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

SUBJECT: Brunswick Steam Electric Plant, Unit No. 2
Docket No. 50-324/License No. DPR-62
Unit 2, Cycle 16 Core Operating Limits Report

Ladies and Gentlemen:

The purpose of this letter is to submit the latest revision of the Core Operating Limits Report for the Brunswick Steam Electric Plant (BSEP), Unit 2. Technical Specification 5.6.5.d requires that the Core Operating Limits Report, including any mid-cycle revisions or supplements, be provided to the NRC upon issuance. A copy of the Brunswick Unit 2, Cycle 16 Core Operating Limits Report, January 2004, Revision 1, is enclosed.

The revised BSEP, Unit 2 report incorporates power-flow maps for operation with reduced final feedwater temperatures. The revised report supersedes the report submitted by letter dated March 26, 2003 (i.e., ADAMS Accession Number ML030940709).

Please refer any questions regarding this submittal to Mr. Leonard R. Beller, Supervisor - Licensing/Regulatory Programs, at (910) 457-2073.

Sincerely,

Leonard R. Beller for

Edward T. O'Neil
Manager - Support Services
Brunswick Steam Electric Plant

A001

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P.O. Box 10429
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WRM/wrm

Enclosure: Brunswick Unit 2, Cycle 16 Core Operating Limits Report, January 2004, Revision 1

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Brunswick Unit 2, Cycle 16 Core Operating Limits Report, January 2004, Revision 1

Progress Energy

BRUNSWICK UNIT 2, CYCLE 16

CORE OPERATING LIMITS REPORT

January 2004

Prepared By: _____ **Date:** 1-22-04
Tom Dresser

Approved By: _____ **Date:** 1-22-04

George E. Smith
Supervisor
BWR Fuel Engineering

LIST OF EFFECTIVE PAGES

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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.

LIST OF TABLES AND 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.

COLR Revision 0 was prepared to support Brunswick 2 Cycle 16 operation at up to 2923 MWt (EPUR). The main changes made in Revision 0 were those associated with the thermal limits and Power-Flow maps. Also, the following thresholds were scaled for the higher rated thermal power: the thermal limit monitoring threshold changed from 25% to 23% and the turbine trip scram bypass threshold changed from 30% to 26%. This report provides the values of the power distribution limits and control rod withdrawal block instrumentation setpoints for Brunswick Unit 2, Cycle 16 (B2C16) as required by TS 5.6.5.

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.

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

Four Siemens ATRIUM-10 (A10) Lead Qualification Assemblies are loaded in the B2C16 core. Reference 9 concludes the A10 is bounded by the GE13 operating limits and licensing analyses, with

additional operating and design constraints are imposed on the GE13 fuel type used to monitor the A10. The additional operating requirements have been incorporated herein as applicable.

Revision 1 of this report adds Power/Flow maps to give guidance during Feedwater Temperature Reduction (FWTR).

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

Single Loop Operation

Brunswick Unit 2, Cycle 16 may operate over the entire MEOD range with Single recirculation Loop Operation (SLO) as permitted by TS 3.4.1 with applicable limits specified in the COLR for TS LCO's 3.2.1, 3.2.2 and 3.3.1.1. The applicable limits are:

LCO 3.2.1, Average Planar Linear Heat Generation Rate (APLHGR) Limits: per Reference 1, the Figures 9 and10 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.

LCO 3.3.1.1, Reactor Protection System Instrumentation Function 2.b (Average Power Range Monitors Simulated Thermal Power - High) Allowable Value: per footnote b, the -ΔW offset value is defined in Plant procedures. The current value of 20.5% is used for the B2C16 COLR.

Inoperable Main Turbine Bypass System

Brunswick Unit 2, 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. Three 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% rated bypass flow 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 between 23% and 26% power, 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 between 23% and 26% power, as shown in Figure 12, as the Turbine Bypass Operable and Inoperable limits are identical. TBPOOS requires increased rated power MCPR limits, included in Table 1.

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. 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.

MCPR Limits

The ODYN OPTION A, ODYN 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. These values were determined with the GEMINI 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. For any given power/flow state, the maximum of MCPR(F) determined from Figures 11-11a and MCPR(P) determined from Figure 12 is used to determine the governing limit.

All MCPR limits presented in Table 1, Figures 11-11a 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 consistent with the bases of the ARTS program and the determination of MCPR limits with the GEMINI methodology and 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 new PRNM system.

