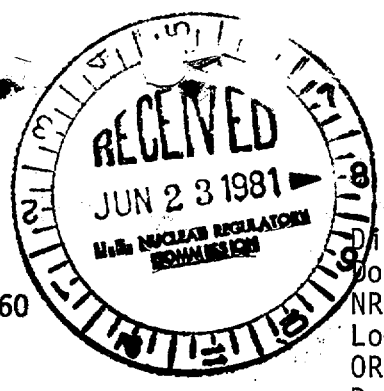


Docket File



Docket No. 50-260

Distribution:
Docket File
NRC PDR
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ORB #2 Rdg
D. Eisenhut
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R. Clark
OELD
OI&E (4)
G. Deegan (4)
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J. Wetmore
ACRS (10)
OPA

R. Diggs
NSIC
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ASLABP
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JUN 12 1981

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. 67 to Facility License No. DPR-52 for the Browns Ferry Nuclear Plant, Unit No. 2. This amendment changes the Technical Specifications in response to your request of February 20, 1981 (TVA BFNP TS 154) to remove the power spiking penalty from the linear heat generation rate limits for 8x8, 8x8R and P8x8R fuel assemblies.

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

Sincerely,

ORIGINAL SIGNED BY

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

Enclosures:

- 1. Amendment No. 67 to DPR-52
- 2. Safety Evaluation
- 3. Notice

8106250191

cc w/encls:
See next page

Technical assistance was not required for this amendment, since I recently issued a similar amendment for Browns Ferry Unit 3. For the latter, I consulted with Frank Coffman, who provided me the report attached as "Background Information" which approved the proposed action on a generic basis.

Dick Clark

REGULATORY DOCKET FILE COPY

no legal objections

OFFICE	DL:ORB#2	DL:ORB#2	DL:ORB#2	DL:ORB#2	OELD	
SURNAME	SNorris	RJClark	TAippolito	TMNovak	JHLaventy	
DATE	5/20/81	5/27/81	6/1/81	6/1/81	6/9/81	



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

June 12, 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. 67 to Facility License No. DPR-52 for the Browns Ferry Nuclear Plant, Unit No. 2. This amendment changes the Technical Specifications in response to your request of February 20, 1981 (TVA BFNP TS 154) to remove the power spiking penalty from the linear heat generation rate limits for 8x8, 8x8R and P8x8R fuel assemblies.

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

Sincerely,

A handwritten signature in cursive script, appearing to read "T. Ippolito".

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

Enclosures:

1. Amendment No. 67 to DPR-52
2. Safety Evaluation
3. Notice

cc w/encls:

See next page

Mr. Hugh G. Parris

cc:

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Knoxville, Tennessee 37902

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State Department of Public Health
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Montgomery, Alabama 36104

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Athens Public Library
South and Forrest
Athens, Alabama 35611

Director, Office of Urban & Federal
Affairs
108 Parkway Towers
404 James Robertson Way
Nashville, Tennessee 37219

U. S. Environmental Protection
Agency
Region IV Office
ATTN: EIS COORDINATOR
345 Courtland Street
Atlanta, Georgia 30308

Mr. Robert F. Sullivan
U. S. Nuclear Regulatory Commission
P. O. Box 1863
Decatur, Alabama 35602

Mr. John F. Cox
Tennessee Valley Authority
W9-D 207C
400 Commerce Avenue
Knoxville, Tennessee 37902

Mr. Herbert Abercrombie
Tennessee Valley Authority
P. O. Box 2000
Decatur, Alabama 35602



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. 67
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 February 20, 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. 67, 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: June 12, 1981

ATTACHMENT TO LICENSE AMENDMENT NO. 67

FACILITY OPERATING LICENSE NO. DPR-52

DOCKET NO. 50-260

Revise Appendix A as follows:

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

159/160
169/170

2. The underlined pages are those being changed; marginal lines on these pages indicate the revised area. The overleaf pages are provided for convenience.

3.5.H Maintenance of Filled Discharge Pipe

The suction of the RCIC and HPCI pumps shall be aligned to the condensate storage tank, and the pressure suppression chamber head tank shall normally be aligned to serve the discharge piping of the RHR and CS pumps. The condensate head tank may be used to serve the RHR and CS discharge piping if the PSC head tank is unavailable. The pressure indicators on the discharge of the RHR and CS pumps shall indicate not less than listed below.

P1-75-20	48 psig
P1-75-48	48 psig
P1-74-51	48 psig
P1-74-65	48 psig

I. Average Planar Linear Heat Generation Rate

During steady state power operation, the Maximum Average Planar Heat Generation Rate (MAPHGR) for each type of fuel as a function of average planar exposure shall not exceed the limiting value shown in Tables 3.5.I-1, -2, -3, -4, and -5. If at any time during operation it is determined by normal surveillance that the limiting value for APLHGR is being exceeded, action shall be initiated within 15 minutes to restore operation to within the prescribed limits. If the APLHGR is not returned to within the prescribed limits within two (2) hours, the reactor shall be brought to the Cold Shutdown condition within 36 hours. Surveillance and corresponding action shall continue until reactor operation is within the prescribed limits.

