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June 19, 2001
NMP1L 1600

U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555

RE: Nine Mile Point Unit 1
Docket No. 50-220
DPR-63

Subject: *Cycle 15 Core Operating Limits Report, Rev. 1*

Gentlemen:

Attached is a copy of the Cycle 15 Core Operating Limits Report (COLR), Rev. 1 for Nine Mile Point Unit 1 (NMP1). Revision 0 to the Cycle 15 COLR was not implemented and therefore, not submitted to the NRC. The COLR is being submitted pursuant to NMP1 Technical Specification 6.9.1.f.4.

Sincerely,

A handwritten signature in black ink that reads "Richard B. Abbott".

Richard B. Abbott
Vice President Nuclear Engineering

RBA/JJD/cld
Attachment

cc: Mr. H. J. Miller, NRC Regional Administrator, Region I
Mr. R. P. Correia, Acting Section Chief PD-I, Section 1, NRR
Mr. G. K. Hunegs, NRC Senior Resident Inspector
Mr. P. S. Tam, Senior Project Manager, NRR
Records Management

A001

ATTACHMENT

TO

NMP1L 1600

ORIGINAL

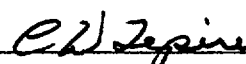


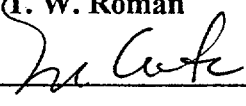
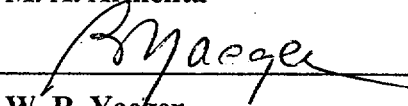
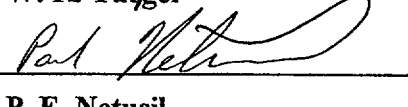
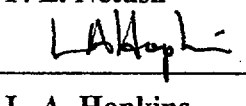
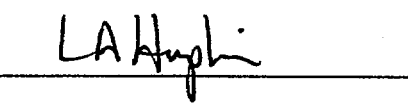
NINE MILE POINT UNIT 1

CORE OPERATING LIMITS REPORT

Document No.: COLR1

Revision 1, Cycle 15

CONTROLLED

| | <u>Name</u> | <u>Title</u> | <u>Date</u> |
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| Approved by: | <u></u> W. R. Yaeger | <u>Manager, Engineering Services</u> | <u>4-5-01</u> |
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| Approved by: | <u></u> L. A. Hopkins | <u>Plant Manager, Unit 1</u> | <u>4/24/01</u> |
| SORC Chairman Approval | <u></u> | | <u>4/24/01</u> |

This Controlled Document provides cycle specific core operating limits for use in conjunction with the Nine Mile Point Unit 1 Technical Specifications. Document pages may only be changed through a reissue of the entire document. This COLR must be signed by the Plant Manager to be valid.

CORE OPERATING LIMITS REPORT

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CORE OPERATING LIMITS REPORT**1.0 AVERAGE PLANAR LINEAR HEAT GENERATION RATE (APLHGR)****1.1 Limits for Technical Specification 3.1.7.a(*)**

During power operation, the APLHGR for each type of fuel as function of average planar exposure shall not exceed the limiting values shown on Figures 1 through 24.

1.2 Limits for Technical Specification 3.1.7.e(*)

During partial loop operation with four recirculation loops in operation, the APLHGR as a function of average planar exposure shall not exceed 98 percent of the limiting values shown in Figures 1 through 24.

During partial loop operation with three recirculation loops in operation, the APLHGR as a function of average planar exposure shall not exceed 98 percent of the limiting values shown in Figures 1 through 24.

- (*) When hand calculations are required, the APLHGR for the respective fuel type as a function of average planar exposure, shall not exceed the limits shown in Tables 1 and 2 during five recirculation loop operation or 98 percent of the limits shown in Tables 1 and 2 during four or three loop operation..

2.0 MINIMUM CRITICAL POWER RATIO (MCPR)

2.1 Limits for Technical Specification 3.1.7.c

During power operation, the operating MCPR at rated power and flow shall be greater than or equal to the Operating Limit MCPR of 1.45⁽¹⁾.

For core flows other than rated, the MCPR limit shall be the Operating Limit MCPR times K_f where K_f is as shown in Figure 25.

2.1.1 If the feedwater pump configuration as defined by Nuclear Engineering Report No. NER-1M-022 is such that a feedwater controller failure could result in maximum feedwater flow greater than that for two feedwater pumps (i.e., the shaft-driven pump plus one motor-driven pump), then the Operating Limit MCPR shall be 1.59.

2.1.2 Conservative limits for operation between 45% and 90% RTP⁽³⁾ are required for operations without a backup pressure regulator. The MCPR based limit for operation without a backup pressure regulator is as shown in Figure 26⁽²⁾⁽⁴⁾.

2.2 Limits for Technical Specification 3.1.7.e

During 3 loop operation, the Operating Limit MCPR shall be increased by 0.01.

NOTES:

- (1) Based on a 1.09 MCPR Safety Limit (SLMCPR).
- (2) Based on an Operating Limit MCPR of 1.45.
- (3) Below 45% and above 90% RTP no additional limits are required for operation without a backup pressure regulator.
- (4) These limits do not require adjustment for 3 loop operation or for K_f .

3.0 LINEAR HEAT GENERATION RATE (LHGR)

3.1 Limits for Technical Specification 3.1.7.b

During power operation, the Linear Heat Generation Rate (LHGR) of any rod in any fuel assembly at any axial location shall not exceed 11.0 KW/FT.

Conservative limits for operation between 45% and 90% RTP⁽¹⁾ are required for operations without a backup pressure regulator. The LHGR based limit for operation without a backup pressure regulator is as shown in Figure 27.

NOTE:

⁽¹⁾ Below 45% and above 90% RTP no additional limits are required for operation without a backup pressure regulator.

4.0 POWER/FLOW RELATIONSHIP DURING OPERATION

4.1 Limits for Technical Specification 3.1.7.d and c

The power/flow relationship shall not exceed the limiting values shown in Figure 28.

5.0 SOURCE DOCUMENTS

The Core Operating Limits contained in this report were obtained from the following documents:

| <u>CORE OPERATING LIMITS</u> | <u>REFERENCE</u> |
|---|---|
| <u>APLHGR Limits (Section 1.0)</u> Figure 1 through 24, Tables 1 and 2 and corresponding three and four loop multipliers | GE 24A5157, Revision 1, June 1996, Supplemental Reload Licensing Report for Nine Mile Point Nuclear Power Station Unit 1, Reload 13 Cycle 12 |
| | GE J11-02962SRLR, Revision 0, January 1997, Supplemental Reload Licensing Report for Nine Mile Point Nuclear Station Unit 1 Reload 14 Cycle 13 |
| | GNF J11-03785ER, Revision 0, February 2001, Engineering Report for Nine Mile Point Nuclear Station Unit 1 Reload 16 |
| <u>MCPR Limits (Section 2)</u> | GNF J11-03785SRLR, Revision 0, February 2001, Supplemental Reload Licensing Report for Nine Mile Point Nuclear Station Unit 1 Reload 16 Cycle 15 |
| Figure 25 | GNF J11-03785ER, Revision 0, February 2001, Engineering Report for Nine Mile Point Nuclear Station Unit 1 Reload 16 |
| 0.01 Three Loop Adder | GNF J11-03785SRLR, Revision 0, February 2001, Supplemental Reload Licensing Report for Nine Mile Point Nuclear Station Unit 1 Reload 16 Cycle 15 |
| Pressure Regulator Out-of-Service Restriction | GE-NE-J11-03433-16-01-00, "Pressure Regulator Out of Service Calculations for Nine Mile Point Unit 1 Cycle 14", March 2001 |
| <u>LHGR Limits (Section 3)</u> | GNF J11-03785ER, Revision 0, February 2001, Engineering Report for Nine Mile Point Nuclear Station Unit 1 Reload 16 |
| Pressure Regulator Out-of-Service restriction | GE-NE-J11-03433-16-01-00, "Pressure Regulator Out of Service Calculations for Nine Mile Point Unit 1 Cycle 14", March 2001 |
| <u>P/F Relationship (Section 4)</u> Figure 28 | NMP1 Technical Specification Amendment 92, Figure 3.1.7.aa |

