

October 25, 1993

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

Dr. Mark O. Medford, Vice President
Nuclear Assurance, Licensing & Fuels
Tennessee Valley Authority
3B Lookout Place
1101 Market Street
Chattanooga, Tennessee 37402-2801

Dear Dr. Medford:

SUBJECT: ISSUANCE OF TECHNICAL SPECIFICATION AMENDMENTS REGARDING EXTENSION
OF EMERGENCY DIESEL GENERATOR INSPECTION FREQUENCY (TS 332)
(TAC NOS. M86092, M86093, AND M86094)

The Commission has issued the enclosed Amendment Nos. 200, 218, and 173 to Facility Operating Licenses Nos. DPR-33, DPR-52, and DPR-68 for the Browns Ferry Nuclear Plant (BFN), Units 1, 2, and 3, respectively. These amendments are in response to your application dated March 19, 1993, as supplemented on September 2, 1993, requesting changes to the BFN Technical Specifications to extend the surveillance frequency for emergency diesel generator maintenance inspections from once per 12 months to once per 24 months.

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

Sincerely,
ORIGINAL SIGNED BY:
Frederick J. Hebdon, Director
Project Directorate II-4
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Enclosures:

1. Amendment No. 200 to License No. DPR-33
 2. Amendment No. 218 to License No. DPR-52
 3. Amendment No. 173 to License No. DPR-68
 4. Safety Evaluation
- cc w/enclosures:
See next page

OFFICE:	PDII-4/LA ^{10/8/93}	PDII-4/PM	PDII-4/PM ^{for TR}	PDII-4/PM	OGC
NAME:	BClayton ^{BC}	DTrimble ^{DET}	TRoss	JWilliams ^{JW}	OB ^{OB}
DATE:	10/6/93	10/6/93	10/8/93	10/8/93	10/14/93
OFFICE:	EELB ^{CUB}	PDII-4/D			
NAME:	CBerlinger	FHebdon			
DATE:	10/7/93	10/25/93			

DOCUMENT NAME: G:/BFN/TS332.AMD

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AMENDMENT NO. 200 FOR BROWNS FERRY UNIT 1 - DOCKET NO. 50-259
AMENDMENT NO. 218 FOR BROWNS FERRY UNIT 2 - DOCKET NO. 50-260
AMENDMENT NO. 173 FOR BROWNS FERRY UNIT 3 - DOCKET NO. 50-296
DATED: October 25, 1993

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OC/LFDCB
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C. Patterson
C. Berlinger
P. Kang

cc: Plant Service list

010039

Tennessee Valley Authority
ATTN: Dr. Mark O. Medford

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BROWNS FERRY NUCLEAR PLANT

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

TENNESSEE VALLEY AUTHORITY

DOCKET NO. 50-259

BROWNS FERRY NUCLEAR PLANT, UNIT 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 200
License No. DPR-33

The Nuclear Regulatory Commission (the Commission) has found that:

- A. The application for amendment by Tennessee Valley Authority (the licensee) dated March 19, 1993, as supplemented on September 2, 1993, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;
- B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;
- C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;
- D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and
- E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

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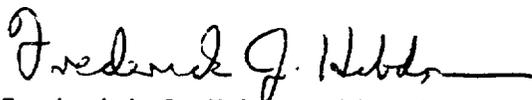
2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment and paragraph 2.C.(2) of Facility Operating License No. DPR-33 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 200, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of its date of issuance and shall be implemented within 30 days from the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION



Frederick J. Hebbon, Director
Project Directorate II-4
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical
Specifications

Date of Issuance: October 25, 1993

ATTACHMENT TO LICENSE AMENDMENT NO. 200

FACILITY OPERATING LICENSE NO. DPR-33

DOCKET NO. 50-259

Revise the Appendix A Technical Specifications by removing the pages identified below and inserting the enclosed pages. The revised pages are identified by the captioned amendment number and contain marginal lines indicating the area of change. Overleaf* pages are provided to maintain document completeness.

REMOVE

3.9/4.9-3
3.9/4.9-4
3.9/4.9-21
3.9/4.9-22

INSERT

3.9/4.9-3
3.9/4.9-4*
3.9/4.9-21
3.9/4.9-22*

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 inspected in accordance with instructions based on the manufacturer's recommendations once every 24 months.
- 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.

