July 30, 1985

Docket No. 50-325

Mr. E. E. Utley
Senior Executive Vice President
Power Supply and Engineering & Construction
Carolina Power & Light Company
Post Office Box 1551
Raleigh, North Carolina 27602

Dear Mr. Utley:

The Commission has issued the enclosed Amendment No. 86 to Facility Operating License No. DPR-71 for the Brunswick Steam Electric Plant, Unit 1. The amendment consists of changes to the Technical Specifications (TS) in response to your application of April 26, 1985, as supplemented July 2, 1985.

The amendment changes the TS to incorporate revised minimum critical power ratio (MCPR) values, revised maximum average planar linear heat generation rate (MAPLHGR) values for the new BP8DRB299 fuel type, additional MAPLHGR values for fuel types P8DRB285, P8DRB265H, and P8DRB299, and the deletion of references to the old 8 X 8 fuel type which has been removed from the core. The amendment permits reload and operation for Cycle 5.

A copy of the Safety Evaluation is also enclosed.

Sincerely,

Original signed by/

Marshall Grotenhuis, Project Manager
Operating Reactors Branch #2
Division of Licensing

Enclosures:
1. Amendment No. 86 to
   License No. DPR-71
2. Safety Evaluation

cc w/enclosures:
See next page

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Mr. E. E. Utley
Carolina Power & Light Company
Brunswick Steam Electric Plant, Units 1 and 2

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

CAROLINA POWER & LIGHT COMPANY

DOCKET NO. 50-325

BRUNSWICK STEAM ELECTRIC PLANT, UNIT 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 86
License No. DPR-71

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

   A. The application for amendment by Carolina Power & Light Company (the licensee) dated April 26, 1985, as supplemented July 2, 1985, 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-71 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 86, 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 the date of its issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Domenic B. Vassallo, Chief
Operating Reactors Branch #2
Division of Licensing

Attachment:
Changes to the Technical
Specifications

Date of Issuance: July 30, 1985

ATTACHMENT TO LICENSE AMENDMENT NO. 86

FACILITY OPERATING LICENSE NO. DPR-71

DOCKET NO. 50-325

Replace the following pages of the Appendix A Technical Specifications with the enclosed pages. The changed areas are indicated by vertical lines.

Pages

3/4 2-2
3/4 2-3
3/4 2-4
3/4 2-5
3/4 2-6
3/4 2-7
3/4 2-8
3/4 2-9
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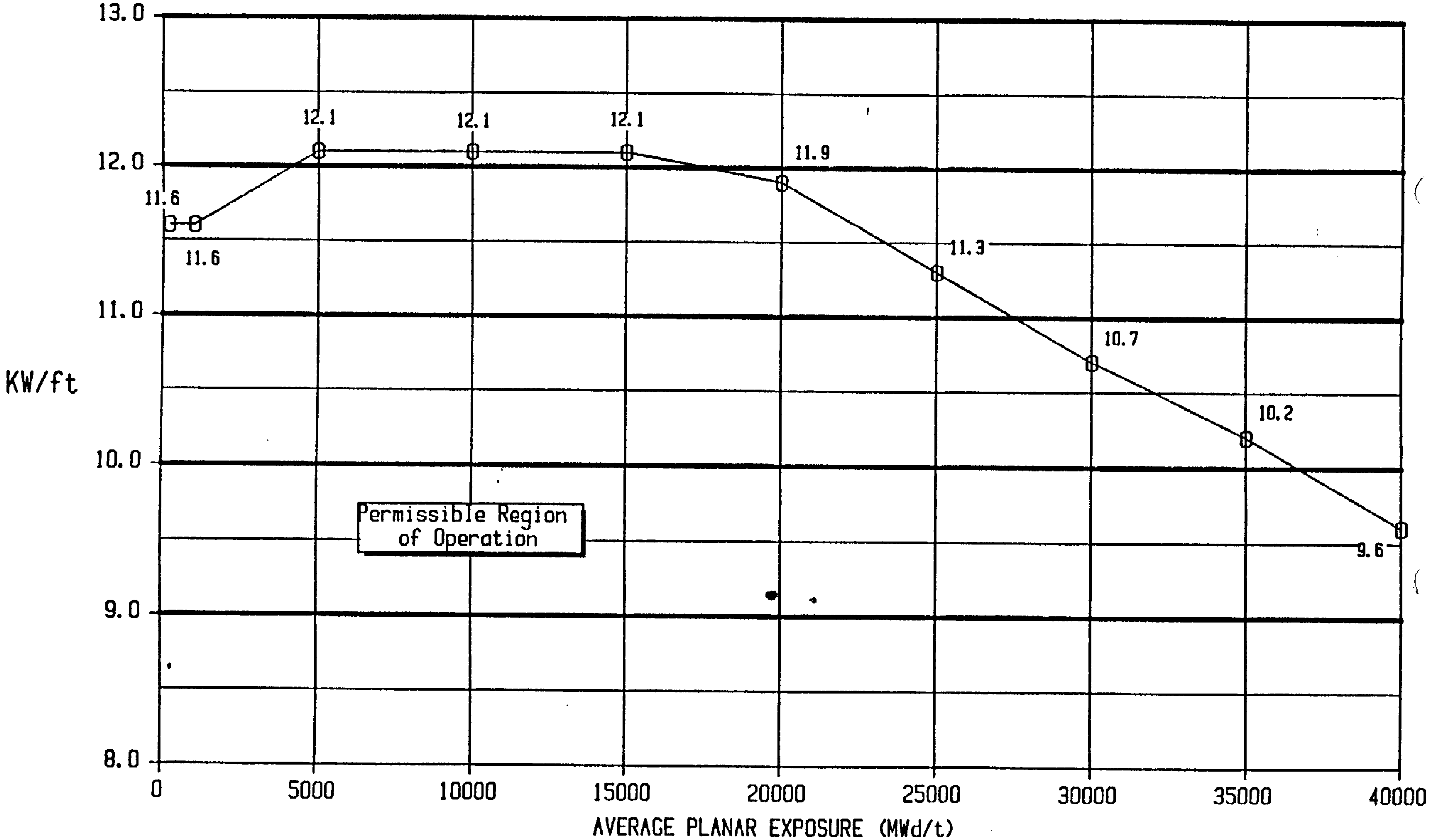
3/4 2-16
3/4 3-42
B 3/4 2-3
5-1

