

January 24, 1991

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

Mr. Oliver D. Kingsley, Jr.
Senior Vice President, Nuclear Power
Tennessee Valley Authority
6N 38A Lookout Place
1101 Market Street
Chattanooga, Tennessee 37402-2801

Dear Mr. Kingsley:

SUBJECT: ISSUANCE OF AMENDMENTS (TAC NOS. 77276, 77277, 77278) (TS 292)

The Commission has issued the enclosed Amendment Nos. 179, 188, and 151 to Facility Operating Licenses Nos. DPR-33, DPR-52 and DPR-68 for the Browns Ferry Nuclear Plant, Units 1, 2 and 3, respectively. These amendments are in response to your application dated August 7, 1990, as supplemented November 30, 1990.

The amendments revise the Technical Specifications (TS) to change the surveillance requirements of TS Section 4.11.B.1.f of all three units related to the electric and diesel-driven high-pressure fire pumps.

The surveillance requirements regarding pump flow and head for the high-pressure fire pumps were revised to reflect the licensee's calculation of actual water demand which assumes Units 1 and 3 are shut down. In addition, the Bases were revised to describe the use of an alternate backup pump or supply in the event that all high-pressure fire pumps are inoperable.

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

Sincerely,

Thierry M. Ross, Project Manager
Project Directorate II-4
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

9102010101 910124
PDR ADDCK 05000259
P PDR

Enclosures:

1. Amendment No. 179 to License No. DPR-33
2. Amendment No. 188 to License No. DPR-52
3. Amendment No. 151 to License No. DPR-68
4. Safety Evaluation

cc w/enclosures:
See next page

OFC : PDII-4/LA	PDII-4/PE	: PDII-1/PM	: OGC	PDII-4/D
NAME : MKrebs	BMoZafari	: TRoss	: FHebdon	:
DATE : 1/15/91	1/15/91	: 1/15/91	: 1/18/91	: 1/24/91

OFFICIAL RECORD COPY
Document Name: BF TAC 77276/7/8
310015

Handwritten notes and signatures in the bottom right corner.

Mr. Oliver D. Kingsley, Jr.

cc:

Mr. Marvin Runyon, Chairman
Tennessee Valley Authority
ET 12A 7A
400 West Summit Hill Drive
Knoxville, Tennessee 37902

Mr. Edward G. Wallace
Manager, Nuclear Licensing
and Regulatory Affairs
Tennessee Valley Authority
5N 157B Lookout Place
Chattanooga, Tennessee 37402-2801

Mr. John B. Waters, Director
Tennessee Valley Authority
ET 12A 9A
400 West Summit Hill Drive
Knoxville, Tennessee 37902

Mr. W. F. Willis
Chief Operating Officer
ET 12B 16B
400 West Summit Hill Drive
Knoxville, Tennessee 37902

General Counsel
Tennessee Valley Authority
400 West Summit Hill Drive
ET 11B 33H
Knoxville, Tennessee 37902

Mr. Dwight Nunn
Vice President, Nuclear Projects
Tennessee Valley Authority
6N 38A Lookout Place
1101 Market Street
Chattanooga, Tennessee 37402-2801

Dr. Mark O. Medford
Vice President, Nuclear Assurance,
Licensing and Fuels
Tennessee Valley Authority
6N 38A Lookout Place
Chattanooga, Tennessee 37402-2801

Mr. O. J. Zeringue, Site Director
Browns Ferry Nuclear Plant
Tennessee Valley Authority
P. O. Box 2000
Decatur, Alabama 35602

Mr. P. Carrier, Site Licensing Manager
Browns Ferry Nuclear Plant
Tennessee Valley Authority
P. O. Box 2000
Decatur, Alabama 35602

Mr. L. W. Myers, Plant Manager
Browns Ferry Nuclear Plant
Tennessee Valley Authority
P. O. Box 2000
Decatur, Alabama 35602

Chairman, Limestone County Commission
P. O. Box 188
Athens, Alabama 35611

Claude Earl Fox, M.D.
State Health Officer
State Department of Public Health
State Office Building
Montgomery, Alabama 36130

Regional Administrator, Region II
U.S. Nuclear Regulatory Commission
101 Marietta Street, N.W.
Atlanta, Georgia 30323

Mr. Charles Patterson
Senior Resident Inspector
Browns Ferry Nuclear Plant
U.S. Nuclear Regulatory Commission
Route 12, Box 637
Athens, Alabama 35611

Tennessee Valley Authority
Rockville Office
11921 Rockville Pike
Suite 402
Rockville, Maryland 20852

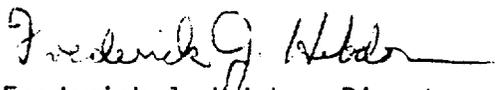
2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment and paragraph 2.C.(2) of Facility Operating License No. DPR-33 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No.179 , 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: January 24, 1991



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. 179
License No. DPR-33

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by Tennessee Valley Authority (the licensee) dated August 7, 1990, as supplemented November 30, 1990, 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.

