

February 13, 1995

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

SUBJECT: ISSUANCE OF TECHNICAL SPECIFICATION AMENDMENTS FOR THE BROWNS FERRY
NUCLEAR PLANT UNITS 1, 2, AND 3 (TAC NOS. M87888, M87889, AND
M87890) (TS 341)

Dear Mr. Kingsley:

The Commission has issued the enclosed Amendment Nos. 215, 231, and 188 to
Facility Operating Licenses Nos. DPR-33, DPR-52, and DPR-68 for the Browns
Ferry Nuclear Plant (BFN), Units 1, 2, and 3, respectively. These amendments
are in response to your application dated September 29, 1993, regarding
testing standards for charcoal used in ventilation systems at BFN.

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

Sincerely,

ORIGINAL SIGNED:

Joseph F. Williams, Project Manager
Project Directorate II-4
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Docket Nos. 50-259, 50-260 and 50-296

Distribution w/enclosure

- Enclosures:
1. Amendment No. 215 to License No. DPR-33
 2. Amendment No. 231 to License No. DPR-52
 3. Amendment No. 188 to License No. DPR-68
 4. Safety Evaluation

Docket File
PUBLIC
BFN Reading
SVarga
JZwolinski
JHayes
GHill (6) T-5-C3
CGrimes 0-11-E22
ACRS (4)
OPA
OC/LFDCB T-9-E10
EMerschhoff RII
MLesser RII

cc w/enclosures: See next page

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DOCUMENT NAME: G:\BFN\TS341.AMD

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attachment/enclosure
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OFFICE	PDII-4/PM	OTSB #95-013	OGC	PDII-4/D	C
NAME	BDayton	JWilliams	CGrimes	FHebdon	
DATE	01/17/95	01/17/95	01/30/95	01/13/95	

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ATTACHMENT TO LICENSE AMENDMENT NO. 215

FACILITY OPERATING LICENSE NO. DPR-33

DOCKET NO. 50-259

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. Overleaf* pages are provided to maintain document completeness.

REMOVE

3.7/4.7-13
3.7/4.7-14
3.7/4.7-19
3.7/4.7-20
3.7/4.7-21
3.7/4.7-22
3.7/4.7-33
3.7/4.7-34
3.7/4.7-37
3.7/4.7-38

INSERT

3.7/4.7-13*
3.7/4.7-14
3.7/4.7-19
3.7/4.7-20*
3.7/4.7-21
3.7/4.7-22*
3.7/4.7-33
3.7/4.7-34*
3.7/4.7-37
3.7/4.7-38

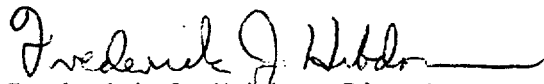
2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment and paragraph 2.C.(2) of Facility Operating License No. DPR-33 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 215, 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 30 days from the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION



Frederick J. Heddon, 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: February 13, 1995

3.7/4.7 CONTAINMENT SYSTEMS

LIMITING CONDITIONS FOR OPERATION

SURVEILLANCE REQUIREMENTS

3.7.B. Standby Gas Treatment System

1. Except as specified in Specification 3.7.B.3 below, all three trains of the standby gas treatment system shall be OPERABLE at all times when secondary containment integrity is required.

4.7.B. Standby Gas Treatment System

1. At least once per year, the following conditions shall be demonstrated.
- a. Pressure drop across the combined HEPA filters and charcoal adsorber banks is less than 6 inches of water at a flow of 9000 cfm ($\pm 10\%$).
 - b. The inlet heaters on each circuit are tested in accordance with ANSI N510-1975, and are capable of an output of at least 40 kW.
 - c. Air distribution is uniform within 20% across HEPA filters and charcoal adsorbers.



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

TENNESSEE VALLEY AUTHORITY

DOCKET NO. 50-259

BROWNS FERRY NUCLEAR PLANT, UNIT 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 215
License No. DPR-33

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

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3.7/4.7 CONTAINMENT SYSTEMS

LIMITING CONDITIONS FOR OPERATION

3.7.B. Standby Gas Treatment System

2. a. The results of the in-place cold DOP and halogenated hydrocarbon tests at $\geq 10\%$ design flow on HEPA filters and charcoal adsorber banks shall show $\geq 99\%$ DOP removal and $\geq 99\%$ halogenated hydrocarbon removal when tested in accordance with ANSI N510-1975.

b. The results of laboratory carbon sample analysis shall show $\geq 90\%$ radioactive methyl iodide removal when tested in accordance with ASTM D3803.

c. System shall be shown to operate within $\pm 10\%$ design flow.

SURVEILLANCE REQUIREMENTS

4.7.B. Standby Gas Treatment System

2. a. The tests and sample analysis of Specification 3.7.B.2 shall be performed at least once per operating cycle or once every 18 months whichever occurs first for standby service or after every 720 hours of system operation and following significant painting, fire, or chemical release in any ventilation zone communicating with the system.

b. Cold DOP testing shall be performed after each complete or partial replacement of the HEPA filter bank or after any structural maintenance on the system housing.

c. Halogenated hydrocarbon testing shall be performed after each complete or partial replacement of the charcoal adsorber bank or after any structural maintenance on the system housing.

3.7/4.7 CONTAINMENT SYSTEMS

LIMITING CONDITIONS FOR OPERATION

3.7.E. Control Room Emergency Ventilation

1. Except as specified in Specification 3.7.E.3 below, both control room emergency pressurization systems shall be OPERABLE at all times when any reactor vessel contains irradiated fuel.
2. a. The results of the in-place cold DOP and halogenated hydrocarbon tests at design flows on HEPA filters and charcoal adsorber banks shall show $\geq 99\%$ DOP removal and $\geq 99\%$ halogenated hydrocarbon removal when tested in accordance with ANSI N510-1975.

b. The results of laboratory carbon sample analysis shall show $\geq 90\%$ radioactive methyl iodide removal at a velocity when tested in accordance with ASTM D3803.

SURVEILLANCE REQUIREMENTS

4.7.E Control Room Emergency Ventilation

1. At least once every 18 months, the pressure drop across the combined HEPA filters and charcoal adsorber banks shall be demonstrated to be less than 6 inches of water at system design flow rate ($\pm 10\%$).
2. a. The tests and sample analysis of Specification 3.7.E.2 shall be performed at least once per operating cycle or once every 18 months, whichever occurs first for standby service or after every 720 hours of system operation and following significant painting, fire, or chemical release in any ventilation zone communicating with the system.

b. Cold DOP testing shall be performed after each complete or partial replacement of the HEPA filter bank or after any structural maintenance on the system housing.

3.7/4.7 CONTAINMENT SYSTEMS

LIMITING CONDITIONS FOR OPERATION

SURVEILLANCE REQUIREMENTS

3.7.E. Control Room Emergency Ventilation

c. System flow rate shall be shown to be within $\pm 10\%$ design flow when tested in accordance with ANSI N510-1975.

† 3. From and after the date that one of the control room emergency pressurization systems is made or found to be inoperable for any reason, REACTOR POWER OPERATIONS or refueling operations are permissible only during the succeeding 7 days unless such circuit is sooner made OPERABLE.

† 4. If these conditions cannot be met, reactor shutdown shall be initiated and all reactors shall be in COLD SHUTDOWN within 24 hours for REACTOR POWER OPERATIONS and refueling operations shall be terminated within 2 hours.

4.7.E. Control Room Emergency Ventilation

c. Halogenated hydrocarbon testing shall be performed after each complete or partial replacement of the charcoal adsorber bank or after any structural maintenance on the system housing.

d. Each circuit shall be operated at least 10 hours every month.

3. At least once every 18 months, automatic initiation of the control room emergency pressurization system shall be demonstrated.

