

EDWIN I. HATCH NUCLEAR PLANT  
UNIT 2

CORE OPERATING LIMITS REPORT  
for  
OPERATING CYCLE 11

REVISION 0

NOVEMBER 1992

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PDR ADOCK 05000366  
P PDR



DATE: November 6, 1992

RE: Hatch Project Support - Licensing  
Core Operating Limits Report for  
Hatch 2 Cycle 11  
File: Fuel Cycle Technical  
Log: HL-3022

FROM: S. J. Bethay *Steve Bethay*

TO: All Unit 2 Technical Specifications Holders

By Amendment 106 to the Unit 2 Technical Specifications (TS), the NRC authorized relocation of certain fuel-related limits from the Technical Specifications to the adjunct Core Operating Limits Report (COLR). This letter transmits to all Unit 2 Technical Specifications holders a copy of Revision 0 of the Core Operating Limits Report for Hatch 2 Cycle 11. This document is utilized in conjunction with the Unit 2 Technical Specifications as referred to in the Specifications. Normally, the shift technical advisor (STA) or reactor engineer utilizes this report. Where necessary, the fuel limits from the COLR are included in plant procedures.

If changes to the core operating limits contained within this report are required, a complete revised COLR will be issued and the appropriate procedures revised.

If there are any questions regarding this report, please contact me at extension 8-821-7392 or telephone number (205) 877-7392.

SRP/cr  
004280

Attachment

cc: NORMS

GEORGIA POWER COMPANY  
EDWIN I. HATCH NUCLEAR PLANT  
UNIT 2 FUEL CYCLE 11  
CORE OPERATING LIMITS REPORT

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SOUTHERN NUCLEAR OPERATING COMPANY  
P. O. BOX 1295  
BIRMINGHAM, AL 35201

EDWIN I. HATCH NUCLEAR PLANT  
UNIT 2 FUEL CYCLE 11  
CORE OPERATING LIMITS REPORT

1. INTRODUCTION

This CORE OPERATING LIMITS REPORT for Hatch Unit 2 Cycle 11 is prepared in accordance with the requirements of Hatch Unit 2 Technical Specification 6.9.1.11. The core operating limits presented herein were developed using NRC-approved methods (References 1 and 2). Results from the reload analyses for the General Electric fuel in Hatch Unit 2 Cycle 11 are documented in References 3 and 4.

The following cycle-specific core operating limits are included in this report:

- a. Control Rod Program Controls - Rod Block Monitor  
(Technical Specification 3/4.1.4.3)
- b. Average Planar Linear Heat Generation Rate (APLHGR) Limit  
(Technical Specification 3/4.2.1)
- c. Minimum Critical Power Ratio (MCPR) Operating Limit  
(Technical Specification 3/4.2.3)
- d. Linear Heat Generation Rate (LHGR) Limit  
(Technical Specification 3/4.2.4)

2. ROD BLOCK MONITOR (Technical Specification 3/4.1.4.3)

Both Rod Block Monitor (RBM) channels shall be operable as specified in Technical Specification 3/4.1.4.3 and when:

- a. THERMAL POWER is  $< 90\%$  of RATED THERMAL POWER and the MCPR is less than 1.70, or
- b. THERMAL POWER is  $\geq 90\%$  of RATED THERMAL POWER and the MCPR is less than 1.40.

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3. APLHGR LIMIT (Technical Specification 3/4.2.1)

The APLHGR limit is given by the applicable rated-power, rated-flow limit taken from Figures 3-3 through 3-8, multiplied by the smaller of either:

- a. The factor given by Figure 3-1, or
- b. The factor given by Figure 3-2.

For the fuel types whose APLHGR limits are shown in Figures 3-3 through 3-8, the APLHGR limit shown shall be applied to each axial location in the fuel assembly.

4. MCPR LIMIT (Technical Specification 3/4.2.3)

The MCPR operating limit (OLMCPR) is a function of fuel design, average scram time, core flow, number of operating recirculation loops, and core power. Note the rated-power and rated-flow OLMCPR is fuel-type dependent in Figure 4-3. For example, the Option B limits are 1.24 for GE7B, 1.25 for GE9, and 1.28 for GE11.

4.1 Two Recirculation Loop Operation

For  $25\% \leq \text{Power} < 30\%$ , the OLMCPR is given in Figure 4-1.  
For  $\text{Power} \geq 30\%$ , the OLMCPR is the greater of either:

- a. The applicable limit determined from Figure 4-2, or

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- b. The appropriate  $K_p$  given by Figure 4-1, multiplied by the appropriate limit from Figure 4-3 where the scram time dependence is given in the Bases for Technical Specification 3/4.2.3.

4.2 Single Recirculation Loop Operation

For single-loop operation, the MCPR operating limit shall be 0.01 greater than the two-loop value which is determined as specified in Section 4.1.

5. LHGR LIMIT (Technical Specification 3/4.2.4)

The LHGR limit is 13.4 kW/ft for all GE7B fuel. The LHGR limit for GE9B and GE11 fuel is 14.4 kW/ft.

6. REFERENCES

1. "General Electric Standard Application for Reactor Fuel," NEDE-24011-P-A-10-US, March 1991.
2. Letter, L. P. Crocker (NRC) to J. P. O'Reilly (GPC), "Issuance of Amendment Nos. 151 and 89 to Facility Operating Licenses DPR-57 and NPF-5 - Edwin I. Hatch Nuclear Plant Units 1 and 2 (TACS 66524/66525)," dated January 22, 1988.
3. "Supplemental Reload Licensing Report for Edwin I. Hatch Nuclear Plant Unit 2 Reload 10 Cycle 11," GE Document 23A7191, Revision 0, September 1992.



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4. "Edwin I. Hatch Nuclear Plant Units 1 and 2 SAFER/GESTR-LOCA Loss-of-Coolant Accident Analysis," NEDC-31376-P, December 1986.
5. Technical Specifications Bases for Sections 3/4.1.4.3, 3/4.2.1, 3/4.2.3, and 3/4.2.4.



