



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

TENNESSEE VALLEY AUTHORITY

DOCKET NO. 50-259

BROWNS FERRY NUCLEAR PLANT, UNIT 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 181
License No. DPR-33

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The applications for amendment by Tennessee Valley Authority (the licensee) dated January 31, March 20, May 14, and December 28 1990, comply with the standard 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 applications, 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.

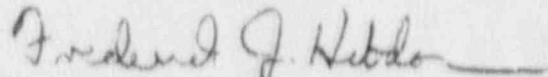
2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment and paragraph 2.C.(2) of Facility Operating License No. DPR-33 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 181, 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. Hibdon, 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 12, 1991

ATTACHMENT TO LICENSE AMENDMENT NO. 181

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.

<u>REMOVE</u>	<u>INSERT</u>
3.9/4.9-1	3.9/4.9-1
3.9/4.9-2	3.9/4.9-2
3.9/4.9-3	3.9/4.9-3
3.9/4.9-4	3.9/4.9-4*
3.9/4.9-7	3.9/4.9-7
3.9/4.9-8	3.9/4.9-8*
3.9/4.9-19	3.9/4.9-19
3.9/4.9-20	3.9/4.9-20*
3.9/4.9-21	3.9/4.9-21
3.9/4.9-22	3.9/4.9-22*

3.9/4.9 AUXILIARY ELECTRICAL SYSTEM

LIMITING CONDITIONS FOR OPERATION

3.9 Auxiliary Electrical System

Applicability

Applies to all 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

1. PRIOR TO STARTUP from a COLD CONDITION, the following must be satisfied:
 - a. Diesel generators A, B, C, and D OPERABLE.
 - b. Requirements 3.9.A.3 through 3.9.A.6 are met.
 - c. At least two of the following offsite power sources are available:
 - (1) The 500-kV system is available to the units 1 and 2 shut-down boards through the unit 1 station-service transformer TUSS/1B with no credit taken for the two 500-kV Trinity lines. If the unit 2 station-service transformer is the second choice, a minimum of two 500-kV lines must be available.

SURVEILLANCE REQUIREMENTS

4.9 Auxiliary Electrical System

Applicability

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

Objective

Verify the OPERABILITY of the auxiliary electrical system.

Specification

A. Auxiliary Electrical System

1. Diesel Generators

- a. Each diesel generator shall be manually started and loaded to demonstrate operational readiness in accordance with the frequency specified in Table 4.9.A on a staggered test basis. The test shall continue for at least a one-hour period at 100% or greater of the continuous rating of the diesel generator, and the operation of the diesel fuel oil transfer pumps shall be demonstrated. Also, the diesel generator starting air compressor shall be checked for operation and its ability to recharge air receivers.

Once per 18 months, each diesel generator will be tested at a load of at least 2800 KW to demonstrate full load carrying capability for

1.9/4.9 AUXILIARY ELECTRICAL SYSTEM

LIMITING CONDITIONS FOR OPERATION

3.9.A. Auxiliary Electrical Equipment

3.9.A.1.c. (Cont'd)

- (2) The 500-kV system is available to the units 1 and 2 shutdown boards through the unit 2 station-service transformer TUSS 2B with no credit taken for the two 500-kV Trinity lines. If the unit 1 station-service transformer is the second choice, a minimum of two 500-kV lines must be available.
- (3) The Trinity 161-kV line is available to the units 1 and 2 shutdown boards through both common station-service transformers.

Notes for (3):

- (a) If unit 3 is claiming the Trinity line as an offsite source, see unit 3 technical specifications, Section 3.9.A.1.c.2.
- (b) If unit 1 is in cold shutdown, only one common station-service transformer is required.

SURVEILLANCE REQUIREMENTS

4.9.A. Auxiliary Electrical System

4.9.A.1.a. (Cont'd)

an interval of not less than 24 hours.

The diesel generator fast starts (10 seconds) from standby conditions shall be performed once per 184 days in these surveillance tests. All other engine starts for the purpose of this test may be preceded by an engine idle start.

Additional reporting requirements due to failures are noted in Table 4.9.A.

All diesel generator starts shall be logged.

- b. Once per operating cycle, a test will be conducted simulating a loss of offsite power and similar conditions that would exist with the presence of an actual safety-injection signal to demonstrate the following:
 - (1) Deenergization of the emergency buses and load shedding from the emergency buses.
 - (2) The diesel starts from ambient condition on the auto-start signal, energizes the emergency buses with permanently connected loads, energizes the auto-connected emergency loads through

3.9/4.9 AUXILIARY ELECTRICAL SYSTEM

LIMITING CONDITIONS FOR OPERATION

3.9.A. Auxiliary Electrical Equipment

3.9.A.1.c. (Cont'd)

- (4) The Athens 161-kV line is available to the units 1 and 2 shutdown boards through a common station-service transformer when unit 1 is in Cold Shutdown and unit 3 is not claiming the Athens line as an offsite source.

NOTE FOR (3) AND (4):

With no cooling tower pumps or fans running, a cooling tower transformer may be substituted for a common station-service transformer.

SURVEILLANCE REQUIREMENTS

4.9.A. Auxiliary Electrical System

4.9.A.1.b (Cont'd)

load sequencing, and operates for greater than or equal to five minutes while its generator is loaded with the emergency loads.

- (3) On diesel generator breaker trip, the loads are shed from the emergency buses and the diesel output breaker recloses on the auto-start signal, the emergency buses are energized with permanently connected loads, the auto-connected emergency loads are energized through load sequencing, and the diesel operates for greater than or equal to five minutes while its generator is loaded with the emergency loads.

- 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. Quarterly the quality of each diesel generator's (A, B, C, and D) seven-day fuel supply shall be checked. The fuel oil quality shall be within the acceptable limits specified in Table 1 of ASTM-D975-89.

