Progress Energy

MAY 15 2007

SERIAL: BSEP 07-0034

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

Subject: Brunswick Steam Electric Plant, Unit No. 1
Docket No. 50-325/License No. DPR-71
Core Operating Limits Report, Revision 1 for Unit 1 Cycle 16

Ladies and Gentlemen:

In accordance with Technical Specification (TS) 5.6.5.d, Carolina Power & Light Company (CP&L), now doing business as Progress Energy Carolinas, Inc., is submitting Revision 1 of the Core Operating Limits Report (COLR) for the Brunswick Steam Electric Plant (BSEP), Unit No. 1. TS 5.6.5.d requires that the COLR, including any mid-cycle revisions or supplements, be provided to the NRC upon issuance.

A copy of the Unit 1 Cycle 16 COLR, May 2007, Revision 1, is enclosed. The Unit 1, Cycle 16 COLR was revised to provide conservatism to the Maximum Extended Load Line Limit Analysis (MELLLA) line when operating in the Neutron Monitoring System Oscillation Power Range Monitor-enabled region during single loop operation. The COLR revision becomes effective on May 16, 2007.

Revision 0 of the COLR for BSEP, Unit 1, Cycle 16 was submitted by CP&L's letter dated March 28, 2006 (i.e., ADAMS Accession Number ML060950120).

No regulatory commitments are contained in this letter. Please refer any questions regarding this submittal to Ms. Annette H. Pope, Supervisor - Licensing/Regulatory Programs, at (910) 457-2184.

Sincerely,

Randy C Ivey

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A001

WRM/wrm

Enclosure: Brunswick Unit 1, Cycle 16, Core Operating Limits Report, May 2007, Revision 1

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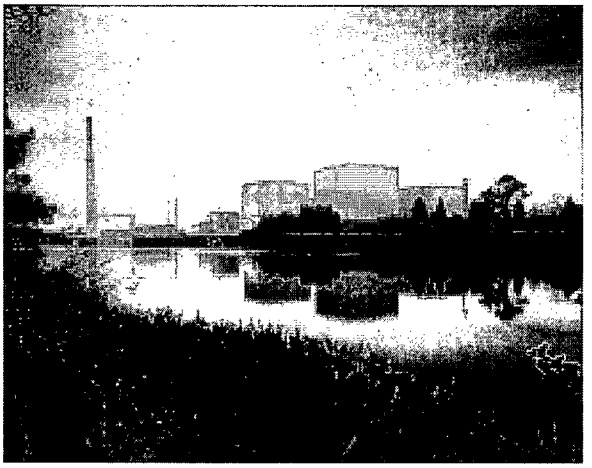
BRUNSWICK UNIT 1, CYCLE 16

CORE OPERATING LIMITS REPORT

May 2007



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CAUTION

References to COLR Figures or Tables should be made using titles only; Figure and Table numbers may change from cycle to cycle.

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LIST OF FIGURES

Introduction and Summary

CAUTION
References to COLR Figures or Tables should be made using titles only; Figure and Table numbers may change from cycle to cycle.

This report provides the values of the power distribution limits and control rod withdrawal block instrumentation setpoints (identified below) for Brunswick Unit 1, Cycle 16 as required by TS 5.6.5 for operation at up to 2923 MWt.

OPERATING LIMIT	REQUIREMENT
Average Planar Linear Heat Generation Rate (APLHGR) limits (with associated core flow and core power adjustment factors)	TS 5.6.5.a.1
Minimum Critical Power Ratio (MCPR) limits (with associated core flow and core power adjustment factors)	TS 5.6.5.a.2
Period Based Detection Algorithm (PBDA) Setpoint for Function 2.f of TS 3.3.1.1, Oscillation Power Range Monitor (OPRM)	TS 5.6.5.a.3
Allowable Values and power range setpoints for Rod Block Monitor Upscale Functions of TS 3.3.2.1	TS 5.6.5.a.4

Per TS 5.6.5.b and 5.6.5.c, these values have been determined using NRC approved methodology and are established such that all applicable limits of the plant safety analysis are met. The limits specified in this report support single loop operation (SLO) as required by TS LCO 3.4.1 and inoperable Main Turbine Bypass System as required by TS 3.7.6.

The main changes in Revision 0 were those associated with the thermal limits and Power-Flow maps from the previous cycle. Revision 1 implements changes to limit the maximum power in SLO with OPRM operable or inoperable to 50% rated thermal power (RTP).

In order to support the Stability Option III with an inoperable OPRM scram function, the following is also included in this report:

OPERATING LIMIT	REQUIREMENT
BWROG Interim Corrective Action Stability Regions	TS 3.3.1.1 LCO Condition I

This report conforms to Quality Assurance requirements as specified in Reference 1.

Single Loop Operation

Brunswick Unit 1, Cycle 16 may operate over the entire MEOD range with Single Recirculation Loop Operation (SLO) over the entire cycle as permitted by TS 3.4.1 with applicable limits specified in the COLR for TS LCO's 3.2.1, and 3.2.2. The applicable limits are:

LCO 3.2.1, Average Planar Linear Heat Generation Rate (APLHGR) Limits: per Reference 1, the Figures 9 and 10 described in the APLHGR Limits section below include a SLO limitation of 0.8 on the MAPLHGR(F) and MAPLHGR(P) multipliers.

LCO 3.2.2, Minimum Critical Power Ratio (MCPR) Limits: per Reference 1, Table 1 and Figures 11 and 12, the MCPR limits presented apply to SLO without modification.

Various indicators on the Power/Flow maps are provided not as operating limits but rather as a convenience for the operators: a single loop operation (SLO) Entry Rod Line is shown on the two loop operation maps to avoid regions of instability in the event of a pump trip; a maximum core flow line is shown on the single loop operation maps to avoid vibration problems; a maximum core power of 50% RTP in SLO mitigates a spurious trip signal which could result from APRM noise; and APRM STP Scram and Rod Block nominal trip setpoint limits are shown at the estimated core flow corresponding to the actual drive flow-based setpoints to indicate where the operator may encounter these setpoints (LCO 3.3.1.1, Reactor Protection System Instrumentation Function 2.b: Average Power Range Monitors Simulated Thermal Power - High Allowable Value).

Inoperable Main Turbine Bypass System

Brunswick Unit 1, Cycle 16 may operate with an inoperable Main Turbine Bypass System in accordance with TS 3.7.6 with applicable limits specified in the COLR for TS LCO 3.2.1 and 3.2.2. Two or more bypass valves inoperable renders the System inoperable, although the Turbine Bypass Out-of-Service (TBPOOS) analysis supports operation with all bypass valves inoperable for the entire MEOD range and up to 110°F rated equivalent feedwater temperature reduction. The system response time assumed by the safety analyses from event initiation to start of bypass valve opening is 0.10 seconds, with 80% of the bypass flow capacity achieved in 0.30 seconds. The applicable limits are as follows:

LCO 3.2.1, Average Planar Linear Heat Generation Rate (APLHGR) Limits: in accordance with Reference 1 as shown in Figure 10, TBPOOS does not require an additional reduction in the MAPLGHR(P) limits, as the Turbine Bypass Operable and Inoperable limits are identical.

LCO 3.2.2, Minimum Critical Power Ratio (MCPR) Limits: in accordance with Reference 1, TBPOOS does not require an additional increase in the MCPR(P) multiplier as shown in Figure 12, as the Turbine Bypass Operable and Inoperable limits are identical. TBPOOS requires increased MCPR limits, included in Table 1.

Feedwater Temperature Reduction

A variation within 10°F of nominal feedwater temperature (NFWT) has been evaluated as in compliance with normal operating limits. A FWT reduction of >10°F together with reactor power ≥ 30% RTP requires the use of Reduced FWT MCPR limits (Table 1) and Stability Option III limits (Figures 17 and 18). For reactor power < 30% RTP, only NFWT MCPR limits are used.

APLHGR Limits

The limiting APLHGR value for the most limiting lattice (excluding natural uranium) of each fuel type as a function of planar average exposure is given in Figures 1 through 8. These values were determined with the SAFER/GESTR LOCA methodology described in GESTAR-II (Reference 2). Figures 1 through 8 are to be used only when hand calculations are required as specified in the bases for TS 3.2.1. Hand calculated results may not match a POWERPLEX calculation since normal monitoring of the APLHGR limits with POWERPLEX uses the complete set of lattices for each fuel type provided in Reference 3. The core flow and core power adjustment factors for use in TS 3.2.1 are presented in Figures 9 and 10 which are also referred to by TS 3.4.1 and 3.7.6. For any given flow/power state, the minimum of MAPLHGR(F) determined from Figure 9 and MAPLHGR(P) determined from Figure 10 is used to determine the governing limit. Figure 10 was revised to include updated limits from Reference 11 that are based on a 65% core flow separator for the power range 23% ≤ P < 40% RTP.

MCPR Limits

The Scram Speed MCPR OPTION A, OPTION B, and non-pressurization transient MCPR limits for use in TS 3.2.2 for each fuel type as a function of cycle average exposure are given in Table 1 which is also referred to by TS 3.4.1 and 3.7.6. These values were determined with the GEMINI(TRACG) methodology and GEXL-PLUS critical power correlation described in GESTAR-II (Reference 2), and are consistent with a Safety Limit MCPR of 1.11 specified by TS 2.1.1.2.

The core flow and core power adjustment factors for use in TS 3.2.2 are presented in Figures 11 and 12 which are also referred to by TS 3.4.1 and 3.7.6. For any given power/flow state, the maximum of MCPR(F) determined from Figure 11 and MCPR(P) determined from Figure 12 is used to determine the governing limit. Figure 12 was revised to include updated limits from Reference 11 that are based on a 65% core flow separator for the power range 23% ≤ P < 40% RTP. All MCPR limits presented in Table 1, Figure 11 and Figure 12 apply to two recirculation pump operation and SLO without modification.

RBM Rod Block Instrumentation Setpoints

The nominal trip setpoints and allowable values of the control rod withdrawal block instrumentation for use in TS 3.3.2.1 (Table 3.3.2.1-1) are presented in Table 2. These values were determined to be consistent with the bases of the ARTS program and the determination of MCPR limits with the GEMINI(TRACG) methodology and the GEXL-PLUS critical power correlation described in GESTAR-II (Reference 2). Reference 8 revised certain of these setpoints to reflect changes associated with the installation of the NUMAC PRNM system. The table also includes information regarding required operability of the RBM, consistent with Technical Specification Table 3.3.2.1-1.

Stability Option III

Brunswick Unit 1 has implemented BWROG Long Term Stability Solution Option III (Oscillation Power Range Monitor-OPRM) with the methodology described in Reference 4. Plant specific analysis incorporating the Option III hardware is described in Reference 5. Reload validation has been performed in accordance with Reference 6. The resulting stability based MCPR Operating Limit is provided for two conditions as a function of OPRM amplitude setpoint in Table 3. If desirable, Table 3 would support higher stability limits for various MCPR operating limits greater than the least limiting Table 1 AOO OLMCPR values, but the suggested stability setpoints are bounded by Table 1. Table 3 shows that OLMCPR(SS) is never as limiting as Figure 11 for any listed OPRM setpoint (Amplitude Setpoint S_p). Table 3 also shows that OLMCPR(2PT) is never as limiting as Table 1 for an OPRM setpoint of 1.13. Therefore the OPRM PBDA setpoint limit referenced by function 2.f of Table 3.3.1.1-1 of Technical Specification 3.3.1.1 is 1.13 for Cycle 16. Per Table 3-2 of Reference 6, an S_p value of 1.13 supports selection of a Confirmation Count Setpoint N_p of 15 or less.

Six Power/Flow maps for use at up to 2923 MWt (Figures 13-18) were developed based on References 1 and 7 to facilitate operation under Stability Option III as implemented by function 2.f of Table 3.3.1.1-1 and LCO Condition I of Technical Specification 3.3.1.1. All six maps illustrate the region of the power/flow map above 25% power and below 60% drive flow where the system is required to be enabled.

The maps supporting an operable OPRM function 2.f (Figures 13, 15 and 17) show a Scram Avoidance Region, which is not a licensing requirement but is an operator aid to illustrate where the OPRM system may generate a scram to avoid an instability event. Figures 13 and 15 differ only in that the Figure 15 that supports SLO, indicates the maximum allowable core flow at 45 Mlbs/hr, and has the Simulated Thermal Power (STP) scram and rod block limits appropriately reduced for SLO. Note that the STP scram and rod block limits are defined in Technical Specifications, the Technical Requirements Manual, and Plant procedures, and are included in the COLR as an operator aid rather than a licensing requirement. Figure 17 differs from Figure 13 by extending the existing regions to provide additional stability protection during FWTR. Intentional operation with SLO and FWTR is prohibited.