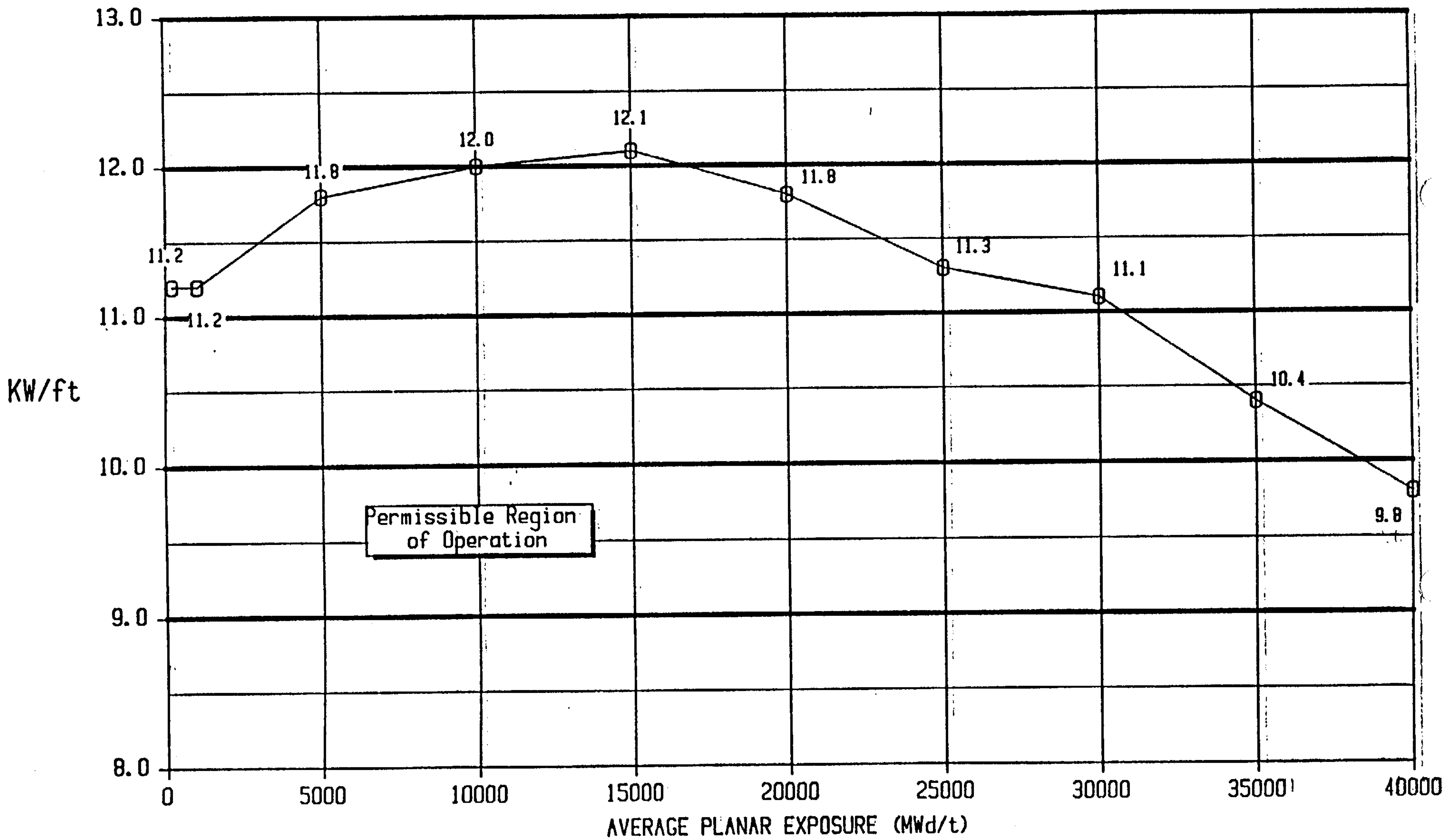
MAXIMUM AVERAGE PLANAR LINEAR HEAT
GENERATION RATE (MAPLHGR)
VERSUS AVERAGE PLANAR EXPOSURE



Fuel Type 8DRB265L (8X8R)

FIGURE 3.2.1-1

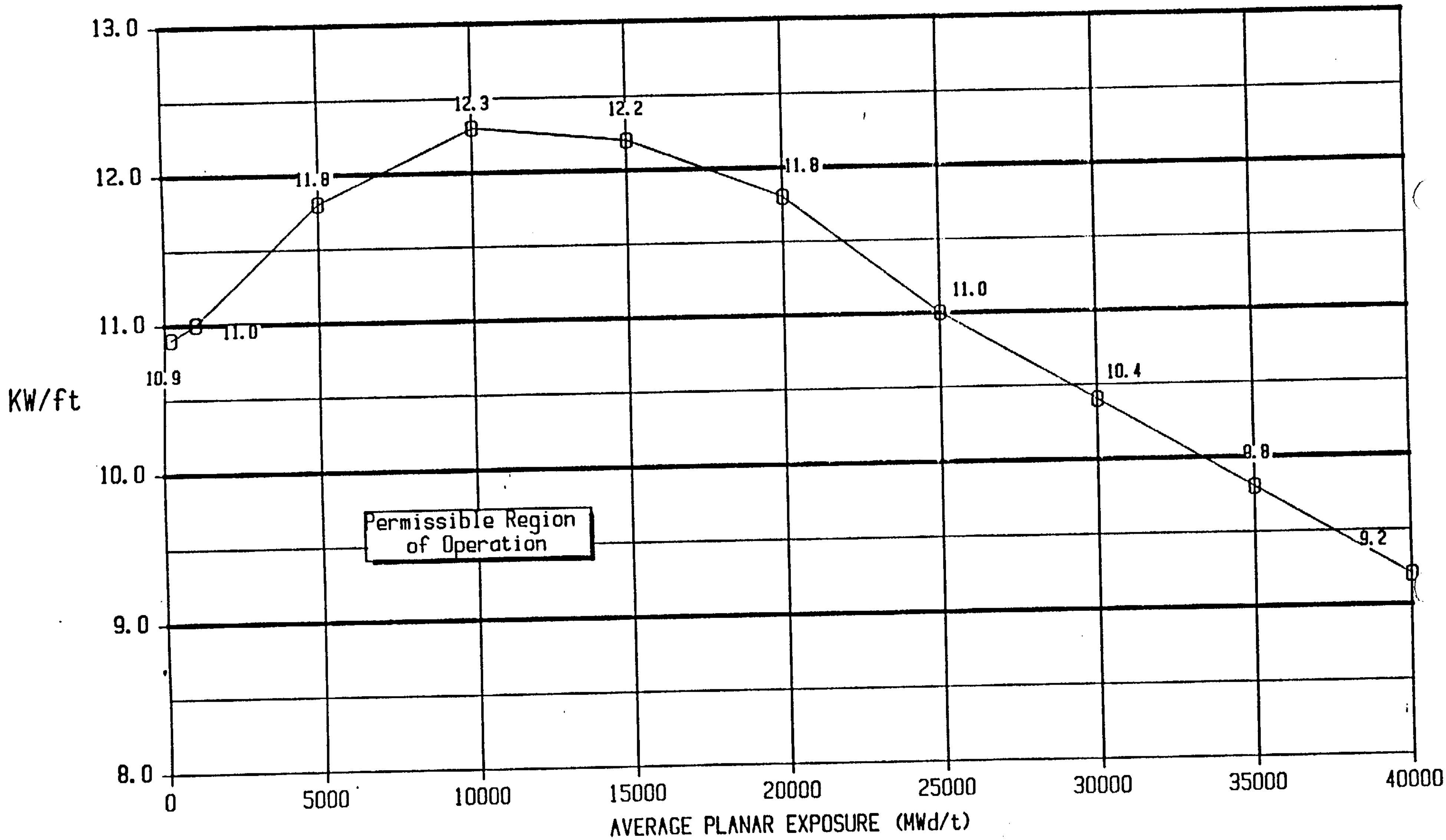
MAXIMUM AVERAGE PLANAR LINEAR HEAT
GENERATION RATE (MAPLHGR)
VERSUS AVERAGE PLANAR EXPOSURE



