LICENSE AUTHORITY FILE COPY
May 19, 1989

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

P O S T E D
50-260
BROWNS FERRY 2
AMENDMENT NO. 166
TO DPR-52

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 - BROWNS FERRY NUCLEAR PLANTS, UNITS 1, 2, AND 3 (TAC 00527, 00528, 00529) (TS-258)

The Commission has issued the enclosed Amendment Nos. 167,166 , and138 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 October 24, 1988, as supplemented by letter dated March 24, 1989.

The amendments change the expiration date for BFN, Unit 1, Facility Operating License DPR-33 from May 10, 2007 to December 20, 2013; Unit 2, Facility Operating License DPR-52 from May 10, 2007 to June 28, 2014; and Unit 3, Facility Operating License DPR-68 from July 31, 2008 to July 2, 2016.

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,

Original signed by

Suzanne Black, Assistant Director
for Projects
TVA Projects Division
Office of Nuclear Reactor Regulation

Enclosures:
1. Amendment No. 167 to License No. DPR-33
2. Amendment No. 166 to License No. DPR-52
3. Amendment No. 138 to License No. DPR-68
4. Safety Evaluation

cc w/enclosures:
See next page

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cc:
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Committee on Interior
and Insular Affairs
U. S. House of Representatives
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Tennessee Valley Authority
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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. 167
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 October 24, 1988 and March 24, 1989, 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, paragraph 2.E of Facility Operating License No. DPR-33 is hereby amended to read as follows:

   This amended license is effective as of the date of issuance and shall expire midnight on December 20, 2013.

3. This license amendment is effective as of its date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Suzanne Black

Suzanne Black, Assistant Director
for Projects
TVA Projects Division
Office of Nuclear Reactor Regulation

Date of Issuance: May 19, 1989

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. 166
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 October 24, 1988 and March 24, 1989, 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, paragraph 2.E of Facility Operating License No. DPR-52 is hereby amended to read as follows:

   This amended license is effective as of the date of issuance and shall expire midnight on June 28, 2014.

3. This license amendment is effective as of its date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Suzanne Black

Suzanne Black, Assistant Director
for Projects
TVA Projects Division
Office of Nuclear Reactor Regulation

Date of Issuance: May 19, 1989

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. 138
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 October 24, 1988 and March 24, 1989, 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, paragraph 2.F of Facility Operating License No. DPR-68 is hereby amended to read as follows:

   This amended license is effective as of the date of issuance and shall expire midnight on July 2, 2016.

3. This license amendment is effective as of its date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Suzanne Black

Suzanne Black, Assistant Director
for Projects
TVA Projects Division
Office of Nuclear Reactor Regulation

Date of Issuance: May 19, 1989

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

ENCLOSURE 4

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SUPPORTING AMENDMENT NO. 167 TO FACILITY OPERATING LICENSE NO. DPR-33

AMENDMENT NO. 166 TO FACILITY OPERATING LICENSE NO. DPR-52

AMENDMENT NO. 138 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 application for license amendments dated October 24, 1988, Tennessee Valley Authority (TVA or the licensee) requested a change in the expiration dates for Operating License DPR-33 (Unit 1) from May 10, 2007 to December 20, 2013, for Operating License DPR-52 (Unit 2) from May 10, 2007 to June 28, 2014, and for Operating License DPR-68 (Unit 3) from July 31, 2008 to July 2, 2016.

2.0 DISCUSSION

Section 103.c of the Atomic Energy Act of 1954 states that a license is to be issued for a specified period not to exceed 40 years. Title 10 CFR 50.51 specifies that each license will be issued for a fixed period of time not to exceed 40 years from the date of issuance. The currently licensed terms for the Browns Ferry Nuclear Plant (BFN), Units 1, 2 and 3, are 40 years commencing with the issuance of the construction permits which was May 10, 1967 for Units 1 and 2, and July 31, 1968 for Unit 3. Accounting for the time required for plant construction, this represents effective operating license terms of 33 years and 5 months for Unit 1, and 31 years and 11 months for Unit 2 and 3. Consistent with Section 103.c of the Atomic Energy Act and Section 50.51 of the Commission's regulations, TVA, by the October 24, 1988 application, seeks an extension of the operating license terms for BFN, Units 1, 2 and 3 so the fixed period of the licenses will be 40 years from the operating license issuance date.

By letter dated March 24, 1989, TVA provided supplemental information to its application which supported the population estimates in the application. This information did not change the substance of the proposed action which TVA submitted in its October 24, 1988 application and which was noticed on January 11, 1989 (54 FR 1024). This information did not affect the staff's initial determination of no significant hazards consideration in that notice.

3.0 EVALUATION

The NRC staff has evaluated the safety issues associated with issuance of the proposed license amendment which will allow approximately seven years for Units 1 and 2, and eight years for Unit 3 of additional operation. The issues addressed consist of additional radiation exposure to the licensee's operating staff, impacts on the offsite population, and the general aging of the plant structures and equipment. The impact of additional radiation exposure to the facility operating staff and the impact on the general population in the vicinity of BFN, Units 1, 2 and 3 are addressed in the NRC staff's Environmental Assessment dated .

