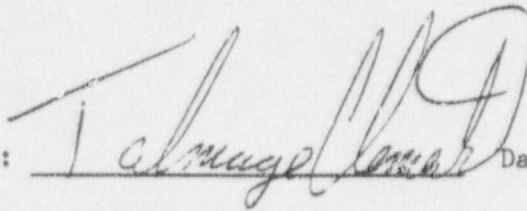


BRUNSWICK UNIT 2, CYCLE 8  
CORE OPERATING LIMITS REPORT  
MARCH 1989

Controlled Copy 01

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Date

3/2/89

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Transient Analysis

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## INTRODUCTION AND SUMMARY

This report provides the values of the AVERAGE PLANAR LINEAR HEAT GENERATION RATE (APLHGR) limits, the  $K_f$  core flow adjustment factor, and the MINIMUM CRITICAL POWER RATIO (MCPR) limits for Brunswick Unit 2, Cycle 8 as required by Technical Specification 6.9.3.1. Per Technical Specifications 6.9.3.2 and 6.9.3.3, these values have been determined using NRC-approved methodology and are established such that all applicable limits of the plant safety analysis are met.

Preparation of this report was performed in accordance with CP&L Nuclear Fuel Section Quality Assurance requirements and is documented in Reference 1.

### APLHGR LIMITS

The limiting APLHGR value for the most limiting lattice (excluding natural uranium) of each fuel type as a function of AVERAGE PLANAR EXPOSURE is given in Figures 1,2,3, and 4. These values were determined with the SAFE/REFLOOD LOCA methodology described in GESTAR-II (Reference 2). Figures 1,2,3, and 4 are used when hand calculations are required as specified in Technical Specification 3.2.1.

### MCPR LIMITS

The OLYN OPTION A, OLYN OPTION B, and non-pressurization transient MCPR limits for use in Technical Specifications 3.2.3.1 and 3.2.3.2 for each fuel type as a function of cycle average exposure are given in Table 1. These values were determined with the GEMINI methodology and GEXL critical power ratio correlation described in GESTAR-II (Reference 2) and are consistent with a Safety Limit MCPR of 1.04.

The  $K_f$  core flow adjustment factor for use in Technical Specification 3.2.3.1 is given in Figure 5.

### REFERENCE(s)

- 1) CP&L Nuclear Fuel Section Quality Assurance File NF 2489.0014, "Preparation of the Brunswick Unit 2, Cycle 8 Core Operating Limits Report", February 1989 (as supplemented).
- 2) NEDE-24011-P-A, "General Electric Standard Application for Reactor Fuel" (latest approved version).



Figure 1

FUEL TYPE P8DRB265H (P8X8R)  
AVERAGE PLANAR LINEAR HEAT  
GENERATION RATE (APLHGR) LIMIT  
VERSUS AVERAGE PLANAR EXPOSURE