The maps (Figures 14, 16, and 18) supporting an inoperable OPRM function 2.f show the BWROG-94078 Interim Corrective Actions stability regions required to support LCO Condition I. These figures also include a 5% Buffer Region around the Immediate Exit Region as an operator aid **[Note for Figure 16 (SLO), the 5% Buffer Region now stops at 50% power and does not fully enclose the Immediate Exit Region as on Figures 14 and 18]**. Figures 14 and 16 differ only in that Figure 16 that supports SLO, indicates the maximum allowable core flow at 45 Mlbs/hr, and has the STP scram and rod block limits appropriately reduced for SLO. Figure 18 differs from Figure 14 by extending the existing regions to provide additional stability protection during FWTR. Intentional operation with SLO and FWTR is prohibited.

Figures 15 and 16 also implement the corrective action for AR 217345 which restricts reactor power in SLO with OPRM operable or inoperable to no more than 50% RTP. This operator aid is intended to mitigate a spurious trip signal which could result from APRM noise while operating at high power levels.

References

1) BNP Design Calculation 1B21-1081; "Preparation of the B1C16 Core Operating Limits Report," Revision 1.

2) NEDE-24011-P-A-14; "GESTAR II, General Electric Standard Application for Reactor Fuel," Revision 14.

3) NEDC-31624P, "Loss-of-Coolant Accident Analysis Report for Brunswick Steam Electric Plant Unit 1 Reload 15 Cycle 16," Supplement 1, Revision 9.

4) NEDO-31960-A, "BWR Owners Group Long-Term Stability Solutions Licensing Methodology," November 1995.

5) GE-NE-C51-00251-00-01, Revision 0, "Licensing Basis Hot Bundle Oscillation Magnitude for Brunswick 1 and 2."

6) NEDO-32465-A, "Reactor Stability Detect and Suppress Solutions Licensing Basis Methodology for Reload Application," August 1996.

7) Design Calculation 0B21-1015, Revision 6, "BNP Power/Flow Maps for Stability Option III."

8) Design Calculation 1C51-0001 Revision 2, "BNP Power Range Neutron Monitoring System Setpoint Uncertainty and Scaling Calculation (1-C51-APRM 1 through 4 Loops and 1-C51-RBM-A and B Loops," October 2003).

9) NEDE-32906P-A, Revision 1, "TRACG Application for Anticipated Operational Occurrences (AOO) Transient Analyses."

10) GE-NE-0000-0022-8180-R0, "Brunswick Nuclear Station TRACG Implementation for Reload Licensing Transient Analysis," February 2004.

11) GE-NE-0000-0036-9469-R0, Revision 0, "Brunswick 1 and 2 Off-Rated Analyses Below the PLU Power Level." (Supplemented by GE-NE-0000-0051-4200-R0, "Brunswick Unit 1 and 2 Power Dependent Limits Below P-Bypass at 65% Core Flow", March 2006).

Table 1

MCPR Limits

Non-pressurization Transient MCPR Limits	
Fuel Type	Exposure Range: BOC – EOC
GE14	1.29

Pressurization Transient MCPR Limits

Turbine Bypass System Operable?	Feedwater Temperature Normal?	Fuel Type	Scram Speed MCPR Option	100% Power OLMCPR	
				Exposure Range: BOC to EOR - 4130 MWd/MT	Exposure Range: EOR-4130 MWd/MT to EOC
Operable	Normal	GE14	A	1.52	1.56
			B	1.34	1.38
Operable	Reduced	GE14	A	1.52	1.56
			B	1.34	1.38
Inoperable	Normal	GE14	A	1.61	1.61
			B	1.43	1.43
Inoperable	Reduced	GE14	A	1.70	1.70
			B	1.52	1.52

This Table is referred to by Technical Specifications 3.2.2, 3.4.1 and 3.7.6.

Table 2

RBM System Setpoints

Setpoint[a]	Trip Setpoint	Allowable Value
Lower Power Setpoint (LPSP[b])	27.7	≤ 29.0
Intermediate Power Setpoint (IPSP[b])	62.7	≤ 64.0
High Power Setpoint (HPSP[b])	82.7	≤ 84.0
Low Trip Setpoint (LTSP[c])	≤ 114.1	≤ 114.6
Intermediate Trip Setpoint (ITSP[c])	≤ 108.3	≤ 108.8
High Trip Setpoint (HTSP[c])	≤ 104.5	≤ 105.0
RBM Time Delay (t_{d2})	≤ 2.0 seconds	≤ 2.0 seconds

a RBM Operability requirements are not applicable:
(1) if MCPR ≥ 1.70; or
(2) if MCPR ≥ 1.40 and thermal power ≥ 90% Rated Thermal Power.

b Setpoints in percent of Rated Thermal Power.

c Setpoints relative to a full scale reading of 125.
For example, ≤ 114.1 means ≤ 114.1/125.0 of full scale.

This Table is referred to by Technical Specification 3.3.2.1 (Table 3.3.2.1-1).

Table 3

PBDA Setpoints

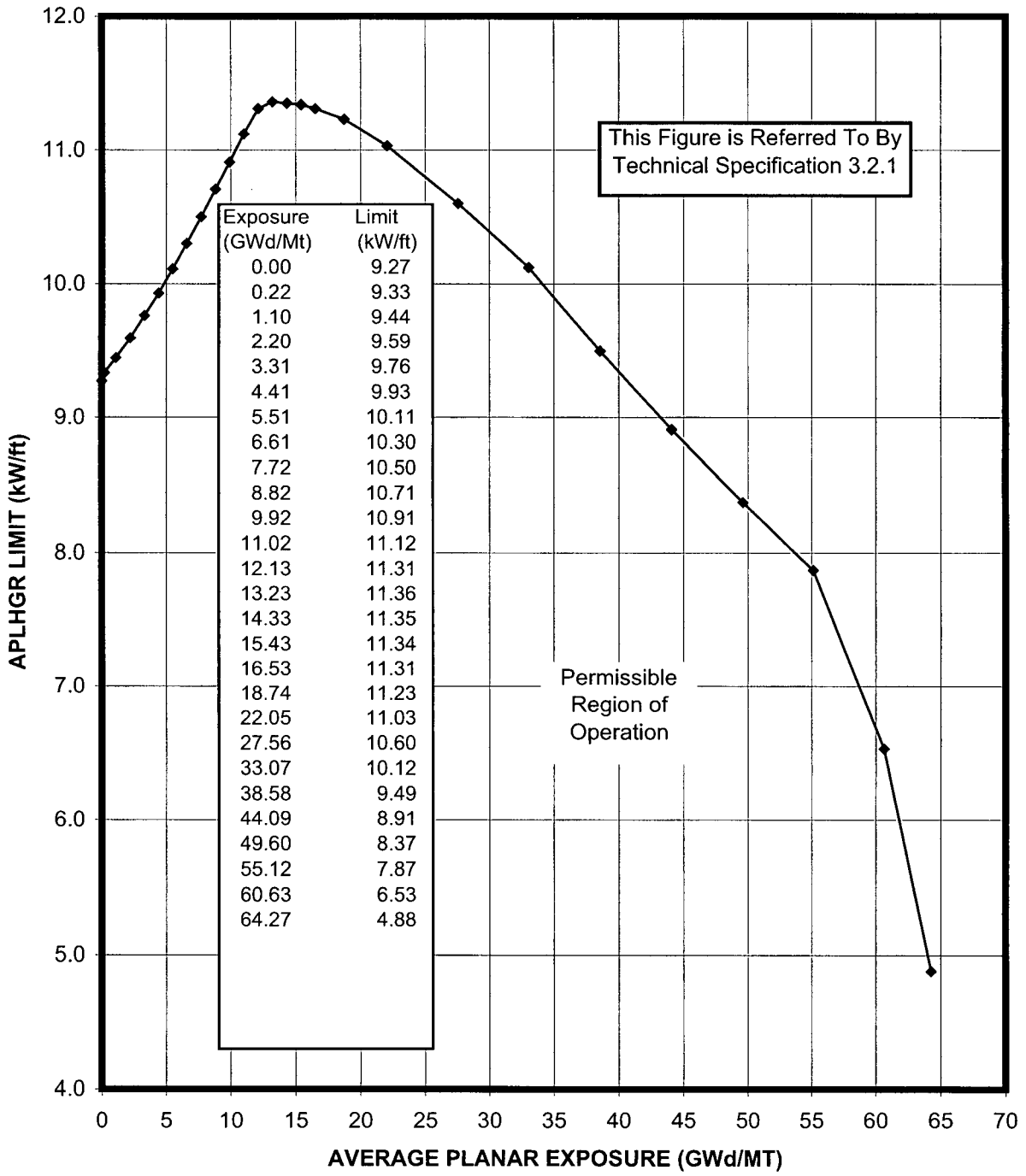
OPRM Setpoint	OLMCPR(SS)	OLMCPR(2PT)
1.05	1.2093	1.0914
1.06	1.2302	1.1103
1.07	1.2519	1.1298
1.08	1.2743	1.1501
1.09	1.2975	1.1711
1.10	1.3216	1.1928
1.11	1.3455	1.2144
1.12	1.3702	1.2367
1.13	**1.3959**	**1.2598**
1.14	1.4225	1.2839
1.15	1.4502	1.3089
Acceptance Criteria	Off-rated OLMCPR @ 45% Flow	Rated Power OLMCPR

PDBA Setpoint	**Setpoint Value**		
Amplitude S_p	**1.13**	1.14	1.15
Confirmation Count N_p	**15**	16	16

This Table is referred to by Technical Specification 3.3.1.1 (Table 3.3.1.1-1).

Figure 1

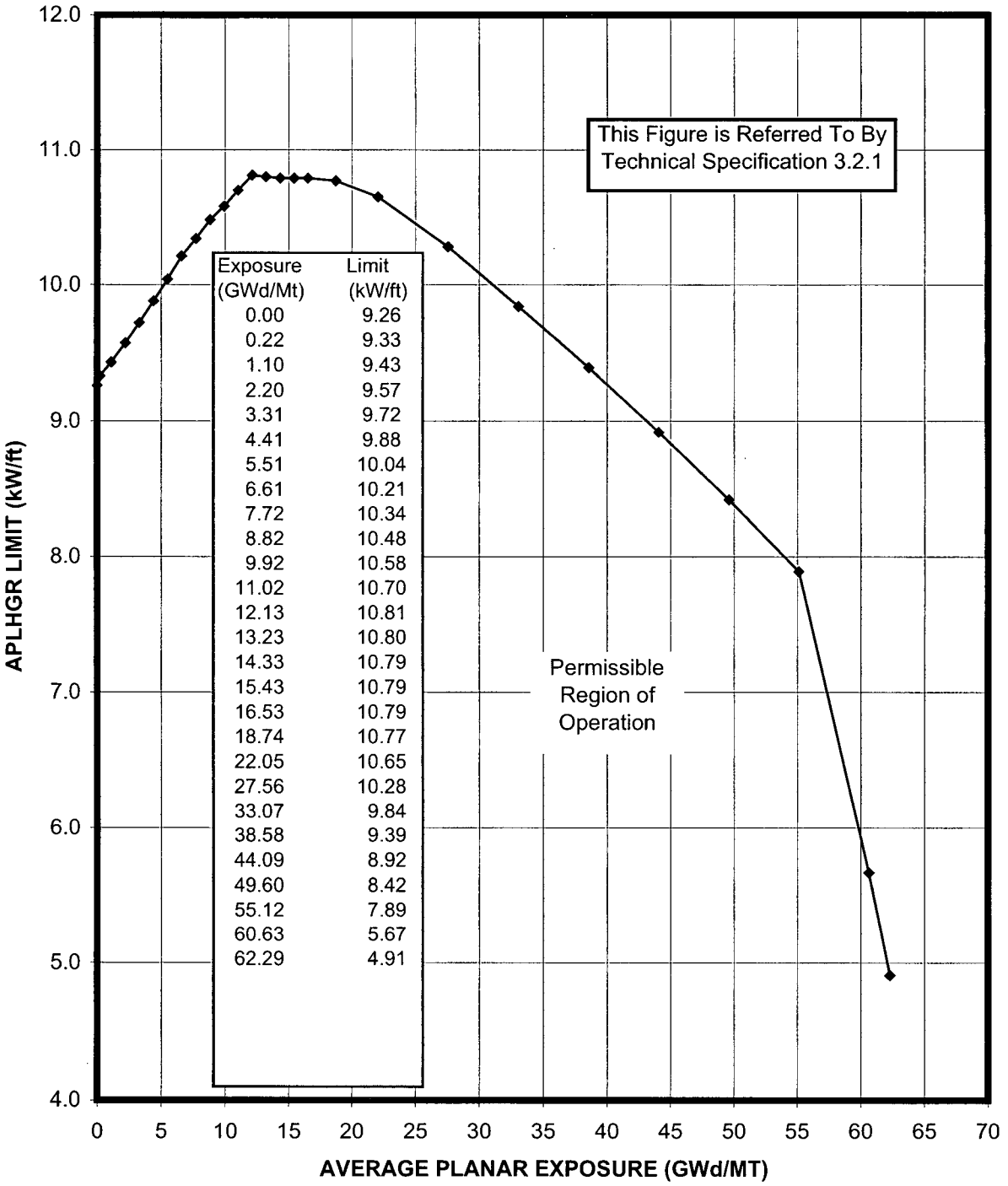
Fuel Type GE14-P10DNAB416-17GZ-100T-150-T-2496 (GE14) Average Planar Linear Heat Generation Rate (APLHGR) Limit Versus Average Planar Exposure



