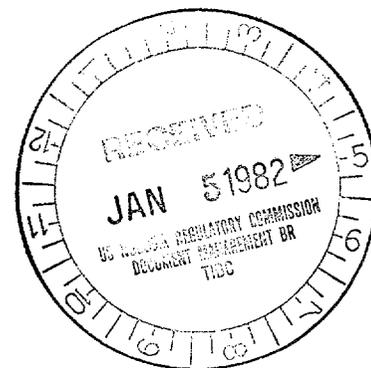


December 29, 1981

Docket No. 50-260



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

Dear Mr. Parris:

The Commission has issued the enclosed Amendment No. 77 to Facility License No. DPR-52 for the Browns Ferry Nuclear Plant, Unit No. 2. This amendment is in response to your application of September 9, 1981 (TVA BFNP TS 165b), as supplemented by your letter of December 11, 1981.

This amendment changes the Technical Specifications to extend the exposure range of the Maximum Average Planar Linear Heat Generation Rate (MAPLHGR) versus average planar exposure from 30,000 MWd/T to 40,000 MWd/T for the 8 x 8 fuel bundles in the core. The MAPLHGR limits for the 7 x 7 fuel bundles still in this core were previously extended to 40,000 MWd/T by Amendment No. 57 to Facility License No. DPR-52 which we issued October 6, 1980.

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

Sincerely,

~~ORIGINAL SIGNED BY~~

Richard J. Clark, Project Manager  
Operating Reactors Branch #2  
Division of Licensing

Enclosures:

1. Amendment No. 77 to DPR-52
2. Safety Evaluation
3. Notice

cc w/enclosures

See next page

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SURNAME	SNorris	RClark	T. Inpp. J. To	T. Novak	OK by See Note
DATE	12/18/81	12/18/81	12/18/81	12/18/81	12/29/81

Mr. Hugh G. Parris

cc:

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

TENNESSEE VALLEY AUTHORITY

DOCKET NO. 50-260

BROWNS FERRY NUCLEAR PLANT, UNIT NO. 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 77  
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 September 9, 1981 and supplemented by letter dated December 11, 1981, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;
  - B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;
  - C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;
  - D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and
  - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.
2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C(2) of Facility License No. DPR-52 is hereby amended to read as follows:

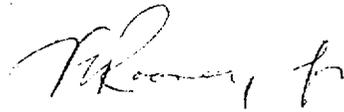
(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 77, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

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

FOR THE NUCLEAR REGULATORY COMMISSION



Thomas A. Ippolito, Chief  
Operating Reactors Branch #2  
Division of Licensing

Attachment:  
Changes to the Technical  
Specifications

Date of Issuance: December 29, 1981

ATTACHMENT TO LICENSE AMENDMENT NO. 77

FACILITY OPERATING LICENSE NO. DPR-52

DOCKET NO. 50-260

Review Appendix A as follows:

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

171/172

172a

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

Table 3.5.I-1

## MAPLHGR VERSUS AVERAGE PLANAR EXPOSURE

Fuel Type: Initial Core - Type 1 & 3

<u>Average Planar Exposure (Mgd/ft)</u>	<u>MAPLHGR (kW/ft)</u>
200	15.0
1,000	15.1
5,000	16.0
10,000	16.3
15,000	16.1
20,000	15.4
25,000	14.2
30,000	13.1
35,000*	11.8
40,000*	10.5

Table 3.5.I-2

## MAPLHGR VERSUS AVERAGE PLANAR EXPOSURE

Fuel Type: Initial Core - Type 2

<u>Average Planar Exposure (Mgd/ft)</u>	<u>MAPLHGR (kW/ft)</u>
200	15.6
1,000	15.5
5,000	16.2
10,000	16.5
15,000	16.5
20,000	15.8
25,000	14.5
30,000	13.3
35,000*	11.9
40,000*	10.6

TABLE 3.5.I-5

MAPLHGR VERSUS AVERAGE PLANAR EXPOSURE

Fuel Types: SDR3284L and PDR3284L

Average Planar Exposure (MG/FT)	MAPLHGR (KW/FT)
200	11.2
1,000	11.3
5,000	11.8
10,000	12.0
15,000	12.0
20,000	11.8
25,000	11.2
30,000	10.8
35,000	10.2
40,000	9.5



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SUPPORTING AMENDMENT NO. 77 TO FACILITY LICENSE NO. DPR-52

TENNESSEE VALLEY AUTHORITY

BROWNS FERRY NUCLEAR PLANT, UNIT NO. 2

DOCKET NO. 50-260

1.0 Introduction

By letter dated September 9, 1981 (TVA BFNP TS 165b), as supplemented by letter dated December 11, 1981, the Tennessee Valley Authority (the licensee or TVA) requested changes to the Technical Specifications (Appendix A) appended to Facility Operating License No. DPR-52 for the Browns Ferry Nuclear Plant, Unit No. 2. The proposed amendment and revised Technical Specifications would extend the exposure range of the Maximum Average Planar Linear Heat Generation Rate (MAPLHGR) versus average planar exposure limits from 30,000 MWd/T to 40,000 MWd/T for the 8 x 8 fuel assemblies in the core.