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., \geq 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 maintenance 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. 20555-0001

TENNESSEE VALLEY AUTHORITY

DOCKET NO. 50-260

BROWNS FERRY NUCLEAR PLANT, UNIT 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 218
License No. DPR-52

The Nuclear Regulatory Commission (the Commission) has found that:

- A. The application for amendment by Tennessee Valley Authority (the licensee) dated March 19, 1993, as supplemented on September 2, 1993, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;
- B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;
- C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;
- D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and
- E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

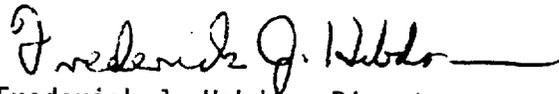
2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment and paragraph 2.C.(2) of Facility Operating License No. DPR-52 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 218, 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: October 25, 1993

ATTACHMENT TO LICENSE AMENDMENT NO. 218

FACILITY OPERATING LICENSE NO. DPR-52

DOCKET NO. 50-260

Revise the Appendix A Technical Specifications by removing the pages identified below and inserting the enclosed pages. The revised pages are identified by the captioned amendment number and contain marginal lines indicating the area of change. Overleaf* pages are provided to maintain document completeness.

REMOVE

3.9/4.9-3
3.9/4.9-4
3.9/4.9-21
3.9/4.9-22

INSERT

3.9/4.9-3
3.9/4.9-4*
3.9/4.9-21
3.9/4.9-22*

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 inspected in accordance with instructions based on the manufacturer's recommendations once every 24 months.
- 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

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.

SURVEILLANCE REQUIREMENTS

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.

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., \geq 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 maintenance 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 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 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. 20555-0001

TENNESSEE VALLEY AUTHORITY

DOCKET NO. 50-296

BROWNS FERRY NUCLEAR PLANT, UNIT 3

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 173
License No. DPR-68

The Nuclear Regulatory Commission (the Commission) has found that:

- A. The application for amendment by Tennessee Valley Authority (the licensee) dated March 19, 1993, as supplemented on September 2, 1993, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;
- B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;
- C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;
- D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and
- E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

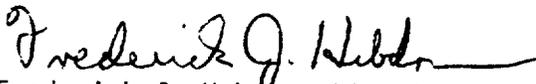
2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment and paragraph 2.C.(2) of Facility Operating License No. DPR-68 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 173, 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: **October 25, 1993**

ATTACHMENT TO LICENSE AMENDMENT NO. 173

FACILITY OPERATING LICENSE NO. DPR-68

DOCKET NO. 50-296

Revise the Appendix A Technical Specifications by removing the pages identified below and inserting the enclosed pages. The revised pages are identified by the captioned amendment number and contain marginal lines indicating the area of change. Overleaf* pages are provided to maintain document completeness.

REMOVE

3.9/4.9-3
3.9/4.9-4
3.9/4.9-20
3.9/4.9-21

INSERT

3.9/4.9-3
3.9/4.9-4*
3.9/4.9-20
3.9/4.9-21*

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 inspected in accordance with instructions based on the manufacturer's recommendations once every 24 months.
- 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.

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. \geq 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 maintenance 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)



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

ENCLOSURE

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NO.200 TO FACILITY OPERATING LICENSE NO. DPR-33

AMENDMENT NO.218 TO FACILITY OPERATING LICENSE NO. DPR-52

AMENDMENT NO.173 TO FACILITY OPERATING LICENSE NO. DPR-68

TENNESSEE VALLEY AUTHORITY

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

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

1.0 INTRODUCTION

By letter dated March 19, 1993, as supplemented on September 2, 1993, the Tennessee Valley Authority (the licensee) submitted a request for changes to the Browns Ferry Nuclear Plant (BFN), Units 1, 2, and 3 Technical Specifications (TS) and associated Bases. The requested changes (1) extend the periodicity of surveillance requirement (SR) 4.9.A.1.d for emergency diesel generator (EDG) inspections from the current once per 12 months to once per 24 months and (2) provide a conforming change to the Bases section concerning SR 4.9.A.1.d by substituting the words "maintenance inspection" in place of "annual inspection". SR 4.9.A.1.d currently requires that each EDG be inspected annually in accordance with instructions based on the manufacturer's recommendations. Since the current inspection program requires each EDG to be removed annually from service for a period of 4 days to 7 days, the proposed amendment reduces the outage time for each EDG, thus improving EDG availability. The licensee contends that the EDG vendor has concurred in a recommendation for a longer maintenance inspection interval.