Exposure (GWd/Mt)	Limit (kW/ft)
0.00	9.27
0.22	9.33
1.10	9.44
2.20	9.59
3.31	9.76
4.41	9.93
5.51	10.11
6.61	10.30
7.72	10.50
8.82	10.71
9.92	10.91
11.02	11.12
12.13	11.31
13.23	11.36
14.33	11.35
15.43	11.34
16.53	11.31
18.74	11.23
22.05	11.03
27.56	10.60
33.07	10.12
38.58	9.49
44.09	8.91
49.60	8.37
55.12	7.87
60.63	6.53
64.27	4.88

Figure 2

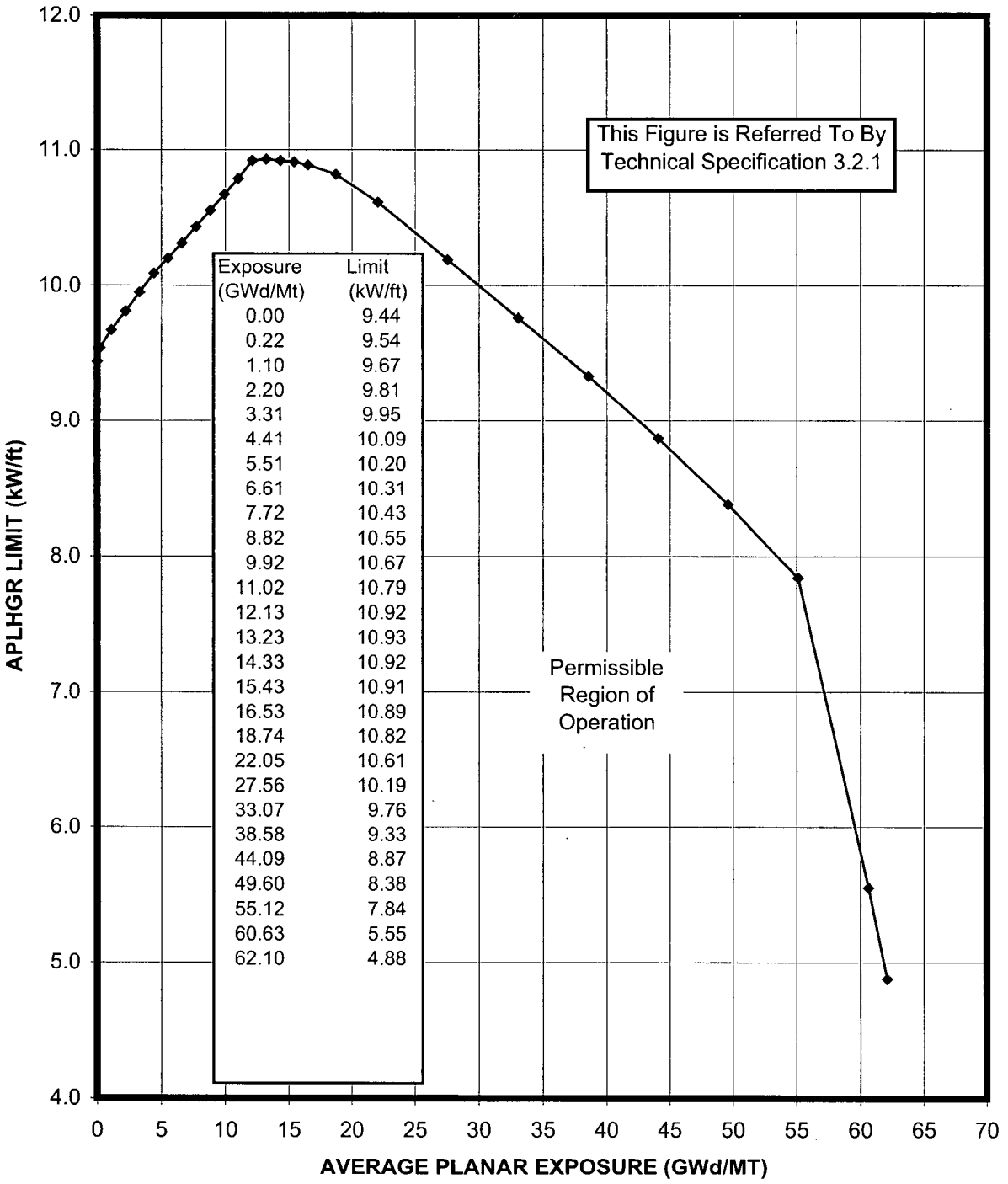
Fuel Type GE14-P10DNAB425-16GZ-100T-150-T-2497 (GE14) Average Planar Linear Heat Generation Rate (APLHGR) Limit Versus Average Planar Exposure



Exposure (GWd/Mt)	Limit (kW/ft)
0.00	9.26
0.22	9.33
1.10	9.43
2.20	9.57
3.31	9.72
4.41	9.88
5.51	10.04
6.61	10.21
7.72	10.34
8.82	10.48
9.92	10.58
11.02	10.70
12.13	10.81
13.23	10.80
14.33	10.79
15.43	10.79
16.53	10.79
18.74	10.77
22.05	10.65
27.56	10.28
33.07	9.84
38.58	9.39
44.09	8.92
49.60	8.42
55.12	7.89
60.63	5.67
62.29	4.91

Figure 3

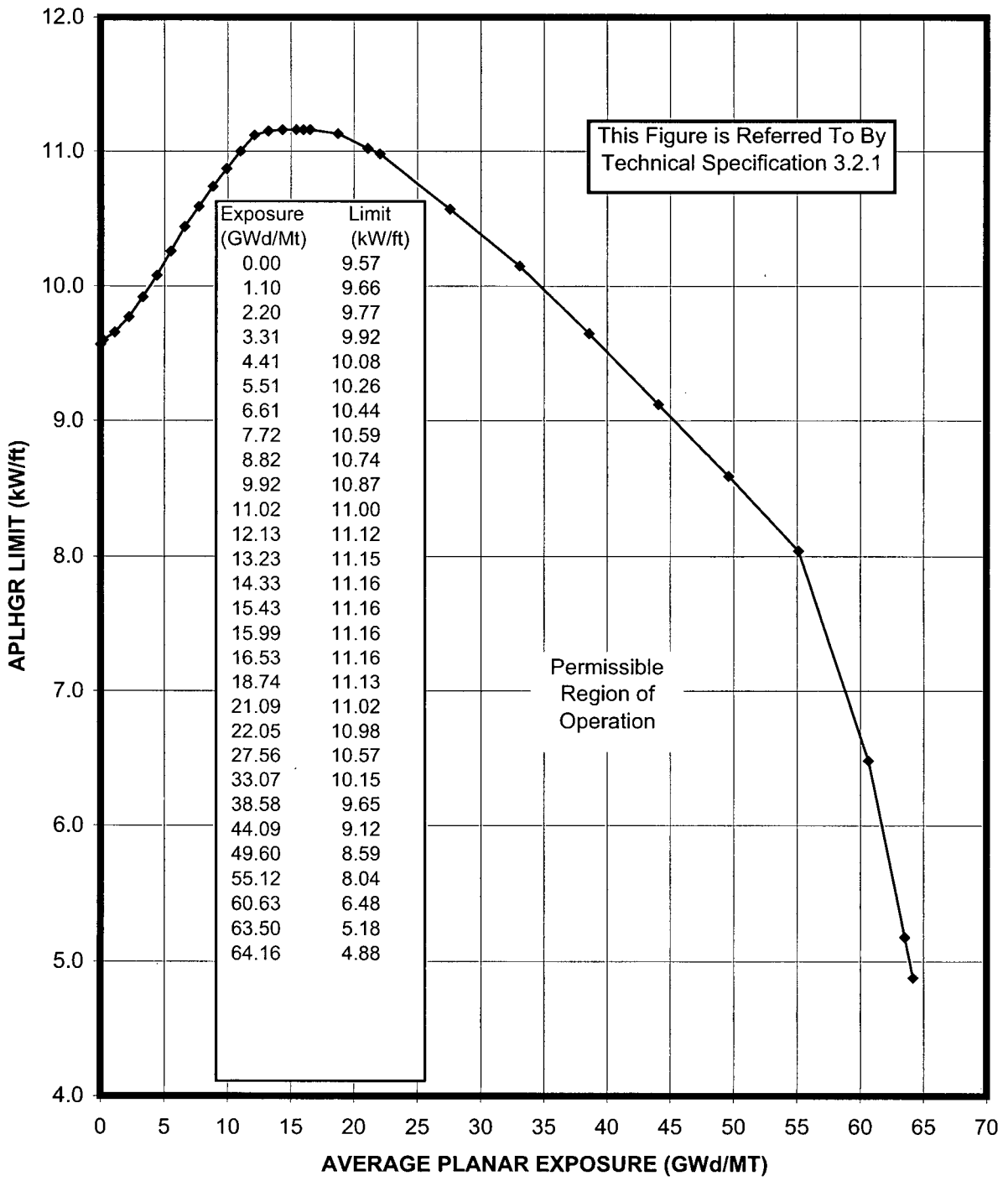
Fuel Type GE14-P10DNAB438-12G6.0-100T-150-T-2498 (GE14) Average Planar Linear Heat Generation Rate (APLHGR) Limit Versus Average Planar Exposure



Exposure (GWd/Mt)	Limit (kW/ft)
0.00	9.44
0.22	9.54
1.10	9.67
2.20	9.81
3.31	9.95
4.41	10.09
5.51	10.20
6.61	10.31
7.72	10.43
8.82	10.55
9.92	10.67
11.02	10.79
12.13	10.92
13.23	10.93
14.33	10.92
15.43	10.91
16.53	10.89
18.74	10.82
22.05	10.61
27.56	10.19
33.07	9.76
38.58	9.33
44.09	8.87
49.60	8.38
55.12	7.84
60.63	5.55
62.10	4.88

Figure 4

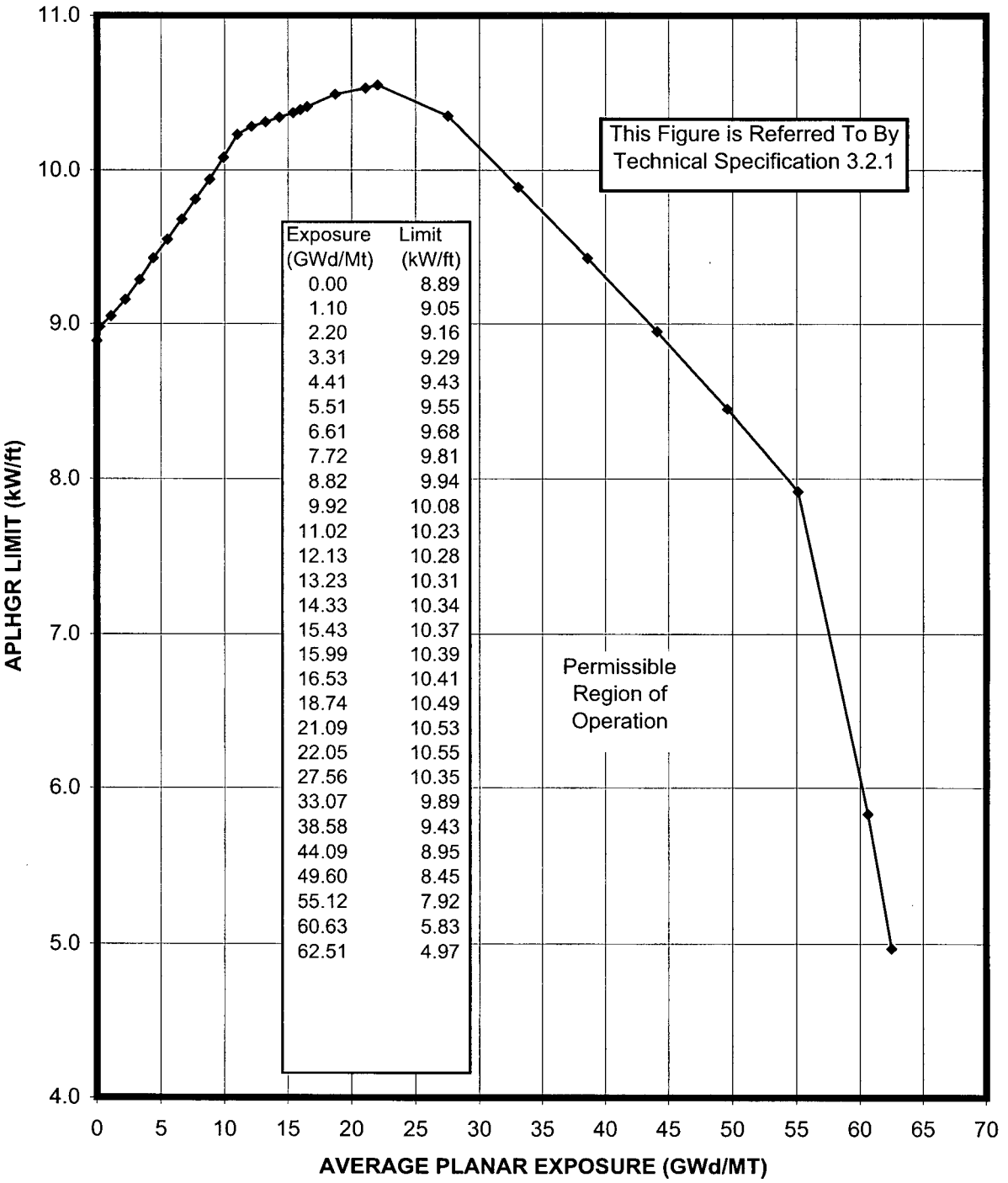
Fuel Type GE14-P10DNAB413-16GZ-100T-150-T-2660 (GE14) Average Planar Linear Heat Generation Rate (APLHGR) Limit Versus Average Planar Exposure