Stability Option III

Brunswick Unit 2 has implemented BWROG Long Term Stability Solution Option III (Oscillation Power Range Monitor-OPRM) as 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. The reload validation calculation demonstrated that reactor stability does not produce the limiting OLMCPR for Cycle 16 as long as the selected OPRM setpoint produces values for OLMCPR(SS) and OLMCPR(2PT) which are less than the corresponding acceptance criteria. Because the acceptance criteria for OLMCPR(SS) is 1.486 and for OLMCPR(2PT) is 1.41, an OPRM setpoint (Amplitude Setpoint S_p) of 1.10 is supported for Cycle 16 without imposing any additional operational restrictions for stability protection. 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 1.10 for Cycle 16. Per Table 3-2 of Reference 6, an S_p value of 1.10 supports selection of a Confirmation Count Setpoint N_p of 13 or less.

Six Power/Flow maps for use at up to 2923 MWt (Figures 13-18) were developed based on Reference 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. The corresponding Reference 7 maps are simplified and re-formatted to exhibit the appropriate headers for the COLR. Note that the Simulated Thermal Power (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. The analytic STP limits illustrated in Reference 7 have been revised to the corresponding nominal trip setpoint limits for the COLR. A single loop operation (SLO) Entry Rod Line has been added to the nominal feedwater temperature two loop operation maps as an additional operator aid. All six maps illustrate the region of the power/flow map above 25% power and below 60% flow where the OPRM system is required to be enabled.

The maps supporting an operable OPRM function 2.f (Figures 13, 15 and 17) show Scram Avoidance Regions, which is not a licensing requirement but is an operator aid to illustrate where the OPRM system is reasonably likely to 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. Both figures also include a 5% Buffer Region around the Immediate Exit Region as an operator aid. Figures 14 and 16 differ only in that the 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.

References

1) BNP Design Calculation 2B21-1045; "Preparation of the B2C16 Core Operating Limits Report," Revision 1, January 2004.

2) NEDE-24011-P-A; "General Electric Standard Application for Reactor Fuel," (latest approved version).

3) NEDC-31624P, "Loss-of-Coolant Accident Analysis Report for Brunswick Steam Electric Plant Unit 2 Reload 15 Cycle 16," Supplement 2, Revision 8, January 2003.

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," March 2001.

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

7) Design Calculation 0B21-1015, Revision 2, "BNP Power/Flow Maps." July 2003.

8) Design Calculation 2C51-0001 Revision 1, "BNP Power Range Neutron Monitoring System Setpoint Uncertainty and Scaling Calculation (2-C51-APRM 1 through 4 Loops and 2-C51-RBM-A and B Loops," August 8, 2001.

9) EMF-2168(P), "Brunswick ATRIUM-10 Lead Qualification Assemblies Safety Analysis," Revision 0, March 1999.

Table 1
MCPR Limits
(EOC-RPT Not Required)

Steady State, Non-pressurization Transient MCPR Limits				
Fuel Type		Exposure Range: BOC - EOC		
GE13 and GE14		1.32		
Atrium-10		1.47		
Pressurization Transient MCPR Limits, OLMCPR (100%P): Turbine Bypass System Operable				
MCPR Option	**Fuel Type**	Normal and Reduced Feedwater Temperature, Exposure Range		
		BOC to EOFPC-2948 MWd/MT	EOFPC-2948 MWd/MT to EOFPC-1448 MWd/MT	EOFPC-1448 MWd/MT to EOC
A	GE13	1.39	1.40	1.45
	GE14	1.52	1.53	1.63
	Atrium-10	1.55	1.56	1.61
B	GE13	1.34	1.35	1.37
	GE14	1.41	1.42	1.46
	Atrium-10	1.49	1.50	1.52
Pressurization Transient MCPR Limits, OLMCPR (100%P): Turbine Bypass System Inoperable				
MCPR Option	**Fuel Type**	Normal and Reduced Feedwater Temperature BOC to EOC		
A	GE13	1.46		
	GE14	1.64		
	Atrium-10	1.62		
B	GE13	1.38		
	GE14	1.47		
	Atrium-10	1.54		

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 ≥ 1.45 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	1.267	1.197
1.06	1.302	1.230
1.07	1.339	1.265
1.08	1.378	1.302
1.09	1.420	1.341
1.10	**1.464**	**1.383**
1.11	1.509	1.425
1.12	1.556	1.470
1.13	1.607	1.518
1.14	1.661	1.569
1.15	1.719	1.623
Acceptance Criteria	Off-rated OLMCPR @ 45% Flow	Rated Power OLMCPR

