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**Constellation Energy**
Nine Mile Point Nuclear Station

April 28, 2004
NMP2L 2116

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

SUBJECT: Nine Mile Point Unit 2
Docket No. 50-410
License No. NPF-69

Cycle 10 Core Operating Limits Report, Rev. 0

Gentlemen:

Attached is a copy of the Cycle 10 Core Operating Limits Report (COLR), Rev. 0, for Nine Mile Point Unit 2 (NMP2). This report is being submitted pursuant to NMP2 Technical Specification 5.6.5.d.

Very truly yours,

William C. Holston
Manager Engineering Services

WCH/RF/bjh
Attachment

cc: Mr. H. J. Miller, NRC Regional Administrator, Region I
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A001

# *NINE MILE POINT UNIT 2*

# *CORE OPERATING LIMITS REPORT*

**Document No.:** COLR2-10

**Revision 0, Cycle 10**

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This Controlled Document provides cycle specific core operating limits for use in conjunction with the Nine Mile Point Unit 2 Technical Specifications. Document pages may only be changed through a reissue of the entire document.

# *NINE MILE POINT UNIT 2*

# *CORE OPERATING LIMITS REPORT*

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# *NINE MILE POINT UNIT 2*
# *CORE OPERATING LIMITS REPORT*

## 1.0 AVERAGE PLANAR LINEAR HEAT GENERATION RATE (APLHGR)

### 1.1 Limits for Technical Specification 3.2.1

The APLHGR(s) for each type of fuel as a function of AVERAGE PLANAR EXPOSURE shall not exceed the limits shown in Tables 1a through 1l.

The limits of Tables 1a through 1n shall be reduced to a value of .78 times the two recirculation loop operation limit when in single recirculation loop operation.

**NOTE:** When hand calculations are required, the APLHGR as a function of average planar exposure shall not exceed the respective limits shown in Tables 1m and 1n during two recirculation loop operation.

Table 1a

## MAPLHGR VERSUS AVERAGE PLANAR EXPOSURE
## Bundle Type: GE11-P9CUB413-12GZ-120T-146-T (GE11)

| Average Planar Exposure, GWd/ST | MAPLHGR Limits (kw/ft) | | | |
|---|---|---|---|---|
| | Lattice 2275 | Lattice 2545 | Lattice 2549 | Lattice 2274 |
| 0.00 | 12.78 | 11.43 | 11.45 | 13.38 |
| 0.20 | 12.72 | 11.46 | 11.49 | 13.35 |
| 1.00 | 12.55 | 11.53 | 11.57 | 13.26 |
| 2.00 | 12.49 | 11.61 | 11.68 | 13.23 |
| 3.00 | 12.49 | 11.69 | 11.78 | 13.24 |
| 4.00 | 12.52 | 11.77 | 11.89 | 13.27 |
| 5.00 | 12.55 | 11.86 | 12.01 | 13.29 |
| 6.00 | 12.58 | 11.94 | 12.12 | 13.32 |
| 7.00 | 12.60 | 12.03 | 12.24 | 13.34 |
| 8.00 | 12.63 | 12.11 | 12.36 | 13.35 |
| 9.00 | 12.64 | 12.20 | 12.48 | 13.36 |
| 10.00 | 12.65 | 12.29 | 12.60 | 13.37 |
| 12.50 | 12.51 | 12.26 | 12.65 | 13.33 |
| 15.00 | 12.12 | 12.11 | 12.44 | 12.94 |
| 17.50 | 11.72 | 11.90 | 12.13 | 12.54 |
| 20.00 | 11.33 | 11.61 | 11.80 | 12.15 |
| 25.00 | 10.62 | 11.08 | 11.09 | 11.36 |
| 30.00 | 10.13 | 10.75 | 10.44 | 10.88 |
| 35.00 | 9.65 | 10.29 | 9.96 | 10.40 |
| 40.00 | 9.18 | 9.82 | 9.52 | 9.93 |
| 45.00 | 8.71 | 9.40 | 9.14 | 9.46 |
| 50.00 | 8.24 | 8.99 | 8.80 | 9.00 |
| 54.96 | 7.78 | — | — | — |
| 55.00 | | 8.62 | 8.48 | 8.53 |
| 58.06 | | 8.41 | — | — |
| 58.32 | | | — | 8.22 |
| 58.66 | | | 8.30 | |

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 1b

## MAPLHGR VERSUS AVERAGE PLANAR EXPOSURE
## Bundle Type: GE11-P9CUB414-13GZ-120T-146-T (GE11)

| Average Planar Exposure, GWd/ST | MAPLHGR Limits (kw/ft) | | | | |
|---|---|---|---|---|---|
| | Lattice 2275 | Lattice 2545 | Lattice 2546 | Lattice 2547 | Lattice 2548 |
| 0.00 | 12.78 | 11.43 | 11.25 | 11.41 | 13.42 |
| 0.20 | 12.72 | 11.46 | 11.30 | 11.45 | 13.39 |
| 1.00 | 12.55 | 11.53 | 11.39 | 11.52 | 13.30 |
| 2.00 | 12.49 | 11.61 | 11.50 | 11.61 | 13.27 |
| 3.00 | 12.49 | 11.69 | 11.62 | 11.71 | 13.28 |
| 4.00 | 12.52 | 11.77 | 11.74 | 11.80 | 13.30 |
| 5.00 | 12.55 | 11.86 | 11.87 | 11.90 | 13.33 |
| 6.00 | 12.58 | 11.94 | 11.99 | 12.01 | 13.35 |
| 7.00 | 12.60 | 12.03 | 12.10 | 12.11 | 13.37 |
| 8.00 | 12.63 | 12.11 | 12.21 | 12.22 | 13.38 |
| 9.00 | 12.64 | 12.20 | 12.32 | 12.33 | 13.39 |
| 10.00 | 12.65 | 12.29 | 12.44 | 12.44 | 13.40 |
| 12.50 | 12.51 | 12.26 | 12.48 | 12.49 | 13.36 |
| 15.00 | 12.12 | 12.11 | 12.36 | 12.36 | 12.97 |
| 17.50 | 11.72 | 11.90 | 12.11 | 12.12 | 12.57 |
| 20.00 | 11.33 | 11.61 | 11.79 | 11.80 | 12.17 |
| 25.00 | 10.62 | 11.02 | 11.08 | 11.08 | 11.39 |
| 30.00 | 10.13 | 10.55 | 10.43 | 10.43 | 10.90 |
| 35.00 | 9.65 | 10.09 | 9.95 | 9.96 | 10.43 |
| 40.00 | 9.18 | 9.63 | 9.52 | 9.52 | 9.95 |
| 45.00 | 8.71 | 9.17 | 9.13 | 9.14 | 9.49 |
| 50.00 | 8.24 | 8.72 | 8.79 | 8.79 | 9.02 |
| 54.96 | 7.78 | — | — | — | — |
| 55.00 | | 8.27 | 8.47 | 8.44 | 8.55 |
| 57.19 | | 8.08 | — | — | — |
| 58.28 | | | — | 8.17 | — |
| 58.42 | | | — | | 8.23 |
| 58.58 | | | 8.30 | | |

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 1c

## MAPLHGR VERSUS AVERAGE PLANAR EXPOSURE
## Bundle Type: GE11-P9CUB407-14GZ-120T-146-T-2382 (GE11)

| Average Planar Exposure, GWd/ST | MAPLHGR Limits (kw/ft) | | | | |
|---|---|---|---|---|---|
| | Lattice 2887 | Lattice 2888 | Lattice 2889 | Lattice 2890 | Lattice 2891 |
| 0.00 | 12.76 | 10.97 | 11.19 | 11.10 | 13.38 |
| 0.20 | 12.69 | 11.02 | 11.23 | 11.14 | 13.35 |
| 1.00 | 12.52 | 11.10 | 11.30 | 11.23 | 13.26 |
| 2.00 | 12.46 | 11.19 | 11.39 | 11.33 | 13.23 |
| 3.00 | 12.46 | 11.29 | 11.48 | 11.44 | 13.24 |
| 4.00 | 12.49 | 11.38 | 11.57 | 11.54 | 13.27 |
| 5.00 | 12.52 | 11.48 | 11.66 | 11.64 | 13.29 |
| 6.00 | 12.55 | 11.58 | 11.75 | 11.75 | 13.32 |
| 7.00 | 12.58 | 11.69 | 11.84 | 11.86 | 13.34 |
| 8.00 | 12.60 | 11.79 | 11.93 | 11.97 | 13.36 |
| 9.00 | 12.62 | 11.90 | 12.03 | 12.09 | 13.37 |
| 10.00 | 12.63 | 12.00 | 12.13 | 12.21 | 13.37 |
| 12.50 | 12.48 | 11.96 | 12.10 | 12.25 | 13.33 |
| 15.00 | 12.09 | 11.84 | 11.98 | 12.17 | 12.94 |
| 17.50 | 11.70 | 11.71 | 11.80 | 11.96 | 12.54 |
| 20.00 | 11.30 | 11.49 | 11.52 | 11.65 | 12.14 |
| 25.00 | 10.59 | 11.01 | 11.01 | 11.10 | 11.36 |
| 30.00 | 10.10 | 10.68 | 10.68 | 10.54 | 10.87 |
| 35.00 | 9.62 | 10.35 | 10.36 | 10.07 | 10.40 |
| 40.00 | 9.15 | 9.89 | 9.92 | 9.63 | 9.93 |
| 45.00 | 8.68 | 9.46 | 9.49 | 9.24 | 9.46 |
| 50.00 | 8.21 | 9.07 | 9.07 | 8.87 | 8.99 |
| 54.80 | 7.77 | — | — | — | — |
| 55.00 | | 8.66 | 8.67 | 8.53 | 8.52 |
| 57.55 | | 8.48 | — | — | — |
| 57.64 | | | 8.48 | — | — |
| 57.97 | | | | 8.36 | — |
| 58.26 | | | | | 8.22 |

