

JANUARY 14 1980

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

Mr. Hugh G. Parris  
Manager of Power  
Tennessee Valley Authority  
500 A Chestnut Street, Tower II  
Chattanooga, Tennessee 37401

Dear Mr. Parris:

The Commission has issued the enclosed Amendment Nos. 56, 51 and 29 to Facility Licenses Nos. DPR-33, DPR-52 and DPR-68 for the Browns Ferry Nuclear Plant, Units Nos. 1, 2 and 3. These amendments are in response to your letter of January 14, 1980 (TVA BFNP TS 135).

These amendments change the Technical Specifications to permit operation of Unit No. 3 while Unit No. 1 is down for refueling by providing a temporary second off-site power source to the Unit No. 3 4-KV shutdown boards through the 4-KV bus tie board.

Copies of the Safety Evaluation and Notice of Issuance are also enclosed.

Sincerely,

*for V. Rooney*

Thomas A. Ippolito, Chief  
Operating Reactors Branch #3  
Division of Operating Reactors

Enclosures:

1. Amendment No. 56 to DPR-33
2. Amendment No. 51 to DPR-52
3. Amendment No. 29 to DPR-68
4. Safety Evaluation
5. Notice

cc w/enclosures:  
See next page

*CP* *GD*

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Distribution

- ✓ Docket
- ORB #3
- NRR Reading
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- OI&E (5)
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- ACRS (16)
- CMiles
- RDiggs
- TERA
- JRBuchanan

OFFICE ▶	ORB #3	ORB #3	AD:ORP	OELD	ORB #3
SURNAME ▶	SSheppard	RClark:mjf	WGammitt		Tippolito
DATE ▶	1/ /80	1/ /80	1/ /80	1/ /80	1/ /80

Mr. Hugh G. Parris  
Tennessee Valley Authority

- 2 -

January 14, 1980

cc:

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General Counsel  
Tennessee Valley Authority  
400 Commerce Avenue  
E 11B 33C  
Knoxville, Tennessee 37902

U. S. Environmental Protection  
Agency  
Region IV Office  
ATTN: EIS COORDINATOR  
345 Courtland Street  
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400 Chestnut Street, Tower II  
Chattanooga, Tennessee 37401

Mr. Robert F. Sullivan  
U. S. Nuclear Regulatory Commission  
P. O. Box 1863  
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Mr. Charles R. Christopher  
Chairman, Limestone County Commission  
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Athens, Alabama 35611

Ira L. Myers, M.D.  
State Health Officer  
State Department of Public Health  
State Office Building  
Montgomery, Alabama 36104

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Athens Public Library  
South and Forrest  
Athens, Alabama 35611

Director, Office of Urban & Federal  
Affairs  
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Nashville, Tennessee 37219

Director, Technical Assessment Division  
Office of Radiation Programs (AW-459)  
US EPA  
Crystal Mall #2  
Arlington, Virginia 20460



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

TENNESSEE VALLEY AUTHORITY

DOCKET NO. 50-259

BROWNS FERRY NUCLEAR PLANT, UNIT NO. 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 56  
License No. DPR-33

1. The Nuclear Regulatory Commission (the Commission) has found that:
  - A. The application for amendments by Tennessee Valley Authority (the licensee) dated January 14, 1980, 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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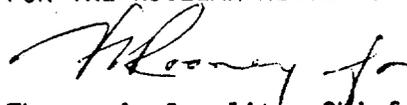
2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment and paragraph 2.C(2) of Facility License No. DPR-33 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 56, 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 the date of its issuance.

FOR THE NUCLEAR REGULATORY COMMISSION



Thomas A. Ippolito, Chief  
Operating Reactors Branch #3  
Division of Operating Reactors

Attachment:  
Changes to the Technical  
Specifications

Date of Issuance: January 14, 1980

ATTACHMENT TO LICENSE AMENDMENT NO. 56

FACILITY OPERATING LICENSE NO. DPR-33

DOCKET NO. 50-259

Revise Appendix A as follows:

1. Remove the following pages and replace with identically numbered pages:

292/293  
294/295  
296/297  
298/299

The underlined pages are those being changed; marginal lines on these pages indicate the area being revised. Overleaf pages are provided for convenience.

2. Add the following new page:

296a

**3.9 AUXILIARY ELECTRICAL SYSTEM**

Applicability

Applies to the auxiliary electrical power system.

Objective

To assure an adequate supply of electrical power for operation of those systems required for safety.

Specification

**A. Auxiliary Electrical Equipment**

A reactor shall not be started up (made critical) from the cold condition unless four units 1 and 2 diesel generators are operable, both 161-kV transmission lines, two common station service transformers

are operable, and the requirements of 3.9.A.4 through 3.9.A.7 are met.

A reactor shall not be started up (made critical) from the Hot Standby Condition unless all of the following conditions are satisfied:

1. At least one off-site 161-kV transmission line and its common transformer are available and capable of automatically supplying auxiliary power to the shutdown boards.
2. Three units 1 and 2 diesel generators shall be operable.
3. An additional source of power consisting of one of the following:
  - a. A second 161-kV transmission line and its

**4.9 AUXILIARY ELECTRICAL SYSTEM**

Applicability

Applies to the periodic testing requirements of the auxiliary electrical systems.

Objective

Verify the operability of the auxiliary electrical system.

Specification

**A. Auxiliary Electrical Equipment**

**1. Diesel Generators**

- a. Each diesel generator shall be manually started and loaded once each month to demonstrate operational readiness. The test shall continue for at least a one-hour period at 75% of rated load or greater.