Exposure (GWd/Mt)	Limit (kW/ft)
0.00	9.57
1.10	9.66
2.20	9.77
3.31	9.92
4.41	10.08
5.51	10.26
6.61	10.44
7.72	10.59
8.82	10.74
9.92	10.87
11.02	11.00
12.13	11.12
13.23	11.15
14.33	11.16
15.43	11.16
15.99	11.16
16.53	11.16
18.74	11.13
21.09	11.02
22.05	10.98
27.56	10.57
33.07	10.15
38.58	9.65
44.09	9.12
49.60	8.59
55.12	8.04
60.63	6.48
63.50	5.18
64.16	4.88

Figure 5

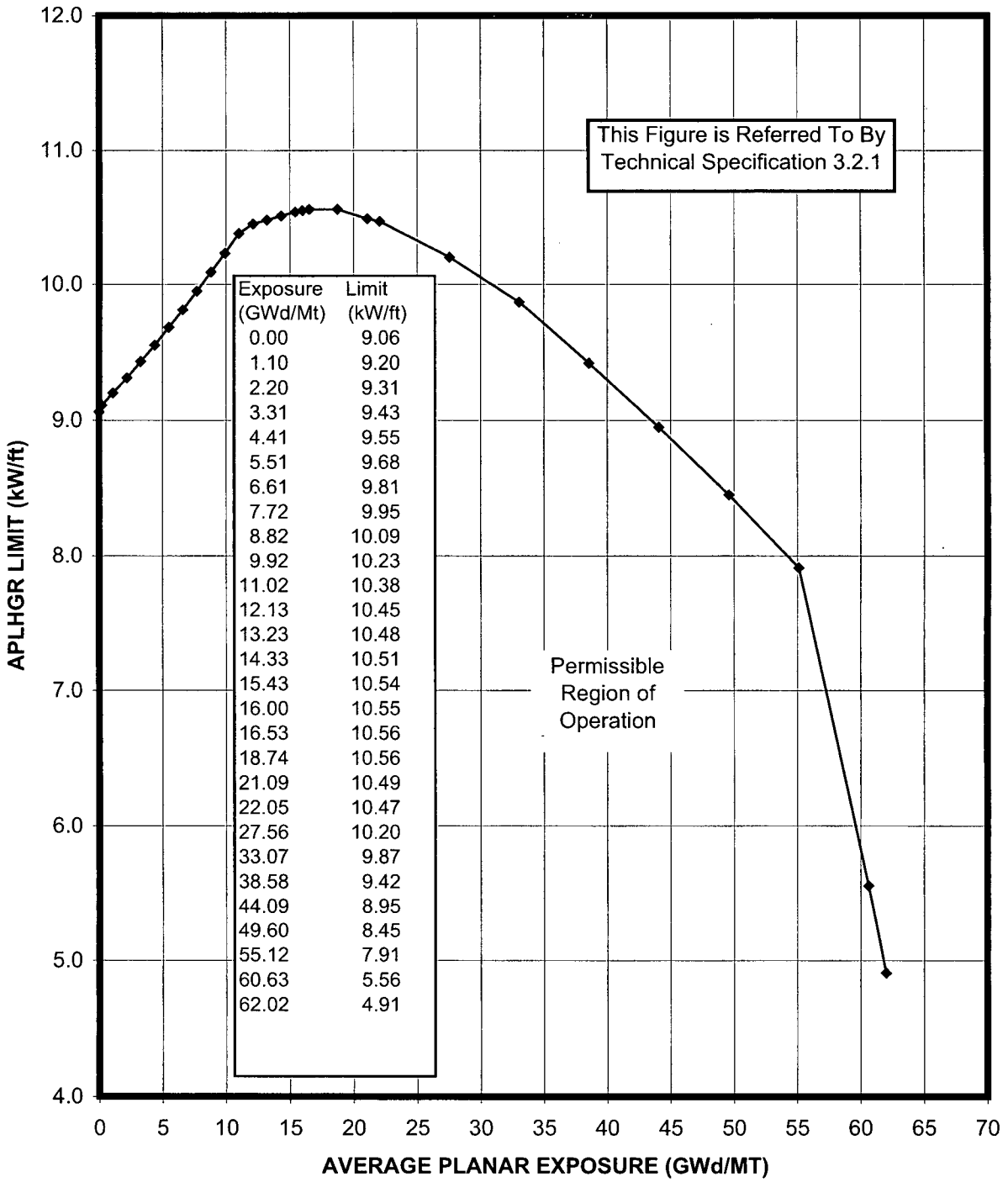
Fuel Type GE14-P10DNAB429-18GZ-100T-150-T-2661 (GE14) Average Planar Linear Heat Generation Rate (APLHGR) Limit Versus Average Planar Exposure



Exposure (GWd/Mt)	Limit (kW/ft)
0.00	8.89
1.10	9.05
2.20	9.16
3.31	9.29
4.41	9.43
5.51	9.55
6.61	9.68
7.72	9.81
8.82	9.94
9.92	10.08
11.02	10.23
12.13	10.28
13.23	10.31
14.33	10.34
15.43	10.37
15.99	10.39
16.53	10.41
18.74	10.49
21.09	10.53
22.05	10.55
27.56	10.35
33.07	9.89
38.58	9.43
44.09	8.95
49.60	8.45
55.12	7.92
60.63	5.83
62.51	4.97

Figure 6

Fuel Type GE14-P10DNAB437-12G6.0-100T-150-T-2662 (GE14) Average Planar Linear Heat Generation Rate (APLHGR) Limit Versus Average Planar Exposure



Exposure (GWd/Mt)	Limit (kW/ft)
0.00	9.06
1.10	9.20
2.20	9.31
3.31	9.43
4.41	9.55
5.51	9.68
6.61	9.81
7.72	9.95
8.82	10.09
9.92	10.23
11.02	10.38
12.13	10.45
13.23	10.48
14.33	10.51
15.43	10.54
16.00	10.55
16.53	10.56
18.74	10.56
21.09	10.49
22.05	10.47
27.56	10.20
33.07	9.87
38.58	9.42
44.09	8.95
49.60	8.45
55.12	7.91
60.63	5.56
62.02	4.91

Figure 7

Fuel Type GE14-P10DNAB407-16GZ-100T-150-T-2853 (GE14)
Average Planar Linear Heat Generation Rate (APLHGR) Limit
Versus Average Planar Exposure

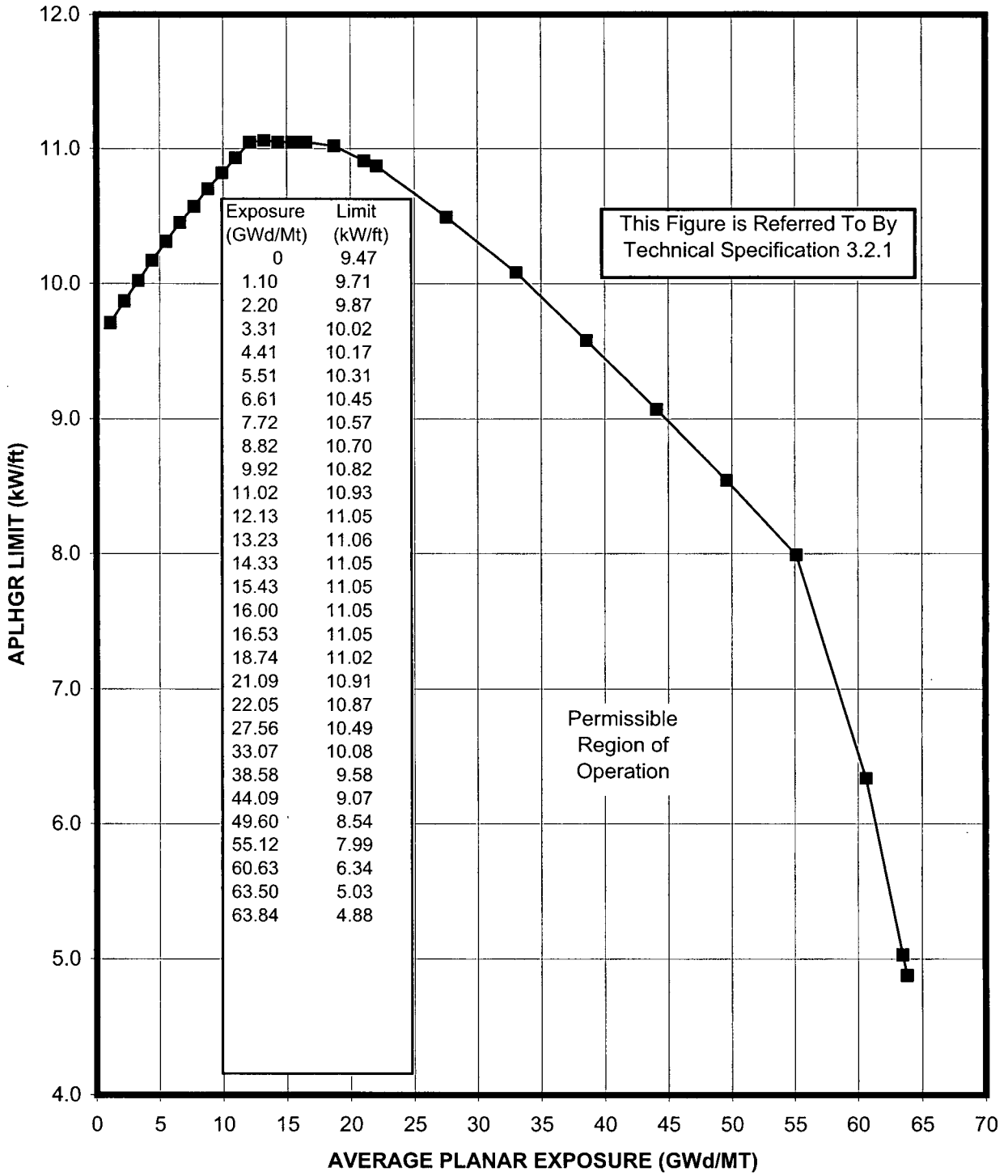
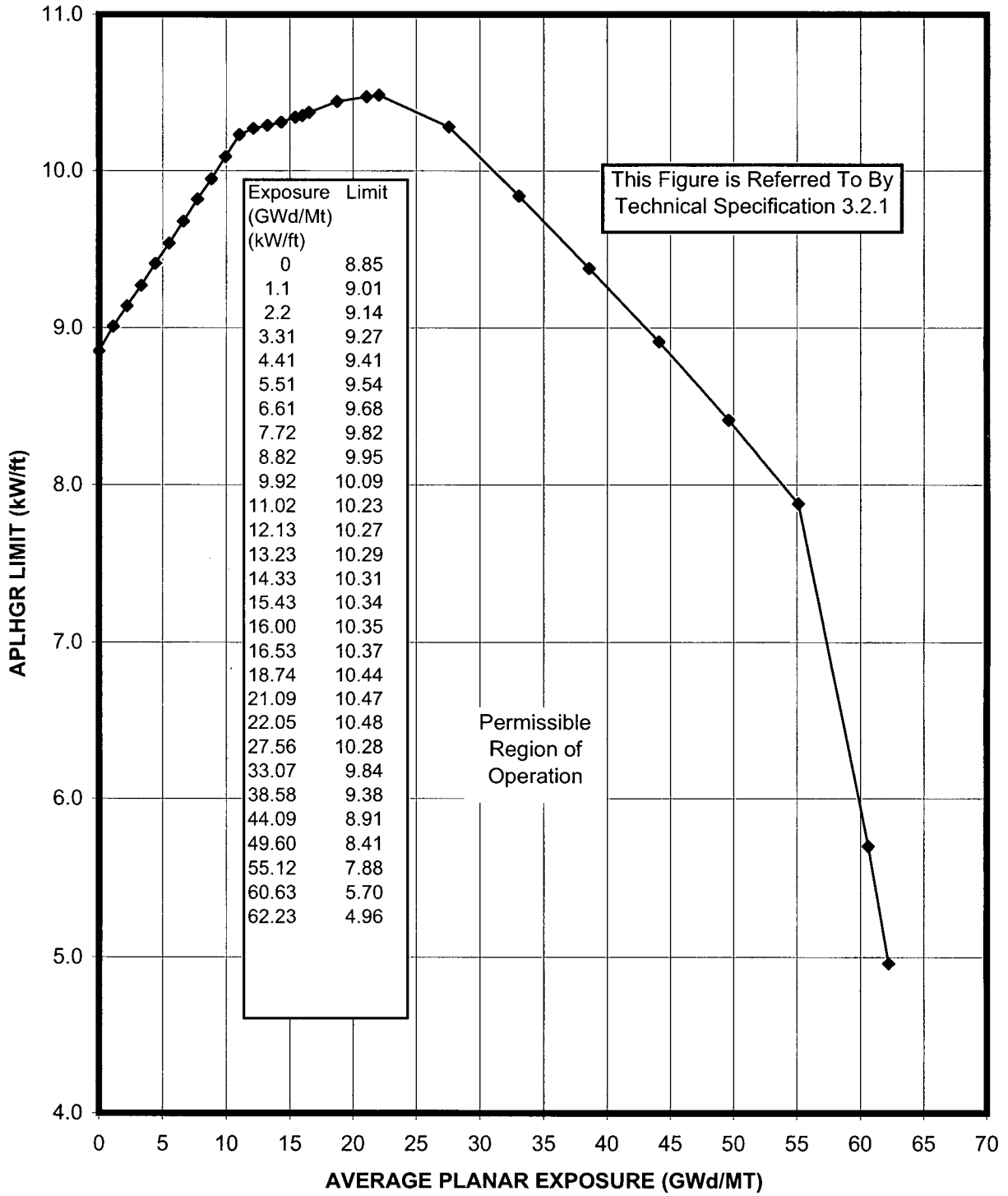