Fuel Type 8DRB283 (8X8R)

FIGURE 3.2.1-2

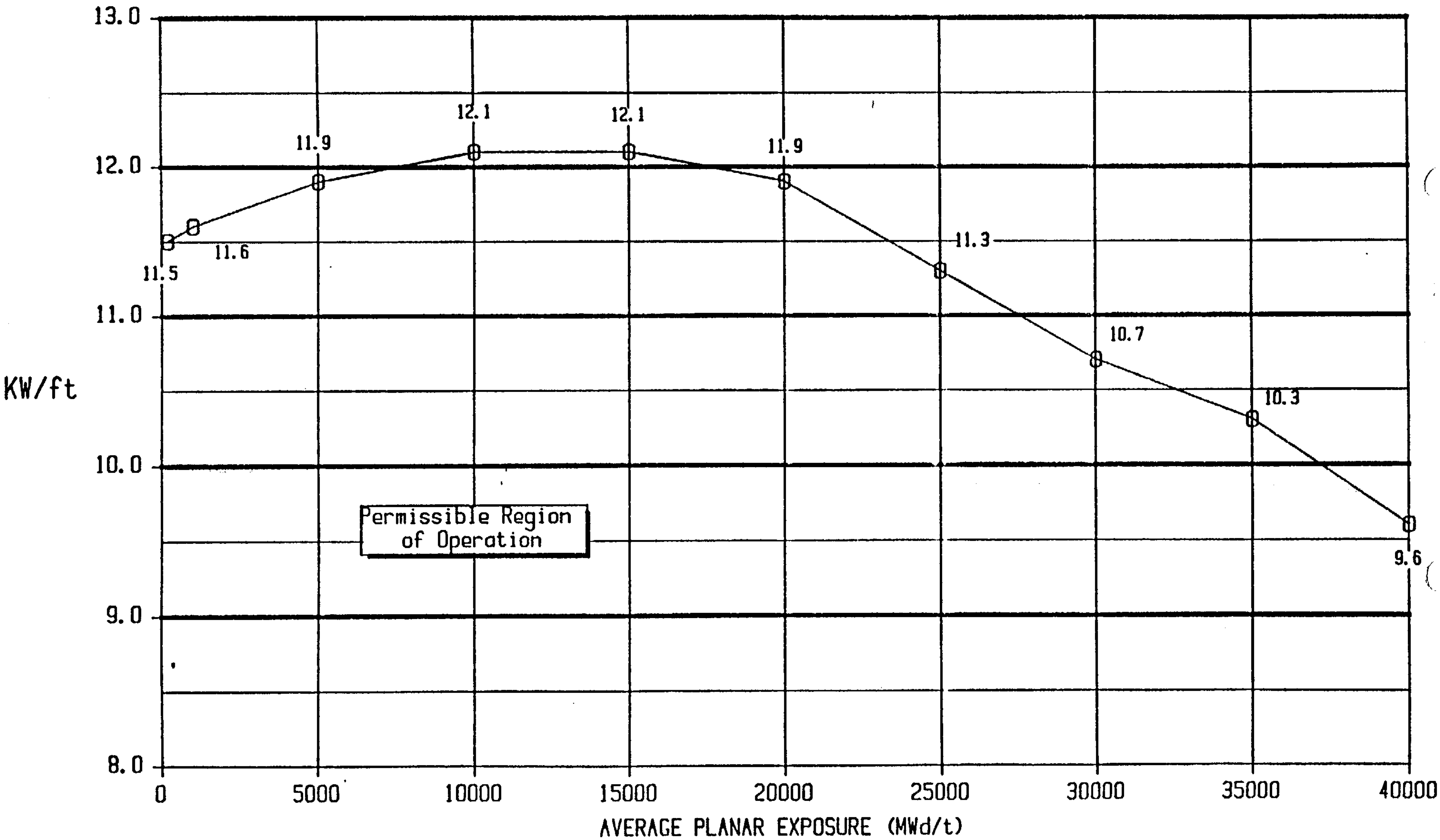
MAXIMUM AVERAGE PLANAR LINEAR HEAT GENERATION RATE (MAPLHGR) VERSUS AVERAGE PLANAR EXPOSURE



Fuel Type P8DRB285 (P8X8R)