J. Linear Heat Generation Rate (LHGR)

During steady state power operation, the linear heat generation rate (LHGR) of any rod in any fuel assembly at any axial location shall not exceed the following limits:

for 8x8, 8x8R, and P8x8R fuel
13.4 Kw/ft;

for 7x7 fuel, the maximum allowable LHGR as calculated by the following equation:

4.5.H Maintenance of Filled Discharge Pipe

1. Every month prior to the testing of the RHRS (LPCI and Containment Spray) and core spray system, the discharge piping of these systems shall be vented from the high point and water flow determined.
2. Following any period where the LPCI or core spray systems have not been required to be operable, the discharge piping of the inoperable system shall be vented from the high point prior to the return of the system to service.
3. Whenever the HPCI or RCIC system is lined up to take suction from the condensate storage tank, the discharge piping of the HPCI and RCIC shall be vented from the high point of the system and water flow observed on a monthly basis.
4. When the RHRS and the CSS are required to be operable, the pressure indicators which monitor the discharge lines shall be monitored daily and the pressure recorded.

I. Maximum Average Planar Linear Heat Generation Rate (MAPLHGR)

The MAPLHGR for each type of fuel as a function of average planar exposure shall be determined daily during reactor operation at $\geq 25\%$ rated thermal power.

J. Linear Heat Generation Rate (LHGR)

The LHGR as a function of core height for 7x7 fuel and as a constant for 8x8, 8x8R, and P8x8R fuel shall be checked daily during reactor operation at $\geq 25\%$ rated thermal power.

3.5.J. Linear Heat Generation Rate (LHGR)

This specification assures that the linear heat generation rate in any rod is less than the design linear heat generation if fuel pellet densification is postulated. The power spike penalty specified is based on the analysis presented in Section 3.2.1 of Reference 1 as modified in References 2 and 3, and assumes a linearly increasing variation in axial gaps between core bottom and top, and assures with a 95% confidence, that no more than one fuel rod exceeds design linear heat generation rate due to power spiking. The LHGR (as a function of core height for 7x7 fuel and as a constant for 8x8, 8x8R, and P8x8R fuel) shall be checked daily during reactor operation at $\geq 25\%$ power to determine if fuel burnup, or control rod movement has caused changes in power distribution. For LHGR to be a limiting value below 25% rated thermal power, the R factor would have to be less than 0.24 which is precluded by a considerable margin when employing any permissible control rod pattern.

3.5.K. Minimum Critical Power Ratio (MCPR)

At core thermal power levels less than or equal to 25%, the reactor will be operating at minimum recirculation pump speed and the moderator void content will be very small. For all designated control rod patterns which may be employed at this point, operating plant experience and thermal hydraulic analysis indicated that the resulting MCPR value is in excess of requirements by a considerable margin. With this low void content, any inadvertent core flow increase would only place operation in a more conservative mode relative to MCPR. The daily requirement for calculating MCPR above 25% rated thermal power is sufficient since power distribution shifts are very slow when there have not been significant power or control rod changes. The requirement for calculating MCPR when a limiting control rod pattern is approached ensures that MCPR will be known following a change in power or power shape (regardless of magnitude) that could place operation at a thermal limit.

3.5.L. Reporting Requirements

The LCO's associated with monitoring the fuel rod operating conditions are required to be met at all times, i.e., there is no allowable time in which the plant can knowingly exceed the limiting values for MAPLHGR, LHGR, and MCPR. It is a requirement, as stated in Specifications 3.5.1., J, and K, that if at any time during steady state power operation, it is determined that the limiting values for MAPLHGR, LHGR, or MCPR are exceeded action is then initiated to restore operation to within the prescribed limits. This action is initiated as soon as normal surveillance indicates that an operating limit has been reached. Each event involving steady state operation beyond a specified limit shall be logged and reported quarterly. It must be recognized that there is always an action which would return any of the parameters (MAPLHGR, LHGR, or MCPR) to within prescribed limits, namely power reduction. Under most circumstances, this will not be the only alternative.

H. References

1. "Fuel Densification Effects on General Electric Boiling Water Reactor Fuel," Supplements 6, 7, and 8, NEDE-10735, August 1973.
2. Supplement 1 to Technical Report on Densifications of General Electric Reactor Fuels, December 14, 1974 (USA Regulatory Staff).
3. Communication: V. A. Moore to I. S. Mitchell, "Modified GE Model for Fuel Densification," Docket 50-321, March 27, 1974.
4. Generic Reload Fuel Application, Licensing Topical Report, NEDE-24011-P-A, and Addenda.