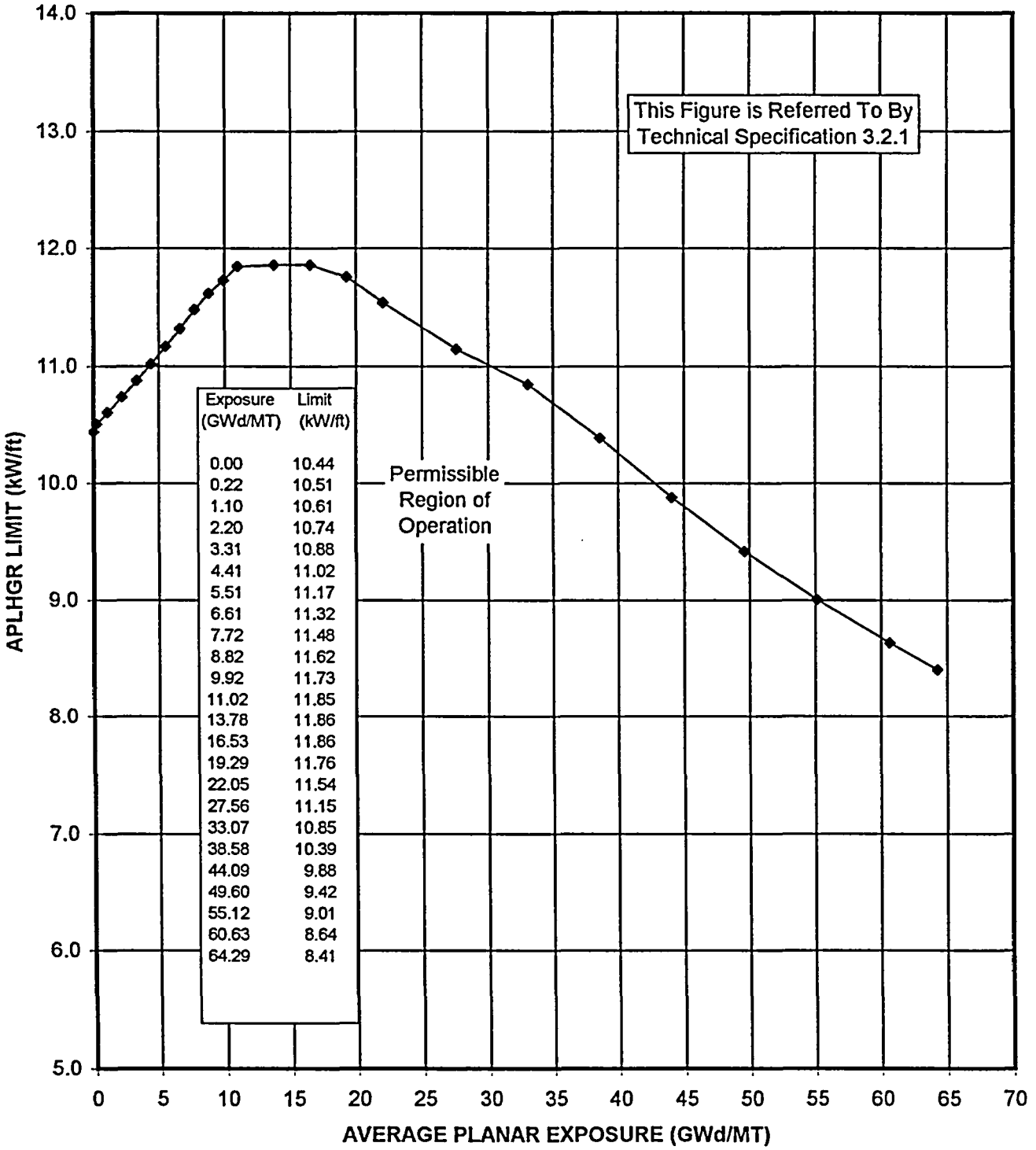
PDBA Setpoint	Setpoint Value
Amplitude S_p	**1.10**
Confirmation Count N_p	**13**