FIGURE 3.2.1-3

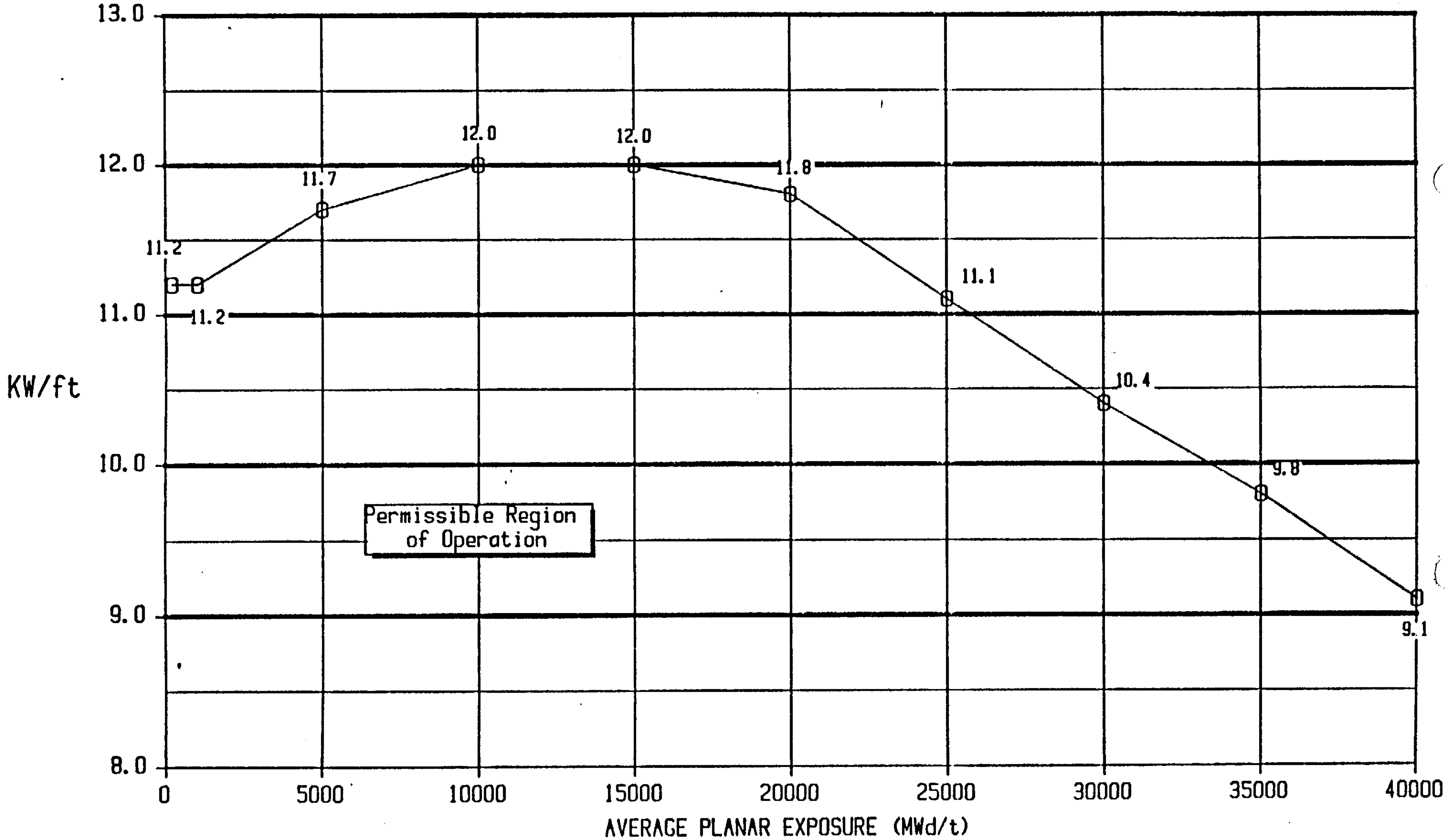
MAXIMUM AVERAGE PLANAR LINEAR HEAT
GENERATION RATE (MAPLHGR)
VERSUS AVERAGE PLANAR EXPOSURE



Fuel Type P8DRB265H (P8X8R)

FIGURE 3.2.1-4

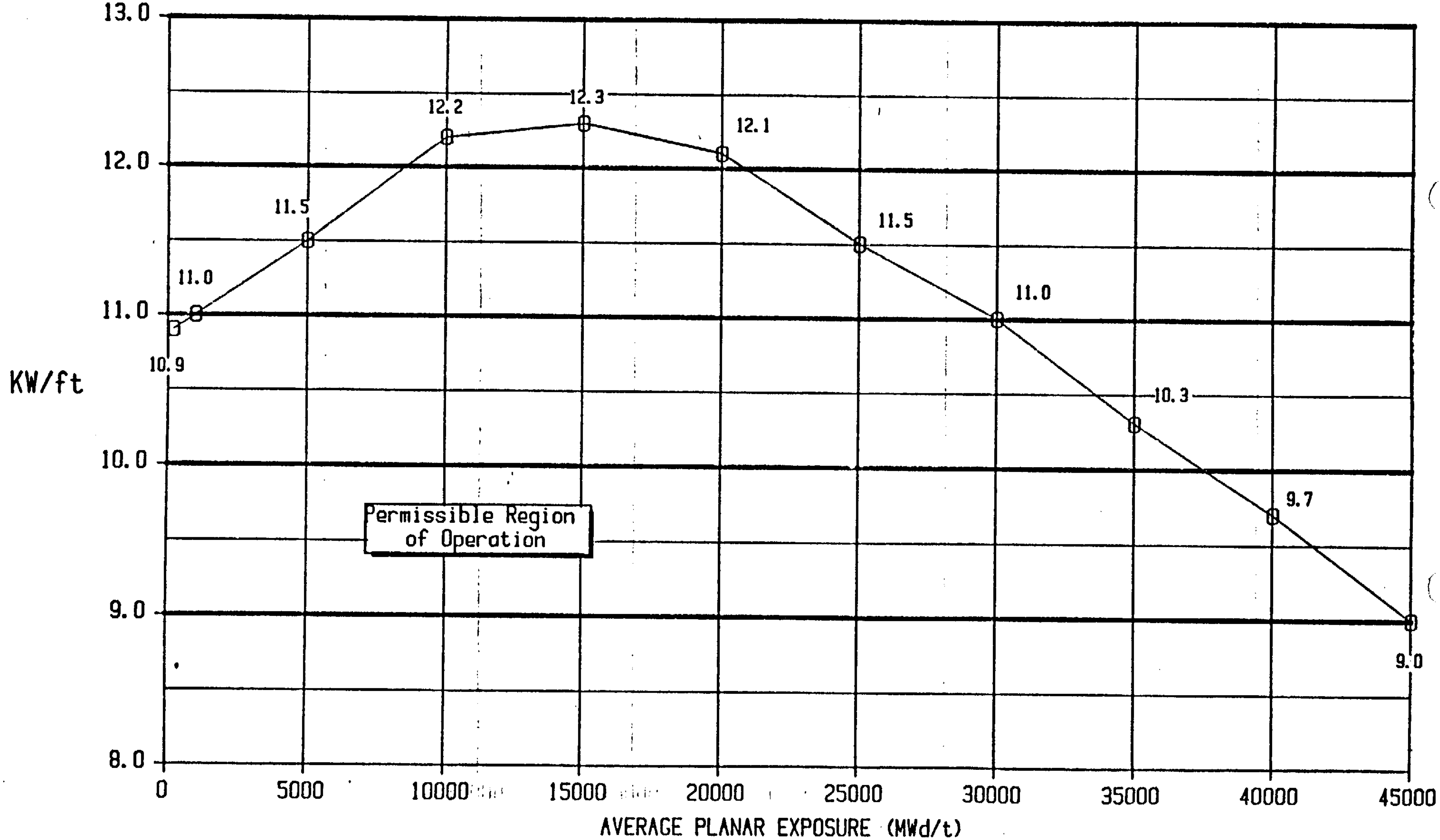
MAXIMUM AVERAGE PLANAR LINEAR HEAT
GENERATION RATE (MAPLHGR)
VERSUS AVERAGE PLANAR EXPOSURE



Fuel Type P8DRB284H (P8X8R)