During the monthly generator test the diesel generator starting air compressor shall be checked for operation and its ability to recharge air receivers. The operation of the diesel fuel oil transfer pumps shall be demonstrated, and the diesel starting time to reach rated voltage and speed shall be logged.

- b. Once per operating cycle a test will be conducted to demonstrate the emergency diesel generators will start and accept emergency load within

LIMITING CONDITIONS FOR OPERATION

3.9.A Auxiliary Electrical Equipment

common transformer

capable of supplying power to the shutdown boards.

- b. A fourth operable units 1 and 2 diesel generator.

4. Buses and Boards Available

- a. Start buses 1A and 1B are energized.

- b. The units 1 and 2 4-kV shutdown boards are energized.

- c. The 480-V shutdown boards associated with the unit are energized.

- d. Undervoltage relays operable on start buses 1A and 1B and 4-kV shutdown boards, A, B, C, and D.

- e. Shutdown buses 1 & 2 energized with each bus supplying no more than two units 1 & 2 shutdown boards and the bus tie board.

- 5. The 250-Volt unit and shutdown board batteries and a battery charger for each battery and associated battery boards are operable.

6. Logic Systems

- a. Common accident signal logic system is operable.

- b. 480-V load shedding logic system is operable.

- 7. There shall be a minimum of 103,300 gallons of diesel fuel in the standby diesel generator fuel tanks.

SURVEILLANCE REQUIREMENTS

4.9.A Auxiliary Electrical Equipment

the specified time sequence.

- c. Once a month the quantity of diesel fuel available shall be logged.

- d. Each diesel generator shall be given an annual inspection in accordance with instructions based on the manufacturer's recommendations.

- e. Once a month a sample of diesel fuel shall be checked for quality. The quality shall be within the acceptable limits specified in Table 1 of the latest revision to ASTM D975 and logged.

- 2. D.C. Power System - Unit Batteries (250-Volt) Diesel Generator Batteries (125-Volt) and Shutdown Board Batteries (250-Volt)

- a. Every week the specific gravity and the voltage of the pilot cell, and temperature of an adjacent cell and overall battery voltage shall be measured and logged.

- b. Every three months the measurements shall be made of voltage of each cell to nearest 0.1 volt, specific gravity of each cell, and temperature of every fifth cell. These measurements shall be logged.

- c. A battery rated discharge (capacity) test shall be performed and the voltage, time, and output current measurements shall be logged at intervals not to exceed 24 months.

1.9.A Auxiliary Electrical Equipment4.9.A Auxiliary Electrical Equipment

## 3. Logic Systems

- a. Both divisions of the common accident signal logic system shall be tested every 6 months to demonstrate that it will function on actuation of the core spray system of each reactor to provide an automatic start signal to all 4 units 1 and 2 diesel generators.
- b. Once every 6 months, the condition under which the 480-Volt load shedding logic system is required shall be simulated using pendant test switches and/or pushbutton test switches to demonstrate that the load shedding logic system would initiate load shedding signals on the diesel auxiliary boards, reactor MOV boards, and the 480-Volt shutdown boards.

## 4. Undervoltage Relays

- a. Once every 6 months, the condition under which the undervoltage relays are required shall be simulated with an undervoltage on start buses 1A and 1B to demonstrate that the diesel generators will start.
- b. Once every 6 months, the conditions under which the undervoltage relays are required shall be simulated with an undervoltage on each shutdown board to demonstrate that the associated diesel generator will start.
- c. The undervoltage relays which start the diesel generators from start buses 1A and 1B and the 4-kV shutdown boards, shall be calibrated annually for trip and reset and the measurements logged.

LIMITING CONDITIONS FOR OPERATION

3.9.B Operation with Inoperable Equipment

Whenever a reactor is in Startup mode or Run mode and not in a cold condition, the availability of electric power shall be as specified in 3.9.A, except as specified herein.

1. From and after the date that one 161-kV line or one common station transformer

or one start bus becomes inoperable, reactor operation is permissible under this condition for seven days.

2. When one of the units 1 and 2 diesel generator is inoperable, continued reactor operation is permissible during the succeeding 7 days, provided that both off-site 161-kV transmission lines and both common station transformers

are available, and all of the CS, RHR (LPCI and Containment Cooling) Systems, and the remaining three units 1 and 2 diesel generators are operable. If this requirement cannot be met, an orderly shutdown shall be initiated and both reactors shall be shutdown and in the cold condition within 24 hours.

SURVEILLANCE REQUIREMENTS

4.9.B Operation with Inoperable Equipment

1. When one 161-kV line or one common station transformer

or one start bus is found to be inoperable, all units 1 and 2 diesel generators and associated boards must be demonstrated to be operable immediately and daily thereafter.

2. When one of the units 1 and 2 diesel generator is found to be inoperable, all of the CS, RHR (LPCI and Containment Cooling) Systems and the remaining diesel generators and associated boards shall be demonstrated to be operable immediately and daily thereafter.

3.9.A Operation with Inoperable Equipment

3. When one units 1 and 2 4-kV shutdown board is inoperable, continued reactor operation is permissible for a period not to exceed 5 days, provided that both off-site 161-kV transmission lines and both common station transformers

are available and the remaining 4-kV shutdown boards and associated diesel generators, CS, RHR (LPCI and Containment Cooling) Systems, and all 480 V emergency power boards are operable. If this requirement cannot be met, an orderly shutdown shall be initiated and both reactors shall be shutdown and in the cold condition within 24 hours.

