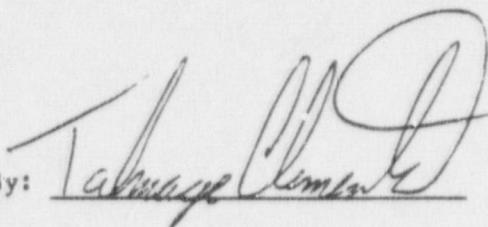


BRUNSWICK UNIT 1, CYCLE 7  
CORE OPERATING LIMITS REPORT  
MARCH 1989

Controlled Copy \_\_\_\_\_

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Date

3/2/89

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LIST OF EFFECTIVE PAGES

Page(s)	Revision
1-10	1

## 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 1, Cycle 7 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, 4, and 5. These values were determined with the SAFE/REFLOOD LOCA methodology described in GESTAR-II (Reference 2). Figures 1,2,3, 4, and 5 are used when hand calculations are required as specified in Technical Specification 3.2.1.

## MCPR LIMITS

The ODYN OPTION A, ODYN 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-PLUS 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 6.

## REFERENCE(s)

- 1) CP&L Nuclear Fuel Section Quality Assurance File NF 2489.0016, "Preparation of the Brunswick Unit 1, Cycle 7 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 P8DRB284H (P8X8R)  
AVERAGE PLANAR LINEAR HEAT  
GENERATION RATE (APLHGR) LIMIT  
VERSUS AVERAGE PLANAR EXPOSURE