Figure 8

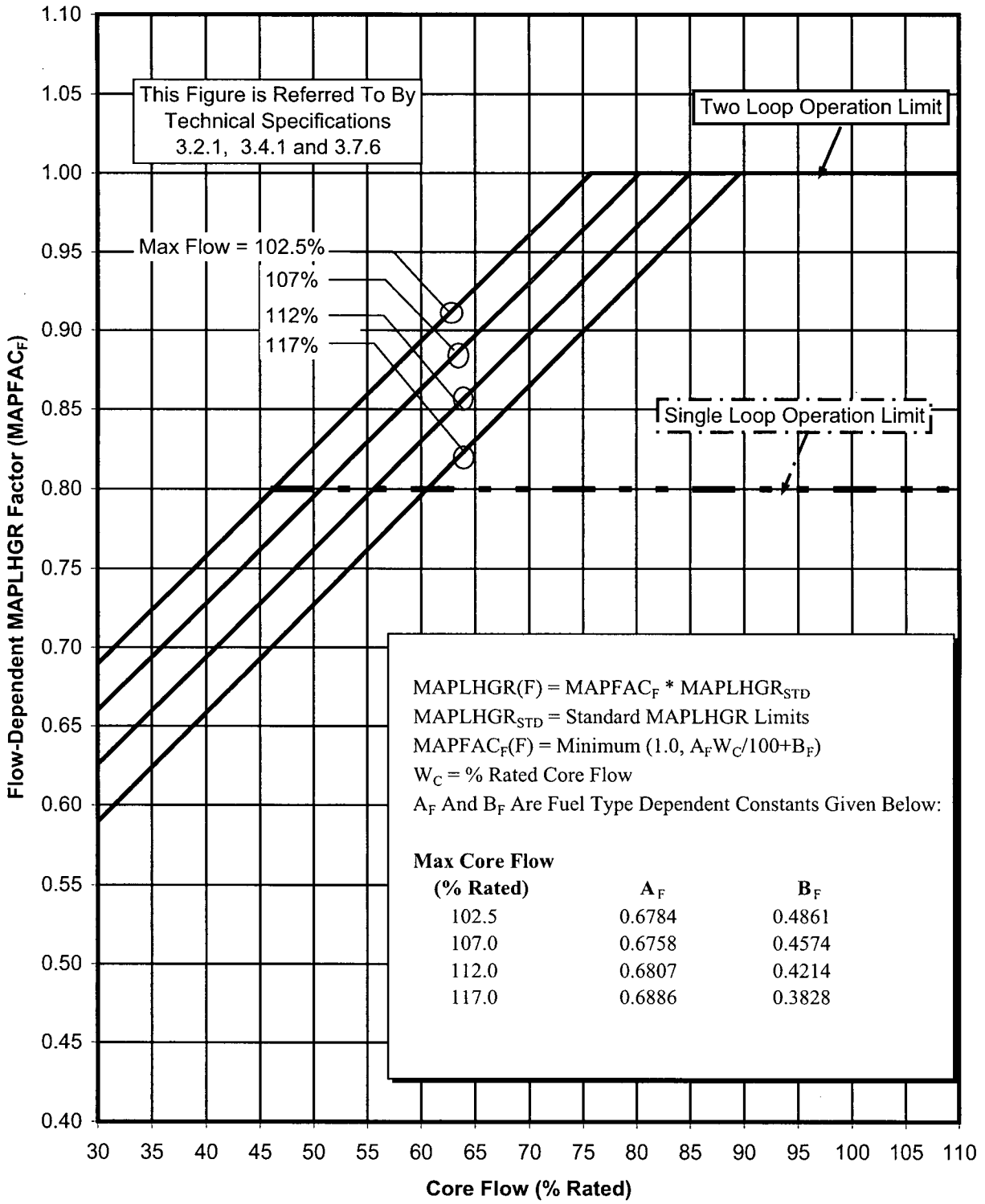
Fuel Type GE14-P10DNAB425-18GZ-100T-150-T-2854 (GE14)
Average Planar Linear Heat Generation Rate (APLHGR) Limit
Versus Average Planar Exposure



Exposure (GWd/Mt)	Limit (kW/ft)
0	8.85
1.1	9.01
2.2	9.14
3.31	9.27
4.41	9.41
5.51	9.54
6.61	9.68
7.72	9.82
8.82	9.95
9.92	10.09
11.02	10.23
12.13	10.27
13.23	10.29
14.33	10.31
15.43	10.34
16.00	10.35
16.53	10.37
18.74	10.44
21.09	10.47
22.05	10.48
27.56	10.28
33.07	9.84
38.58	9.38
44.09	8.91
49.60	8.41
55.12	7.88
60.63	5.70
62.23	4.96

Figure 9

GE14 Flow-Dependent MAPLHGR Limit, MAPLHGR(F)



Max Core Flow (% Rated)	A_F	B_F
102.5	0.6784	0.4861
107.0	0.6758	0.4574
112.0	0.6807	0.4214
117.0	0.6886	0.3828

Figure 10

GE14 Power-Dependent MAPLHGR Limit, MAPLHGR (P)

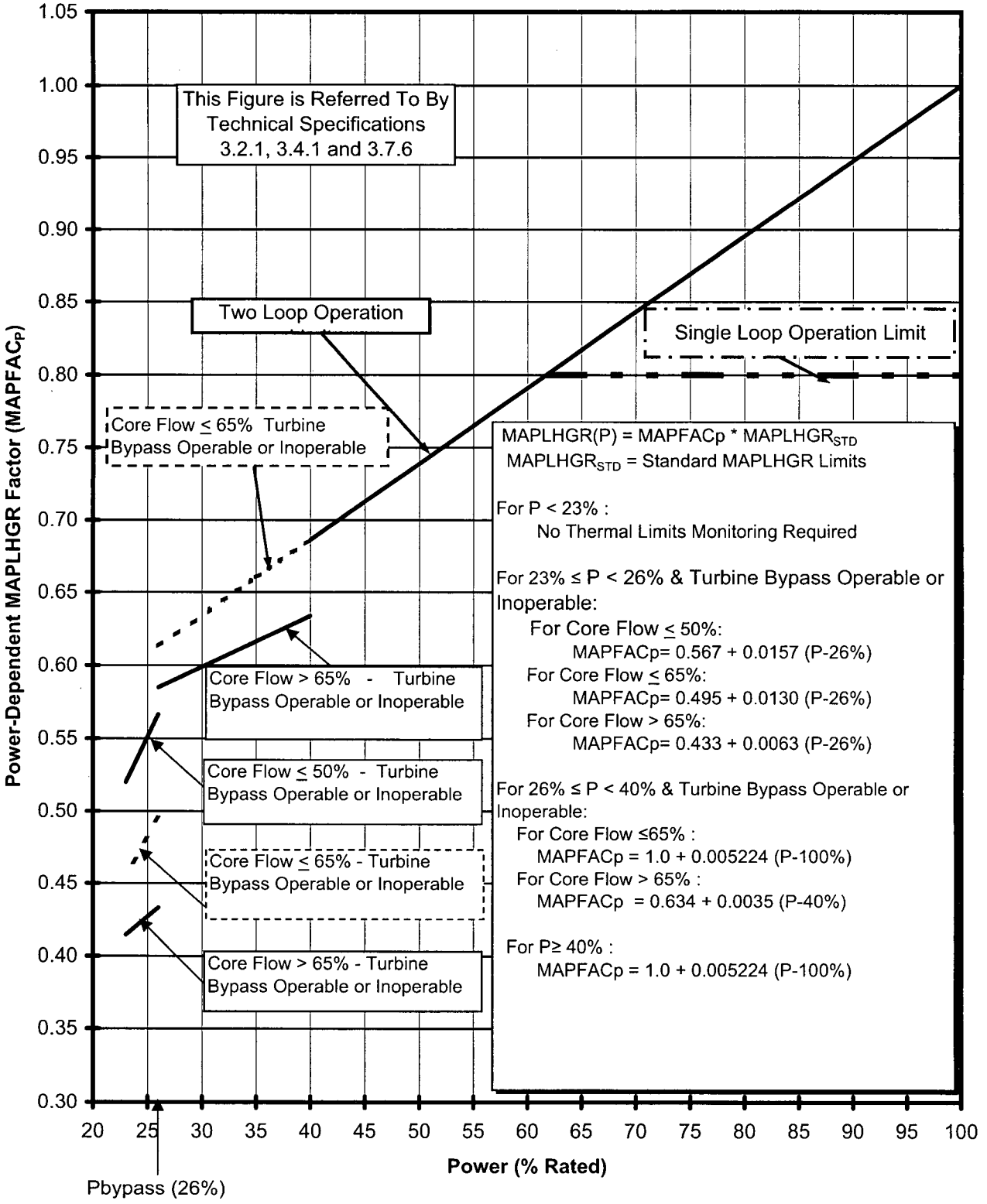


Figure 11

GE14 Flow-Dependent MCPR Limit, MCPR(F)

