

RIVER BEND STATION, CYCLE 6

CORE OPERATING LIMITS REPORT (COLR) RECEIVED

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## INTRODUCTION AND SUMMARY

This report provides the values of the AVERAGE PLANAR LINEAR HEAT GENERATION RATE (APLHGR) limits, the core flow dependent MINIMUM CRITICAL POWER RATIO (MCPR) limits,  $MCPR_f$ , the thermal power dependent MCPR limits  $MCPR_p$ , the LINEAR HEAT GENERATION RATE (LHGR) limits, and the REACTOR PROTECTION SYSTEM (RPS) response time for APRM thermal time constant for River Bend Station, Cycle 6 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.

### TECHNICAL SPECIFICATION 3.2.1

#### POWER DISTRIBUTION LIMITS

##### AVERAGE PLANAR LINEAR HEAT GENERATION RATE

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, 5, 6, 7 and 8. These values were determined with the SAFE/REFLOOD LOCA methodology described in GESTAR-II (Reference 1). Core location by fuel type is provided in Figure 11, which is a modification of the reference core loading pattern in Reference 3 to reflect the as loaded core configuration described in Reference 5. These figures are used if alternate calculations are required. The limits of these figures shall be reduced to a value of 0.84 times the two recirculation loop operation limit when in single loop operation (Reference 4).

### TECHNICAL SPECIFICATION 3.2.3

#### POWER DISTRIBUTION LIMITS

#### MINIMUM CRITICAL POWER RATIO

The MCPR limits for use in Technical Specification 3.2.3 for  $MCPR_f$  and  $MCPR_p$  are shown in Figures 9 and 10. These values were determined with the GEMINI methodology and GEXL-PLUS critical power ratio correlation described in GESTAR-II (Reference 1) and are consistent with a Safety Limit MCPR of 1.07.

#### TECHNICAL SPECIFICATION 3.2.4

##### POWER DISTRIBUTION LIMITS

##### LINEAR HEAT GENERATION RATE

The LHGR limits for use in Technical Specification 3.2.4 are 14.4 kw/ft for GE8x8EB fuel and 13.4 kw/ft for all other fuel types. The GE8x8EB fuel consists of fuel types GE8B-P8SQB322-8GZ-120M-4WR-150-T, GE8B-P8SQB322-9GZ-120M-4WR-150-T, GE8B-P8SQB333-10GZ-120M-4WR-150-T, GE8B-P8SQB331-11GZ-120M-4WR-150-T, GE8B-P8SQB334-10GZ-120M-4WR-150-T, GE8B-P8SQB334-10GZ2-120M-4WR-150-T and GE8B-P8SQB334-11GZ-120M-4WR-150-T. Core location by fuel type is provided in Figure 11.

The higher limit for GE8X8EB fuel is proprietary to GE and does not appear in Reference 1. The NRC SER on the GE8B design (Reference 2) recognizes the change to the LHGR limit, and the proprietary value is found in References 18 and 19 of Reference 2.

TECHNICAL SPECIFICATION TABLES 3.3.1-2 and 4.3.1.1-1

The simulated thermal power time constant for use in  
Technical Specification Table 3.3.1-2, Footnote \*\* is:

$6 \pm 0.6$  seconds.

The maximum simulated thermal power time constant for use in  
Technical Specification surveillance Table 4.3.1.1-1 is:

6.6 seconds

REFERENCES

- 1) NEDE-24011-P-A, "General Electric Standard Application for Reactor Fuel," (latest approved version).
- 2) Letter, C.O. Thomas to J.S. Charnley, "Acceptance for Referencing of Licensing Topical Report," NEDE-24011-P-A-6, Amendment 10, General Electric Standard Application for Reload Fuel, May 28, 1985.
- 3) Document 23A7244, Revision 0, "Supplemental Reload Licensing Report for River Bend Station Reload 5, Cycle 6," May 1994.
- 4) "Single-Loop Operation Analysis for River Bend Station, Unit 1," NEDO-31441, May 1987.
- 5) Letter, Scott Young to Gary Scronce, "RF5 Core Alterations, LPRM Replacements, and Control Blade Replacements," RXE 94-058, Rev. 1, May 27, 1994.