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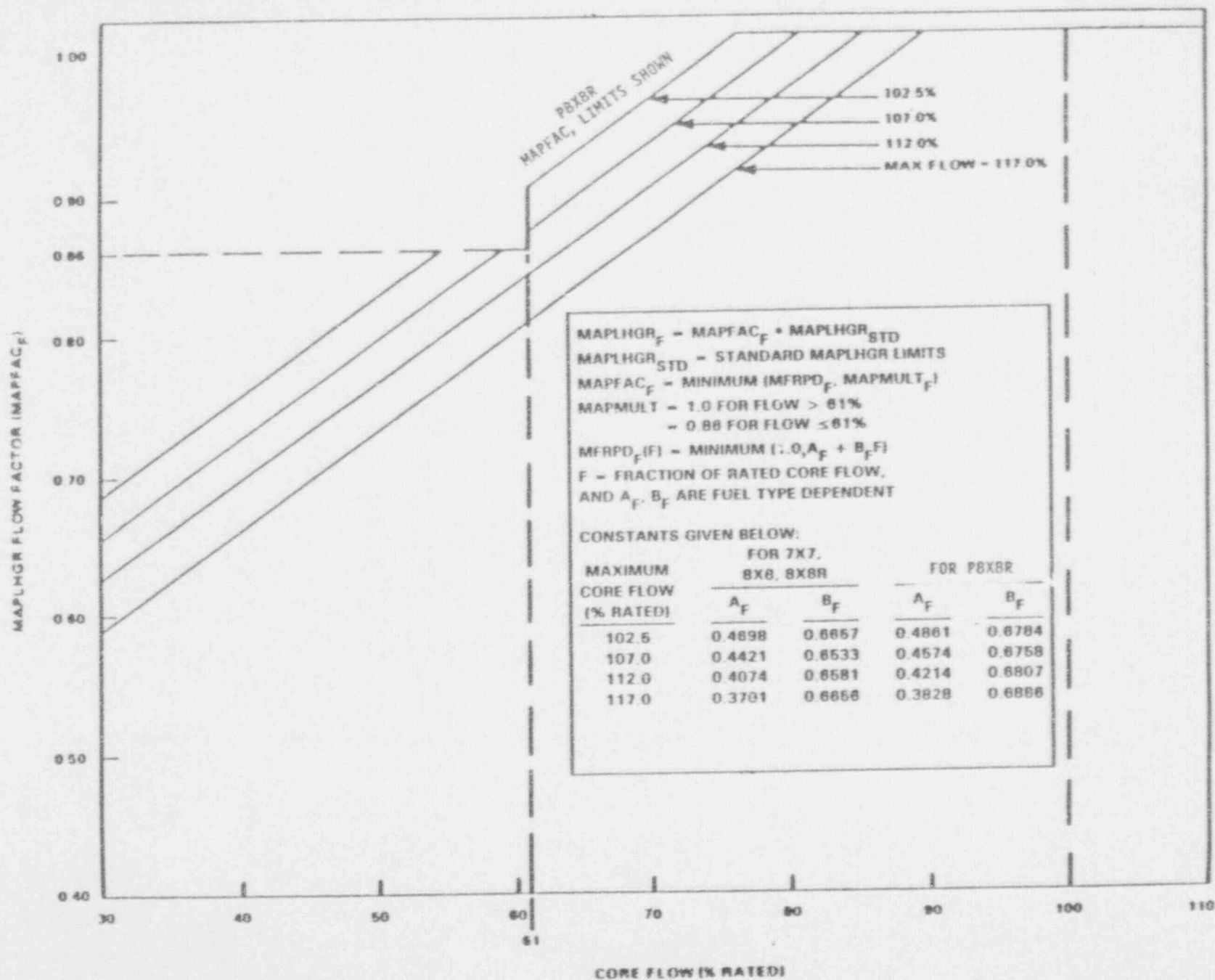