3.9/4.9 AUXILIARY ELECTRICAL SYSTEM

LIMITING CONDITIONS FOR OPERATION

SURVEILLANCE REQUIREMENTS

3.9.A. Auxiliary Electrical Equipment

2. The reactor shall not be started up (made critical) from the HOT STANDBY CONDITION unless all of the following conditions are satisfied:

a. At least one offsite power source is available as specified in 3.9.A.1.c.

b. Three units 1 and 2 diesel generators shall be OPERABLE.

c. An additional source of power consisting of one of the following:

(1) A second offsite power source available as specified in 3.9.A.1.c.

(2) A fourth OPERABLE units 1 and 2 diesel generator.

d. Requirements 3.9.A.3 through 3.9.A.6 are met.

4.9.A. Auxiliary Electrical System

2. DC Power System - Unit Batteries (250-V), Diesel-Generator Batteries (125-V) and Shutdown Board Batteries (250-V)

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

b. Every three months the measurement 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. At least once every 24 months, a battery rated discharge (capacity) test shall be performed and the voltage, time, and output current measurements shall be logged.

3.9/4.9 AUXILIARY ELECTRICAL SYSTEM

LIMITING CONDITIONS FOR OPERATION

SURVEILLANCE REQUIREMENTS

3.9.A. Auxiliary Electrical Equipment

4.9.A. Auxiliary Electrical System

4.9.A.4. (Cont'd)

- c. The loss of voltage and degraded voltage relays which start the diesel generators from the 4-kV shutdown boards shall be calibrated annually for trip and reset and the measurements logged. These relays shall be calibrated as specified in Table 4.9.A.4.c.
- d. 4-kV shutdown board voltages shall be recorded once every 12 hours.

5. Logic Systems

5. 480-V RMOV Boards 1D and 1E

- a. Common accident signal logic system is OPERABLE.

- a. Once per operating cycle the automatic transfer feature for 480-V RMOV boards 1D and 1E shall be functionally tested to verify auto-transfer capability.

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

- 6. There shall be a minimum of 35,280 gallons of diesel fuel in each of the 7-day diesel-generator fuel tank assemblies.

3.9/4.9 AUXILIARY ELECTRICAL SYSTEM

LIMITING CONDITIONS FOR OPERATION

SURVEILLANCE REQUIREMENTS

3.9.B. Operation with Inoperable Equipment

Whenever the 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 only one offsite power source is available, reactor operation is permissible for 7 days.
2. From and after the date that the 4-kV bus tie board becomes inoperable, reactor operation is permissible indefinitely provided one of the required offsite power sources is not supplied from the 161-kV system through the bus tie board.

4.9.B. Operation with Inoperable Equipment

1. When only one offsite power source is OPERABLE, all units 1 and 2 diesel generators must be demonstrated to be OPERABLE within 24 hours, and power availability for the associated boards shall be verified within 1 hour and at least once per 8 hours thereafter.
2. When a required offsite power source is unavailable to unit 1 because the 4-kV bus tie board or a start bus is inoperable, all unit 1 and 2 diesel generators shall be demonstrated OPERABLE within 24 hours, and power availability for the associated boards shall be verified within 1 hour and at least once per 8 hours thereafter. The remaining offsite source and associated buses shall be checked to be energized daily.

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 500-kV transmission system, and the diesel generators.

The unit station-service transformer B for unit 1 or the unit station-service transformer B for unit 2 provide noninterruptible sources of offsite power from the 500-kV transmission system to the units 1 and 2 shutdown boards. Auxiliary power can also be supplied from the 161-kV transmission system through the common station-service transformers or through the cooling water pumps by way of the bus tie board. The 4-kV bus tie board is out of service indefinitely provided one of the required offsite power sources is not supplied from the 161-kV system through the bus tie board.

The minimum fuel oil requirement of 35,280 gallons for each diesel generator fuel tank assembly is sufficient for seven days of full load operation of each diesel and is conservatively based on availability of a replenishment supply. Each diesel generator has its own independent 7-day fuel oil storage tank assembly.

The degraded voltage sensing relays provide a start signal to the diesel generators in the event that a deteriorated voltage condition exists on a 4-kV shutdown board. This starting signal is independent of the starting signal generated by the complete loss of voltage relays and will continue to function and start the diesel generators on complete loss of voltage should the loss of voltage relays become inoperable. The 15-day inoperable time limit specified when one of the three phase-to-phase degraded voltage relays is inoperable is justified based on the two-out-of-three permissive logic scheme provided with these relays.

A 4-kV shutdown board is allowed to be out of operation for a brief period to allow for maintenance and testing, provided 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-V dc 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-V ac unit-preferred mg set. One 250-V dc system provides power for common plant and transmission system control functions, drive power for a 115-V ac plant-preferred mg set, and emergency drive power for certain unit large motor loads. The four remaining systems deliver control power to the 4,160-V shutdown boards.

3.9 BASES (Cont'd)

Each 250-V dc 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-V dc system is so arranged, and the batteries sized so 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 safeguard control circuits is annunciated in the main control room of the unit affected. The loss of one 250-V shutdown board battery affect normal control power only for the 4,160-V 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.

There are two 480-volt ac RMOV boards that contain mg sets in their feeder lines. These 480-Volt ac RMOV boards have an automatic transfer from their normal to alternate power source (480-Volt ac shutdown boards). The mg sets act as electrical isolators to prevent a fault from propagating between electrical divisions due to an automatic transfer. The 480-Volt ac RMOV boards involved provide motive power to valves associated with the LPCI mode of the RHR system. Having an mg set out of service reduces the assurance that full RHR (LPCI) capacity will be available when required. Since sufficient equipment is available to maintain the minimum complement required for RHR (LPCI) operation, a 7-day servicing period is justified. Having two mg sets out of service can considerably reduce equipment availability; therefore, the affected unit shall be placed in Cold Shutdown within 24 hours.