4. During the simulated automatic actuation test of this system (see Table 4.2.G), it shall be verified that the necessary dampers operate as required.

3.7/4.7 CONTAINMENT SYSTEMS

LIMITING CONDITIONS FOR OPERATION

3.7.F. Primary Containment Purge System

1. The primary containment purge system shall be OPERABLE for PURGING, except as specified in 3.7.F.2.
 - a. The results of the in-place cold DOP and halogenated hydrocarbon tests at design flows on HEPA filters and charcoal adsorber banks shall show $\geq 99\%$ DOP removal and $\geq 99\%$ halogenated hydrocarbon removal when tested in accordance with ANSI N510-1975.
 - b. The results of laboratory carbon sample analysis shall show $\geq 85\%$ radioactive methyl iodide removal when tested in accordance with ASTM D3803.
 - c. System flow rate shall be shown to be within $\pm 10\%$ of design flow when tested in accordance with ANSI N510-1975.
2. If the provisions of 3.7.F.1.a, b, and c cannot be met, the system shall be declared inoperable. The provisions of Technical Specification 1.C.1 do not apply. PURGING may continue using the Standby Gas Treatment System.
3. a. The 18-inch primary containment isolation valves associated with PURGING may be open during the RUN mode for a 24-hour period after entering the RUN mode and/or for a 24-hour period prior to entering the SHUTDOWN mode. The OPERABILITY of

SURVEILLANCE REQUIREMENTS

4.7.F. Primary Containment Purge System

1. At least once every 18 months, the pressure drop across the combined HEPA filters and charcoal adsorber banks shall be demonstrated to be less than 8.5 inches of water at system design flow rate ($\pm 10\%$).
 - a. The tests and sample analysis of Specification 3.7.F.1 shall be performed at least once per operating cycle or once every 18 months, whichever occurs first or after 720 hours of system operation and following significant painting, fire, or chemical release in any ventilation zone communicating with the system.
 - b. Cold DOP testing shall be performed after each complete or partial replacement of the HEPA filter bank or after any structural maintenance on the system housing.
 - c. Halogenated hydrocarbon testing shall be performed after each complete or partial replacement of the charcoal adsorber bank or after any structural maintenance on the system housing.

3.7/4.7 CONTAINMENT SYSTEMS

LIMITING CONDITIONS FOR OPERATION

SURVEILLANCE REQUIREMENTS

3.7.F. Primary Containment Purge System

4.7.F. Primary Containment Purge System

3.7.F.3 (Continued)

these primary containment isolation valves is governed by Technical Specification 3.7.D.

- b. Pressure control of the containment is normally performed by VENTING through 2-inch primary containment isolation valves which route effluent to the Standby Gas Treatment System. The OPERABILITY of these primary containment isolation valves is governed by Technical Specification 3.7.D.

3.7.G. Containment Atmosphere Dilution System (CAD)

4.7.G. Containment Atmosphere Dilution System (CAD)

- 1. The Containment Atmosphere Dilution (CAD) System shall be OPERABLE with:
 - a. Two independent systems capable of supplying nitrogen to the drywell and torus.
 - b. A minimum supply of 2,500 gallons of liquid nitrogen per system.

1. System Operability

- a. Cycle each solenoid operated air/nitrogen valve through at least one complete cycle of full travel in accordance with Specification 1.0.MM, and at least once per month verify that each manual valve in the flow path is open.
- b. Verify that the CAD System contains a minimum supply of 2,500 gallons of liquid nitrogen twice per week.

3.7/4.7 BASES (Cont'd)

containment is opened for refueling. Periodic testing gives sufficient confidence of reactor building integrity and standby gas treatment system performance capability.

The test frequencies are adequate to detect equipment deterioration prior to significant defects, but the tests are not frequent enough to load the filters, thus reducing their reserve capacity too quickly. That the testing frequency is adequate to detect deterioration was demonstrated by the tests which showed no loss of filter efficiency after two years of operation in the rugged shipboard environment on the US Savannah (ORNL 3726). Pressure drop across the combined HEPA filters and charcoal adsorbers of less than six inches of water at the system design flow rate will indicate that the filters and adsorbers are not clogged by excessive amounts of foreign matter. Heater capability, pressure drop and air distribution should be determined at least once per operating cycle to show system performance capability.

The frequency of tests and sample analysis are necessary to show that the HEPA filters and charcoal adsorbers can perform as evaluated. Tests of the charcoal adsorbers with halogenated hydrocarbon refrigerant shall be performed in accordance with USAEC Report DP-1082. Iodine removal efficiency tests shall follow ASTM D3803-89. The charcoal adsorber efficiency test procedures should allow for the removal of one adsorber tray, emptying of one bed from the tray, mixing the adsorbent thoroughly and obtaining at least two samples. Each sample should be at least two inches in diameter and a length equal to the thickness of the bed. If test results are unacceptable, all adsorbent in the system shall be replaced with an adsorbent qualified according to Table 1 of Regulatory Guide 1.52. The replacement tray for the adsorber tray removed for the test should meet the same adsorbent quality. Tests of the HEPA filters with DOP aerosol shall be performed in accordance to ANSI N510-1975. Any HEPA filters found defective shall be replaced with filters qualified pursuant to Regulatory Position C.3.d of Regulatory Guide 1.52.

All elements of the heater should be demonstrated to be functional and OPERABLE during the test of heater capacity. Operation of each filter train for a minimum of 10 hours each month will prevent moisture buildup in the filters and adsorber system.

With doors closed and fan in operation, DOP aerosol shall be sprayed externally along the full linear periphery of each respective door to check the gasket seal. Any detection of DOP in the fan exhaust shall be considered an unacceptable test result and the gaskets repaired and test repeated.

If significant painting, fire or chemical release occurs such that the HEPA filter or charcoal adsorber could become contaminated from the fumes, chemicals or foreign material, the same tests and sample analysis shall be performed as required for operational use. The determination of significance shall be made by the operator on duty at the time of the incident. Knowledgeable staff members should be consulted prior to making this determination.

3.7/4.7 BASES (Cont'd)

Demonstration of the automatic initiation capability and OPERABILITY of filter cooling is necessary to assure system performance capability. If one standby gas treatment system is inoperable, the other systems must be tested daily. This substantiates the availability of the OPERABLE systems and thus reactor operation and refueling operation can continue for a limited period of time.

3.7.D/4.7.D Primary Containment Isolation Valves

The Browns Ferry Containment Leak Rate Program and Procedures contains the list of all the Primary Containment Isolation Valves for which the Technical Specification requirements apply. The procedures are subject to the change control provisions for plant procedures in the administrative controls section of the Technical Specifications. The opening of locked or sealed closed containment isolation valves on an intermittent basis under administrative control includes the following considerations: (1) stationing an operator, who is in constant communication with the control room, at the valve controls, (2) instructing this operator to close these valves in an accident situation, and (3) assuring that environmental conditions will not preclude access to close the valves and that this action will prevent the release of radioactivity outside the containment.

Double isolation valves are provided on lines penetrating the primary containment and open to the free space of the containment. Closure of one of the valves in each line would be sufficient to maintain the integrity of the pressure suppression system. Automatic initiation is required to minimize the potential leakage paths from the containment in the event of a LOCA.

Group 1 - Process lines are isolated by reactor vessel low water level (378") in order to allow for removal of decay heat subsequent to a scram, yet isolate in time for proper operation of the core standby cooling systems. The valves in Group 1, except the reactor water sample line valves, are also closed when process instrumentation detects excessive main steam line flow, low pressure, or main steam space high temperature. The reactor water sample line valves isolate only on reactor low water level at 378".

Group 2 - Isolation valves are closed by reactor vessel low water level (538") or high drywell pressure. The Group 2 isolation signal also "isolates" the reactor building and starts the standby gas treatment system. It is not desirable to actuate the Group 2 isolation signal by a transient or spurious signal.