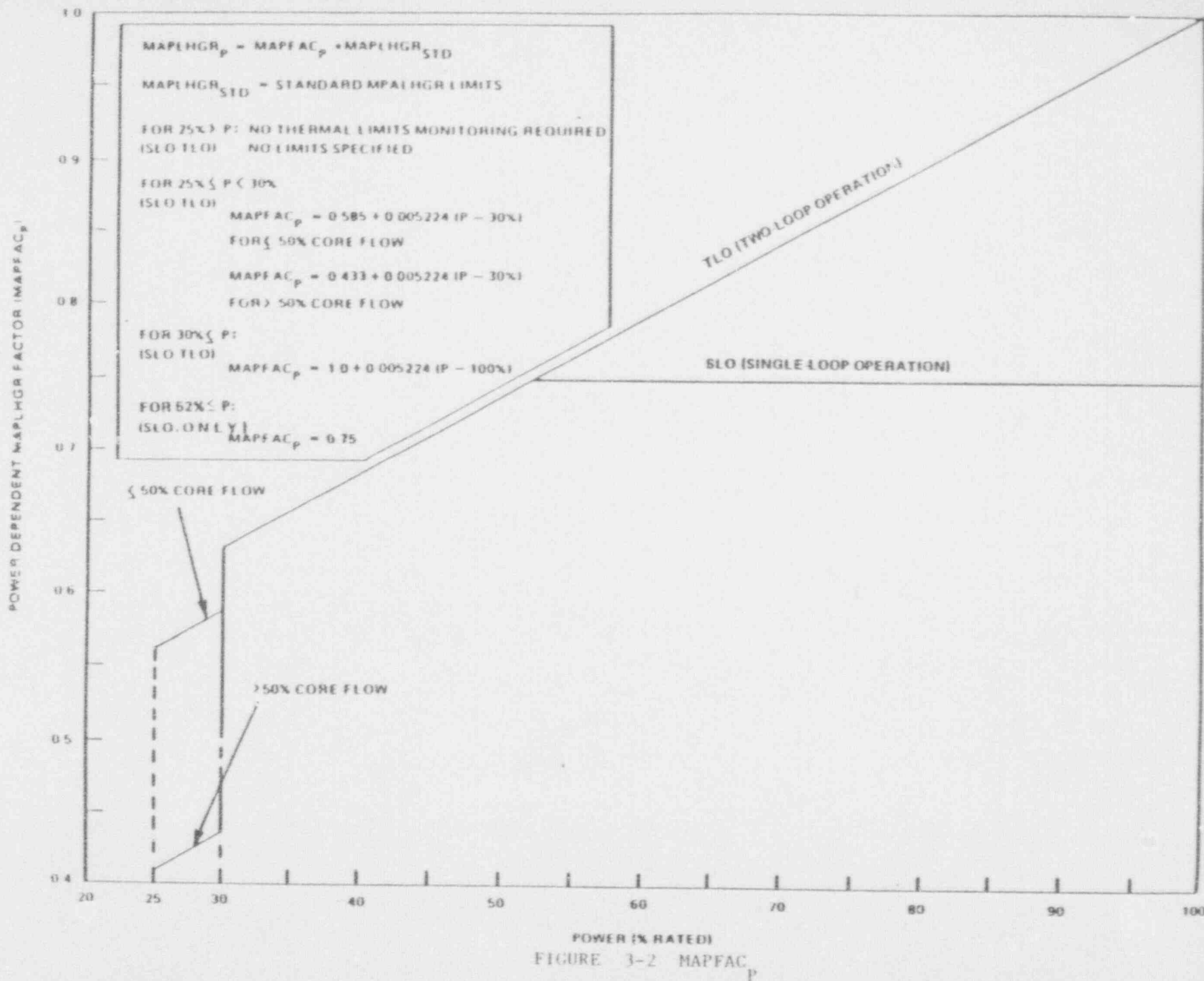
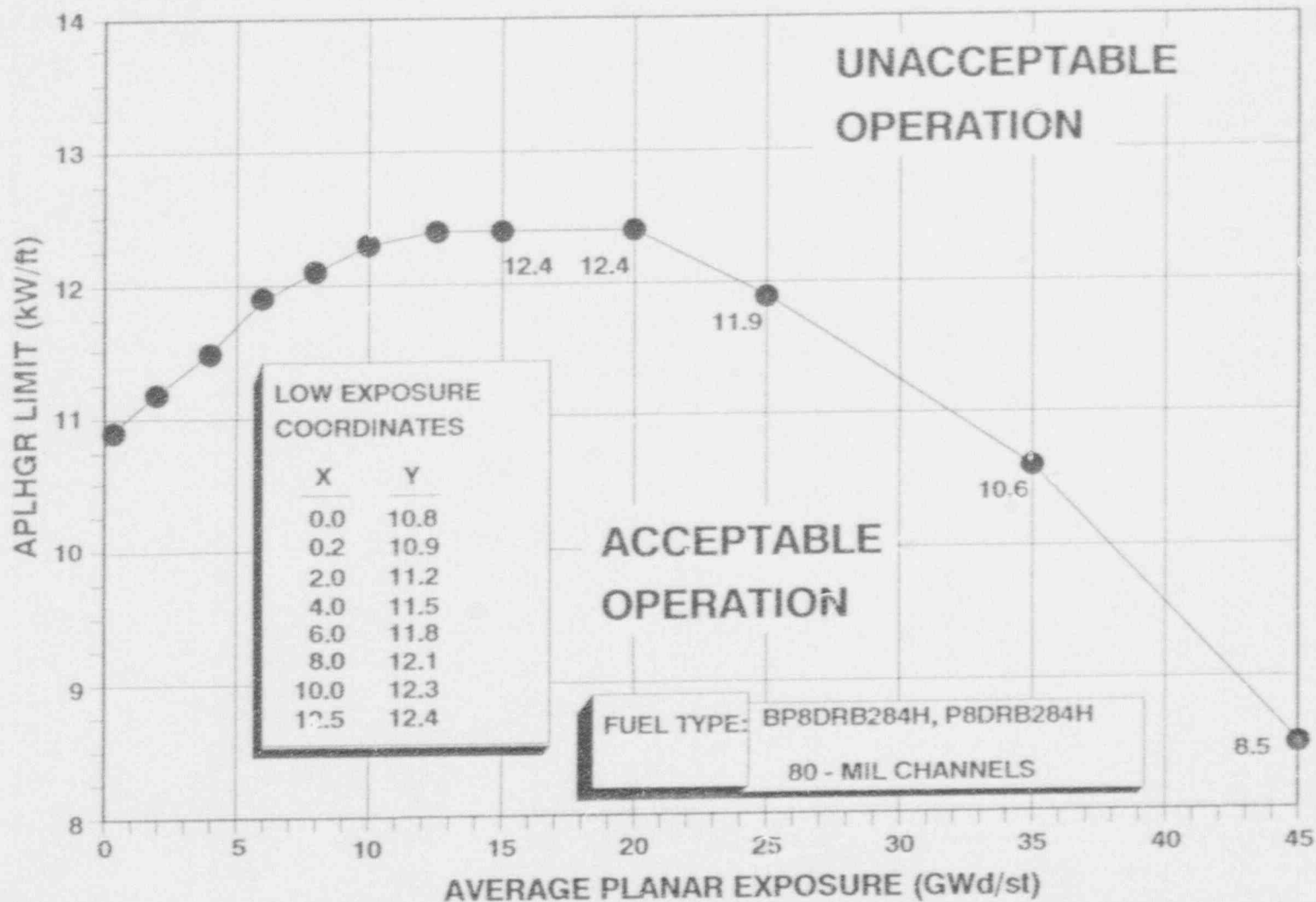