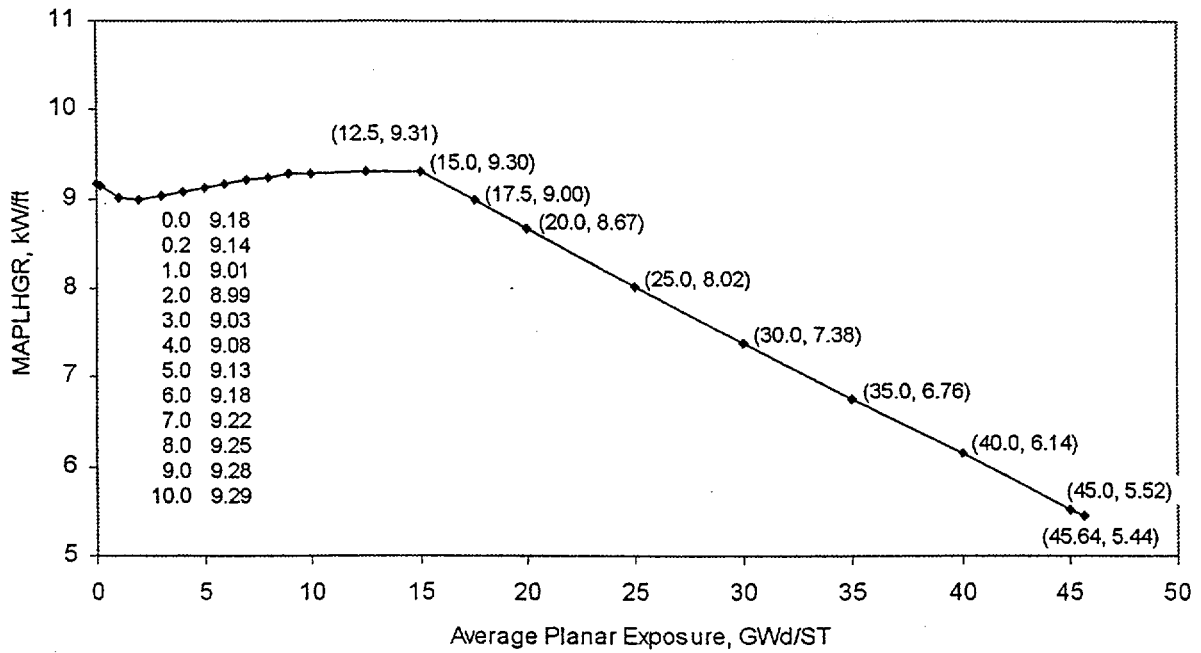


Figure 1: MAPLHGR Limits for Lattice 1522 of GE11-P9HUB340-10GZ-100M-145-T

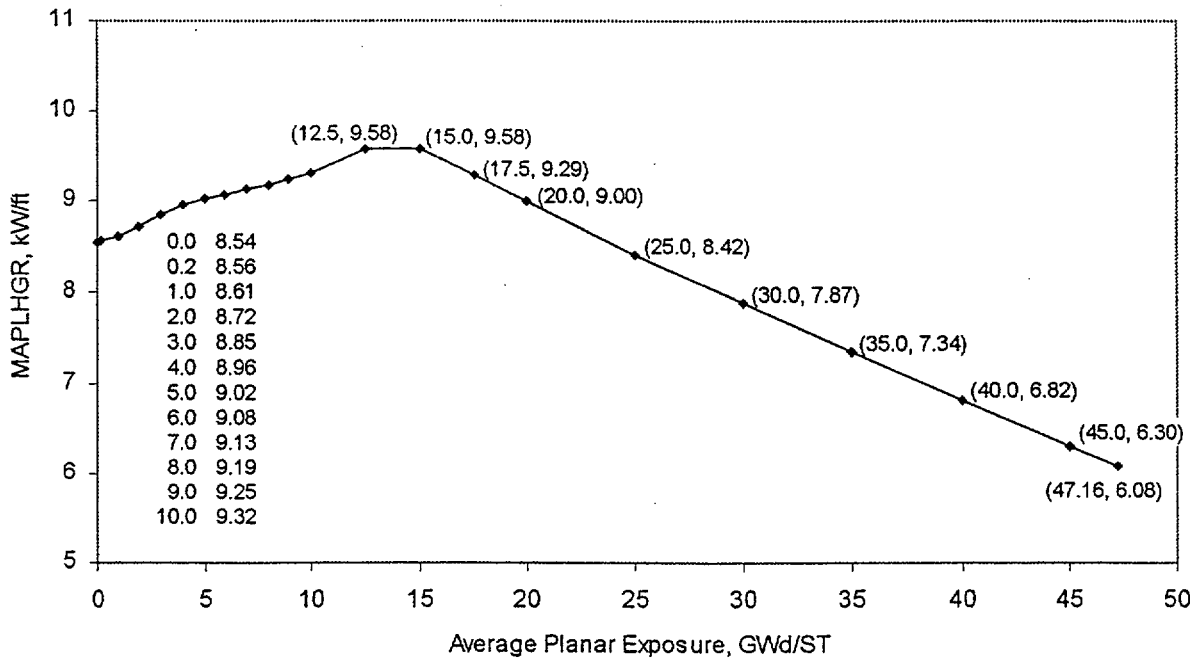


Figure 2: MAPLHGR Limits for Lattice 1937 of GE11-P9HUB340-10GZ-100M-145-T

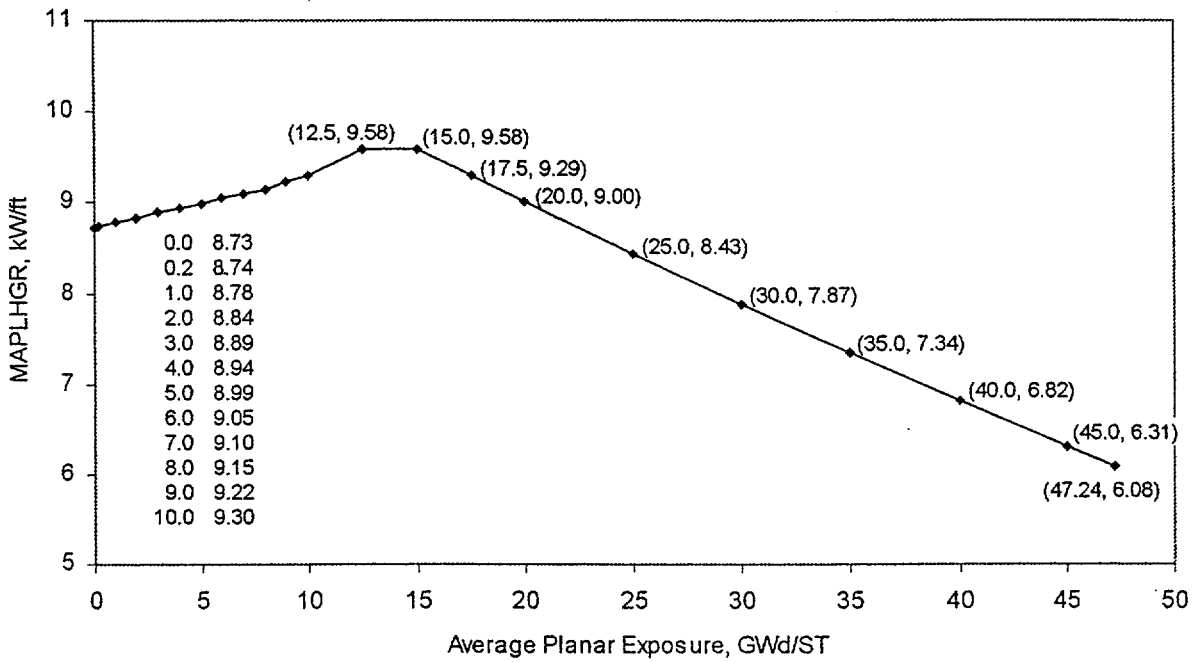


Figure 3: MAPLHGR Limits for Lattice 1938 of GE11-P9HUB340-10GZ-100M-145-T

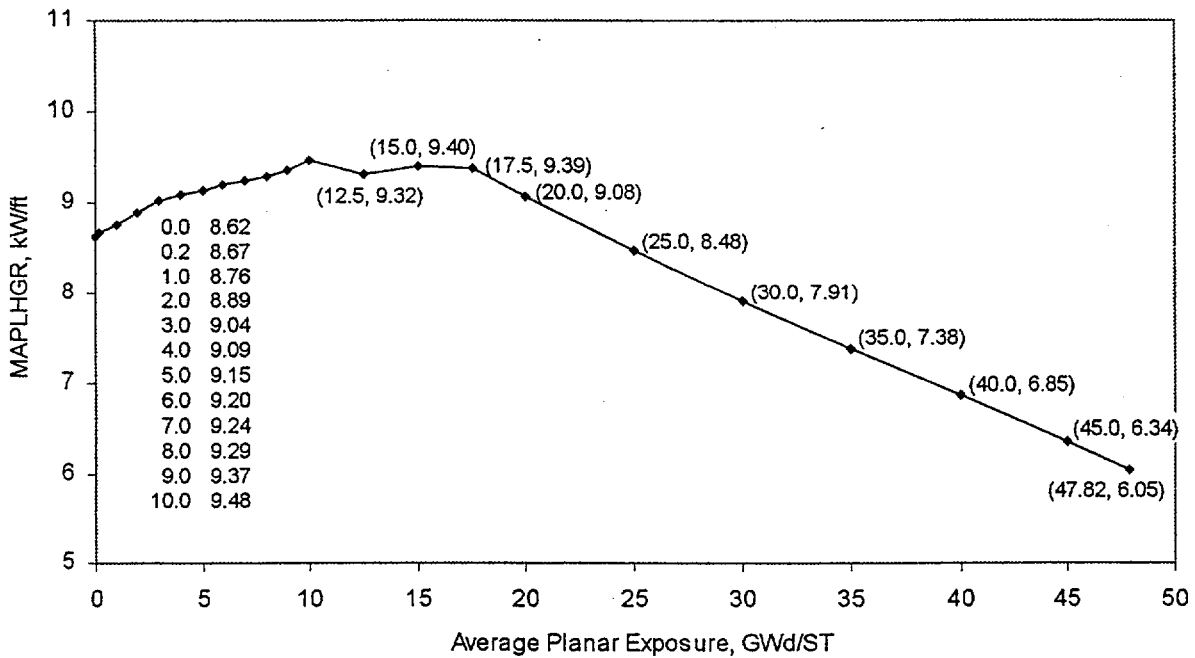


Figure 4: MAPLHGR Limits for Lattice 1939 of GE11-P9HUB340-10GZ-100M-145-T

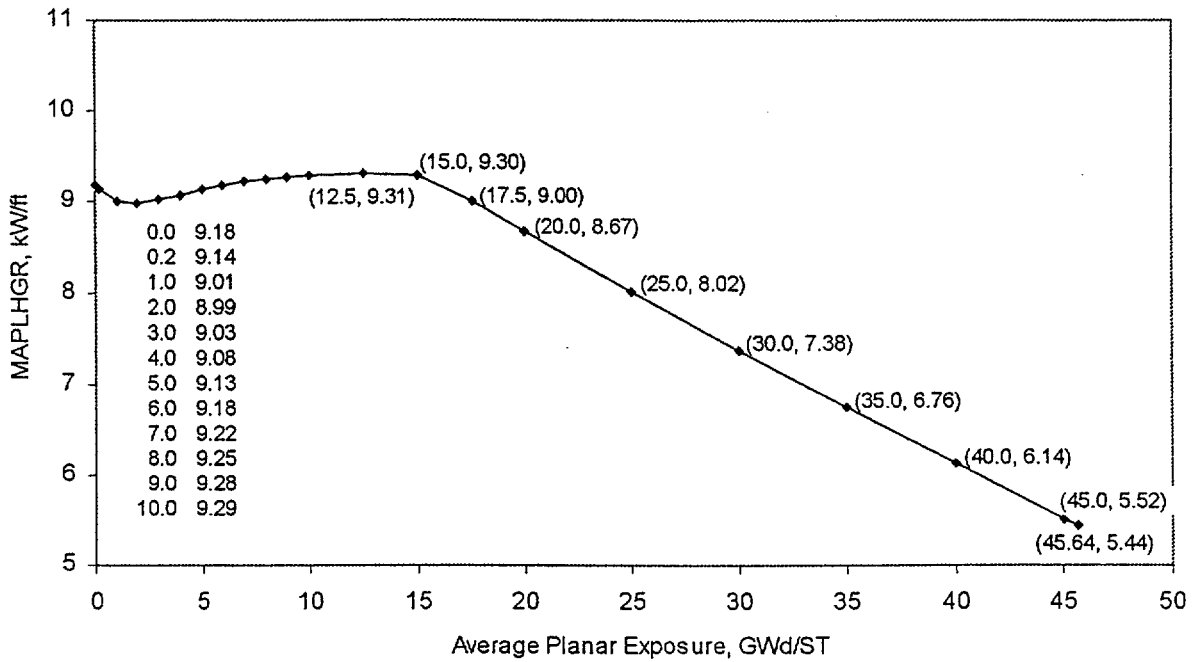