FIGURE 1. MAXIMUM AVERAGE PLANAR LINEAR HEAT  
GENERATION RATE (MAPLHGR) VERSUS AVERAGE PLANAR  
EXPOSURE BP8SRB299

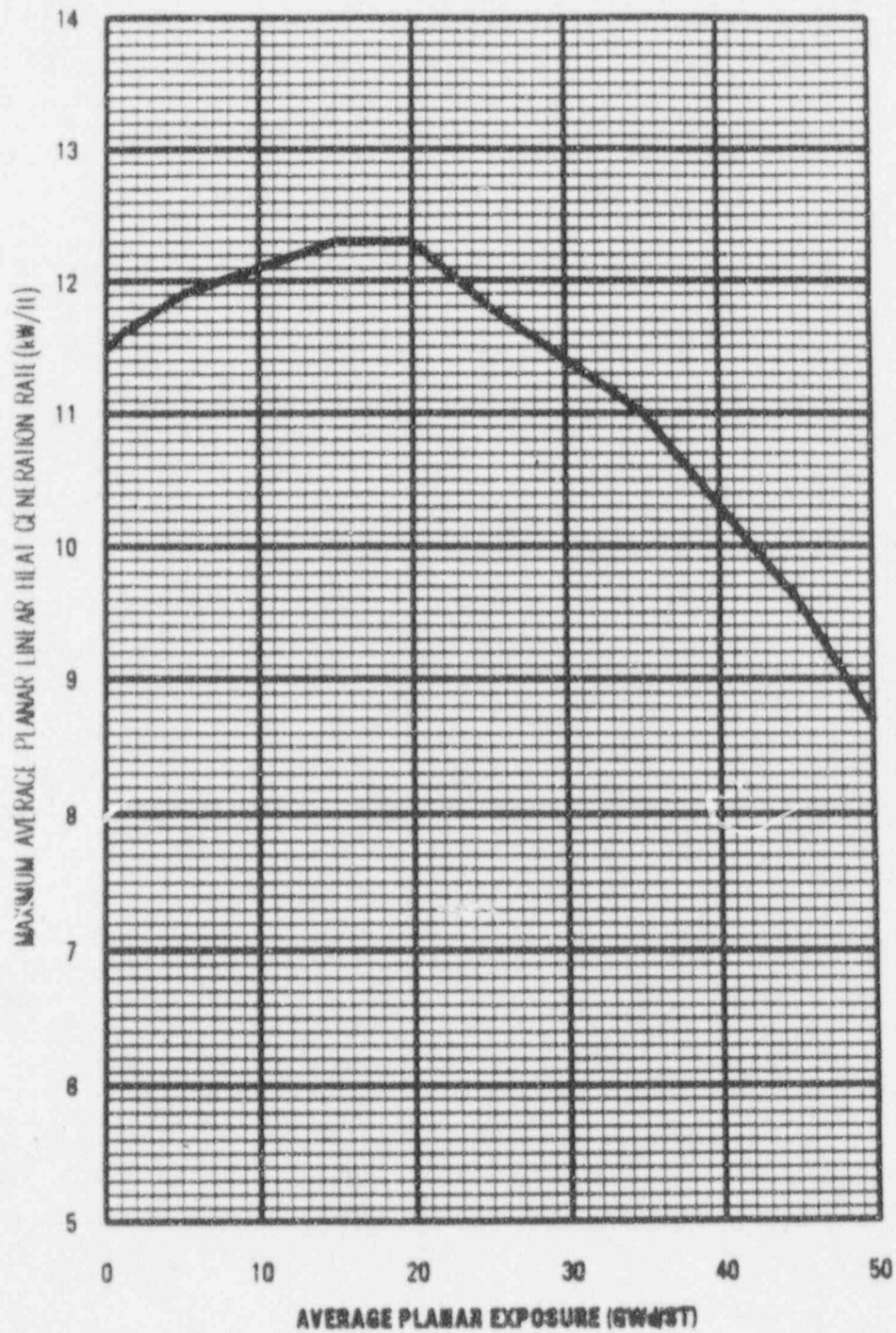


FIGURE 2. MAXIMUM AVERAGE PLANAR LINEAR HEAT  
GENERATION RATE (MAPLHGR) VERSUS AVERAGE PLANAR  
EXPOSURE GE88-P8SQB322-8GZ-120-M-4WR-150-T

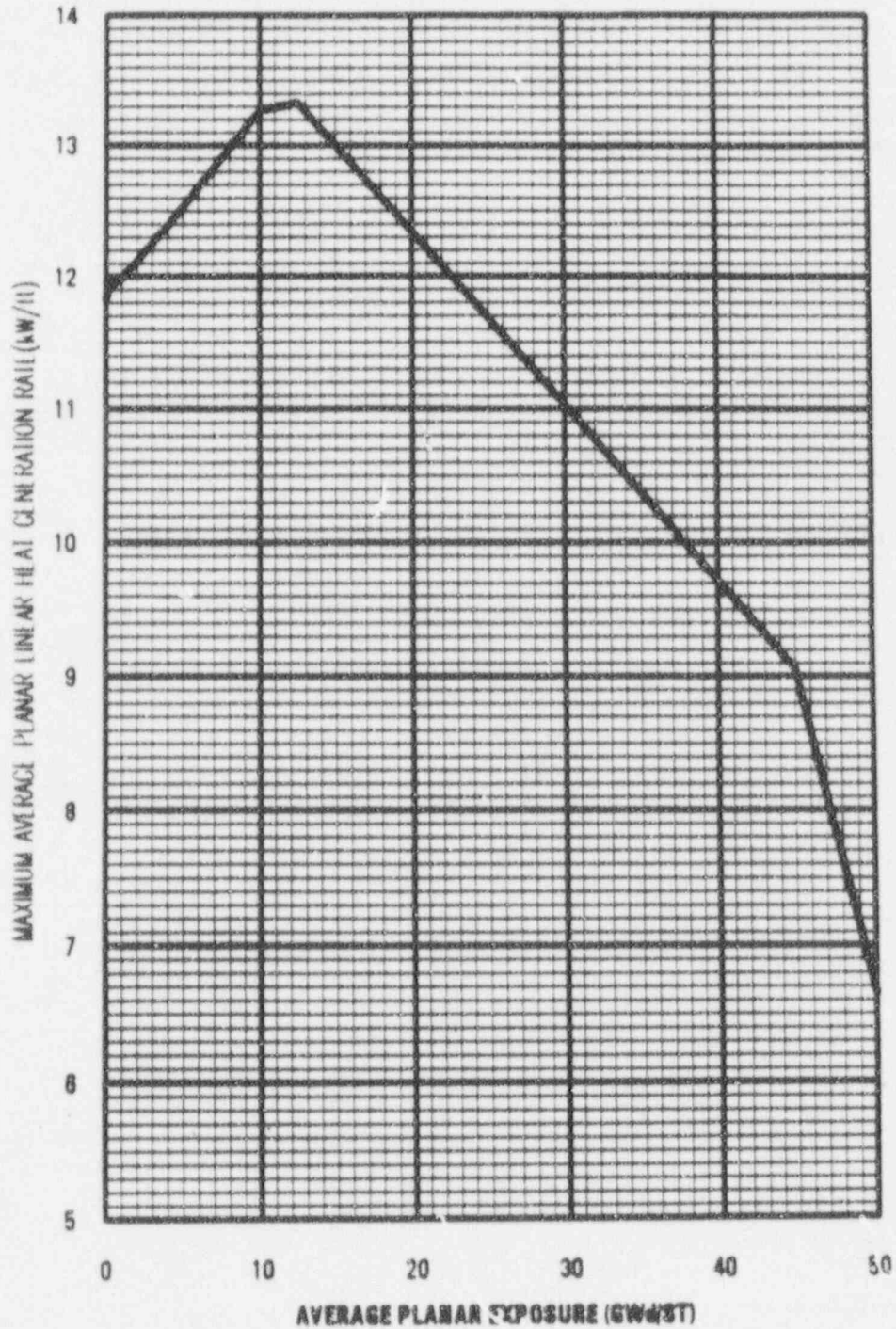


FIGURE 3. MAXIMUM AVERAGE PLANAR LINEAR HEAT  
GENERATION RATE (MAPLHGH) VERSUS AVERAGE PLANAR  
EXPOSURE GE84-P8SQB322-8GZ-120-M-4WR-150-T