ATTACHMENT TO LICENSE AMENDMENT NO. 179

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

3.11/4.11-3

3.11/4.11-4

3.11/4.11-23

3.11/4.11-24

INSERT

3.11/4.11-3

3.11/4.11-4*

3.11/4.11-23

3.11/4.11-24*

*Denotes overleaf or spillover page.

3.11/4.11 FIRE PROTECTION SYSTEMS

LIMITING CONDITIONS FOR OPERATION

SURVEILLANCE REQUIREMENTS

3.11.B FIRE PUMPS AND WATER DISTRIBUTION MAINS (Cont'd)

2. With only the diesel or one or more of the three electric pumps OPERABLE, restore the inoperable equipment to OPERABLE status within 7 days or provide an alternate backup pump or supply.
3. With no high-pressure fire pumps OPERABLE, establish a backup fire water system within 24 hours or be in COLD SHUTDOWN CONDITION within the following 24 hours.

4.11.B FIRE PUMPS AND WATER DISTRIBUTION MAINS (Cont'd)

- e. At least yearly by cycling each testable valve in the flow path through at least one complete cycle of full travel.
- f. At least once per 18 months, by performing a system functional test which includes simulated actuation of the system throughout its operating sequence, and:
 - (1) Verifying that each automatic valve in the flow path actuates to its correct position,
 - (2) Verifying that each electric high-pressure fire pump develops at least 2250 gpm at a system head of 300 feet.
 - (3) Verifying the diesel-driven high-pressure fire pump develops at least 2250 gpm at a system head of 300 feet.

LIMITING CONDITIONS FOR OPERATION

SURVEILLANCE REQUIREMENTS

3.11.B FIRE PUMPS AND WATER DISTRIBUTION MAINS (Cont'd)

4.11.B FIRE PUMPS AND WATER DISTRIBUTION MAINS (Cont'd)

(4) Verifying that after initial high-pressure fire pump actuation each subsequent high-pressure fire pump starts sequentially to maintain the High-Pressure Fire Protection System pressure greater than or equal to 120 psig.

g. At least once per 3 years by performing a flow test of the system in accordance with the Fire Protection Handbook published by the National Fire Protection Association.

2. The diesel-driven high-pressure fire pump shall be demonstrated OPERABLE:

a. At least monthly by:

(1) Verifying the fuel tank contains at least 150 gallons of fuel.

(2) Starting the pump from ambient conditions and operating for greater than or equal to 30 minutes on recirculation flow.

3.11 BASES

FIRE PROTECTION SYSTEMS

The OPERABILITY of the fire protection systems ensures that adequate fire protection features are available to detect, confine, and extinguish fires occurring in any portion of the facility where safety-related equipment is located. The fire protection system consists of fire detection instrumentation, fire pumps, and water distribution mains, spray and/or sprinkler systems, CO₂ systems, fire hose stations, yard fire hydrants and hose house stations and fire barriers. The collective capability of the fire suppression systems is adequate to minimize potential damage to safety-related equipment and is a major element in the facility fire protection program. OPERABILITY of the detection instrumentation ensures that both adequate warning capability is available for prompt detection of fires and that fire suppression systems that are actuated by fire detectors will discharge extinguishing agent in a timely manner. Prompt detection and suppression of fires will reduce the potential for damage to safety-related equipment and is an integral element in the overall facility fire protection program.

In the event that portions of the fire protection systems are inoperable, alternate backup fire fighting equipment is required to be made available in the affected areas until the inoperable equipment is restored to service. When the inoperable fire fighting equipment is intended for use as a backup means of fire suppression, a longer period of time is allowed to provide an alternate means of fire fighting than if the inoperable equipment is the primary means of fire suppression.

If in the event that all the high-pressure fire pumps become inoperable, an alternate backup pump or supply is available, such as using the additional fire pump which normally protects outlying areas and mobile fire apparatus to maintain the 2250 gpm water supply at a system head of 300 feet.