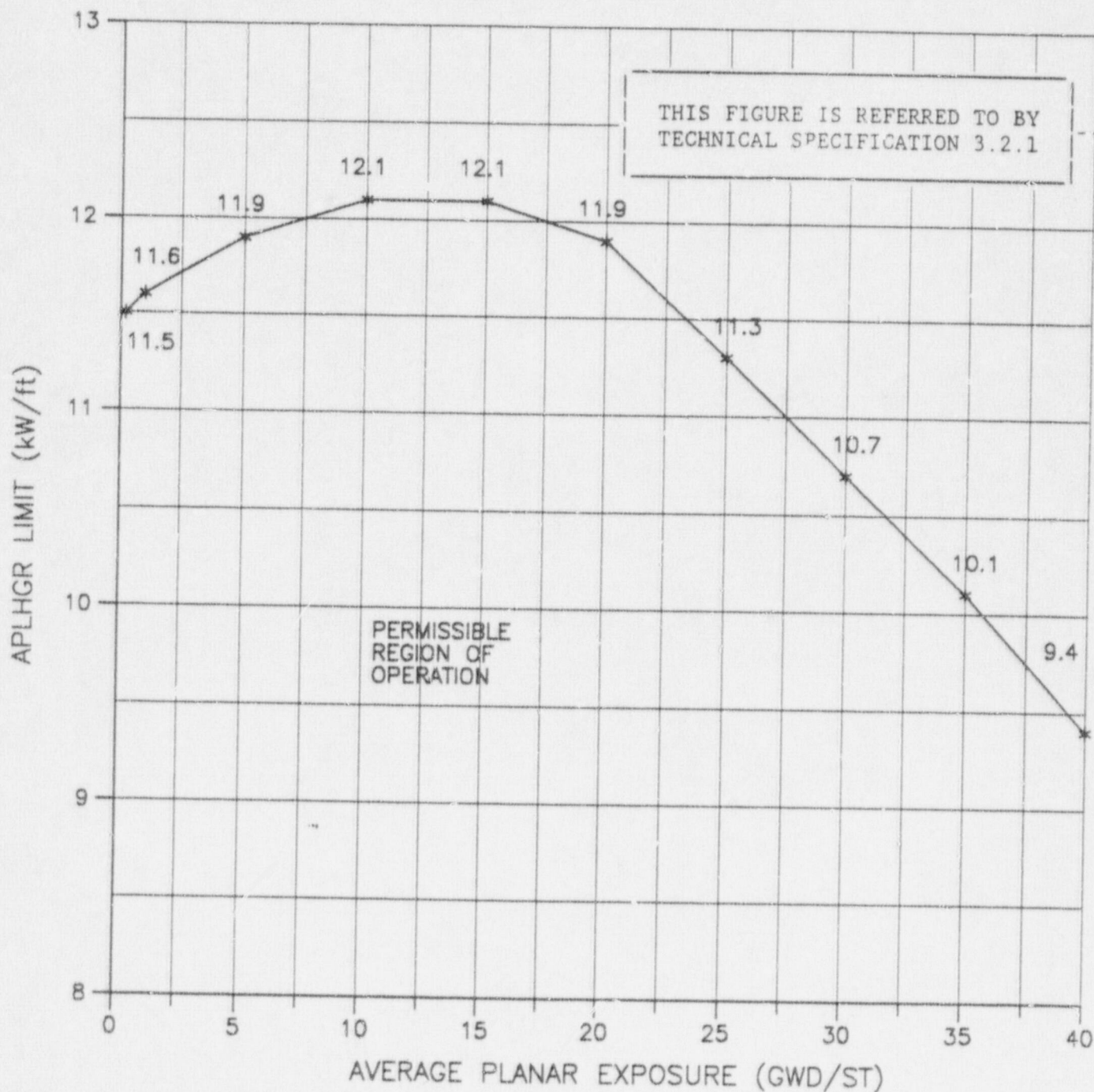


Figure 2

FUEL TYPE BP8DRB299 (BP8X8R)  
AVERAGE PLANAR LINEAR HEAT  
GENERATION RATE (APLHGR) LIMIT  
VERSUS AVERAGE PLANAR EXPOSURE