5. From and after the date that one of the three 250-volt unit batteries and/or its associated battery board is found to be inoperable for any reason, continued reactor operation is permissible during the succeeding seven days. Except for routine surveillance testing the NRC shall be notified within 24 hours of the situation, the precautions to be taken during this period and the plans to return the failed component to an operable state.
6. From and after the date that one of the four 250-volt shutdown

4.9.B Operation with Inoperable Equipment

3. When one 4-kV shutdown board is found to be inoperable, all remaining 4-kV shutdown boards and associated diesel generators, CS and RHR (LPCI and Containment Cooling) Systems supplies by the remaining 4-kV shutdown boards shall be demonstrated to be operable, immediately and daily thereafter.

LIMITING CONDITIONS FOR OPERATION

SURVEILLANCE REQUIREMENTS

3.9.B Operation with Inoperable Equipment

board batteries and/or its associated battery board is found to be inoperable for any reason, continued reactor operation is permissible during the succeeding five days in accordance with 3.9.B.5.

7. When one division of the Logic System is inoperable, continued reactor operation is permissible under this condition for seven days, provided the CSCS requirements listed in specification 3.9.B.2 are satisfied. The NRC shall be notified within 24 hours of the situation, the precautions to be taken during this period and the plans to return the failed component to an operable state.

4.9.B Operation with Inoperable Equipment

LIMITING CONDITIONS FOR OPERATION

SURVEILLANCE REQUIREMENTS

- 4. From and after the date that one 4 KV shutdown bus is inoperable, continued reactor operation is permissible for a period of 7 days provided the following conditions are satisfied:
  - a. The bus tie board is immediately de-energized if supplied from a shutdown bus.
  - b. The breakers to the bus tie board from the shutdown busses are racked out and placed under administrative control within 2 hours.
  - c. The remaining shutdown bus is operable.

- 4. When one shutdown bus is found to be inoperable the following will be verified immediately.
  - a. The remaining shutdown bus is energized.
  - b. The unit 3 bus tie board is disconnected from the shutdown bus by opening the supply breaker.

**3.9.C Operation in Cold Shutdown**

Whenever both reactors are in cold shutdown condition with irradiated fuel in either reactor, the availability of electric power shall be as specified in section 3.9.A except as specified herein.

1. At least two units 1 and 2 diesel generators and their associated 4-kV shutdown boards shall be operable.
2. An additional source of power consisting of at least one of the following:
  - a. One 161-kV transmission line and its associated common station transformer  
  
capable of supplying power to the Units 1 and 2 shutdown boards.
  - b. A third operable diesel generator.
3. At least one 480-V shutdown board for each unit must be operable.

### 3.9 BASES

The objective of this specification is to assure an adequate source of electrical power to operate facilities to cool the plant during shutdown and to operate the engineered safeguards following an accident. There are three sources of alternating current electrical energy available, namely, the 161-kV transmission system, the nuclear generating units, and the diesel generators.

The 161-kV offsite power supply consists of two lines which are fed from different sections of the TVA 161-kV grid. In the normal mode of operation, the 161-kV system is operating and four diesel generators are operational. If one diesel generator is out of service, there normally remain the 161-kV sources, the nuclear generating units, and the other three diesel generators. For a diesel generator to be considered operable its associated 125 V battery must be operable.

The minimum fuel oil requirement of 103,300 gallons is sufficient for 7 days of full load operation of 3 diesels and is conservatively based on availability of a replenishment supply.

Auxiliary power for Browns Ferry Nuclear Plant is supplied from two sources; either the unit station transformers or from the 161-kV transmission system through the common station transformers. If a common station transformer is lost, the units can continue to operate since the unit station transformers are in service, the other common station transformer and four diesel generators are operational.

The shutdown busses distribute power to the shutdown boards and allow for flexibility to the offsite power circuits. The shutdown busses will temporarily supply the bus tie board until normal supply is restored, but no later than 2/2/80. The capacity of the shutdown bus is such that any four shutdown boards can be supplied and provide adequate power for the designed basis accident. In the event a shutdown bus is lost, unit 3 bus tie board will be disconnected to ensure no more than four shutdown boards are supplied.

A 4-kV shutdown board is allowed to be out of operation for a brief period to allow for maintenance and testing, providing all remaining 4-kV shutdown boards and associated diesel generators CS, RHR, (LPCI and Containment Cooling) Systems supplied by the remaining 4-kV shutdown boards, and all emergency 480 V power boards are operable.

There are eight 250-volt d-c battery systems each of which consists of a battery, battery charger, and distribution equipment. Three of these systems provide power for unit control functions, operative power for unit motor loads, and alternative drive power for a 115-volt a-c unit preferred motor-generator set. One 250-volt d-c system provides power for common plant and transmission system control functions, drive power for a 115-volt a-c plant preferred motor-generator set, and emergency drive power for certain unit large motor loads. The four remaining systems deliver control power to the 4160-volt shutdown boards.



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

TENNESSEE VALLEY AUTHORITY

DOCKET NO. 50-260

BROWNS FERRY NUCLEAR PLANT, UNIT NO. 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 51  
License No. DPR-52

1. The Nuclear Regulatory Commission (the Commission) has found that:
  - A. The application for amendments by Tennessee Valley Authority (the licensee) dated January 14, 1980, 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.

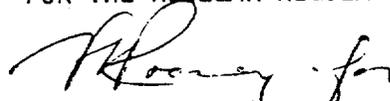
2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment and paragraph 2.C(2) of Facility License No. DPR-52 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 51, 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 the date of its issuance.

FOR THE NUCLEAR REGULATORY COMMISSION



Thomas A. Ippolito, Chief  
Operating Reactors Branch #3  
Division of Operating Reactors

Attachment:  
Changes to Technical  
Specifications

Date of Issuance: January 14, 1980

ATTACHMENT TO LICENSE AMENDMENT NO. 51

FACILITY OPERATING LICENSE NO. DPR-52

DOCKET NO. 50-260

Revise Appendix A as follows:

1. Remove the following pages and replace with identically numbered pages:

291/292  
293/294

295/296  
297/298

299/300

The underlined pages are those being changes; marginal lines on these pages indicate the area being revised. Overleaf pages are provided for convenience.