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 1d

## MAPLHGR VERSUS AVERAGE PLANAR EXPOSURE
## Bundle Type: GE11-P9CUB407-14GZ-120T-146-T-2383 (GE11)

| Average Planar Exposure, GWd/ST | MAPLHGR Limits (kw/ft) | | | | |
|---|---|---|---|---|---|
| | Lattice 2887 | Lattice 2888 | Lattice 2892 | Lattice 2893 | Lattice 2891 |
| 0.00 | 12.76 | 10.97 | 11.03 | 10.93 | 13.38 |
| 0.20 | 12.69 | 11.02 | 11.08 | 10.98 | 13.35 |
| 1.00 | 12.52 | 11.10 | 11.17 | 11.08 | 13.26 |
| 2.00 | 12.46 | 11.19 | 11.28 | 11.21 | 13.23 |
| 3.00 | 12.46 | 11.29 | 11.40 | 11.35 | 13.24 |
| 4.00 | 12.49 | 11.38 | 11.51 | 11.49 | 13.27 |
| 5.00 | 12.52 | 11.48 | 11.63 | 11.62 | 13.29 |
| 6.00 | 12.55 | 11.58 | 11.74 | 11.74 | 13.32 |
| 7.00 | 12.58 | 11.69 | 11.84 | 11.86 | 13.34 |
| 8.00 | 12.60 | 11.79 | 11.94 | 11.98 | 13.36 |
| 9.00 | 12.62 | 11.90 | 12.03 | 12.10 | 13.37 |
| 10.00 | 12.63 | 12.00 | 12.13 | 12.22 | 13.37 |
| 12.50 | 12.48 | 11.96 | 12.10 | 12.26 | 13.33 |
| 15.00 | 12.09 | 11.84 | 11.98 | 12.17 | 12.94 |
| 17.50 | 11.70 | 11.71 | 11.79 | 11.95 | 12.54 |
| 20.00 | 11.30 | 11.49 | 11.51 | 11.65 | 12.14 |
| 25.00 | 10.59 | 11.01 | 11.01 | 11.10 | 11.36 |
| 30.00 | 10.10 | 10.68 | 10.68 | 10.54 | 10.87 |
| 35.00 | 9.62 | 10.35 | 10.36 | 10.07 | 10.40 |
| 40.00 | 9.15 | 9.89 | 9.92 | 9.63 | 9.93 |
| 45.00 | 8.68 | 9.46 | 9.49 | 9.24 | 9.46 |
| 50.00 | 8.21 | 9.07 | 9.07 | 8.87 | 8.99 |
| 54.80 | 7.77 | --- | --- | --- | --- |
| 55.00 | | 8.66 | 8.67 | 8.52 | 8.52 |
| 57.55 | | 8.48 | --- | --- | --- |
| 57.62 | | | 8.48 | --- | --- |
| 57.96 | | | | 8.36 | --- |
| 58.26 | | | | | 8.22 |

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 1e

## MAPLHGR VERSUS AVERAGE PLANAR EXPOSURE
## Bundle Type: GE11-P9CUB404-12GZ-120T-146-T-2501 (GE11)

| Average Planar Exposure, GWd/ST | MAPLHGR Limits (kw/ft) | | | | |
|---|---|---|---|---|---|
| | Lattice 5230 | Lattice 5231 | Lattice 5232 | Lattice 5233 | Lattice 5234 |
| 0.00 | 12.76 | 11.12 | 11.14 | 10.93 | 13.36 |
| 0.20 | 12.69 | 11.17 | 11.19 | 11.00 | 13.33 |
| 1.00 | 12.52 | 11.26 | 11.29 | 11.13 | 13.24 |
| 2.00 | 12.46 | 11.39 | 11.42 | 11.32 | 13.21 |
| 3.00 | 12.46 | 11.54 | 11.57 | 11.53 | 13.22 |
| 4.00 | 12.49 | 11.66 | 11.69 | 11.74 | 13.25 |
| 5.00 | 12.52 | 11.73 | 11.77 | 11.87 | 13.27 |
| 6.00 | 12.55 | 11.80 | 11.85 | 11.98 | 13.30 |
| 7.00 | 12.58 | 11.88 | 11.93 | 12.09 | 13.32 |
| 8.00 | 12.60 | 11.96 | 12.02 | 12.19 | 13.34 |
| 9.00 | 12.62 | 12.04 | 12.10 | 12.29 | 13.35 |
| 10.00 | 12.63 | 12.12 | 12.18 | 12.40 | 13.36 |
| 12.50 | 12.48 | 12.05 | 12.14 | 12.44 | 13.31 |
| 15.00 | 12.09 | 11.89 | 11.98 | 12.24 | 12.92 |
| 17.50 | 11.70 | 11.73 | 11.77 | 11.94 | 12.53 |
| 20.00 | 11.30 | 11.47 | 11.48 | 11.61 | 12.13 |
| 25.00 | 10.59 | 10.97 | 10.97 | 11.05 | 11.35 |
| 30.00 | 10.10 | 10.64 | 10.64 | 10.70 | 10.86 |
| 35.00 | 9.62 | 10.32 | 10.32 | 10.17 | 10.39 |
| 40.00 | 9.15 | 9.95 | 9.98 | 9.70 | 9.92 |
| 45.00 | 8.68 | 9.48 | 9.50 | 9.27 | 9.45 |
| 50.00 | 8.21 | 9.05 | 9.07 | 8.88 | 8.98 |
| 54.80 | 7.77 | — | — | — | — |
| 55.00 | | 8.66 | 8.67 | 8.52 | 8.51 |
| 57.53 | | 8.52 | — | — | — |
| 57.56 | | | 8.52 | — | — |
| 57.87 | | | | 8.36 | — |
| 58.22 | | | | | 8.21 |

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 1f

## MAPLHGR VERSUS AVERAGE PLANAR EXPOSURE
## Bundle Type: GE11-P9CUB407-14GZ-120T-146-T-2502 (GE11)

| Average Planar Exposure, GWd/ST | MAPLHGR Limits (kw/ft) | | | | |
|---|---|---|---|---|---|
| | Lattice 5230 | Lattice 5235 | Lattice 5236 | Lattice 5237 | Lattice 5238 |
| 0.00 | 12.76 | 10.98 | 11.19 | 11.10 | 13.38 |
| 0.20 | 12.69 | 11.03 | 11.23 | 11.15 | 13.35 |
| 1.00 | 12.52 | 11.10 | 11.30 | 11.23 | 13.26 |
| 2.00 | 12.46 | 11.19 | 11.39 | 11.33 | 13.23 |
| 3.00 | 12.46 | 11.29 | 11.48 | 11.44 | 13.24 |
| 4.00 | 12.49 | 11.38 | 11.57 | 11.54 | 13.27 |
| 5.00 | 12.52 | 11.48 | 11.66 | 11.64 | 13.29 |
| 6.00 | 12.55 | 11.58 | 11.75 | 11.75 | 13.32 |
| 7.00 | 12.58 | 11.68 | 11.84 | 11.86 | 13.34 |
| 8.00 | 12.60 | 11.79 | 11.93 | 11.97 | 13.36 |
| 9.00 | 12.62 | 11.89 | 12.03 | 12.09 | 13.37 |
| 10.00 | 12.63 | 12.00 | 12.12 | 12.21 | 13.37 |
| 12.50 | 12.48 | 11.96 | 12.10 | 12.25 | 13.33 |
| 15.00 | 12.09 | 11.83 | 11.97 | 12.16 | 12.94 |
| 17.50 | 11.70 | 11.71 | 11.79 | 11.95 | 12.54 |
| 20.00 | 11.30 | 11.49 | 11.51 | 11.65 | 12.14 |
| 25.00 | 10.59 | 11.01 | 11.00 | 11.10 | 11.36 |
| 30.00 | 10.10 | 10.68 | 10.68 | 10.54 | 10.87 |
| 35.00 | 9.62 | 10.36 | 10.35 | 10.07 | 10.40 |
| 40.00 | 9.15 | 9.89 | 9.93 | 9.63 | 9.93 |
| 45.00 | 8.68 | 9.46 | 9.49 | 9.24 | 9.46 |
| 50.00 | 8.21 | 9.07 | 9.07 | 8.87 | 8.99 |
| 54.80 | 7.77 | — | — | — | — |
| 55.00 | | 8.66 | 8.67 | 8.53 | 8.52 |
| 57.53 | | 8.48 | — | — | — |
| 57.63 | | | 8.48 | — | — |
| 57.96 | | | | 8.36 | — |
| 58.26 | | | | | 8.22 |

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 1g

## MAPLHGR VERSUS AVERAGE PLANAR EXPOSURE
## Bundle Type: GE11-P9CUB407-14GZ-120T-146-T-2503 (GE11)

| Average Planar Exposure, GWd/ST | MAPLHGR Limits (kw/ft) | | | | |
|---|---|---|---|---|---|
| | Lattice 5230 | Lattice 5235 | Lattice 5239 | Lattice 5240 | Lattice 5238 |
| 0.00 | 12.76 | 10.98 | 11.04 | 10.93 | 13.38 |
| 0.20 | 12.69 | 11.03 | 11.08 | 10.99 | 13.35 |
| 1.00 | 12.52 | 11.10 | 11.17 | 11.08 | 13.26 |
| 2.00 | 12.46 | 11.19 | 11.28 | 11.21 | 13.23 |
| 3.00 | 12.46 | 11.29 | 11.40 | 11.35 | 13.24 |
| 4.00 | 12.49 | 11.38 | 11.51 | 11.48 | 13.27 |
| 5.00 | 12.52 | 11.48 | 11.63 | 11.62 | 13.29 |
| 6.00 | 12.55 | 11.58 | 11.74 | 11.74 | 13.32 |
| 7.00 | 12.58 | 11.68 | 11.84 | 11.86 | 13.34 |
| 8.00 | 12.60 | 11.79 | 11.93 | 11.98 | 13.36 |
| 9.00 | 12.62 | 11.89 | 12.03 | 12.09 | 13.37 |
| 10.00 | 12.63 | 12.00 | 12.13 | 12.22 | 13.37 |
| 12.50 | 12.48 | 11.96 | 12.10 | 12.25 | 13.33 |
| 15.00 | 12.09 | 11.83 | 11.97 | 12.16 | 12.94 |
| 17.50 | 11.70 | 11.71 | 11.79 | 11.95 | 12.54 |
| 20.00 | 11.30 | 11.49 | 11.51 | 11.65 | 12.14 |
| 25.00 | 10.59 | 11.01 | 11.00 | 11.10 | 11.36 |
| 30.00 | 10.10 | 10.68 | 10.68 | 10.54 | 10.87 |
| 35.00 | 9.62 | 10.36 | 10.35 | 10.07 | 10.40 |
| 40.00 | 9.15 | 9.89 | 9.93 | 9.64 | 9.93 |
| 45.00 | 8.68 | 9.46 | 9.49 | 9.24 | 9.46 |
| 50.00 | 8.21 | 9.07 | 9.07 | 8.87 | 8.99 |
| 54.80 | 7.77 | --- | --- | --- | --- |
| 55.00 | | 8.66 | 8.67 | 8.53 | 8.52 |
| 57.53 | | 8.48 | --- | --- | --- |
| 57.61 | | | 8.48 | --- | --- |
| 57.95 | | | | 8.36 | --- |
| 58.26 | | | | | 8.22 |