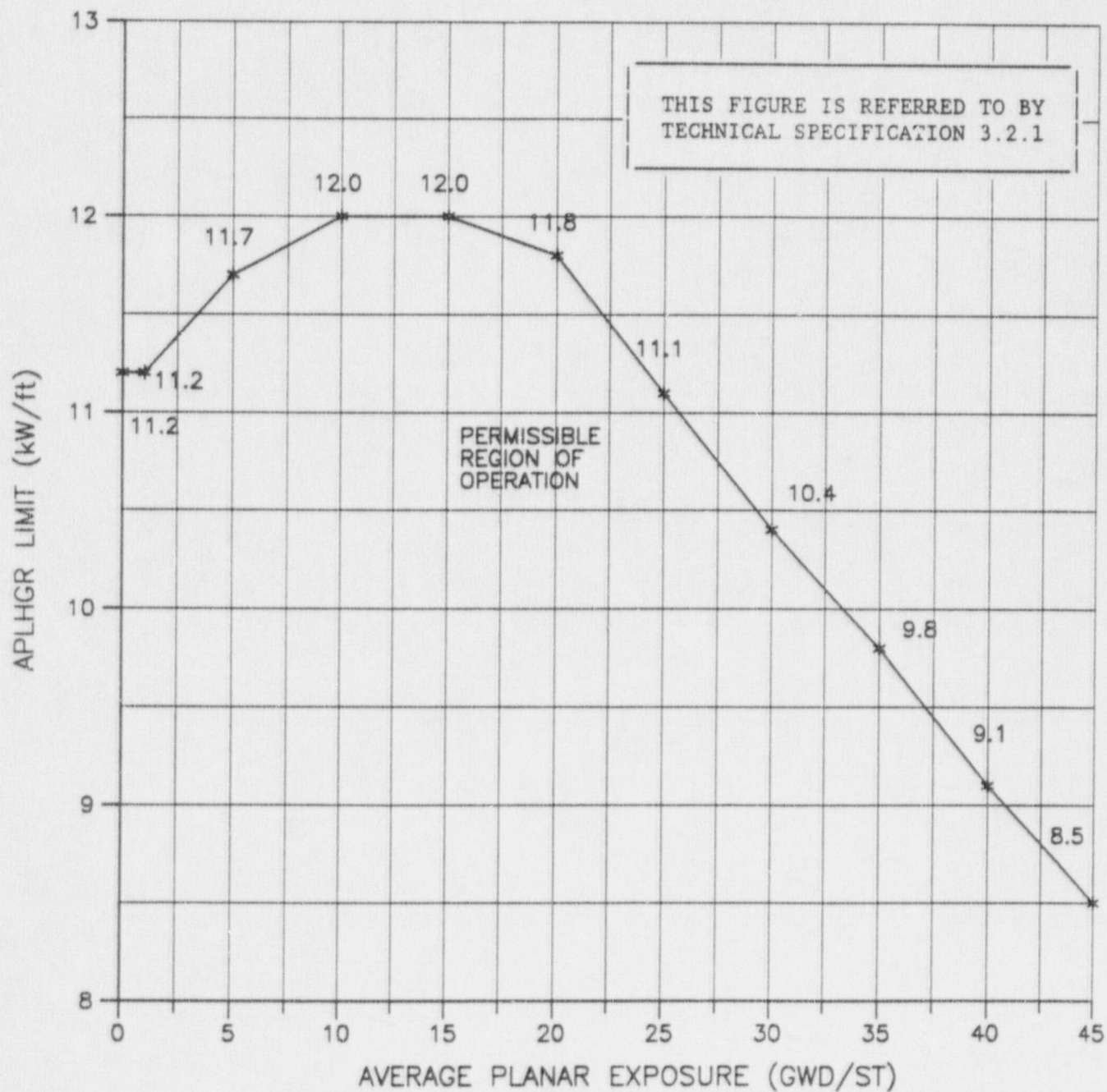


Figure 2

FUEL TYPE P8DRB299 (P8X8R)  
AVERAGE PLANAR LINEAR HEAT  
GENERATION RATE (APLHGR) LIMIT  
VERSUS AVERAGE PLANAR EXPOSURE