2. Add the following new page:

296a

### 3.8.C/4.8.C Mechanical Vacuum Pump

The purpose of isolating the mechanical vacuum pump line is to limit the release of activity from the main condenser. During an accident, fission products would be transported from the reactor through the main steam line to the condenser. The fission product radioactivity would be sensed by the main steam line radioactivity monitors which initiate isolation.

### 4.8.A and 4.8.B BASES

The surveillance requirements given under Specification 4.8.A and 4.8.B provide assurance that liquid and gaseous wastes are properly controlled and monitored during any release of radioactive materials in the liquid and gaseous effluents. These surveillance requirements provide the data for the licensee and the Commission to evaluate the station's performance relative to radioactive wastes released to the environment. Reports on the quantities of radioactive materials released in effluents shall be furnished to the Commission on the basis of Section 6 of these technical specifications. On the basis of such reports and any additional information the Commission may obtain from the licensee or others, the Commission may from time to time require the licensee to take such actions as the Commission deems appropriate.

### 3.8.D and 4.8.D BASES

The objective of this specification is to assure that leakage from byproduct, source, and special nuclear radioactive material sources does not exceed allowable limits.

**3.9** AUXILIARY ELECTRICAL SYSTEMApplicability

Applies to the auxiliary electrical power system.

Objective

To assure an adequate supply of electrical power for operation of those systems required for safety.

Specification**A.** Auxiliary Electrical Equipment

A reactor shall not be started up (made critical) from the cold condition unless four units 1 and 2 diesel generators are operable, both 161-kV transmission lines, two common station service transformers

are operable, and the requirements of 3.9.A.4 through 3.9.A.7 are met.

A reactor shall not be started up (made critical) from the Hot Standby Condition unless all of the following conditions are satisfied:

1. At least one off-site 161-kV transmission line and its common transformer are available and capable of automatically supplying auxiliary power to the shutdown boards.
2. Three units 1 and 2 diesel generators shall be operable.
3. An additional source of power consisting of one of the following:
  - a. A second 161-kV transmission line and its

**4.9** AUXILIARY ELECTRICAL SYSTEMApplicability

Applies to the periodic testing requirements of the auxiliary electrical systems.

Objective

Verify the operability of the auxiliary electrical system.

Specification**A.** Auxiliary Electrical Equipment**1.** Diesel Generators

- a. Each diesel generator shall be manually started and loaded once each month to demonstrate operational readiness. The test shall continue for at least a one-hour period at 75% of rated load or greater.

During the monthly generator test the diesel generator starting air compressor shall be checked for operation and its ability to recharge air receivers. The operation of the diesel fuel oil transfer pumps shall be demonstrated, and the diesel starting time to reach rated voltage and speed shall be logged.

- b. Once per operating cycle a test will be conducted to demonstrate the emergency diesel generators will start and accept emergency load within

**LIMITING CONDITIONS FOR OPERATION**

**SURVEILLANCE REQUIREMENTS**

**3.9.A Auxiliary Electrical Equipment**

common transformer

capable of supplying power to the shutdown boards.

- b. A fourth operable units 1 and 2 diesel generator.
- 4. Buses and Boards Available
  - a. Start buses 1A and 1B are energized.
  - b. The units 1 and 2 4-kV shutdown boards are energized.
  - c. The 480-V shutdown boards associated with the unit are energized.
  - d. Undervoltage relays operable on start buses 1A and 1B and 4-kV shutdown boards, A, B, C, and D.
  - e. Shutdown buses 1 & 2 energized with each bus supplying no more than two units 1 & 2 shutdown boards and the bus tie board.
- 5. The 250-Volt unit and shutdown board batteries and a battery charger for each battery and associated battery boards are operable.
- 6. Logic Systems
  - a. Common accident signal logic system is operable.
  - b. 480-V load shedding logic system is operable.
- 7. There shall be a minimum of 103,300 gallons of diesel fuel in the standby diesel generator fuel tanks.

**4.9.A Auxiliary Electrical Equipment**

the specified time sequence.

- c. Once a month the quantity of diesel fuel available shall be logged.
- d. Each diesel generator shall be given an annual inspection in accordance with instructions based on the manufacturer's recommendations.
- e. Once a month a sample of diesel fuel shall be checked for quality. The quality shall be within the acceptable limits specified in Table 1 of the latest revision to ASTM D975 and logged.
- 2. D.C. Power System - Unit Batteries (250-Volt) Diesel Generator Batteries (125-Volt) and Shutdown Board Batteries (250-Volt)
  - a. Every week the specific gravity and the voltage of the pilot cell, and temperature of an adjacent cell and overall battery voltage shall be measured and logged.
  - b. Every three months the measurements shall be made of voltage of each cell to nearest 0.1 volt, specific gravity of each cell, and temperature of every fifth cell. These measurements shall be logged.
  - c. A battery rated discharge (capacity) test shall be performed and the voltage, time, and output current measurements shall be logged at intervals not to exceed 24 months.

9.A Auxiliary Electrical Equipment

6.9.A Auxiliary Electrical Equipment

**3. Logic Systems**

- a. Both divisions of the common accident signal logic system shall be tested every 6 months to demonstrate that it will function on actuation of the core spray system of each reactor to provide an automatic start signal to all 4 units 1 and 2 diesel generators.
- b. Once every 6 months, the condition under which the 480-Volt load shedding logic system is required shall be simulated using pendant test switches and/or pushbutton test switches to demonstrate that the load shedding logic system would initiate load shedding signals on the diesel auxiliary boards, reactor MOV boards, and the 480-Volt shutdown boards.

