January 30, 1989

Docket No. 50-458

Gulf States Utilities
ATTN: Mr. James C. Deddens
Senior Vice President (RBNG)
Post Office Box 220
St. Francisville, LA 70775

Dear Mr. Deddens:

SUBJECT: RIVER BEND STATION, UNIT 1 - AMENDMENT NO. 33 TO FACILITY OPERATING LICENSE NO. NPF-47 (TAC NO. 71204)

The Nuclear Regulatory Commission has issued the enclosed Amendment No. 33 to Facility Operating License No. NPF-47 for the River Bend Station, Unit 1. The amendment consists of changes to the Technical Specifications (TSs) in response to your application dated November 18, 1988, as supplemented December 16 and 20, 1988.

The amendment provides the bundle Maximum Average Planar Linear Heat Generation Rate (MAPLHGR) and the higher Linear Heat Generation Rate (LHGR) limits for the new fuel being added for the second reload. The amendment also revises Technical Specification Section 5, Design Features, Item 5.3.1 to generalize the fuel details to allow referencing future fuel designs included in the "General Electric Standard Application for Reactor Fuels" (GESTAR), Technical Specification Bases 3/4.2.1 to reference Technical Specification 3.2.1 instead of referencing individual MAPLHGR curves, and Figure 3.2.3-1 to show the revised flow dependent Minimum Critical Power Ratio (MCPR) operating limit curve.

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

Sincerely,

/s/

Walter A. Paulson, Project Manager
Project Directorate - IV
Division of Reactor Projects - III, IV, V and Special Projects
Office of Nuclear Reactor Regulation

Enclosures:
1. Amendment No. 33 to License No. NPF-47
2. Safety Evaluation

cc w/enclosures:
See next page

DFOl
1/1

c/p-1

DISTRIBUTION:

Docket File	BGrimes	PNoonan (3)	ACRS (10)	EJordan
NRC PDR	TMeek (4)	WPaulson (2)	GPA/PA	PD4 Plant File
Local PDR	Wanda Jones	JCalvo	ARM/LFMB	CAbbate
PD4 Reading	EButcher	OGC-Rockville	DHagan	M. Hodges

DOCUMENT NAME: RIVER BEND 1/4

PD4/LA	PD4/PE	PD4/PM	SRXB/BC	OGC-Rockville	PD4/D
PNoonan	CAbbate	WPaulson:	MHodges		JCalvo
01/9/89	01/6/89	01/06/89	01/11/89	01/25/89	01/30/89

January 30, 1989

Docket No. 50-458

Gulf States Utilities
ATTN: Mr. James C. Deddens
Senior Vice President (RBNG)
Post Office Box 220
St. Francisville, LA 70775

Dear Mr. Deddens:

SUBJECT: RIVER BEND STATION, UNIT 1 - AMENDMENT NO. 33 TO FACILITY OPERATING LICENSE NO. NPF-47 (TAC NO. 71204)

The Nuclear Regulatory Commission has issued the enclosed Amendment No. 33 to Facility Operating License No. NPF-47 for the River Bend Station, Unit 1. The amendment consists of changes to the Technical Specifications (TSs) in response to your application dated November 18, 1988, as supplemented December 16 and 20, 1988.

The amendment provides the bundle Maximum Average Planar Linear Heat Generation Rate (MAPLHGR) and the higher Linear Heat Generation Rate (LHGR) limits for the new fuel being added for the second reload. The amendment also revises Technical Specification Section 5, Design Features, Item 5.3.1 to generalize the fuel details to allow referencing future fuel designs included in the "General Electric Standard Application for Reactor Fuels" (GESTAR), Technical Specification Bases 3/4.2.1 to reference Technical Specification 3.2.1 instead of referencing individual MAPLHGR curves, and Figure 3.2.3-1 to show the revised flow dependent Minimum Critical Power Ratio (MCPR) operating limit curve.

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

Sincerely,

/s/

Walter A. Paulson, Project Manager
Project Directorate - IV
Division of Reactor Projects - III, IV, V and Special Projects
Office of Nuclear Reactor Regulation

Enclosures:
1. Amendment No. 33 to License No. NPF-47
2. Safety Evaluation

cc w/enclosures:
See next page

DISTRIBUTION:

Docket File	BGrimes	PNoonan (3)	ACRS (10)	EJordan
NRC PDR	TMeek (4)	WPaulson (2)	GPA/PA	PD4 Plant File
Local PDR	Wanda Jones	JCalvo	ARM/LFMB	CAbbate
PD4 Reading	EButcher	OGC-Rockville	DHagan	M. Hodges

DOCUMENT NAME: RIVER BEND 1/4

PD4/LA	PD4/PE	PD4/PM	SRXB/BC	OGC-Rockville	PD4/D
PNoonan	CAbbate	WPaulson:	MHodges		JCalvo
01/9/89	01/6/89	01/06/89	01/11/89	01/25/89	01/30/89

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

January 30, 1989

Docket No. 50-458

Gulf States Utilities
ATTN: Mr. James C. Deddens
Senior Vice President (RBNG)
Post Office Box 220
St. Francisville, LA 70775

Dear Mr. Deddens:

SUBJECT: RIVER BEND STATION, UNIT 1 - AMENDMENT NO. 33 TO FACILITY OPERATING LICENSE NO. NPF-47 (TAC NO. 71204)

The Nuclear Regulatory Commission has issued the enclosed Amendment No. 33 to Facility Operating License No. NPF-47 for the River Bend Station, Unit 1. The amendment consists of changes to the Technical Specifications (TSs) in response to your application dated November 18, 1988, as supplemented December 16 and 20, 1988.

The amendment provides the bundle Maximum Average Planar Linear Heat Generation Rate (MAPLHGR) and the higher Linear Heat Generation Rate (LHGR) limits for the new fuel being added for the second reload. The amendment also revises Technical Specification Section 5, Design Features, Item 5.3.1 to generalize the fuel details to allow referencing future fuel designs included in the "General Electric Standard Application for Reactor Fuels" (GESTAR), Technical Specification Bases 3/4.2.1 to reference Technical Specification 3.2.1 instead of referencing individual MAPLHGR curves, and Figure 3.2.3-1 to show the revised flow dependent Minimum Critical Power Ratio (MCPR) operating limit curve.