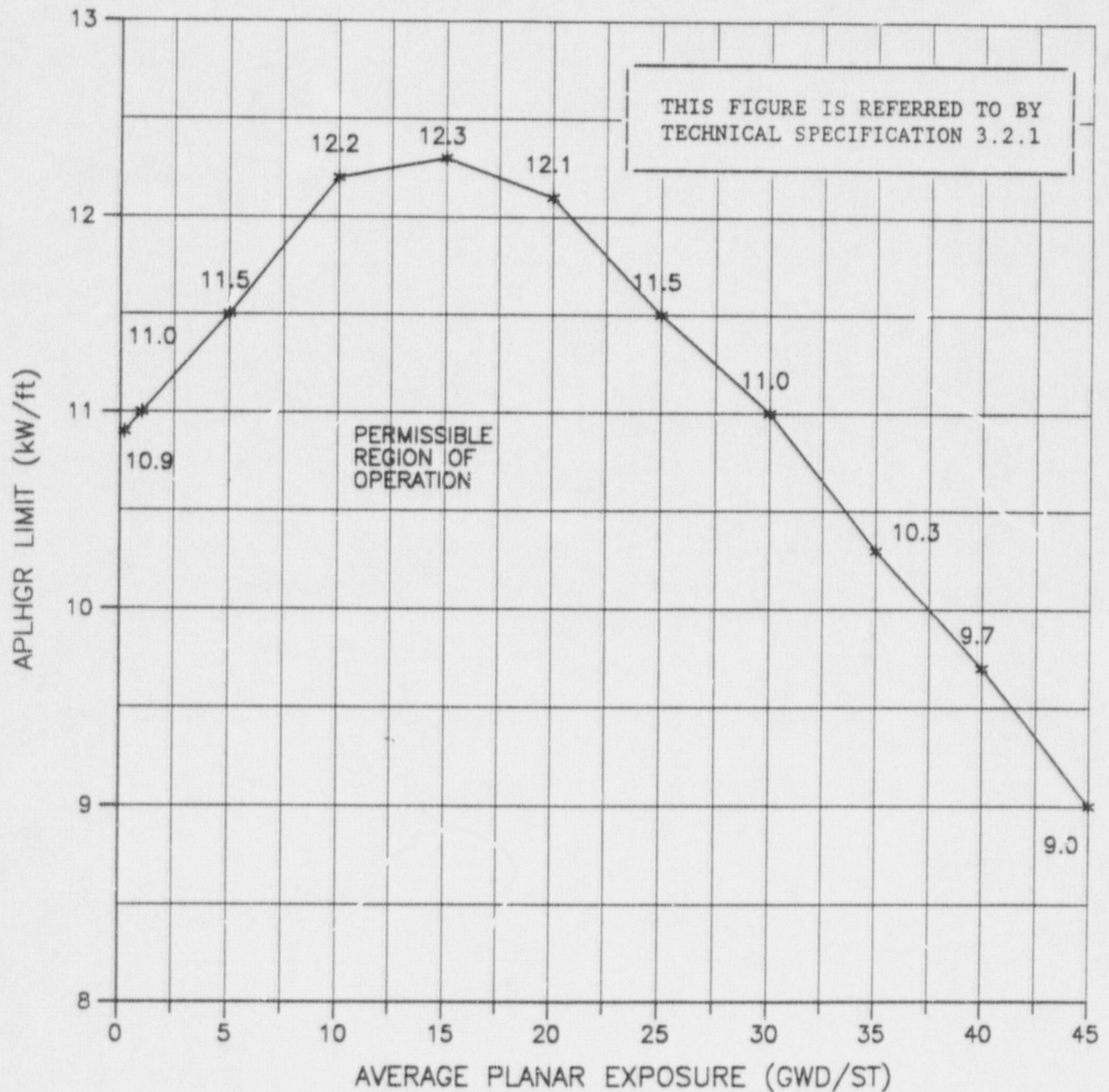


Figure 3

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

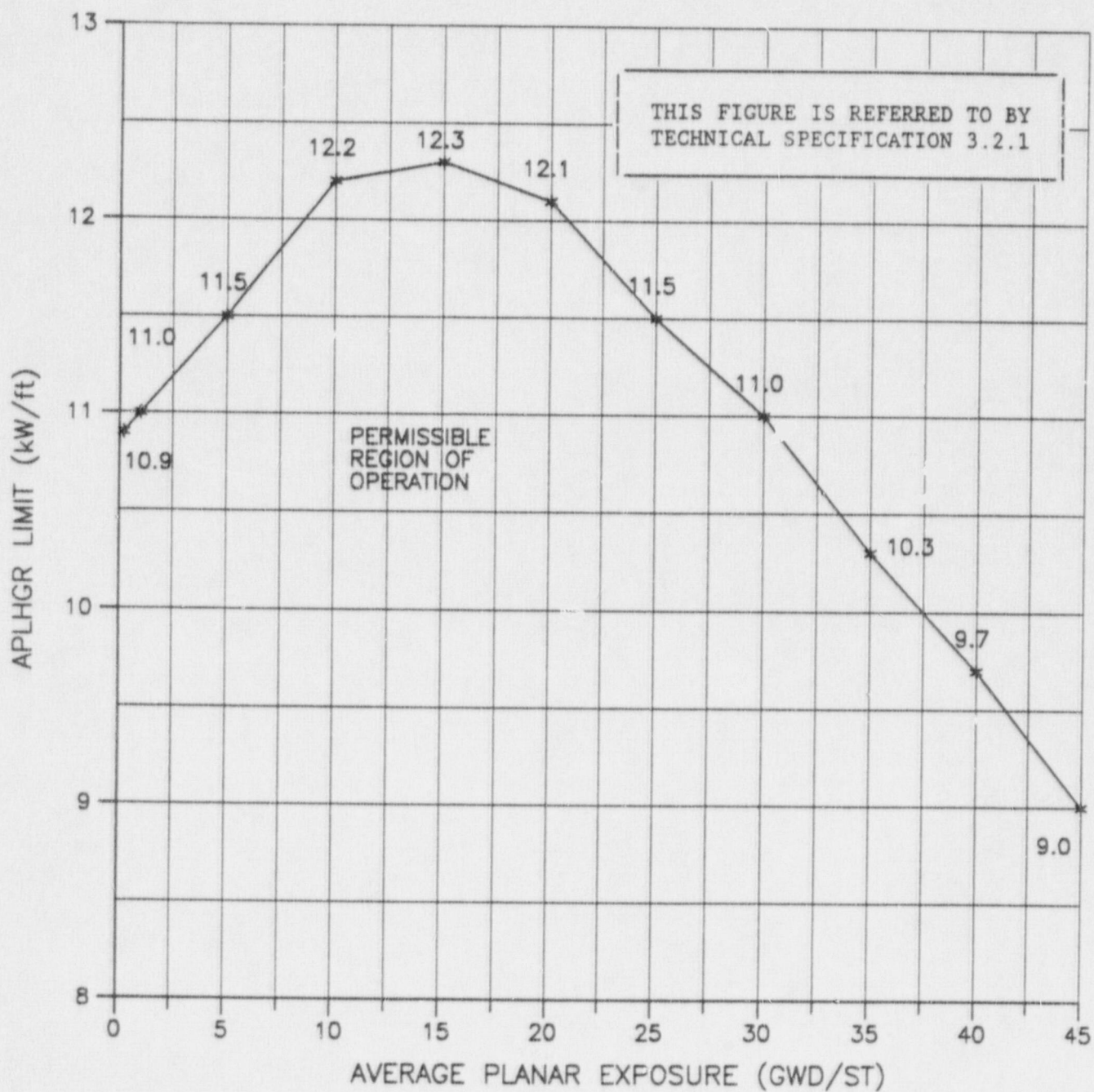




Figure 4

FUEL TYPE BD323B (GE8X8EB)  
AVERAGE PLANAR LINEAR HEAT  
GENERATION RATE (APLHGR) LIMIT  
VERSUS AVERAGE PLANAR EXPOSURE