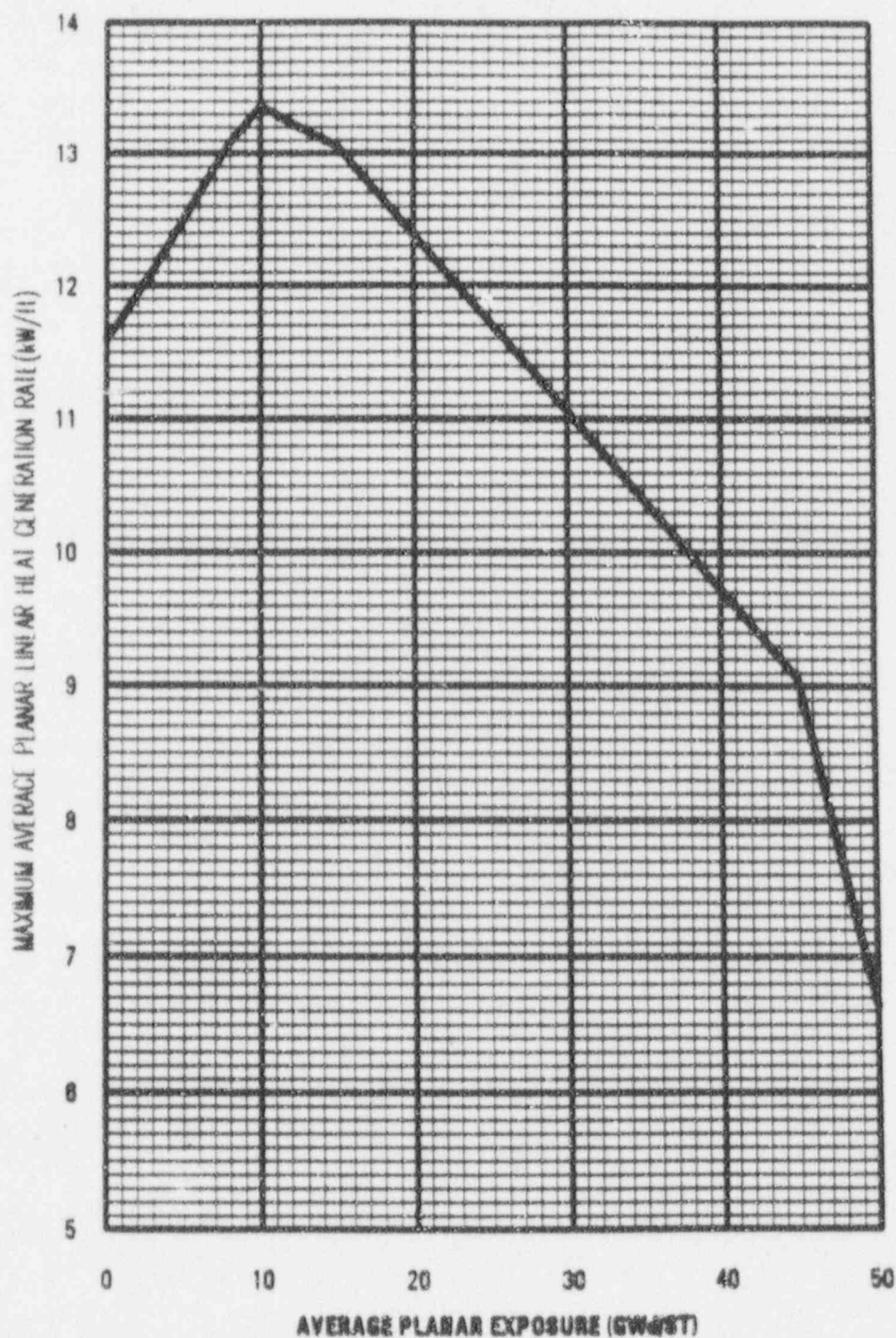


FIGURE 4. MAXIMUM AVERAGE PLANAR LINEAR HEAT  
GENERATION RATE (MAPLHGR) VERSUS AVERAGE PLANAR  
EXPOSURE GE8B-P8SQB333-10GZ-120-M-4WR-150-T

