4000 cfm + 10%. R77
 2. Verifying that the filter train starts on a Phase A containment isolation Test Signal.
 3. Verify the operation of the filter cooling bypass valves. R92
 4. Verifying that each system produces a negative pressure of greater than or equal to 0.5 inches W.G. in the annulus within 1 minute after a start signal. R11
- e. After each complete or partial replacement of a HEPA filter bank by verifying that the HEPA filter banks remove greater than or equal to 99.95% of the DOP when they are tested in-place in accordance with ANSI N510-1975 while operating the system at a flow rate of 4000 cfm + 10%.
- f. After each complete or partial replacement of a charcoal adsorber bank by verifying that the charcoal adsorbers remove greater than or equal to 99.95% of a halogenated hydrocarbon refrigerant test gas when they are tested in-place in accordance with ANSI N510-1975 while operating the system at a flow rate of 4000 cfm + 10%.

PLANT SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

1. Verifying that the cleanup system satisfies the in-place testing acceptance criteria and uses the test procedures of Regulatory Positions C.5.a, C.5.c and C.5.d of Regulatory Guide 1.52, Revision 2, March 1978 (except for the provisions of ANSI N510 Sections 8 and 9), and the system flow rate is 4000 cfm \pm 10%.
2. Verifying, within 31 days after removal, that a laboratory analysis of a representative carbon sample obtained in accordance with Regulatory Position C.6.b of Regulatory Guide 1.52, Revision 2, March 1978, shows the methyl iodide penetration less than 2.5% when tested in accordance with ATSM D3803-1989 at a temperature of 30°C (86°F) and a relative humidity of 70%.
3. Verifying a system flow rate of 4000 cfm \pm 10% during system operation when tested in accordance with ANSI N510-1975.
- d. After every 720 hours of charcoal adsorber operation by verifying within 31 days after removal, that a laboratory analysis of a representative carbon sample obtained in accordance with Regulatory Position C.6.b of Regulatory Guide 1.52, Revision 2, March 1978, shows the methyl iodide penetration less than 2.5% when tested in accordance with ATSM D3803-1989 at a temperature of 30°C (86°F) and a relative humidity of 70%.
- e. At least once per 18 months by:
 1. Verifying that the pressure drop across the combined HEPA filters and charcoal adsorber banks is less than 3 inches Water Gauge while operating the system at a flow rate of 4000 cfm \pm 10%. R77
 2. Verifying that on a safety injection signal or high radiation signal from the air intake stream, the system automatically diverts its inlet flow through the HEPA filters and charcoal adsorber banks.
 3. Verifying that the system maintains the control room at a positive pressure of greater than or equal to 1/8 inch Water Gauge relative to the outside atmosphere at a system flow rate of 4000 cfm \pm 10% (\geq 3000 cfm recirculation and \leq 1000 cfm fresh air). R60
- f. After each complete or partial replacement of a HEPA filter bank by verifying that the HEPA filter banks remove greater than or equal to 99.95% of the DOP when they are tested in-place in accordance with ANSI N510-1975 while operating the system at a flow rate of 4000 cfm \pm 10%.
- g. After each complete or partial replacement of a charcoal adsorber bank by verifying that the charcoal adsorbers remove greater than or equal to 99.95% of a halogenated hydrocarbon refrigerant test gas when they are tested in-place in accordance with ANSI N510-1975 while operating the system at a flow rate of 4000 cfm \pm 10%.

PLANT SYSTEMS

3/4.7.8 AUXILIARY BUILDING GAS TREATMENT SYSTEM

LIMITING CONDITION FOR OPERATION

3.7.8 Two independent auxiliary building gas treatment filter trains shall be OPERABLE.

APPLICABILITY: Modes 1, 2, 3 and 4.