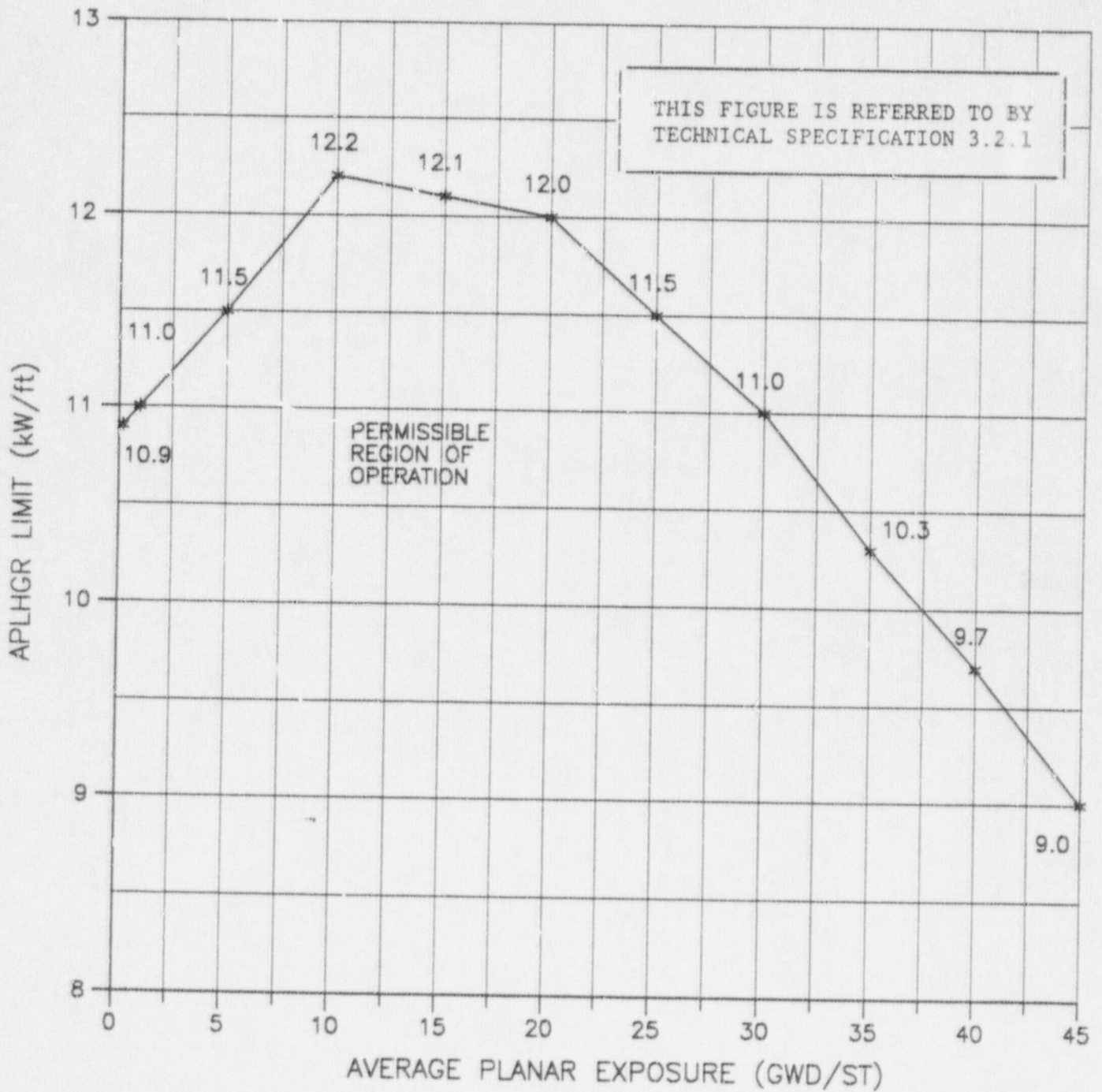


Figure 3

FUEL TYPE BD317A (GE8X8EB)  
AVERAGE PLANAR LINEAR HEAT  
GENERATION RATE (APLHGR) LIMIT  
VERSUS AVERAGE PLANAR EXPOSURE