The offsite power source requirements are based on the capacity of the respective lines. The Trinity line is limited to supplying two operating units because of the load limitations of CSST's A and B. The Athens line is limited to supplying one operating unit because of the load limitations of the Athens line. The limiting conditions are intended to prevent the 161-kV system from supplying more than two units in the event of a single failure in the offsite power system.

4.9 BASES (Cont'd)

The monthly test of the diesel generators is primarily to check for failures and deterioration in the system since last use. The diesels will be loaded to at least 100 percent of its continuous rating (i.e., 2 2600 KW) while engine and generator temperatures are stabilized (about one hour). A minimum 75-percent load will prevent soot formation in the cylinders and injection nozzles. Operation up to an equilibrium temperature ensures that there is no overheating problem. The tests also provide an engine and generator operating history to be compared with subsequent engine-generator test data to identify and to correct any mechanical or electrical deficiency before it can result in a system failure.

Diesel testing once per 18 months (i.e., at least once per fuel cycle) at a minimum load of 2800 KW for an interval of not less than 24 hours, assures that each diesel generator will be capable of supplying the maximum load during the first 2 hours of a loss of offsite power/loss of coolant accident. This test also demonstrates each diesel generator's long-term load carrying capability.

The test during refueling outages is more comprehensive, including procedures that are most effectively conducted at that time. These include automatic actuation and functional capability tests to verify that the generators can start and be ready to assume load in 10 seconds. The annual inspection will detect any signs of wear long before failure.

BFN tests the 7-day diesel generator fuel oil supplies in accordance with Table 1 of ASTM-D975-89. Each fuel oil supply is tested quarterly.

Battery maintenance with regard to the floating charge, equalizing charge, and electrolyte level will be based on the manufacturer's instruction and sound maintenance practices. In addition, written records will be maintained of the battery performance. The plant batteries will deteriorate with time but precipitous failure is unlikely. The type of surveillance called for in this specification is that which has been demonstrated through experience to provide an indication of a cell becoming irregular or unserviceable long before it becomes a failure.

The equalizing charge, as recommended by the manufacturer, is vital to maintaining the ampere-hour capacity of the battery and will be applied as recommended.

The testing of the logic systems will verify the ability of the logic systems to bring the auxiliary electrical system to running standby readiness with the presence of an accident signal from any reactor or an undervoltage signal on the 4-kV shutdown boards.

The periodic simulation of accident signals in conjunction with diesel generator voltage available signals will confirm the ability of the 480-V load shedding logic system to sequentially shed and restart 480-V loads if an accident signal were present, and diesel generator voltage was the only source of electrical power.

4.9 BASES (Cont'd)

REFERENCES

1. Normal Auxiliary Power System (BFNP FSAR Subsection 8.4)
2. Standby AC Power Supply and Distribution (BFNP FSAR Subsection 8.5)
3. 250-V DC Power Supply and Distribution (BFNP FSAR Subsection 8.6)
4. Memorandum from Gene M. Wilhoite to H. J. Green dated December 4, 1981 (LOO 811208 664) and memorandum from C. E. Winn to H. J. Green dated January 10, 1983 (G02 830112 002)



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

TENNESSEE VALLEY AUTHORITY

DOCKET NO. 50-260

BROWNS FERRY NUCLEAR PLANT, UNIT 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 191
License No. DPR-52

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The applications for amendment by Tennessee Valley Authority (the licensee) dated January 31, March 20, May 14, and December 28, 1990, comply 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 applications, 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.

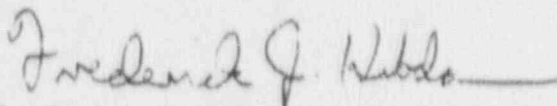
2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment and paragraph 2.C.(2) of Facility Operating License No. DPR-52 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 191, 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 12, 1991

ATTACHMENT TO LICENSE AMENDMENT NO. 191

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* and spillover** pages are provided to maintain document completeness.

REMOVE

3.9/4.9-1

3.9/4.9-2

3.9/4.9-3

3.9/4.9-4

3.9/4.9-7

3.9/4.9-8

3.9/4.9-19

3.9/4.9-20

3.9/4.9-21

3.9/4.9-2^a

INSERT

3.9/4.9-1

3.9/4.9-2

3.9/4.9-3

3.9/4.9-4*

3.9/4.9-7

3.9/4.9-8*

3.9/4.9-19

3.9/4.9-20*

3.9/4.9-21

3.9/4.9-22**

3.9/4.9 AUXILIARY ELECTRICAL SYSTEM

LIMITING CONDITIONS FOR OPERATION

SURVEILLANCE REQUIREMENTS

3.9 AUXILIARY ELECTRICAL SYSTEM

Applicability

Applies to all 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

1. PRIOR TO STARTUP from a COLD CONDITION, the following must be satisfied:
 - a. Diesel generators A, B, C, and D OPERABLE.
 - b. Requirements 3.9.A.3 through 3.9.A.6 are met.
 - c. At least two of the following offsite power sources are available:
 - (1) The 500-kV system is available to the units 1 and 2 shut-down boards through the unit 1 station-service transformer TUSS 1B with no credit taken for the two 500-kV Trinity lines. If the unit 2 station-service transformer is the second source, a minimum of two 500-kV lines must be available.

4.9 AUXILIARY ELECTRICAL SYSTEM

Applicability

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

Objective

Verify the OPERABILITY of the auxiliary electrical system.