ACTION:

With one auxiliary building gas treatment filter train inoperable, restore the inoperable train to OPERABLE status within 7 days or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS

4.7.8 Each auxiliary building gas treatment filter train shall be demonstrated OPERABLE:

- a. At least once per 31 days on a STAGGERED TEST BASIS by initiating, from the control room, flow through the HEPA filter and charcoal adsorber train and verifying that the system operates for at least 10 hours with the heaters on.
- b. At least once per 18 months or (1) after any structural maintenance on the HEPA filter or charcoal adsorber housings, or (2) following painting, fire or chemical release in any ventilation zone communicating with the system by:
 1. Verifying that the cleanup system satisfies the in-place testing acceptance criteria and uses the test procedures of Regulatory Positions C.5.a, C.5.c and C.5.d of Regulatory Guide 1.52, Revision 2, March 1978 (except for the provisions of ANSI N510 Sections 8 and 9), and the system flow rate is 9000 cfm \pm 10%.
 2. Verifying within 31 days after removal that a laboratory analysis of a representative carbon sample obtained in accordance with Regulatory Position C.6.b of Regulatory Guide 1.52, Revision 2, March 1978, shows the methyl iodide penetration less than 2.5% when tested in accordance with ATSM D3803-1989 at a temperature of 30°C (86°F) and a relative humidity of 70%.
 3. Verifying a system flow rate of 9000 cfm \pm 10% during system operation when tested in accordance with ANSI N510-1975.

PLANT SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

- c. After every 720 hours of charcoal adsorber operation by verifying within 31 days after removal that a laboratory analysis of representative carbon sample obtained in accordance with Regulatory Position C.6.b of Regulatory Guide 1.52, Revision 2, March 1978, shows the methyl iodide penetration less than 2.5% when tested in accordance with ATSM D3803-1989 at a temperature of 30°C (86°F) and a relative humidity of 70%.
- d. At least once per 18 months by:
1. Verifying that the pressure drop across the combined HEPA filters and charcoal adsorber banks is less than 3 inches Water Gauge while operating the filter train at a flow rate of 9000 cfm \pm 10%. | R77
 2. Verifying that the filter trains start on a Containment Phase A Isolation test signal. | R111
 3. Verifying that the system maintains the spent fuel storage area and the ESF pump rooms at a pressure equal to or more negative than minus 1/4 inch water gauge relative the outside atmosphere while maintaining a vacuum relief flow greater than 2000 cfm and a total system flow of 9000 cfm \pm 10%.
 4. Verifying that the heaters dissipate 32 \pm 3.2 kw when tested in accordance with ANSI N510-1975.
- e. After each complete or partial replacement of a HEPA filter bank by verifying that the HEPA filter banks remove greater than or equal to 99.95% of the DOP when they are tested in-place in accordance with ANSI N510-1975 while operating the system at a flow rate of 9000 cfm \pm 10%.
- f. After each complete or partial replacement of a charcoal adsorber bank by verifying that the charcoal adsorbers remove greater than or equal to 99.95% of a halogenated hydrocarbon refrigerant test gas when they are tested in-place in accordance with ANSI N510-1975 while operating the system at a flow rate of 9000 cfm \pm 10%.

REFUELING OPERATIONS

3/4.9.12 AUXILIARY BUILDING GAS TREATMENT SYSTEM

LIMITING CONDITION FOR OPERATION

3.9.12 One auxiliary building gas treatment filter train shall be OPERABLE.

APPLICABILITY: Whenever irradiated fuel is in the storage pool.

ACTION:

- a. With no auxiliary building gas treatment filter train OPERABLE, suspend all operations involving movement of fuel within the spent fuel pit or crane operation with loads over the spent fuel pit until at least one auxiliary building gas treatment filter train is restored to OPERABLE status.
- b. The provisions of Specifications 3.0.3 and 3.0.4 are not applicable.