Group 3 - Process lines are normally in use, and it is therefore not desirable to cause spurious isolation due to high drywell pressure resulting from nonsafety related causes. To protect the reactor from a possible pipe break

3.7/4.7 BASES (Cont'd)

limited period of time while repairs are being made. If the system cannot be repaired within seven days, the reactor is shutdown and brought to Cold Shutdown within 24 hours or refueling operations are terminated.

Pressure drop across the combined HEPA filters and charcoal adsorbers of less than six inches of water at the system design flow rate will indicate that the filters and adsorbers are not clogged by excessive amounts of foreign matter. Pressure drop should be determined at least once per operating cycle to show system performance capability.

The frequency of tests and sample analysis are necessary to show that the HEPA filters and charcoal adsorbers can perform as evaluated. Tests of the charcoal adsorbers with halogenated hydrocarbon shall be performed in accordance with USAEC Report-1082. Iodine removal efficiency tests shall follow ASTM D3803-89. The charcoal adsorber efficiency test procedures should allow for the removal of one adsorber tray, emptying of one bed from the tray, mixing the adsorbent thoroughly and obtaining at least two samples. Each sample should be at least two inches in diameter and a length equal to the thickness of the bed. If test results are unacceptable, all adsorbent in the system shall be replaced with an adsorbent qualified according to Table 1 of Regulatory Guide 1.52. The replacement tray for the adsorber tray removed for the test should meet the same adsorbent quality. Tests of the HEPA filters with DOP aerosol shall be performed in accordance to ANSI N510-1975. Any HEPA filters found defective shall be replaced with filters qualified pursuant to Regulatory Position C.3.d of Regulatory Guide 1.52.

Operation of the system for 10 hours every month will demonstrate OPERABILITY of the filters and adsorber system and remove excessive moisture built up on the adsorber.

If significant painting, fire or chemical release occurs such that the HEPA filter or charcoal adsorber could become contaminated from the fumes, chemicals or foreign materials, the same tests and sample analysis shall be performed as required for operational use. The determination of significance shall be made by the operator on duty at the time of the incident. Knowledgeable staff members should be consulted prior to making this determination.

Demonstration of the automatic initiation capability is necessary to assure system performance capability.

3.7.F/4.7.F Primary Containment Purge System

The Primary Containment Purge System is a non-safety related system that is normally isolated and normally not required to be functional during power operation. The system is designed to provide the preferred exhaust path for purging the primary containment system; however, the Standby Gas Treatment System can be used to perform the equivalent function.

3.7/4.7 BASES (Cont'd)

When the Primary Containment Purge System is in operation, the exhaust from the primary containment is first processed by a filter train assembly and then channeled through the reactor building roof exhaust system.

The filter train assembly contains a HEPA (high efficiency particulate air) filter, charcoal adsorber, and centrifugal fan. In-place tests are performed to ensure leak tightness of the filter train assembly of at least 99% and a HEPA efficiency of at least 99% removal of DOP particulates. Laboratory tests are performed on adsorber carbon samples to ensure an 85% removal efficiency for radioactive methyl iodide. Tests are performed to ensure that the system is not operating at a flow significantly different from the design flow, which may affect the removal efficiency of the HEPA filters and charcoal adsorbers. The pressure drop across the combined HEPA filters and charcoal adsorbers is checked once per operating cycle to be less than 8.5 inches of water at the system design flow rate to ensure that the filters and adsorbers are not clogged with excessive amounts of foreign matter.

The above tests are necessary to show that the HEPA filters and charcoal adsorbers can perform as evaluated. Tests of the charcoal adsorbers with halogenated hydrocarbon shall be performed in accordance with USAEC Report-1082. Iodine removal efficiency tests shall follow ASTM D3803-89. The charcoal adsorber efficiency test procedures should allow for the removal of one adsorber tray, emptying of one bed from the tray, mixing the adsorbent thoroughly and obtaining at least two samples. Each sample should be at least two inches in diameter and a length equal to the thickness of the bed. If test results are unacceptable, all adsorbent in the system shall be replaced with an adsorbent qualified according to Table 1 of Regulatory Guide 1.52. The replacement tray for the adsorber tray removed for the test should meet the same adsorbent quality. Tests of the HEPA filters with DOP aerosol shall be performed in accordance to ANSI N510-1975. Any HEPA filters found defective shall be replaced with filters qualified pursuant to Regulatory Position C.3.d of Regulatory Guide 1.52.

If significant painting, fire, or chemical release occurs such that the HEPA filter or charcoal adsorber could become contaminated from the fumes, chemicals, or foreign materials, the same tests and sample analysis shall be performed as required for operational use. The determination of significance shall be made by the operator on duty at the time of the incident. Knowledgeable staff members should be consulted prior to making this determination.

The primary containment isolation valves associated with the purging of the primary containment are FCV 64-17, 64-18, 64-19, 64-29, 64-30, 64-32, 64-33, and 76-24. These valves may be open for a 24-hour period after entering the RUN mode and/or for a 24-hour period prior to entering the SHUTDOWN mode. Closure of these large diameter valves within the 24-hour period is needed to



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

TENNESSEE VALLEY AUTHORITY

DOCKET NO. 50-260

BROWNS FERRY NUCLEAR PLANT, UNIT 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 231
License No. DPR-52

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

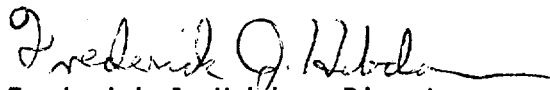
2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment and paragraph 2.C.(2) of Facility Operating License No. DPR-52 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No.231 , 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 30 days from the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION



Frederick J. Hebbon, 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: February 13, 1995

ATTACHMENT TO LICENSE AMENDMENT NO. 231

FACILITY OPERATING LICENSE NO. DPR-52

DOCKET NO. 50-260

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. Overleaf* pages are provided to maintain document completeness.

REMOVE

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3.7/4.7-22
3.7/4.7-33
3.7/4.7-34
3.7/4.7-37
3.7/4.7-38

INSERT

3.7/4.7-13*
3.7/4.7-14
3.7/4.7-19
3.7/4.7-20*
3.7/4.7-21
3.7/4.7-22*
3.7/4.7-33
3.7/4.7-34*
3.7/4.7-37
3.7/4.7-38

3.7/4.7 CONTAINMENT SYSTEMS

LIMITING CONDITIONS FOR OPERATION

SURVEILLANCE REQUIREMENTS

3.7.B. Standby Gas Treatment System

1. Except as specified in Specification 3.7.B.3 below, all three trains of the standby gas treatment system shall be OPERABLE at all times when secondary containment integrity is required.

4.7.B. Standby Gas Treatment System

1. At least once per year, the following conditions shall be demonstrated.
 - a. Pressure drop across the combined HEPA filters and charcoal adsorber banks is less than 6 inches of water at a flow of 9000 cfm ($\pm 10\%$).
 - b. The inlet heaters on each circuit are tested in accordance with ANSI N510-1975, and are capable of an output of at least 40 kW.
 - c. Air distribution is uniform within 20% across HEPA filters and charcoal adsorbers.

3.7/4.7 CONTAINMENT SYSTEMS

LIMITING CONDITIONS FOR OPERATION

3.7.B. Standby Gas Treatment System

2. a. The results of the in-place cold DOP and halogenated hydrocarbon tests at $\geq 10\%$ design flow on HEPA filters and charcoal adsorber banks shall show $\geq 99\%$ DOP removal and $\geq 99\%$ halogenated hydrocarbon removal when tested in accordance with ANSI N510-1975.

b. The results of laboratory carbon sample analysis shall show $\geq 90\%$ radioactive methyl iodide removal when tested in accordance with ASTM D3803.

c. System shall be shown to operate within $\pm 10\%$ design flow.