Fire protection water systems protecting areas containing redundant safe shutdown systems, as defined in BFN's Fire Hazard Analysis, warrant more stringent compensatory measures (i.e., continuous fire watches) than areas containing only one division of safe shutdown systems or safety-related equipment not required for safe shutdown under fire conditions.

The surveillance requirements provide assurances that the minimum OPERABILITY requirements of the fire protection systems are met. All fire protection equipment surveillances required by this technical specification can be performed when the unit is in any operating mode.

3.11 BASES (Cont'd)

FIRE PROTECTION SYSTEMS (Cont'd)

Flushing of the high-pressure fire protection system mains and building headers assures that sediment and marine growth is removed from the system to prevent obstruction. Subsequent biocide addition reduces further marine organism growth. Individual hose stations and fire hydrants are not included in the overall flush requirements, but are flushed periodically during specific OPERABILITY verifications. Hydraulic performance of the water fire suppression system is tested in accordance with the 16th Edition of the Fire Protection Handbook, published by the National Fire Protection Association.

The functional integrity of the fire barrier assemblies and penetration sealing devices ensures that fires will be confined or adequately retarded from spreading to adjacent portions of the facility. This design feature minimizes the possibility of a single fire from involving several areas of the facility prior to detection and extinguishment. The fire barrier penetrations are a passive element in the facility fire protection program and are subject to periodic inspections.

The barrier penetrations, including fire doors, fire dampers, and cable and pipe penetration seals, are considered functional when the visually observed condition indicates no significant degradation.



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. 188
License No. DPR-52

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by Tennessee Valley Authority (the licensee) dated August 7, 1990, as supplemented November 30, 1990, 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.

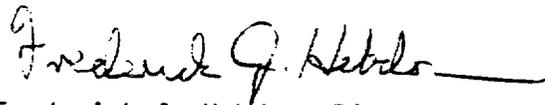
2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment and paragraph 2.C.(2) of Facility Operating License No. DPR-52 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 188, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

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

FOR THE NUCLEAR REGULATORY COMMISSION



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

Attachment:
Changes to the Technical
Specifications

Date of Issuance: January 24, 1991

ATTACHMENT TO LICENSE AMENDMENT NO. 151

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

3.11/4.11-3

3.11/4.11-4

3.11/4.11-21

3.11/4.11-22

INSERT

3.11/4.11-3

3.11/4.11-4*

3.11/4.11-23

3.11/4.11-24*

*Denotes overleaf or spillover page.

3.11/4.11 FIRE PROTECTION SYSTEMS

LIMITING CONDITIONS FOR OPERATION

SURVEILLANCE REQUIREMENTS

3.11.B FIRE PUMPS AND WATER DISTRIBUTION MAINS (Cont'd)

2. With only the diesel or one or more of the three electric pumps OPERABLE, restore the inoperable equipment to OPERABLE status within 7 days or provide an alternate backup pump or supply.
3. With no high-pressure fire pumps OPERABLE, establish a backup fire water system within 24 hours or be in COLD SHUTDOWN CONDITION within the following 24 hours.

4.11.B FIRE PUMPS AND WATER DISTRIBUTION MAINS (Cont'd)

- e. At least yearly by cycling each testable valve in the flow path through at least one complete cycle of full travel.
- f. At least once per 18 months, by performing a system functional test which includes simulated actuation of the system throughout its operating sequence, and:
 - (1) Verifying that each automatic valve in the flow path actuates to its correct position,
 - (2) Verifying that each electric high-pressure fire pump develops at least 2250 gpm at a system head of 300 feet.
 - (3) Verifying the diesel-driven high-pressure fire pump develops at least 2250 gpm at a system head of 300 feet.

LIMITING CONDITIONS FOR OPERATION

3.11.B FIRE PUMPS AND WATER DISTRIBUTION MAINS (Cont'd)

SURVEILLANCE REQUIREMENTS

4.11.B FIRE PUMPS AND WATER DISTRIBUTION MAINS (Cont'd)

(4) Verifying that after initial high-pressure fire pump actuation each subsequent high-pressure fire pump starts sequentially to maintain the High-Pressure Fire Protection System pressure greater than or equal to 120 psig.

g. At least once per 3 years by performing a flow test of the system in accordance with the Fire Protection Handbook published by the National Fire Protection Association.