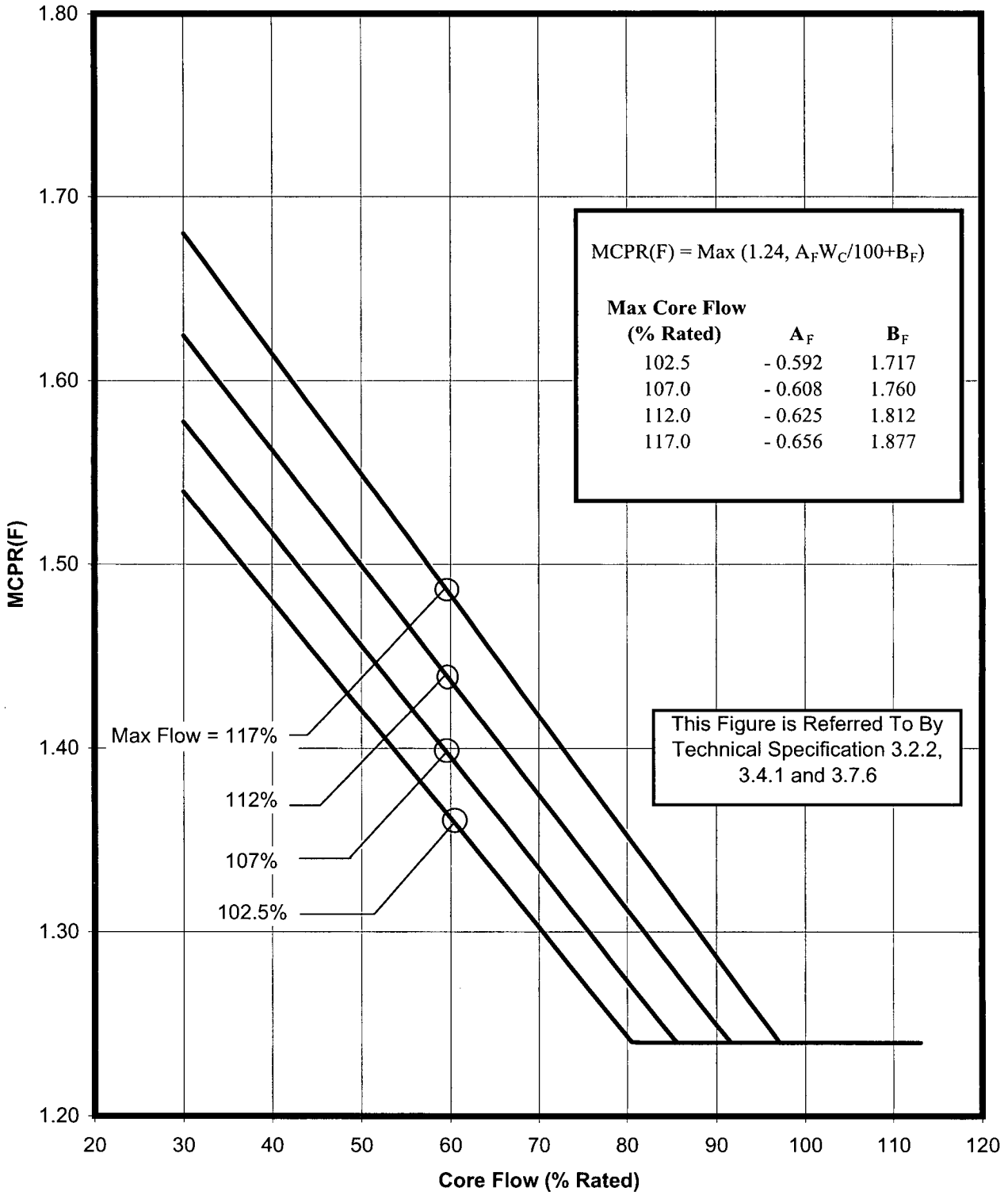


Figure 12

GE14 Power - Dependent MCPR Limit, MCPR (P)

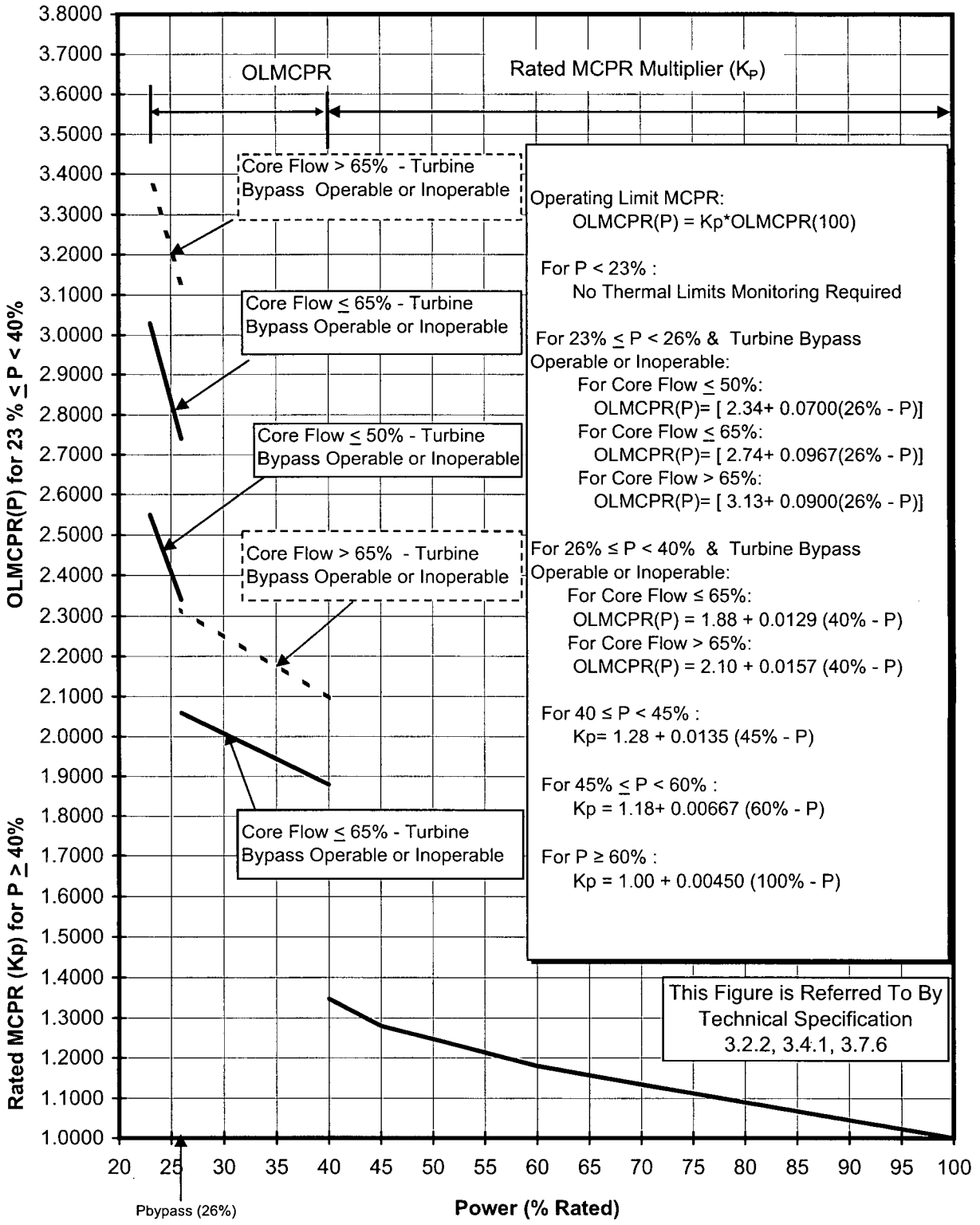
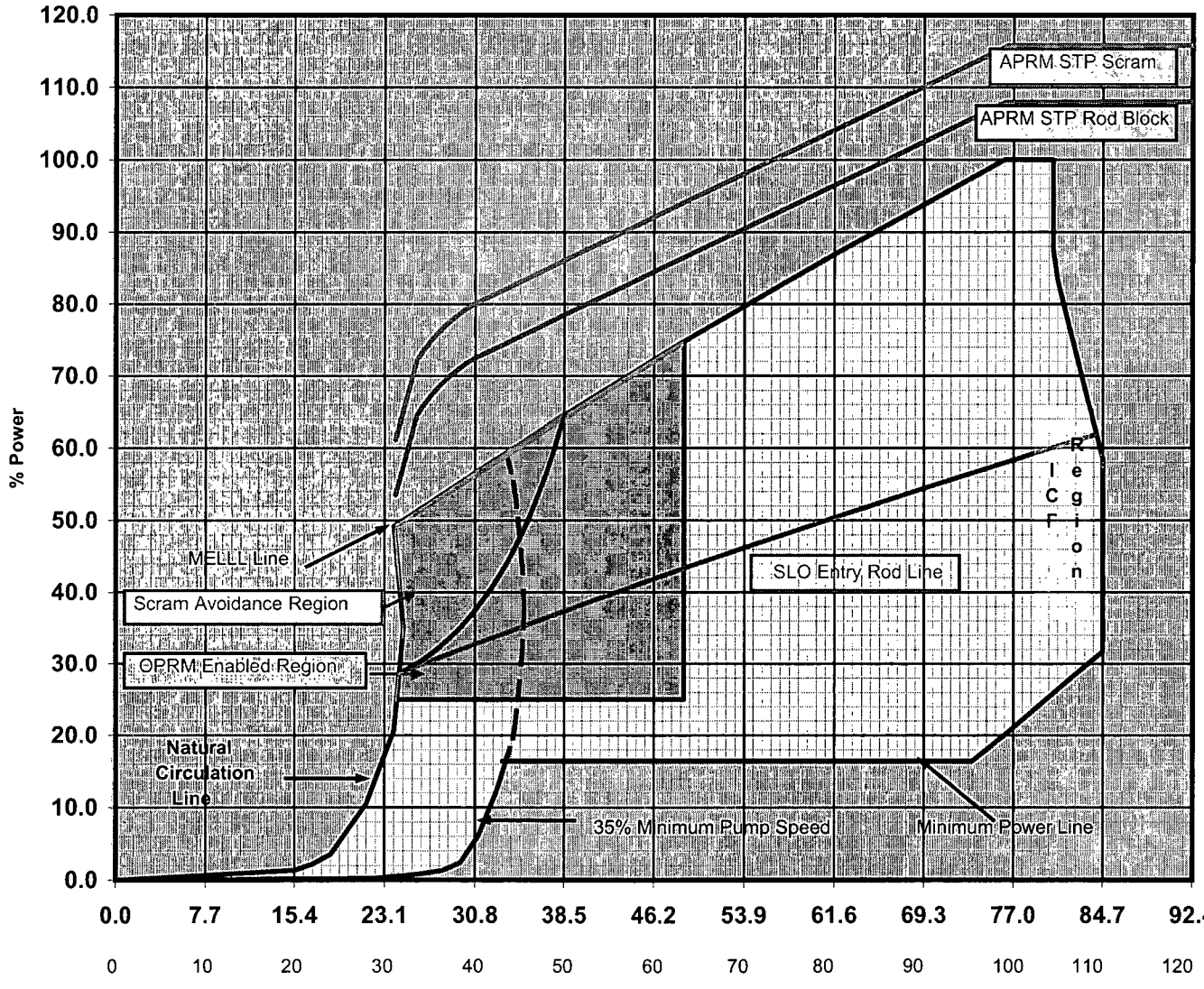


Figure 13
Stability Option III Power/Flow Map

OPRM Operable, Two Loop Operation, 2923 MWt

This Figure supports Improved Technical Specification 3.3.1.1 and the Technical Requirements Manual Specification 3.3