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

Figure 1

Progress Energy

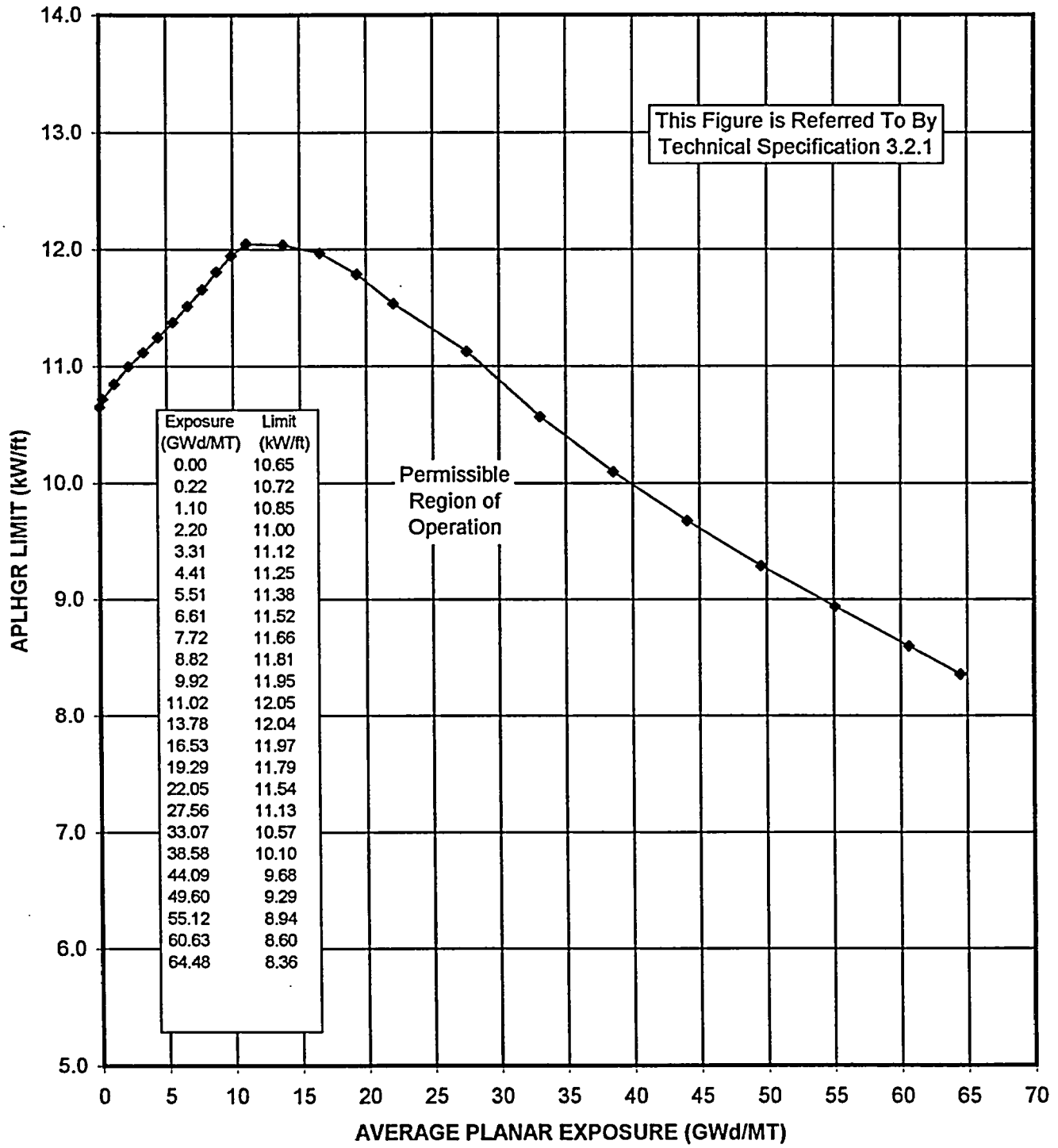
Fuel Type GE13-P9DTB403-7G6.0/7G5.0-100T-146-T (GE13)
Average Planar Linear Heat Generation Rate (APLHGR) Limit
Versus Average Planar Exposure



Progress Energy

Figure 2

Fuel Type GE13-P9DTB403-5G6.0/7G5.0-100T-146-T (GE13)
Average Planar Linear Heat Generation Rate (APLHGR) Limit
Versus Average Planar Exposure