Figure 5: MAPLHGR Limits for Lattice 1523 of GE11-P9HUB340-10GZ-100M-145-T

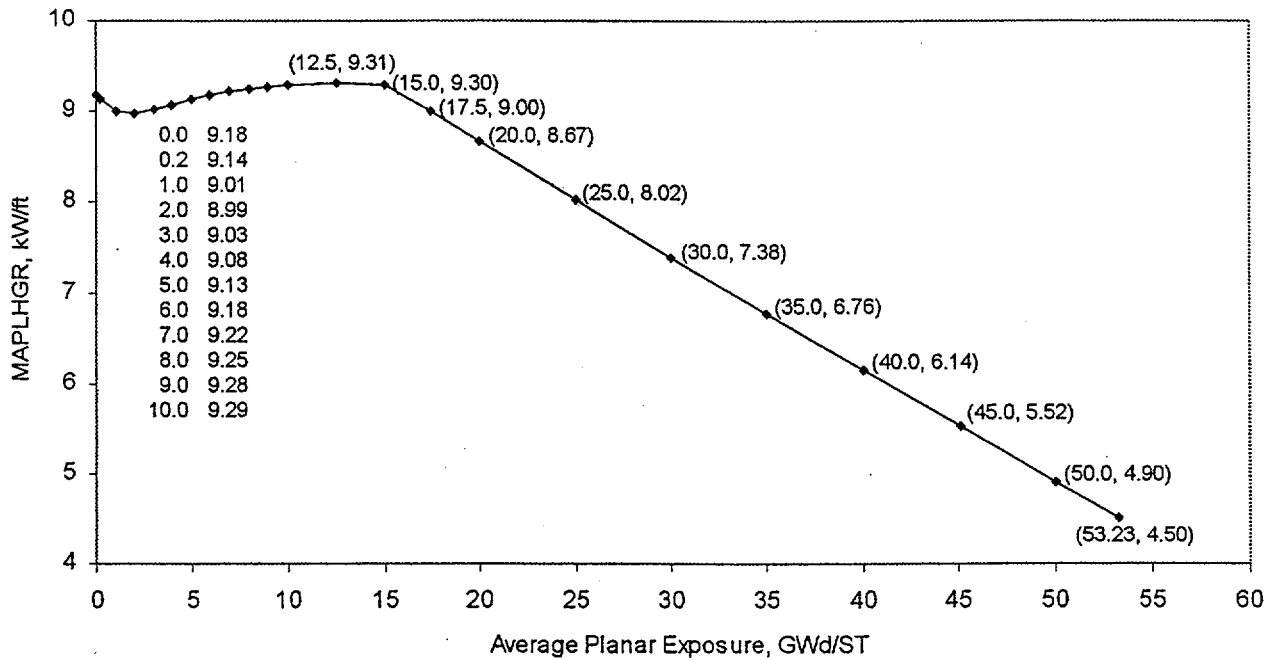


Figure 6: MAPLHGR Limits for Lattice 1940 of GE11-P9HUB340-10GZ-100M-145-T

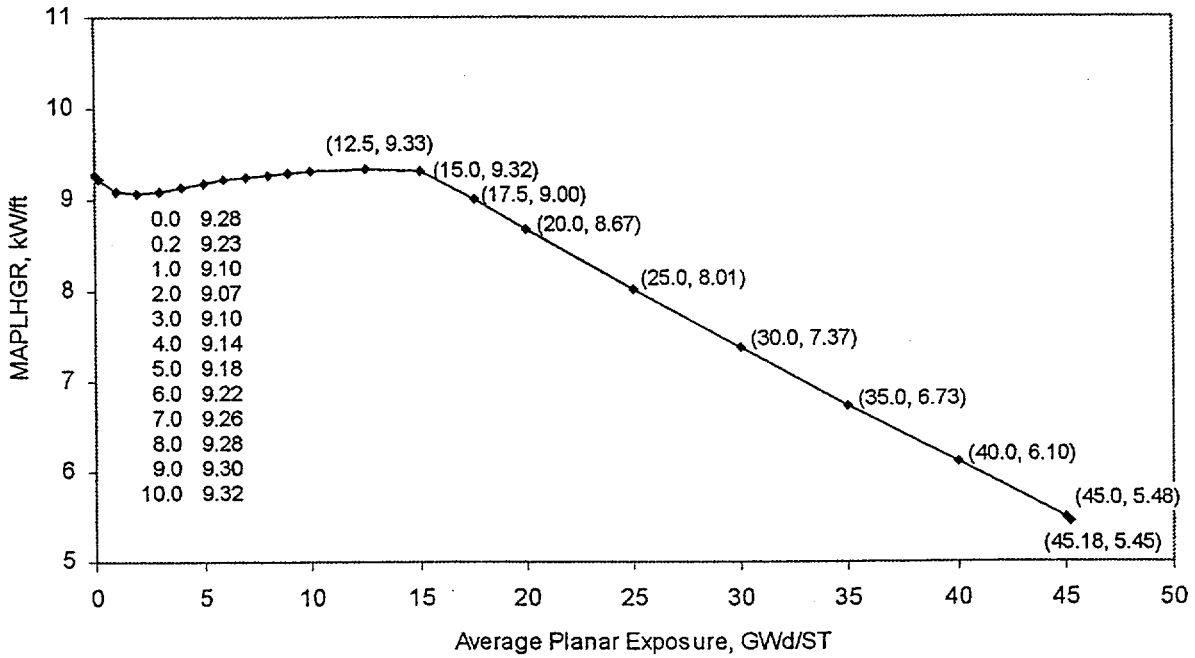


Figure 7: MAPLHGR Limits for Lattice 2361 of GE11-P9DUB340-12GZ1-100T-145-T

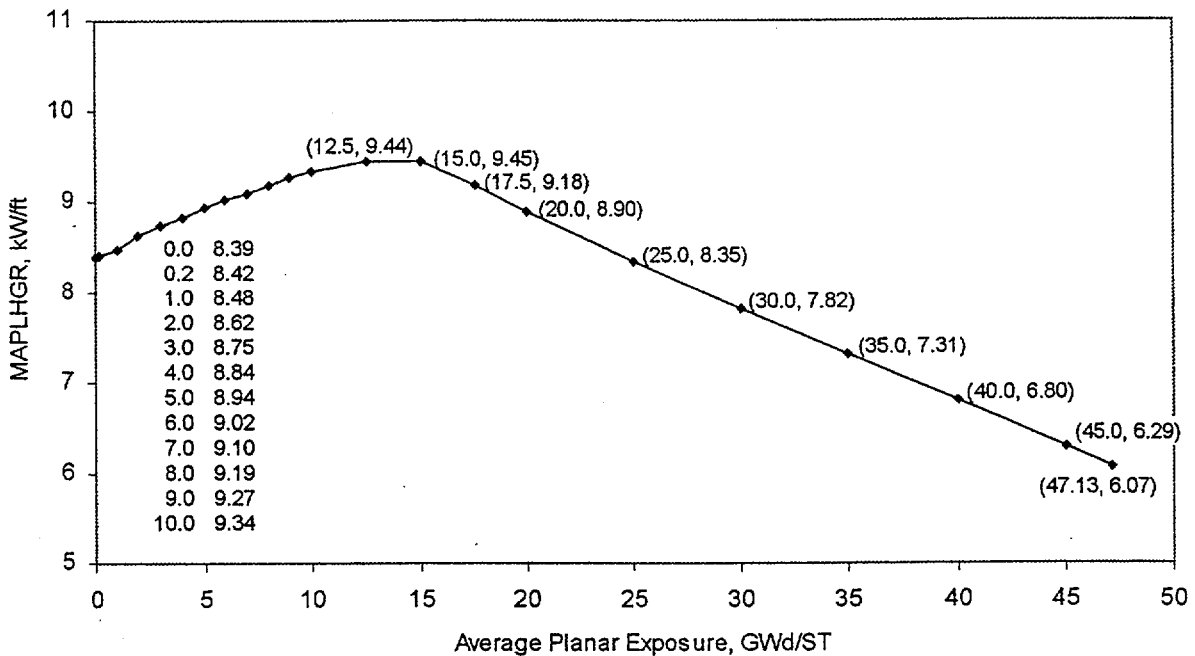


Figure 8: MAPLHGR Limits for Lattice 2419 of GE11-P9DUB340-12GZ1-100T-145-T

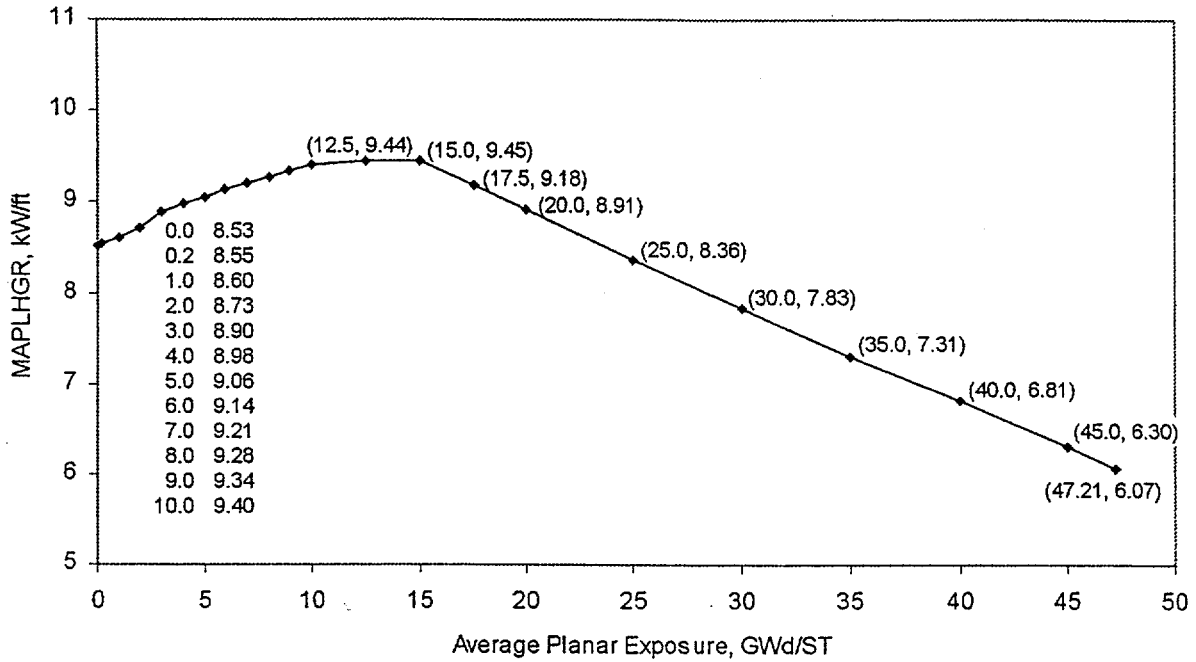


Figure 9: MAPLHGR Limits for Lattice 2420 of GE11-P9DUB340-12GZ1-100T-145-T