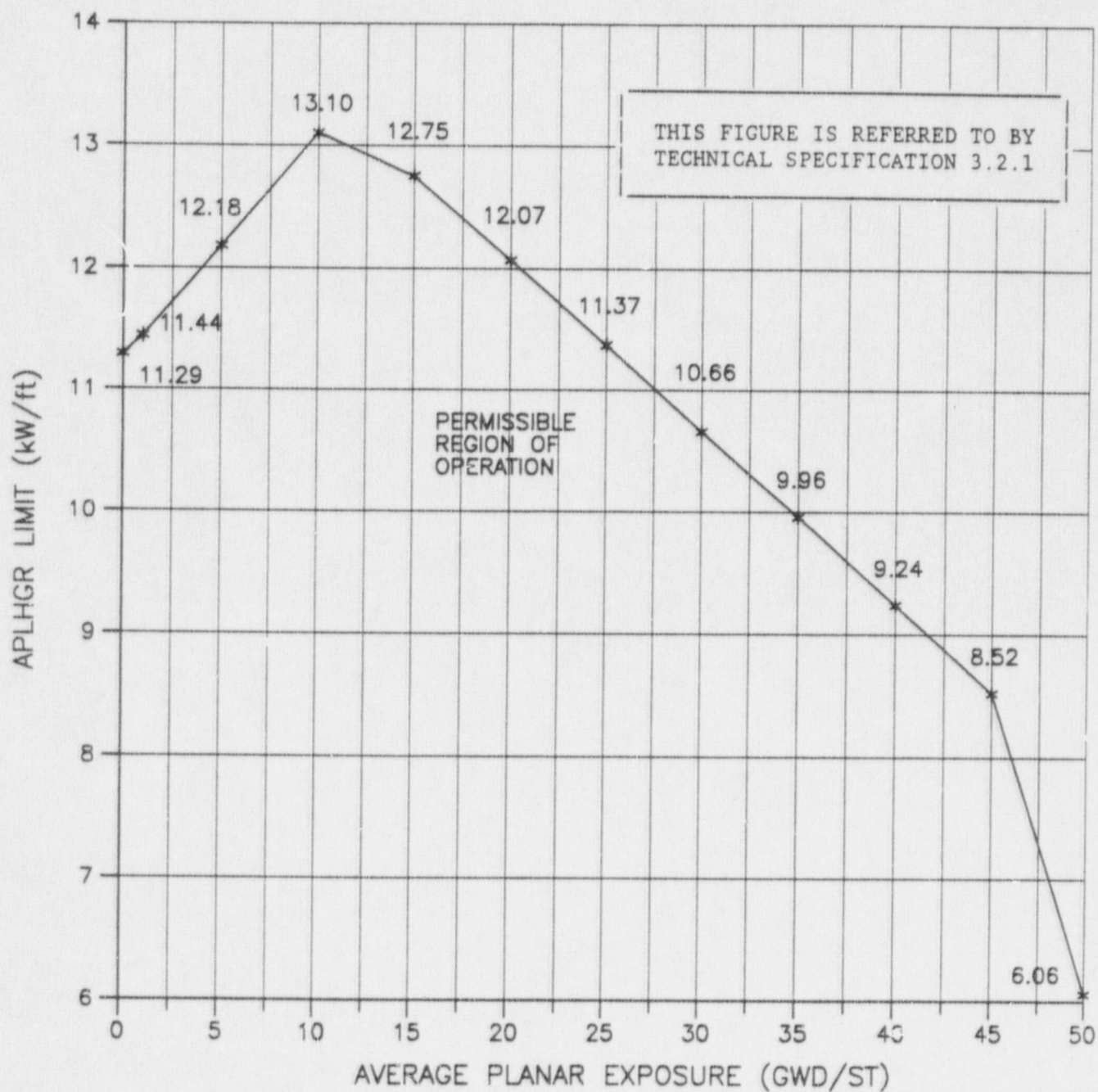


Figure 5

FUEL TYPE BD339A (GE8X8E3)  
AVERAGE PLANAR LINEAR HEAT  
GENERATION RATE (APLHGR) LIMIT  
VERSUS AVERAGE PLANAR EXPOSURE