Specification

A. Auxiliary Electrical System

1. Diesel Generators
 - a. Each diesel generator shall be manually started and loaded to demonstrate operational readiness in accordance with the frequency specified in Table 4.9.A on a staggered test basis. The test shall continue for at least a one-hour period at 100% or greater of the continuous rating of the diesel generator, and the operation of the diesel fuel oil transfer pumps shall be demonstrated. Also the diesel generator starting air compressor shall be checked for operation and its ability to recharge air receivers.

Once per 18 months, each diesel generator will be tested at a load of at least 2800 KW to demonstrate full load carrying capability for

3.9/4.9 AUXILIARY ELECTRICAL SYSTEM

LIMITING CONDITIONS FOR OPERATION

3.9.A. Auxiliary Electrical Equipment

3.9.A.1.c. (Cont'd)

- (2) The 500 kV system is available to the units 1 and 2 shutdown boards through the unit 2 station-service transformer TUSS 2B with no credit taken for the two 500-kV Trinity lines. If the unit 1 station-service transformer is the second choice, a minimum of two 500-kV lines must be available.
- (3) The Trinity 161-kV line is available to the units 1 and 2 shutdown boards through both common station-service transformers.

NOTES FOR (3):

- (a) If unit 3 is claiming the Trinity line as an offsite source, see unit 3 technical specifications, Section 3.9.A.1.c.2.
- (b) If unit 1 is in cold shutdown, only one common station-service transformer is required.

SURVEILLANCE REQUIREMENTS

4.9.A. Auxiliary Electrical System

4.9.A.1.a. (Cont'd)

an interval of not less than 24 hours.

The diesel generator fast starts (10 seconds) from standby conditions shall be performed once per 184 days in these surveillance tests. All other engine starts for the purpose of this test may be preceded by an engine idle start.

Additional reporting requirements due to failures are noted in Table 4.9.A.

All diesel generator starts shall be logged.

- b. Once per operating cycle, a test will be conducted simulating a loss of offsite power and similar conditions that would exist with the presence of an actual safety-injection signal to demonstrate the following:
- (1) Deenergization of the emergency buses and load shedding from the emergency buses.
 - (2) The diesel starts from ambient condition on the auto-start signal, energizes the emergency buses with permanently connected loads, energizes the auto-connected

3.9/4.9 AUXILIARY ELECTRICAL SYSTEM

LIMITING CONDITIONS FOR OPERATION

3.9.A. Auxiliary Electrical Equipment

3.9.A.1.c. (Cont'd)

- (4) The Athens 161-kV line is available to the units 1 and 2 shutdown boards through a common station-service transformer when unit 1 is in Cold Shutdown and unit 3 is not claiming the Athens line as an offsite source.

NOTE FOR (3) AND (4):

With no cooling tower pumps or fans running, a cooling tower transformer may be substituted for a common station-service transformer.

SURVEILLANCE REQUIREMENTS

4.9.A. Auxiliary Electrical System

4.9.A.1.b. (Cont'd)

emergency loads through load sequencing, and operates for greater than or equal to five minutes while its generator is loaded with the emergency loads.

- (3) On diesel generator breaker trip, the loads are shed from the emergency buses and the diesel output breaker recloses on the auto-start signal, the emergency buses are energized with permanently connected loads, the auto-connected emergency loads are energized through load sequencing, and the diesel operates for greater than or equal to five minutes while its generator is loaded with the emergency loads.
- 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. Quarterly the quality of each diesel generator's (A, B, C, and D) seven-day fuel supply shall be checked. The fuel oil quality shall be within the acceptable limits specified in Table 1 of ASTM-D975-89.

3.9/4.9 AUXILIARY ELECTRICAL SYSTEM

LIMITING CONDITIONS FOR OPERATION

SURVEILLANCE REQUIREMENTS

3.9.A. Auxiliary Electrical Equipment

2. The reactor shall not be started up (made critical) from the HOT STANDBY CONDITION unless all of the following conditions are satisfied:

a. At least one offsite power source is available as specified in 3.9.A.1.c.

b. Three units 1 and 2 diesel generators shall be OPERABLE.

c. An additional source of power consisting of one of the following:

(1) A second offsite power source available as specified in 3.9.A.1.c.

(2) A fourth OPERABLE units 1 and 2 diesel generator.

d. Requirements 3.9.A.3 through 3.9.A.6 are met.

4.9.A. Auxiliary Electrical System

2. DC Power System - Unit Batteries (250-V), Diesel-Generator Batteries (125-V) and Shutdown Board Batteries (250-V)

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

b. Every three months the measurement 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. At least once every 24 months, a battery rated discharge (capacity) test shall be performed and the voltage, time, and output current measurements shall be logged.

3.9/4.9 AUXILIARY ELECTRICAL SYSTEM

LIMITING CONDITIONS FOR OPERATION

3.9.A. Auxiliary Electrical Equipment

5. Logic Systems

a. Common accident signal logic system is OPERABLE.

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

6. There shall be a minimum of 35,280 gallons of diesel fuel in each of the 7-day diesel-generator fuel tank assemblies.

SURVEILLANCE REQUIREMENTS

4.9.A. Auxiliary Electrical System

4.9.A.4. (Cont'd)

c. The loss of voltage and degraded voltage relays which start the diesel generators from the 4-kV shutdown boards shall be calibrated annually for trip and reset and the measurements logged. These relays shall be calibrated as specified in Table 4.9.A.4.c.

d. 4-kV shutdown board voltages shall be recorded once every 12 hours.

5. 480-V RMOV Boards 2D and 2E

a. Once per operating cycle the automatic transfer feature for 480-V RMOV boards 2D and 2E shall be functionally tested to verify auto-transfer capability.