**4. Undervoltage Relays**

- a. Once every 6 months, the condition under which the undervoltage relays are required shall be simulated with an undervoltage on start buses 1A and 1B to demonstrate that the diesel generators will start.
- b. Once every 6 months, the conditions under which the undervoltage relays are required shall be simulated with an undervoltage on each shutdown board to demonstrate that the associated diesel generator will start.
- c. The undervoltage relays which start the diesel generators from start buses 1A and 1B and the 4-kV shutdown boards, shall be calibrated annually for trip and reset and the measurements logged.

**3.9.3 Operation with Inoperable Equipment**

Whenever a reactor is in Startup mode or Run mode and not in a cold condition, the availability of electric power shall be as specified in 3.9.A, except as specified herein.

1. From and after the date that one 161-kV line or one common station transformer

or one start bus becomes inoperable, reactor operation is permissible under this condition for seven days.

2. When one of the units 1 and 2 diesel generator is inoperable, continued reactor operation is permissible during the succeeding 7 days, provided that both off-site 161-kV transmission lines and both common station transformers

are available, and all of the CS, RHR (LPCI and Containment Cooling) Systems, and the remaining three units 1 and 2 diesel generators are operable. If this requirement cannot be met, an orderly shutdown shall be initiated and both reactors shall be shutdown and in the cold condition within 24 hours.

**4.9.3 Operation with Inoperable Equipment**

1. When one 161-kV line or one common station transformer

or one start bus is found to be inoperable, all units 1 and 2 diesel generators and associated boards must be demonstrated to be operable immediately and daily thereafter.

2. When one of the units 1 and 2 diesel generator is found to be inoperable, all of the CS, RHR (LPCI and Containment Cooling) Systems and the remaining diesel generators and associated boards shall be demonstrated to be operable immediately and daily thereafter.

LIMITING CONDITIONS FOR OPERATION

SURVEILLANCE REQUIREMENTS

3.9.3 Operation with Inoperable Equipment

3. When one units 1 and 2 4-kV shutdown board is inoperable, continued reactor operation is permissible for a period not to exceed 5 days, provided that both off-site 161-kV transmission lines and both common station transformers

are available and the remaining 4-kV shutdown boards and associated diesel generators, CS, RHR (LPCI and Containment Cooling) Systems, and all 480 V emergency power boards are operable. If this requirement cannot be met, an orderly shutdown shall be initiated and both reactors shall be shutdown and in the cold condition within 24 hours.

5. From and after the date that one of the three 250-volt unit batteries and/or its associated battery board is found to be inoperable for any reason, continued reactor operation is permissible during the succeeding seven days. Except for routine surveillance testing the NRC shall be notified within 24 hours of the situation, the precautions to be taken during this period and the plans to return the failed component to an operable state.
6. From and after the date that one of the four 250-volt shutdown

4.9.3 Operation with Inoperable Equipment

3. When one 4-kV shutdown board is found to be inoperable, all remaining 4-kV shutdown boards and associated diesel generators, CS and RHR (LPCI and Containment Cooling) Systems supplies by the remaining 4-kV shutdown boards shall be demonstrated to be operable, immediately and daily thereafter.

LIMITING CONDITIONS FOR OPERATION

SURVEILLANCE REQUIREMENTS

- 4. From and after the date that one 4 V shutdown bus is inoperable, continued reactor operation is permissible for a period of 7 days provided the following conditions are satisfied:
  - a. The bus tie board is immediately de-energized if supplied from a shutdown bus.
  - b. The breakers to the bus tie board from the shutdown busses are racked out and placed under administrative control within 2 hours.
  - c. The remaining shutdown bus is operable.

- 4. When one shutdown bus is found to be inoperable the following will be verified immediately.
  - a. The remaining shutdown bus is energized.
  - b. The unit 3 bus tie board is disconnected from the shutdown bus by opening the supply breaker.

LIMITING CONDITIONS FOR OPERATION

SURVEILLANCE REQUIREMENTS

3.9.B Operation with Inoperable Equipment

board batteries and/or its associated battery board is found to be inoperable for any reason, continued reactor operation is permissible during the succeeding five days in accordance with 3.9.B.5.

7. When one division of the Logic System is inoperable, continued reactor operation is permissible under this condition for seven days, provided the CSCS requirements listed in specification 3.9.B.2 are satisfied. The NRC shall be notified within 24 hours of the situation, the precautions to be taken during this period and the plans to return the failed component to an operable state.

4.9.B Operation with Inoperable Equipment

**3.9.C Operation in Cold Shutdown**

Whenever both reactors are in cold shutdown condition with irradiated fuel in either reactor, the availability of electric power shall be as specified in section 3.9.A except as specified herein.

1. At least two units 1 and 2 diesel generators and their associated 4-kV shutdown boards shall be operable.
2. An additional source of power consisting of at least one of the following:
  - a. One 161-kV transmission line and its associated common station transformer  
  
capable of supplying power to the Units 1 and 2 shutdown boards.
  - b. A third operable diesel generator.
3. At least one 480-V shutdown board for each unit must be operable.

The objective of this specification is to assure an adequate source of electrical power to operate facilities to cool the plant during shutdown and to operate the engineered safeguards following an accident. There are three sources of alternating current electrical energy available, namely, the 161-kV transmission system, the nuclear generating units, and the diesel generators.