FIGURE 3-1 MAPFAC<sub>F</sub>



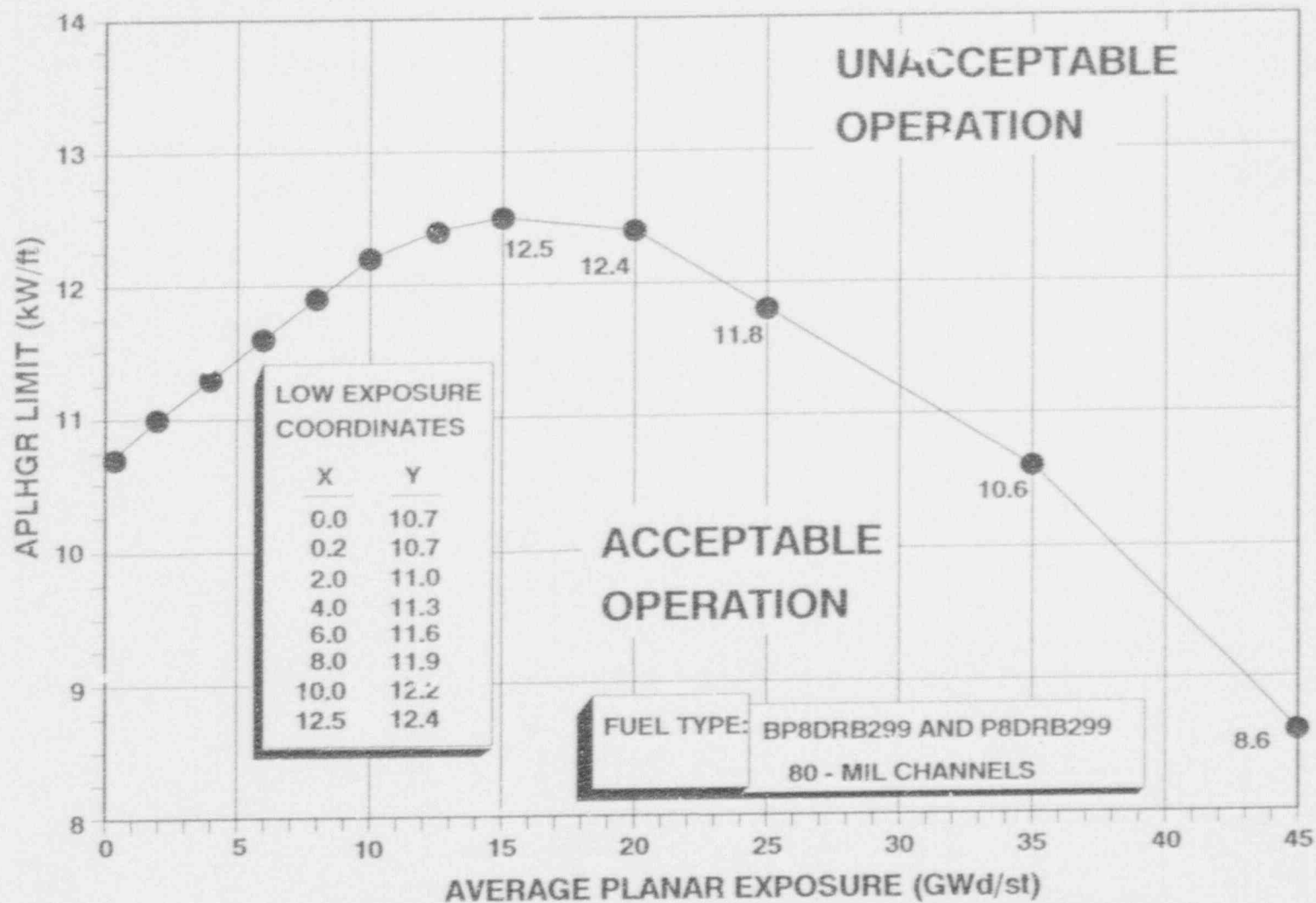
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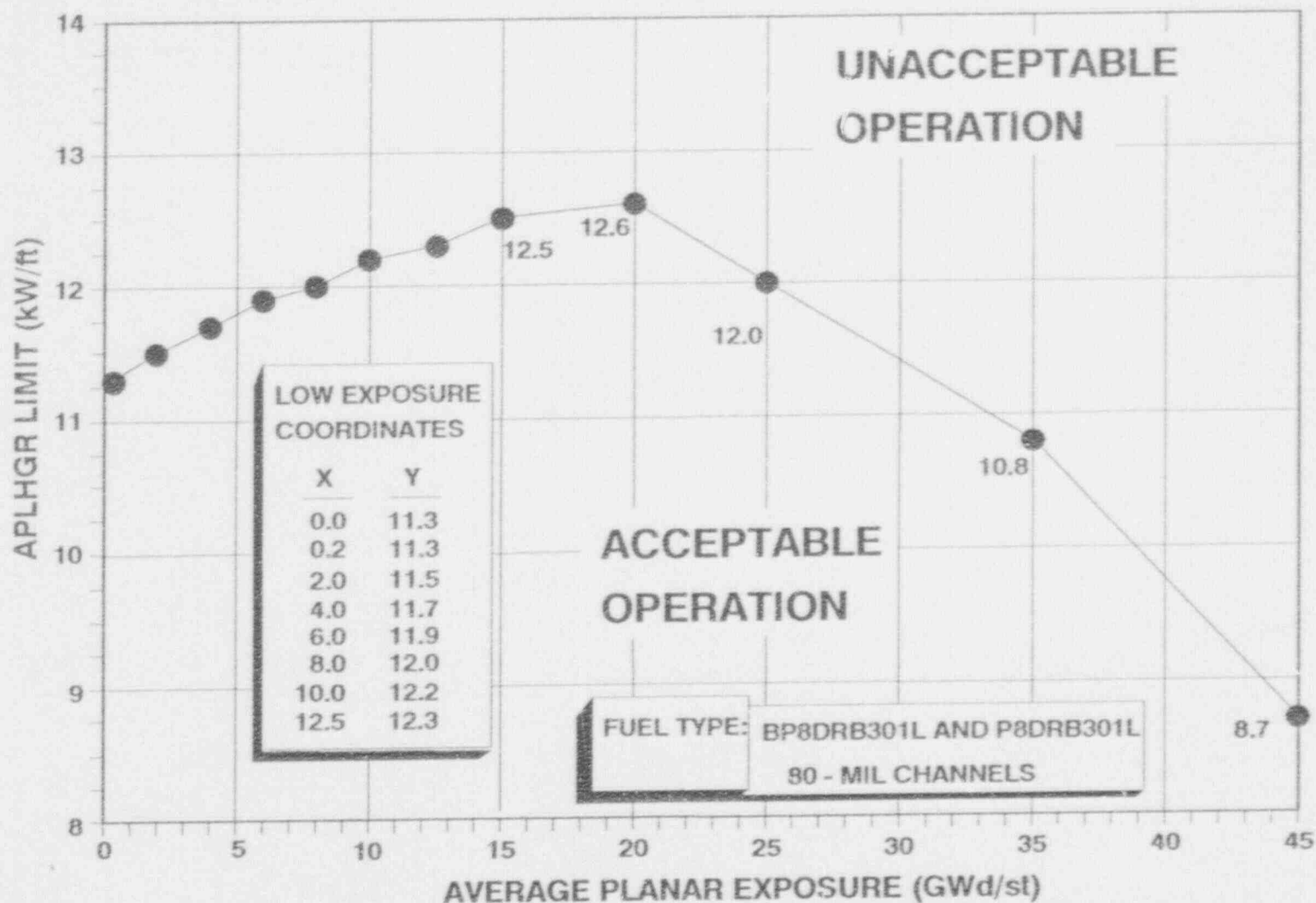