3.9/4.9 AUXILIARY ELECTRICAL SYSTEM

LIMITING CONDITIONS FOR OPERATION

SURVEILLANCE REQUIREMENTS

3.9.B. Operation with Inoperable Equipment

Whenever the 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 only one offsite power source is available, reactor operation is permissible for 7 days.

2. From and after the date that the 4-kV bus tie board becomes inoperable, reactor operation is permissible indefinitely provided one of the required offsite power sources is not supplied from the 161-kV system through the bus tie board.

4.9.B. Operation with Inoperable Equipment

1. When only one offsite power source is OPERABLE, all units 1 and 2 diesel generators must be demonstrated to be OPERABLE within 24 hours, and power availability for the associated boards shall be verified within 1 hour and at least once per 8 hours thereafter.

2. When a required offsite power source is unavailable to unit 1 because the 4-kV bus tie board or a start bus is inoperable, all unit 1 and 2 diesel generators shall be demonstrated OPERABLE within 24 hours, and power availability for the associated boards shall be verified within 1 hour and at least once per 8 hours thereafter. The remaining offsite source and associated buses shall be checked to be energized daily.

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 500-kV transmission system, and the diesel generators.

The unit station-service transformer B for unit 1 or the unit station-service transformer B for unit 2 provide noninterruptible sources of offsite power from the 500-kV transmission system to the units 1 and 2 shutdown boards. Auxiliary power can also be supplied from the 161-kV transmission system through the common station-service transformers or through the cooling tower transformers by way of the bus tie board. The 4-kV bus tie board may remain out of service indefinitely provided one of the required offsite power sources is not supplied from the 161-kV system through the bus tie board.

The minimum fuel oil requirement of 35,280 gallons for each diesel generator fuel tank assembly is sufficient for seven days of full load operation of each diesel and is conservatively based on availability of a replenishment supply. Each diesel generator has its own independent 7-day fuel oil storage tank assembly.

The degraded voltage sensing relays provide a start signal to the diesel generators in the event that a deteriorated voltage condition exists on a 4-kV shutdown board. This starting signal is independent of the starting signal generated by the complete loss of voltage relays and will continue to function and start the diesel generators on complete loss of voltage should the loss of voltage relays become inoperable. The 15-day inoperable time limit specified when one of the three phase-to-phase degraded voltage relays is inoperable is justified based on the two-out-of-three permissive logic scheme provided with these relays.

A 4-kV shutdown board is allowed to be out of operation for a brief period to allow for maintenance and testing, provided 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-V dc 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-V ac unit-preferred mg set. One 250-V dc system provides power for common plant and transmission system control functions, drive power for a 115-V ac plant-preferred mg set, and emergency drive power for certain unit large motor loads. The four remaining systems deliver control power to the 4,160-V shutdown boards.

3.9 BASES (Cont'd)

Each 250-V dc 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-V dc system is so arranged, and the batteries sized so 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 safeguard control circuits is annunciated in the main control room of the unit affected. The loss of one 250-V shutdown board battery affects normal control power for the 480-V and 4,160-V shutdown boards 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.

There are two 480-V ac RMOV boards that contain mg sets in their feeder lines. These 480-V ac RMOV boards have an automatic transfer from their normal to alternate power source (480-V ac shutdown boards). The mg sets act as electrical isolators to prevent a fault from propagating between electrical divisions due to an automatic transfer. The 480-V ac RMOV boards involved provide motive power to valves associated with the LPCI mode of the RHR system. Having an mg set out of service reduces the assurance that full RHR (LPCI) capacity will be available when required. Since sufficient equipment is available to maintain the minimum complement required for RHR (LPCI) operation, a 7-day servicing period is justified. Having two mg sets out of service can considerably reduce equipment availability; therefore, the affected unit shall be placed in Cold Shutdown within 24 hours.

The offsite power source requirements are based on the capacity of the respective lines. The Trinity line is limited to supplying two operating units because of the load limitations of CSST's A and B. The Athens line is limited to supplying one operating unit because of the load limitations of the Athens line. The limiting conditions are intended to prevent the 161-kV system from supplying more than two units in the event of a single failure in the offsite power system.

Specification 3.9.D provides the operability requirements for the Unit 3 diesel generators when they serve as emergency power supplies to standby gas treatment train C and control room emergency ventilation train B when they are being considered operable for Unit 2 technical specifications. The allowable out of service time of 30 days is commensurate with the importance of the affected systems when Unit 3 is in cold shutdown, the low probability of a LOCA/Loss of offsite power and availability of onsite power to redundant trains.

AMENDMENT NO. 186

4.9 BASES (Conv'd)

The monthly tests of the diesel generators are primarily to check for failures and deterioration in the system since last test. The diesels will be loaded to at least 100 percent of its continuous rating (i.e., 22600 KW) while engine and generator temperatures are stabilized (about one hour). A minimum 75-percent load will prevent soot formation in the cylinders and injection nozzles. Operation up to an equilibrium temperature ensures that there is no overheating problem. The tests also provide an engine and generator operating history to be compared with subsequent engine-generator test data to identify and to correct any mechanical or electrical deficiency before it can result in a system failure.

Diesel testing once per 18 months (i.e., at least once per fuel cycle) at a minimum load of 2800 KW for an interval of not less than 24 hours assures that each diesel generator will be capable of supplying the maximum load during the first 2 hours of a loss of offsite power/loss of coolant accident. This test also demonstrates each diesel generator's long-term load carrying capability.

The test during refueling outages is more comprehensive, including procedures that are most effectively conducted at that time. These include automatic actuation and functional capability tests to verify that the generators can start and be ready to assume load in 10 seconds. The annual inspection will detect any signs of wear long before failure.

BFN tests the 7-day diesel generator fuel oil supplies in accordance with Table 1 of ASTM-D975-89. Each fuel oil supply is tested quarterly.