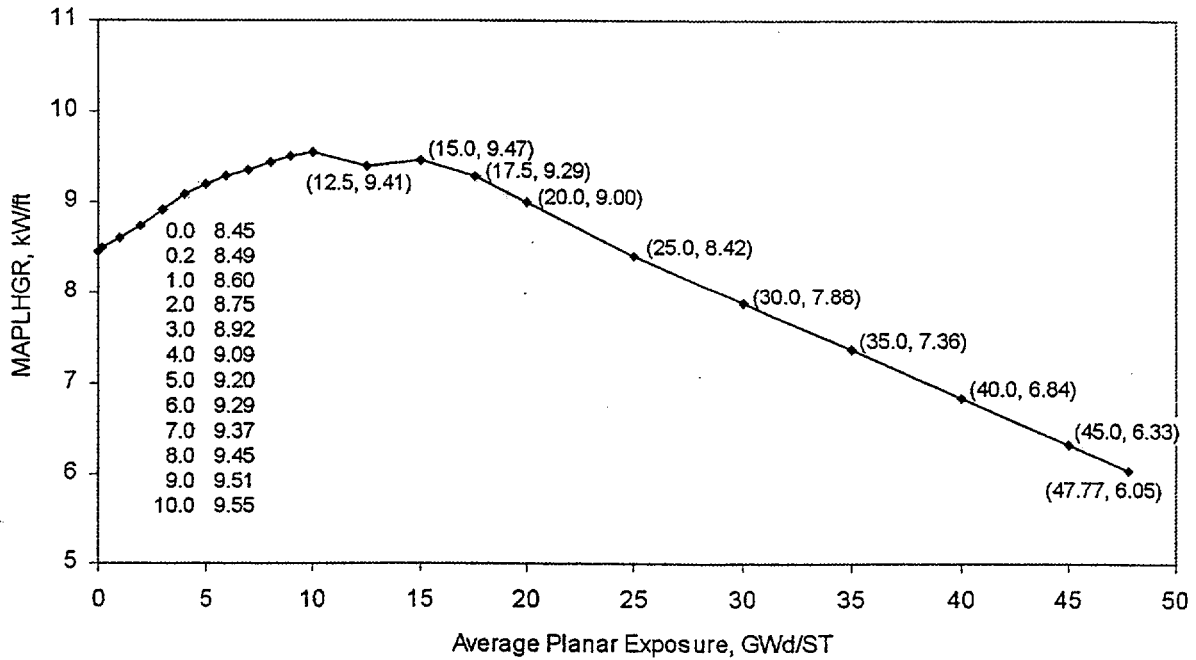


Figure 10: MAPLHGR Limits for Lattice 2364 of GE11-P9DUB340-12GZ1-100T-145-T

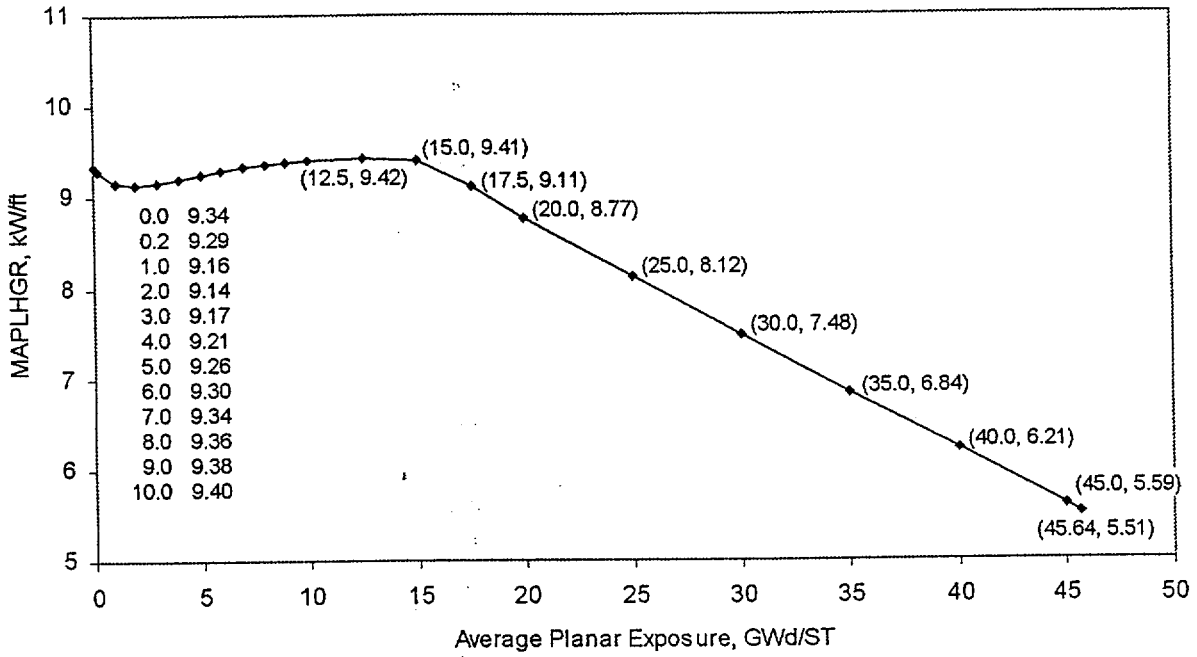


Figure 11: MAPLHGR Limits for Lattice 2366 of GE11-P9DUB340-12GZ1-100T-145-T

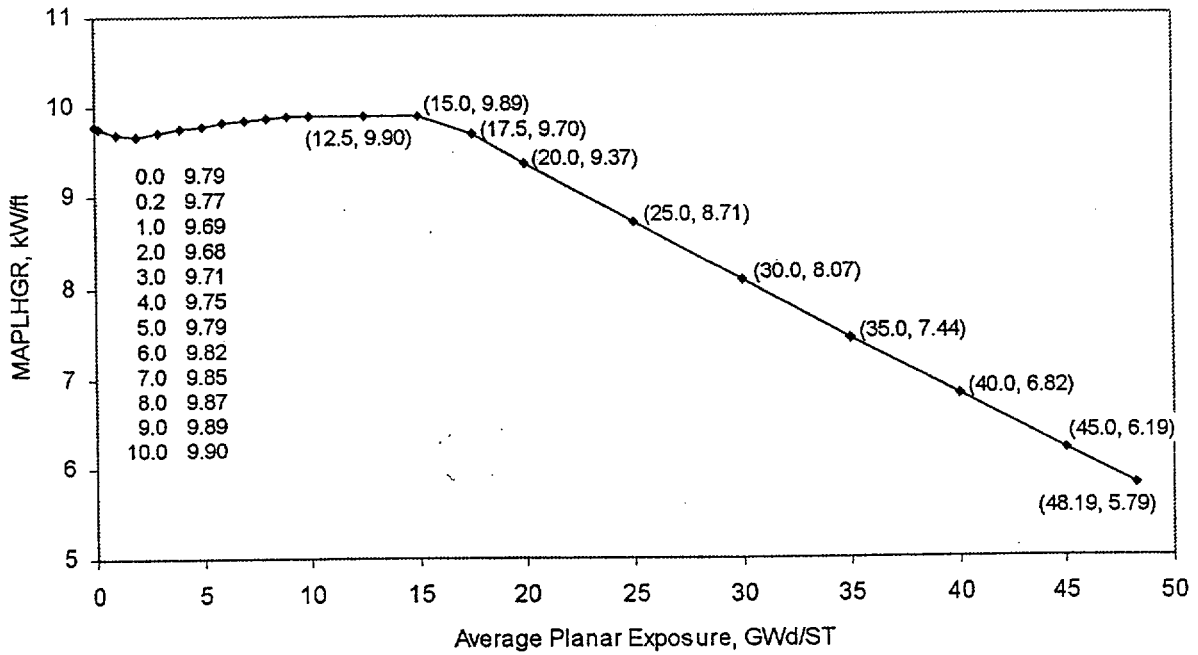


Figure 12: MAPLHGR Limits for Lattice 2367 of GE11-P9DUB340-12GZ1-100T-145-T

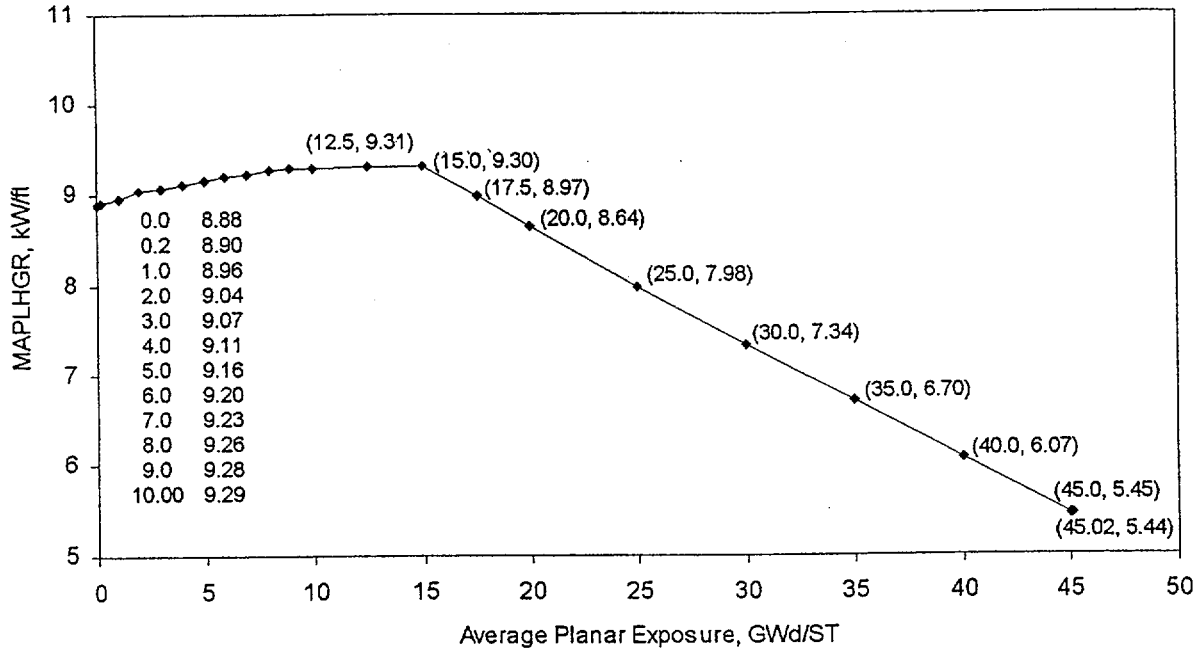


Figure 13: MAPLHGR Limits for Lattice 2718 of GE11-P9DUB339-12GZ-100T-145-T

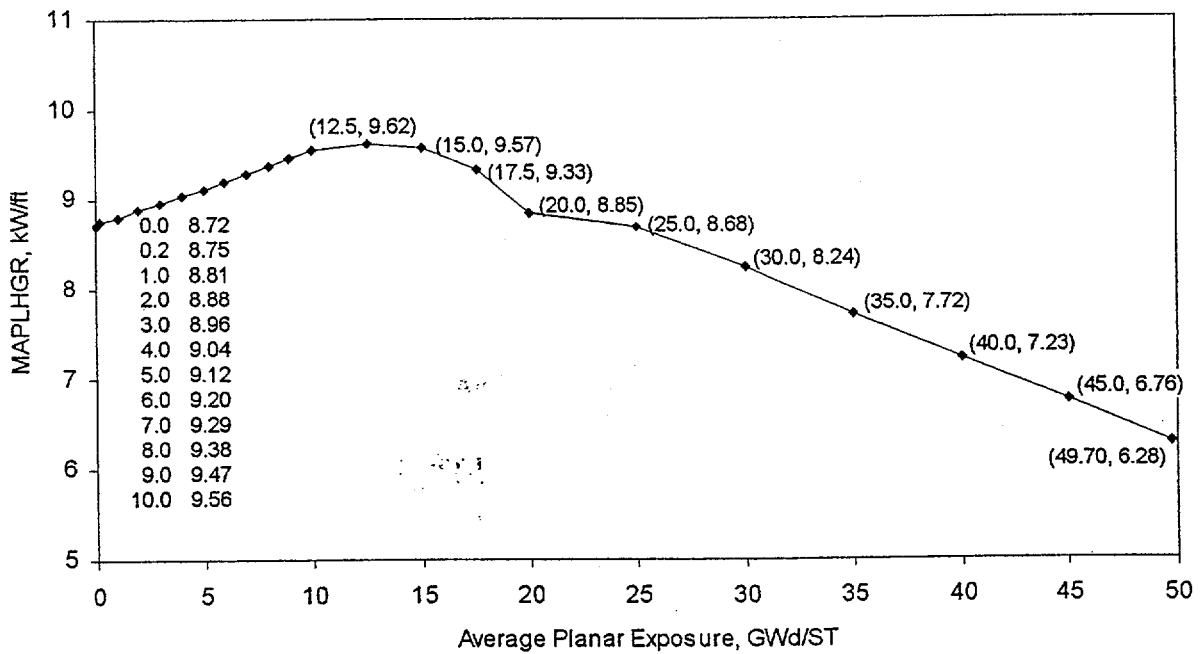