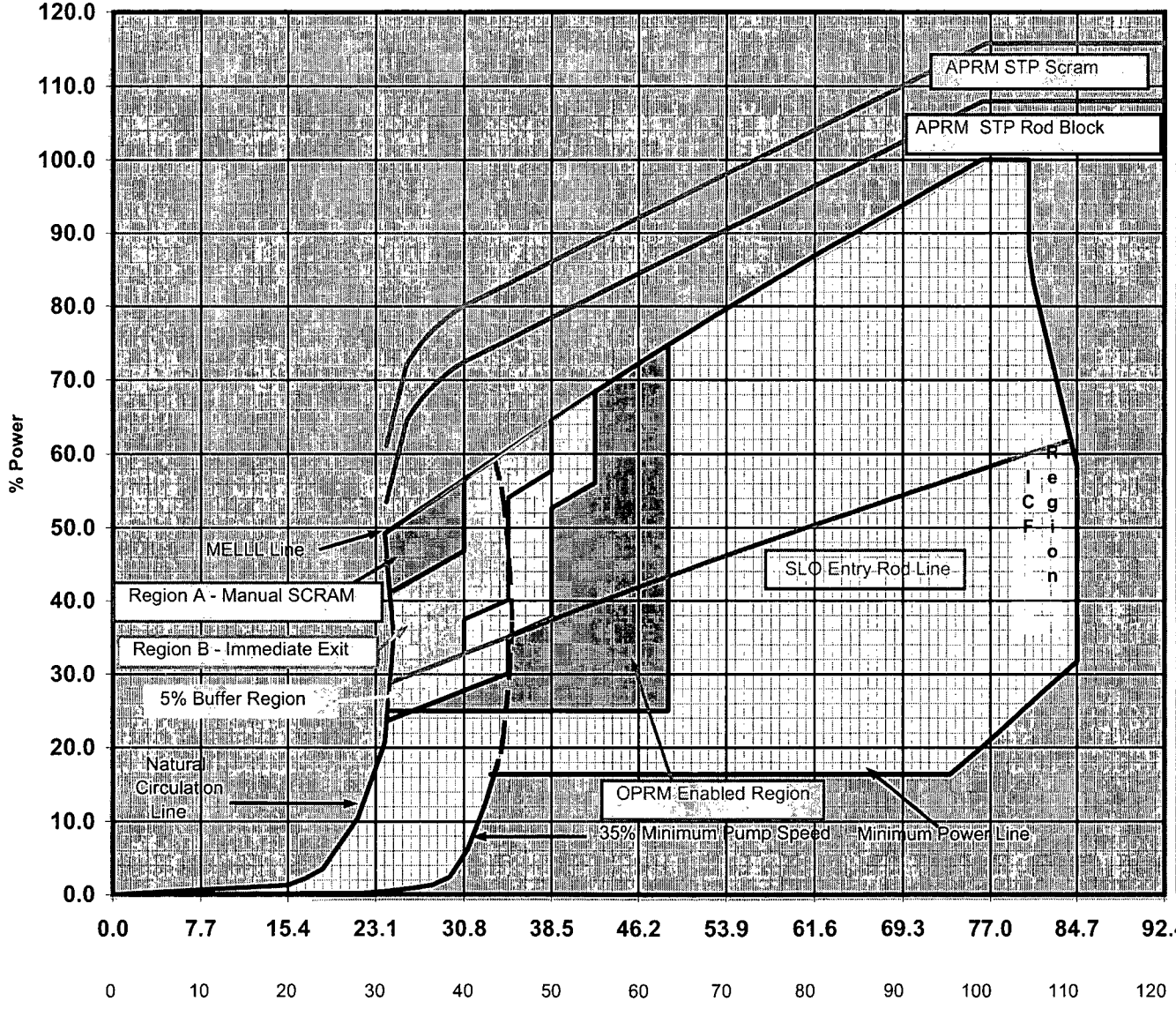


Power %	Minimum (MELLL) Core Flow, Mlbs/hr	Maximum (ICF) Core Flow, Mlbs/hr
100	76.19	80.47
99	75.04	80.47
98	73.89	80.47
97	72.75	80.47
96	71.61	80.47
95	70.49	80.47
94	69.36	80.47
93	68.25	80.47
92	67.13	80.47
91	66.03	80.47
90	64.93	80.47
89	63.83	80.47
88	62.74	80.47
87	61.66	80.51
86	60.58	80.60
85	59.50	80.70
84	58.43	80.79
83	57.37	80.90
82	56.31	81.05
81	55.25	81.21
80	54.20	81.36
79	53.16	81.52
78	52.12	81.67
77	51.08	81.83
76	50.05	81.98
75	49.02	82.13
74	48.00	82.29
73	46.98	82.44
72	45.96	82.60
71	44.95	82.75
70	43.94	82.91
69	42.94	83.06
68	41.94	83.21
67	40.95	83.37
66	39.96	83.52
65	38.97	83.68
64	37.99	83.83
63	37.01	83.99
62	36.04	84.14
61	35.06	84.29
60	34.10	84.45
59	33.13	84.60
58	32.17	84.70

Figure 14
Stability Option III Power/Flow Map

OPRM Inoperable, Two Loop Operation, 2923 MWt

This Figure supports Improved Technical Specification 3.3.1.1 and the Technical Requirements Manual Specification 3.3

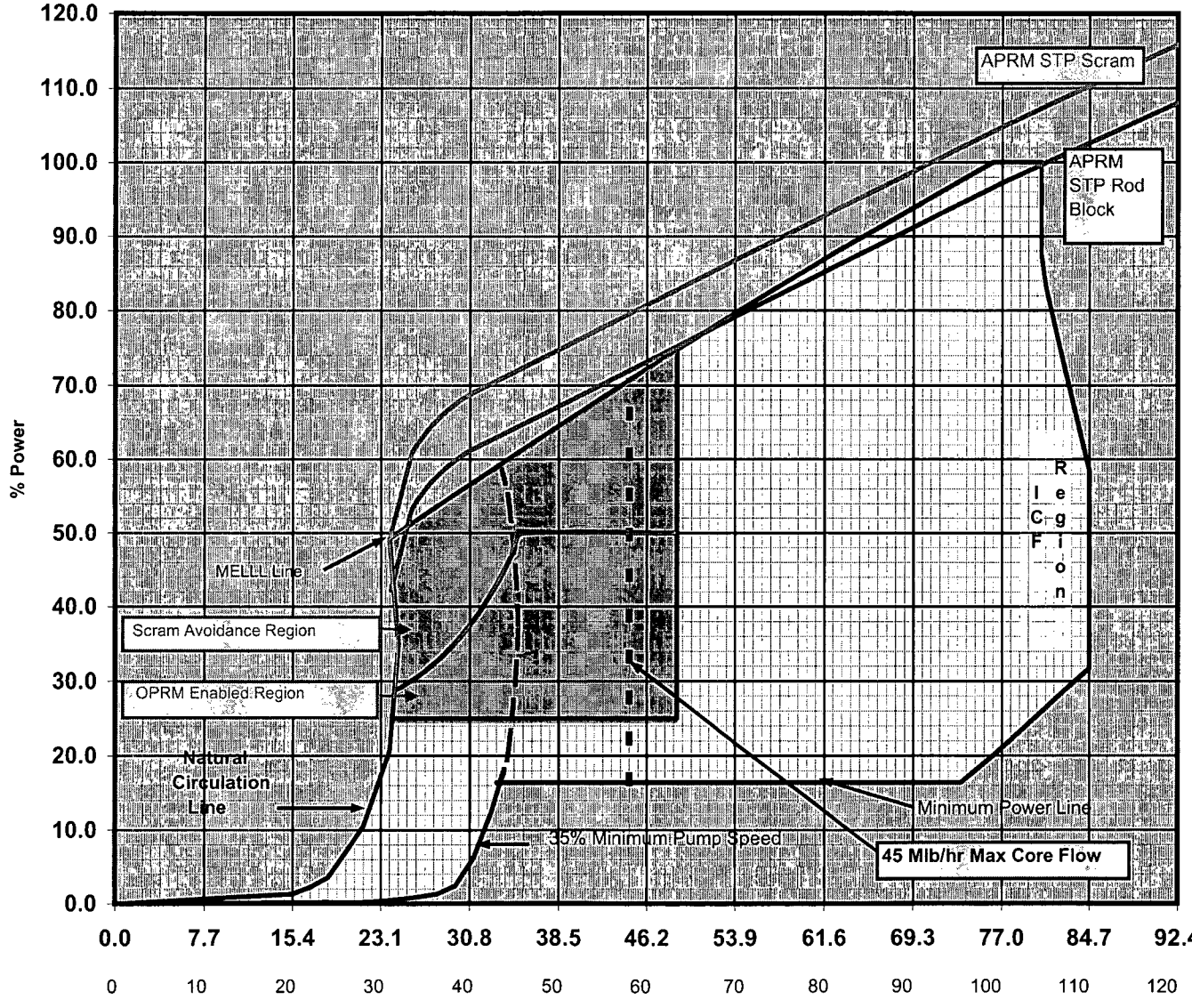


Power %	Minimum (MELLL) Core Flow, Mlbs/hr	Maximum (ICF) Core Flow, Mlbs/hr
100	76.19	80.47
99	75.04	80.47
98	73.89	80.47
97	72.75	80.47
96	71.61	80.47
95	70.49	80.47
94	69.36	80.47
93	68.25	80.47
92	67.13	80.47
91	66.03	80.47
90	64.93	80.47
89	63.83	80.47
88	62.74	80.47
87	61.66	80.51
86	60.58	80.60
85	59.50	80.70
84	58.43	80.79
83	57.37	80.90
82	56.31	81.05
81	55.25	81.21
80	54.20	81.36
79	53.16	81.52
78	52.12	81.67
77	51.08	81.83
76	50.05	81.98
75	49.02	82.13
74	48.00	82.29
73	46.98	82.44
72	45.96	82.60
71	44.95	82.75
70	43.94	82.91
69	42.94	83.06
68	41.94	83.21
67	40.95	83.37
66	39.96	83.52
65	38.97	83.68
64	37.99	83.83
63	37.01	83.99
62	36.04	84.14
61	35.06	84.29
60	34.10	84.45
59	33.13	84.60
58	32.17	84.70

Figure 15
Stability Option III Power/Flow Map

OPRM Operable, Single Loop Operation, 2923 MWt

This Figure supports Improved Technical Specification 3.3.1.1 and the Technical Requirements Manual Specification 3.3

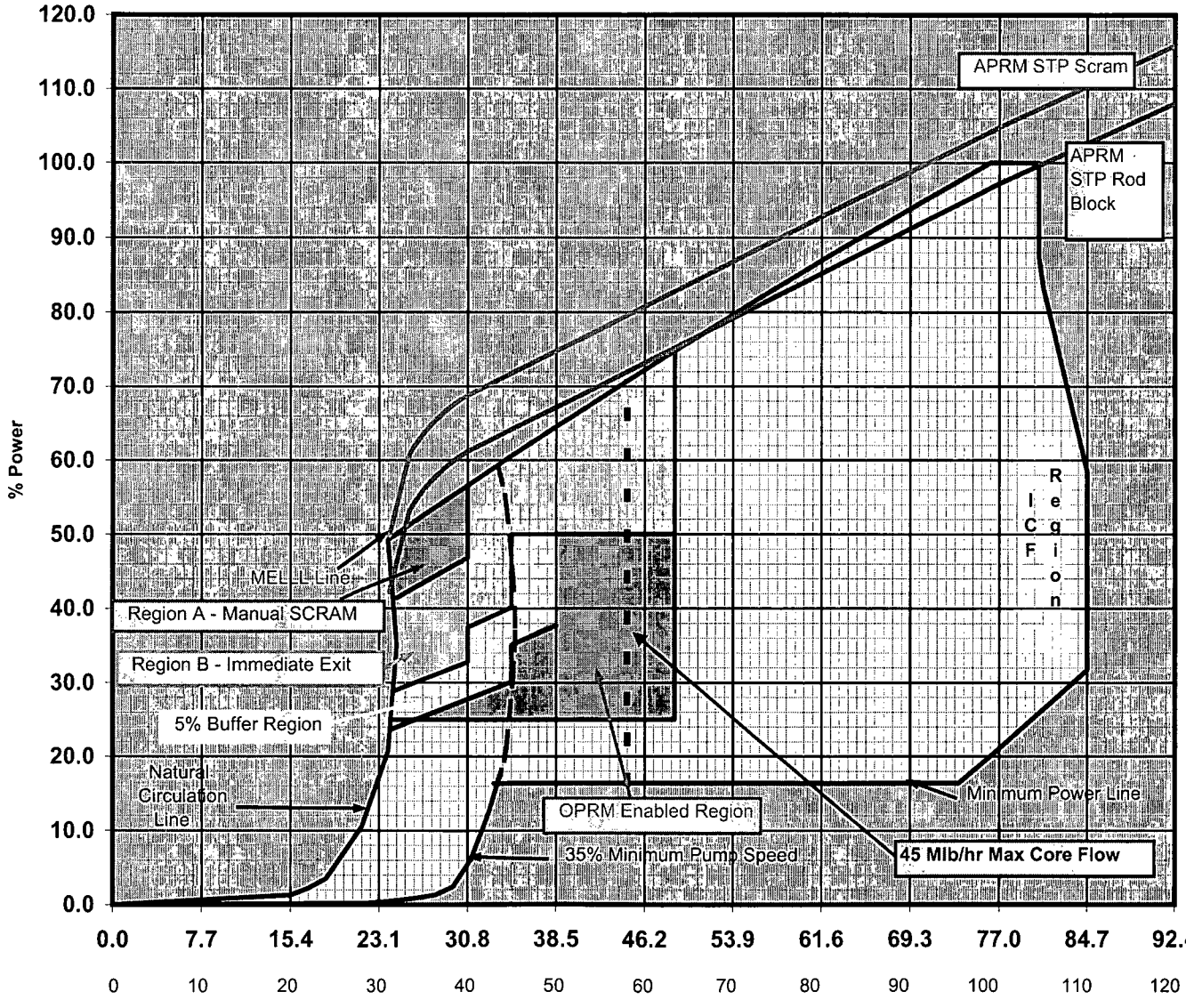


Power %	Minimum (MELLL) Core Flow, Mlbs/hr	Maximum (ICF) Core Flow, Mlbs/hr
100	76.19	80.47
99	75.04	80.47
98	73.89	80.47
97	72.75	80.47
96	71.61	80.47
95	70.49	80.47
94	69.36	80.47
93	68.25	80.47
92	67.13	80.47
91	66.03	80.47
90	64.93	80.47
89	63.83	80.47
88	62.74	80.47
87	61.66	80.51
86	60.58	80.60
85	59.50	80.70
84	58.43	80.79
83	57.37	80.90
82	56.31	81.05
81	55.25	81.21
80	54.20	81.36
79	53.16	81.52
78	52.12	81.67
77	51.08	81.83
76	50.05	81.98
75	49.02	82.13
74	48.00	82.29
73	46.98	82.44
72	45.96	82.60
71	44.95	82.75
70	43.94	82.91
69	42.94	83.06
68	41.94	83.21
67	40.95	83.37
66	39.96	83.52
65	38.97	83.68
64	37.99	83.83
63	37.01	83.99
62	36.04	84.14
61	35.06	84.29
60	34.10	84.45
59	33.13	84.60
58	32.17	84.70