2. The diesel-driven high-pressure fire pump shall be demonstrated OPERABLE:

a. At least monthly by:

(1) Verifying the fuel tank contains at least 150 gallons of fuel.

(2) Starting the pump from ambient conditions and operating for greater than or equal to 30 minutes on recirculation flow.

3.11 BASES

FIRE PROTECTION SYSTEMS

The OPERABILITY of the fire protection systems ensures that adequate fire protection features are available to detect, confine, and extinguish fires occurring in any portion of the facility where safety-related equipment is located. The fire protection system consists of fire detection instrumentation, fire pumps, and water distribution mains, spray and/or sprinkler systems, CO₂ systems, fire hose stations, yard fire hydrants and hose house stations and fire barriers. The collective capability of the fire suppression systems is adequate to minimize potential damage to safety-related equipment and is a major element in the facility fire protection program. OPERABILITY of the detection instrumentation ensures that both adequate warning capability is available for prompt detection of fires and that fire suppression systems that are actuated by fire detectors will discharge extinguishing agent in a timely manner. Prompt detection and suppression of fires will reduce the potential for damage to safety-related equipment and is an integral element in the overall facility fire protection program.

In the event that portions of the fire protection systems are inoperable, alternate backup fire fighting equipment is required to be made available in the affected areas until the inoperable equipment is restored to service. When the inoperable fire fighting equipment is intended for use as a backup means of fire suppression, a longer period of time is allowed to provide an alternate means of fire fighting than if the inoperable equipment is the primary means of fire suppression.

If in the event that all the high-pressure fire pumps become inoperable, an alternate backup pump or supply is available, such as using the additional fire pump which normally protects outlying areas and mobile fire apparatus to maintain the 2250 gpm water supply at a system head of 300 feet.

Fire protection water systems protecting areas containing redundant safe shutdown systems, as defined in BFN's Fire Hazard Analysis, warrant more stringent compensatory measures (i.e., continuous fire watches) than areas containing only one division of safe shutdown systems or safety-related equipment not required for safe shutdown under fire conditions.

The surveillance requirements provide assurances that the minimum OPERABILITY requirements of the fire protection systems are met. All fire protection equipment surveillances required by this technical specification can be performed when the unit is in any operating mode.

3.11 BASES (Cont'd)

FIRE PROTECTION SYSTEMS (Cont'd)

Flushing of the high-pressure fire protection system mains and building headers assures that sediment and marine growth is removed from the system to prevent obstruction. Subsequent biocide addition reduces further marine organism growth. Individual hose stations and fire hydrants are not included in the overall flush requirements, but are flushed periodically during specific OPERABILITY verifications. Hydraulic performance of the water fire suppression system is tested in accordance with the 16th Edition of the Fire Protection Handbook, published by the National Fire Protection Association.

The functional integrity of the fire barrier assemblies and penetration sealing devices ensures that fires will be confined or adequately retarded from spreading to adjacent portions of the facility. This design feature minimizes the possibility of a single fire from involving several areas of the facility prior to detection and extinguishment. The fire barrier penetrations are a passive element in the facility fire protection program and are subject to periodic inspections.

The barrier penetrations, including fire doors, fire dampers, and cable and pipe penetration seals, are considered functional when the visually observed condition indicates no significant degradation.

AMENDMENT NO. 159



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. 151
License No. DPR-68

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by Tennessee Valley Authority (the licensee) dated August 7, 1990, as supplemented November 30, 1990, 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.151, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

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

FOR THE NUCLEAR REGULATORY COMMISSION



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

Attachment:
Changes to the Technical
Specifications

Date of Issuance: January 24, 1991

ATTACHMENT TO LICENSE AMENDMENT NO.188

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

3.11/4.11-3

3.11/4.11-4

3.11/4.11-21

3.11/4.11-22

INSERT

3.11/4.11-3

3.11/4.11-4*

3.11/4.11-21

3.11/4.11-22*

*Denotes overleaf or spillover page.

3.11/4.11 FIRE PROTECTION SYSTEMS

LIMITING CONDITIONS FOR OPERATION

3.11.B FIRE PUMPS AND WATER DISTRIBUTION MAINS (Cont'd)

2. With only the diesel or one or more of the three electric pumps OPERABLE, restore the inoperable equipment to OPERABLE status within 7 days or provide an alternate backup pump or supply.
3. With no high-pressure fire pumps OPERABLE, establish a backup fire water system within 24 hours or be in COLD SHUTDOWN CONDITION within the following 24 hours.