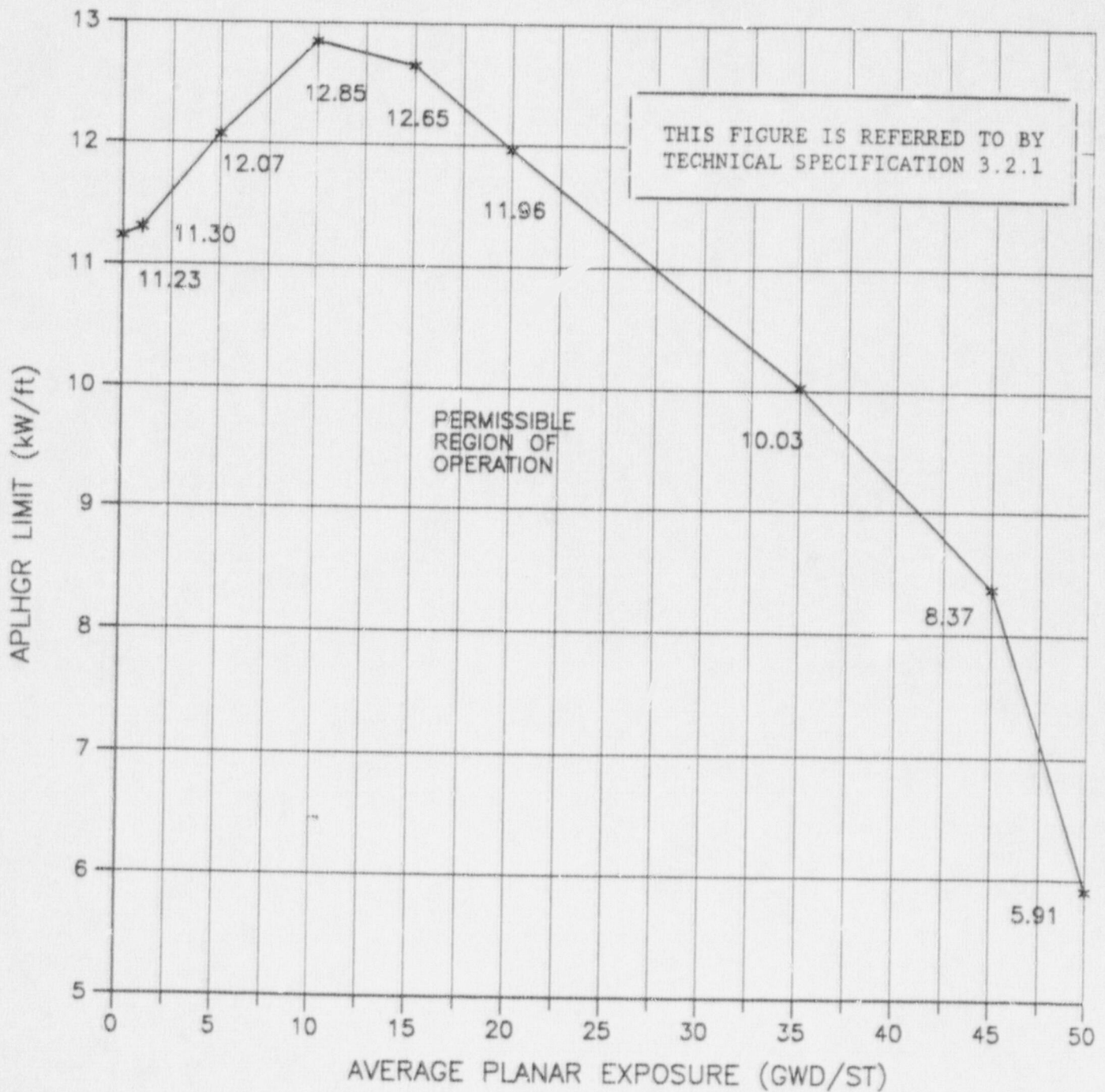




Figure 4

FUEL TYPE BD323A (GE8X8EB)  
AVERAGE PLANAR LINEAR HEAT  
GENERATION RATE (APLHGR) LIMIT  
VERSUS AVERAGE PLANAR EXPOSURE