SURVEILLANCE REQUIREMENTS

4.9.12 The above required auxiliary building gas treatment filter train shall be demonstrated OPERABLE:

- a. At least once per 31 days on a STAGGERED TEST BASIS by initiating, from the control room, flow through the HEPA filters and charcoal adsorbers and verifying that the system operates for at least 10 hours with the heaters on.
- b. At least once per 18 months or (1) after any structural maintenance on the HEPA filter or charcoal adsorber housings, or (2) following painting, fire or chemical release in any ventilation zone communicating with the system by:
 1. Verifying that the cleanup system satisfies the in-place testing acceptance criteria and uses the test procedures of Regulatory Positions C.5.a, C.5.c and C.5.d of Regulatory Guide 1.52, Revision 2, March 1978 (except for the provisions of ANSI N510 Sections 8 and 9), and the system flow rate is $9000 \text{ cfm} \pm 10\%$.
 2. Verifying within 31 days after removal that a laboratory analysis of a representative carbon sample obtained in accordance with Regulatory Position C.6.b of Regulatory Guide 1.52, Revision 2, March 1978, shows the methyl iodide penetration less than 2.5% when tested in accordance with ATSM D3803-1989 at a temperature of 30°C (86°F) and a relative humidity of 70%.
 3. Verifying a system flow rate of $9000 \text{ cfm} \pm 10\%$ during system operation when tested in accordance with ANSI N510-1975.

REFUELING OPERATIONS

SURVEILLANCE REQUIREMENTS (Continued)

- c. After every 720 hours of charcoal adsorber operation by verifying within 31 days after removal that a laboratory analysis of representative carbon sample obtained in accordance with Regulatory Position C.6.b of Regulatory Guide 1.52, Revision 2, March 1978, shows the methyl iodide penetration less than 2.5% when tested in accordance with ATSM D3803-1989 at a temperature of 30°C (86°F) and a relative humidity of 70%.
- d. At least once per 18 months by:
1. Verifying that the pressure drop across the combined HEPA filters and charcoal adsorber banks is less than 3 inches Water Gauge while operating the filter train at a flow rate of 9000 cfm \pm 10%. R77
 2. Verifying that the filter train starts on a high radiation signal from the fuel pool radiation monitoring system. R111
 3. Verifying that the heaters dissipate 32 ± 3.2 kw when tested in accordance with ANSI N510-1975.
- e. After each complete or partial replacement of a HEPA filter bank by verifying that the HEPA filter banks remove greater than or equal to 99.95% of the DOP when they are tested in-place in accordance with ANSI N510-1975 while operating the system at a flow rate of 9000 cfm \pm 10%.
- f. After each complete or partial replacement of a charcoal adsorber bank by verifying that the charcoal adsorbers remove greater than or equal to 99.95% of a halogenated hydrocarbon refrigerant test gas when they are tested in-place in accordance with ANSI N510-1975 while operating the system at a flow rate of 9000 cfm \pm 10%.



UNITED STATES
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NO. 263 TO FACILITY OPERATING LICENSE NO. DPR-77
AND AMENDMENT NO. 254 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 November 24, 1999, as supplemented by letter dated September 21, 2000, the Tennessee Valley Authority (TVA, the licensee) requested changes to the Technical Specifications (TSs) for the Sequoyah Nuclear Plant (SQN), Units 1 and 2. The proposed changes would change several Surveillance Requirements (SRs) for three safety-related ventilation systems to include the requirement for laboratory testing of Engineered Safety Feature (ESF) Ventilation System charcoal samples per American Society for Testing and Materials (ASTM) Test Standard D3803-1989 and the application of a safety factor of 2.0 to the charcoal filter efficiency assumed in the plant design-basis dose analyses. The September 21, 2000, supplement provided clarifying information that did not change the scope of the original license amendment application or the U.S. Nuclear Regulatory Commission (NRC or the Commission) staff's proposed no significant hazards consideration determination.