SURVEILLANCE REQUIREMENTS

4.7.B. Standby Gas Treatment System

2. a. The tests and sample analysis of Specification 3.7.B.2 shall be performed at least once per operating cycle or once every 18 months whichever occurs first for standby service or after every 720 hours of system operation and following significant painting, fire, or chemical release in any ventilation zone communicating with the system.

b. Cold DOP testing shall be performed after each complete or partial replacement of the HEPA filter bank or after any structural maintenance on the system housing.

c. Halogenated hydrocarbon testing shall be performed after each complete or partial replacement of the charcoal adsorber bank or after any structural maintenance on the system housing.

3.7/4.7 CONTAINMENT SYSTEMS

LIMITING CONDITIONS FOR OPERATION

3.7.E. Control Room Emergency Ventilation

1. Except as specified in Specification 3.7.E.3 below, both control room emergency pressurization systems shall be OPERABLE at all times when any reactor vessel contains irradiated fuel.

2. a. The results of the in-place cold DOP and halogenated hydrocarbon tests at design flows on HEPA filters and charcoal adsorber banks shall show $\geq 99\%$ DOP removal and $\geq 99\%$ halogenated hydrocarbon removal when tested in accordance with ANSI N510-1975.

- b. The results of laboratory carbon sample analysis shall show $\geq 90\%$ radioactive methyl iodide removal at a velocity when tested in accordance with ASTM D3803.

SURVEILLANCE REQUIREMENTS

4.7.E Control Room Emergency Ventilation

1. At least once every 18 months, the pressure drop across the combined HEPA filters and charcoal adsorber banks shall be demonstrated to be less than 6 inches of water at system design flow rate ($\pm 10\%$).

2. a. The tests and sample analysis of Specification 3.7.E.2 shall be performed at least once per operating cycle or once every 18 months, whichever occurs first for standby service or after every 720 hours of system operation and following significant painting, fire, or chemical release in any ventilation zone communicating with the system.

- b. Cold DOP testing shall be performed after each complete or partial replacement of the HEPA filter bank or after any structural maintenance on the system housing.

3.7/4.7 CONTAINMENT SYSTEMS

LIMITING CONDITIONS FOR OPERATION

3.7.E. Control Room Emergency Ventilation

c. System flow rate shall be shown to be within $\pm 10\%$ design flow when tested in accordance with ANSI N510-1975.

† 3. From and after the date that one of the control room emergency pressurization systems is made or found to be inoperable for any reason, REACTOR POWER OPERATIONS or refueling operations are permissible only during the succeeding 7 days unless such circuit is sooner made OPERABLE.

† 4. If these conditions cannot be met, reactor shutdown shall be initiated and all reactors shall be in COLD SHUTDOWN within 24 hours for REACTOR POWER OPERATIONS and refueling operations shall be terminated within 2 hours.

†

SURVEILLANCE REQUIREMENTS

4.7.E. Control Room Emergency Ventilation

c. Halogenated hydrocarbon testing shall be performed after each complete or partial replacement of the charcoal adsorber bank or after any structural maintenance on the system housing.

d. Each circuit shall be operated at least 10 hours every month.

3. At least once every 18 months, automatic initiation of the control room emergency pressurization system shall be demonstrated.

4. During the simulated automatic actuation test of this system (see Table 4.2.G), it shall be verified that the necessary dampers operate as required.

3.7/4.7 CONTAINMENT SYSTEMS

LIMITING CONDITIONS FOR OPERATION

3.7.F. Primary Containment Purge System

1. The primary containment purge system shall be OPERABLE for PURGING, except as specified in 3.7.F.2.
 - a. The results of the in-place cold DOP and halogenated hydrocarbon tests at design flows on HEPA filters and charcoal adsorber banks shall show $\geq 99\%$ DOP removal and $\geq 99\%$ halogenated hydrocarbon removal when tested in accordance with ANSI N510-1975.
 - b. The results of laboratory carbon sample analysis shall show $\geq 85\%$ radioactive methyl iodide removal when tested in accordance with ASTM D3803.
 - c. System flow rate shall be shown to be within $\pm 10\%$ of design flow when tested in accordance with ANSI N510-1975.
2. If the provisions of 3.7.F.1.a, b, and c cannot be met, the system shall be declared inoperable. The provisions of Technical Specification 1.C.1 do not apply. PURGING may continue using the Standby Gas Treatment System.
3. a. The 18-inch primary containment isolation valves associated with PURGING may be open during the RUN mode for a 24-hour period after entering the RUN mode and/or for a 24-hour period prior to entering the SHUTDOWN mode. The OPERABILITY of

SURVEILLANCE REQUIREMENTS

4.7.F. Primary Containment Purge System

1. At least once every 18 months, the pressure drop across the combined HEPA filters and charcoal adsorber banks shall be demonstrated to be less than 8.5 inches of water at system design flow rate ($\pm 10\%$).
 - a. The tests and sample analysis of Specification 3.7.F.1 shall be performed at least once per operating cycle or once every 18 months, whichever occurs first or after 720 hours of system operation and following significant painting, fire, or chemical release in any ventilation zone communicating with the system.
 - b. Cold DOP testing shall be performed after each complete or partial replacement of the HEPA filter bank or after any structural maintenance on the system housing.
 - c. Halogenated hydrocarbon testing shall be performed after each complete or partial replacement of the charcoal adsorber bank or after any structural maintenance on the system housing.

3.7/4.7 CONTAINMENT SYSTEMS

LIMITING CONDITIONS FOR OPERATION

3.7.F. Primary Containment Purge System

3.7.F.3 (Continued)

these primary containment isolation valves is governed by Technical Specification 3.7.D.

- b. Pressure control of the containment is normally performed by VENTING through 2-inch primary containment isolation valves which route effluent to the Standby Gas Treatment System. The OPERABILITY of these primary containment isolation valves is governed by Technical Specification 3.7.D.

3.7.G. Containment Atmosphere Dilution System (CAD)

1. The Containment Atmosphere Dilution (CAD) System shall be OPERABLE with:
 - a. Two independent systems capable of supplying nitrogen to the drywell and torus.
 - b. A minimum supply of 2,500 gallons of liquid nitrogen per system.

SURVEILLANCE REQUIREMENTS

4.7.F. Primary Containment Purge System

4.7.G. Containment Atmosphere Dilution System (CAD)

1. System Operability

- a. Cycle each solenoid operated air/nitrogen valve through at least one complete cycle of full travel in accordance with Specification 1.0.MM, and at least once per month verify that each manual valve in the flow path is open.
- b. Verify that the CAD System contains a minimum supply of 2,500 gallons of liquid nitrogen twice per week.

3.7/4.7 BASES (Cont'd)

containment is opened for refueling. Periodic testing gives sufficient confidence of reactor building integrity and standby gas treatment system performance capability.

The test frequencies are adequate to detect equipment deterioration prior to significant defects, but the tests are not frequent enough to load the filters, thus reducing their reserve capacity too quickly. That the testing frequency is adequate to detect deterioration was demonstrated by the tests which showed no loss of filter efficiency after two years of operation in the rugged shipboard environment on the US Savannah (ORNL 3726). Pressure drop across the combined HEPA filters and charcoal adsorbers of less than six inches of water at the system design flow rate will indicate that the filters and adsorbers are not clogged by excessive amounts of foreign matter. Heater capability, pressure drop and air distribution should be determined at least once per operating cycle to show system performance capability.