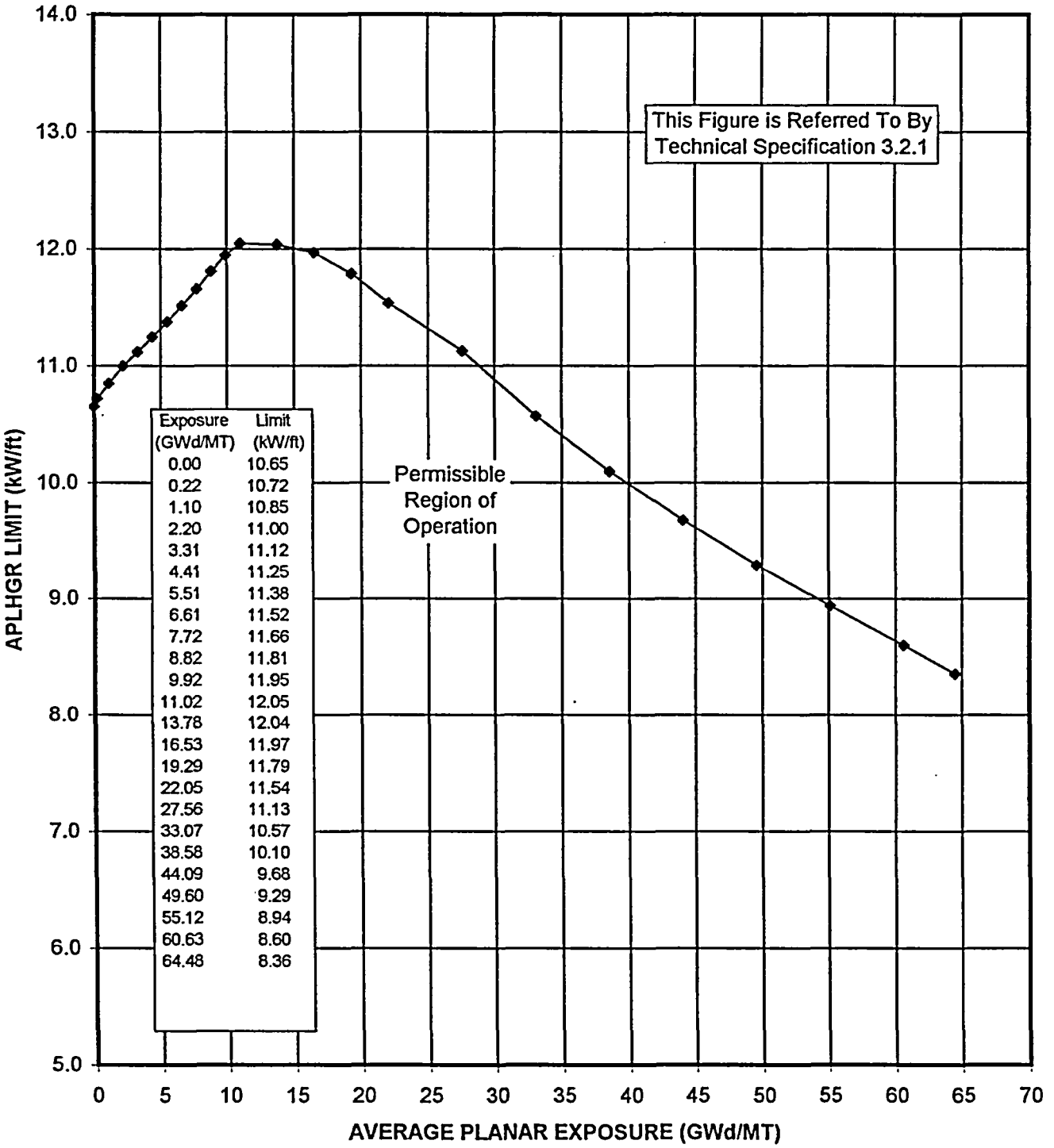


Exposure (GWd/MT)	Limit (kW/ft)
0.00	10.65
0.22	10.72
1.10	10.85
2.20	11.00
3.31	11.12
4.41	11.25
5.51	11.38
6.61	11.52
7.72	11.66
8.82	11.81
9.92	11.95
11.02	12.05
13.78	12.04
16.53	11.97
19.29	11.79
22.05	11.54
27.56	11.13
33.07	10.57
38.58	10.10
44.09	9.68
49.60	9.29
55.12	8.94
60.63	8.60
64.48	8.36

Progress Energy

Figure 2a

Fuel Type Atrium-10
Average Planar Linear Heat Generation Rate (APLHGR) Limit Versus Average Planar Exposure