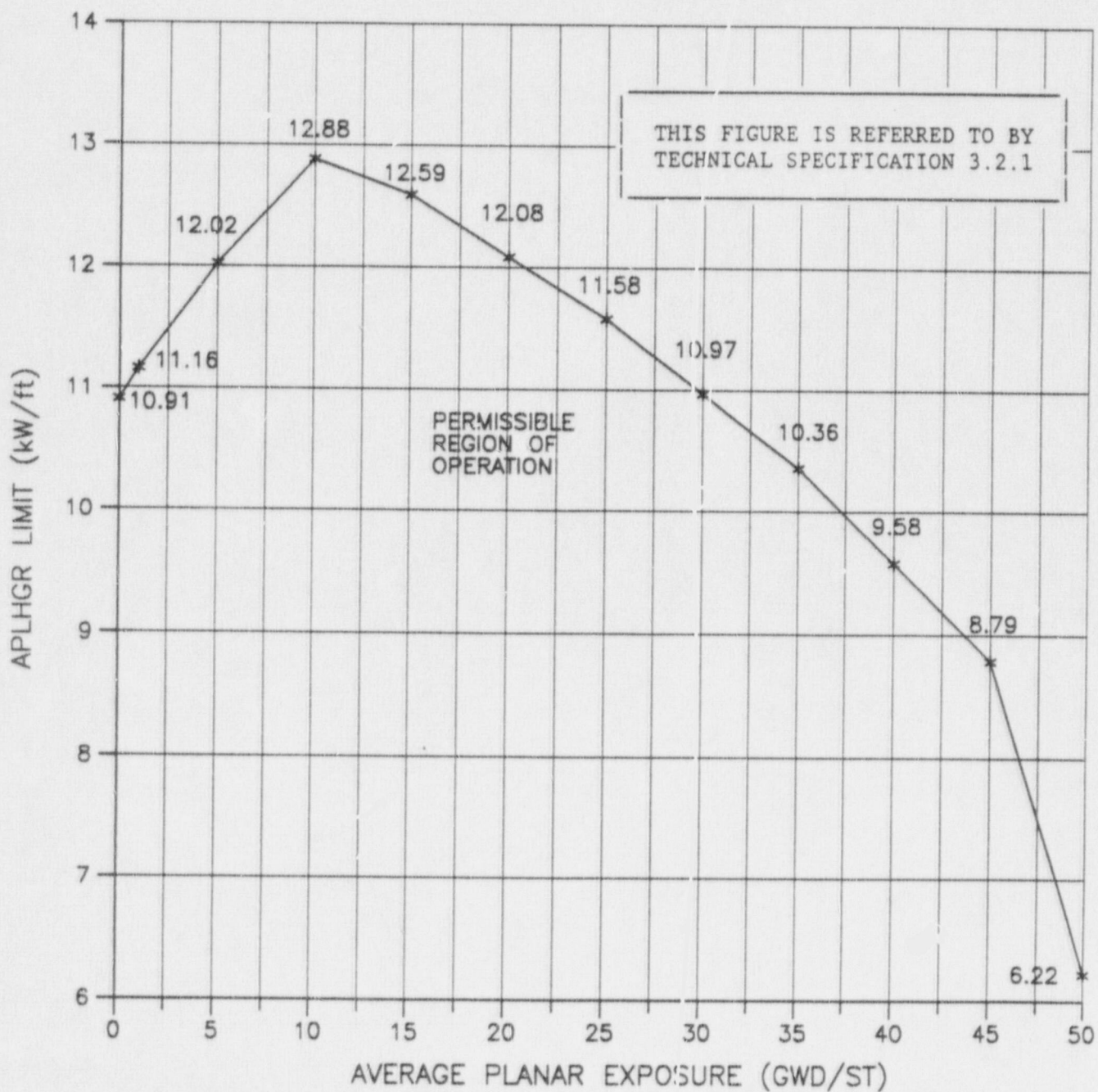




TABLE 1

MCPR LIMITS

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

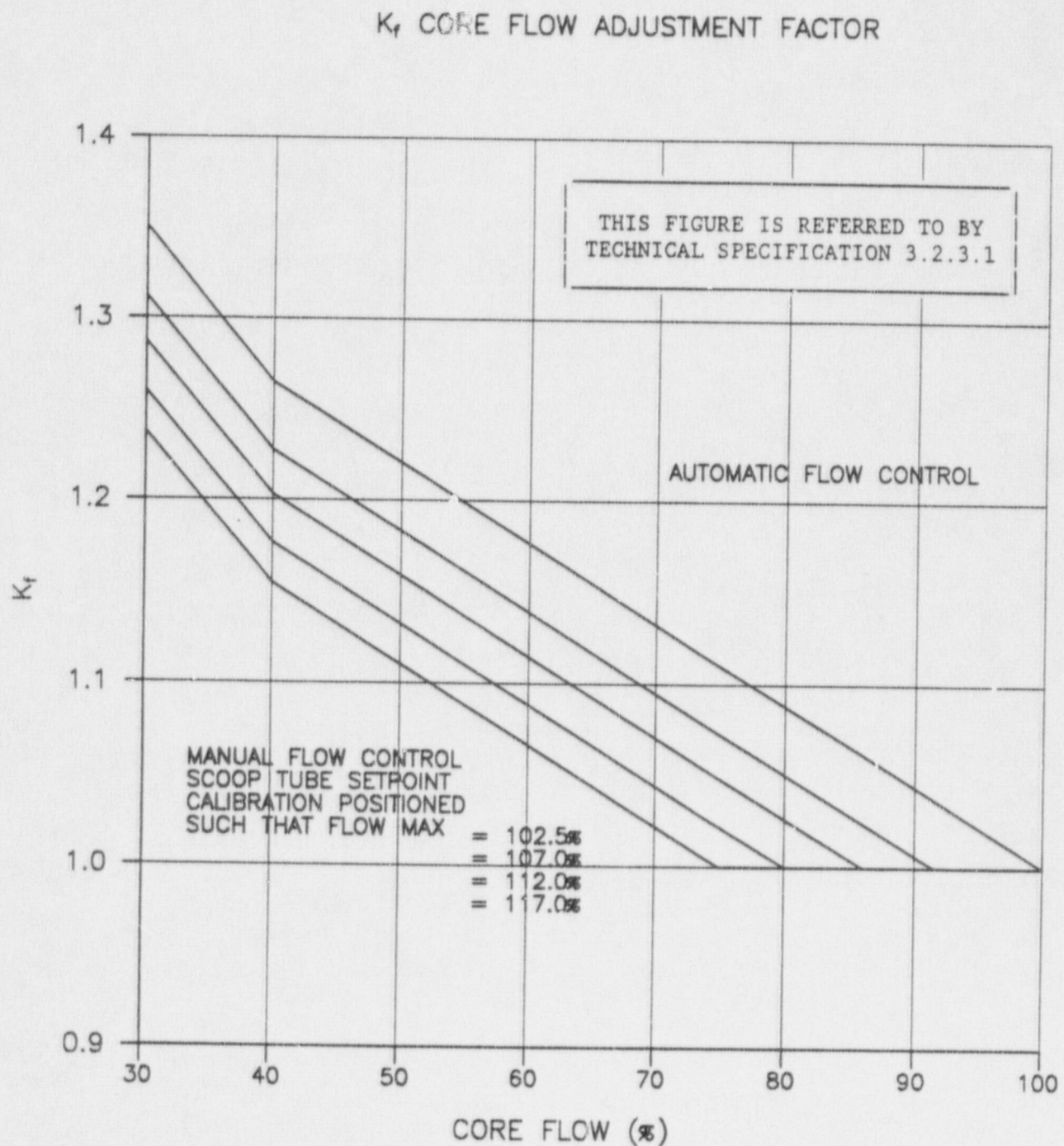
Non-Pressurization Transient MCPR = 1.25

Pressurization Transient MCPR

Exposure Range	MCPR	MCPR
	Option A	Option B
BOC7 to EOC7-2000 MWD/ST	1.32	1.25
EOC7-2000 MWD/ST to EOC7	1.34	1.30

THIS TABLE IS REFERRED TO BY  
TECHNICAL SPECIFICATIONS  
3.2.3.1 AND 3.2.3.2

Figure 6



ENCLOSURE 5

BRUNSWICK STEAM ELECTRIC PLANT, UNITS 1 AND 2  
NRC DOCKETS 50-325 & 50-324  
OPERATING LICENSES DPR-71 & DPR-62  
SUPPLEMENT TO REQUEST FOR LICENSE AMENDMENT  
ELIMINATION OF CYCLE-SPECIFIC PARAMETER LIMITS  
(NRC GENERIC LETTER 88-16)

CORE OPERATING LIMITS REPORT - UNIT 2