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

Sincerely,

Walter A. Paulson

Walter A. Paulson, Project Manager
Project Directorate - IV
Division of Reactor Projects - III, IV, V and Special Projects
Office of Nuclear Reactor Regulation

Enclosures:
1. Amendment No. 33 to License No. NPF-47
2. Safety Evaluation

cc w/enclosures:
See next page

Mr. James C. Deddens
Gulf States Utilities Company

River Bend Nuclear Plant

cc:
Troy B. Conner, Jr., Esq.
Conner and Wetterhahn
1747 Pennsylvania Avenue, NW
Washington, D.C. 20006

Mr. Les England
Director - Nuclear Licensing
Gulf States Utilities Company
P. O. Box 220
St. Francisville, LA 70775

Richard M. Troy, Jr., Esq.
Assistant Attorney General in Charge
State of Louisiana Department of Justice
234 Loyola Avenue
New Orleans, Louisiana 70112

Resident Inspector
P. O. Box 1051
St. Francisville, Louisiana 70775

Gretchen R. Rothschild-Reinike
Louisianians for Safe Energy, Inc.
2108 Broadway Street
New Orleans, Louisiana 70118-5462

Regional Administrator, Region IV
U.S. Nuclear Regulatory Commission
Office of Executive Director
for Operations
611 Ryan Plaza Drive, Suite 1000
Arlington, Texas 76011

Philip G. Harris
Cajun Electric Power Coop. Inc.
10719 Airline Highway
P. O. Box 15540
Baton Rouge, LA 70895

Mr. J. E. Booker
Manager-River Bend Oversight
P. O. Box 2951
Beaumont, TX 77704

Mr. William H. Spell, Administrator
Nuclear Energy Division
Office of Environmental Affairs
P. O. Box 14690
Baton Rouge, Louisiana 70898

Mr. J. David McNeill, III
William G. Davis, Esq.
Department of Justice
Attorney General's Office
7434 Perkins Road
Baton Rouge, Louisiana 70808

H. Anne Plettinger
3456 Villa Rose Drive
Baton Rouge, Louisiana 70806

President of West Feliciana
Police Jury
P. O. Box 1921
St. Francisville, Louisiana 70775

Mr. Frank J. Uddo
Uddo & Porter
6305 Elysian Fields Avenue
Suite 400
New Orleans, Louisiana 70122

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

GULF STATES UTILITIES COMPANY

DOCKET NO. 50-458

RIVER BEND STATION, UNIT 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 33
License No. NPF-47

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

A. The application for amendment by Gulf States Utilities Company (the licensee) dated November 18, 1988, as supplemented December 16 and 20, 1988, 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, as amended, 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 license 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. NPF-47 is hereby amended to read as follows:

   (2) Technical Specifications and Environmental Protection Plan

The Technical Specifications contained in Appendix A, as revised through Amendment No. 33 and the Environmental Protection Plan contained in Appendix B, are hereby incorporated in the license. GSU shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

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

FOR THE NUCLEAR REGULATORY COMMISSION

José A. Calvo

Jose A. Calvo, Director
Project Directorate - IV
Division of Reactor Projects - III,
IV, V and Special Projects
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical
Specifications

Date of Issuance: January 30, 1989

ATTACHMENT TO LICENSE AMENDMENT NO. 33

FACILITY OPERATING LICENSE NO. NPF-47

DOCKET NO. 50-458

Replace the following page of the Appendix "A" Technical Specifications with the enclosed page. The revised page is identified by Amendment number and contains a vertical line indicating the area of change. Overleaf page provided to maintain document completeness.

REMOVE PAGES	INSERT PAGES
3/4 2-1	3/4 2-1
-	3/4 2-6B
-	3/4 2-6C
3/4 2-9	3/4 2-9
3/4 2-11	3/4 2-11
B 3/4 2-1	B 3/4 2-1
5-5	5-5

3/4.2 POWER DISTRIBUTION LIMITS

3/4.2.1 AVERAGE PLANAR LINEAR HEAT GENERATION RATE

LIMITING CONDITION FOR OPERATION

3.2.1 All AVERAGE PLANAR LINEAR HEAT GENERATION RATES (APLHGRs) for each type of fuel as a function of AVERAGE PLANAR EXPOSURE shall not exceed the limits shown in Figures 3.2.1-1, 3.2.1-2, 3.2.1-3, 3.2.1-4, 3.2.1-5, 3.2.1-6, 3.2.1-7 and 3.2.1-8.*

APPLICABILITY: OPERATIONAL CONDITION 1, when THERMAL POWER is greater than or equal to 25% of RATED THERMAL POWER.

ACTION:

With an APLHGR exceeding the limits of Figure 3.2.1-1, 3.2.1-2, 3.2.1-3, 3.2.1-4, 3.2.1-5, 3.2.1-6, 3.2.1-7 or 3.2.1-8, initiate corrective action within 15 minutes and restore APLHGR to within the required limits within 2 hours or reduce THERMAL POWER to less than 25% of RATED THERMAL POWER within the next 4 hours.

SURVEILLANCE REQUIREMENTS

4.2.1 All APLHGRs shall be verified to be equal to or less than the limits determined from Figures 3.2.1-1, 3.2.1-2, 3.2.1-3, 3.2.1-4, 3.2.1-5, 3.2.1-6, 3.2.1-7 and 3.2.1-8:

a. At least once per 24 hours,

b. Within 12 hours after completion of a THERMAL POWER increase of at least 15% of RATED THERMAL POWER, and

c. Initially and at least once per 12 hours when the reactor is operating with a LIMITING CONTROL ROD PATTERN for APLHGR.

d. The provisions of Specification 4.0.4 are not applicable.

*The limits on Figures 3.2.1-7 and 3.2.1-8 are to be used only for manual calculations.