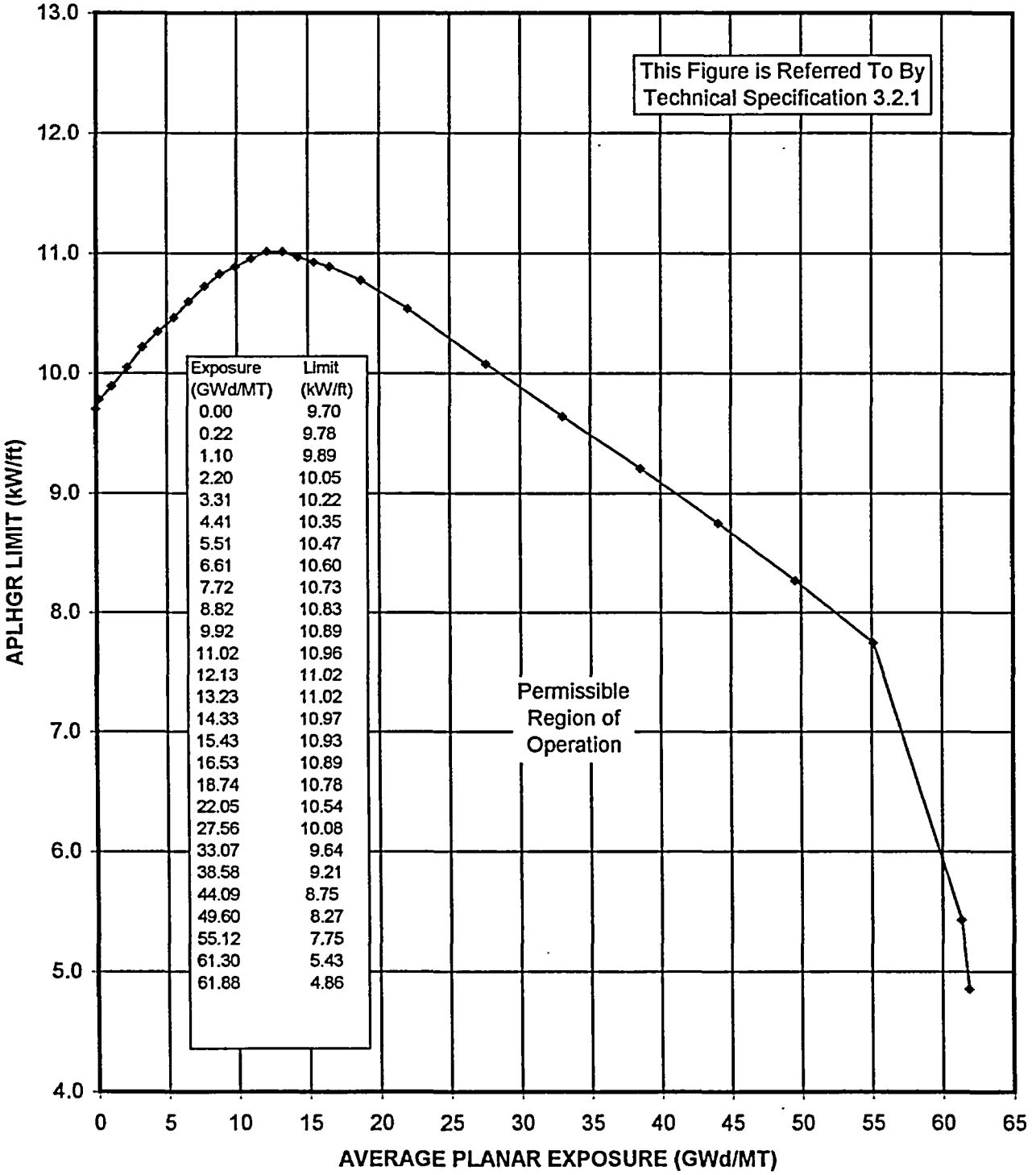


Exposure (GWd/MT)	Limit (kW/ft)
0.00	10.65
0.22	10.72
1.10	10.85
2.20	11.00
3.31	11.12
4.41	11.25
5.51	11.38
6.61	11.52
7.72	11.66
8.82	11.81
9.92	11.95
11.02	12.05
13.78	12.04
16.53	11.97
19.29	11.79
22.05	11.54
27.56	11.13
33.07	10.57
38.58	10.10
44.09	9.68
49.60	9.29
55.12	8.94
60.63	8.60
64.48	8.36

Figure 3

Progress Energy

Fuel Type GE14-P10DNAB398-13GZ-100T-150-T-2417 (GE14) Average Planar Linear Heat Generation Rate (APLHGR) Limit Versus Average Planar Exposure