The 161-kV offsite power supply consists of two lines which are fed from different sections of the TVA 161-kV grid. In the normal mode of operation, the 161-kV system is operating and four diesel generators are operational. If one diesel generator is out of service, there normally remain the 161-kV sources, the nuclear generating units, and the other three diesel generators. For a diesel generator to be considered operable its associated 125 V battery must be operable.

The minimum fuel oil requirement of 103,300 gallons is sufficient for 7 days of full load operation of 3 diesels and is conservatively based on availability of a replenishment supply.

Auxiliary power for Browns Ferry Nuclear Plant is supplied from two sources; either the unit station transformers or from the 161-kV transmission system through the common station transformers or the cooling tower transformers. If a common station transformer is lost, the units can continue to operate since the unit station transformers are in service, the other common station transformer and four diesel generators are operational.

The shutdown busses distribute power to the shutdown boards and allow for flexibility to the offsite power circuits. The shutdown busses will temporarily supply the bus tie board until normal supply is restored, but no later than 2/2/80. The capacity of the shutdown bus is such that any four shutdown boards can be supplied and provide adequate power for the designed basis accident. In the event a shutdown bus is lost, unit 3 bus tie board will be disconnected to ensure no more than four shutdown boards are supplied.

A 4-kV shutdown board is allowed to be out of operation for a brief period to allow for maintenance and testing, providing all remaining 4-kV shutdown boards and associated diesel generators CS, RHR, (LPCI and Containment Cooling) systems supplied by the remaining 4-kV shutdown boards, and all emergency 480 V power boards are operable.

There are eight 250-volt d-c battery systems each of which consists of a battery, battery charger, and distribution equipment. Three of these systems provide power for unit control functions, operative power for unit motor loads, and alternative drive power for a 115-volt a-c unit preferred motor-generator set. One 250-volt d-c system provides power for common plant and transmission system control functions, drive power for a 115-volt a-c plant preferred motor-generator set, and emergency drive power for certain unit large motor loads. The four remaining systems deliver control power to the 4160-volt shutdown boards.

### 3.9 BASES

Each 250-volt d-c shutdown board control power supply can receive power from its own battery, battery charger, or from a spare charger. The chargers are powered from normal plant auxiliary power or from the standby diesel-driven generator system. Zero resistance short circuits between the control power supply and the shutdown board are cleared by fuses located in the respective control power supply. Each power supply is located in the reactor building near the shutdown board it supplies. Each battery is located in its own independently ventilated battery room.

The 250-volt d-c system is so arranged, and the batteries sized such, that the loss of any one unit battery will not prevent the safe shutdown and cooldown of all three units in the event of the loss of offsite power and a design basis accident in any one unit. Loss of control power to any engineered safeguards control circuit is annunciated in the main control room of the unit affected. The loss of one 250-volt shutdown board battery affects normal control power only for the 4160-volt shutdown board which it supplies. The station battery supplies loads that are not essential for safe shutdown and cooldown of the nuclear system. This battery was not considered in the accident load calculations.



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

TENNESSEE VALLEY AUTHORITY

DOCKET NO. 50-296

BROWNS FERRY NUCLEAR PLANT, UNIT NO. 3

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 29  
License No. DPR-68

1. The Nuclear Regulatory Commission (the Commission) has found that:
  - A. The application for amendments by Tennessee Valley Authority (the licensee) dated January 14, 1980 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.

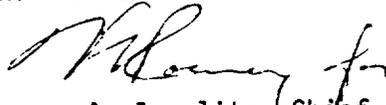
2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment and paragraph 2.C(2) of Facility License No. DPR-68 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 29, 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 the date of its issuance.

FOR THE NUCLEAR REGULATORY COMMISSION



Thomas A. Ippolito, Chief  
Operating Reactors Branch #3  
Division of Operating Reactors

Attachment:  
Changes to the Technical  
Specifications

Date of Issuance: January 14, 1980

ATTACHMENT TO LICENSE AMENDMENT NO. 29

FACILITY OPERATING LICENSE NO. DPR-68

DOCKET NO. 50-296

Revise Appendix A as follows:

1. Remove the following pages and replace with identically numbered pages:

324  
325  
327

2. Marginal lines on the above pages indicate revised area.

3.9 AUXILIARY ELECTRICAL SYSTEM

3. When one unit 3 4-kV shutdown board is inoperable, continued reactor operation is permissible for a period not to exceed 5 days, provided that both offsite 161-kV transmission lines and both cooling tower transformers are available and the remaining unit 3 4-kV shutdown boards and associated diesel generators, CS, RHR (LPCI and Containment Cooling) Systems, and all unit 3 480-V emergency power boards are operable. If this requirement cannot be met, an orderly shutdown shall be initiated and the reactor shall be shutdown and in the cold condition within 24 hours.
4. From and after the date the bus tie board is found to be inoperable, reactor operation is permissible for a period of three days provided that unit #3 shutdown boards are operable and supplied from the unit boards and the diesel generators are operable.

4.9 AUXILIARY ELECTRICAL SYSTEM

3. When one unit 3 4-kV shutdown board is found to be inoperable, all remaining unit 3 4-kV shutdown boards and associated diesel generators, CS and RHR (LPCI and Containment Cooling) Systems supplied by the remaining 4-kV shutdown boards shall be demonstrated to be operable, immediately and daily thereafter.
4. When the bus tie board is inoperable, the unit #3 4-KV shutdown boards and unit 3 diesel generators will be verified operable immediately and daily thereafter.