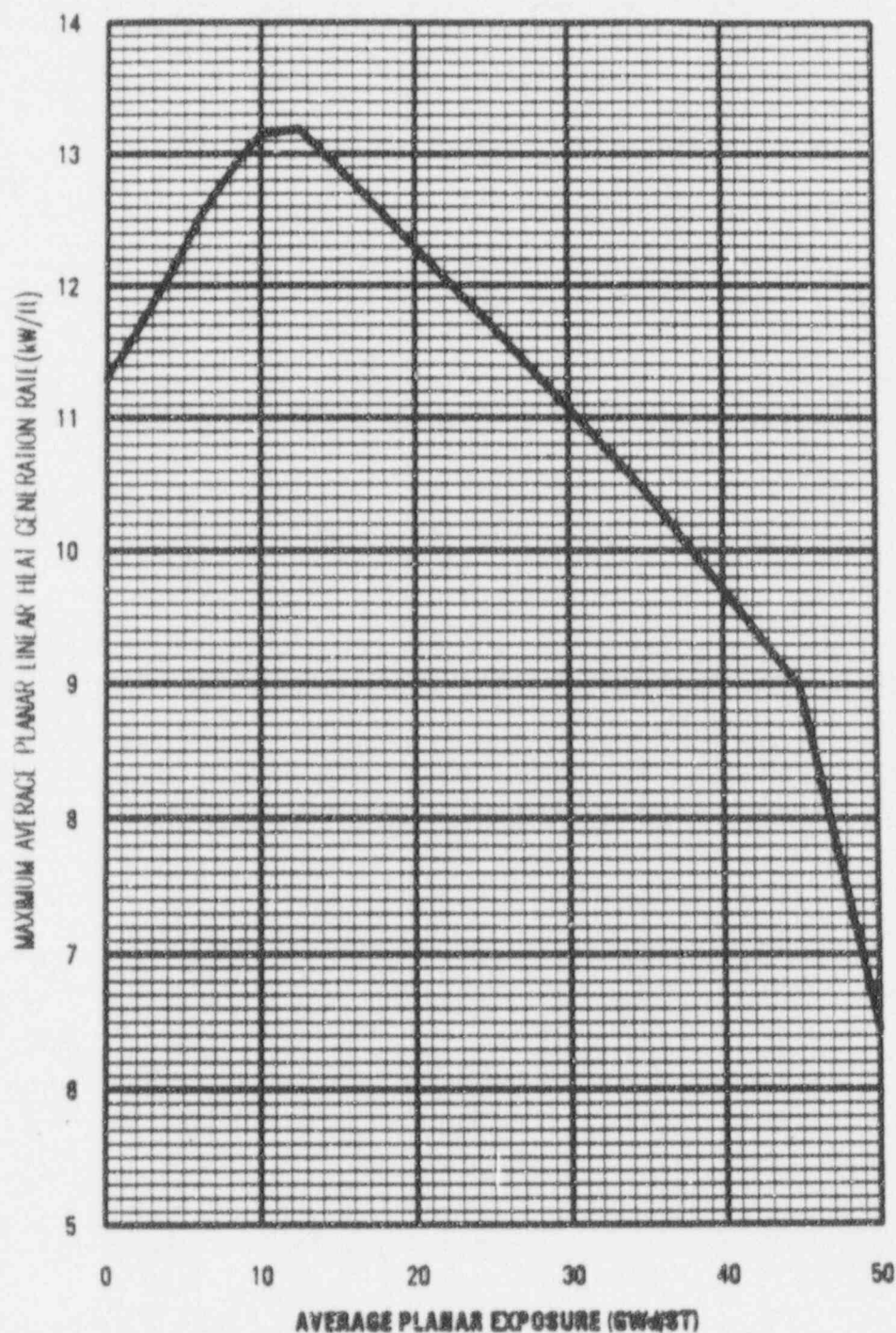




FIGURE 5. MAXIMUM AVERAGE PLANAR LINEAR HEAT  
GENERATION RATE (MAPLHGR) VERSUS AVERAGE PLANAR  
EXPOSURE GE8B-P8SQB331-11GZ-120-M-4WR-150-T