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 1h

## MAPLHGR VERSUS AVERAGE PLANAR EXPOSURE
## Bundle Type: GE14-P10CNAB406-15GZ-120T-150-T-2674 (GE14C)

| Average Planar Exposure, GWd/ST | MAPLHGR Limits (kw/ft) | | | | | | |
|---|---|---|---|---|---|---|---|
| | Lattice 6101 | Lattice 6102 | Lattice 6103 | Lattice 6104 | Lattice 6105 | Lattice 6106 | Lattice 6107 |
| 0.00 | 11.42 | 9.75 | 10.05 | 10.07 | 9.97 | 11.82 | 12.11 |
| 0.20 | 11.33 | 9.82 | 10.11 | 10.12 | 10.03 | 11.77 | 12.08 |
| 1.00 | 11.10 | 9.92 | 10.19 | 10.22 | 10.12 | 11.61 | 11.97 |
| 2.00 | 11.01 | 10.04 | 10.29 | 10.35 | 10.26 | 11.56 | 11.95 |
| 3.00 | 11.00 | 10.16 | 10.39 | 10.46 | 10.41 | 11.57 | 11.96 |
| 4.00 | 11.02 | 10.28 | 10.50 | 10.58 | 10.56 | 11.60 | 11.99 |
| 5.00 | 11.04 | 10.40 | 10.60 | 10.70 | 10.73 | 11.63 | 12.02 |
| 6.00 | 11.07 | 10.53 | 10.70 | 10.83 | 10.86 | 11.67 | 12.05 |
| 7.00 | 11.09 | 10.66 | 10.81 | 10.96 | 10.99 | 11.69 | 12.08 |
| 8.00 | 11.11 | 10.79 | 10.91 | 11.09 | 11.13 | 11.72 | 12.10 |
| 9.00 | 11.13 | 10.93 | 11.02 | 11.22 | 11.25 | 11.73 | 12.11 |
| 10.00 | 11.14 | 11.07 | 11.13 | 11.36 | 11.35 | 11.75 | 12.12 |
| 11.00 | 11.15 | 11.20 | 11.25 | 11.49 | 11.45 | 11.76 | 12.12 |
| 12.00 | 11.14 | 11.25 | 11.30 | 11.57 | 11.53 | 11.76 | 12.12 |
| 13.00 | 11.02 | 11.26 | 11.27 | 11.54 | 11.51 | 11.70 | 12.11 |
| 14.00 | 10.89 | 11.23 | 11.23 | 11.50 | 11.48 | 11.58 | 11.98 |
| 14.51 | 10.83 | 11.20 | 11.20 | 11.47 | 11.46 | 11.51 | 11.92 |
| 15.00 | 10.76 | 11.18 | 11.18 | 11.44 | 11.43 | 11.45 | 11.85 |
| 17.00 | 10.50 | 11.06 | 11.07 | 11.30 | 11.30 | 11.19 | 11.58 |
| 19.13 | 10.22 | 10.89 | 10.91 | 11.11 | 11.12 | 10.90 | 11.30 |
| 20.00 | 10.11 | 10.82 | 10.84 | 11.04 | 11.04 | 10.79 | 11.18 |
| 25.00 | 9.46 | 10.36 | 10.38 | 10.55 | 10.56 | 10.13 | 10.52 |
| 30.00 | 8.81 | 9.88 | 9.90 | 10.06 | 10.07 | 9.48 | 9.87 |
| 35.00 | 8.17 | 9.40 | 9.42 | 9.58 | 9.60 | 8.84 | 9.23 |
| 40.00 | 7.53 | 8.91 | 8.93 | 9.09 | 9.11 | 8.20 | 8.60 |
| 45.00 | 6.90 | 8.40 | 8.42 | 8.58 | 8.60 | 7.57 | 7.97 |
| 50.00 | 5.13 | 7.86 | 7.87 | 8.04 | 8.06 | 6.84 | 7.34 |
| 51.90 | 4.15 | -- | -- | -- | -- | -- | -- |
| 54.81 | | -- | -- | -- | -- | 4.36 | -- |
| 55.00 | | 5.98 | 5.94 | 6.41 | 6.44 | | 5.27 |
| 56.52 | | -- | -- | -- | -- | | 4.49 |
| 57.19 | | -- | 4.85 | -- | -- | | |
| 57.28 | | 4.84 | | -- | -- | | |
| 57.61 | | | | 5.11 | 5.13 | | |
| 58.06 | | | | 4.88 | -- | | |
| 58.07 | | | | | 4.90 | | |

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 1i

## MAPLHGR VERSUS AVERAGE PLANAR EXPOSURE
## Bundle Type: GE14-P10CNAB404-15GZ-120T-150-T-2675 (GE14C)

| Average Planar Exposure, GWd/ST | MAPLHGR Limits (kw/ft) | | | | | | |
|---|---|---|---|---|---|---|---|
| | Lattice 6101 | Lattice 6108 | Lattice 6109 | Lattice 6110 | Lattice 6111 | Lattice 6106 | Lattice 6112 |
| 0.00 | 11.42 | 9.72 | 9.91 | 9.95 | 9.84 | 11.82 | 12.37 |
| 0.20 | 11.33 | 9.78 | 9.97 | 10.01 | 9.91 | 11.77 | 12.34 |
| 1.00 | 11.10 | 9.87 | 10.05 | 10.11 | 10.01 | 11.61 | 12.24 |
| 2.00 | 11.01 | 9.98 | 10.18 | 10.26 | 10.17 | 11.56 | 12.20 |
| 3.00 | 11.00 | 10.12 | 10.31 | 10.42 | 10.33 | 11.57 | 12.21 |
| 4.00 | 11.02 | 10.29 | 10.45 | 10.59 | 10.51 | 11.60 | 12.24 |
| 5.00 | 11.04 | 10.44 | 10.60 | 10.77 | 10.70 | 11.63 | 12.26 |
| 6.00 | 11.07 | 10.61 | 10.75 | 10.95 | 10.89 | 11.67 | 12.28 |
| 7.00 | 11.09 | 10.76 | 10.91 | 11.14 | 11.10 | 11.69 | 12.30 |
| 8.00 | 11.11 | 10.89 | 11.04 | 11.28 | 11.31 | 11.72 | 12.32 |
| 9.00 | 11.13 | 11.02 | 11.16 | 11.42 | 11.52 | 11.73 | 12.33 |
| 10.00 | 11.14 | 11.16 | 11.27 | 11.56 | 11.67 | 11.75 | 12.33 |
| 11.00 | 11.15 | 11.29 | 11.39 | 11.71 | 11.76 | 11.76 | 12.34 |
| 12.00 | 11.14 | 11.35 | 11.46 | 11.85 | 11.85 | 11.76 | 12.34 |
| 13.00 | 11.02 | 11.35 | 11.46 | 11.87 | 11.84 | 11.70 | 12.34 |
| 14.00 | 10.89 | 11.34 | 11.45 | 11.81 | 11.78 | 11.58 | 12.23 |
| 14.51 | 10.83 | 11.33 | 11.44 | 11.78 | 11.75 | 11.51 | 12.17 |
| 15.00 | 10.76 | 11.33 | 11.42 | 11.74 | 11.72 | 11.45 | 12.10 |
| 17.00 | 10.50 | 11.23 | 11.31 | 11.57 | 11.55 | 11.19 | 11.84 |
| 19.13 | 10.22 | 11.08 | 11.12 | 11.35 | 11.34 | 10.90 | 11.56 |
| 20.00 | 10.11 | 11.01 | 11.04 | 11.26 | 11.25 | 10.79 | 11.44 |
| 25.00 | 9.46 | 10.52 | 10.53 | 10.73 | 10.72 | 10.13 | 10.78 |
| 30.00 | 8.81 | 10.02 | 10.03 | 10.21 | 10.20 | 9.48 | 10.14 |
| 35.00 | 8.17 | 9.51 | 9.53 | 9.69 | 9.70 | 8.84 | 9.50 |
| 40.00 | 7.53 | 8.99 | 9.02 | 9.18 | 9.19 | 8.20 | 8.87 |
| 45.00 | 6.90 | 8.47 | 8.49 | 8.65 | 8.67 | 7.57 | 8.24 |
| 50.00 | 5.13 | 7.92 | 7.93 | 8.10 | 8.12 | 6.84 | 7.61 |
| 51.90 | 4.15 | -- | -- | -- | -- | -- | -- |
| 54.81 | | -- | -- | -- | -- | 4.36 | -- |
| 55.00 | | 6.14 | 6.12 | 6.68 | 6.75 | | 5.95 |
| 57.52 | | -- | 4.85 | -- | -- | | -- |
| 57.60 | | 4.84 | | -- | -- | | -- |
| 57.61 | | | | 5.37 | 5.44 | | 4.61 |
| 57.68 | | | | -- | -- | | 4.57 |
| 58.58 | | | | 4.89 | -- | | |
| 58.71 | | | | | 4.89 | | |