**FIGURE 3-3 AVERAGE PLANAR LINEAR  
HEAT GENERATION RATE LIMIT  
vs. AVERAGE PLANAR EXPOSURE**





**FIGURE 3-4 AVERAGE PLANAR LINEAR  
HEAT GENERATION RATE LIMIT  
vs. AVERAGE PLANAR EXPOSURE**

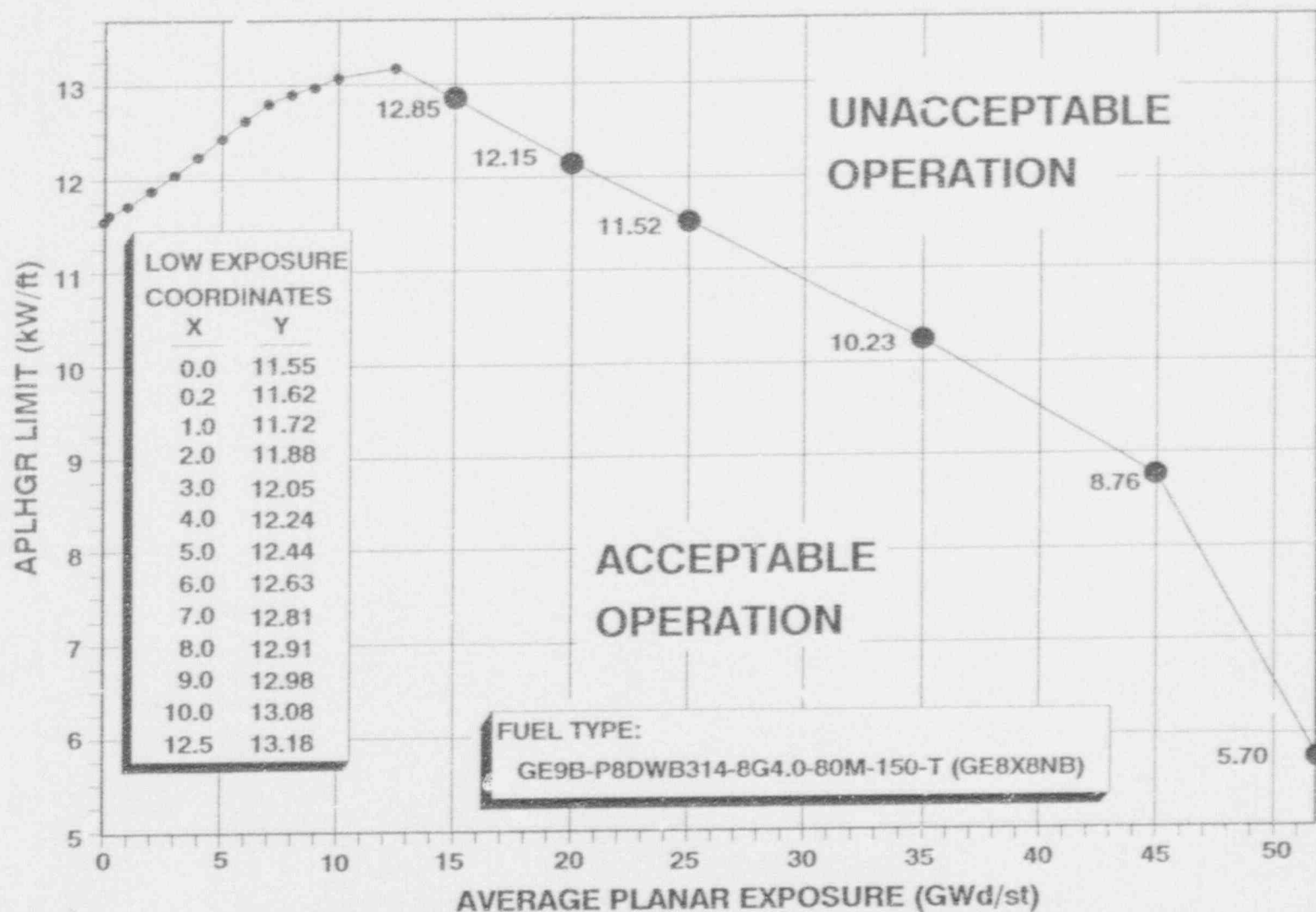


**FIGURE 3-5 AVERAGE PLANAR LINEAR  
HEAT GENERATION RATE LIMIT  
vs. AVERAGE PLANAR EXPOSURE**