FIGURE 3.2.1-5

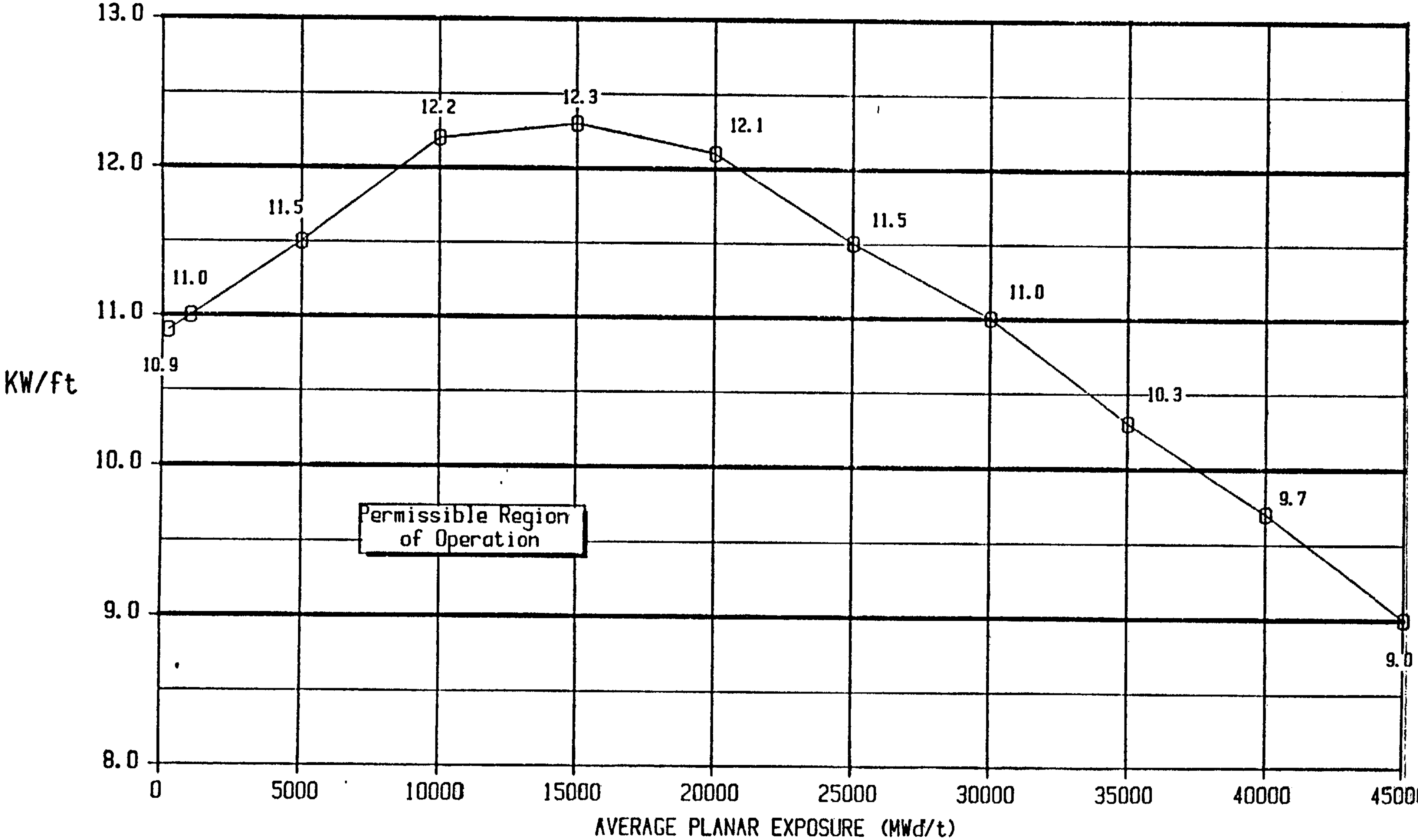
MAXIMUM AVERAGE PLANAR LINEAR HEAT GENERATION RATE (MAPLHGR) VERSUS AVERAGE PLANAR EXPOSURE



Fuel Type P8DRB299 (P8X8R)

FIGURE 3.2.1-6

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



Fuel Type BP8DRB299 (BP8X8R)

FIGURE 3.2.1-7

POWER DISTRIBUTION LIMITS

3/4.2.2 APRM SETPOINTS

LIMITING CONDITION FOR OPERATION

3.2.2 The flow-biased APRM scram trip setpoint (S) and rod block trip set point (S_{RB}) shall be established according to the following relationship:

$S \leq (0.66W + 54\%)\ T$

$S_{RB} \leq (0.66W + 42\%)\ T$

where: S and S_{RB} are in percent of RATED THERMAL POWER.
W = Loop recirculation flow in percent of rated flow,
T = Lowest value of the ratio of design TPF divided by the MTPF obtained for any class of fuel in the core ($T \leq 1.0$), and

Design TPF for: 8 x 8R fuel = 2.39
P8 x 8R fuel = 2.39
BP8 x 8R fuel = 2.39

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

ACTION:

With S or S_{RB} exceeding the allowable value, initiate corrective action within 15 minutes and continue corrective action so that S and S_{RB} are within the required limits within 4 hours or reduce THERMAL POWER to less than 25% of RATED THERMAL POWER within the next 4 hours.

SURVEILLANCE REQUIREMENTS

4.2.2 The MTPF for each class of fuel shall be determined, the value of T calculated, and the flow biased APRM trip setpoint adjusted, as required:

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 MTPF.

POWER DISTRIBUTION LIMITS

3/4.2.3 MINIMUM CRITICAL POWER RATIO

LIMITING CONDITION FOR OPERATION

3.2.3.1 The MINIMUM CRITICAL POWER RATIO (MCPR), as a function of core flow, shall be equal to or greater than the MCPR limit times the K_f shown in Figure 3.2.3-1 with the following MCPR limit adjustments:

a. Beginning-of-cycle (BOC) to end-of-cycle (EOC) minus 2000 MWD/t with ODYN OPTION A analyses in effect, the MCPR limits are listed below:

   1. MCPR for 8 x 8R fuel = 1.25
   2. MCPR for P8 x 8R fuel = 1.27
   3. MCPR for BP8 x 8R fuel = 1.27

b. EOC minus 2000 MWD/t to EOC with ODYN OPTION A analyses in effect, the MCPR limits are listed below:

   1. MCPR for 8 x 8R fuel = 1.36
   2. MCPR for P8 x 8R fuel = 1.39
   3. MCPR for BP8 x 8R fuel = 1.39

c. BOC to EOC minus 2000 MWD/t with ODYN OPTION B analyses in effect, the MCPR limits are listed below:

   1. MCPR for 8 x 8R fuel = 1.24
   2. MCPR for P8 x 8R fuel = 1.24
   3. MCPR for BP8 x 8R fuel = 1.24

d. EOC minus 2000 MWD/t to EOC with ODYN OPTION B analyses in effect, the MCPR limits are listed below:

   1. MCPR for 8 x 8R fuel = 1.25
   2. MCPR for P8 x 8R fuel = 1.27
   3. MCPR for BP8 x 8R fuel = 1.27

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

ACTION:

With MCPR, as a function of core flow, less than the applicable limit determined from Figure 3.2.3-1 initiate corrective action within 15 minutes and restore MCPR to within the applicable limit within 4 hours or reduce THERMAL POWER to less than 25% of RATED THERMAL POWER within the next 4 hours.