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 1j

## MAPLHGR VERSUS AVERAGE PLANAR EXPOSURE
## Bundle Type: GE14-P10CNAB403-17GZ-120T-150-T-2676 (GE14C)

| Average Planar Exposure, GWd/ST | MAPLHGR Limits (kw/ft) | | | | | | |
|---|---|---|---|---|---|---|---|
| | Lattice 6101 | Lattice 6113 | Lattice 6114 | Lattice 6115 | Lattice 6116 | Lattice 6106 | Lattice 6117 |
| 0.00 | 11.42 | 9.60 | 9.76 | 9.67 | 9.52 | 11.82 | 12.29 |
| 0.20 | 11.33 | 9.67 | 9.81 | 9.76 | 9.62 | 11.77 | 12.26 |
| 1.00 | 11.10 | 9.76 | 9.90 | 9.88 | 9.75 | 11.61 | 12.16 |
| 2.00 | 11.01 | 9.89 | 10.02 | 10.05 | 9.92 | 11.56 | 12.14 |
| 3.00 | 11.00 | 10.02 | 10.13 | 10.19 | 10.09 | 11.57 | 12.15 |
| 4.00 | 11.02 | 10.16 | 10.26 | 10.34 | 10.28 | 11.60 | 12.18 |
| 5.00 | 11.04 | 10.30 | 10.38 | 10.48 | 10.47 | 11.63 | 12.20 |
| 6.00 | 11.07 | 10.44 | 10.51 | 10.64 | 10.65 | 11.67 | 12.23 |
| 7.00 | 11.09 | 10.58 | 10.64 | 10.80 | 10.82 | 11.69 | 12.25 |
| 8.00 | 11.11 | 10.73 | 10.78 | 10.96 | 10.99 | 11.72 | 12.27 |
| 9.00 | 11.13 | 10.88 | 10.91 | 11.13 | 11.16 | 11.73 | 12.28 |
| 10.00 | 11.14 | 11.03 | 11.05 | 11.29 | 11.34 | 11.75 | 12.28 |
| 11.00 | 11.15 | 11.18 | 11.19 | 11.46 | 11.50 | 11.76 | 12.29 |
| 12.00 | 11.14 | 11.22 | 11.23 | 11.56 | 11.58 | 11.76 | 12.29 |
| 13.00 | 11.02 | 11.24 | 11.25 | 11.57 | 11.55 | 11.70 | 12.28 |
| 14.00 | 10.89 | 11.25 | 11.25 | 11.51 | 11.50 | 11.58 | 12.17 |
| 14.51 | 10.83 | 11.22 | 11.22 | 11.48 | 11.47 | 11.51 | 12.11 |
| 15.00 | 10.76 | 11.19 | 11.20 | 11.44 | 11.44 | 11.45 | 12.04 |
| 17.00 | 10.50 | 11.06 | 11.07 | 11.27 | 11.28 | 11.19 | 11.78 |
| 19.13 | 10.22 | 10.88 | 10.88 | 11.07 | 11.07 | 10.90 | 11.49 |
| 20.00 | 10.11 | 10.81 | 10.81 | 10.99 | 10.99 | 10.79 | 11.38 |
| 25.00 | 9.46 | 10.33 | 10.33 | 10.49 | 10.50 | 10.13 | 10.72 |
| 30.00 | 8.81 | 9.85 | 9.85 | 10.00 | 10.01 | 9.48 | 10.07 |
| 35.00 | 8.17 | 9.37 | 9.37 | 9.52 | 9.54 | 8.84 | 9.43 |
| 40.00 | 7.53 | 8.88 | 8.88 | 9.03 | 9.05 | 8.20 | 8.80 |
| 45.00 | 6.90 | 8.37 | 8.37 | 8.53 | 8.55 | 7.57 | 8.17 |
| 50.00 | 5.13 | 7.83 | 7.84 | 7.99 | 8.02 | 6.84 | 7.54 |
| 51.90 | 4.15 | -- | -- | -- | -- | -- | -- |
| 54.81 | | -- | -- | -- | -- | 4.36 | -- |
| 55.00 | | 5.88 | 5.91 | 6.38 | 6.40 | | 5.78 |
| 57.11 | | 4.83 | -- | -- | -- | | -- |
| 57.15 | | | 4.83 | -- | -- | | -- |
| 57.39 | | | | -- | -- | | 4.55 |
| 57.61 | | | | 5.07 | 5.10 | | |
| 58.04 | | | | 4.86 | -- | | |
| 58.05 | | | | | 4.88 | | |

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 1k

## MAPLHGR VERSUS AVERAGE PLANAR EXPOSURE
## Bundle Type: GE11-P9CUB349-10GZ1-120M-146-T (GE11)

| Average Planar Exposure, GWd/ST | MAPLHGR Limits (kw/ft) | | | | |
|---|---|---|---|---|---|
| | Lattice 1941 | Lattice 1942 | Lattice 1943 | Lattice 1944 | Lattice 1723 and 1945 |
| 0.00 | 11.41 | 11.62 | 11.11 | 11.35 | 12.83 |
| 0.20 | 11.46 | 11.67 | 11.17 | 11.40 | 12.77 |
| 1.00 | 11.58 | 11.78 | 11.31 | 11.53 | 12.61 |
| 2.00 | 11.75 | 11.93 | 11.52 | 11.72 | 12.56 |
| 3.00 | 11.93 | 12.10 | 11.74 | 11.93 | 12.57 |
| 4.00 | 12.09 | 12.24 | 11.98 | 12.15 | 12.60 |
| 5.00 | 12.25 | 12.39 | 12.23 | 12.38 | 12.63 |
| 6.00 | 12.42 | 12.53 | 12.49 | 12.63 | 12.67 |
| 7.00 | 12.59 | 12.61 | 12.73 | 12.84 | 12.70 |
| 8.00 | 12.73 | 12.69 | 12.78 | 12.90 | 12.72 |
| 9.00 | 12.83 | 12.78 | 12.82 | 12.92 | 12.74 |
| 10.00 | 12.89 | 12.87 | 12.85 | 12.93 | 12.75 |
| 12.50 | 12.84 | 12.86 | 12.77 | 12.80 | 12.62 |
| 15.00 | 12.48 | 12.49 | 12.39 | 12.40 | 12.24 |
| 17.50 | 12.12 | 12.13 | 12.00 | 12.00 | 11.84 |
| 20.00 | 11.76 | 11.76 | 11.61 | 11.61 | 11.45 |
| 25.00 | 11.03 | 11.03 | 10.84 | 10.84 | 10.66 |
| 30.00 | 10.31 | 10.31 | 10.10 | 10.10 | 9.88 |
| 35.00 | 9.59 | 9.60 | 9.40 | 9.41 | 9.11 |
| 40.00 | 8.89 | 8.90 | 8.75 | 8.75 | 8.34 |
| 45.00 | 8.20 | 8.21 | 8.12 | 8.13 | 7.58 |
| 50.00 | 7.51 | 7.51 | 7.51 | 7.52 | 6.82 |
| 55.00 | 6.81 | 6.81 | 6.89 | 6.90 | 6.06 |
| 55.45 | — | — | — | — | 5.99 |
| 57.39 | — | — | 6.58 | — | |
| 57.45 | — | — | | 6.59 | |
| 57.66 | — | 6.43 | | | |
| 57.71 | 6.43 | | | | |

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 11

## MAPLHGR VERSUS AVERAGE PLANAR EXPOSURE
## Bundle Type: GE11-P9CUB375-12GZ-120T-146-T (GE11)

| Average Planar Exposure, GWd/ST | MAPLHGR Limits (kw/ft) | | | | | |
|---|---|---|---|---|---|---|
| | Lattice 2275 | Lattice 2270 | Lattice 2271 | Lattice 2272 | Lattice 2273 | Lattice 2274 |
| 0.00 | 12.78 | 11.34 | 11.57 | 11.12 | 11.37 | 13.38 |
| 0.20 | 12.72 | 11.39 | 11.61 | 11.18 | 11.42 | 13.35 |
| 1.00 | 12.55 | 11.49 | 11.68 | 11.29 | 11.52 | 13.26 |
| 2.00 | 12.49 | 11.63 | 11.76 | 11.46 | 11.67 | 13.23 |
| 3.00 | 12.49 | 11.78 | 11.85 | 11.64 | 11.84 | 13.24 |
| 4.00 | 12.52 | 11.94 | 11.94 | 11.83 | 11.97 | 13.27 |
| 5.00 | 12.55 | 12.02 | 12.03 | 12.02 | 12.07 | 13.29 |
| 6.00 | 12.58 | 12.11 | 12.12 | 12.13 | 12.17 | 13.32 |
| 7.00 | 12.60 | 12.20 | 12.21 | 12.24 | 12.27 | 13.34 |
| 8.00 | 12.63 | 12.30 | 12.31 | 12.36 | 12.38 | 13.35 |
| 9.00 | 12.64 | 12.39 | 12.41 | 12.48 | 12.49 | 13.36 |
| 10.00 | 12.65 | 12.49 | 12.52 | 12.61 | 12.61 | 13.37 |
| 12.50 | 12.51 | 12.52 | 12.55 | 12.71 | 12.70 | 13.33 |
| 15.00 | 12.12 | 12.37 | 12.38 | 12.55 | 12.55 | 12.94 |
| 17.50 | 11.72 | 12.09 | 12.10 | 12.26 | 12.26 | 12.54 |
| 20.00 | 11.33 | 11.73 | 11.74 | 11.93 | 11.93 | 12.15 |
| 25.00 | 10.62 | 11.05 | 11.07 | 11.23 | 11.25 | 11.36 |
| 30.00 | 10.13 | 10.62 | 10.63 | 10.75 | 10.76 | 10.88 |
| 35.00 | 9.65 | 10.19 | 10.20 | 10.29 | 10.30 | 10.40 |
| 40.00 | 9.18 | 9.77 | 9.78 | 9.86 | 9.87 | 9.93 |
| 45.00 | 8.71 | 9.36 | 9.37 | 9.47 | 9.47 | 9.46 |
| 50.00 | 8.24 | 8.96 | 8.97 | 9.09 | 9.10 | 9.00 |
| 54.96 | 7.78 | — | — | — | — | — |
| 55.00 | | 8.56 | 8.57 | 8.73 | 8.74 | 8.53 |
| 57.43 | | — | 8.38 | — | — | — |
| 57.56 | | 8.36 | | — | — | — |
| 58.27 | | | | — | 8.50 | — |
| 58.32 | | | | — | | 8.22 |
| 58.41 | | | | 8.48 | | |