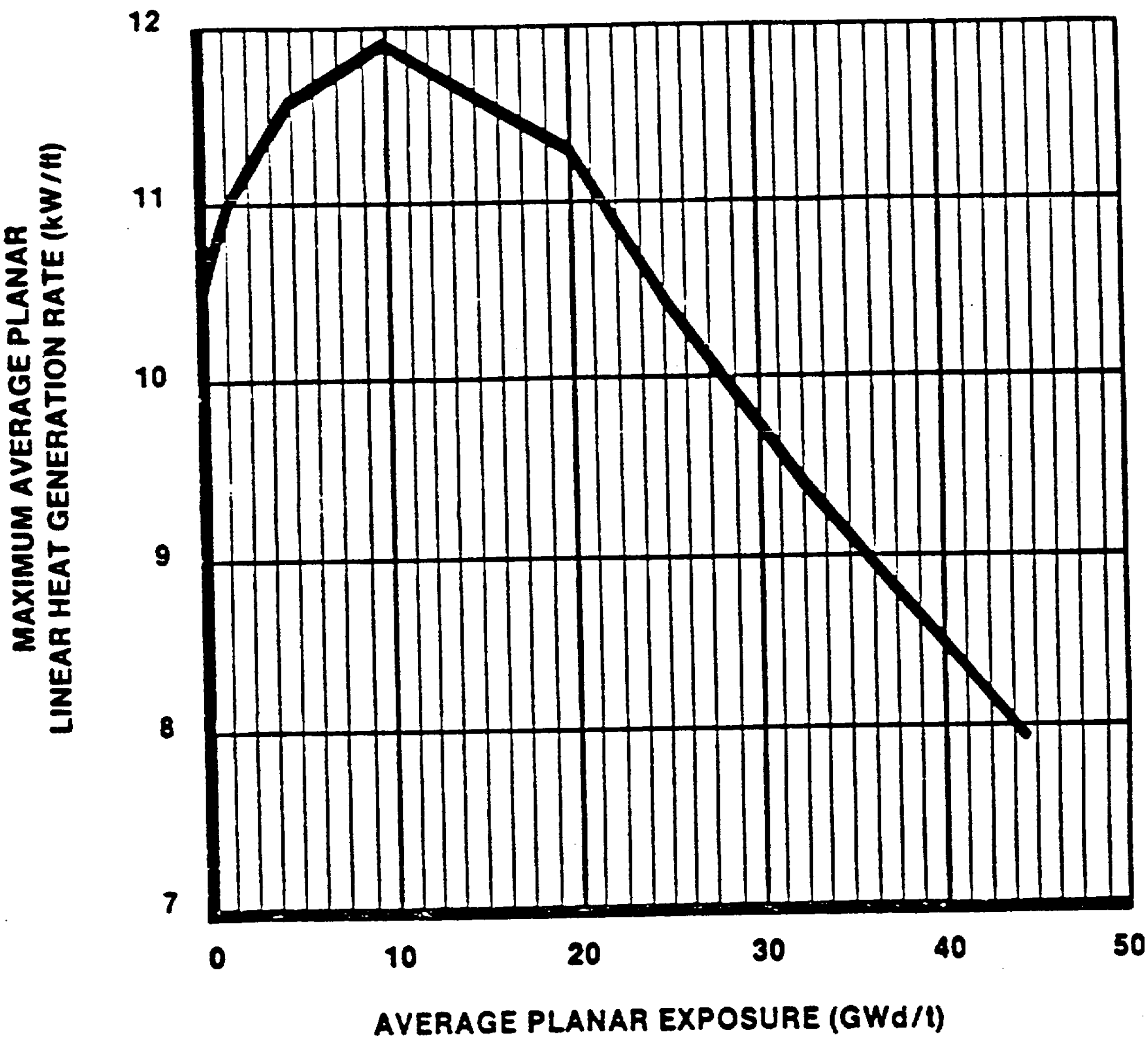

FIGURE 3.2.1-1
MAXIMUM AVERAGE PLANAR LINEAR HEAT GENERATION RATE (MAPLHGR)
VERSUS AVERAGE PLANAR EXPOSURE BP8SRB094

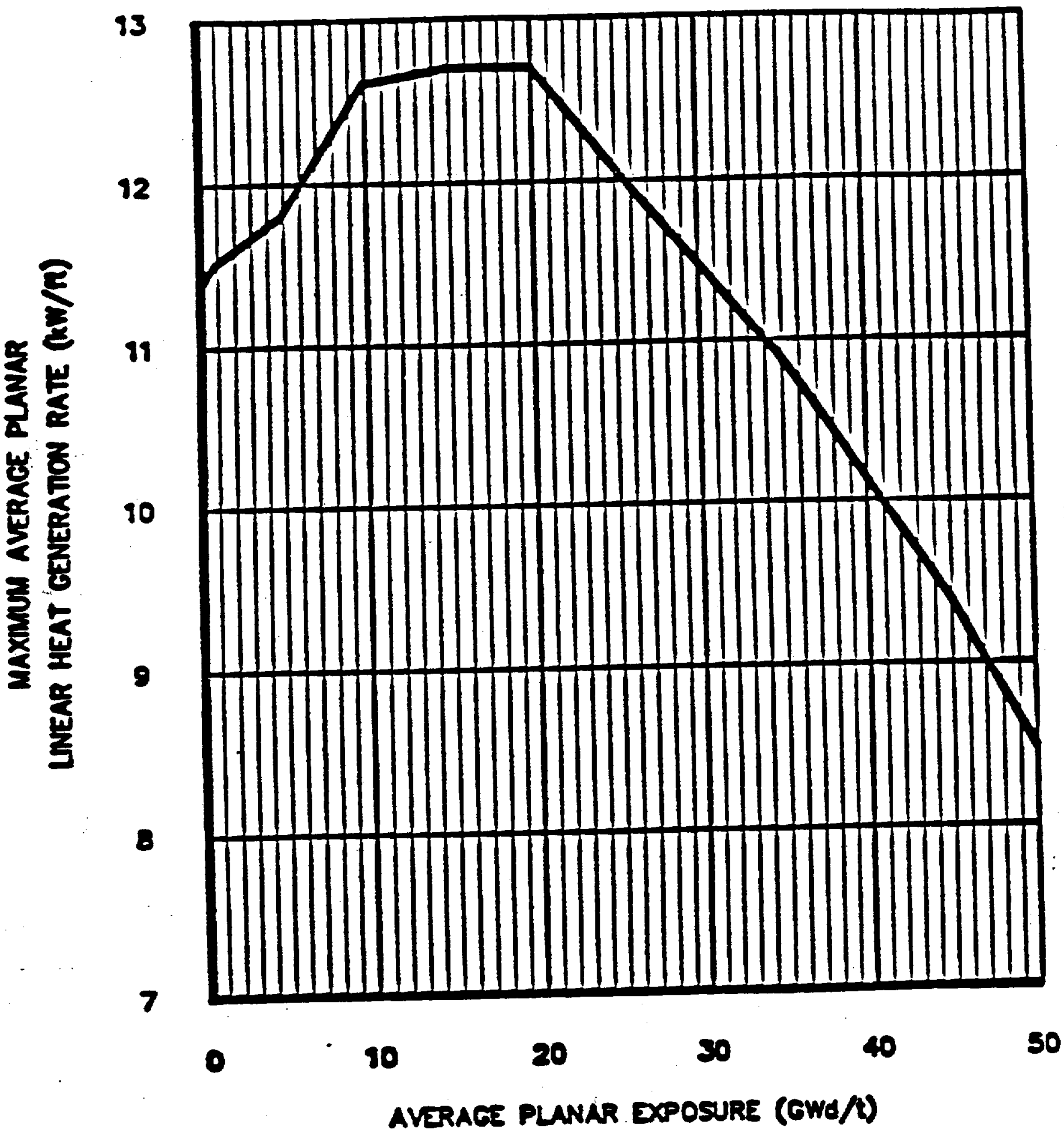

FIGURE 3.2.1-6

MAXIMUM AVERAGE PLANAR LINEAR HEAT GENERATION RATE (MAPLHGR) VERSUS AVERAGE PLANAR EXPOSURE – BP8SRB305