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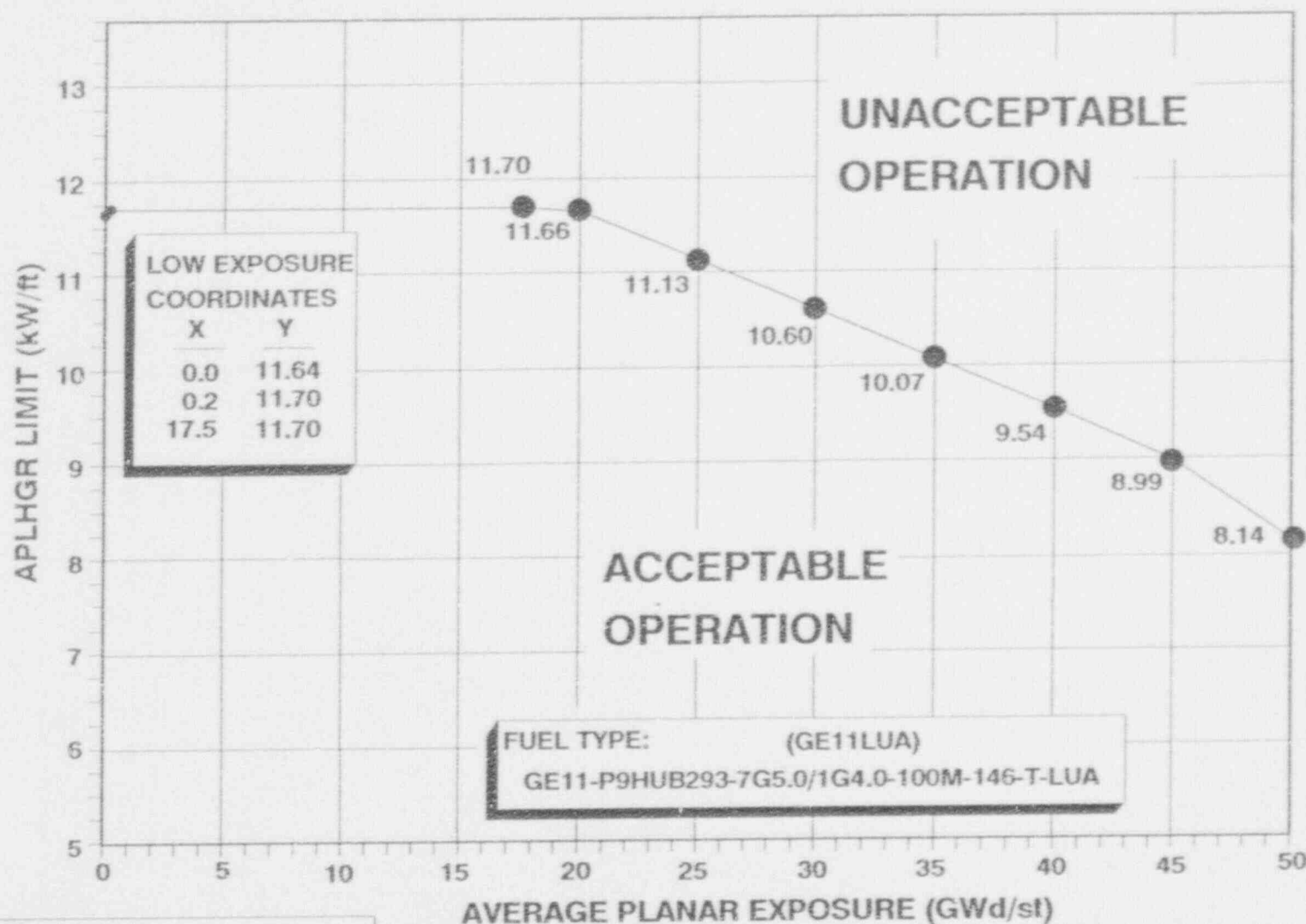
**FIGURE 3-6 AVERAGE PLANAR LINEAR  
HEAT GENERATION RATE LIMIT  
vs. AVERAGE PLANAR EXPOSURE**



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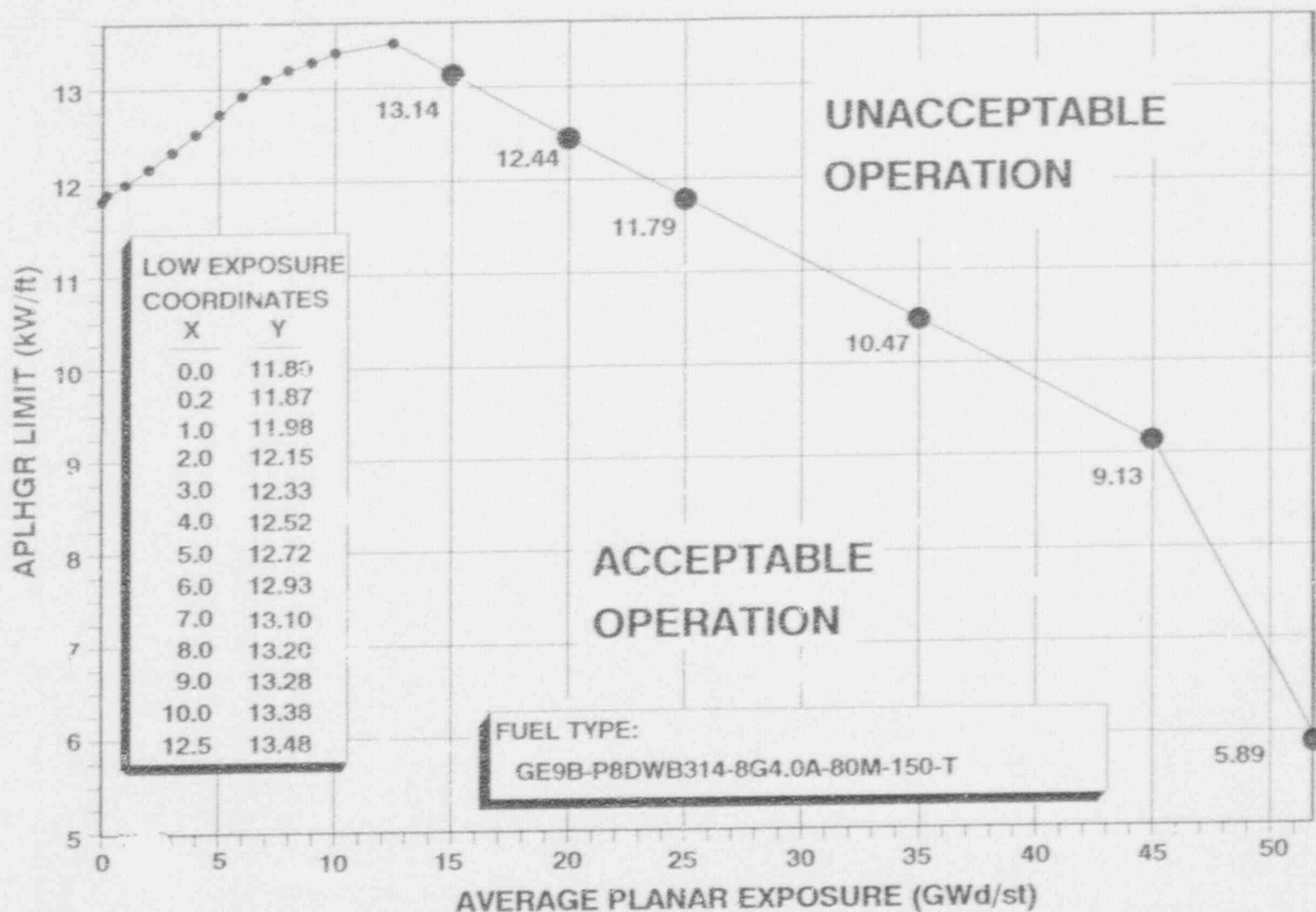
NOTE:  
APLHGR LIMIT FOR MOST LIMITING  
LATTICE AS FUNCTION OF AVERAGE  
PLANAR EXPOSURE