The staff's proposed finding of no significant hazards considerations is unaffected by the licensee's September 2, 1993, supplement.

2.0 DISCUSSION

The eight EDGs at BFN are shared among the three units and are manufactured by the Electro-Motive Division (EMD) of General Motors. Each consists of a single EMD model 20-645-E4 engine driving a EMD A20 generator.

The maintenance currently performed on the EDGs is based on two vendor maintenance instructions. These instructions specify the maintenance to be performed on both calendar and running-time bases. Due to the very limited run-times on BFN EDGs (each EDG averages about 50 hours of run-time per year), the maintenance at BFN has been performed on the calendar basis rather than run-time.

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Recently, the EMD Owners Group (EMDOG), including the licensee and 22 additional nuclear utilities, reviewed the maintenance programs performed at member facilities. This effort was, in part, to identify practices that penalize EDG availability. The EMDOG then developed a maintenance program which is more appropriate to the operating requirements of EDGs at nuclear power plants. The newly developed EMDOG maintenance program recommended that the interval between the maintenance inspections be extended from once per 12 months to once per refueling cycle (18-24 months). MKW Power Systems (MKW), the licensee's supplier of EMD parts and services, reviewed the EMDOG developed maintenance program.

3.0 EVALUATION

The licensee provided a description of its plans to implement the EMDOG maintenance program. The licensee adopted all the elements of the EMDOG program with the exception of monitoring the intake aftercooler differential pressure (DP). That parameter cannot be monitored due to lack of the installed instrumentation.

MKW has approved the EMDOG maintenance program with two exceptions, regarding the lengthening of replacement intervals (from 12 months to 24 months) for the fuel filter and two lube oil filters. To satisfy the MKW concerns, the licensee will replace those filters (i.e., fuel transfer, main lube oil, and turbocharger lube oil) on an annual basis. With regard to intake aftercooler DP, the licensee has been monitoring the internal condition of the intake aftercoolers, and the facility's maintenance records (from 1983 to present) indicate that no deficiencies that would cause a high aftercooler DP condition have been identified.

Although the purpose of the current annual inspection is to detect premature wear of EDG components, the licensee has concluded that EDG wear is not likely to significantly increase over an extended surveillance interval of 24 months. The licensee bases this conclusion on the following facts:

- (1) Past inspections (annual, two-year, three-year, and six-year) performed on the BFN EDGs have revealed no significant wear on any of the EDG parts required to be inspected.
- (2) The licensee has already reduced the frequency of fast cold starts, which were highlighted by Generic Letter 84-15 as significant contributors to engine wear.
- (3) Under the licensee's proposal, the EDG average run time between inspections would only be increased from approximately 50 hours to 100 hours, which is still below the 500 hours of operation originally recommended by the vendor for EDG inspection under the run-time based maintenance instruction.
- (4) Because lube oil analysis can provide early warning of engine distress, the licensee has proposed to increase the frequency of EDG lube oil analysis to once per month, and this frequency exceeds that recommended by the EMDOG program of once per quarter.

(5) The licensee has an established program for monitoring EDG reliability (which could be adversely affected by component wear), and the overall EDG reliability has been 99.5%.

The staff has reviewed the proposed amendment to SR 4.9.A.1.d and its associated Bases. The staff finds that the proposed increase in the surveillance interval to 24 months would not adversely affect the reliability of the BFN EDGs and offers the potential for improved EDG availability. Therefore, the staff concludes that the proposed amendment to SR 4.9.A.1.d and its Bases, which increases the EDG surveillance interval from once per 12 months to once per 24 months, is acceptable. Additionally, the staff notes that the improved Standard Technical Specifications for General Electric Plants (NUREG-1433, September 1992) no longer require the performance of EDG inspections on a regular interval and that a similar request for EDG inspection interval extension has been approved by the NRC for the Davis-Besse facility.

4.0 STATE CONSULTATION

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

5.0 ENVIRONMENTAL CONSIDERATION

The amendments change requirements with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 and change the Surveillance Requirements and Bases. The NRC staff has determined that the amendments involve no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendments involve no significant hazards consideration, and there has been no public comment on such finding (58 FR 34095). Accordingly, the amendments meet the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b) no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendments.

6.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributors: David Trimble and Peter Kang

Date: October 25, 1993