As a matter of background information, the NRC received a comment letter from ASTM in response to a March 8, 2000, Federal Register Notice (65 FR 12286) related to revising testing standards in accordance with ASTM D3803-1989 for laboratory testing of activated charcoal as discussed in Generic Letter (GL) 99-02, "Laboratory Testing of Nuclear-Grade Activated Charcoal," dated June 3, 1999. The TVA Amendment Request of November 24, 1999, was submitted in response to GL 99-02. ASTM notified the NRC that the 1989 standard is out of date and should be replaced by Test Standard D3803-1991(1998). The staff acknowledges that the most current version of ASTM D3803 is ASTM D3803-1991 (reaffirmed in 1998). However, the NRC staff decided, for consistency purposes, to have all of the commercial nuclear power reactors test to the same standard (ASTM D3803-1989) because, prior to GL 99-02 being issued, approximately one third of nuclear reactors in the United States had TSs that referenced ASTM D3803-1989. The NRC staff has reviewed both versions and finds that there are no substantive changes between the 1989 and 1998 versions.

Enclosure

2.0 EVALUATION

The NRC staff, with technical assistance from Brookhaven National Laboratory (BNL), has reviewed the licensee's license amendment application. In addition, the staff has reviewed the attached BNL Technical Evaluation Report (TER) regarding the proposed TS changes for SQN, Units 1 and 2. Based on its review, the NRC staff adopts the BNL TER.

Staff Conclusion

In view of the above, and because the NRC staff considers ASTM D3803-1989 to be the most accurate and most realistic protocol for testing charcoal in safety-related ventilation systems, the NRC staff finds that the proposed TS changes satisfy the actions requested in GL 99-02 and are, therefore, 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 requirement with respect to installation or use of a facility component located within the restricted area as defined in *Title 10 Code of Federal Regulations* (10 CFR) Part 20. 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 (65 FR 1929, dated January 12, 2000). 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: Ronald W. Hernan

Date: **November 2, 2000**

Attachment: Technical Evaluation Report, Brookhaven National Laboratory

TECHNICAL EVALUATION REPORT
BROOKHAVEN NATIONAL LABORATORY
FOR THE OFFICE OF NUCLEAR REACTOR REGULATION
DIVISION OF SYSTEMS SAFETY AND ANALYSIS
PLANT SYSTEMS BRANCH
RELATED TO AMENDMENT TO FACILITY OPERATING LICENSE NO. DPR- 77 & DPR-79
TENNESSEE VALLEY AUTHORITY
SEQUOYAH NUCLEAR PLANT - UNITS 1 & 2
DOCKETS NO. 50 - 327 & 50 - 328

1.0 INTRODUCTION

By letter dated November 24, 1999, Tennessee Valley Authority (TVA) submitted its response to the actions requested in Generic Letter (GL) 99-02, "Laboratory Testing of Nuclear-Grade Activated Charcoal," dated June 3, 1999, for the Sequoyah Nuclear Plant - Units 1&2. By another letter also dated November 24, 1999 (TVA-SQN-TS-99-16), TVA requested changes to the Technical Specifications (TS) Sections 4.6.1.8.b.2, 4.7.7.c.2, for the Emergency Gas Treatment System (EGTS), 4.7.8.b.2, 4.7.8.c, for the Control Room Emergency Ventilation System (CREVS), and 4.6.1.8.c, 4.7.7.d, 4.9.12.b.2, 4.9.12.c, for the Auxiliary Building Gas Treatment System (ABGTS) for both units of the Sequoyah Nuclear Plant. By letter dated September 21, 2000 (TVA-SQN-TS-99-16), TVA provided additional justifications for testing filters for the EGTS and CREVS at 70% relative humidity. The proposed changes would revise the TS surveillance testing of the safety related ventilation system charcoal to meet the requested actions of GL 99-02.

2.0 BACKGROUND

Safety-related air-cleaning units used in the engineered safety features (ESF) ventilation systems of nuclear power plants reduce the potential onsite and offsite consequences of a radiological accident by filtering radioiodine. Analyses of design basis accidents assume particular safety related charcoal adsorption efficiencies when calculating offsite and control room operator doses. To ensure that the charcoal filters used in these systems will perform in a manner that is consistent with the licensing basis of a facility, licensees have requirements in their TS to periodically perform a laboratory test (in accordance with a test standard) of charcoal samples taken from these ventilation systems.