3.9 AUXILIARY ELECTRICAL SYSTEM

5. From and after the date that one of the three 250-Volt unit batteries and/or its associated battery board is found to be inoperable for any reason, continued reactor operation is permissible during the succeeding seven days. Except for routine surveillance testing, the NRC shall be notified within 24 hours of the situation, the precautions to be taken during this period and the plans to return the failed component to an operable state.
6. When one division of the Logic System is inoperable, continued reactor operation is permissible under this condition for seven days, provided the CSCS requirements listed in Specification 3.9.B.2 are satisfied. The NRC shall be notified within 24 hours of the situation, the precautions to be taken during this period and the plans to return the failed component to an operable state.

4.9 AUXILIARY ELECTRICAL SYSTEM

### 3.9 BASES

The objective of this specification is to assure an adequate source of electrical power to operate facilities to cool the unit during shutdown and to operate the engineered safeguards following an accident. There are three sources of alternating current electrical energy available, namely, the 161-kV transmission system, the nuclear generating units, and the diesel generators.

The 161-kV offsite power supply consists of two lines which are fed from different sections of the TVA 161-kV grid. In the normal mode of operation, the 161-kV system is operating and four diesel generators are operational. If one diesel generator is out of service, there normally remain the 161-kV sources, and the other three diesel generators. For a diesel generator to be considered operable its associated 125 V battery must be operable.

The minimum fuel oil requirement of 103,300 gallons is sufficient for 7 days of full load operation of 3 diesels and is conservatively based on availability of a replenishment supply.

Offsite auxiliary power for Browns Ferry Nuclear Plant Unit 3 is supplied from two sources: the unit station transformers from the main generator or the 161-kV transmission system through the cooling tower transformers. If a cooling tower transformer is lost, the unit can continue to operate since the station transformer is in service, the other cooling tower transformer is available, and four diesel generators are operational.

The 4-KV bus tie board provides the shutdown boards with backup access to the offsite power system through the common station service transformer. A 4-kV shutdown board is allowed to be out of operation for a brief period to allow for maintenance and testing, providing all remaining 4-kV shutdown boards and associated diesel generators CS, RHR, (LPCI and Containment Cooling) Systems supplied by the remaining 4-kV shutdown boards, and all emergency 480 V power boards are operable.

There are four 250-volt d-c battery systems each of which consists of a battery, battery charger, and distribution equipment. Three of these systems provide power for unit control functions, operative power for unit motor loads, and alternative drive power for a 115-volt a-c unit preferred motor-generator set. One 250-volt d-c system provides power for common plant and transmission system control functions, drive power for a 115-volt a-c plant preferred motor-generator set, and emergency drive power for certain unit large motor loads.

The 250-volt d-c system is so arranged, and the batteries sized such, that the loss of any one unit battery will not prevent the safe shutdown and cooldown of all three units in the event of the loss of offsite power and a design basis accident in any one unit. Loss of control power to any engineered safeguards control



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION  
SUPPORTING AMENDMENT NO. 56 TO FACILITY OPERATING LICENSE NO. DPR-33  
AMENDMENT NO. 51 TO FACILITY OPERATING LICENSE NO. DPR-52  
AMENDMENT NO. 29 TO FACILITY OPERATING LICENSE NO. DPR-68  
TENNESSEE VALLEY AUTHORITY  
BROWNS FERRY NUCLEAR PLANT, UNITS NOS. 1, 2 AND 3  
DOCKET NOS. 50-259, 50-260 AND 50-296

1.0 Introduction

By letter dated January 14, 1980, the Tennessee Valley Authority (the licensee or TVA) requested changes to the Technical Specifications (Appendix A) appended to Facility Operating Licenses Nos. DPR-33, DPR-52 and DPR-68 for the Browns Ferry Nuclear Plant, Units Nos. 1, 2 and 3. The proposed amendments and revised Technical Specifications would permit operation of Unit No. 3 while Unit No. 1 is down for refueling by providing a temporary second off-site power source to the Unit No. 3 4-KV shutdown boards through the 4 KV bus tie board. These revised Technical Specifications will only be in effect while Unit No. 1 is in cold shutdown for refueling and until the principal source of off-site power for Unit No. 3 through the cooling tower transformers is repaired and back in service.

2.0 Discussion

By Amendments Nos. 39, 37 and 13 to DPR-33, DPR-52 and DPR-68, respectively, dated June 23, 1978, we approved modifications to the Browns Ferry inplant electrical systems to maintain adequate inplant electrical system voltage for three unit operation. One of the modifications was to rearrange the 4160 volt loads that had previously been connected to the common station transformers and reconnection of some of these loads to the cooling tower transformers. The purpose of this modification was to reduce the voltage drop due to high impedance in the common station service transformers. The related safety evaluation to these amendments describes the modifications and our evaluation thereof; the safety evaluation to Amendments Nos. 39, 37 and 13 is incorporated in this safety evaluation by reference.

On December 30, 1979 Unit 3 (BF-3) was shutdown when grounds were detected in the underground cable feeding off-site power through the cooling tower transformers to the Unit 3 4 KV bus tie board. On January 3, 1980, Unit No. 1 was shutdown for refueling; Unit 1 is scheduled to be down until February 21, 1980. To avoid a possible repetition of the grounding problem,

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TVA has redesigned the incoming line to run overhead above ground rather than in the existing underground concrete conduit. However, the replacement cable will not be available until about January 21, 1980. Since Unit 1 is down for refueling - and will be down for another 4 to 5 weeks - this reduces the load on the off-site power sources to Unit 1. The purpose of the proposed modification and revised Technical Specifications is to supply a temporary second source of off-site power to Unit 3 to permit this facility to startup and operate based on the reduced load on Unit 1. Once the cable is replaced - estimated to be no later than February 2, 1980 - the Technical Specifications will be revised to revert to be the same as existed prior to the issuance of the amendments that are the subject of this safety evaluation.