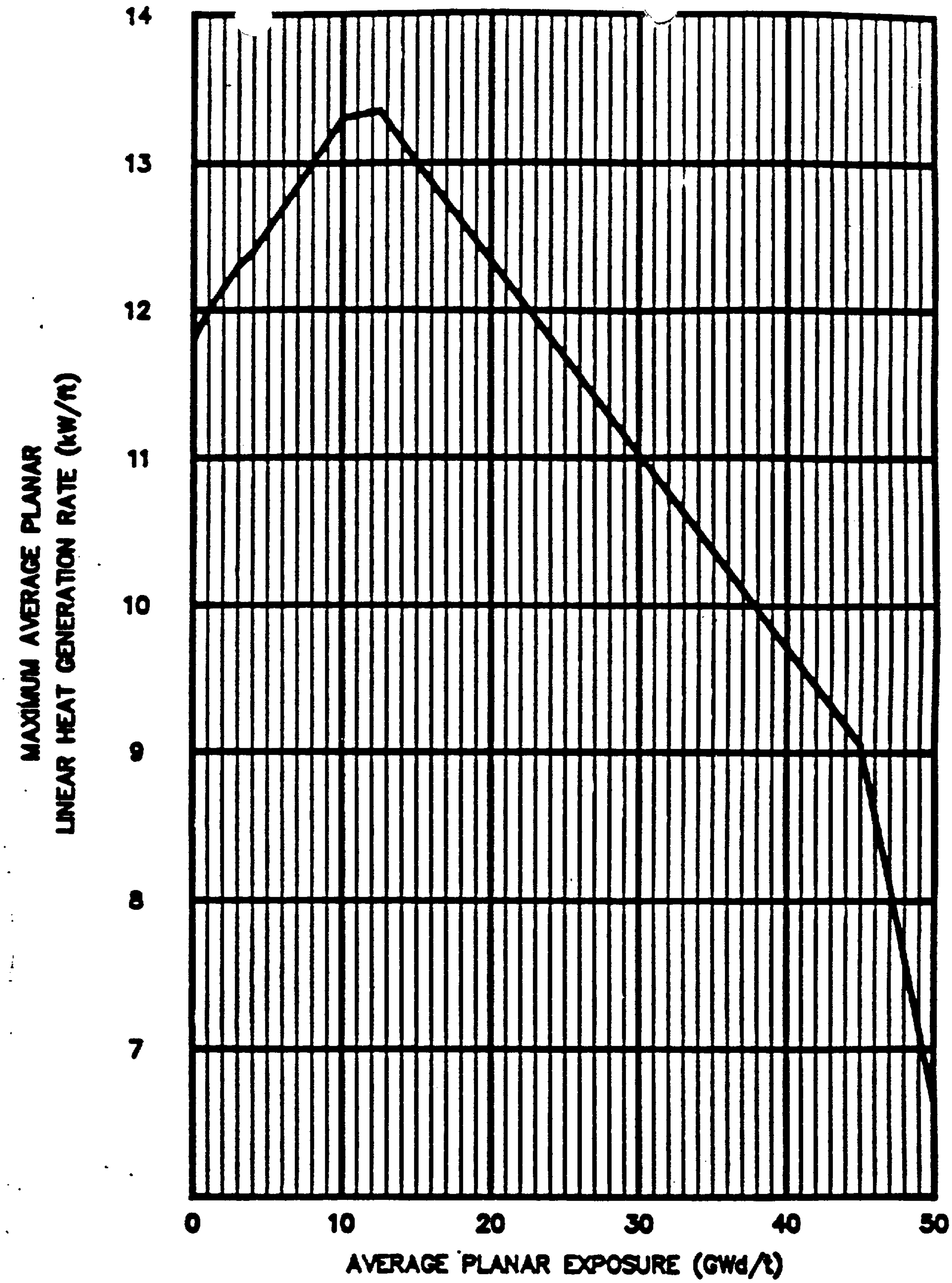

FIGURE 3.2.1-7

MAXIMUM AVERAGE PLANAR LINEAR HEAT GENERATION RATE (MAPLHGR) VERSUS AVERAGE PLANAR EXPOSURE - BS322B

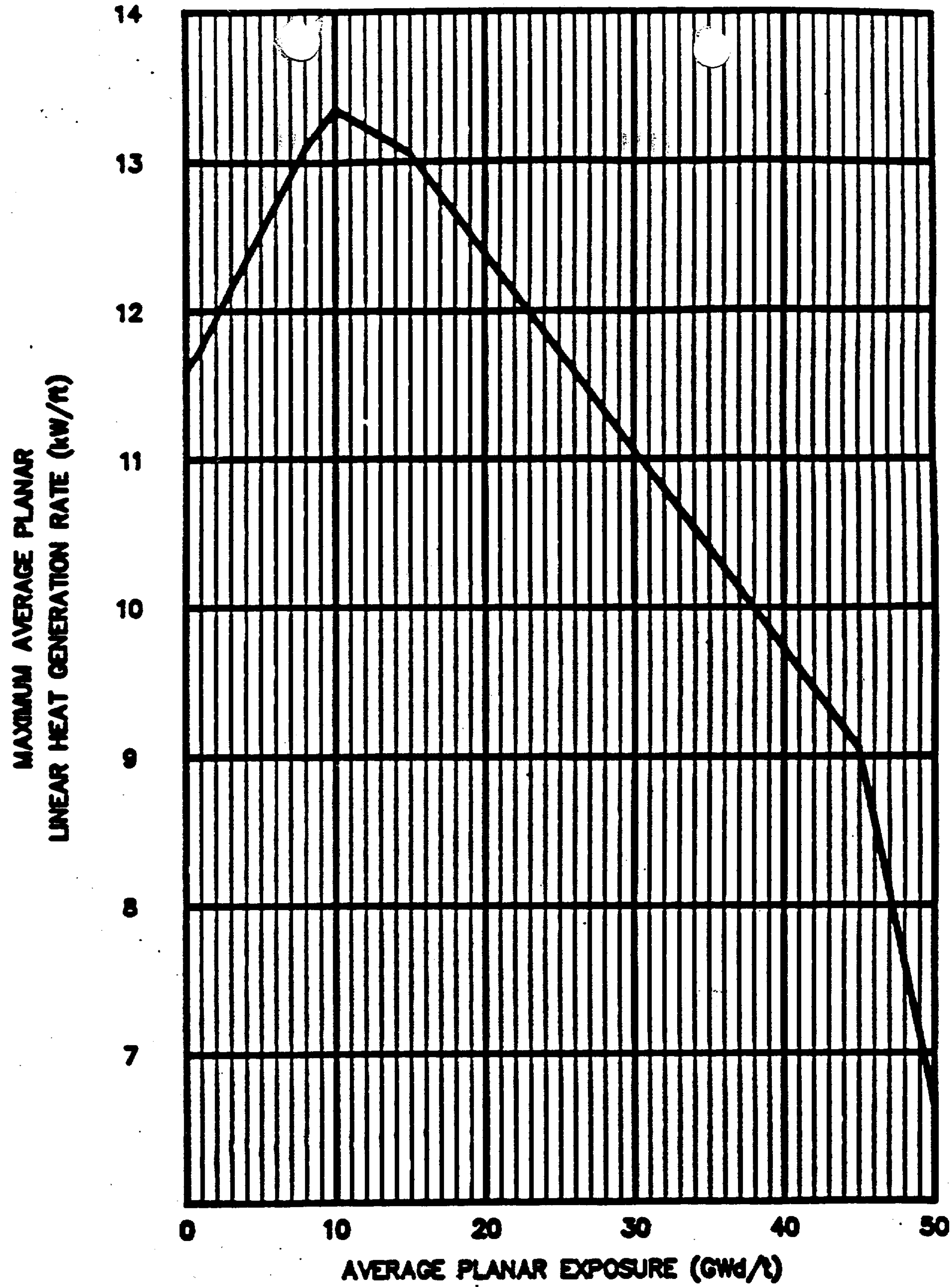

FIGURE 3.2.1-8

MAXIMUM AVERAGE PLANAR LINEAR HEAT GENERATION RATE (MAPLHGR) VERSUS AVERAGE PLANAR EXPOSURE - BS322C