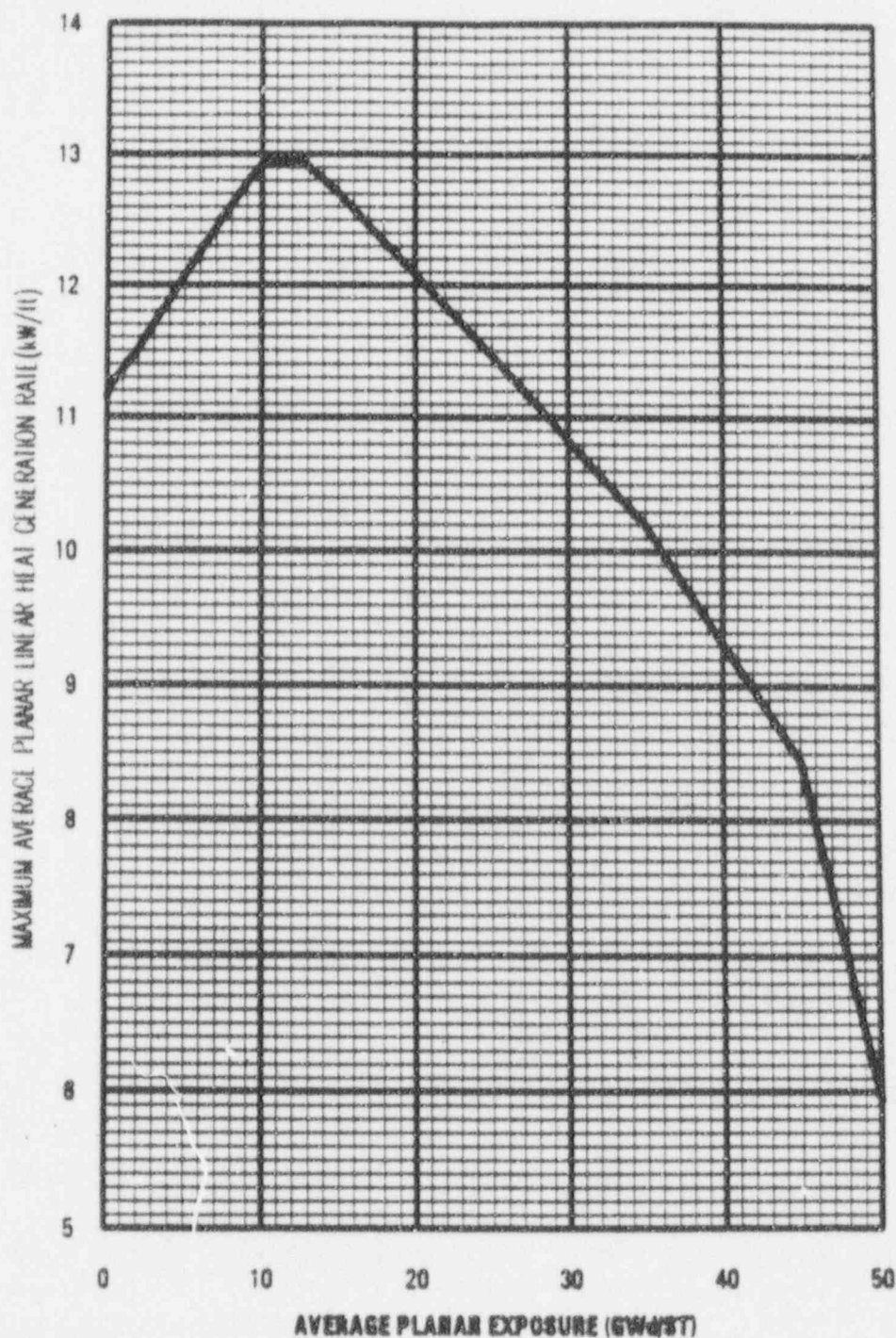


FIGURE 9. MCPR<sub>f</sub>

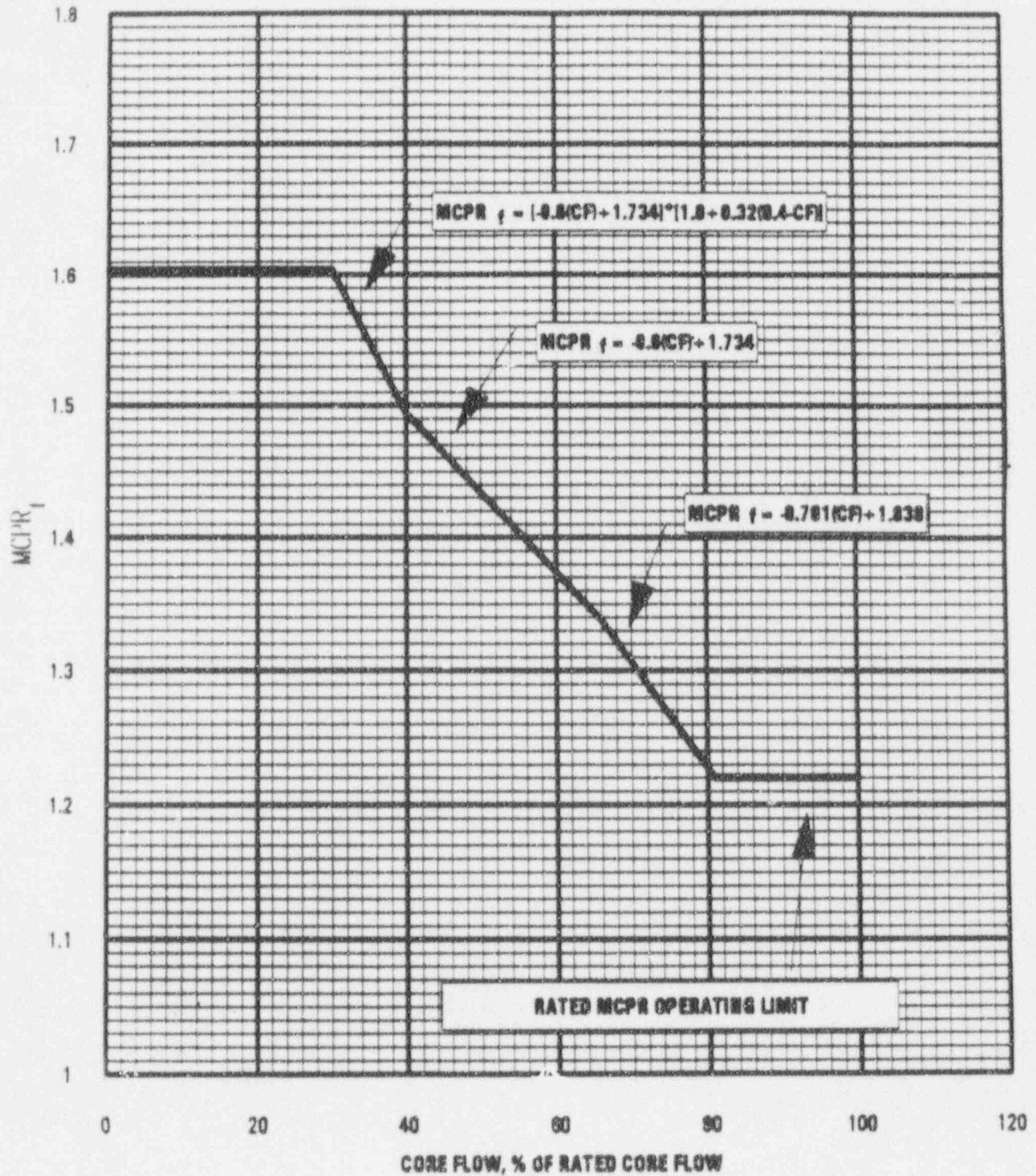


FIGURE 7. MAXIMUM AVERAGE PLANAR LINEAR HEAT  
GENERATION RATE (MAPLHGR) VERSUS AVERAGE PLANAR  
EXPOSURE GE8B-P8SQB334-10GZ2-120-M-4WR-150-T