Figure 14: MAPLHGR Limits for Lattice 2719 of GE11-P9DUB339-12GZ-100T-145-T

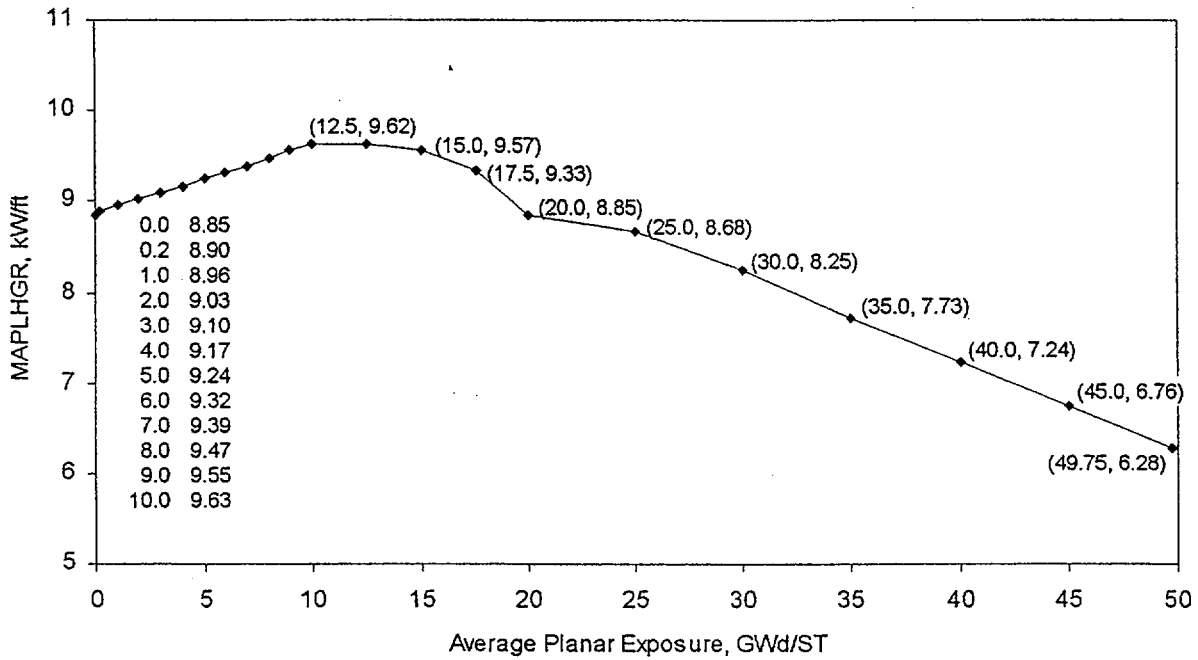


Figure 15: MAPLHGR Limits for Lattice 2720 of GE11-P9DUB339-12GZ-100T-145-T

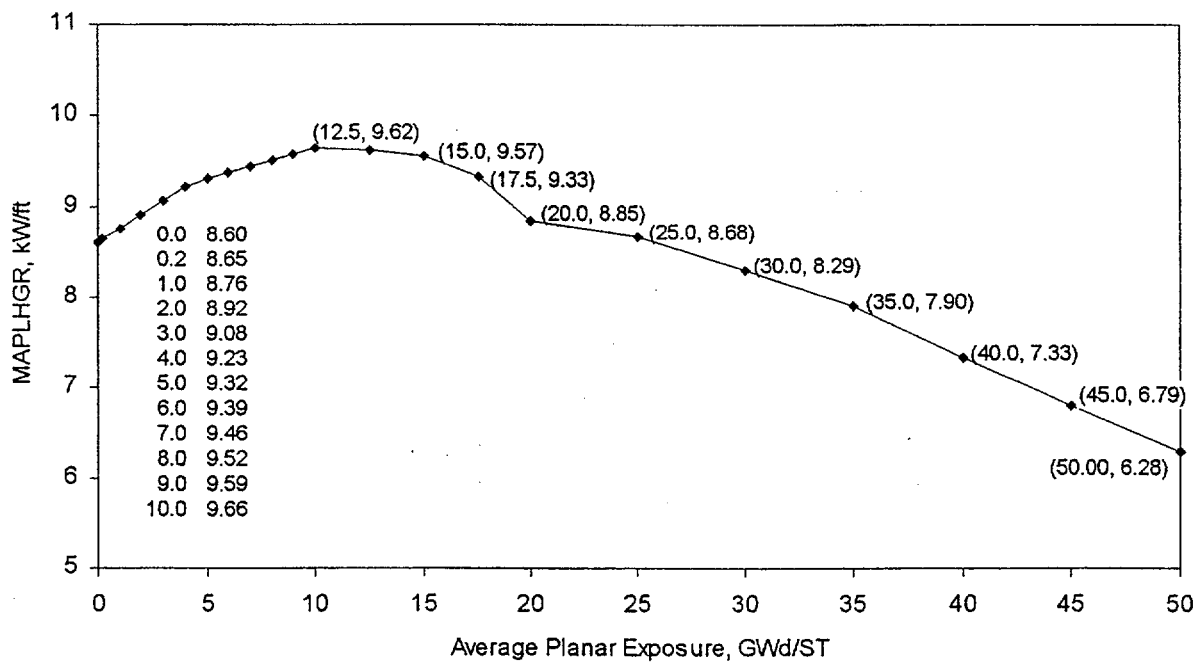


Figure 16: MAPLHGR Limits for Lattice 2721 of GE11-P9DUB339-12GZ-100T-145-T

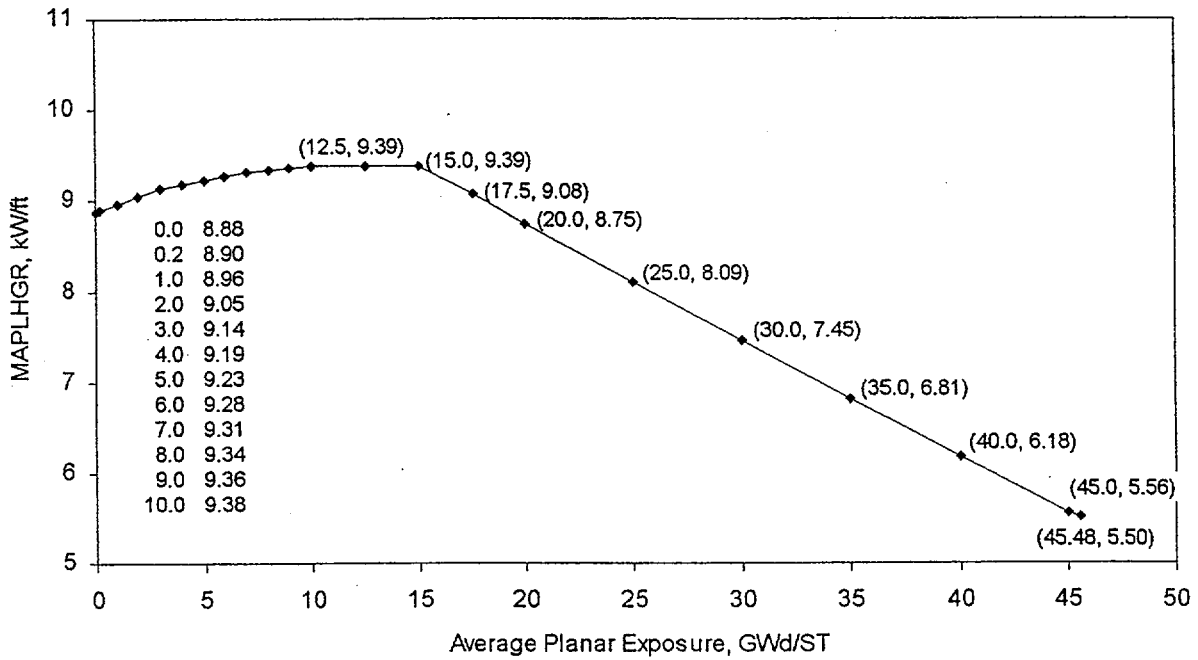


Figure 17: MAPLHGR Limits for Lattice 2722 of GE11-P9DUB339-12GZ-100T-145-T

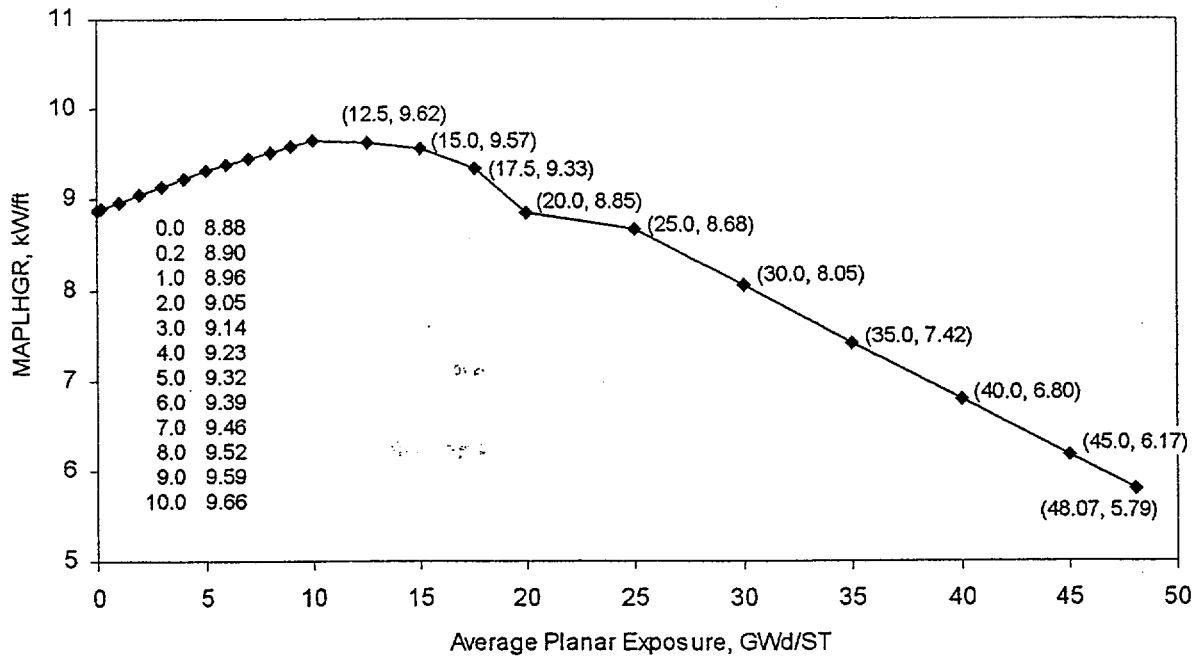


Figure 18: MAPLHGR Limits for Lattice 2723 of GE11-P9DUB339-12GZ-100T-145-T