The frequency of tests and sample analysis are necessary to show that the HEPA filters and charcoal adsorbers can perform as evaluated. Tests of the charcoal adsorbers with halogenated hydrocarbon refrigerant shall be performed in accordance with USAEC Report DP-1082. Iodine removal efficiency tests shall follow ASTM D3803-89. The charcoal adsorber efficiency test procedures should allow for the removal of one adsorber tray, emptying of one bed from the tray, mixing the adsorbent thoroughly and obtaining at least two samples. Each sample should be at least two inches in diameter and a length equal to the thickness of the bed. If test results are unacceptable, all adsorbent in the system shall be replaced with an adsorbent qualified according to Table 1 of Regulatory Guide 1.52. The replacement tray for the adsorber tray removed for the test should meet the same adsorbent quality. Tests of the HEPA filters with DOP aerosol shall be performed in accordance to ANSI N510-1975. Any HEPA filters found defective shall be replaced with filters qualified pursuant to Regulatory Position C.3.d of Regulatory Guide 1.52.

All elements of the heater should be demonstrated to be functional and OPERABLE during the test of heater capacity. Operation of each filter train for a minimum of 10 hours each month will prevent moisture buildup in the filters and adsorber system.

With doors closed and fan in operation, DOP aerosol shall be sprayed externally along the full linear periphery of each respective door to check the gasket seal. Any detection of DOP in the fan exhaust shall be considered an unacceptable test result and the gaskets repaired and test repeated.

If significant painting, fire or chemical release occurs such that the HEPA filter or charcoal adsorber could become contaminated from the fumes, chemicals or foreign material, the same tests and sample analysis shall be performed as required for operational use. The determination of significance shall be made by the operator on duty at the time of the incident. Knowledgeable staff members should be consulted prior to making this determination.

3.7/4.7 BASES (Cont'd)

Demonstration of the automatic initiation capability and OPERABILITY of filter cooling is necessary to assure system performance capability. If one standby gas treatment system is inoperable, the other systems must be tested daily. This substantiates the availability of the OPERABLE systems and thus reactor operation and refueling operation can continue for a limited period of time.

3.7.D/4.7.D Primary Containment Isolation Valves

The Browns Ferry Containment Leak Rate Program and Procedures contains the list of all the Primary Containment Isolation Valves for which the Technical Specification requirements apply. The procedures are subject to the change control provisions for plant procedures in the administrative controls section of the Technical Specifications. The opening of locked or sealed closed containment isolation valves on an intermittent basis under administrative control includes the following considerations: (1) stationing an operator, who is in constant communication with the control room, at the valve controls, (2) instructing this operator to close these valves in an accident situation, and (3) assuring that environmental conditions will not preclude access to close the valves and that this action will prevent the release of radioactivity outside the containment.

Double isolation valves are provided on lines penetrating the primary containment and open to the free space of the containment. Closure of one of the valves in each line would be sufficient to maintain the integrity of the pressure suppression system. Automatic initiation is required to minimize the potential leakage paths from the containment in the event of a LOCA.

Group 1 - Process lines are isolated by reactor vessel low water level ($\geq 398''$) in order to allow for removal of decay heat subsequent to a scram, yet isolate in time for proper operation of the core standby cooling systems. The valves in Group 1, except the reactor water sample line valves, are also closed when process instrumentation detects excessive main steam line flow, low pressure, or main steam space high temperature. The reactor water sample line valves isolate only on reactor low water level at $\geq 398''$.

Group 2 - Isolation valves are closed by reactor vessel low water level (538'') or high drywell pressure. The Group 2 isolation signal also "isolates" the reactor building and starts the standby gas treatment system. It is not desirable to actuate the Group 2 isolation signal by a transient or spurious signal.

Group 3 - Process lines are normally in use, and it is therefore not desirable to cause spurious isolation due to high drywell pressure resulting from nonsafety related causes. To protect the reactor from a possible pipe break

3.7/4.7 BASES (Cont'd)

limited period of time while repairs are being made. If the system cannot be repaired within seven days, the reactor is shutdown and brought to Cold Shutdown within 24 hours or refueling operations are terminated.

Pressure drop across the combined HEPA filters and charcoal adsorbers of less than six inches of water at the system design flow rate will indicate that the filters and adsorbers are not clogged by excessive amounts of foreign matter. Pressure drop should be determined at least once per operating cycle to show system performance capability.

The frequency of tests and sample analysis are necessary to show that the HEPA filters and charcoal adsorbers can perform as evaluated. Tests of the charcoal adsorbers with halogenated hydrocarbon shall be performed in accordance with USAEC Report-1082. Iodine removal efficiency tests shall follow ASTM D3803-89. The charcoal adsorber efficiency test procedures should allow for the removal of one adsorber tray, emptying of one bed from the tray, mixing the adsorbent thoroughly and obtaining at least two samples. Each sample should be at least two inches in diameter and a length equal to the thickness of the bed. If test results are unacceptable, all adsorbent in the system shall be replaced with an adsorbent qualified according to Table 1 of Regulatory Guide 1.52. The replacement tray for the adsorber tray removed for the test should meet the same adsorbent quality. Tests of the HEPA filters with DOP aerosol shall be performed in accordance to ANSI N510-1975. Any HEPA filters found defective shall be replaced with filters qualified pursuant to Regulatory Position C.3.d of Regulatory Guide 1.52.

Operation of the system for 10 hours every month will demonstrate OPERABILITY of the filters and adsorber system and remove excessive moisture built up on the adsorber.

If significant painting, fire or chemical release occurs such that the HEPA filter or charcoal adsorber could become contaminated from the fumes, chemicals or foreign materials, the same tests and sample analysis shall be performed as required for operational use. The determination of significance shall be made by the operator on duty at the time of the incident. Knowledgeable staff members should be consulted prior to making this determination.

Demonstration of the automatic initiation capability is necessary to assure system performance capability.

3.7.F/4.7.F Primary Containment Purge System

The Primary Containment Purge System is a non-safety related system that is normally isolated and normally not required to be functional during power operation. The system is designed to provide the preferred exhaust path for purging the primary containment system; however, the Standby Gas Treatment System can be used to perform the equivalent function.

3.7/4.7 BASES (Cont'd)

When the Primary Containment Purge System is in operation, the exhaust from the primary containment is first processed by a filter train assembly and then channeled through the reactor building roof exhaust system.

The filter train assembly contains a HEPA (high efficiency particulate air) filter, charcoal adsorber, and centrifugal fan. In-place tests are performed to ensure leak tightness of the filter train assembly of at least 99% and a HEPA efficiency of at least 99% removal of DOP particulates. Laboratory tests are performed on adsorber carbon samples to ensure an 85% removal efficiency for radioactive methyl iodide. Tests are performed to ensure that the system is not operating at a flow significantly different from the design flow, which may affect the removal efficiency of the HEPA filters and charcoal adsorbers. The pressure drop across the combined HEPA filters and charcoal adsorbers is checked once per operating cycle to be less than 8.5 inches of water at the system design flow rate to ensure that the filters and adsorbers are not clogged with excessive amounts of foreign matter.

The above tests are necessary to show that the HEPA filters and charcoal adsorbers can perform as evaluated. Tests of the charcoal adsorbers with halogenated hydrocarbon shall be performed in accordance with USAEC Report-1082. Iodine removal efficiency tests shall follow ASTM D3803-89. The charcoal adsorber efficiency test procedures should allow for the removal of one adsorber tray, emptying of one bed from the tray, mixing the adsorbent thoroughly and obtaining at least two samples. Each sample should be at least two inches in diameter and a length equal to the thickness of the bed. If test results are unacceptable, all adsorbent in the system shall be replaced with an adsorbent qualified according to Table 1 of Regulatory Guide 1.52. The replacement tray for the adsorber tray removed for the test should meet the same adsorbent quality. Tests of the HEPA filters with DOP aerosol shall be performed in accordance to ANSI N510-1975. Any HEPA filters found defective shall be replaced with filters qualified pursuant to Regulatory Position C.3.d of Regulatory Guide 1.52.