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 1m

## MOST LIMITING MAPLHGR VERSUS AVERAGE PLANAR EXPOSURE

| Average Planar Exposure, GWd/ST | MAPLHGR Limits (kw/ft) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | P9CUB413 (GE11) | P9CUB414 (GE11) | P9CUB407-2382 (GE11) | P9CUB407-2383 (GE11) | P9CUB404-2501 (GE11) | P9CUB407-2502 (GE11) | P9CUB407-2503 (GE11) | P9CUB375 (GE11) |
| 0.00 | 11.43 | 11.25 | 10.97 | 10.93 | 10.93 | 10.98 | 10.93 | 11.12 |
| 0.20 | 11.46 | 11.30 | 11.02 | 10.98 | 11.00 | 11.03 | 10.99 | 11.18 |
| 1.00 | 11.53 | 11.39 | 11.10 | 11.08 | 11.13 | 11.10 | 11.08 | 11.29 |
| 2.00 | 11.61 | 11.50 | 11.19 | 11.19 | 11.32 | 11.19 | 11.19 | 11.46 |
| 3.00 | 11.69 | 11.62 | 11.29 | 11.29 | 11.53 | 11.29 | 11.29 | 11.64 |
| 4.00 | 11.77 | 11.74 | 11.38 | 11.38 | 11.66 | 11.38 | 11.38 | 11.83 |
| 5.00 | 11.86 | 11.86 | 11.48 | 11.48 | 11.73 | 11.48 | 11.48 | 12.02 |
| 6.00 | 11.94 | 11.94 | 11.58 | 11.58 | 11.80 | 11.58 | 11.58 | 12.11 |
| 7.00 | 12.03 | 12.03 | 11.69 | 11.69 | 11.88 | 11.68 | 11.68 | 12.20 |
| 8.00 | 12.11 | 12.11 | 11.79 | 11.79 | 11.96 | 11.79 | 11.79 | 12.30 |
| 9.00 | 12.20 | 12.20 | 11.90 | 11.90 | 12.04 | 11.89 | 11.89 | 12.39 |
| 10.00 | 12.29 | 12.29 | 12.00 | 12.00 | 12.12 | 12.00 | 12.00 | 12.49 |
| 12.50 | 12.26 | 12.26 | 11.96 | 11.96 | 12.05 | 11.96 | 11.96 | 12.52 |
| 15.00 | 12.11 | 12.11 | 11.84 | 11.84 | 11.89 | 11.83 | 11.83 | 12.37 |
| 17.50 | 11.90 | 11.90 | 11.71 | 11.71 | 11.73 | 11.71 | 11.71 | 12.09 |
| 20.00 | 11.61 | 11.61 | 11.49 | 11.49 | 11.47 | 11.49 | 11.49 | 11.73 |
| 25.00 | 11.08 | 11.02 | 11.01 | 11.01 | 10.97 | 11.00 | 11.00 | 11.05 |
| 30.00 | 10.44 | 10.43 | 10.54 | 10.54 | 10.64 | 10.54 | 10.54 | 10.62 |
| 35.00 | 9.96 | 9.95 | 10.07 | 10.07 | 10.17 | 10.07 | 10.07 | 10.19 |
| 40.00 | 9.52 | 9.52 | 9.63 | 9.63 | 9.70 | 9.63 | 9.64 | 9.77 |
| 45.00 | 9.14 | 9.13 | 9.24 | 9.24 | 9.27 | 9.24 | 9.24 | 9.36 |
| 50.00 | 8.80 | 8.72 | 8.87 | 8.87 | 8.88 | 8.87 | 8.87 | 8.96 |
| 55.00 | 8.48 | 8.27 | 8.53 | 8.52 | 8.52 | 8.53 | 8.53 | 8.56 |
| 57.19 | — | 8.08 | — | — | — | — | — | — |
| 57.43 | — | | — | — | — | — | — | 8.37 |
| 57.53 | — | | — | — | 8.38 | 8.38 | 8.38 | |
| 57.55 | — | | 8.38 | 8.38 | | | | |
| 58.06 | 8.33 | | | | | | | |

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 1n

## MOST LIMITING MAPLHGR VERSUS AVERAGE PLANAR EXPOSURE

| Average Planar Exposure, GWd/ST | MAPLHGR Limits (kw/ft) | | | |
|---|---|---|---|---|
| | P10CNAB406-2674 (GE14C) | P10CNAB404-2675 (GE14C) | P10CNAB403-2676 (GE14C) | P9CUB349 (GE11) |
| 0.00 | 9.75 | 9.72 | 9.52 | 11.11 |
| 0.20 | 9.82 | 9.78 | 9.62 | 11.17 |
| 1.00 | 9.92 | 9.87 | 9.75 | 11.31 |
| 2.00 | 10.04 | 9.98 | 9.89 | 11.52 |
| 3.00 | 10.16 | 10.12 | 10.02 | 11.74 |
| 4.00 | 10.28 | 10.29 | 10.16 | 11.98 |
| 5.00 | 10.40 | 10.44 | 10.30 | 12.23 |
| 6.00 | 10.53 | 10.61 | 10.44 | 12.42 |
| 7.00 | 10.66 | 10.76 | 10.58 | 12.59 |
| 8.00 | 10.79 | 10.89 | 10.73 | 12.69 |
| 9.00 | 10.93 | 11.02 | 10.88 | 12.78 |
| 10.00 | 11.07 | 11.16 | 11.03 | 12.85 |
| 11.00 | 11.20 | 11.29 | 11.18 | --- |
| 12.00 | 11.25 | 11.35 | 11.22 | --- |
| 12.50 | --- | --- | --- | 12.77 |
| 13.00 | 11.26 | 11.35 | 11.24 | --- |
| 14.00 | 11.23 | 11.34 | 11.25 | --- |
| 14.51 | 11.20 | 11.33 | 11.22 | --- |
| 15.00 | 11.18 | 11.33 | 11.19 | 12.39 |
| 17.00 | 11.06 | 11.23 | 11.06 | --- |
| 17.50 | --- | --- | --- | 12.00 |
| 19.13 | 10.89 | 11.08 | 10.88 | --- |
| 20.00 | 10.82 | 11.01 | 10.81 | 11.61 |
| 25.00 | 10.36 | 10.52 | 10.33 | 10.84 |
| 30.00 | 9.88 | 10.02 | 9.85 | 10.10 |
| 35.00 | 9.40 | 9.51 | 9.37 | 9.40 |
| 40.00 | 8.91 | 8.99 | 8.88 | 8.75 |
| 45.00 | 8.40 | 8.47 | 8.37 | 8.12 |
| 50.00 | 7.86 | 7.92 | 7.83 | 7.51 |
| 55.00 | 5.94 | 6.12 | 5.88 | 6.81 |
| 57.11 | --- | --- | 4.83 | --- |
| 57.19 | 4.85 | --- | | --- |
| 57.39 | | --- | | 6.47 |
| 57.52 | | 4.85 | | |

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.

# *NINE MILE POINT UNIT 2*
# *CORE OPERATING LIMITS REPORT*

## 2.0 MINIMUM CRITICAL POWER RATIO (ODYN OPTION B)

### 2.1 Limits for Technical Specification 3.2.2

The Minimum Critical Power Ratio (MCPR) shall be equal to or greater than the appropriate MCPR limit from Figures 2a and 2b times the K(f) shown in Figure 2c with tau (or "τ") defined as follows:

$$\tau = (\tau_{ave} - \tau_B) / (\tau_A - \tau_B)$$

where:

$\tau_A$ = 0.866 seconds, control rod average scram insertion time limit to notch 39 per Specification 3.1.4.

$$\tau_B = .672 + 1.65 * [\ N_1 / \sum_{i=1}^{n} N_i\ ]^{1/2} * .016$$

$$\tau_{ave} = (\sum_{i=1}^{n} N_i \tau_i) / (\sum_{i=1}^{n} N_i)$$

n = number of surveillance tests performed in cycle
$N_i$ = number of active control rods measured in the $i^{th}$ surveillance test
$\tau_i$ = average scram time to notch 39 of all rods measured in the $i^{th}$ surveillance test
$N_1$ = total number of active rods measured in Specification 3.1.4.1.

**NOTES:**

1. The MCPR Operating Limits in Figures 2a and 2b are based on a 1.07 Safety Limit MCPR (SLMCPR) for two recirculation loop operation and a 1.09 Safety Limit MCPR for single loop operation.
2. τ = 1.0 prior to performance of the initial scram time measurements for the cycle.
3. The GE11 Operating Limit MCPR values for EOC-RPT Out of Service are greater than or equal to the standard normal operation case, and are therefore specifically identified in Figure 2a. The GE14C Operating Limit MCPR values for Turbine Bypass Out of Service and EOC-RPT Out of Service are higher (more limiting) than for the standard normal operation case, and are therefore specifically identified in Figure 2b.The OLMCPR values for all other analyzed EOOS transient events are bounded by the Normal Operation limits.
4. For operation between 30% and 90% RTP with a backup pressure regulator out of service, additional MCPR limit requirements have been established. For operation >70% but <90% RTP maintain MCPR ≥ normal operation MCPR limit from Figures 2a and 2b divided by the fraction of rated thermal power. For operation ≥30% and ≤70% RTP the additional requirements are established in Figures 2d and 2e. There are no additional MCPR limits required for operation <30% and ≥90% RTP with a backup pressure regulator out of service.