TABLE 3.2.3.2-1

TRANSIENT OPERATING LIMIT MCPR VALUES

TRANSIENT	FUEL TYPE 8x8R		P8x8R		BP8x8R	
NONPRESSURIZATION TRANSIENTS						
BOC → EOC	1.24		1.24		1.24	
TURBINE TRIP/LOAD REJECT WITHOUT BYPASS						
	$MCPR_A$	$MCPR_B$	$MCPR_A$	$MCPR_B$	$MCPR_A$	$MCPR_B$
BOC → EOC - 2000	1.25	1.08	1.27	1.08	1.27	1.08
EOC - 2000 → EOC	1.36	1.24	1.39	1.27	1.39	1.27
FEEDWATER CONTROL FAILURE						
	$MCPR_A$	$MCPR_B$	$MCPR_A$	$MCPR_B$	$MCPR_A$	$MCPR_B$
BOC → EOC - 2000	1.21	1.15	1.21	1.15	1.21	1.15
EOC - 2000 → EOC	1.32	1.25	1.34	1.27	1.34	1.27

POWER DISTRIBUTION LIMITS

3/4.2.4 LINEAR HEAT GENERATION RATE

LIMITING CONDITION FOR OPERATION

3.2.4 The LINEAR HEAT GENERATION RATE (LHGR) shall not exceed 13.4 kw/ft for 8 X 8R, P8 X 8R, and BP8 x 8R fuel assemblies.

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 above limit, initiate corrective action within 15 minutes and continue corrective action so that the LHGR is within the limit within 4 hours, or reduce THERMAL POWER to less than 25% of RATED THERMAL POWER within the next 4 hours.

SURVEILLANCE REQUIREMENTS

4.2.4 LHGR 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.

TABLE 3.3.4-2 (BSEP-1-60)

CONTROL ROD WITHDRAWAL BLOCK INSTRUMENTATION SETPOINTS

TRIP FUNCTION AND INSTRUMENT NUMBER	TRIP SETPOINT	ALLOWABLE VALUE
1. APRM (C51-APRM-CH. A,B,C,D,E,F)		
a. Upscale (Flow Biased)	$\leq (0.66W + 42\%) \frac{T^*}{MTPF}$	$\leq (0.66W + 42\%) \frac{T^*}{MTPF}$
b. Inoperative	NA	NA
c. Downscale	$\geq$ 3/125 of full scale	$\geq$ 3/125 of full scale
d. Upscale (Fixed)	$\leq$ 12% of RATED THERMAL POWER	$\leq$ 12% of RATED THERMAL POWER
2. ROD BLOCK MONITOR (C51-RBM-CH.A,B)		
a. Upscale	$\leq (0.66W + 41\%) \frac{T^*}{MTPF}$	$\leq (0.66W + 41\%) \frac{T^*}{MTPF}$
b. Inoperative	NA	NA
c. Downscale	$\geq$ 3/125 of full scale	$\geq$ 3/125 of full scale
3. SOURCE RANGE MONITORS (C51-SRM-K600A,B,C,D)		
a. Detector not full in	NA	NA
b. Upscale	$\leq 1 \times 10^5$ cps	$\leq 1 \times 10^5$ cps
c. Inoperative	NA	NA
d. Downscale	$\geq$ 3 cps	$\geq$ 3 cps
4. INTERMEDIATE RANGE MONITORS (C51-IRM-K601A,B,C,D,E,F,G,H)		
a. Detector not full in	NA	NA
b. Upscale	$\leq$ 108/125 of full scale	$\leq$ 108/125 of full scale
c. Inoperative	NA	NA
d. Downscale	$\geq$ 3/125 of full scale	$\geq$ 3/125 of full scale
5. SCRAM DISCHARGE VOLUME (C11-LSH-N013E)		
a. Water Level - High	$\leq$ 73 gallons	$\leq$ 73 gallons

*T=2.39 for 8x8R fuel
T=2.39 for P8x8R fuel
T=2.39 for BP8x8R fuel

POWER DISTRIBUTION LIMITS

BASES

3/4.2.2 APRM SETPOINTS

The fuel cladding integrity Safety Limits of Specification 2.1 were based on a TOTAL PEAKING FACTOR of 2.39 for 8 x 8R, P8 x 8R, and BP8 x 8R fuel. The scram setting and rod block functions of the APRM instruments must be adjusted to ensure that the MCPR does not become less than 1.0 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 peak flux indicates a TOTAL PEAKING FACTOR greater than 2.39 for 8 x 8R, P8 x 8R, and BP8 x 8R fuel. This adjustment may be accomplished by increasing the APRM gain and thus reducing the slope and intercept point of the flow referenced APRM high flux scram curve by the reciprocal of the APRM gain change. The method used to determine the design TPF shall be consistent with the method used to determine the MTPF.

3/4.2.3 MINIMUM CRITICAL POWER RATIO

The required operating limit MCPR's at steady state operating conditions as specified in Specification 3.2.3 are derived from the established fuel cladding integrity Safety Limit MCPR of 1.07, and an analysis of abnormal operational transients[1]. For any abnormal operating transient analysis evaluation with the initial condition of the reactor being at the steady state operating limit, it is required that the resulting MCPR does not decrease below the Safety Limit MCPR at any time during the transient, assuming instrument trip setting as given in Specification 2.2.1.

To assure that the fuel cladding integrity Safety Limit is not exceeded during any anticipated abnormal operational transient, the most limiting transients have been analyzed to determine which result in the largest reduction in CRITICAL POWER RATIO (CPR). The type of transients evaluated were loss of flow, increase in pressure and power, positive reactivity insertion, and coolant temperature decrease.

The required minimum operating limit MCPR of Specification 3.2.3 is obtained when the transient which yields the largest ΔCPR is added to the Safety Limit MCPR of 1.07. Prior to analysis of abnormal operational transients, an initial fuel bundle MCPR was determined. This parameter is based on the bundle flow calculated by a GE multichannel steady state flow distribution model as described in Section 4.4 of NEDO-20360[4] and on core parameters shown in Reference 3, response to Items 2 and 9.