If significant painting, fire, or chemical release occurs such that the HEPA filter or charcoal adsorber could become contaminated from the fumes, chemicals, or foreign materials, the same tests and sample analysis shall be performed as required for operational use. The determination of significance shall be made by the operator on duty at the time of the incident. Knowledgeable staff members should be consulted prior to making this determination.

The primary containment isolation valves associated with the purging of the primary containment are FCV 64-17, 64-18, 64-19, 64-29, 64-30, 64-32, 64-33, and 76-24. These valves may be open for a 24-hour period after entering the RUN mode and/or for a 24-hour period prior to entering the SHUTDOWN mode. Closure of these large diameter valves within the 24-hour period is needed to



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

TENNESSEE VALLEY AUTHORITY

DOCKET NO. 50-296

BROWNS FERRY NUCLEAR PLANT, UNIT 3

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 188
License No. DPR-68

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

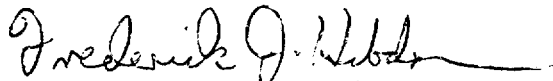
2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment and paragraph 2.C.(2) of Facility Operating License No. DPR-68 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 188, 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 30 days from the date of issuance.

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: February 13, 1995

ATTACHMENT TO LICENSE AMENDMENT NO. 188

FACILITY OPERATING LICENSE NO. DPR-68

DOCKET NO. 50-296

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. Overleaf* pages are provided to maintain document completeness.

REMOVE

3.7/4.7-13
3.7/4.7-14
3.7/4.7-19
3.7/4.7-20
3.7/4.7-21
3.7/4.7-22
3.7/4.7-32
3.7/4.7-33
3.7/4.7-36
3.7/4.7-37

INSERT

3.7/4.7-13*
3.7/4.7-14
3.7/4.7-19
3.7/4.7-20*
3.7/4.7-21
3.7/4.7-22*
3.7/4.7-32
3.7/4.7-33*
3.7/4.7-36
3.7/4.7-37

3.7/4.7 CONTAINMENT SYSTEMS

LIMITING CONDITIONS FOR OPERATION

SURVEILLANCE REQUIREMENTS

3.7.B. Standby Gas Treatment System

1. Except as specified in Specification 3.7.B.3 below, all three trains of the standby gas treatment system shall be OPERABLE at all times when secondary containment integrity is required.

4.7.B. Standby Gas Treatment System

1. At least once per year, the following conditions shall be demonstrated.
- a. Pressure drop across the combined HEPA filters and charcoal adsorber banks is less than 6 inches of water at a flow of 9000 cfm ($\pm 10\%$).
 - b. The inlet heaters on each circuit are tested in accordance with ANSI N510-1975, and are capable of an output of at least 40 kW.
 - c. Air distribution is uniform within 20% across HEPA filters and charcoal adsorbers.

3.7/4.7 CONTAINMENT SYSTEMS

LIMITING CONDITIONS FOR OPERATION

3.7.B. Standby Gas Treatment System

2. a. The results of the in-place cold DOP and halogenated hydrocarbon tests at $\geq 10\%$ design flow on HEPA filters and charcoal adsorber banks shall show $\geq 99\%$ DOP removal and $\geq 99\%$ halogenated hydrocarbon removal when tested in accordance with ANSI N510-1975.

b. The results of laboratory carbon sample analysis shall show $\geq 90\%$ radioactive methyl iodide removal when tested in accordance with ASTM D3803.

c. System shall be shown to operate within $\pm 10\%$ design flow.

SURVEILLANCE REQUIREMENTS

4.7.B. Standby Gas Treatment System

2. a. The tests and sample analysis of Specification 3.7.B.2 shall be performed at least once per operating cycle or once every 18 months whichever occurs first for standby service or after every 720 hours of system operation and following significant painting, fire, or chemical release in any ventilation zone communicating with the system.

b. Cold DOP testing shall be performed after each complete or partial replacement of the HEPA filter bank or after any structural maintenance on the system housing.

c. Halogenated hydrocarbon testing shall be performed after each complete or partial replacement of the charcoal adsorber bank or after any structural maintenance on the system housing.

3.7/4.7 CONTAINMENT SYSTEMS

LIMITING CONDITIONS FOR OPERATION

3.7.E. Control Room Emergency Ventilation

1. Except as specified in Specification 3.7.E.3 below, both control room emergency pressurization systems shall be OPERABLE at all times when any reactor vessel contains irradiated fuel.

2. a. The results of the in-place cold DOP and halogenated hydrocarbon tests at design flows on HEPA filters and charcoal adsorber banks shall show $\geq 99\%$ DOP removal and $\geq 99\%$ halogenated hydrocarbon removal when tested in accordance with ANSI N510-1975.

- b. The results of laboratory carbon sample analysis shall show $\geq 90\%$ radioactive methyl iodide removal at a velocity when tested in accordance with ASTM D3803.

SURVEILLANCE REQUIREMENTS

4.7.E Control Room Emergency Ventilation

1. At least once every 18 months, the pressure drop across the combined HEPA filters and charcoal adsorber banks shall be demonstrated to be less than 6 inches of water at system design flow rate ($\pm 10\%$).

2. a. The tests and sample analysis of Specification 3.7.E.2 shall be performed at least once per operating cycle or once every 18 months, whichever occurs first for standby service or after every 720 hours of system operation and following significant painting, fire, or chemical release in any ventilation zone communicating with the system.

- b. Cold DOP testing shall be performed after each complete or partial replacement of the HEPA filter bank or after any structural maintenance on the system housing.

3.7/4.7 CONTAINMENT SYSTEMS

LIMITING CONDITIONS FOR OPERATION

3.7.E. Control Room Emergency Ventilation

c. System flow rate shall be shown to be within $\pm 10\%$ design flow when tested in accordance with ANSI N510-1975.

† 3. From and after the date that one of the control room emergency pressurization systems is made or found to be inoperable for any reason, REACTOR POWER OPERATIONS or refueling operations are permissible only during the succeeding 7 days unless such circuit is sooner made OPERABLE.

† 4. If these conditions cannot be met, reactor shutdown shall be initiated and all reactors shall be in COLD SHUTDOWN within 24 hours for REACTOR POWER OPERATIONS and refueling operations shall be terminated within 2 hours.

†

SURVEILLANCE REQUIREMENTS

4.7.E. Control Room Emergency Ventilation

c. Halogenated hydrocarbon testing shall be performed after each complete or partial replacement of the charcoal adsorber bank or after any structural maintenance on the system housing.

d. Each circuit shall be operated at least 10 hours every month.

3. At least once every 18 months, automatic initiation of the control room emergency pressurization system shall be demonstrated.

4. During the simulated automatic actuation test of this system (see Table 4.2.G), it shall be verified that the necessary dampers operate as required.