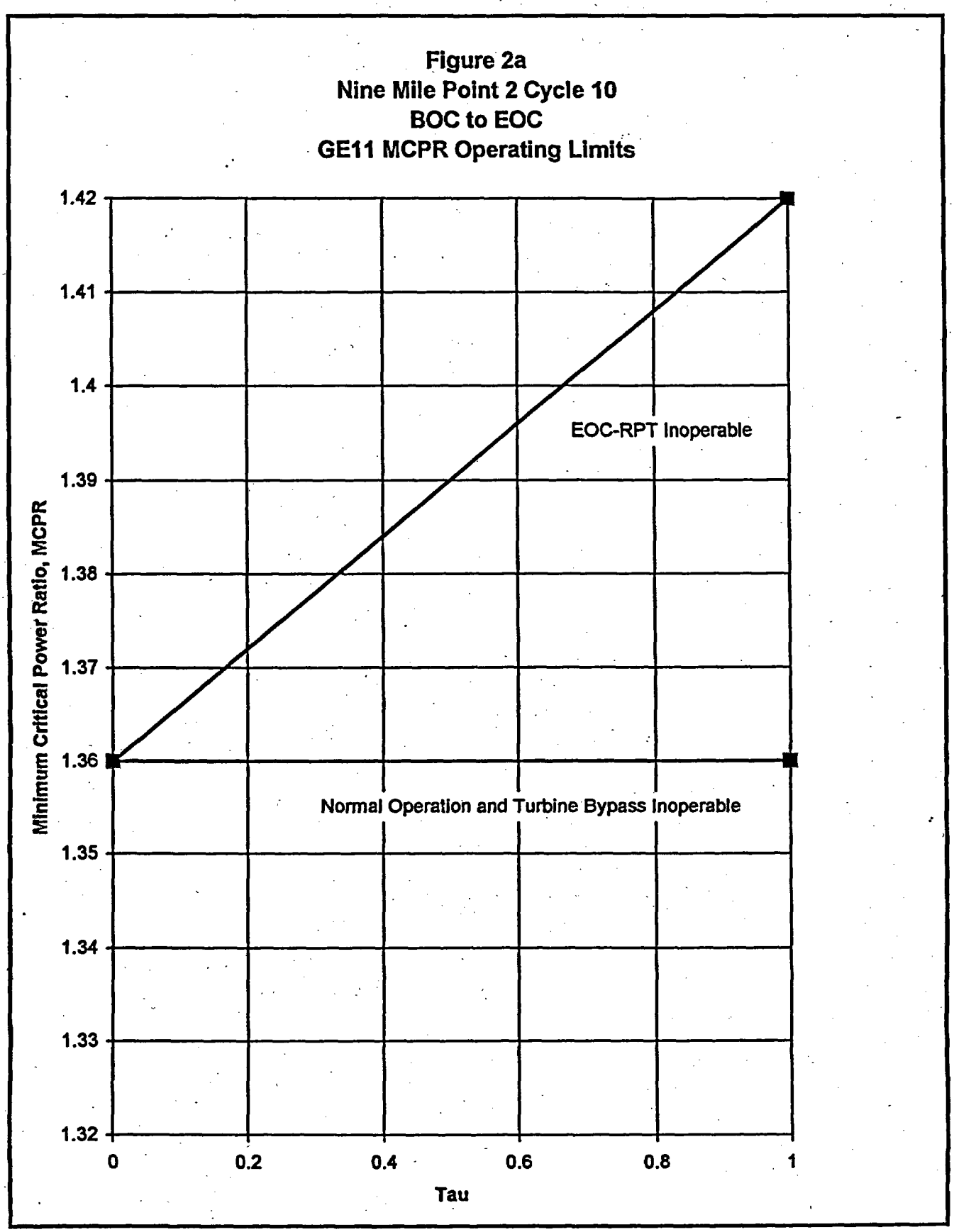
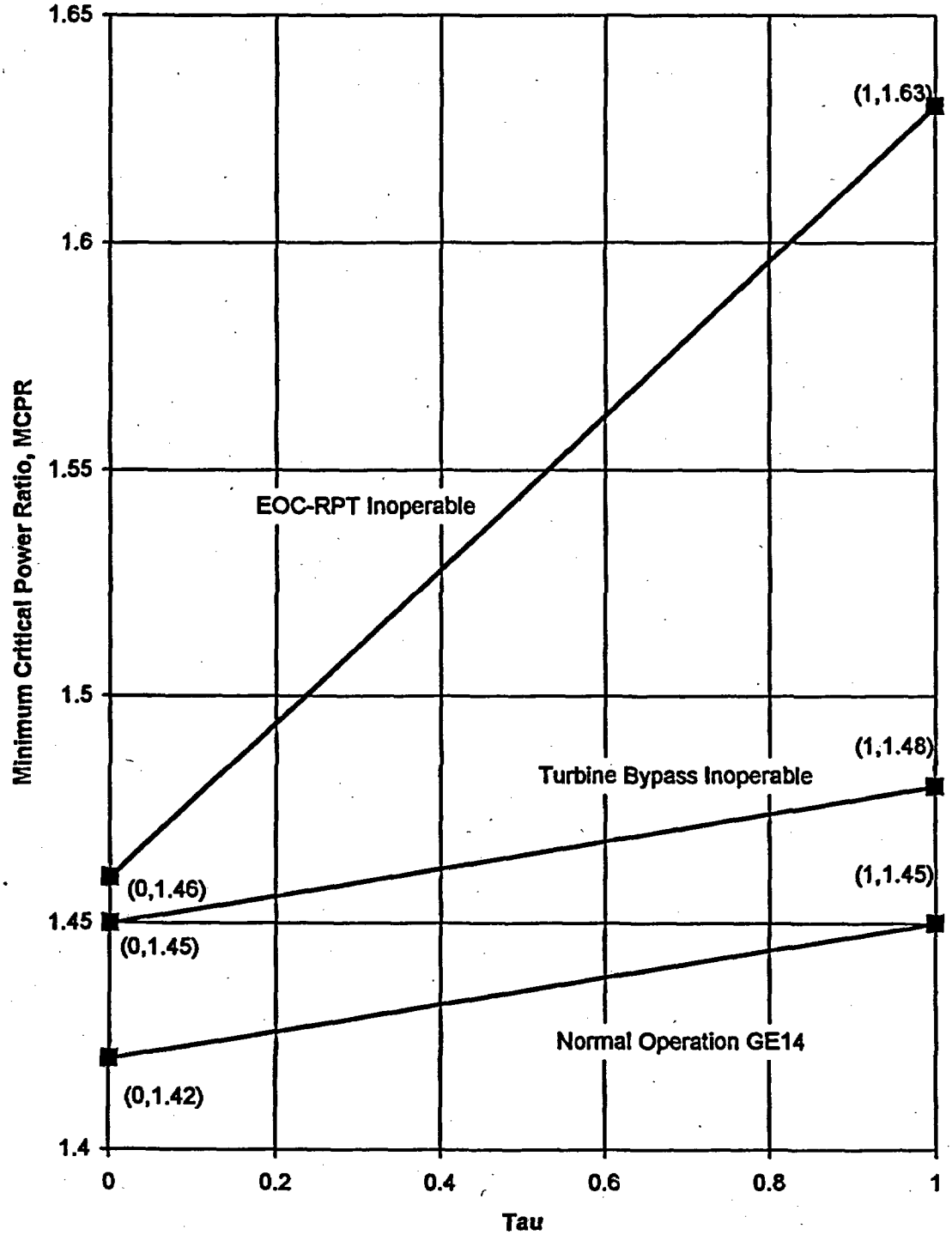


Figure 2a
Nine Mile Point 2 Cycle 10
BOC to EOC
GE11 MCPR Operating Limits
1.42
1.41
1.4
1.39
1.38
1.37
1.36
1.35
1.34
1.33
1.32
Minimum Critical Power Ratio, MCPR
EOC-RPT Inoperable
Normal Operation and Turbine Bypass Inoperable
0
0.2
0.4
0.6
0.8
1
Tau