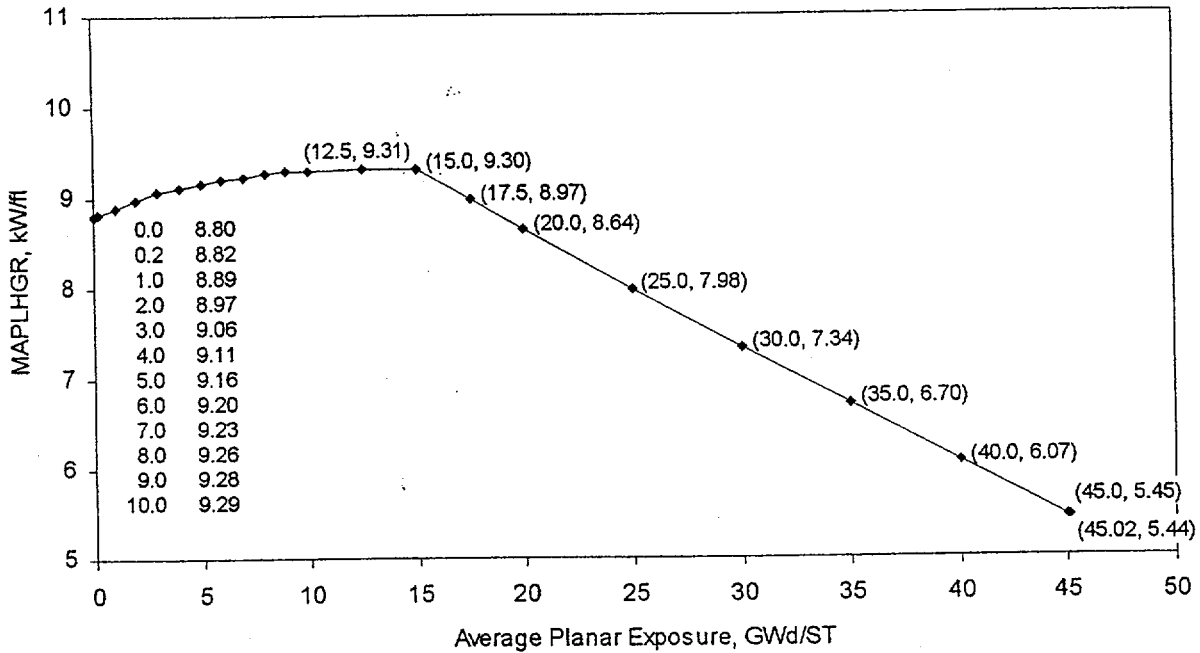


Figure 19: MAPLHGR Limits for Lattice 8047 of GE11-P9DUB362-13GZ-100T-145-T-2414

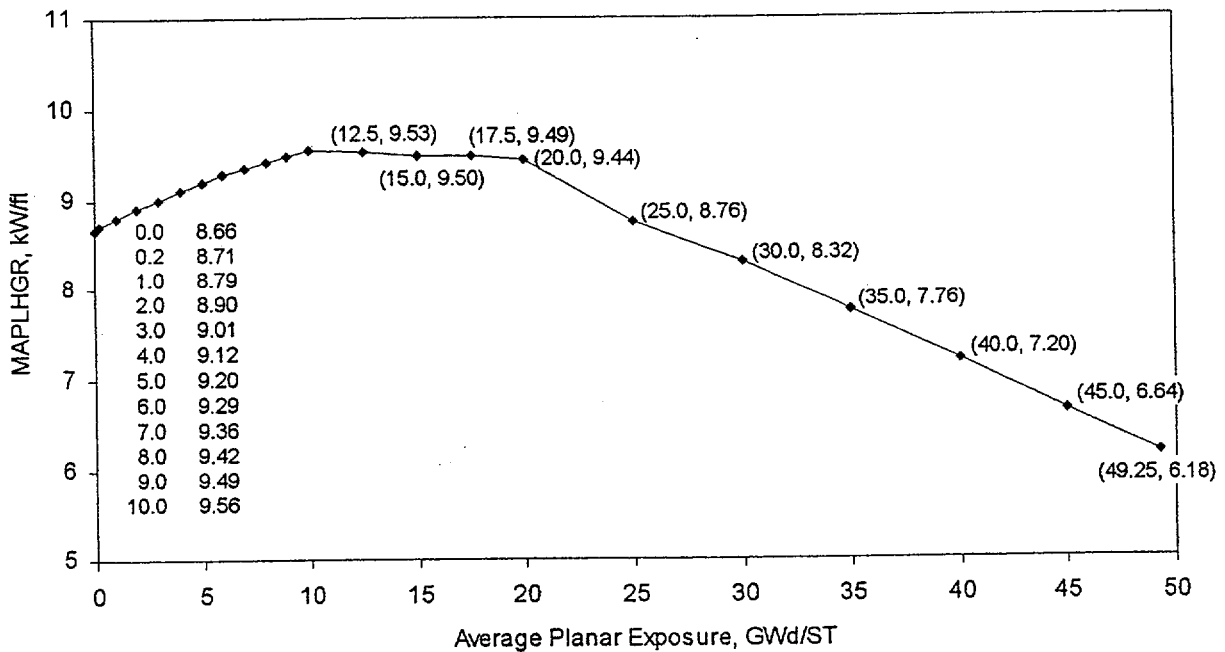


Figure 20: MAPLHGR Limits for Lattice 8048 of GE11-P9DUB362-13GZ-100T-145-T-2414

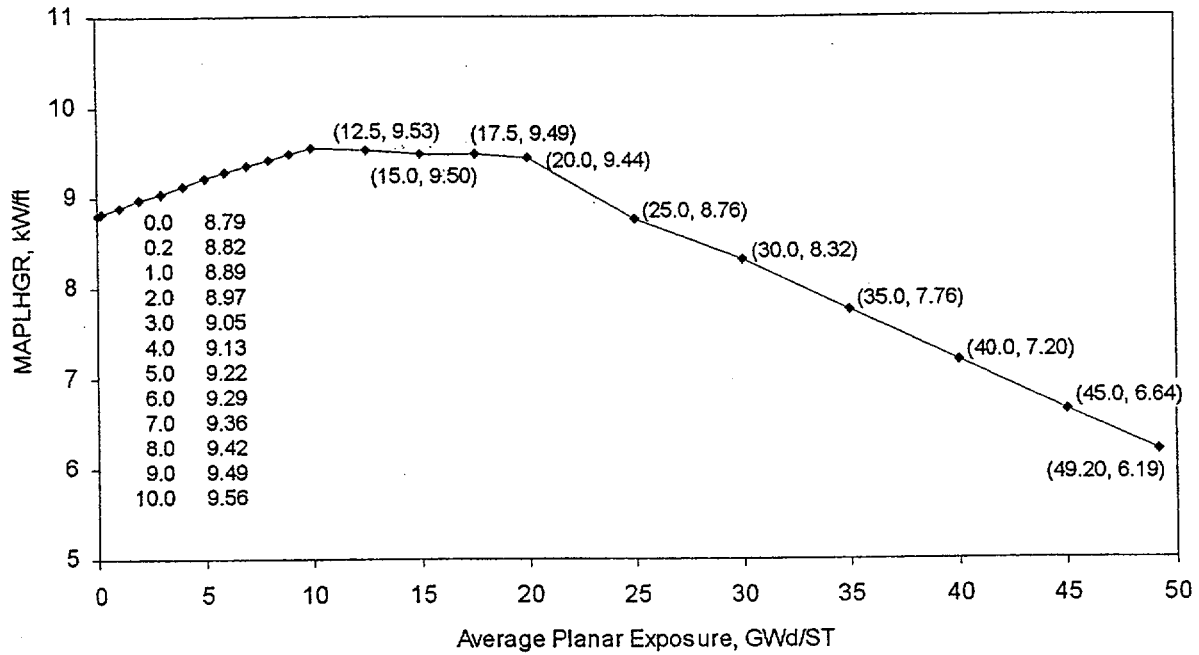


Figure 21: MAPLHGR Limits for Lattice 8049 of GE11-P9DUB362-13GZ-100T-145-T-2414

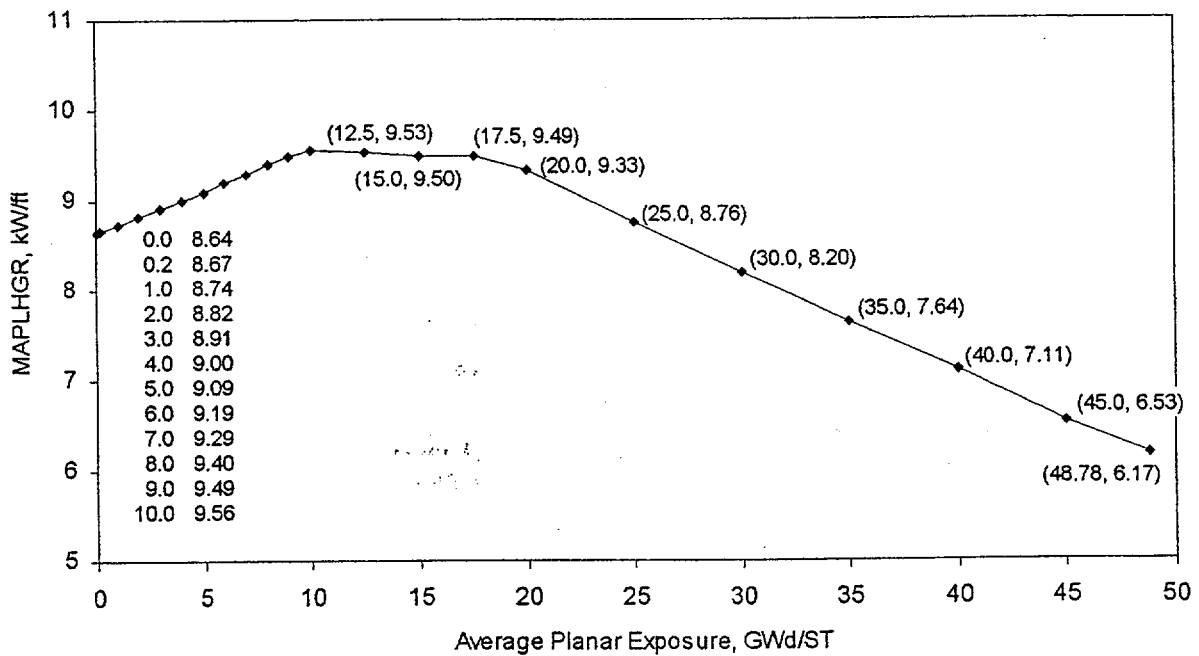


Figure 22: MAPLHGR Limits for Lattice 8050 of GE11-P9DUB362-13GZ-100T-145-T-2414

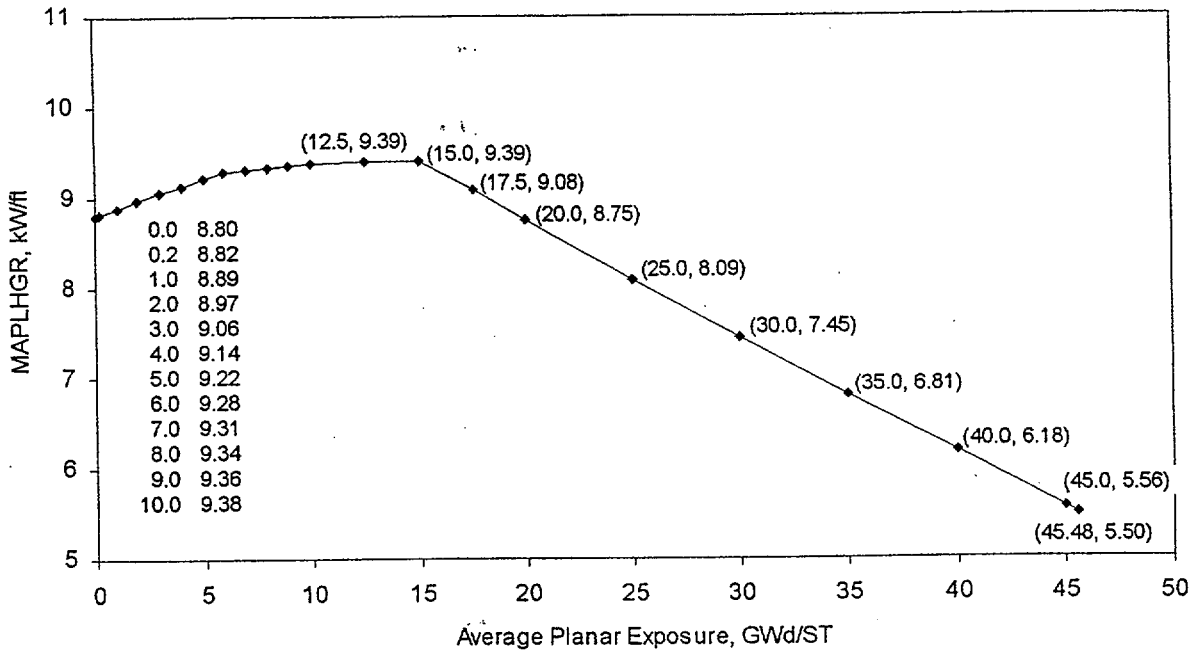