**FIGURE 3-7 AVERAGE PLANAR LINEAR  
HEAT GENERATION RATE LIMIT  
vs. AVERAGE PLANAR EXPOSURE**

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**FIGURE 3-8 AVERAGE PLANAR LINEAR  
HEAT GENERATION RATE LIMIT  
vs. AVERAGE PLANAR EXPOSURE**

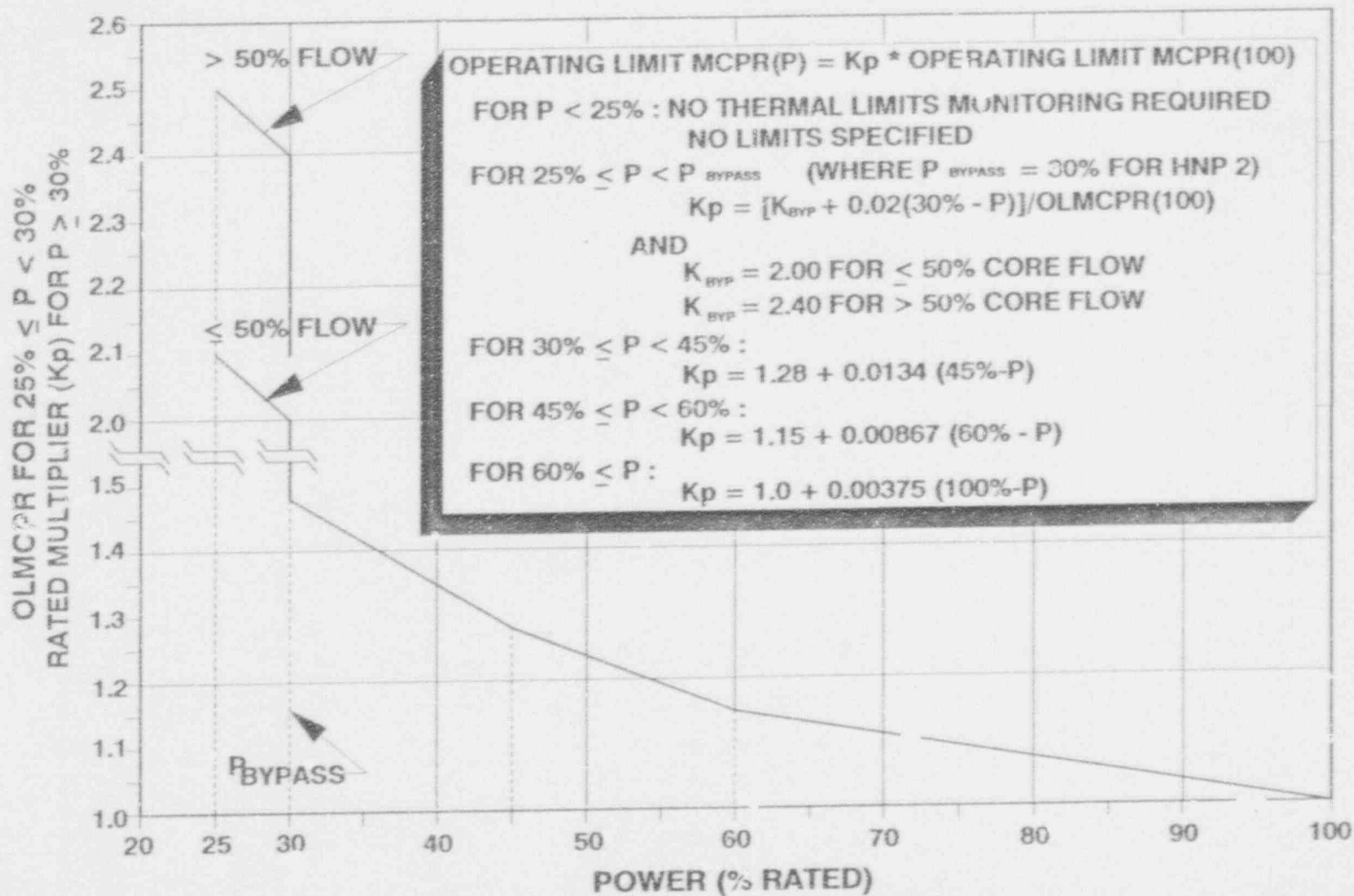


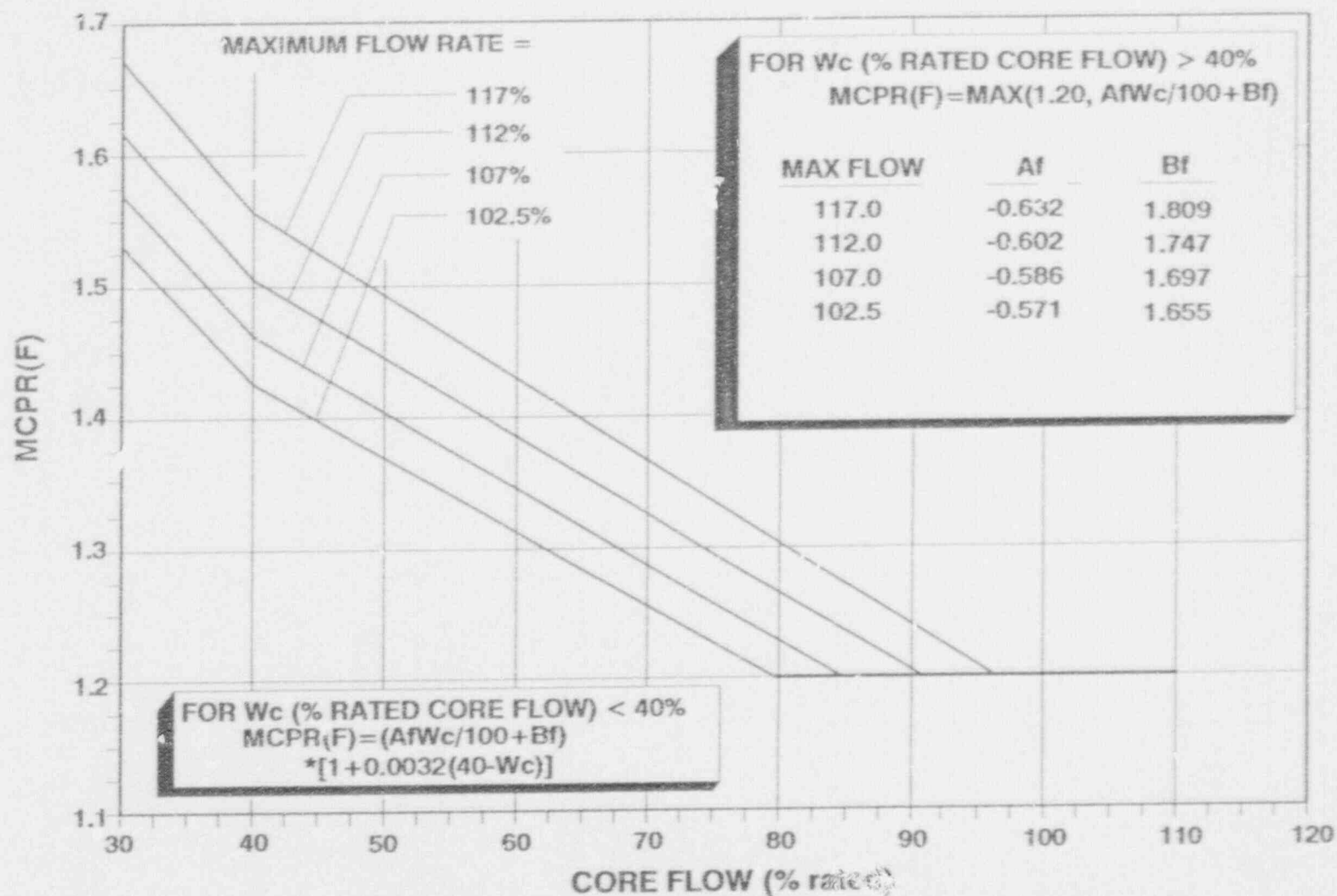