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SUPPORTING AMENDMENT NO. 67 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 February 20, 1981 (TVA BFNP TS 154) 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 remove the power spiking penalty from the specified linear heat generation rate (LHGR) for 8x8, 8x8R and P8x8R fuel assemblies in the Unit 2 core. In support of the application, TVA submitted an addenda prepared by the General Electric Company (GE) to the most recent supplemental reload licensing submittal for Unit 2⁽¹⁾.

2.0 Discussion

By letter dated June 19, 1978 from Darrell G. Eisenhut to Richard Gridley, we provided the General Electric Company (GE) the results of the staff's safety evaluation of GE's revised analytical procedures to account for effects of fuel densification power spiking in connection with core safety analyses. As a result of our review, we determined that the revised analytical procedures would adequately account for the effects of fuel densification power spiking and provide the technical basis for deleting the fuel densification power spiking factor from the standard 8x8 and retrofit 8x8 design limit linear heat generation rate (LHGR) which currently appears in BWR plant Technical Specifications. For the analytical procedures to account for power spiking in connection with fuel consequences resulting from abnormal operational transients, the staff concluded that the calculated maximum transient LHGRs (for the 8x8 and 8x8R fuel types) should be augmented by the fuel densification power spiking allowance before comparison with the exposure-dependent safety limit LHGR. The staff additionally concluded that the revised analytical procedures were acceptable for reference in connection with licensing applications to delete the 8x8 and/or 8x8R densification power spiking penalty from plant Technical Specifications.

⁽¹⁾ Errata and Addenda pages dated September 1980 to "Supplemental Reload Licensing Submittal for Browns Ferry Nuclear Power Station Unit 2, Reload No. 3" dated June 1980, GE Publication No. Y1003J01A12.

By letter dated August 27, 1980, TVA submitted a reload amendment request for Browns Ferry Unit No. 3. The supplemental reload licensing submittal prepared by GE for the Unit 3 reload included a 2.2% peaking penalty for densification in determining the maximum LHGR associated with local rod withdrawal error (with limiting instrument failure) transient summary and in the fuel loading error LHGR. In all cases, the predicted worst-case maximum transient LHGRs, when augmented by the power spike penalty, did not violate the exposure-dependent safety limit LHGRs. Accordingly, when we issued Amendment No. 37 to Facility License No. DPR-68 on January 12, 1981 for Browns Ferry Unit No. 3, Section 3.5.J of the Technical Specifications on required LHGRs was revised to specify a constant value of 13.4 kw/ft rather than a value that had to be calculated as a function of core height.

TVA's submittal of February 20, 1981 for Browns Ferry Unit 2 is to revise Section 3.5.J of the Unit 2 Technical Specifications similar to the changes we approved on January 12, 1981 for Unit 3.

3.0 Evaluation

The most recent reload application for Browns Ferry Unit No. 2 was submitted by letter from TVA dated July 14, 1980, which we approved by issuance of Amendment No. 58 to Facility License No. DPR-52 on November 12, 1980. The supplemental reload license submittal prepared by GE for this reload did not include a peaking penalty for fuel densification in the calculation of predicted maximum transient LHGRs. The addendum to these analyses submitted by TVA's letter of February 20, 1981 included revised maximum LHGRs calculated for the local rod withdrawal error transient summary and fuel loading errors.

As discussed above, the analytical procedures for accounting for the effects of fuel densification power spiking have been approved on a generic basis for all 8x8 fuel types. Using these approved procedures, the worst-case maximum transient LHGRs calculated for the present Unit 2 core do not violate the exposure-dependent safety limit LHGRs. Accordingly, we find the proposed changes to Section 3.5.J of the Technical Specifications and to the bases therefore to be acceptable. The revisions will specify a constant LHGR limit of 13.4 Kw/ft for the 8x8, 8x8R and P8x8R fuel elements in the core. There is no change to the LHGR limit on the one batch of 7x7 fuel elements remaining in the core; the LHGR on the 7x7 fuel must still be calculated according to the prescribed formula as a function of core height.

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 §1.5(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 and safety of the public.

Dated: June 12, 1981

UNITED STATES NUCLEAR REGULATORY COMMISSIONDOCKET NO. 50-260TENNESSEE VALLEY AUTHORITYNOTICE OF ISSUANCE OF AMENDMENT TO FACILITY
OPERATING LICENSE

The U. S. Nuclear Regulatory Commission (the Commission) has issued Amendment No. 67 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 remove the power spiking penalty from the linear heat generation rate limits for 8x8, 8x8R and P8x8R fuel assemblies.

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 §1.5(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 February 20, 1981, (2) Amendment No. 67 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 12th day of June 1981.

FOR THE NUCLEAR REGULATORY COMMISSION


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