Figure 23: MAPLHGR Limits for Lattice 8051 of GE11-P9DUB362-13GZ-100T-145-T-2414

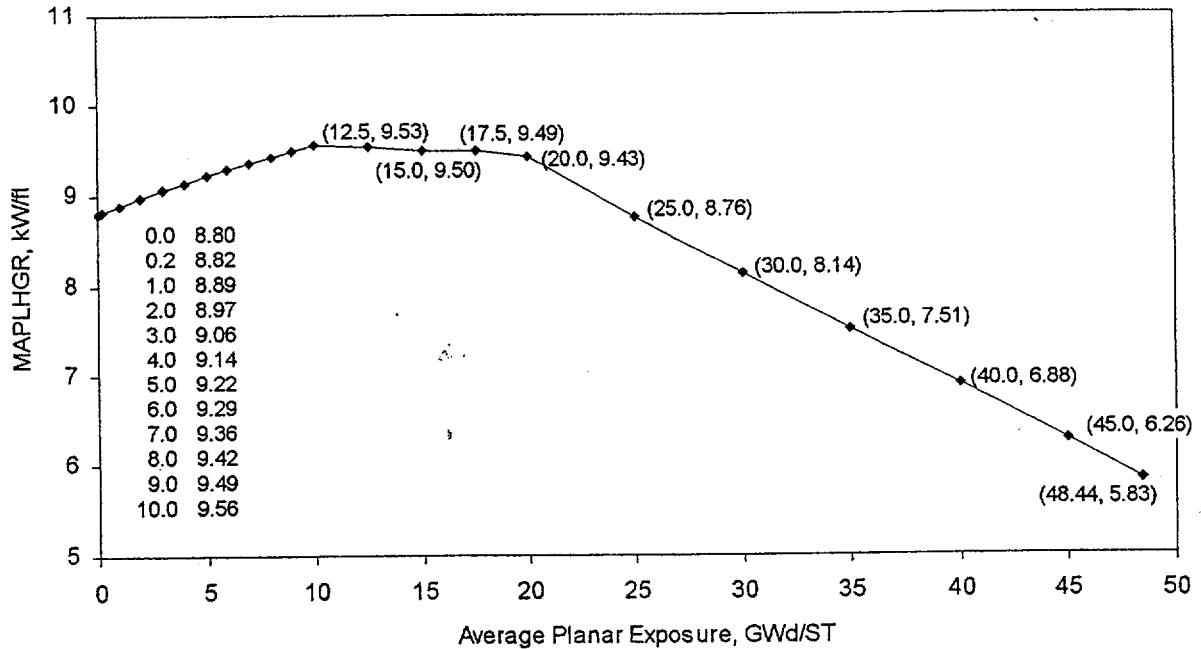


Figure 24: MAPLHGR Limits for Lattice 8052 of GE11-P9DUB362-13GZ-100T-145-T-2414

Figure 25 NMP-1 K(f) Curve for MCPR

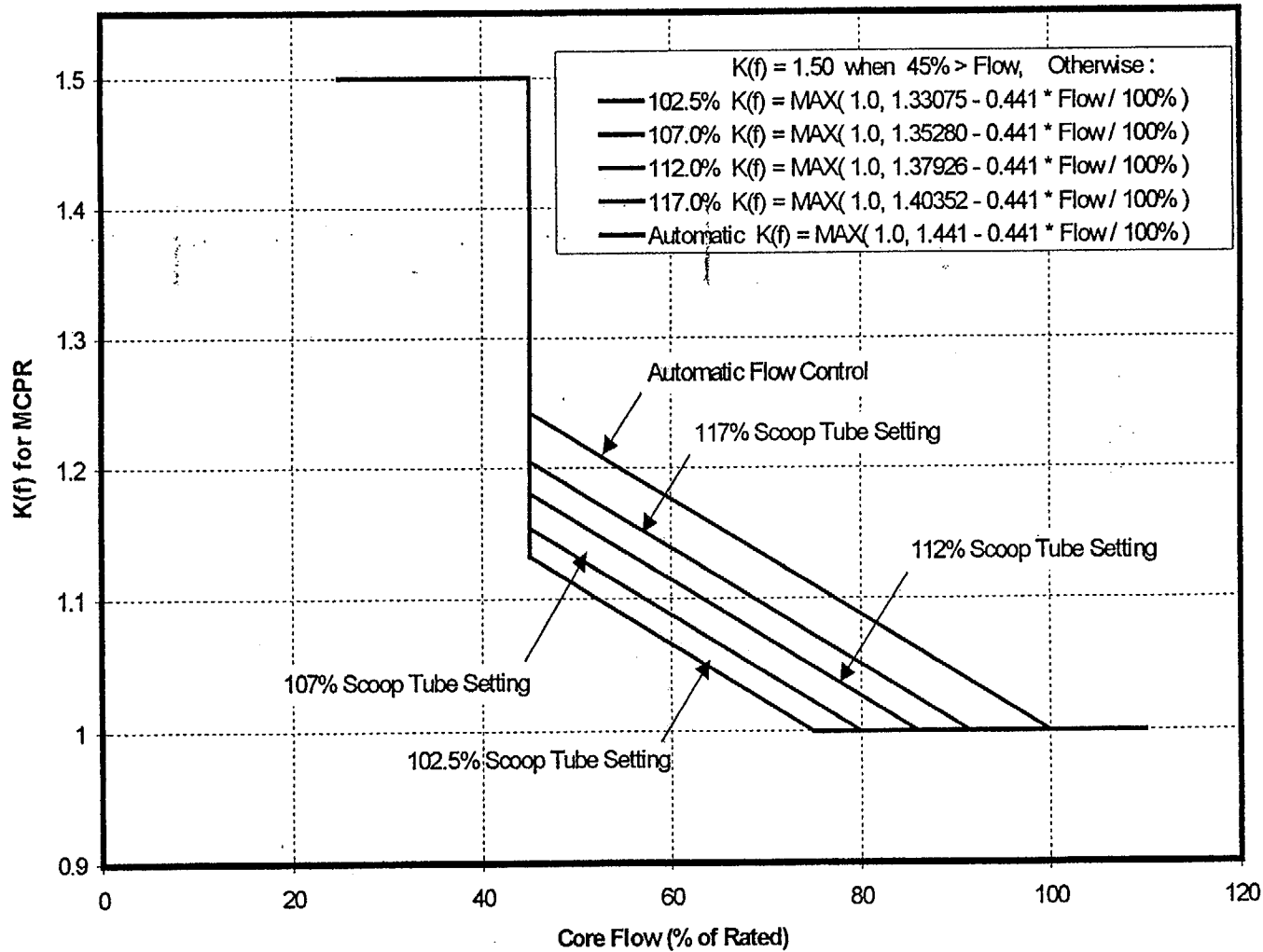


Figure 26: MCPR Limits for Operation Between 45% and 90% RTP
Without a Backup Pressure Regulator

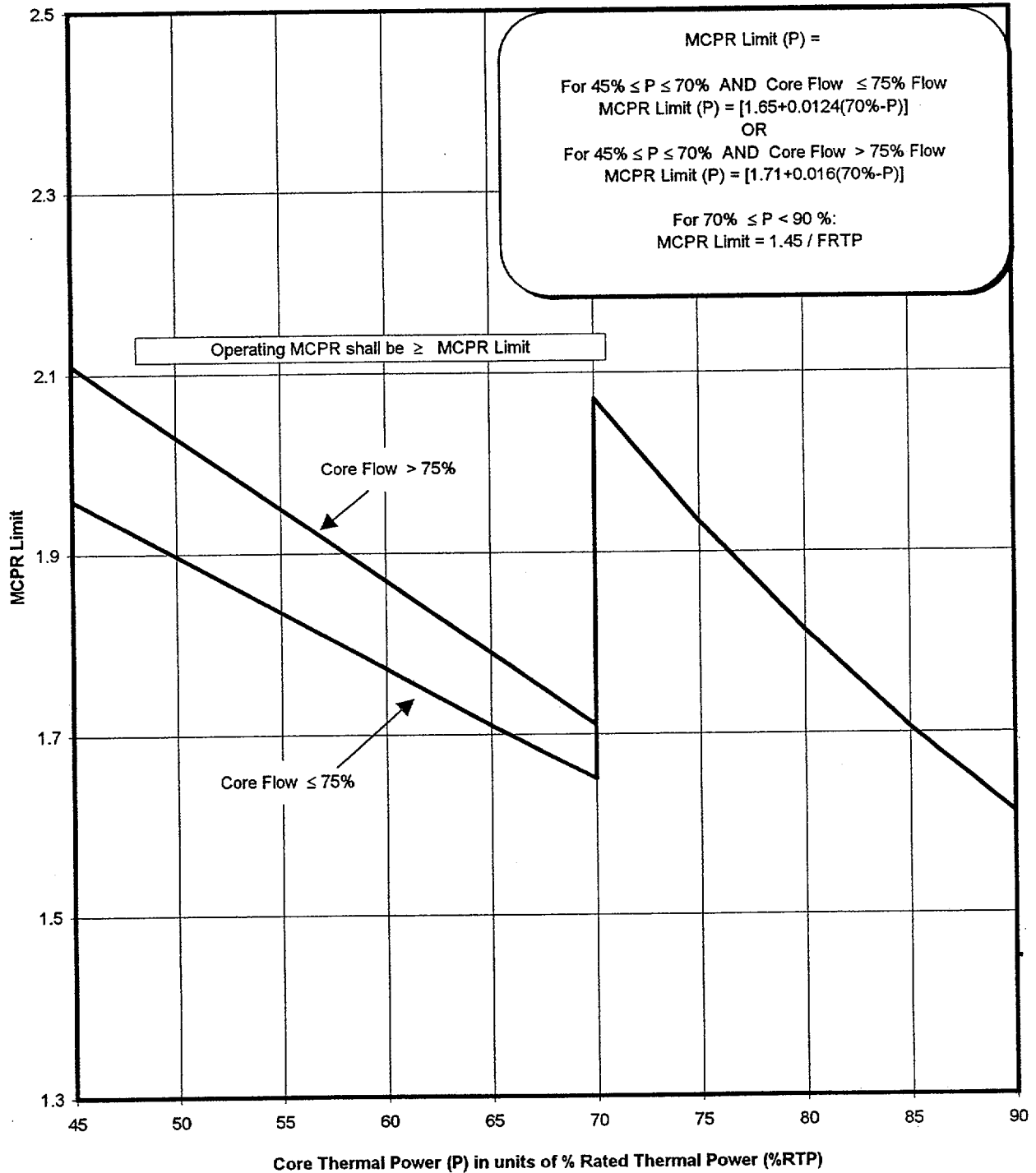


Figure 27: LHGR Limits for Operation Between 45% and 90% RTP
Without a Backup Pressure Regulator