FIGURE 4-1  
POWER-DEPENDENT MCPR MULTIPLIER ( $K_p$ )



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FIGURE 4-2  
FLOW-DEPENDENT MCPR LIMITS, MCPR(F)

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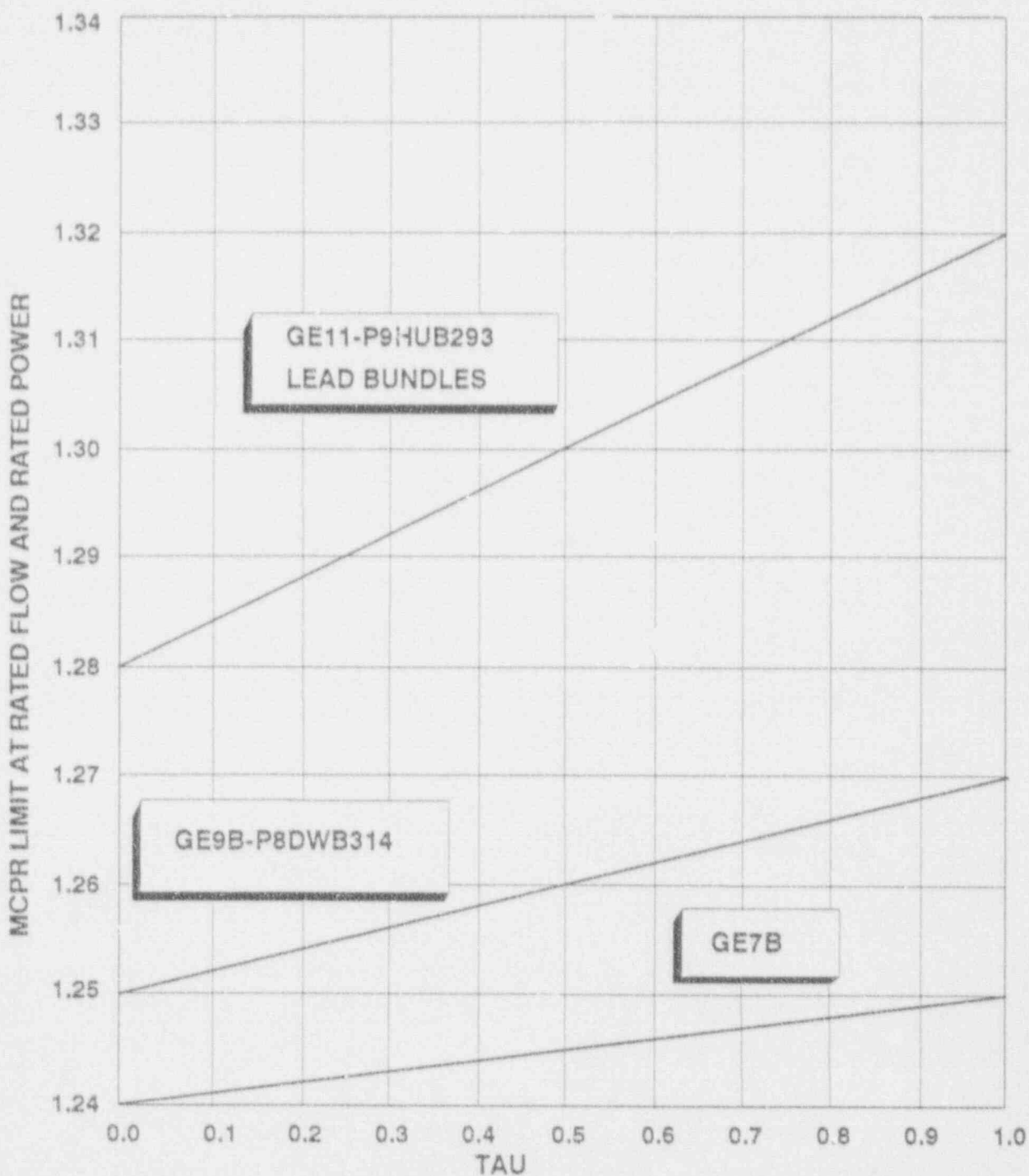


FIGURE 4-3  
MCPR LIMIT AS FUNCTION OF AVERAGE SCRAM TIME