SURVEILLANCE REQUIREMENTS

4.11.B FIRE PUMPS AND WATER DISTRIBUTION MAINS (Cont'd)

- e. At least yearly by cycling each testable valve in the flow path through at least one complete cycle of full travel.
- f. At least once per 18 months, by performing a system functional test which includes simulated actuation of the system throughout its operating sequence, and:
 - (1) Verifying that each automatic valve in the flow path actuates to its correct position,
 - (2) Verifying that each electric high-pressure fire pump develops at least 2250 gpm at a system head of 300 feet.
 - (3) Verifying the diesel-driven high-pressure fire pump develops at least 2250 gpm at a system head of 300 feet.

LIMITING CONDITIONS FOR OPERATION

3.11.B FIRE PUMPS AND WATER DISTRIBUTION MAINS (Cont'd)

SURVEILLANCE REQUIREMENTS

4.11.B FIRE PUMPS AND WATER DISTRIBUTION MAINS (Cont'd)

- (4) Verifying that after initial high-pressure fire pump actuation each subsequent high-pressure fire pump starts sequentially to maintain the High-Pressure Fire Protection System pressure greater than or equal to 120 psig.
- g. At least once per 3 years by performing a flow test of the system in accordance with the Fire Protection Handbook published by the National Fire Protection Association.
- 2. The diesel-driven high-pressure fire pump shall be demonstrated OPERABLE:
 - a. At least monthly by:
 - (1) Verifying the fuel tank contains at least 150 gallons of fuel.
 - (2) Starting the pump from ambient conditions and operating for greater than or equal to 30 minutes on recirculation flow.

3.11 BASES

FIRE PROTECTION SYSTEMS

The OPERABILITY of the fire protection systems ensures that adequate fire protection features are available to detect, confine, and extinguish fires occurring in any portion of the facility where safety-related equipment is located. The fire protection system consists of fire detection instrumentation, fire pumps, and water distribution mains, spray and/or sprinkler systems, CO₂ systems, fire hose stations, yard fire hydrants and hose house stations and fire barriers. The collective capability of the fire suppression systems is adequate to minimize potential damage to safety-related equipment and is a major element in the facility fire protection program. OPERABILITY of the detection instrumentation ensures that both adequate warning capability is available for prompt detection of fires and that fire suppression systems that are actuated by fire detectors will discharge extinguishing agent in a timely manner. Prompt detection and suppression of fires will reduce the potential for damage to safety-related equipment and is an integral element in the overall facility fire protection program.

In the event that portions of the fire protection systems are inoperable, alternate backup fire fighting equipment is required to be made available in the affected areas until the inoperable equipment is restored to service. When the inoperable fire fighting equipment is intended for use as a backup means of fire suppression, a longer period of time is allowed to provide an alternate means of fire fighting than if the inoperable equipment is the primary means of fire suppression.

If in the event that all the high-pressure fire pumps become inoperable, an alternate backup pump or supply is available, such as using the additional fire pump which normally protects outlying areas and mobile fire apparatus to maintain the 2250 gpm water supply at a system head of 300 feet.

Fire protection water systems protecting areas containing redundant safe shutdown systems, as defined in BFN's Fire Hazard Analysis, warrant more stringent compensatory measures (i.e., continuous fire watches) than areas containing only one division of safe shutdown systems or safety-related equipment not required for safe shutdown under fire conditions.

The surveillance requirements provide assurances that the minimum OPERABILITY requirements of the fire protection systems are met. All fire protection equipment surveillances required by this technical specification can be performed when the unit is in any operating mode.

3.11 BASES (Cont'd).

FIRE PROTECTION SYSTEMS (Cont'd)

Flushing of the high-pressure fire protection system mains and building headers assures that sediment and marine growth is removed from the system to prevent obstruction. Subsequent biocide addition reduces further marine organism growth. Individual hose stations and fire hydrants are not included in the overall flush requirements, but are flushed periodically during specific OPERABILITY verifications. Hydraulic performance of the water fire suppression system is tested in accordance with the 16th Edition of the Fire Protection Handbook, published by the National Fire Protection Association.

The functional integrity of the fire barrier assemblies and penetration sealing devices ensures that fires will be confined or adequately retarded from spreading to adjacent portions of the facility. This design feature minimizes the possibility of a single fire from involving several areas of the facility prior to detection and extinguishment. The fire barrier penetrations are a passive element in the facility fire protection program and are subject to periodic inspections.