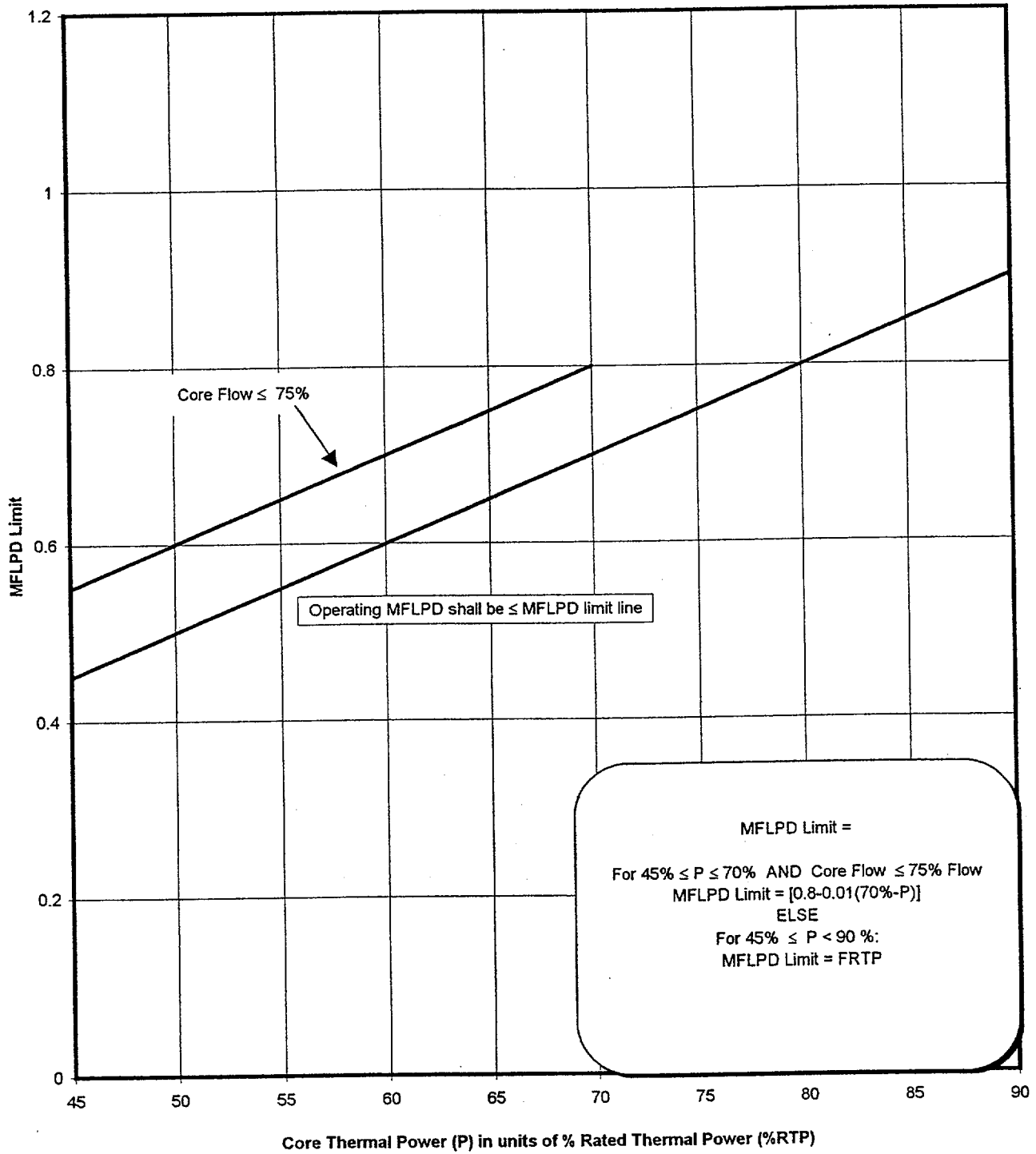


Figure 28 Limiting Power / Flow Line

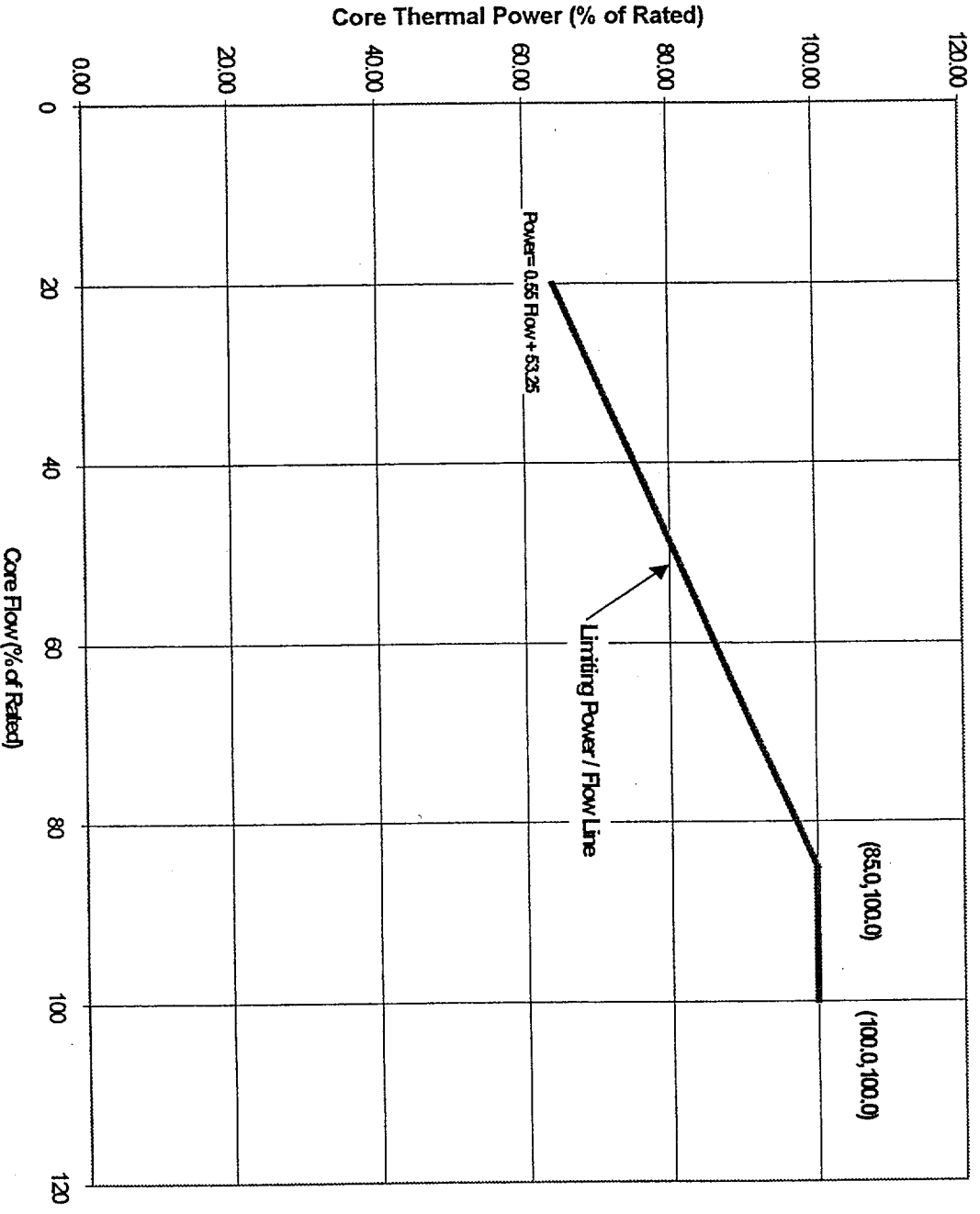


Table 1

Most Limiting APLHGR vs. Average Planar Exposure

| Average Planar Exposure (GWd/ST) | MAPLHGR (kW/ft) | |
|-------------------------------------|-----------------------------------|--|
| | GE11-P9DUB339-12GZ- 100T-145-T | GE11-P9DUB362-13GZ- 100T-145-T-2414 |
| 0.00 | 8.60 | 8.64 |
| 0.20 | 8.65 | 8.67 |
| 1.00 | 8.76 | 8.74 |
| 2.00 | 8.88 | 8.82 |
| 3.00 | 8.96 | 8.91 |
| 4.00 | 9.04 | 9.00 |
| 5.00 | 9.12 | 9.09 |
| 6.00 | 9.20 | 9.19 |
| 7.00 | 9.29 | 9.29 |
| 8.00 | 9.38 | 9.40 |
| 9.00 | 9.47 | 9.49 |
| 10.00 | 9.56 | 9.56 |
| 12.50 | 9.62 | 9.53 |
| 15.00 | 9.57 | 9.50 |
| 17.50 | 9.33 | 9.49 |
| 20.00 | 8.85 | 9.33 |
| 25.00 | 8.68 | 8.76 |
| 30.00 | 8.24 | 8.20 |
| 35.00 | 7.72 | 7.64 |
| 40.00 | 7.23 | 7.11 |
| 45.00 | 6.76 | 6.53 |
| 48.78 | -- | 6.17 |
| 49.70 | 6.28 | -- |

NOTE: A "--" indicates that there is no entry for this box and the limit can be determined by linearly interpolating between the previous and next point in each column. MAPLHGRs are interpolated between exposure points for which explicit values are given. The exposure for the last MAPLHGR listed for a lattice is the maximum allowed nodal exposure for that lattice.

Table 2

Most Limiting APLHGR vs. Average Planar Exposure

| Average Planar Exposure (GWd/ST) | MAPLHGR (kW/ft) | |
|-------------------------------------|-----------------------------------|------------------------------------|
| | GE11-P9HUB340-10GZ- 100M-145-T | GE11-P9DUB340-12GZ1- 100T-145-T |
| 0.00 | 8.54 | 8.39 |
| 0.20 | 8.56 | 8.42 |
| 1.00 | 8.61 | 8.48 |
| 2.00 | 8.72 | 8.62 |
| 3.00 | 8.85 | 8.75 |
| 4.00 | 8.94 | 8.84 |
| 5.00 | 8.99 | 8.94 |
| 6.00 | 9.05 | 9.02 |
| 7.00 | 9.10 | 9.10 |
| 8.00 | 9.15 | 9.19 |
| 9.00 | 9.22 | 9.27 |
| 10.00 | 9.30 | 9.34 |
| 12.50 | 9.32 | 9.41 |
| 15.00 | 9.40 | 9.45 |
| 17.50 | 9.29 | 9.18 |
| 20.00 | 9.00 | 8.90 |
| 25.00 | 8.42 | 8.35 |
| 30.00 | 7.87 | 7.82 |
| 35.00 | 7.34 | 7.31 |
| 40.00 | 6.82 | 6.80 |
| 45.00 | 6.30 | 6.29 |
| 47.13 | -- | 6.07 |
| 47.16 | 6.08 | -- |

NOTE: A "-" indicates that there is no entry for this box and the limit can be determined by linearly interpolating between the previous and next point in each column. MAPLHGRs are interpolated between exposure points for which explicit values are given. The exposure for the last MAPLHGR listed for a lattice is the maximum allowed nodal exposure for that lattice