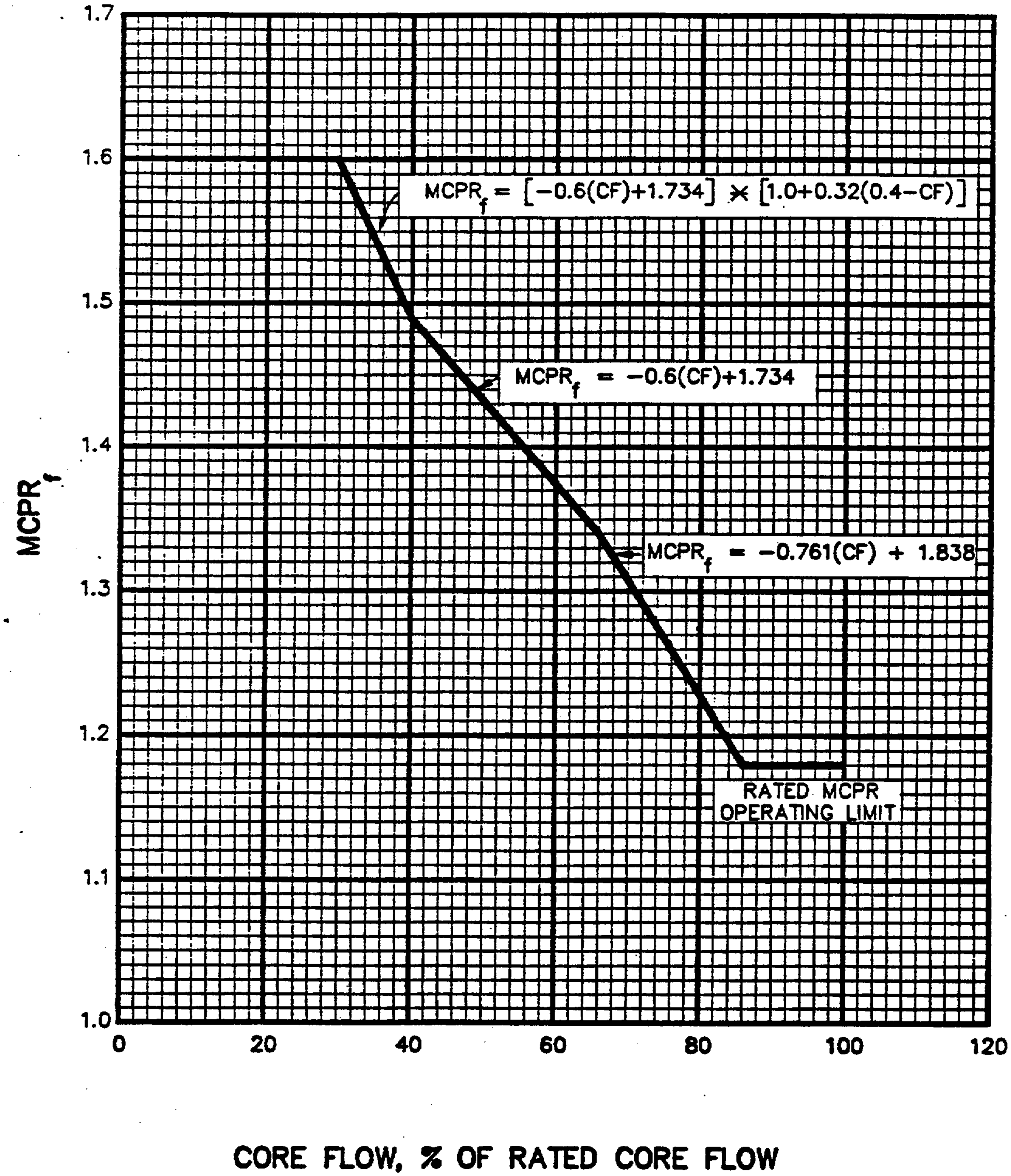

FIGURE 3.2.3-1
MCPR$_f$

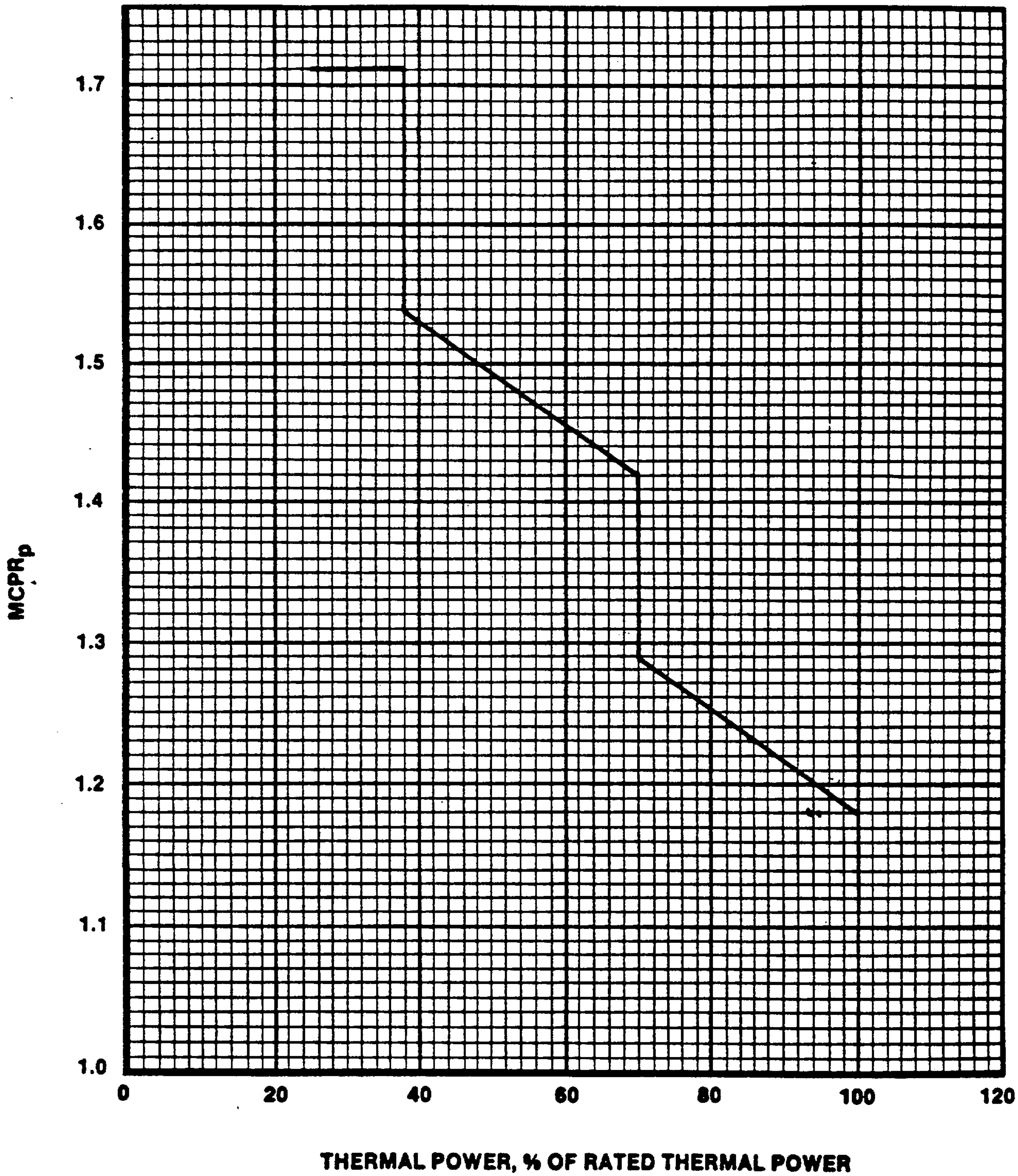

FIGURE 3.2.3-2
$MCPR_p$

3/4.2.4 LINEAR HEAT GENERATION RATE

LIMITING CONDITION FOR OPERATION

3.2.4 The LINEAR HEAT GENERATION RATE (LHGR) shall not exceed 14.4 kw/ft for GE8X8EB* fuel and 13.4 kw/ft for all other fuel.