5.0 DESIGN FEATURES

5.1 SITE

EXCLUSION AREA

5.1.1 The exclusion area shall be as shown in Figure 5.1.1-1.

LOW POPULATION ZONE

5.1.2 The low population zone shall be as shown in Figure 5.1.2-1, based on the information given in Section 2.2 of the FSAR.

SITE BOUNDARY

5.1.3 The SITE BOUNDARY shall be as a shown in Figure 5.1.3-1. For the purpose of effluent release calculations, the boundary for atmospheric releases is the SITE BOUNDARY and the boundary for liquid releases is the SITE BOUNDARY prior to dilution in the Atlantic Ocean.

5.2 CONTAINMENT

CONFIGURATION

5.2.1 The PRIMARY CONTAINMENT is a steel-lined reinforced concrete structure composed of a series of vertical right cylinders and truncated cones which form a drywell. This drywell is attached to a suppression chamber through a series of vents. The suppression chamber is a concrete steel-lined pressure vessel in the shape of a torus. The primary containment has a minimum free air volume of (288,000) cubic feet.

DESIGN TEMPERATURE AND PRESSURE

5.2.2 The primary containment is designed and shall be maintained for:

a. Maximum internal pressure 62 psig.

b. Maximum internal temperature: drywell 300°F.
suppression chamber 200°F.

c. Maximum external pressure 2 psig.

5.3 REACTOR CORE

FUEL ASSEMBLIES

5.3.1 The reactor core shall contain 560 fuel assemblies, of 8x8R, P8x8R, and BP8x8R fuel types. Each fuel assembly contains 62 fuel rods. All fuel rods shall be cladded with Zircaloy 2. Each fuel rod shall have a nominal active fuel length 150 inches.

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SUPPORTING AMENDMENT NO. 86 TO FACILITY LICENSE NO. DPR-71

CAROLINA POWER & LIGHT COMPANY

BRUNSWICK STEAM ELECTRIC PLANT, UNIT 1

DOCKET NO. 50-325

1.0 INTRODUCTION

By letter dated April 26, 1985, as supplemented July 2, 1985, the Carolina Power & Light Company (CP&L, the licensee) requested an amendment to Facility Operating License No. DPR-71 for the Brunswick Steam Electric Plant, Unit 1 (BSEP-1). The amendment changes the Technical Specifications (TS) to incorporate revised minimum critical power ratio (MCPR) values, revised maximum average planar linear heat generation rate (MAPLHGR) values for the new BP8DRB299 fuel type, additional MAPLHGR values for fuel types P8DRB285, P8DRB265H, and P8DRB299, and the deletion of references to the old 8 X 8 fuel type which has been removed from the core. The amendment permits reload and operation for Cycle 5. In support of the application the licensee submitted a Supplemental Reload licensing document (Ref. 2).

The supplement dated July 2, 1985 corrects an editorial error of page 5-1 that omitted Section 5.1.3. Section 5.1.3 was inserted by Amendment No. 62 dated December 27, 1983 but erroneously omitted from this amendment request. This is an administrative change that has no significance for this amendment.

2.0 FUEL SYSTEM DESIGN

The licensee's analysis of the safety considerations involved in the proposed fifth cycle of operation at BSEP-1 is described in the Supplemental Reload Licensing Submittal (Ref. 2). In all fuel-design-related areas, the reload submittal relies on the generic report, General Electric (GE) Standard Application for Reactor Fuel (Ref. 3). Reference 3 has been reviewed and approved by the staff. This reload will be the first for BSEP-1 to include a batch of barrier fuel (BP8DRB299). This type of fuel has been approved in Reference 10 and has already been utilized in the Brunswick Unit 2 (BSEP-2) Cycle 6 Reload. Thus we find it acceptable for use in BSEP-1 Cycle 5.

The licensee's submittal provided Maximum Average Planar Linear Heat Generation Rate (MAPLHGR) limits for the BP8x8R and P8x8R fuel assemblies in the Cycle 5 core. Although the methodology used is generically applicable for the MAPLHGR limit determination, the staff believes that the effects of enhanced fission gas release at high burnup (i.e., greater than 20 MWd/kgU) were not adequately considered in the fuel performance model. In response to this concern, GE requested (Refs. 5 and 6) that credit for approved, but unapplied, emergency core cooling system (ECCS) evaluation model changes and calculated peak cladding temperature margin be used to avoid MAPLHGR penalties at higher burnups. This proposal was found acceptable (Ref. 7) provided that certain plant-specific conditions were met. The General Electric Standard Application for Reactor Fuel (GESTAR-II - Ref. 3) has been modified (Section 5.2.5.2.5) to incorporate these considerations. The licensee has stated (Ref. 8) that the GE proposal is applicable to both the BSEP-1 and BSEP-2 safety analyses. We therefore conclude that the proposed MAPLHGR limits are appropriate for Cycle 5 operation.

3.0 NUCLEAR DESIGN

The nuclear design and analysis of the proposed reload has been performed by the methods described in Reference 3. This report has been approved for use in the design and analysis of reloads in boiling water reactors (BWR) and its use is acceptable for this reload. The results of the nuclear design analysis are consistent with those for similar reloads and are acceptable.

4.0 THERMAL HYDRAULIC DESIGN

The objective of the review is to confirm that the thermal-hydraulic design of the reload core has been accomplished using acceptable methods, and to provide an acceptable margin of safety from conditions which could lead to fuel damage during normal operation and anticipated transients, and to demonstrate that the Cycle 5 core is not susceptible to thermal-hydraulic instability.

The review includes the following areas: (1) safety limit minimum critical power ratio (MCPR), (2) operating limit MCPR and (3) thermal-hydraulic stability.

The licensee has submitted the reload analysis report for Cycle 5 operation (Ref. 2), which is based on the approved GE report (Ref. 3).

Discussion of the review concerning the thermal-hydraulic design for Cycle 5 operation follows:

4.1 Safety Limit MCPR

A safety limit MCPR has been imposed to assure that 99.9 percent of the fuel rods in the core are not expected to experience boiling transition during normal operation and anticipated transients. The approved safety limit MCPR of 1.07 as stated in Reference 3 was used for the Cycle 5 analyses.

4.2 Operating Limit MCPR

To assure that the fuel cladding integrity safety limit MCPR will not be violated during any abnormal transient, the most limiting events have been reanalyzed for this reload (Ref. 2) by the licensee, in order to determine which event results in the largest reduction in the minimum critical power ratio. The operating limit MCPRs for each fuel type were then established by adding the largest reduction in the minimum critical power ratio and the uncertainties associated with the calculational methods to the safety limit MCPR.

The OLMCPR must be greater than 1.25 for 8x8R fuel and greater than 1.27 for BP8x8R and P8x8R fuel types at fuel exposures from BOC to EOC minus 2000 MWD/ST. For fuel exposures from EOC minus 2000 MWD/ST to EOC, the OLMCPR must be greater than 1.35 for 8x8R fuel, greater than 1.39 for BP8x8R fuel and P8x8R fuel.