Battery maintenance with regard to the floating charge, equalizing charge, and electrolyte level will be based on the manufacturer's instruction and sound maintenance practices. In addition, written records will be maintained of the battery performance. The plant batteries will deteriorate with time but precipitous failure is unlikely. The type of surveillance called for in this specification is that which has been demonstrated through experience to provide an indication of a cell becoming irregular or unserviceable long before it becomes a failure.

The equalizing charge, as recommended by the manufacturer, is vital to maintaining the ampere-hour capacity of the battery and will be applied as recommended.

The testing of the logic systems will verify the ability of the logic systems to bring the auxiliary electrical system to running standby readiness with the presence of an accident signal from any reactor or an undervoltage signal on the 4-kV shutdown boards.

The periodic simulation of accident signals in conjunction with diesel generator voltage available signals will confirm the ability of the 480-V load shedding logic system to sequentially shed and restart 480-V loads if an accident signal were present, and diesel generator voltage were the only source of electrical power.

4.9 BASRE (Cont'd)

Specification 4.9.D provides surveillance requirements for Unit 3 diesel generators for the purpose of satisfying Specification 3.9.D. It contains less stringent testing requirements for the Unit 3 diesel generators when they are only being used to support Unit 2 equipment.

REFERENCES

1. Normal Auxiliary Power System (BFNP FSAR Subsection 4)
2. Standby AC Power Supply and Distribution (BFNP FSAR Subsection 8.5)
3. 250-V D.C. Power Supply and Distribution (BFNP FSAR Subsection 8.6)
4. Memorandum from Gene M. Wilhoite to H. J. Green dated December 4, 1981 (LOO 811208 664) and memorandum from C. E. Winn to H. J. Green dated January 10, 1983 (G02 830112 002)



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

TENNESSEE VALLEY AUTHORITY

DOCKET NO. 50-296

BROWNS FERRY NUCLEAR PLANT, UNIT 3

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 153
License No. DPR-68

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The applications for amendment by Tennessee Valley Authority (the licensee) dated January 31, March 20, May 14, and December 28, 1990, comply 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 applications, 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.

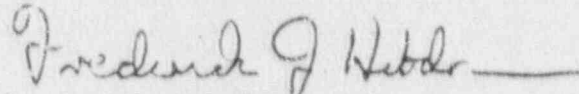
2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment and paragraph 2.C.(2) of Facility Operating License No. DPR-68 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 153, 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 12, 1991

ATTACHMENT TO LICENSE AMENDMENT NO. 153

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* and spillover** pages are provided to maintain document completeness.

<u>REMOVE</u>	<u>INSERT</u>
3.9/4.9-1	3.9/4.9-1
3.9/4.9-2	3.9/4.9-2
3.9/4.9-3	3.9/4.9-3
3.9/4.9-4	3.9/4.9-4*
3.9/4.9-7	3.9/4.9-7
3.9/4.9-8	3.9/4.9-8*
3.9/4.9-18	3.9/4.9-18
3.9/4.9-19	3.9/4.9-19*
3.9/4.9-20	3.9/4.9-20
3.9/4.9-21	3.9/4.9-21**

3.9/4.9 AUXILIARY ELECTRICAL SYSTEM

LIMITING CONDITIONS FOR OPERATION

3.9 Auxiliary Electrical System

Applicability

Applies to all 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

1. PRIOR TO STARTUP from a GOLD CONDITION, the following must be satisfied:

a. Diesel generators 3A, 3B, 3C, and 3D OPERABLE.

b. Requirements 3.9.A.3 through 3.9.A.6 are met.

c. At least two of the following offsite power sources are available:

(1) The 500-kV system is available to the unit 3 shutdown boards through the unit 3 station-service transformer TUSS 3B with no credit taken for the two 500-kV Trinity lines.

SURVEILLANCE REQUIREMENTS

4.9 Auxiliary Electrical System

Applicability

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

Objective

Verify the OPERABILITY of the auxiliary electrical system.

Specification

A. Auxiliary Electrical System

1. Diesel Generators

a. Each diesel generator shall be manually started and loaded to demonstrate operational readiness in accordance with the frequency specified in Table 4.9.A on a staggered test basis. The test shall continue for at least a one-hour period at 100% or greater of the continuous rating of the diesel generator, and the operation of the diesel fuel oil transfer pumps shall be demonstrated. Also, the diesel generator starting air compressor shall be checked for operation and its ability to recharge air receivers.

Once per 18 months, each diesel generator will be tested at a load of at least 2800 KW to demonstrate full load carrying capability

3.9/4.9 AUXILIARY ELECTRICAL SYSTEM

LIMITING CONDITIONS FOR OPERATION

SURVEILLANCE REQUIREMENTS

3.9.A. Auxiliary Electrical Equipment

4.9.A. Auxiliary Electrical System

3.9.A.1.c. (Cont'd)

4.9.A.1.a. (Cont'd)

- (2) The Trinity 161-kV line is available to the unit 3 shutdown boards through a common station-service or cooling tower transformer.

for an interval of not less than 24 hours.

NOTE FOR (2):

If units 1 and 2 are both in operation and claiming the Trinity line as an offsite source, TUSS 3B must be claimed as the other offsite source for unit 3.

The diesel generator fast starts (10 seconds) from standby conditions shall be performed once per 184 days in these surveillance tests. All other engine starts for the purpose of this test may be preceded by an engine idle start.

Additional reporting requirements due to failures are noted in Table 4.9.2.

- (3) The Athens 161-kV line is available to unit 3 shutdown boards through a common station-service or cooling tower transformer.

All diesel generator starts shall be logged.

NOTE FOR (3):

If either unit 1 or unit 2 is claiming the Athens line as an offsite source, it may not be claimed as an offsite source for unit 3.