APPLICABILITY: OPERATIONAL CONDITION 1, when THERMAL POWER is greater than or equal to 25% of RATED THERMAL POWER.

ACTION:

With the LHGR of any fuel rod exceeding the limit, initiate corrective action within 15 minutes and restore the LHGR to within the limit within 2 hours or reduce THERMAL POWER to less than 25% of RATED THERMAL POWER within the next 4 hours.

SURVEILLANCE REQUIREMENTS

4.2.4 LHGR's shall be determined to be equal to or less than the limit:

a. At least once per 24 hours,

b. Within 12 hours after completion of a THERMAL POWER increase of at least 15% of RATED THERMAL POWER, and

c. Initially and at least once per 12 hours when the reactor is operating on a LIMITING CONTROL ROD PATTERN for LHGR.

d. The provisions of Specification 4.0.4 are not applicable.

*GE8X8EB Fuel includes types BS322B and BS322C.

3/4.2 POWER DISTRIBUTION LIMITS

BASES

The specifications of this section assure that the peak cladding temperature following the postulated design basis loss-of-coolant accident will not exceed the 2200°F limit specified in 10 CFR 50.46.

3/4.2.1 AVERAGE PLANAR LINEAR HEAT GENERATION RATE

The peak cladding temperature (PCT) following a postulated loss-of-coolant accident is primarily a function of the average heat generation rate of all the rods of a fuel assembly at any axial location and is dependent only secondarily on the rod to rod power distribution within an assembly. The peak clad temperature is calculated assuming a LHGR for the highest powered rod which is equal to or less than the design LHGR corrected for densification. This LHGR times 1.02 is used in the heatup code along with the exposure-dependent steady state gap conductance and rod-to-rod local peaking factor. The Technical Specification AVERAGE PLANAR LINEAR HEAT GENERATION RATE (APLHGR) is this LHGR of the highest powered rod divided by its local peaking factor. The limiting value for APLHGR is shown in Specification 3.2.1.

The daily requirement for calculating APLHGR when THERMAL POWER is greater than or equal to 25% of 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 to calculate APLHGR within 12 hours after the completion of a THERMAL POWER increase of at least 15% of RATED THERMAL POWER ensures thermal limits are met after power distribution shifts while still allotting time for the power distribution to stabilize. The requirement for calculating APLHGR after initially determining a LIMITING CONTROL ROD PATTERN exists ensures that APLHGR will be known following a change in THERMAL POWER or power shape that could place operation into a condition exceeding a thermal limit.

The calculational procedure used to establish the APLHGR shown in Specification 3.2.1 is based on a loss-of-coolant accident analysis. The analysis was performed using General Electric (GE) calculational models which are consistent with the requirements of Appendix K to 10 CFR 50. A complete discussion of each code employed in the analysis is presented in NEDE-20566[1]. Differences in this analysis compared to previous analyses can be broken down as follows.

a. <u>Input Changes</u>

1. Corrected Vaporization Calculation - Coefficients in the vaporization correlation used in the REFLOOD code were corrected.

2. Incorporated more accurate bypass areas - The bypass areas in the top guide were recalculated using a more accurate technique.

AVERAGE PLANAR LINEAR HEAT GENERATION RATE (Continued)

3. Corrected guide tube thermal resistance.

4. Correct heat capacity of reactor internals heat nodes.

b. Model Change

1. Core CCFL pressure differential - 1 psi - Incorporate the assumption that flow from the bypass to lower plenum must overcome a 1 psi pressure drop in core.

2. Incoporate NRC pressure transfer assumption - The assumption used in the SAFE-REFLOOD pressure transfer when the pressure is increasing was changed.

A few of the changes affect the accident calculation irrespective of CCFL. These changes are listed below.

a. Input Change

1. Break Areas - The DBA break area was calculated more accurately.

b. Model Change

1. Improved Radiation and Conduction Calculation - Incorporation of CHASTE-05 for heatup calculation.

A list of the significant plant input parameters to the loss-of-coolant accident analysis is presented in Bases Table B 3.2.1-1.

3/4.2.2 APRM SETPOINTS

The fuel cladding integrity Safety Limits of Specification 2.1 were based on a power distribution which would yield the design LHGR at RATED THERMAL POWER. The flow biased simulated thermal power-high scram trip setpoint and the flow biased neutron flux-upscale control rod block trip setpoints of the APRM instruments must be adjusted to ensure that the MCPR does not become less than 1.07 or that $\geq$ 1% plastic strain does not occur in the degraded situation. The scram settings and rod block settings are adjusted in accordance with the formula in this specification, when the combination of THERMAL POWER and CMFLPD indicates a peak power distribution, to ensure that an LHGR transient would not be increased in degraded conditions.

5.3 REACTOR CORE

FUEL ASSEMBLIES

5.3.1 The reactor core shall contain 624 fuel assemblies. Each assembly consists of zirconium alloy fuel and water rods arranged in a nominal 8x8 array. The fuel rods contain uranium dioxide fuel pellets with active lengths generally ranging between 144 and 150 inches. These fuel assemblies are limited to those that have been analyzed with NRC approved codes and methods and have been shown to comply with all of the criteria in the latest approved revision of GESTAR (NEDE-24011-P-A-US).

CONTROL ROD ASSEMBLIES

5.3.2 The reactor core shall contain 145 control rod assemblies, each consisting of a cruciform array of stainless steel tubes surrounded by a cruciform shaped stainless steel sheath. Each tube shall contain 143.7 inches of boron carbide (B_4C) powder.

5.4 REACTOR COOLANT SYSTEM

DESIGN PRESSURE AND TEMPERATURE

5.4.1 The reactor coolant system is designed and shall be maintained:

a. In accordance with the code requirements specified in Section 5.2 of the FSAR, with allowance for normal degradation pursuant to the applicable Surveillance Requirements,

b. For a pressure of:

  1. 1250 psig on the suction side of the recirculation pump.
  2. 1650 psig from the recirculation pump discharge to the outlet side of the discharge shutoff valve.
  3. 1550 psig from the discharge shutoff valve to the jet pumps.

c. For a temperature of 575°F.

VOLUME

5.4.2 The total water and steam volume of the reactor vessel and recirculation system is approximately 16,000 cubic feet.

5.5 METEOROLOGICAL TOWER LOCATION

5.5.1 The meteorological tower shall be located as shown on Figure 5.1.1-1.

5.6 FUEL STORAGE

CRITICALITY

5.6.1.1 The spent fuel storage racks are designed and shall be maintained with:

a. A k_{eff} less than or equal to 0.95, when flooded with unborated water, including all calculational uncertainties and biases as described in Section 9.1 of the FSAR.

b. A fuel assembly center-to-center storage spacing of 7 in. within rows and 12.25 in. between rows in the Low Density Storage Racks in the upper containment pool.

c. A fuel assembly center-to-center storage spacing of 6.28 in., with a neutron poison material between storage spaces, in the High Density Storage Racks in the spent fuel storage facility in the Fuel Building.