3.1 Plant Structures and Systems

The licensee's request for extension of the operating license is based, in part, on the determination that a 40-year service life was considered during the design and construction of the plant. This does not mean that some components will not wear out during the plant lifetime. Rather, design features were incorporated which provide for inspectability of structures, systems and equipment. In addition, structures, systems and components are required by the Technical Specifications (TS) to undergo routine surveillance to assure that there is a high degree of confidence that they will perform their safety functions when required.

The environmental qualification (EQ) program for electrical equipment operating in a harsh environment is described in Section III.1 of the BFN Nuclear Performance Plan (NPP). The program ensures that EQ is maintained for electrical equipment necessary to ensure reactor coolant pressure boundary integrity, to shut down the reactor and maintain it in a safe shutdown condition, and to prevent or mitigate the consequences of accidents that could result in offsite exposures comparable to the 10 CFR 100 guidelines. Non-safety-related electrical equipment whose failure under postulated harsh environmental conditions could prevent satisfactory accomplishment of safety functions by safety-related equipment was also included in the program.

The licensee has performed aging analyses for all safety-related electrical equipment within the scope of 10 CFR 50.49. The qualified life of the equipment or component is incorporated with BFN's maintenance and replacement practices to ensure that this safety-related electrical equipment remains qualified and available to perform its safety function regardless of the overall age of the plant. The NRC staff evaluated the program and found it acceptable. The evaluation is documented in the Safety Evaluation by the Office of Special Projects dated October 21, 1988.

BFN Technical Specifications 1.MM requires that the licensee maintain an inservice inspection (ISI) program for ASME Code Class 1, 2 and 3 components and an inservice test (IST) program for ASME Code Class 1, 2 and 3 pumps and valves. These programs are necessary to assure the continued operability and integrity of systems important to plant safety. TS 1.MM requirements further specify that the above programs comply with the applicable Code and addenda as required by 10 CFR 50, Section 50.55a(g) except where the NRC staff provides written relief per 10 CFR 50.55a(g)(6)(i).

In addition to the ISI and IST programs, the following BFN TS also provide additional requirements for monitoring component aging and the cumulative effects of power operation over the life of the plant.

a. TS 3/4.6.A - Reactor Coolant System Pressure/Temperature Limits

Temperature and pressure changes during heatup, cooldown, and normal operation of the reactor coolant system are limited to protect against non-ductile failure of the reactor coolant system. These limits are calculated using the methods derived from Appendix G in Section III of the ASME Boiler and Pressure Vessel Code as required in 10 CFR 50, Appendix G.

The above specification also includes a reactor vessel material surveillance program that monitors reactor vessel embrittlement over the 40-year design life in accordance with 10 CFR 50, Appendix H. Reactor vessel irradiation specimens are removed and examined at specific intervals to determine changes in material properties. The results of the examinations are used to update the pressure and temperature limits.

b. TS 3/4.6.G - Reactor Coolant System Structures and Components

The ISI and IST programs for ASME Code Class 1, 2, and 3 components ensure that the structural integrity and operational readiness of these components will be maintained at an acceptable level throughout the life of the plant.

In addition to the ISI and IST programs, additional Limiting Conditions for Operation (LCO) are specified for reactor vessel head bolting stud tensioning and starting of recirculation pumps with excessive temperature differentials between loops and between dome and bottom head drain.

c. TS 6.10.1.g Component Cyclic or Transient Limit

This requirement ensures that certain components within the reactor coolant and secondary systems are maintained within their cyclic or transient limits over the life of the plant. These limits are monitored, recorded, and evaluated for component fatique to provide confidence that each component will perform its intended function over a 40-year design life.

3.2 Reactor Pressure Vessel

The original design of the reactor pressure vessel (RPV) and associated internals considered the effects of 40 years of operation within the cyclic limits given in the BFN Final Safety Analysis Report, Section 4.2. Those cyclic limits equate to 40 years of operation at full power with a plant capacity factor of 80% (i.e., 32 effective full power years), included expected operational and thermal transients. To date, the largest capacity factor has been approximately 70% and should not exceed that for the remainder of plant life.

3.3 Summary of Findings

Based on the above, we find that extensions of the operating licenses for BFN, Units 1, 2 and 3 to allow a 40-year service life are consistent with the safety analysis for BFN, Units 1, 2 and 3, and that the Commission's previous safety findings are not changed. All issues associated with plant systems and equipment, including aging and changes in RPV fracture toughness properties, have been addressed and are acceptable for 40-years of operation.

4.0 ENVIRONMENTAL CONSIDERATION

A Notice of Environmental Assessment and Finding of No Significant Impact relating to the proposed extension of the Facility Operating License termination date for Browns Ferry Nuclear Plant, Units 1, 2 and 3 was published in the Federal Register (54 FR 21587) on May 19, 1989. No public comments were received and the State of Alabama did not have comments.

5.0 CONCLUSION

We have 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, and (2) such activities will be conducted in compliance with the Commission's regulations, and the issuance of the amendments will not be inimical to the common defense and security nor to the health and safety of the public.

Principal Contributor: T. Daniels

Dated: May 19, 1989