- b. Once per operating cycle, a test will be conducted simulating a loss of offsite power and similar conditions that would exist with the presence of an actual safety-injection signal to demonstrate the following:

(1) Deenergization of the emergency buses and load shedding from the emergency buses.

(2) The diesel starts from ambient condition on the auto-start signal, energizes the emergency buses with permanently connected loads, energizes the auto-connected emergency loads

3.9/4.9 AUXILIARY ELECTRICAL SYSTEM

LIMITING CONDITIONS FOR OPERATION

3.9.A. Auxiliary Electrical Equipment

3.9.A.1.c.(3) (Cont'd)

NOTES FOR (2) AND (3):

If both Athens and Trinity lines are claimed as the two offsite sources for unit 3, no credit may be taken for the Athens-Trinity line tie breaker. Specifically, the Athens line supplies unit 3 through common station-service transformer A or cooling tower transformer 1, and the Trinity line must supply unit 3 through common station-service transformer B or cooling tower transformer 2.

SURVEILLANCE REQUIREMENTS

4.9.A. Auxiliary Electrical System

4.9.A.1.b. (Cont'd)

through load sequencing, and operates for greater than or equal to five minutes while its generator is loaded with the emergency loads.

- (3) On diesel generator breaker trip, the loads are shed from the emergency buses and the diesel output breaker closes on the auto-start signal, the emergency buses are energized with permanently connected loads, the auto-connected emergency loads are energized through load sequencing, and the diesel operates for greater than or equal to five minutes while its generator is loaded with the emergency loads.
- 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. Quarterly the quality of each diesel generator's (3A, 3B, 3C, and 3D) seven-day fuel load supply shall be checked. The fuel oil quality shall be within the acceptable limits specified in Table 1 of ASTM-D975-89.

3.9/4.9 AUXILIARY ELECTRICAL SYSTEM

LIMITING CONDITIONS FOR OPERATION

SURVEILLANCE REQUIREMENTS

3.9.A. Auxiliary Electrical Equipment

2. The reactor shall not be started up (made critical) from the HOT STANDBY CONDITION unless all of the following conditions are satisfied:

a. At least one offsite power source is available as specified in 3.9.A.1.c.

b. Three units 3 diesel generators shall be OPERABLE.

c. An additional source of power consisting of one of the following:

(1) A second offsite power source available as specified in 3.9.A.1.c.

(2) A fourth unit 3 diesel generator OPERABLE.

d. Requirements 3.9.A.3 through 3.9.A.6 are met.

4.9.A. Auxiliary Electrical System

2. DC Power System - Unit Batteries (250-V), Diesel-Generator Batteries (125-V) and Shutdown Board Batteries (250-v)

a. Every week the specific gravity, voltage, and temperature of the pilot 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. At least once every 24 months, a battery rated discharge (capacity) test shall be performed and the voltage, time, and output current measurements shall be logged.

3.9/4.9 AUXILIARY ELECTRICAL SYSTEM

LIMITING CONDITIONS FOR OPERATION

3.9.A. Auxiliary Electrical Equipment

5. Accident signal logic system is OPERABLE.

6. There shall be a minimum of 35,280 gallons of diesel fuel in each of the 7-day diesel-generator fuel tank assemblies.

SURVEILLANCE REQUIREMENTS

4.9.A. Auxiliary Electrical System

4.9.A.4. (Cont'd)

c. The loss of voltage and degraded voltage relays which start the diesel generators from the 4-kV shutdown boards shall be calibrated annually for trip and reset and the measurements logged. These relays shall be calibrated as specified in Table 4.9.A.4.c.

d. 4-kV shutdown board voltages shall be recorded once every 12 hours.

5. 480-V RMOV Boards 3D and 3E

a. Once per operating cycle, the automatic transfer feature for 480-V RMOV boards 3D and 3E shall be functionally tested to verify auto-transfer capability.

3.9/4.9 AUXILIARY ELECTRICAL SYSTEM

LIMITING CONDITIONS FOR OPERATION

3.9.B. Operation with Inoperable Equipment

Whenever the 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 only one offsite power source is available, reactor operation is permissible under this condition for seven days.
2. When one unit 3 diesel generator (3A, 3B, 3C, or 3D) is inoperable, continued reactor operation is permissible during the succeeding 7 days, provided that two offsite power sources are available as specified in 3.9.A.1.c. and all of the CS, RHR (LPCI and containment cooling) systems, and the remaining three unit 3 diesel generators are OPERABLE. If this requirement cannot be met, an orderly shutdown shall be initiated and the reactor shall be shut down and in the Cold Condition within 24 hours.

SURVEILLANCE REQUIREMENTS

4.9.B. Operation with Inoperable Equipment

1. When only one offsite power source is OPERABLE, all unit 3 diesel generators must be demonstrated to be OPERABLE within 24 hours, and power availability for the associated boards shall be verified within 1 hour and at least once per 8 hours thereafter.
2. When one unit 3 diesel generator is found to be inoperable, all of the remaining unit 3 diesel generators shall be demonstrated to be OPERABLE within 24 hours, and power availability for the associated boards shall be verified within 1 hour and at least once per 8 hours thereafter.

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 500-kV transmission system, and the diesel generators.

The unit station-service transformer B for unit 3 provides a noninterruptible source of offsite power from the 500-kV transmission system to the unit 3 shutdown boards. Auxiliary power can also be supplied from the 161-kV transmission system through the common station-service transformers or through the cooling tower transformers by way of the bus tie board. The 4-kV bus tie board may remain out of service indefinitely provided one of the required offsite power sources is not supplied from the 161-kV system through the bus tie board.

The minimum fuel oil requirement of 35,280 gallons for each diesel generator fuel tank assembly is sufficient for seven days of full load operation of each diesel and is conservatively based on availability of a replenishment supply. Each diesel generator has its own independent 7-day fuel oil storage tank assembly.