**Figure 2b**
**Nine Mile Point 2 Cycle 10**
**BOC to EOC**
**GE14C MCPR Operating Limits**



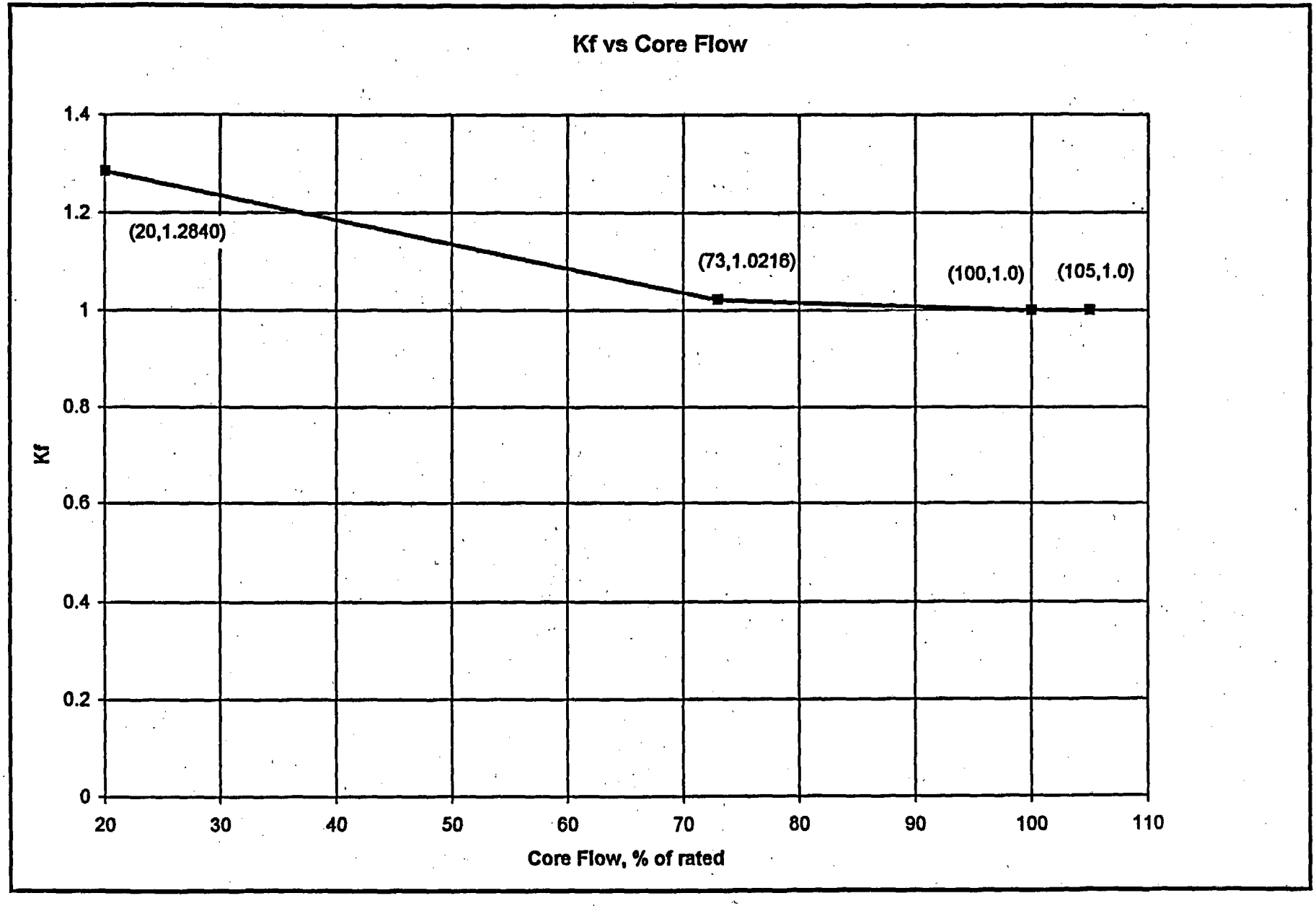

Kf vs Core Flow
1.4
1.2
1
0.8
0.6
0.4
0.2
0
Kf
(20,1.2840)
(73,1.0216)
(100,1.0)
(105,1.0)
20
30
40
50
60
70
80
90
100
110
Core Flow, % of rated

**Figure 2d**

**GE11 MCPR Limits for Operation Between 30% and 70% RTP Without a Backup Pressure Regulator**

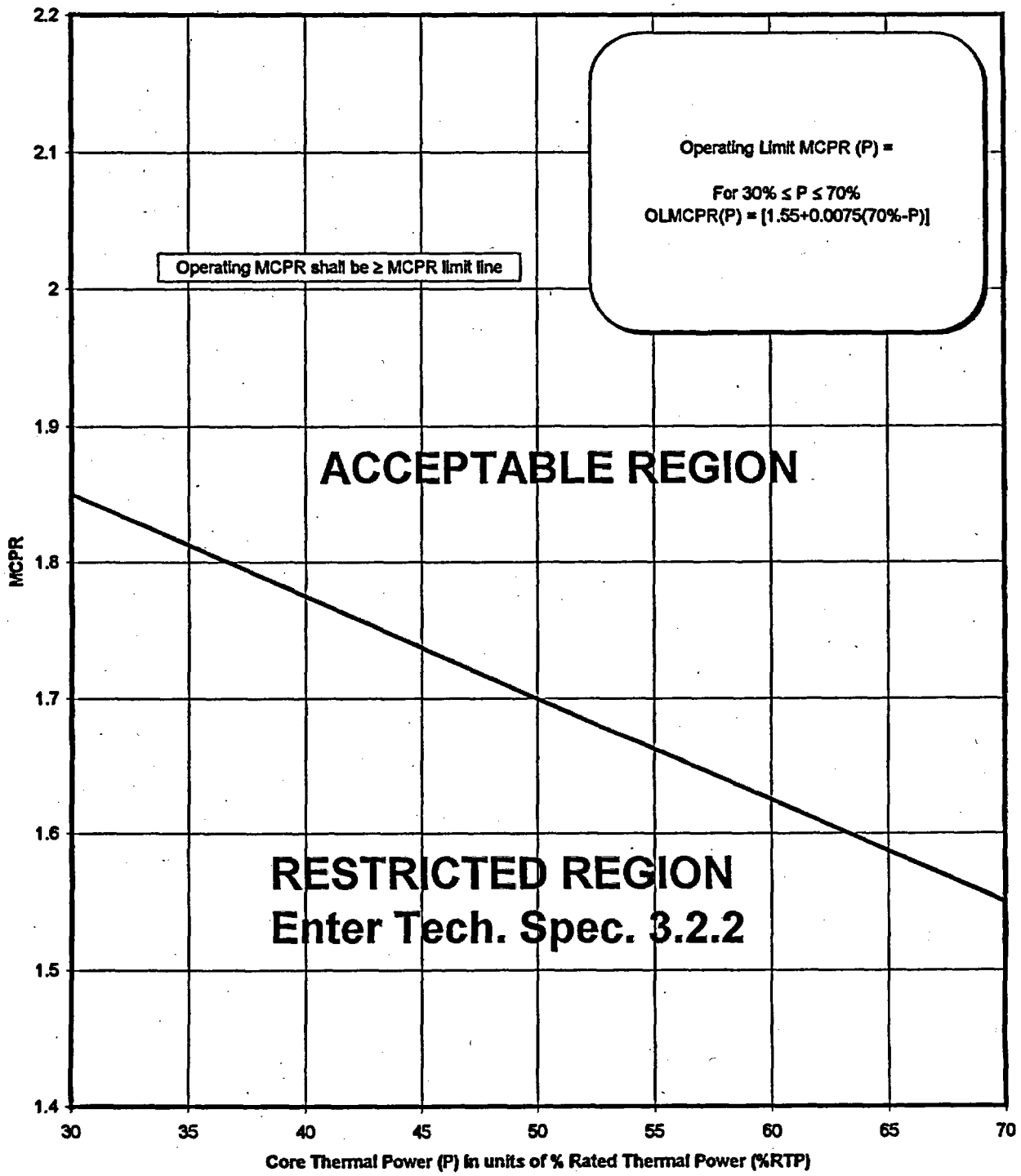
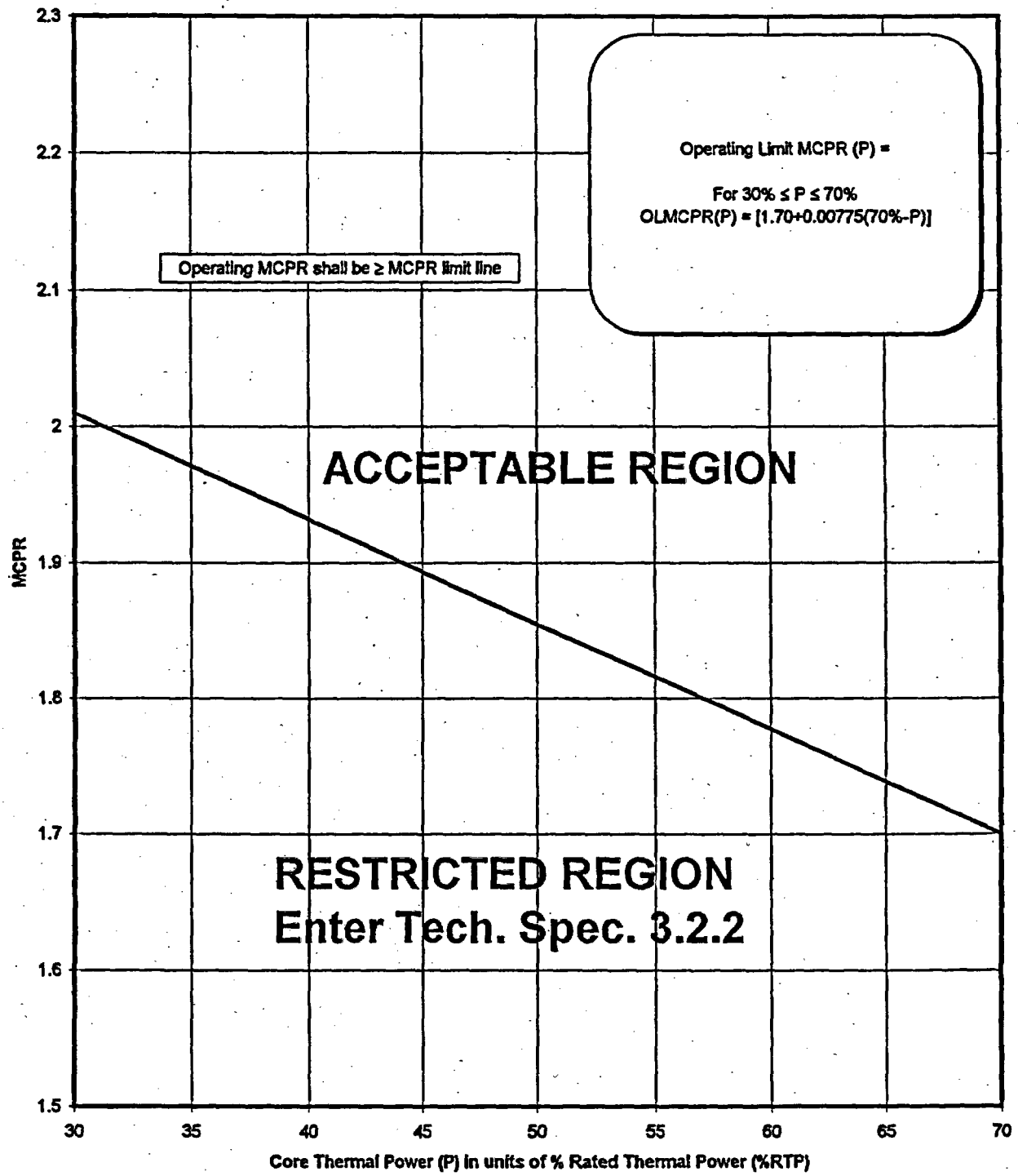


Figure 2e

GE14C MCPR Limits for Operation Between 30% and 70% RTP
Without a Backup Pressure Regulator