The storage of spent fuel in the upper containment fuel storage pool is prohibited during OPERATIONAL CONDITIONS 1 and 2.

5.6.1.2 For the first core loading, the K_{eff} for new fuel stored dry in the spent fuel storage racks shall be administratively controlled to not exceed 0.98 when optimum moderation (foam, spray, fogging, or small droplets) is assumed.

5.6.1.3 Provisions shall be taken to avoid the entry of sources of optimum moderation (foam, spray, fogging, or small droplets) to preclude that K_{eff} for new fuel, stored in the new fuel storage facility, could exceed 0.98.

DRAINAGE

5.6.2 The spent fuel storage pool is designed and shall be maintained to prevent inadvertent draining of the pool below elevation 95'.

CAPACITY

5.6.3 The spent fuel storage pool in the fuel building is designed and shall be maintained with a storage capacity limited to no more than 2680 fuel assemblies. Only fuel manufactured by General Electric may be stored in the spent fuel pool.

5.7 COMPONENT CYCLIC OR TRANSIENT LIMIT

5.7.1 The components identified in Table 5.7.1-1 are designed and shall be maintained within the cyclic or transient limits of Table 5.7.1-1.

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 33 TO FACILITY OPERATING LICENSE NO. NPF-47

GULF STATES UTILITIES COMPANY

RIVER BEND STATION, UNIT 1

DOCKET NO. 50-458

1.0 INTRODUCTION

By letter dated November 18, 1988 (References 1 and 2), as supplemented December 16 and 20, 1988 (References 3 and 4), Gulf States Utilities Company (GSU) (the licensee) requested an amendment to Facility Operating License No. NPF-47 for the River Bend Station, Unit 1. The proposed amendment would amend the Technical Specifications (TS) for the Cycle 3 reload and subsequent operation. The amendment would provide the bundle Maximum Average Planar Linear Heat Generation Rate (MAPLHGR) and the higher Linear Heat Generation Rate (LHGR) limits for the new fuel being added for the second reload. The new fuel being added is GE8X8EB which includes an increased LHGR mechanical limit of 14.4 kW/ft. The 224 new GE8X8EB bundles to be added in the reload are similar to other bundles currently in the River Bend Station core. The proposed amendment would revise Technical Specification 3/4.2.1 to include new figures and revise Technical Specification 3.2.4 to include the higher LHGR limit.

The proposed amendment would also revise three additional areas of the TS. Technical Specification Section 5, Design Features, Item 5.3.1 would be revised to generalize the fuel details to allow referencing future fuel designs included in the "General Electric Standard Application for Reactor Fuels" (GESTAR). Technical Specification Bases 3/4.2.1 would be revised to reference Technical Specification 3.2.1 instead of referencing individual MAPLHGR curves. Figure 3.2.3-1 would be replaced to show the revised flow dependent Minimum Critical Power Ratio (MCPR) operating limit curve.

The licensee provided plant-specific information used to determine reactor limits in the letter dated December 16, 1988. Supplemental information requested by the staff was submitted in the letter dated December 20, 1988. These submittals did not alter the proposed amendment as noticed in the Federal Register on December 14, 1988 and did not affect the initial determination.

2.0 EVALUATION

2.1 Reload Description

The licensee requested to be allowed to use General Electric (GE) fuel types BS322B and BS322C which have an average enrichment of 3.22 weight percent U-235. The reload is based on a Cycle 2 end of cycle core nominal average exposure of 16,861 MWd/MT and a Cycle 3 assumed end of cycle core average exposure of 19,977 MWd/MT. The core loading is the conventional new assembly scatter pattern, with low reactivity (old) assemblies on the periphery. The fuel assemblies are not described in GESTAR II (Reference 5).

2.2 Fuel Design

The new fuel for Cycle 3 is GE8X8EB fuel which has an increased LHGR mechanical limit of 14.4 kW/ft and a varying gadolinia content. The fuel also has a slightly higher enrichment than the present fuel types and will allow higher burnup. The fuel is in the same class with approved designs with the exception of the enrichments used here. The increased LHGR and varying gadolinia result in MAPLHGR limits that vary axially (by lattice type) as well as with fuel exposure. In accordance with NRC guidance (Reference 8), the most limiting lattice MAPLHGR plot is being proposed for the TS limit. The MAPLHGR limits were calculated using the NRC approved methods in SAFE/REFLOOD. The LHGR mechanical limit for this type of fuel has been generically approved by the NRC (Reference 6).

Although the new fuel design is similar to that currently in the River Bend core, the new bundles incorporate additional water rods and gadolinia to improve power distribution and fuel use efficiency. The new fuel has been designed in accordance with the NRC approved methods in GESTAR, and approved supplements. The specific description of the fuel is presented in Reference 4. This fuel description is acceptable.

2.3 Nuclear Design

The nuclear design for Cycle 3 has been performed by GE using the approved GESTAR methodology (Reference 7). The results of the analyses were given in the GE reload report in the GESTAR format (Reference 2). The results are within the acceptable reload range. The shutdown margin is 1.0% ΔK at BOC with the strongest control rod out and 1.0% ΔK at the exposure with the minimum shutdown margin. The standby liquid control system shutdown margin is 2.8% ΔK. These shutdown margins meet the TS required margin of 0.38% ΔK. The margins have been computed with previously approved methods and are within the specified range, thus the nuclear design is acceptable.

2.4 Thermal-Hydraulic Design

The thermal-hydraulic design for Cycle 3 has been calculated using the approved methods described in GESTAR. The results were given in the standard GESTAR format in the reload report (Reference 2). The parameters and initial values used for the calculations have been approved for the BWR 6 class of reactors. The GEMINI-ODYN transient analysis methodology was used.

The operating limit of the MCPR values are determined by limiting the transient among the following: loss of 100°F feedwater heating, rod withdrawal error, pressurizer regulator failure downscale, feedwater controller failure, and load rejection without bypass. The analyses for these events used the GEXL-PLUS correlation which has been approved by the NRC (Reference 9). The loss of 100°F feedwater heating and rod withdrawal error continue to be the most limiting transients and have an MCPR equal

to that identified for Cycle 2. Therefore, the analyzed transients continue to support the operating limit MCPR of 1.07.
GSU responded to Bulletin 88-07, "Power Oscillations in Boiling Water Reactors (BWRs)" in a letter dated September 8, 1988. The letter addressed the adequacy of the instrumentation, procedures and training at River Bend with regard to stability. Interim guidance on stability actions was issued by the Boiling Water Reactor Owners Group (BWROG) on November 4, 1988. The licensee's December 20, 1988 letter stated that GSU implemented the following actions in plant operating procedures: (1) Scram the reactor manually if core flow is less than 40% and rod line is greater than 100% (2) Take immediate action if core flow is less than 40% and rod line is between 80% and 100% (3) Avoid core flow between 40% and 45% and rod line greater than 80%, if possible (4) Scram the reactor manually if oscillations occur at core flow less than 40% and rod line above 80%. These actions are acceptable. The staff will review the licensee's response to Bulletin 88-07, Supplement 1, dated December 30, 1988, on a schedule consistent with the reporting requirements listed in the bulletin.