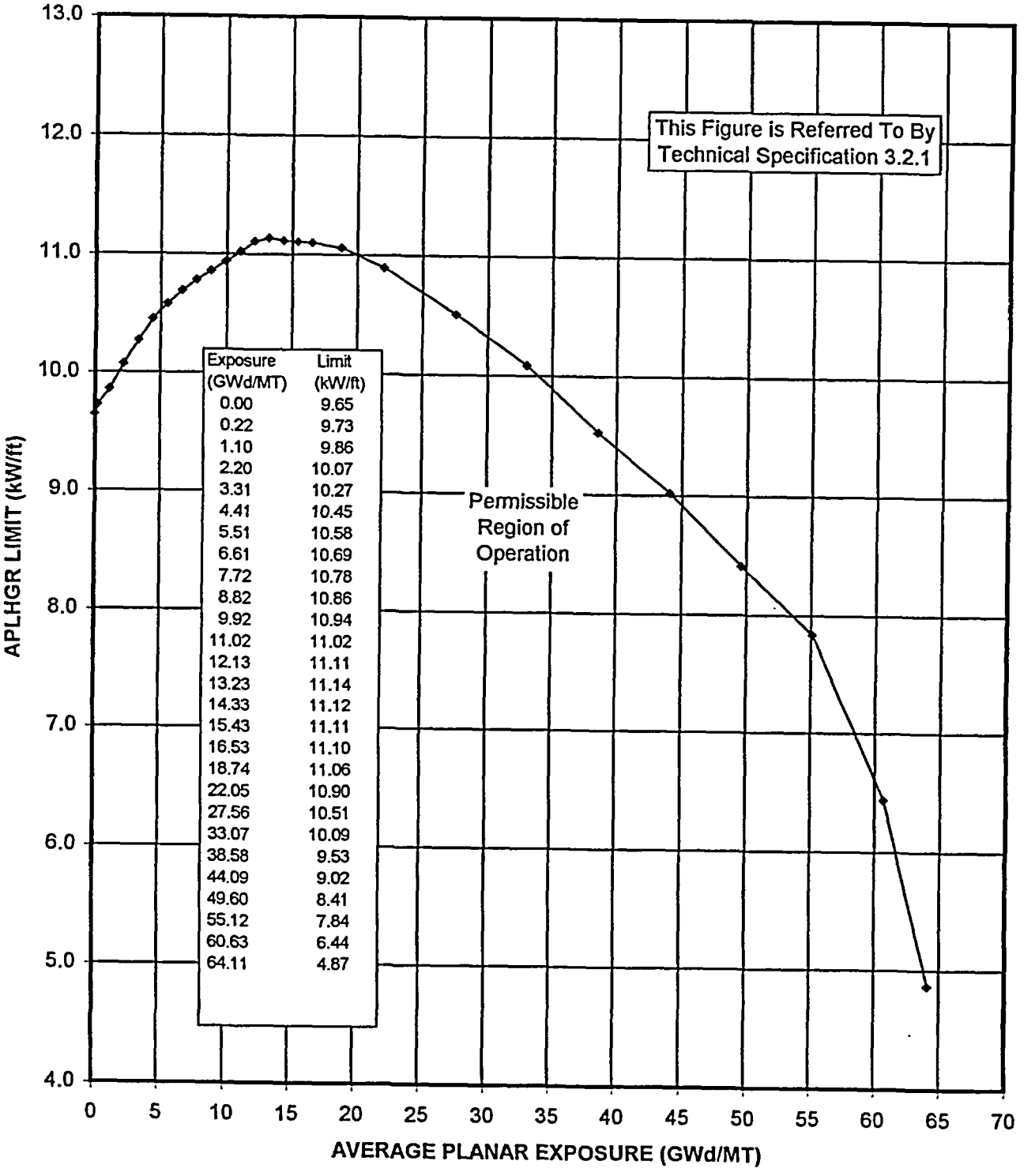


Exposure (GWd/MT)	Limit (kW/ft)
0.00	9.70
0.22	9.78
1.10	9.89
2.20	10.05
3.31	10.22
4.41	10.35
5.51	10.47
6.61	10.60
7.72	10.73
8.82	10.83
9.92	10.89
11.02	10.96
12.13	11.02
13.23	11.02
14.33	10.97
15.43	10.93
16.53	10.89
18.74	10.78
22.05	10.54
27.56	10.08
33.07	9.64
38.58	9.21
44.09	8.75
49.60	8.27
55.12	7.75
61.30	5.43
61.88	4.86

Figure 4

Progress Energy

Fuel Type GE14-P10DNAB399-16GZ-100T-150-T-2418 (GE14)
Average Planar Linear Heat Generation Rate (APLHGR) Limit
Versus Average Planar Exposure