# *NINE MILE POINT UNIT 2*
# *CORE OPERATING LIMITS REPORT*

## 3.0 LINEAR HEAT GENERATION RATE (LHGR)

### 3.1 Limits for Technical Specification 3.2.3

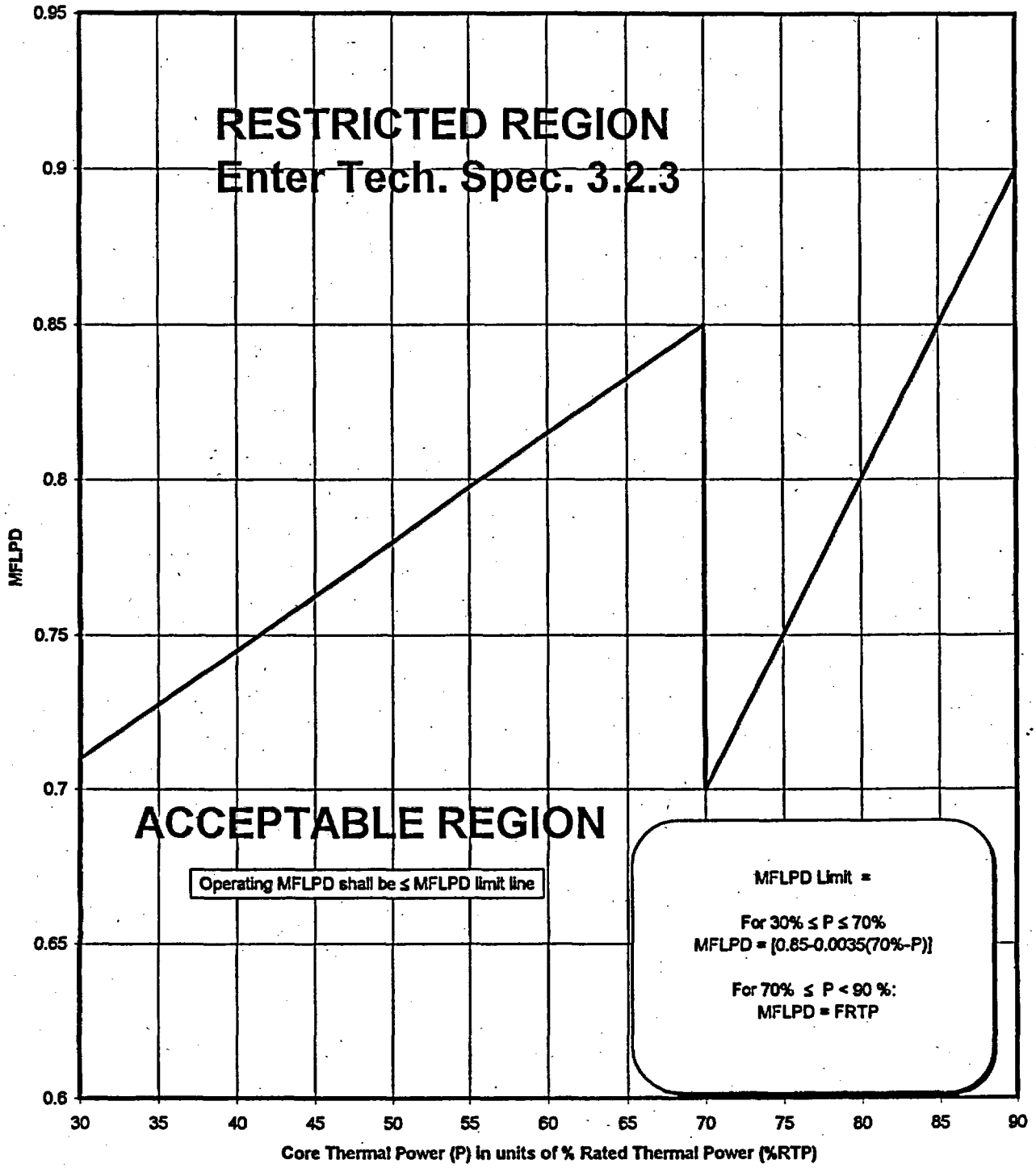
The LHGR shall not exceed the limits in the table below.

| Fuel Type | LHGR Limits |
|---|---|
| GE11 | 14.4 KW/FT |
| GE14 | 13.4 KW/FT |

**NOTE:** For operation ≥30% and <90% RTP with a backup pressure regulator out of service, additional LHGR limit requirements have been established as shown in Figure 3. There are no additional LHGR limits required for operation <30% and ≥90% RTP for operation with a backup pressure regulator out of service.

Figure 3

LHGR Limit for Operation Between 30% and 90% RTP
Without a Backup Pressure Regulator
for GE14C and GE11



# *NINE MILE POINT UNIT 2*
# *CORE OPERATING LIMITS REPORT*

## 4.0 AVERAGE POWER RANGE MONITOR SETPOINTS

### 4.1 Limits for Technical Specification Table 3.3.1.1-1 (OPRM Upscale)

ALLOWABLE VALUE $\leq$ 1.13

# *NINE MILE POINT UNIT 2*
# *CORE OPERATING LIMITS REPORT*

## 5.0 ROD BLOCK MONITOR (RBM)

### 5.1 Allowable Value for Technical Specification Table 3.3.2.1-1

| Function | Allowable Value |
|---|---|
| RBM Upscale | $\leq 0.66\ (W - \Delta W) + 47\%$ with a maximum of 113% |

**NOTE:** W = Loop Recirculation Flow as a percentage of the loop recirculation flow which produces a rated core flow of 108.5 MLB/HR. $\Delta W$ is defined as the difference in indicated drive flow (in percent of drive flow which produces rated core flow) between two loop and single loop operation at the same core flow. $\Delta W = 0$ for two loop operation. $\Delta W = 5\%$ for single loop operation.

# *NINE MILE POINT UNIT 2*
# *CORE OPERATING LIMITS REPORT*

## 6.0 REFERENCES FOR TECHNICAL SPECIFICATION

Technical Specification 5.6.5.b.1:
General Electric Standard Application for Reactor Fuel, NEDE 24011-P-A-14 and NEDE 24011-P-A-14-US (June 2000).

# *NINE MILE POINT UNIT 2*
# *CORE OPERATING LIMITS REPORT*

## 7.0 REFERENCES FOR TECHNICAL SPECIFICATION BASES

2.1.1 BASES REFERENCE 3:
General Electric Standard Application for Reactor Fuel, NEDE 24011-P-A-14 and NEDE 24011-P-A-14-US (June 2000).

2.1.1 BASES REFERENCE 4:
Supplemental Reload Licensing Report for Nine Mile Point Nuclear Station Unit 2, Reload 9, Cycle 10, 0000-0017-0888-SRLR, Rev. 0, March 2004.

3.1.1 BASES REFERENCE 7:
General Electric Standard Application for Reactor Fuel, NEDE 24011-P-A-14 and NEDE 24011-P-A-14-US (June 2000).

3.1.6 BASES REFERENCE 1:
Supplemental Reload Licensing Report for Nine Mile Point Nuclear Station Unit 2, Reload 9, Cycle 10, 0000-0017-0888-SRLR, Rev. 0, March 2004.

3.2.1 BASES REFERENCE 1:
General Electric Standard Application for Reactor Fuel, NEDE 24011-P-A-14 and NEDE 24011-P-A-14-US (June 2000).

3.2.2 BASES REFERENCE 2:
General Electric Standard Application for Reactor Fuel, NEDE 24011-P-A-14 and NEDE 24011-P-A-14-US (June 2000).

3.2.2 BASES REFERENCE 3:
Supplemental Reload Licensing Report for Nine Mile Point Nuclear Station Unit 2, Reload 9, Cycle 10, 0000-0017-0888-SRLR, Rev. 0, March 2004.

3.2.3 BASES REFERENCE 1:
General Electric Standard Application for Reactor Fuel, NEDE 24011-P-A-14 and NEDE 24011-P-A-14US (June 2000).

3.2.3 BASES REFERENCE 2:
Supplemental Reload Licensing Report for Nine Mile Point Nuclear Station Unit 2, Reload 9, Cycle 10, 0000-0017-0888-SRLR, Rev. 0, March 2004.

3.2.4 BASES REFERENCE 3:
General Electric Standard Application for Reactor Fuel, NEDE 24011-P-A-14 and NEDE 24011-P-A-14-US (June 2000).

# *NINE MILE POINT UNIT 2*
# *CORE OPERATING LIMITS REPORT*

## 8.0 SOURCE DOCUMENTS

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

| CORE OPERATING LIMIT | REFERENCE |
|---|---|
| Section 1.0 - APLHGR LIMITS | |
| Tables 1a through 1n and corresponding single loop multiplier | Lattice Dependent MAPLHGR Report for NMP2 Reload 9, Cycle 10, 0000-0017-0888-MAPL, Revision 0, March 2004, "Supplemental Reload Licensing Report for Nine Mile Point Nuclear Station Unit 2, Reload 9, Cycle 10", 0000-0017-0888-SRLR, Rev 0, March 2004, and "Engineering Report for Nine Mile Point Nuclear Station Unit 2, Reload 9, Cycle 10", 0000-0024-9933-ER, Rev 0, March 2004 |
| Section 2.0 - MCPR LIMITS | "Supplemental Reload Licensing Report for Nine Mile Point Nuclear Station Unit 2, Reload 9, Cycle 10", 0000-0017-0888-SRLR, Rev 0, March 2004, and "Engineering Report for Nine Mile Point Nuclear Station Unit 2, Reload 9, Cycle 10", 0000-0024-9933-ER, Rev 0, March 2004 |
| Section 3.0 - LHGR LIMITS | "Supplemental Reload Licensing Report for Nine Mile Point Nuclear Station Unit 2, Reload 9, Cycle 10", 0000-0017-0888-SRLR, Rev 0, March 2004 |
| Pressure Regulator Out of Service | "Engineering Report for Nine Mile Point Nuclear Station Unit 2, Reload 9, Cycle 10", 0000-0024-9933-ER, Rev 0, March 2004 |

# *NINE MILE POINT UNIT 2*
# *CORE OPERATING LIMITS REPORT*

8.0 SOURCE DOCUMENTS (Cont)

| CORE OPERATING LIMIT | REFERENCE |
|---|---|
| Section 4.0 - APRM SETPOINTS | |
| Limits for Technical Specification Table 3.3.1.1-1 (OPRM Upscale) | "Supplemental Reload Licensing Report for Nine Mile Point Station Unit 2, Reload 9, Cycle 10", 0000-0017-0888-SRLR, Rev 0, March 2004 |
| Section 5.0 - RBM SETPOINTS | GE Engineering Report for Nine Mile Point Nuclear Station Unit 2 Reload 2 Cycle 3, NFD92-016 January 1992 |