We find that, since approved methods (Ref. 3) were used and the results show an acceptable margin of safety from conditions which could lead to fuel damage during any anticipated operational occurrence, the thermal-hydraulic design of the Cycle 5 core is acceptable. The corresponding Technical Specification changes are also acceptable since they are consistent with the Cycle 5 safety analysis.

4.3 Thermal-Hydraulic Stability

The results of thermal-hydrualic analyses (Ref. 2) show that the maximum core stability decay ratio is 0.73 for Cycle 5 as compared to 0.72 for Cycle 4. We find that the calculated decay ratio for Cycle 5 is (1) less than 0.8 which is the maximum acceptable limit as explained in Reference 9 and (2) that operation in the natural circulation mode will be prohibited by Technical Specification 3/4.4.1. We therefore conclude that the thermal-hydraulic stability results are acceptable for Cycle 5 operation.

5.0 TRANSIENT AND ACCIDENT ANALYSES

Various transients could cause a reduction in the MCPR value. The most limiting events have been analyzed by the licensee to determine which event could potentially induce the largest reduction in the critical power ratio (delta CPR). The delta CPR values given in Section 10 of Reference 2 are plant specific values calculated by using ODYN methods. For Core Wide Transients the calculated delta CPRs were adjusted to reflect "A" Option or "B" Option delta CPRs as described in Reference 4. The operating limit MCPR values are determined by adding the delta CPRs to the safety limit MCPR. Section 12 of Reference 2 presents both the cycle MCPR values for the pressurization and nonpressurization events. The maximum cycle MCPR values (for "A" Option and "B" Option) in Section 12 are specified as the operating limit MCPRs and are incorporated into the Technical Specifications.

For Local Transients Reference 2 shows that the rod withdrawal error, fuel misorientation event and rod drop accident have been analyzed for this cycle. The cycle specific rod drop accident analysis was necessary because certain parameters (accident reactivity shape function and scram shape function in the cold startup mode) were not bounded by the generic analysis. The results of the cycle specific analysis (220 calories per gram peak enthalpy) meet our acceptance criterion for this event and are therefore acceptable. The fuel misorientation event is not limiting at any time in the cycle. The rod withdrawal event is limiting during the portion of the cycle prior to 2000 MWD/ST before End-of-Cycle if the ODYN OPTION B Transient Analysis is used. On the basis that approved methods have been used to perform the analyses and to obtain input parameters for them, we conclude that the transient analyses are acceptable.

6.0 TECHNICAL SPECIFICATION CHANGES

Various revisions to the Technical Specifications have been proposed. The results of our review are as follows:

Changes were made in Figures 3.2.1-1 through 3.2.1-7 of the Technical Specifications in order to reflect the use of extended burnup to 40 GWd/ST for the 8x8R, P8x8R fuel types and 45 GWd/ST for the new BP8x8R fuel. We conclude that these changes regarding the proposed MAPLHGR limits are acceptable based on the discussion in Section 2 of this Safety Evaluation.

Section 3/4.2.3 and Table 3.2.3.2-1 of the Technical Specifications have been revised to include the proposed operating limit MCPRs for Cycle 5 operation. We find that the proposed operating limit MCPRs have been established using approved methods to avoid violation of the safety limit MCPR during any anticipated operational transient. We conclude that the Technical Specification changes related to the operating limit MCPRs are acceptable based on the discussion in Section 4.2 of this Safety Evaluation.

Changes were made in Technical Specification 3/4.2.2, Table 3.3.4-2 and Bases 3/4.2.2 related to the design total peaking factors (TPF). The changes reflect the value of design TPF for Cycle 5 core and are acceptable.

Technical Specification 3/4.2.4 and Technical Specification 5.3.1 were revised to include the BP8x8R for the Cycle 5 operation and are acceptable as discussed in Section 2 of this Safety Evaluation.

7.0 SUMMARY

The following statements summarize the staff conclusions concerning the Cycle 5 reload for BSEP-1.

On the basis that the fuel-related design features of BWR reloads provided by General Electric have been generically approved we find these features to be acceptable for BSEP-1 Cycle 5. On the basis that the licensee has used approved General Electric Company methods to determine these MAPLHGR values (see Section 2 of this Safety Evaluation), we conclude that extension of the MAPLHGR limits to higher burnup values is acceptable for Cycle 5.

On the basis that approved methods have been used and that the results are consistent with those for similar reloads we conclude that the nuclear and thermal-hydraulic design of the reload is acceptable. On the same basis we conclude that the transient and accident analyses are acceptable and that the results support the operation of BSEP-1 for Cycle 5.

We further conclude that the proposed changes in the plant Technical Specifications as explained in Section 6 above to incorporate revised MCPR, MAPLHGR and TPF values for 8x8R, P8x8R and the new BP8x8R fuel are acceptable. In summary, we conclude that BSEP-1 may be reloaded and operated for Cycle 5 without undue hazard to the public health and safety.

8.0 ENVIRONMENTAL CONSIDERATIONS

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 exposure. 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 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.

9.0 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 amendment will not be inimical to the common defense and security or to the health and safety of the public.

10.0 REFERENCES

1. Letter from A. B. Cutter (CP&L) to D. Vassallo (NRC), Request for Revision to Technical Specifications (Fuel Cycle No. 5 - Reload Licensing), April 26, 1985.

2. 23A4663, Supplement Reload Licensing Submittal for Brunswick Steam Electric Plant Unit 1, Reload 4 (Without Recirculation Pump Trip), April 1985.

3. NEDE-24011-P-A-6, General Electric Standard Application for Fuel, April 1983.

4. Letter from R. Bucholz (GE) to P. Check (NRC), "Response to NRC Request for Information on ODYN Computer Model", September 5, 1980.

5. R. E. Engel (GE) letter to T. A. Ippolito (NRC) dated May 6, 1981.

6. R. E. Engel (GE) letter to T. A. Ippolito (NRC) dated May 28, 1981.

7. L. S. Rubenstein (NRC) memorandum for T. M. Novak (NRC) on "Extension of General Electric Emergency Core Cooling System Performance Limits" dated June 25, 1981.

8. P. W. Howe (CP&L) letter to D. B. Vassallo (NRC) dated June 7, 1982.

9. L. S. Rubenstein (NRC) memorandum for D. M. Crutchfield (NRC), SER on "Compliance of GE BWR Fuel Design to Stability Licensing Criteria" NEDE-22277-P-1, dated April 5, 1985.

10. L. S. Rubenstein (NRC) to F. J. Miraglia (NRC) on "GE Barrier Fuel Topical Report Evaluation - Barrier Fuel Amendment to NEDE-24011-P-A-4" dated March 29, 1983.

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