3.7/4.7 CONTAINMENT SYSTEMS

LIMITING CONDITIONS FOR OPERATION

3.7.F. Primary Containment Purge System

1. The primary containment purge system shall be OPERABLE for PURGING, except as specified in 3.7.F.2.
 - a. The results of the in-place cold DOP and halogenated hydrocarbon tests at design flows on HEPA filters and charcoal adsorber banks shall show $\geq 99\%$ DOP removal and $\geq 99\%$ halogenated hydrocarbon removal when tested in accordance with ANSI N510-1975.
 - b. The results of laboratory carbon sample analysis shall show $\geq 85\%$ radioactive methyl iodide removal when tested in accordance with ASTM D3803.
 - c. System flow rate shall be shown to be within $\pm 10\%$ of design flow when tested in accordance with ANSI N510-1975.
2. If the provisions of 3.7.F.1.a, b, and c cannot be met, the system shall be declared inoperable. The provisions of Technical Specification 1.C.1 do not apply. PURGING may continue using the Standby Gas Treatment System.
3. a. The 18-inch primary containment isolation valves associated with PURGING may be open during the RUN mode for a 24-hour period after entering the RUN mode and/or for a 24-hour period prior to entering the SHUTDOWN mode. The OPERABILITY of

SURVEILLANCE REQUIREMENTS

4.7.F. Primary Containment Purge System

1. At least once every 18 months, the pressure drop across the combined HEPA filters and charcoal adsorber banks shall be demonstrated to be less than 8.5 inches of water at system design flow rate ($\pm 10\%$).
 - a. The tests and sample analysis of Specification 3.7.F.1 shall be performed at least once per operating cycle or once every 18 months, whichever occurs first or after 720 hours of system operation and following significant painting, fire, or chemical release in any ventilation zone communicating with the system.
 - b. Cold DOP testing shall be performed after each complete or partial replacement of the HEPA filter bank or after any structural maintenance on the system housing.
 - c. Halogenated hydrocarbon testing shall be performed after each complete or partial replacement of the charcoal adsorber bank or after any structural maintenance on the system housing.

3.7/4.7 CONTAINMENT SYSTEMS

LIMITING CONDITIONS FOR OPERATION

SURVEILLANCE REQUIREMENTS

3.7.F. Primary Containment Purge System

4.7.F. Primary Containment Purge System

3.7.F.3 (Continued)

these primary containment isolation valves is governed by Technical Specification 3.7.D.

- b. Pressure control of the containment is normally performed by VENTING through 2-inch primary containment isolation valves which route effluent to the Standby Gas Treatment System. The OPERABILITY of these primary containment isolation valves is governed by Technical Specification 3.7.D.

3.7.G. Containment Atmosphere Dilution System (CAD)

4.7.G. Containment Atmosphere Dilution System (CAD)

- 1. The Containment Atmosphere Dilution (CAD) System shall be OPERABLE with:

- a. Two independent systems capable of supplying nitrogen to the drywell and torus.
- b. A minimum supply of 2,500 gallons of liquid nitrogen per system.

- 1. System Operability

- a. Cycle each solenoid operated air/nitrogen valve through at least one complete cycle of full travel in accordance with Specification 1.0.MM, and at least once per month verify that each manual valve in the flow path is open.
- b. Verify that the CAD System contains a minimum supply of 2,500 gallons of liquid nitrogen twice per week.

3.7/4.7 BASES (Cont'd)

containment is opened for refueling. Periodic testing gives sufficient confidence of reactor building integrity and standby gas treatment system performance capability.

The test frequencies are adequate to detect equipment deterioration prior to significant defects, but the tests are not frequent enough to load the filters, thus reducing their reserve capacity too quickly. That the testing frequency is adequate to detect deterioration was demonstrated by the tests which showed no loss of filter efficiency after two years of operation in the rugged shipboard environment on the US Savannah (ORNL 3726). Pressure drop across the combined HEPA filters and charcoal adsorbers of less than six inches of water at the system design flow rate will indicate that the filters and adsorbers are not clogged by excessive amounts of foreign matter. Heater capability, pressure drop and air distribution should be determined at least once per operating cycle to show system performance capability.

The frequency of tests and sample analysis are necessary to show that the HEPA filters and charcoal adsorbers can perform as evaluated. Tests of the charcoal adsorbers with halogenated hydrocarbon refrigerant shall be performed in accordance with USAEC Report DP-1082. Iodine removal efficiency tests shall follow ASTM D3803-89. The charcoal adsorber efficiency test procedures should allow for the removal of one adsorber tray, emptying of one bed from the tray, mixing the adsorbent thoroughly and obtaining at least two samples. Each sample should be at least two inches in diameter and a length equal to the thickness of the bed. If test results are unacceptable, all adsorbent in the system shall be replaced with an adsorbent qualified according to Table 1 of Regulatory Guide 1.52. The replacement tray for the adsorber tray removed for the test should meet the same adsorbent quality. Tests of the HEPA filters with DOP aerosol shall be performed in accordance to ANSI N510-1975. Any HEPA filters found defective shall be replaced with filters qualified pursuant to Regulatory Position C.3.d of Regulatory Guide 1.52.

All elements of the heater should be demonstrated to be functional and OPERABLE during the test of heater capacity. Operation of each filter train for a minimum of 10 hours each month will prevent moisture buildup in the filters and adsorber system.

With doors closed and fan in operation, DOP aerosol shall be sprayed externally along the full linear periphery of each respective door to check the gasket seal. Any detection of DOP in the fan exhaust shall be considered an unacceptable test result and the gaskets repaired and test repeated.

If significant painting, fire or chemical release occurs such that the HEPA filter or charcoal adsorber could become contaminated from the fumes, chemicals or foreign material, the same tests and sample analysis shall be performed as required for operational use. The determination of significance shall be made by the operator on duty at the time of the incident. Knowledgeable staff members should be consulted prior to making this determination.

3.7/4.7 BASES (Cont'd)

Demonstration of the automatic initiation capability and OPERABILITY of filter cooling is necessary to assure system performance capability. If one standby gas treatment system is inoperable, the other systems must be tested daily. This substantiates the availability of the OPERABLE systems and thus reactor operation and refueling operation can continue for a limited period of time.

3.7.D/4.7.D Primary Containment Isolation Valves

The Browns Ferry Containment Leak Rate Program and Procedures contains the list of all the Primary Containment Isolation Valves for which the Technical Specification requirements apply. The procedures are subject to the change control provisions for plant procedures in the administrative controls section of the Technical Specifications. The opening of locked or sealed closed containment isolation valves on an intermittent basis under administrative control includes the following considerations: (1) stationing an operator, who is in constant communication with the control room, at the valve controls, (2) instructing this operator to close these valves in an accident situation, and (3) assuring that environmental conditions will not preclude access to close the valves and that this action will prevent the release of radioactivity outside the containment.

Double isolation valves are provided on lines penetrating the primary containment and open to the free space of the containment. Closure of one of the valves in each line would be sufficient to maintain the integrity of the pressure suppression system. Automatic initiation is required to minimize the potential leakage paths from the containment in the event of a LOCA.

Group 1 - Process lines are isolated by reactor vessel low water level (378") in order to allow for removal of decay heat subsequent to a scram, yet isolate in time for proper operation of the core standby cooling systems. The valves in Group 1, except the reactor water sample line valves, are also closed when process instrumentation detects excessive main steam line flow, low pressure, or main steam space high temperature. The reactor water sample line valves isolate only on reactor low water level at 378".

Group 2 - Isolation valves are closed by reactor vessel low water level (538") or high drywell pressure. The Group 2 isolation signal also "isolates" the reactor building and starts the standby gas treatment system. It is not desirable to actuate the Group 2 isolation signal by a transient or spurious signal.

Group 3 - Process lines are normally in use, and it is therefore not desirable to cause spurious isolation due to high drywell pressure resulting from nonsafety related causes. To protect the reactor from a possible pipe break

3.7/4.7 BASES (Cont'd)

limited period of time while repairs are being made. If the system cannot be repaired within seven days, the reactor is shutdown and brought to Cold Shutdown within 24 hours or refueling operations are terminated.

Pressure drop across the combined HEPA filters and charcoal adsorbers of less than six inches of water at the system design flow rate will indicate that the filters and adsorbers are not clogged by excessive amounts of foreign matter. Pressure drop should be determined at least once per operating cycle to show system performance capability.