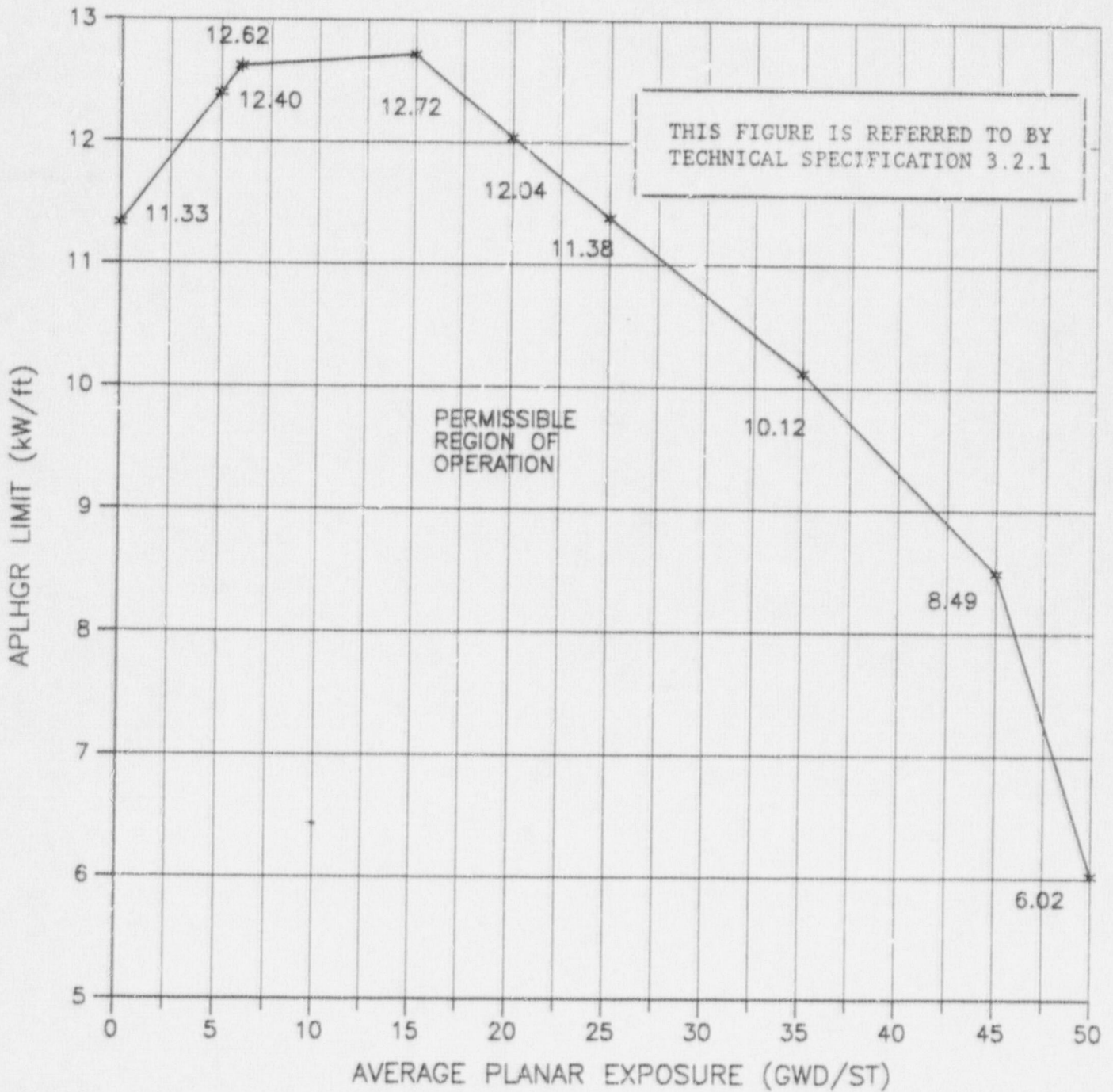


TABLE 1

M CPR LIMITS

Fuel Type(s): P8X8R, BP8X8R, and GE8X8EB

Non-Pressurization Transient MCPR = 1.22

Pressurization Transient MCPR

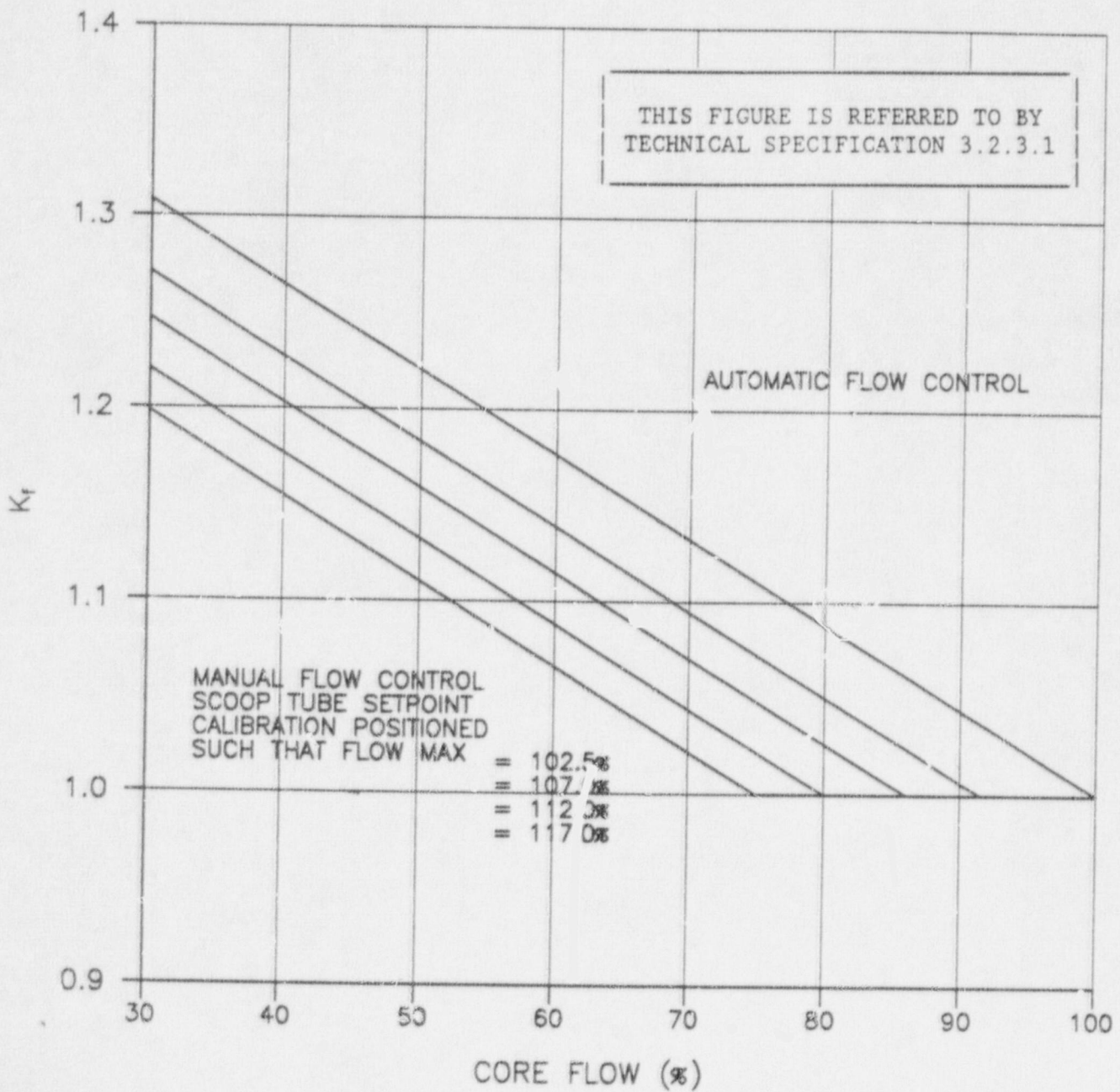
Exposure Range	M CPR	M CPR
	Option A	Option B
BOC8 to EOC8-2000 MWD/ST	1.29	1.22
EOC8-2000 MWD/ST to EOC8	1.30	1.26

THIS TABLE IS REFERRED TO BY  
TECHNICAL SPECIFICATIONS  
3.2.3.1 AND 3.2.3.2



Figure 5

$K_f$  CORE FLOW ADJUSTMENT FACTOR



ENCLOSURE 2

CORE OPERATING LIMITS REPORT, REVISION 1, MARCH 1989  
BRUNSWICK STEAM ELECTRIC PLANT, UNIT 2