2.5 Transient and Accident Analysis

The transient and accident analysis methods used for Cycle 3 were described in GESTAR. GSU used the GEXL-PLUS and GEMINI methods for the analysis. These methods have been approved by the NRC. The analysis identified the limiting transients for Cycle 3 are the same transients identified for Cycle 2. These are: (1) local rod withdrawal error, and (2) loss of 100°F feedwater heating. The MCPR for both transients was 1.07. The generic BWR 6 rod withdrawal error analysis resulted in a CPR of 0.11. Therefore, the cycle MCPR is 1.18. These results fall within the expected ranges and are acceptable.

Loss of Coolant Accident (LOCA) analyses used the SAFE/REFLOOD methodology, which is approved by the NRC. The LOCA analyses and the parameter values were used to provide the MAPLHGR values, peak clad temperatures and oxidation factors for the new fuel. The results show compliance with 10 CFR 50.46 and the LHGR limit of 14.4 kW/ft, and therefore are acceptable.

The overpressurization analysis identified the main steam isolation valve closure with flux scram to be the most limiting. The results of the analysis show a steam line pressure of 1207 psig and a vessel pressure of 1248 psig. The results are under the TS limit of 1325 psig; therefore, the overpressurization event analysis is acceptable.

The licensee intends to coastdown after all rods have been withdrawn. The original coastdown analysis was presented in a letter to the NRC from GE dated September 1, 1981 (Reference 11). The analysis was applicable to all BWRs and addressed events which should be considered during coastdown. Rapid pressurization events were discussed and were shown to be less severe during coastdown because MCPR and LHGR margins increased with coastdown. Accordingly, this mode of operation is acceptable.

2.6 Flexibility Enhancements

River Bend has selected two flexibility enhancements to improve operation. The two enhancements are for single loop operation and feedwater heater out of service. These were requested in letters dated April 6 and August 5, 1988, respectively. Cycle-specific evaluations were used to confirm continued operation within the reactor core limits and analyses were submitted to support operation for Cycle 3 with single loop operation. Single loop operation was approved by the staff in a letter dated November 22, 1988 (Reference 12). Operation with the feedwater heater out of service is currently under staff review.

2.7 Technical Specifications

The following TS changes have been proposed by River Bend for implementation. The changes address reload analyses modifications and operational changes. The reason or bases for the changes were discussed above and approved. The changes are described briefly below:

1. Technical Specification 3/4.2.1

The referenced figures have been revised to include two figures of the MAPLHGR versus Average Planar Exposure for the new fuel types BS322B and BS322C.

These figures represent a plot of the most limiting value of APLHGR for the most limiting lattice and the APLHGR of any lattice. The APLHGR of any lattice in the bundle shall not exceed this most limiting plot when calculations are performed by hand. The information in the TS is more limiting than the approved operating domain which is calculated with the process computer. Thus, a footnote was added to the TS figures stating that the limits are to be used for manual calculations only. The two figures are based on guidance addressed in Reference 7. This change is acceptable.

2. Figures 3.2.1-7 and 3.2.1-8

These figures have been added and address the MAPLHGR versus Average Planar Exposure for the new fuel types. These additions are acceptable.

3. Technical Specifications 3/4.2.4

The LHGR limit of 14.4 kW/ft for the GE8X8EB reload fuel has been added to the Limiting Condition for Operation. This change is due to the new fuel type for the Cycle 3 reload and is acceptable.

4. Bases 3/4.2

The reference to the figures has been deleted and replaced with a reference to Technical Specification 3.2.1. This will alleviate future changes to the TS for each cycle. The change is administrative and is acceptable.

5. Design Features 5.3

The specific description of the fuel has been deleted and replaced with a general description of the fuel assemblies. This will allow different designs of fuel to be used in the future without changing the TS with each cycle. The change is administrative and is acceptable.

3.0 SUMMARY

The NRC staff has reviewed the information submitted for the Cycle 3 operation of River Bend. Based on this review, the staff concludes that the fuel design, nuclear design, thermal-hydraulic design, and transient and accident analyses are acceptable. The proposed TS submitted for Cycle 3 represent the modifications and are acceptable.

4.0 ENVIRONMENTAL CONSIDERATION

The amendment involves a change in the installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. The staff has determined that the amendment involves 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 exposures. The Commission has previously issued a proposed finding that the amendment involves no significant hazards consideration and there has been no public comment on such finding. Accordingly, the amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR Section 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 amendment.

5.0 CONCLUSION

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, and (2) such activities will be conducted in compliance with the Commission's regulations, and the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public. The staff therefore concludes that the proposed changes are acceptable, and they are hereby incorporated into the River Bend Unit 1 Technical Specifications.

6.0 REFERENCES

1. Letter from J. C. Deddens (Gulf States Utilities Company) to NRC, dated November 18, 1988.

2. "Supplemental Reload Licensing Submittal for River Bend Station Reload 2, Cycle 3", GE Report 23A5934, Revision 0, dated October 1988.

3. "Supplemental Reload Licensing Submittal for River Bend Station Reload 2, Cycle 3", GE Report 23A5934AA, Revision 1, Supplement 1, submitted December 16, 1988.

4. Letter from J. C. Deddens (Gulf States Utilities Company) to NRC, dated December 20, 1988.

5. NEDE-24011-P-A-8, "General Electric Standard Application for Reactor Fuel (GESTAR)", dated May 1986.

6. Letter (and attachments) from C. Thomas (NRC) to J. S. Charnley (GE) dated May 28, 1985, "Acceptance for Referencing of Licensing Topical Report NEDE-24011-A-A-6, Amendment 10".

7. GESTAR II, NEDE-24011, Revision 8, "General Electric Standard Application for Reactor Fuel", United States Supplement

8. Letter from A. C. Thadani (NRC) to J. S. Charnley (GE) dated November 17, 1987, Acceptance for Referencing of Amendment 19 to General Electric Topical Report NEDE-24011-P-A (GESTAR II), "General Electric Standard Application for Reactor Fuel".

9. Letter from A. C. Thadani (NRC) to J. S. Charnley (GE) dated May 5, 1988, Acceptance for Referencing of Application of Amendment 15 to General Electric Licensing Topical Report NEDE-24011-P-A, "General Electric Standard Application for Reactor Fuel".

10. Letter from H. N. Berkow (NRC) to J. S. Charnley (GE) dated December 3, 1985, "Acceptance for Approval of Fuel Designs Described in Licensing Topical Report NEDE-24011-P-A-6, Amendment 10, for Extended Burnup Operations".

11. Letter from R. E. Engle (GE) to T. A. Ippolito (NRC) dated September 1, 1981, "End of Cycle Coastdown Analyzed with ODYN/TASC".

12. Letter from W. A. Paulson (NRC) to J. C. Deddens (GSU), Amendment No. 31 to Facility Operating License No NPF-47, dated November 21, 1988.

Dated: January 30, 1989

Principal Contributors: W. Paulson
C. Abbate