The frequency of tests and sample analysis are necessary to show that the HEPA filters and charcoal adsorbers can perform as evaluated. Tests of the charcoal adsorbers with halogenated hydrocarbon shall be performed in accordance with USAEC Report-1082. Iodine removal efficiency tests shall follow ASTM D3803-89. The charcoal adsorber efficiency test procedures should allow for the removal of one adsorber tray, emptying of one bed from the tray, mixing the adsorbent thoroughly and obtaining at least two samples. Each sample should be at least two inches in diameter and a length equal to the thickness of the bed. If test results are unacceptable, all adsorbent in the system shall be replaced with an adsorbent qualified according to Table 1 of Regulatory Guide 1.52. The replacement tray for the adsorber tray removed for the test should meet the same adsorbent quality. Tests of the HEPA filters with DOP aerosol shall be performed in accordance to ANSI N510-1975. Any HEPA filters found defective shall be replaced with filters qualified pursuant to Regulatory Position C.3.d of Regulatory Guide 1.52.

Operation of the system for 10 hours every month will demonstrate OPERABILITY of the filters and adsorber system and remove excessive moisture built up on the adsorber.

If significant painting, fire or chemical release occurs such that the HEPA filter or charcoal adsorber could become contaminated from the fumes, chemicals or foreign materials, the same tests and sample analysis shall be performed as required for operational use. The determination of significance shall be made by the operator on duty at the time of the incident. Knowledgeable staff members should be consulted prior to making this determination.

Demonstration of the automatic initiation capability is necessary to assure system performance capability.

3.7.F/4.7.F Primary Containment Purge System

The Primary Containment Purge System is a non-safety related system that is normally isolated and normally not required to be functional during power operation. The system is designed to provide the preferred exhaust path for purging the primary containment system; however, the Standby Gas Treatment System can be used to perform the equivalent function.

3.7/4.7 BASES (Cont'd)

When the Primary Containment Purge System is in operation, the exhaust from the primary containment is first processed by a filter train assembly and then channeled through the reactor building roof exhaust system.

The filter train assembly contains a HEPA (high efficiency particulate air) filter, charcoal adsorber, and centrifugal fan. In-place tests are performed to ensure leak tightness of the filter train assembly of at least 99% and a HEPA efficiency of at least 99% removal of DOP particulates. Laboratory tests are performed on adsorber carbon samples to ensure an 85% removal efficiency for radioactive methyl iodide. Tests are performed to ensure that the system is not operating at a flow significantly different from the design flow, which may affect the removal efficiency of the HEPA filters and charcoal adsorbers. The pressure drop across the combined HEPA filters and charcoal adsorbers is checked once per operating cycle to be less than 8.5 inches of water at the system design flow rate to ensure that the filters and adsorbers are not clogged with excessive amounts of foreign matter.

The above tests are necessary to show that the HEPA filters and charcoal adsorbers can perform as evaluated. Tests of the charcoal adsorbers with halogenated hydrocarbon shall be performed in accordance with USAEC Report-1082. Iodine removal efficiency tests shall follow ASTM D3803-89. The charcoal adsorber efficiency test procedures should allow for the removal of one adsorber tray, emptying of one bed from the tray, mixing the adsorbent thoroughly and obtaining at least two samples. Each sample should be at least two inches in diameter and a length equal to the thickness of the bed. If test results are unacceptable, all adsorbent in the system shall be replaced with an adsorbent qualified according to Table 1 of Regulatory Guide 1.52. The replacement tray for the adsorber tray removed for the test should meet the same adsorbent quality. Tests of the HEPA filters with DOP aerosol shall be performed in accordance to ANSI N510-1975. Any HEPA filters found defective shall be replaced with filters qualified pursuant to Regulatory Position C.3.d of Regulatory Guide 1.52.

If significant painting, fire, or chemical release occurs such that the HEPA filter or charcoal adsorber could become contaminated from the fumes, chemicals, or foreign materials, the same tests and sample analysis shall be performed as required for operational use. The determination of significance shall be made by the operator on duty at the time of the incident. Knowledgeable staff members should be consulted prior to making this determination.

The primary containment isolation valves associated with the purging of the primary containment are FCV 64-17, 64-18, 64-19, 64-29, 64-30, 64-32, 64-33, and 76-24. These valves may be open for a 24-hour period after entering the RUN mode and/or for a 24-hour period prior to entering the SHUTDOWN mode. Closure of these large diameter valves within the 24-hour period is needed to



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 215 TO FACILITY OPERATING LICENSE NO. DPR-33

AMENDMENT NO. 231 TO FACILITY OPERATING LICENSE NO. DPR-52

AMENDMENT NO. 188 TO FACILITY OPERATING LICENSE NO. DPR-68

TENNESSEE VALLEY AUTHORITY

BROWNS FERRY NUCLEAR PLANT, UNITS 1, 2, AND 3

DOCKET NOS. 50-259, 50-260, AND 50-296

1.0 INTRODUCTION

In a letter dated September 29, 1993, the Tennessee Valley Authority (the licensee) requested amendments for the Technical Specifications (TS) for the Browns Ferry Nuclear Plant (BFN) Units 1, 2 and 3. The licensee proposed a change to the BFN Units 1, 2, and 3 TS 3.7.B.2.b, 3.7.E.2.b and 3.7.F.2.b and their corresponding Bases. These TSs address the laboratory testing of Engineered Safety Feature (ESF) ventilation systems. At Browns Ferry, these systems are the standby gas treatment (SGT), the control room emergency ventilation, and containment purge. The licensee proposed to delete those aspects of the TSs which reference the temperature and relative humidity at which the laboratory test of the charcoal contained in these ESF systems is conducted. The modified TSs would reference only the test protocol, ASTM D3803. The Bases would specify the 1989 version of ASTM D3803 as the test protocol to be utilized in the conduct of the laboratory test.

2.0 EVALUATION

BFN Unit 1, 2, and 3 TSs 3.7.B.2.b, 3.7.E.2.b and 3.7.F.2.b currently require the performance of a laboratory analysis on the charcoal contained in ESF ventilation system filtration units. As a result of an NRC issued Notice of Violation in February 1986, the licensee proposed TS for BFN which stipulated that the laboratory test of charcoal in ESF systems would be performed in accordance with ASTM D3803-1979, and that the test would be conducted at a temperature of 130°C and a relative humidity of 95%. Amendments to the Browns Ferry licenses granting this change were issued in March 1988.

Information Notice (IN) 86-76, "Problems Noted in Control Room Emergency Ventilation Systems," indicated that laboratory testing of charcoal at a temperature higher than that expected during the course of an accident could result in an overprediction of the capability of the charcoal to remove methyl iodine. The 1979 version of ASTM D3803 had three test temperatures for the performance of the laboratory test of charcoal: 30°C, 80°C and 130°C. The test temperature which is most limiting when predicting the capability of charcoal to remove methyl iodine is 30°C.

ENCLOSURE 4

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Accidents associated with the operation of the BFN ESF ventilation systems could result in actual accident conditions where the limiting temperature is closest to the 30°C. In IN 87-32, "Deficiencies in the Testing of Nuclear-Grade Activated Charcoal," problems associated with the use of test protocol of ASTM D3803-1979 were delineated. The licensee has chosen to address the problems noted by these two INs by switching to the 1989 version of ASTM D3803. In this version, there is only one test temperature, 30°C, and the only relative humidity condition is 95%. The licensee stated that testing in accordance with the 1989 standard would result in a more realistic prediction of the charcoal capability.

The staff has reviewed the licensee's proposed change. The staff agrees that the proposed change to the BFN TSs will result in a more realistic assessment of the capability of the charcoal to remove methyl iodine. Therefore, the staff finds the proposed change acceptable.

3.0 STATE CONSULTATION

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

4.0 ENVIRONMENTAL CONSIDERATION

The amendments change requirements with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 and changes the surveillance requirements. 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 67862). 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 upon 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, and (2) such activities will be conducted in compliance with the Commission's regulations, and (3) issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributor: John J. Hayes

Dated: February 13, 1995