2.0 Discussion

Basically, MAPLHGR limits are imposed to restrict the amount of stored energy in the fuel to limit the amount of cladding heatup in the event of a Loss of Coolant Accident (LOCA). The specific requirement in 10 CFR 50, Appendix K, is that the peak cladding temperature (PCT) following the postulated design basis loss-of-coolant accident not exceed 2200°F. To support the extension of the MAPLHGR limits, TVA submitted a revision (No. 3) to NEDO-24088-1, "LOCA Analysis for Browns Ferry Nuclear Plant Unit 2 dated May 1981 prepared by the General Electric Company (GE).

3.0 Evaluation

On October 6, 1980, we issued Amendment No. 57 to Facility Operating License No. DPR-52 which extended the MAPLHGR limits for the 7 x 7 fuel elements in the Unit 2 core from 30,000 to 40,000 MWd/T. The safety evaluation supporting this amendment described the considerations relating to MAPLHGR limits and the basis for the staff's conclusion that extension of the MAPLHGR limits for 7 x 7 fuel was acceptable. The safety evaluation supporting Amendment No. 57 is incorporated herein by reference.

On behalf of the licensee, GE has re-evaluated the adequacy of the Unit 2 ECCS systems for 8 x 8 fuel (the core now contains a mixture of 7 x 7, 8 x 8, 8 x 8R and P8 x 8R) at exposures out to 40,000 MWd/T. The supplemental analysis was performed using analytical procedures previously approved by the staff. Additionally, these methods are applicable for an average planar exposure of 40,000 MWd/T. The analysis results show that with MAPLHGRs limited to the values in Tables 3.5.I-1 thru 3.5.I-5 of the proposed Technical Specifications, the cladding temperature and local cladding oxidation are well below the 2200°F PCT and 17% local cladding oxidation limits in 10 CFR 50.46.

As can be noted, the MAPLHGR limits being added for fuel exposures of 35,000 and 40,000 MWd/t are approximately 10% lower than the limits during the first 30,000 MWd/t of exposure for each fuel type. The calculated PCTs that the fuel might reach in a postulated uncover accident are also lower by about 200°F during the last 10,000 MWd/t of exposure compared to when the fuel is fresh (i.e., during the first 20,000 MWd/t of exposure). For each of the 8x8 fuel types, the calculated oxidation fraction at 35,000 and 40,000 MWd/t of exposure is 0.001 in all cases vs. 0.003 or 0.004 when the fuel is fresh. Thus, at the proposed extended exposures, the margin between the acceptable thermal hydraulic limits and the calculated maximum operating limits will be increased compared to operation during the first 30,000 MWd/t of exposure.

Since Amendment No. 57 was issued, GE had proposed by letters dated May 6, 1981 and May 28, 1981 from R. E. Engel (GE) to T. A. Ippolito (NRC) that credit for approved ECCS evaluation model changes be applied to offset MAPLHGR penalties we had proposed to account for possible high burnup fission gas release. GE's proposal was found conditionally acceptable, and by letter dated December 11, 1981, TVA informed us that the required conditions are applicable to Browns Ferry Unit Nos. 1, 2 and 3.

We conclude that the proposed changes to the Technical Specification to extend the MAPLHGR limits to a burnup of 40,000 MWd/T are acceptable.

#### 4.0 Environmental Considerations

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

## 5.0 Conclusion

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

Dated: December 29, 1981

UNITED STATES NUCLEAR REGULATORY COMMISSIONDOCKET 50-260TENNESSEE VALLEY AUTHORITYNOTICE OF ISSUANCE OF AMENDMENT TO FACILITY  
OPERATING LICENSE

The U. S. Nuclear Regulatory Commission (the Commission) has issued Amendment No. 77 to Facility Operating License No. DPR-52 issued to Tennessee Valley Authority (the licensee), which revised the Technical Specifications for operation of the Browns Ferry Nuclear Plant, Unit No. 2 (the facility) located in Limestone County, Alabama. The amendment is effective as of the date of issuance.

This amendment changes the Technical Specifications to extend the exposure range of the Maximum Average Planar Linear Heat Generation Rate (MAPLHGR) versus average planar exposure from 30,000 MWd/T to 40,000 MWd/T for the 8 x 8 fuel elements in the core.

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

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

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For further details with respect to this action, see (1) the application for amendment dated September 9, 1981 as supplemented by letter dated December 11, 1981, (2) Amendment No. 77 to License No. DPR-52, and (3) the Commission's related Safety Evaluation. All of these items are available for public inspection at the Commission's Public Document Room, 1717 H Street, NW., Washington, D. C. and at the Athens Public Library, South and Forrest, Athens, Alabama 35611. A copy of items (2) and (3) may be obtained upon request addressed to the U.S. Nuclear Regulatory Commission, Washington, D. C. 20555, Attention: Director, Division of Licensing.

Dated at Bethesda, Maryland, this 29th day of December 1981.

FOR THE NUCLEAR REGULATORY COMMISSION



V. L. Rooney, Acting Chief  
Operating Reactors Branch #2  
Division of Licensing