Figure 16
Stability Option III Power/Flow Map

OPRM Inoperable, Single Loop Operation, 2923 MWt

This Figure supports Improved Technical Specification 3.3.1.1 and the Technical Requirements Manual Specification 3.3

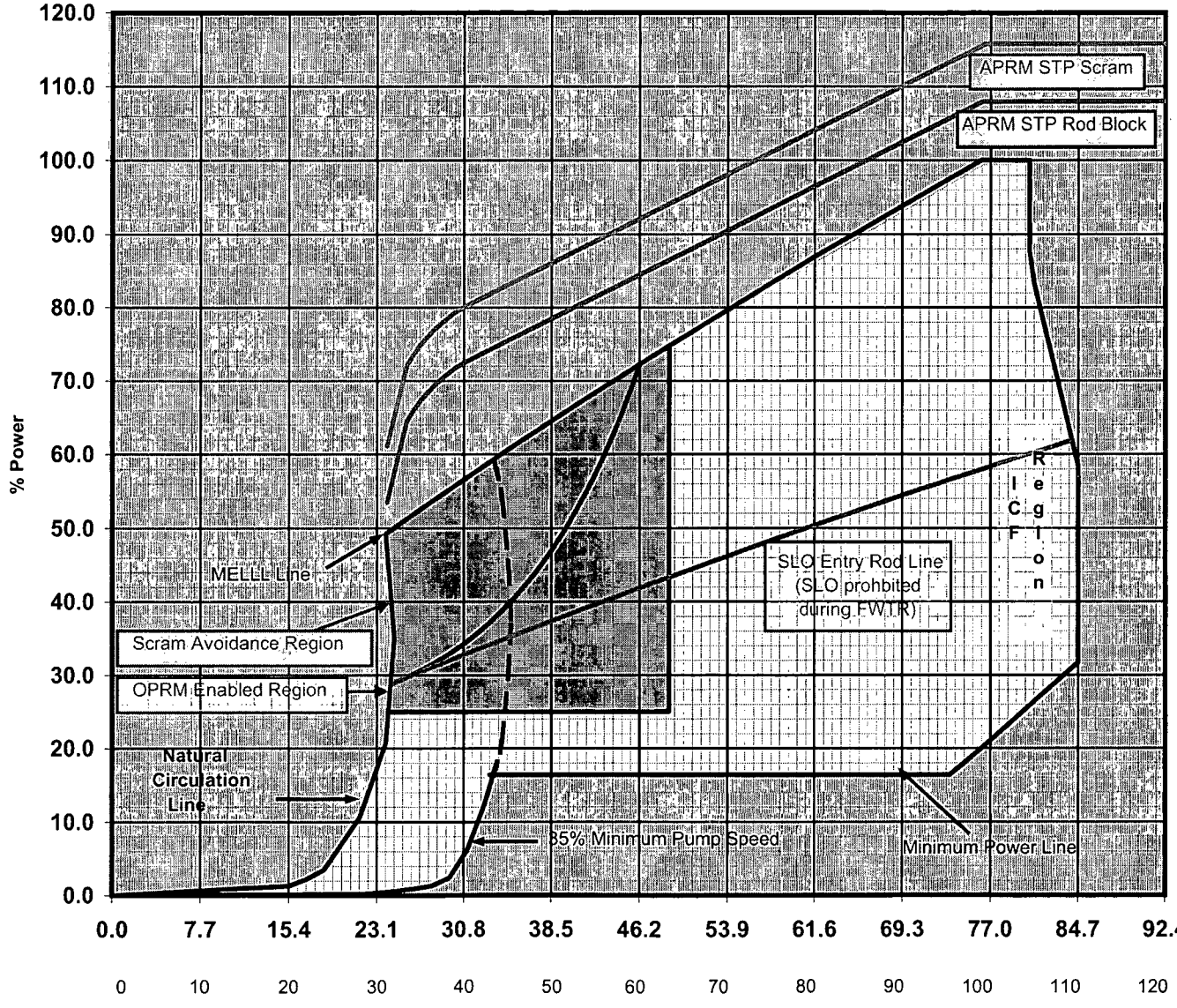


Power %	Minimum (MELLL) Core Flow, Mlbs/hr	Maximum (ICF) Core Flow, Mlbs/hr
100	76.19	80.47
99	75.04	80.47
98	73.89	80.47
97	72.75	80.47
96	71.61	80.47
95	70.49	80.47
94	69.36	80.47
93	68.25	80.47
92	67.13	80.47
91	66.03	80.47
90	64.93	80.47
89	63.83	80.47
88	62.74	80.47
87	61.66	80.51
86	60.58	80.60
85	59.50	80.70
84	58.43	80.79
83	57.37	80.90
82	56.31	81.05
81	55.25	81.21
80	54.20	81.36
79	53.16	81.52
78	52.12	81.67
77	51.08	81.83
76	50.05	81.98
75	49.02	82.13
74	48.00	82.29
73	46.98	82.44
72	45.96	82.60
71	44.95	82.75
70	43.94	82.91
69	42.94	83.06
68	41.94	83.21
67	40.95	83.37
66	39.96	83.52
65	38.97	83.68
64	37.99	83.83
63	37.01	83.99
62	36.04	84.14
61	35.06	84.29
60	34.10	84.45
59	33.13	84.60
58	32.17	84.70

Figure 17
Stability Option III Power/Flow Map

OPRM Operable, FWTR, 2923 MWt

This Figure supports Improved Technical Specification 3.3.1.1 and the Technical Requirements Manual Specification 3.3

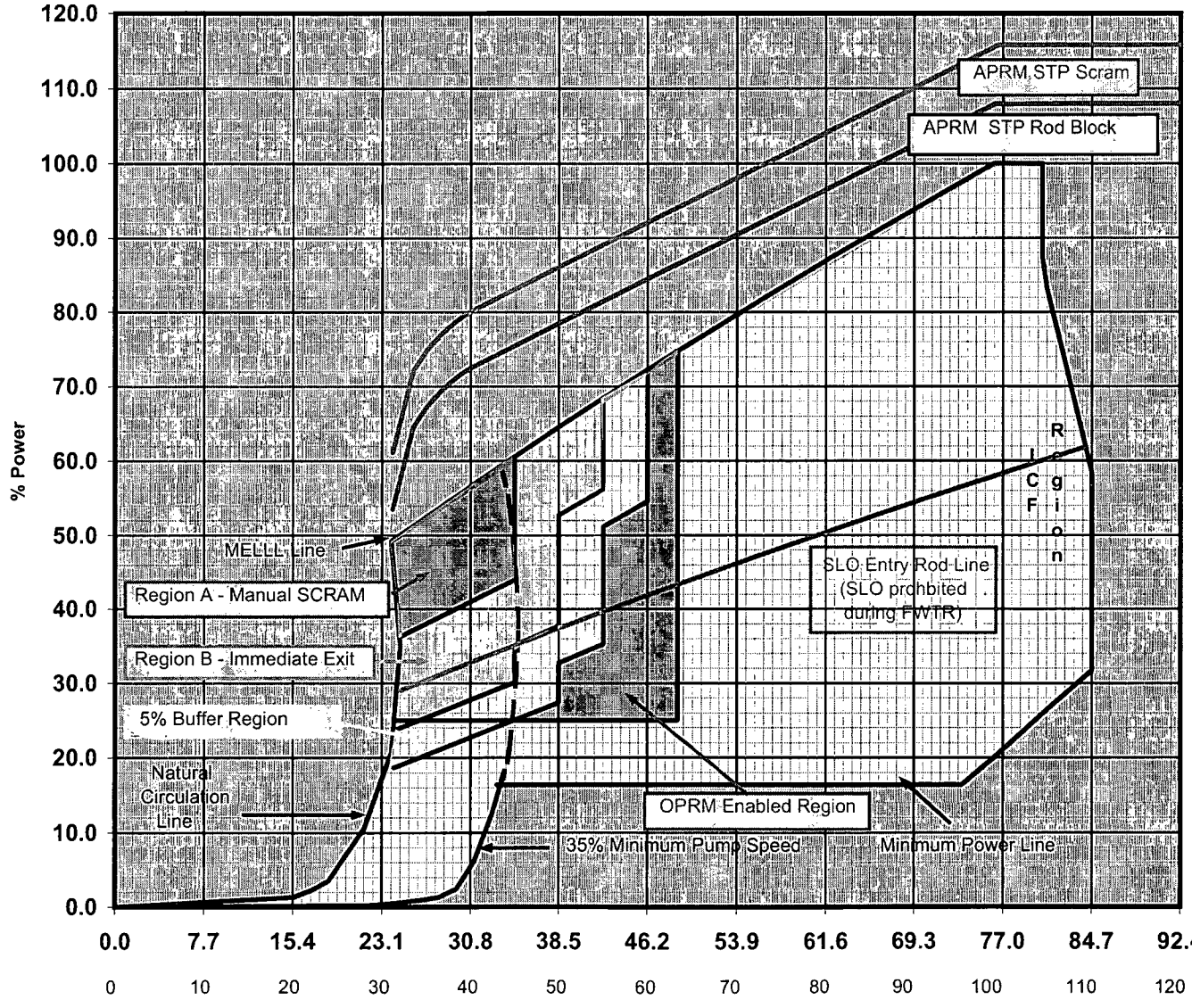


Power %	Minimum (MELLL) Core Flow, Mlbs/hr	Maximum (ICF) Core Flow, Mlbs/hr
100	76.19	80.47
99	75.04	80.47
98	73.89	80.47
97	72.75	80.47
96	71.61	80.47
95	70.49	80.47
94	69.36	80.47
93	68.25	80.47
92	67.13	80.47
91	66.03	80.47
90	64.93	80.47
89	63.83	80.47
88	62.74	80.47
87	61.66	80.51
86	60.58	80.60
85	59.50	80.70
84	58.43	80.79
83	57.37	80.90
82	56.31	81.05
81	55.25	81.21
80	54.20	81.36
79	53.16	81.52
78	52.12	81.67
77	51.08	81.83
76	50.05	81.98
75	49.02	82.13
74	48.00	82.29
73	46.98	82.44
72	45.96	82.60
71	44.95	82.75
70	43.94	82.91
69	42.94	83.06
68	41.94	83.21
67	40.95	83.37
66	39.96	83.52
65	38.97	83.68
64	37.99	83.83
63	37.01	83.99
62	36.04	84.14
61	35.06	84.29
60	34.10	84.45
59	33.13	84.60
58	32.17	84.70

Figure 18
Stability Option III Power/Flow Map

OPRM Inoperable, FWTR, 2923 MWt

This Figure supports Improved Technical Specification 3.3.1.1 and the Technical Requirements Manual Specification 3.3



Power %	Minimum (MELLL) Core Flow, Mlbs/hr	Maximum (ICF) Core Flow, Mlbs/hr
100	76.19	80.47
99	75.04	80.47
98	73.89	80.47
97	72.75	80.47
96	71.61	80.47
95	70.49	80.47
94	69.36	80.47
93	68.25	80.47
92	67.13	80.47
91	66.03	80.47
90	64.93	80.47
89	63.83	80.47
88	62.74	80.47
87	61.66	80.51
86	60.58	80.60
85	59.50	80.70
84	58.43	80.79
83	57.37	80.90
82	56.31	81.05
81	55.25	81.21
80	54.20	81.36
79	53.16	81.52
78	52.12	81.67
77	51.08	81.83
76	50.05	81.98
75	49.02	82.13
74	48.00	82.29
73	46.98	82.44
72	45.96	82.60
71	44.95	82.75
70	43.94	82.91
69	42.94	83.06
68	41.94	83.21
67	40.95	83.37
66	39.96	83.52
65	38.97	83.68
64	37.99	83.83
63	37.01	83.99
62	36.04	84.14
61	35.06	84.29
60	34.10	84.45
59	33.13	84.60
58	32.17	84.70