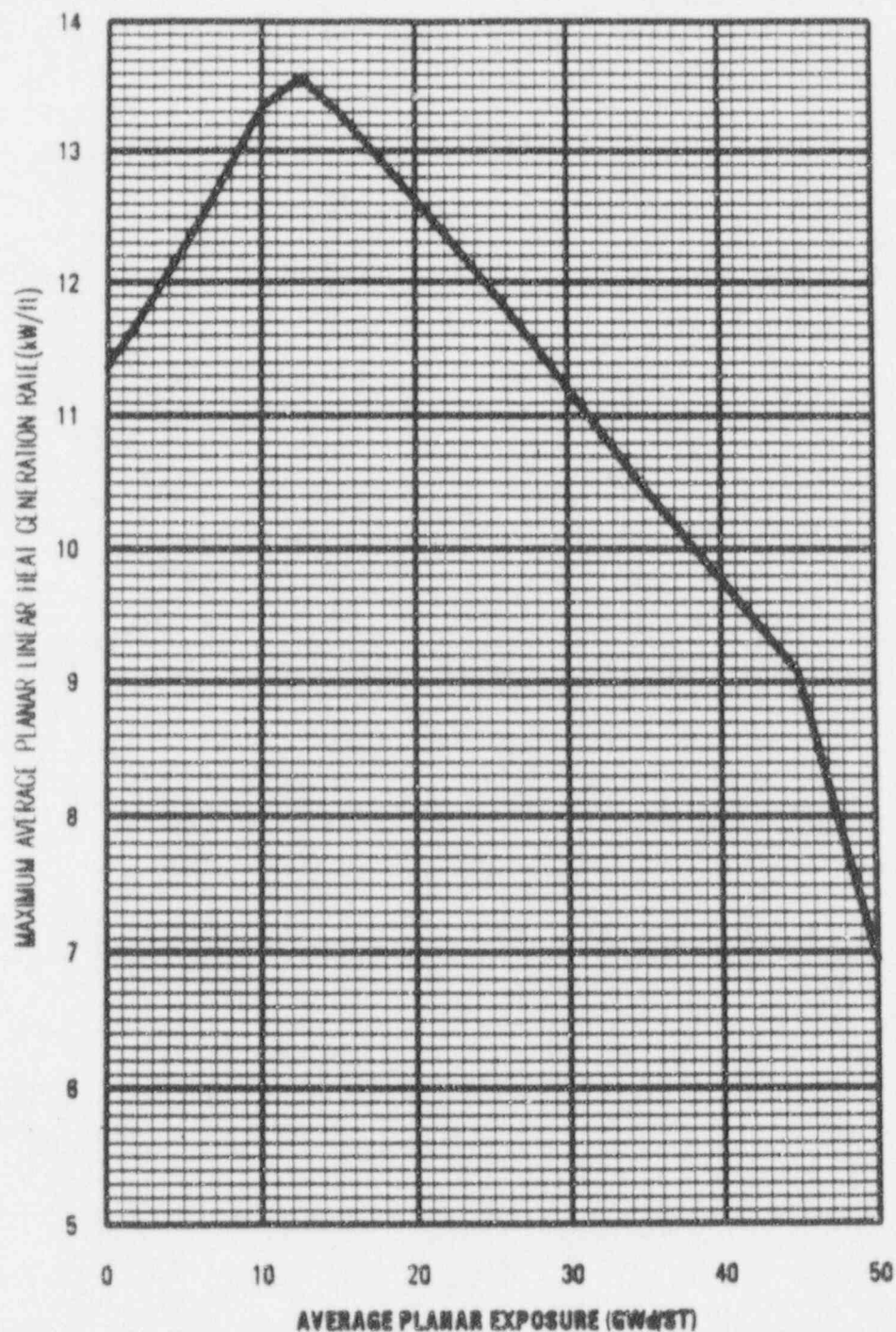




FIGURE 8. MAXIMUM AVERAGE PLANAR LINEAR HEAT  
GENERATION RATE (MAPLHGR) VERSUS AVERAGE PLANAR  
EXPOSURE GE8B-P8SQB334-10GZ-120-M-4WR-150-T

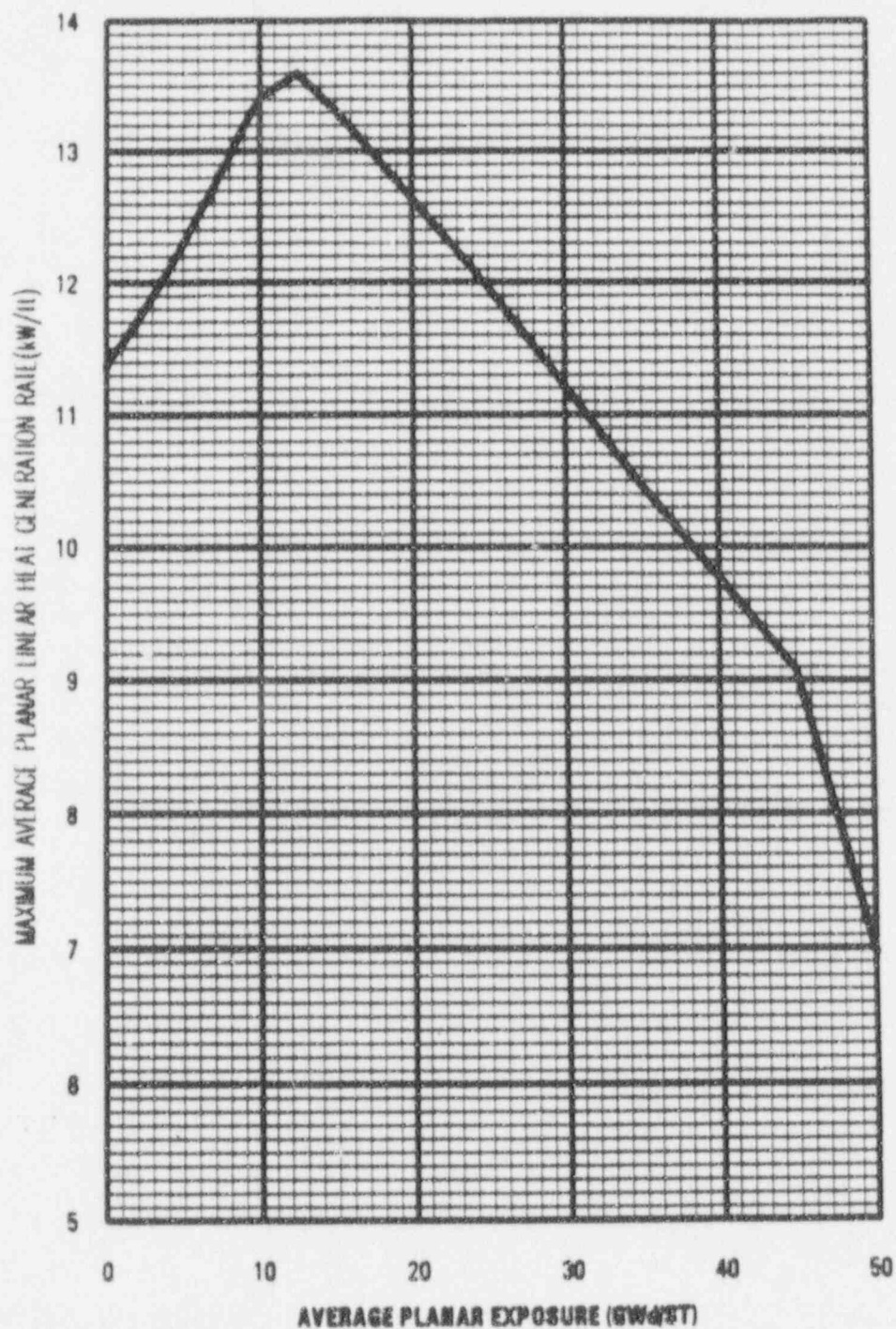




FIGURE 8. MAXIMUM AVERAGE PLANAR LINEAR HEAT  
GENERATION RATE (MAPLHGR) VERSUS AVERAGE PLANAR  
EXPOSURE GE88-P8SQ8334-11GZ-120-M-4WR-150-T