### 3.0 Evaluation

The modification proposed by the licensee is to remove the interlocks between the Unit 1 and 2 shutdown boards and the Unit 3 bus tie board. The modification will allow either shutdown bus 1 or shutdown bus 2 to provide power to the 4 KV bus tie board.

During the current Unit 1 refueling shutdown, power to shutdown bus 1 and 2 will be provided through:

1. Backfeed from Unit 1 500-KV main transformer through Unit 1 station-service transformer.
2. Unit 2 generator through Unit 2 station-service transformer.
3. Common station-service transformer 1 and 2.

This modification will provide a temporary second off-site power source to the Unit 3 4 KV shutdown boards through the 4 KV bus tie board. The interlocks on these breakers prevent the cross tie of the cooling tower transformer with transformers supplying shutdown bus 1 and shutdown bus 2. The cooling tower connection to the bus tie board has been physically removed until repairs are completed.

Alternate power from the Unit 3 4-KV bus tie can only be provided to either of the units 4 KV shutdown board pairs 3EA and 3EB or 3EC and 3ED. This limitation is due to the shutdown bus 1 and shutdown bus 2 feeder breaker 1200 amp current ratings. However, loss of normal offsite power to all four Unit 3 shutdown boards would require two independent single failures.

TVA has verified that the loading and voltage levels will remain within equipment ratings under the worse case loading conditions. TVA has also verified that existing protective relaying is fully adequate and no changes are required.

In a telephone conversation with TVA personnel on January 14, 1980, they stated that the operating and emergency procedures have been changed as required to reflect the temporary modifications and that the operators have been instructed and trained to the new procedures. TVA also stated that the system will be preoperationally tested and will verify that the circuitry in which the modifications were made will function as designed by testing the power system operation.

Upon completion of the overhead line installation from the cooling tower transformers to the Unit 3 4 KV system, the licensee (1) shall verify, by test, the operability of the restored system, (2) shall restore the interlocks circuitry removed by this change request and (3) will return to the Technical Specification limiting conditions for operation and surveillance requirements that existed immediately prior to the changes effected by the amendments discussed herein. The operating procedures and operator instructions shall also be revised at the same time to reflect the restored system.

We have evaluated TVA's submittal of January 14, 1980 and the subsequent commitments by TVA discussed above. We conclude that the proposed temporary changes to the electrical systems are acceptable and that it is safe to operate Unit No. 3 in the proposed manner - as long as Unit No. 1 is in cold shutdown for refueling.

#### 4.0 Environmental Considerations

We have determined that these amendments do not authorize a change in effluent types or total amounts nor an increase in power level and will not result in any significant environmental impact. Having made this determination, we have further concluded that these amendments involve an action which is insignificant from the standpoint of environmental impact and pursuant to 10 CFR §51.5(d)(4) that an environmental impact statement or negative declaration and environmental impact appraisal need not be prepared in connection with the issuance of these amendments.

#### 5.0 Conclusion

We have concluded based on the considerations discussed above: (1) because the amendments do not involve a significant increase in the probability or consequences of accidents previously considered and do not involve a significant decrease in a safety margin, the amendments do not involve a significant hazards consideration, (2) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, and (3) such activities will be conducted in compliance with the Commission's regulations and the issuance of these amendments will not be inimical to the common defense and security or to the health and safety of the public.

Dated: January 14, 1980

UNITED STATES NUCLEAR REGULATORY COMMISSION

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

TENNESSEE VALLEY AUTHORITY

NOTICE OF ISSUANCE OF AMENDMENTS TO FACILITY

OPERATING LICENSES

The U. S. Nuclear Regulatory Commission (the Commission) has issued Amendment No. 56 to Facility Operating License No. DPR-33, Amendment No. 51 to Facility Operating License No. DPR-52 and Amendment No. 29 to Facility Operating License No. DPR-68 issued to Tennessee Valley Authority (the licensee), which revised Technical Specifications for operation of the Browns Ferry Nuclear Plant, Units Nos. 1, 2 and 3, located in Limestone County, Alabama. The amendments are effective as of the date of issuance.

These amendments change the Technical Specifications to permit operation of Unit No. 3 while Unit No. 1 is down for refueling by providing a temporary second off-site power source to the Unit No. 3 4-KV shutdown boards through the 4-KV bus tie board.

The application for the amendments complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations. The Commission has made appropriate findings as required by the Act and the Commission's rules and regulations in 10 CFR Chapter I, which are set forth in the license amendments. Prior public notice of these amendments was not required since the amendments do not involve a significant hazards consideration.

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The Commission has determined that the issuance of these amendments will not result in any significant environmental impact and that pursuant to 10 CFR §51.5(d)(4) an environmental impact statement or negative declaration and environmental impact appraisal need not be prepared in connection with issuance of these amendments.

For further details with respect to this action, see (1) the application for amendments dated January 14, 1980, (2) Amendment No. 56 to License No. DPR-33, Amendment No. 51 to License No. DPR-52, and Amendment No. 29 to License No. DPR-68, and (3) the Commission's related Safety Evaluation. All of these items are available for public inspection at the Commission's Public Document Room, 1717 H Street, N.W., Washington, D. C. and at the Athens Public Library, South and Forrest, Athens, Alabama 35611. A copy of items (2) and (3) may be obtained upon request addressed to the U. S. Nuclear Regulatory Commission, Washington, D. C. 20555, Attention: Director, Division of Operating Reactors.

Dated at Bethesda, Maryland, this 14th day of January 1980.

FOR THE NUCLEAR REGULATORY COMMISSION

  
Vernon L. Rooney, Acting Chief  
Operating Reactors Branch #3  
Division of Operating Reactors