The degraded voltage sensing relays provide a start signal to the diesel generators in the event that a deteriorated voltage condition exists on a 4-kV shutdown board. This starting signal is independent of the starting signal generated by the complete loss of voltage relays and will continue to function and start the diesel generators on complete loss of voltage should the loss of voltage relays become inoperable. The 15-day inoperable time limit specified when one of the three phase-to-phase degraded voltage relays is inoperable is justified based on the two-out-of-three permissive logic scheme provided with these relays.

A 4-kV shutdown board is allowed to be out of operation for a brief period to allow for maintenance and testing, provided 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.

The 480-V diesel auxiliary board may be out of service for short periods for tests and maintenance. There are five 250-V dc battery systems associated with unit 3, 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-V ac unit-preferred mg set. One 250-V dc system provides power for common plant and transmission system control functions, drive power for a 115-V ac plant-preferred mg set, and emergency drive power for certain unit large motor loads. The fifth battery system delivers control power to a 4-kV shutdown board.

3.9 BASES (Cont'd)

The 250-V dc system is so arranged and the batteries sized so 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 safeguard control circuits is annunciated in the main control room of the unit affected.

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.

There are two 480-V ac RMOV boards that contain mg sets in their feeder lines. These 480-V ac RMOV boards have an automatic transfer from their normal to alternate power source (480-V ac shutdown boards). The mg sets act as electrical isolators to prevent a fault from propagating between electrical divisions due to an automatic transfer. The 480-V ac RMOV boards involved provide motive power to valves associated with the LPCI mode of the RHR system. Having an mg set out of service reduces the assurance that full RHR (LPCI) capacity will be available when required. Since sufficient equipment is available to maintain the minimum complement required for RHR (LPCI) operation, a 7-day servicing period is justified. Having two mg sets out of service can considerably reduce equipment availability; therefore, the affected unit shall be placed in Cold Shutdown within 24 hours.

The offsite power source requirements are based on the capacity of the respective lines. The Trinity line is limited to supplying two operating units because of the load limitations of CSST's A and B. The Athens line is limited to supplying one operating unit because of the load limitations of the Athens line. The limiting conditions are intended to prevent the 161-kV system from supplying more than two units in the event of a single failure in the offsite power system.

Specification 3.9.D provides the operability requirements for the Unit 3 diesel generators when they serve as emergency power supplies to standby gas treatment train C and control room emergency ventilation train B when they are being considered operable for Unit 2 technical specifications. The allowable out of service time of 30 days is commensurate with the importance of the affected systems when Unit 3 is in cold shutdown, the low probability of a LOCA/Loss of offsite power and availability of onsite power to redundant trains.

4.9 BASES (Cont'd)

The monthly tests of the diesel generators are primarily to check for failures and deterioration in the system since last use. The diesels will be loaded to at least 100 percent of its continuous rating (i.e., 2600 KW) while engine and generator temperatures are stabilized (about one hour). A minimum 75-percent load will prevent soot formation in the cylinders and injection nozzles. Operation up to an equilibrium temperature ensures that there is no overheating problem. The tests also provide an engine and generator operating history to be compared with subsequent engine-generator test data to identify and to correct any mechanical or electrical deficiency before it can result in a system failure.

Diesel testing once per 18 months (i.e., at least once per fuel cycle) at a minimum load of 2800 KW for an interval of not less than 24 hours assures that each diesel generator will be capable of supplying the maximum load during the first 2 hours of a loss of offsite power/loss of coolant accident. This test also demonstrates each diesel generator's long-term load carrying capability.

The test during refueling outages is more comprehensive, including procedures that are most effectively conducted at that time. These include automatic actuation and functional capability tests to verify that the generators can start and be ready to assume load in 10 seconds. The annual inspection will detect any signs of wear long before failure.

BFN tests the 7-day diesel generator fuel oil supplies in accordance with Table 1 of ASTM-D975-89. Each fuel oil supply is tested quarterly.

Battery maintenance with regard to the floating charge, equalizing charge, and electrolyte level will be based on the manufacturer's instruction and sound maintenance practices. In addition, written records will be maintained of the battery performance. The plant batteries will deteriorate with time but precipitous failure is unlikely. The type of surveillance called for in this specification is that which has been demonstrated through experience to provide an indication of a cell becoming irregular or unserviceable long before it becomes a failure.

The equalizing charge, as recommended by the manufacturer, is vital to maintaining the ampere-hour capacity of the battery and will be applied as recommended.

The testing of the logic system will verify the ability of the logic systems to bring the auxiliary electrical system to running standby readiness with the presence of an accident signal from any reactor or an undervoltage signal on the start buses or 4-kV shutdown boards.

The periodic simulation of accident signals in conjunction with diesel generator voltage available signals will confirm the ability of the 480-V load shedding logic system to sequentially shed and restart 480-V loads if an accident signal were present and diesel generator voltage were the only source of electrical power.

4.9 BASES (Cont'd)

Specification 4.9.D provides surveillance requirements for Unit 3 diesel generators for the purpose of satisfying Specification 3.9.D. It contains less stringent testing requirements for the Unit 3 diesel generators when they are only being used to support Unit 2 equipment.

References

1. Normal Auxiliary Power System (BFNP FSAR Subsection 8.4)
2. Standby AC Power Supply and Distribution (BFNP FSAR Subsection 8.5)
3. 250-V DC Power Supply and Distribution (BFNP FSAR Subsection 8.6)
4. Memorandum from G. M. Wilhoite to H. J. Green dated December 4, 1981 (LOO 811208 664) and memorandum from C. E. Winn to H. J. Green dated January 10, 1983 (G02 830112 002)