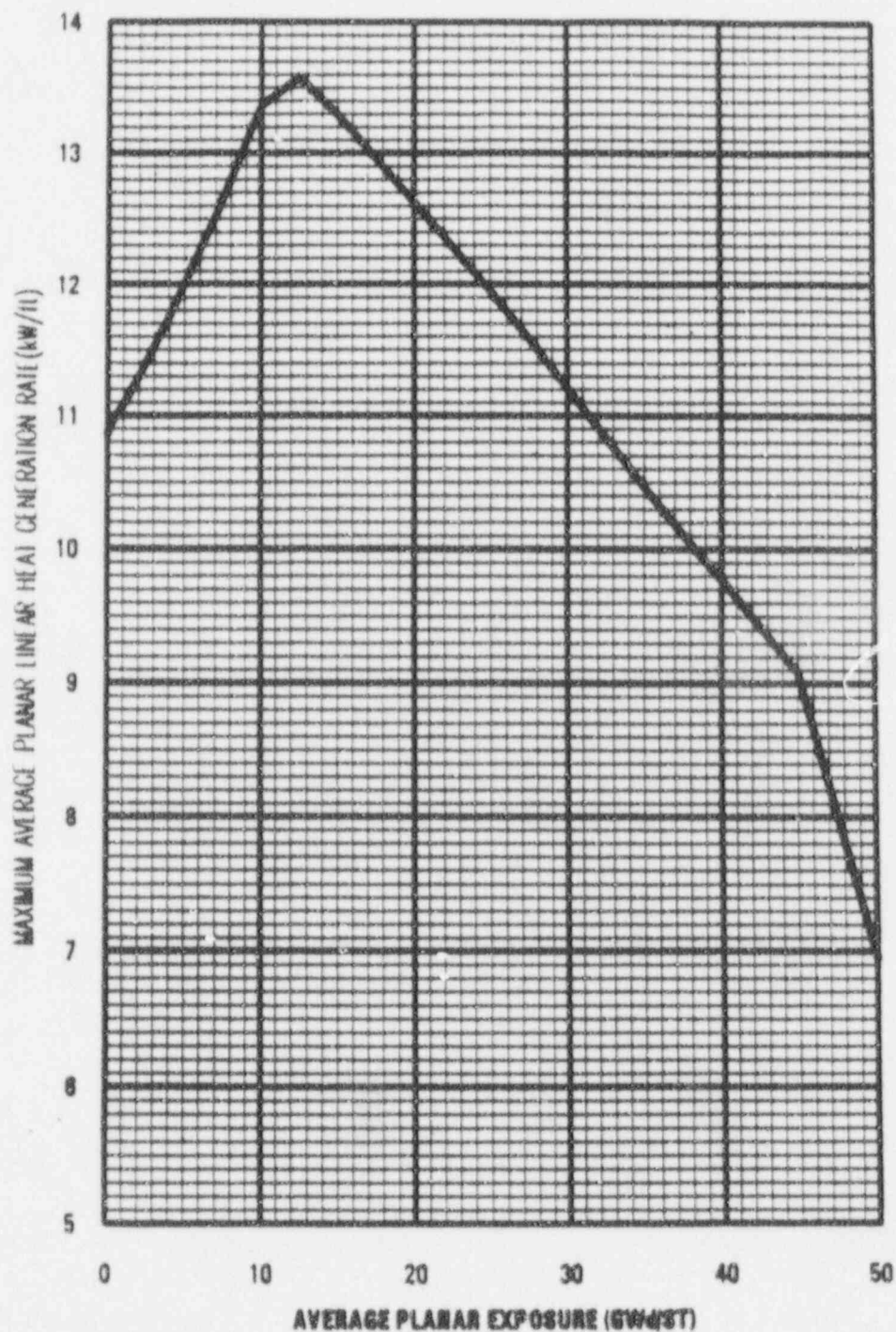
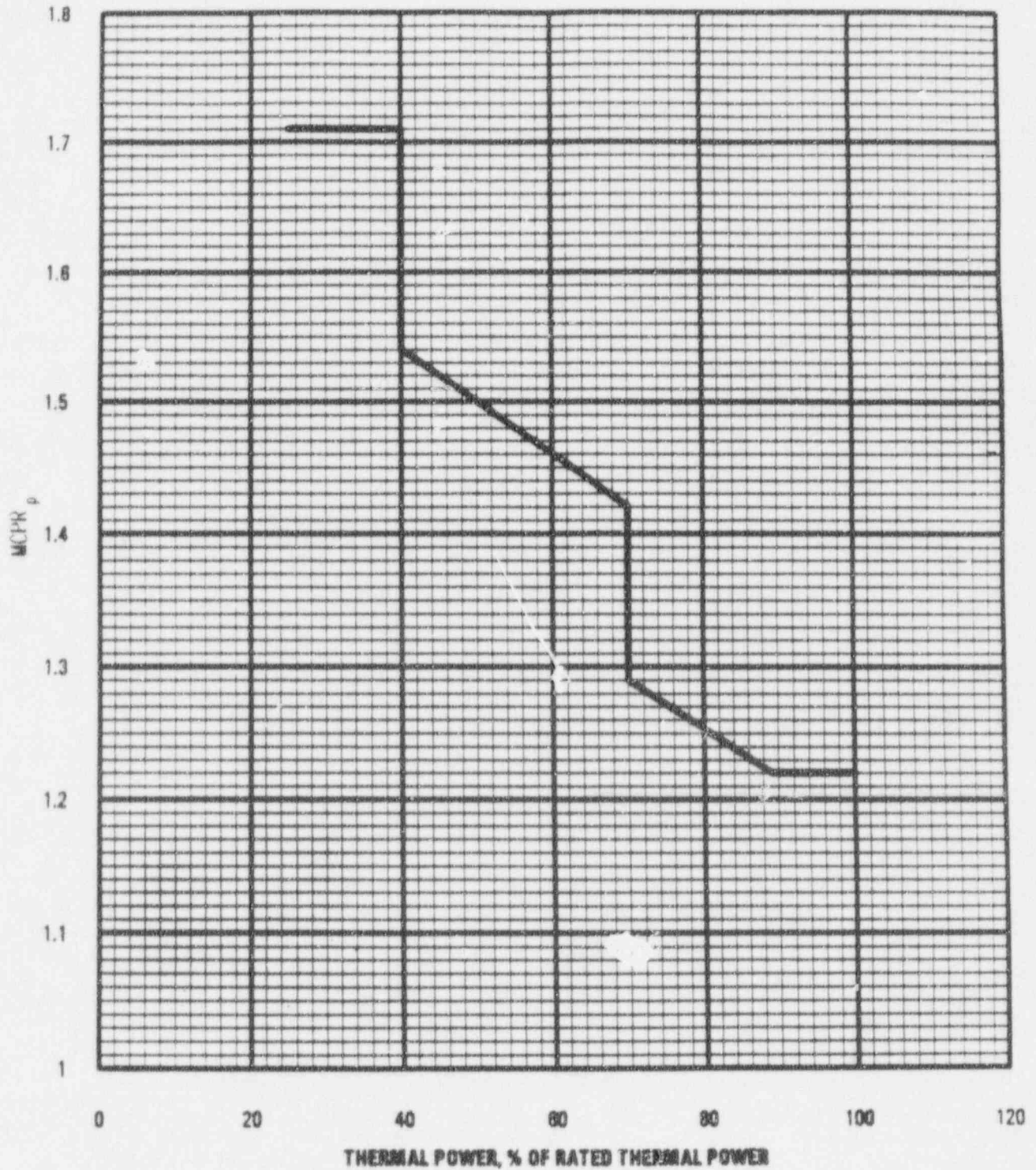
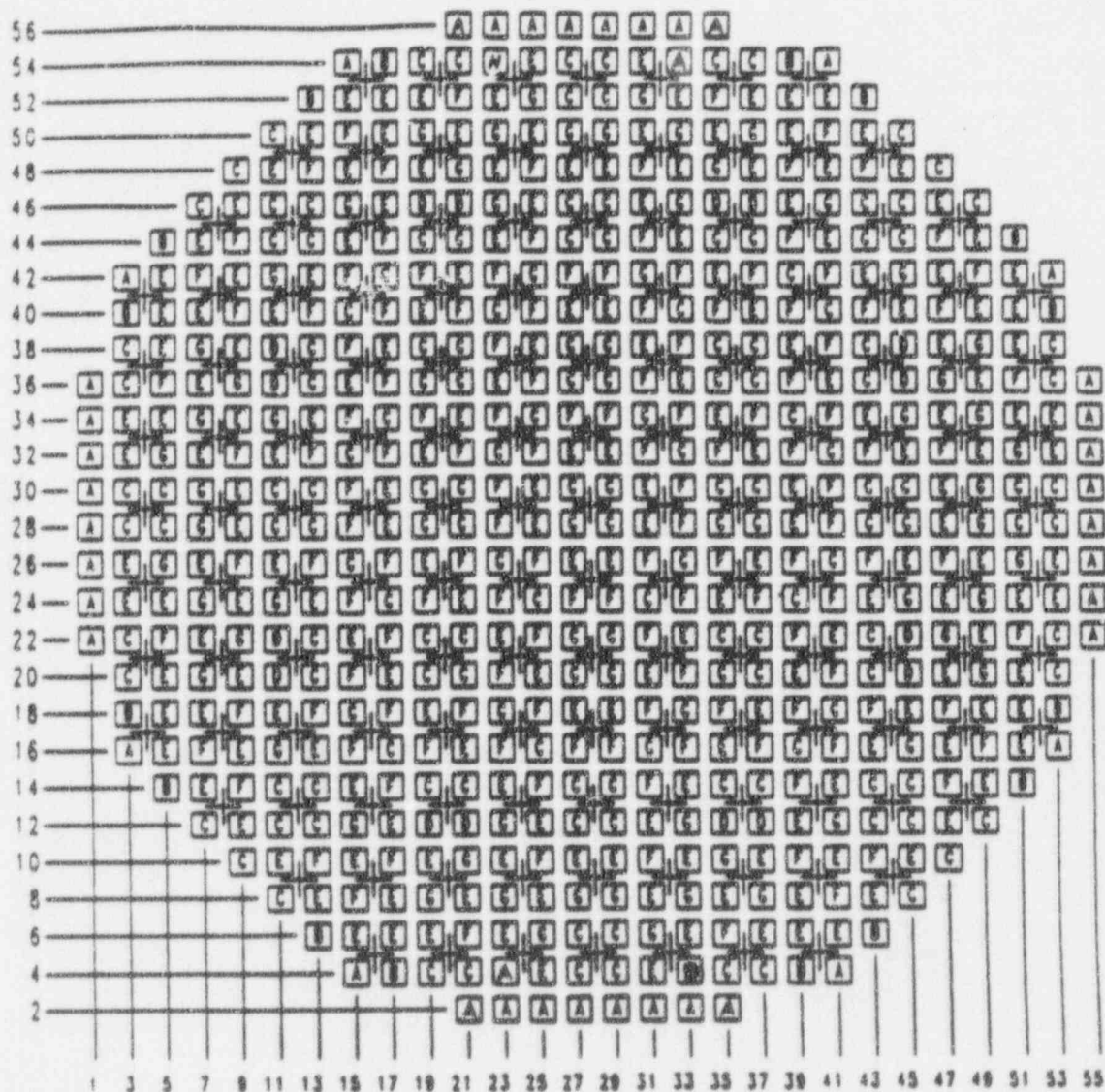


FIGURE 10. MCPR,





Fuel Type	
A=GE8B-P8SQB322-8GZ-120M-4WR-150-T	E=GE8B-P8SQB334-10GZ-120M-4WR-150-T
B=GE8B-P8SQB322-9GZ-120M-4WR-150-T	F=GE8B-P8SQB334-10GZ-120M-4WR-150-T
C=GE8B-P8SQB333-10GZ-120M-4WR-150-T	G=GE8B-P8SQB334-11GZ-120M-4WR-150-T
D=GE8B-P8SQB331-11GZ-120M-4WR-150-T	H=BP8SRB299

Figure 11 Final Core Loading Pattern