In GL 99-02, the staff alerted licensees that testing nuclear-grade activated charcoal to standards other than American Society for Testing and Materials (ASTM) D3803-1989, "Standard Test Method for Nuclear-Grade Activated Carbon," does not provide assurance for complying with their current licensing bases with respect to the dose limits of General Design Criterion (GDC) 19 of Appendix A to Part 50 of Title 10 of the Code of Federal Regulations (10 CFR) and Subpart A of 10 CFR Part 100.

GL 99-02 requested that all licensees determine whether their TS reference ASTM D3803-1989

for charcoal filter laboratory testing. Licensees whose TS do not reference ASTM D3803-1989 were requested to either amend their TS to reference ASTM D3803-1989 or propose an alternative test protocol.

3.0 EVALUATION

3.1 Laboratory Charcoal Sample Testing Surveillance Requirements

The current and proposed laboratory charcoal sample testing TS surveillance requirements for the Emergency Gas Treatment System (EGTS), the Control Room Emergency Ventilation System (CREVS), and the Auxiliary Building Gas Treatment System (ABGTS) are shown in Table 1 and Table 2, respectively, for both Units 1&2.

The proposed use of ASTM D3803-1989 is acceptable because it provides accurate and reproducible test results. The proposed test temperature of 30°C is acceptable because it is consistent with ASTM D3803-1989. The proposed test relative humidity (RH) of 70 percent for all three systems is acceptable, as follows: (1) The ABGTS is equipped with safety-related heaters. (2) Based on the September 21, 2000 letter, the licensee stated that NRC has approved TS Amendment Nos. 103 and 92 on March 6, 1989 where the licensee has demonstrated by calculation that the EGTS filters are maintained at or below 70% RH. (3) TVA's calculation SQN-31A-D053-EPM-NQL-103088, "Find the Relative Humidity Ratio for the MCR Emergency Air Cleanup Units," demonstrated that the CREVS is provided with humidity control by the control room air conditioning system, which will maintain the air entering the CREVS at less than or equal to 70% RH during design basis accident conditions. This is consistent with the actions requested in GL 99-02.

The credited removal efficiencies for radioactive organic iodine for all systems is 95%. The proposed test penetration for radioactive methyl iodide for all these systems is 2.5%% and results in a safety factor of 2 for each of these systems. The proposed safety factor of 2 is acceptable because it ensures that the efficiency credited in the accident analysis is still valid at the end of the surveillance interval. This is consistent with the minimum safety factor of 2 specified in GL 99-02.

The August 23, 1999 errata to GL 99-02 clarified that if the maximum actual face velocity is greater than 110% of 40 fpm, then the test face velocity should be specified in the TS. TVA stated in the November 24, 1999 letter that all three systems, the EGTS, CREVS, and ABGTS, have a face velocity of less than 110% of 40 fpm and therefore, the test face velocity is not specified in the proposed TS amendments. The proposed testing of the charcoal adsorbers will be performed in accordance with ASTM D3803-1989 which specifies a test face velocity of 40 fpm with appropriate margins. This is acceptable because it ensures that the testing will be consistent with the operation of the ventilation system during accident conditions. This is consistent with the August 23, 1999 errata to GL 99-02.

4.0 CONCLUSION

On the basis of its evaluation, BNL recommends that the NRC staff consider the proposed TS

changes to be acceptable.