The barrier penetrations, including fire doors, fire dampers, and cable and pipe penetration seals, are considered functional when the visually observed condition indicates no significant degradation.



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

ENCLOSURE 4

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SUPPORTING AMENDMENT NO. 179 TO FACILITY OPERATING LICENSE NO. DPR-33

AMENDMENT NO. 188 TO FACILITY OPERATING LICENSE NO. DPR-52

AMENDMENT NO. 151 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 August 7, 1990, as supplemented November 30, 1990, the Tennessee Valley Authority (the licensee) requested changes to the Technical Specifications surveillance requirements for the high-pressure fire pumps installed at Browns Ferry Nuclear Plant (BFN).

The following NRC evaluation of the requested changes is based on the review of supporting justification furnished by the licensee in Enclosures 1 through 5 of the letter of August 7, 1990.

2.0 EVALUATION

The fire protection water supply and the raw service water (RSW) system at BFN have a common supply header. Both distribution systems are normally pressurized and supplied by the RSW pumps. In addition to the RSW pumps, there are three electric motor driven and one diesel engine driven high-pressure fire pumps, each capable of supplying the single largest expected fire flow and RSW demands.

The original specifications for the fire pumps called for a minimum discharge volume of 2500 gpm at discharge head (pressure) of 300 feet (130 psig) for the electric driven pumps and 340 feet (147 psig) for the diesel driven pumps. However, none of the four fire pumps can meet the manufacturer's original design specifications, due in part to system aging and changes in pump drives. Operation of the fire pumps occurs when a drop in system pressure produces an alarm in the control room and signals the control room operators to manually initiate the starting sequence. Once initiated, the sequence proceeds automatically with each pump starting in turn (electric driven pumps first and the diesel driven pump last) when the system pressure drops below 120 psig. The sequence has a built-in time delay of 15 seconds between the starting of each pump and the next pump. This delay is provided to protect the system from excessive pressure surges that develop from simultaneous pump starts and to prevent unnecessary multiple pump starts.

Flow demand assumptions used by TVA to determine the highest expected flows, and therefore the minimum acceptable capacities of their fire pumps are as follows:

- Automatic fire suppression system - 589 gpm assumes operation of all automatic sprinkler heads in the worst 1500 square foot area of the plant.
- Manual fire suppression activities - 250 gpm for manual hose lines.
- RSW loads - 1250 gpm for largest expected RSW demand.

Together, these three water demands give a total expected maximum flow demand of 2089 gpm. The licensee initially proposed to round the value to 2100 gpm at 130 psig and establish this as the minimum technical specification surveillance requirement. The NRC staff did not agree that 2100 gpm would furnish an adequate margin of safety and recommended that the licensee specify 2250 gpm at 130 psig as the revised TS fire pump surveillance requirement. This value was based on providing sufficient safety margin and represents a degraded condition of 10 percent below the manufacturer's recommended pump performance. The TVA letter dated November 30, 1990, with enclosed TS pages, incorporated the staff's recommendation.

3.0 ENVIRONMENTAL CONSIDERATION

The amendments involve changes to the surveillance requirements. The 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 these amendments involve no significant hazards consideration and there has been no public comment on such finding (55 FR 36356). 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 nor environmental assessment need be prepared in connection with the issuance of these amendments.

4.0 CONCLUSION

Based on the above evaluation, we conclude that the licensee's proposed Technical Specification surveillance requirements for acceptable minimum flow of BFN fire pumps of 2250 gpm at 130 psig are acceptable.

Note, however, that while this change applies to all of the pumps which supply fire protection water for the entire three unit site, justification is based on the ability of the pumps to individually supply the fire protection and raw service water needs for only one unit. The TVA amendment request and the associated NRC safety evaluation have been prepared to support Unit 2 restart. TVA has not completed fire protection related modifications for Units 1 and 3. When those modifications are completed, the licensee will perform a similar evaluation of the combined fire protection/raw service water for the entire site.

The Commission made a proposed determination that the amendments involve no significant hazards consideration which was published in the Federal Register (55 FR 36356) on September 5 and December 10, 1990 (55 FR 50791) and consulted with the State of Alabama. No public comments were received and the State of Alabama did not have any comments.

The staff has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendments will not be inimical to the common defense and security nor to the health and safety of the public.

Author: D. Notley

Date: January 24, 1991