Principal Contributors: Richard E. Deem, Anthony Fresco, and Mano Subudhi
Date: October 3, 2000

SEQUOYAH NUCLEAR PLANT - UNITS 1&2

TABLE 1 - CURRENT TS REQUIREMENTS

System Description						Current TS Requirements					
TS Section	System	Bed Thickness (inches)	Actual Charcoal		Credited Efficiency (% Total MI+EI)	Test Penetration (% methyl iodide)	Safety Factor	Test Standard	Test Temp (° C)	Test RH (%)	Test Face Velocity (fpm)
			Res. Time (sec)	Face Velocity (fpm)							
4.6.1.8.b.2 4.6.1.8.b.2	Emergency Gas Treatment System (EGTS)	2 + 2 (two 2 in. in series)*	0.25/2 in. bed depth*	≤110% of 40 fpm	95**	<0.175***	Not stated (28.6)**	Reg. Guide 1.52, Rev.2, Position C.6.a March 1978***	Not stated (80)****	Not stated (70)****	Not stated
4.7.7.c.2 4.7.7.d	Control Room Emergency Ventilation System (CREVS)	2	0.25	≤110% of 40 fpm	95**	<1.00***	Not stated (5)**	Reg. Guide 1.52, Rev.2, Position C.6.a March 1978***	Not stated (80)****	Not stated (70)****	Not stated
4.7.8.b.2 4.7.8.c 4.9.12.b.2 & 4.9.12.c	Auxiliary Building Gas Treatment System (ABGTS)	2	0.25	≤110% of 40 fpm	95**	<1.00***	Not stated (5)**	Reg. Guide 1.52, Rev.2, Position C.6.a March 1978***	Not stated (80)****	Not stated (70)****	Not stated

* The EGTS has two charcoal banks in series. Each bank of filters is 2 in. thick with each having 0.25 seconds residence time. For the EGTS, while the design-basis dose analysis assumes 95% efficiency, the acceptance criteria continued the past practice of using extra conservatism by testing the filters as if the assumed efficiency were 99% (therefore, the safety factor = 5). This was done to avoid any compliance concerns during the transition from existing TS requirements to the proposed TS requirements using ASTM D3803-1989.

** Safety factors are calculated based on the credited efficiency and the test penetration values.

*** RG 1.52, Rev. 2, March 1978, Position C.6.a references Test 5.b of ANSI N509-1976, which in turn references ¶ 4.5.3 of RDT M16-1T, date not indicated. Test penetration values are not stated directly in the TS, but are as stated in RG 1.52.

**** November 24, 1999 Letter (TVA-SQN- TS-99-16) states that "The essential elements of the '25-80-25' test as given in RG 1.52, Revision

2 (i.e., ANSI N509-1976), are as follows: - 70% relative humidity....” The current TS do not specify the 70% RH directly, nor does it state the 80°C test temperature directly.

SEQUOYAH NUCLEAR PLANT - UNITS 1&2

TABLE 2 - PROPOSED TS REQUIREMENTS

TABLE 2 - PROPOSED TS REQUIREMENTS											
System Description						Proposed TS Requirements					
TS Section	System	Bed Thickness (inches)	Actual Charcoal		Credited Efficiency (% Total MI+EI)	Test Penetration (% methyl iodide)	Safety Factor	Test Standard	Test Temp (° C)	Test RH (%)	Test Face Velocity (fpm)
			Res. Time (sec)	Face Velocity (fpm)							
4.6.1.8.b.2 4.6.1.8.b.2	Emergency Gas Treatment System (EGTS)	2 + 2 (two 2 in. in series)	0.25/2 in. bed depth	≤110% of 40 fpm	95	<2.5	2	ASTM D3803-1989	30	70	Not stated (40)*
4.7.7.c.2 4.7.7.d	Control Room Emergency Ventilation System (CREVS)	2	0.25	≤110% of 40 fpm	95	<2.5	2	ASTM D3803-1989	30	70	Not stated (40)*
4.7.8.b.2 4.7.8.c 4.9.12.b.2 & 4.9.12.c	Auxiliary Building Gas Treatment System (ABGTS)	2	0.25	≤110% of 40 fpm	95	<2.5	2	ASTM D3803-1989	30	70	Not stated (40)*

* Test face velocity of 40 fpm is based on value specified by ASTM D3803-1989.

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SEQUOYAH NUCLEAR PLANT

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