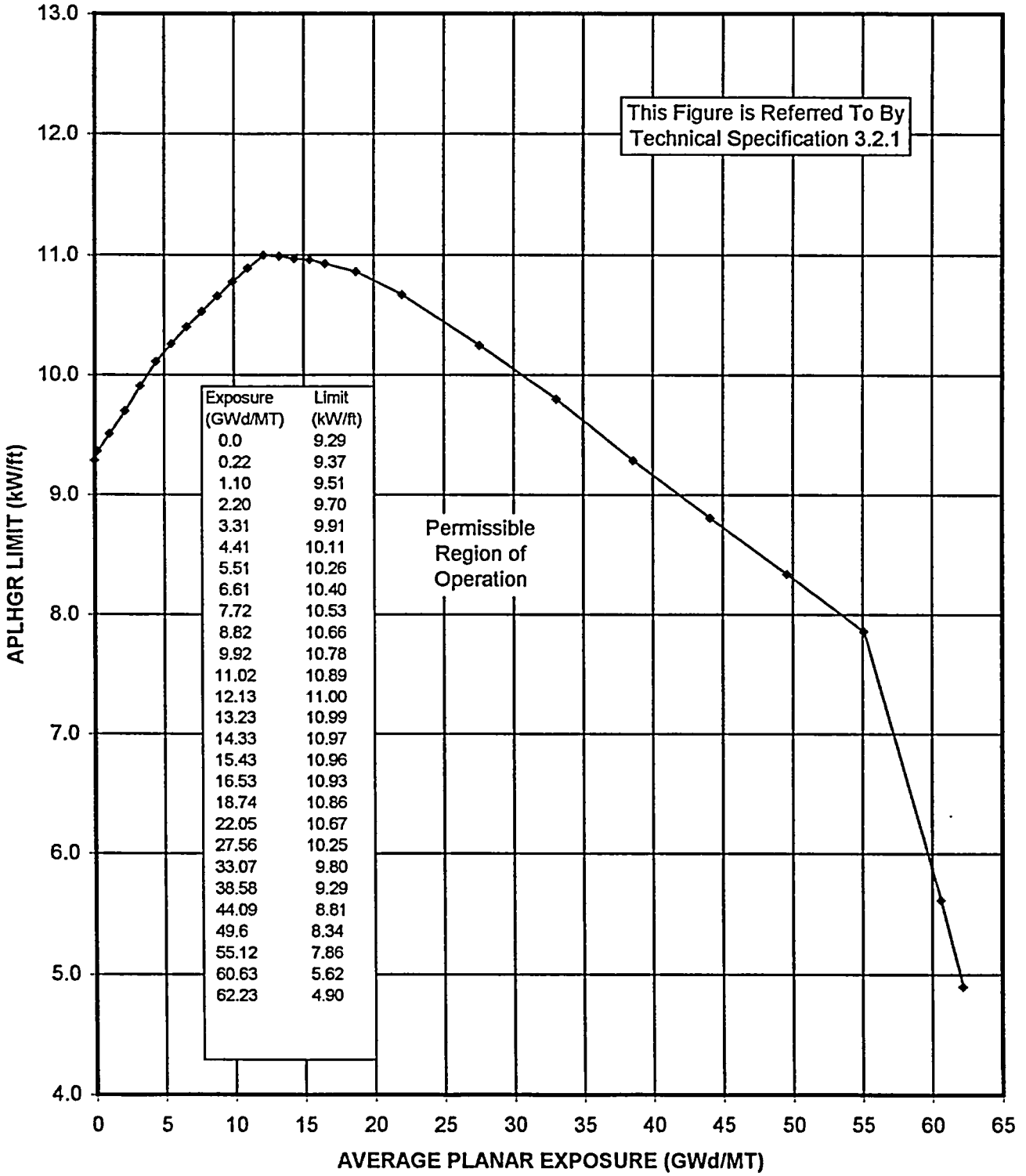


Exposure (GWd/MT)	Limit (kW/ft)
0.00	9.65
0.22	9.73
1.10	9.86
2.20	10.07
3.31	10.27
4.41	10.45
5.51	10.58
6.61	10.69
7.72	10.78
8.82	10.86
9.92	10.94
11.02	11.02
12.13	11.11
13.23	11.14
14.33	11.12
15.43	11.11
16.53	11.10
18.74	11.06
22.05	10.90
27.56	10.51
33.07	10.09
38.58	9.53
44.09	9.02
49.60	8.41
55.12	7.84
60.63	6.44
64.11	4.87

Figure 5

Progress Energy

Fuel Type GE14-P10DNAB420-18GZ-100T-150-T-2572 (GE14)
Average Planar Linear Heat Generation Rate (APLHGR) Limit
Versus Average Planar Exposure

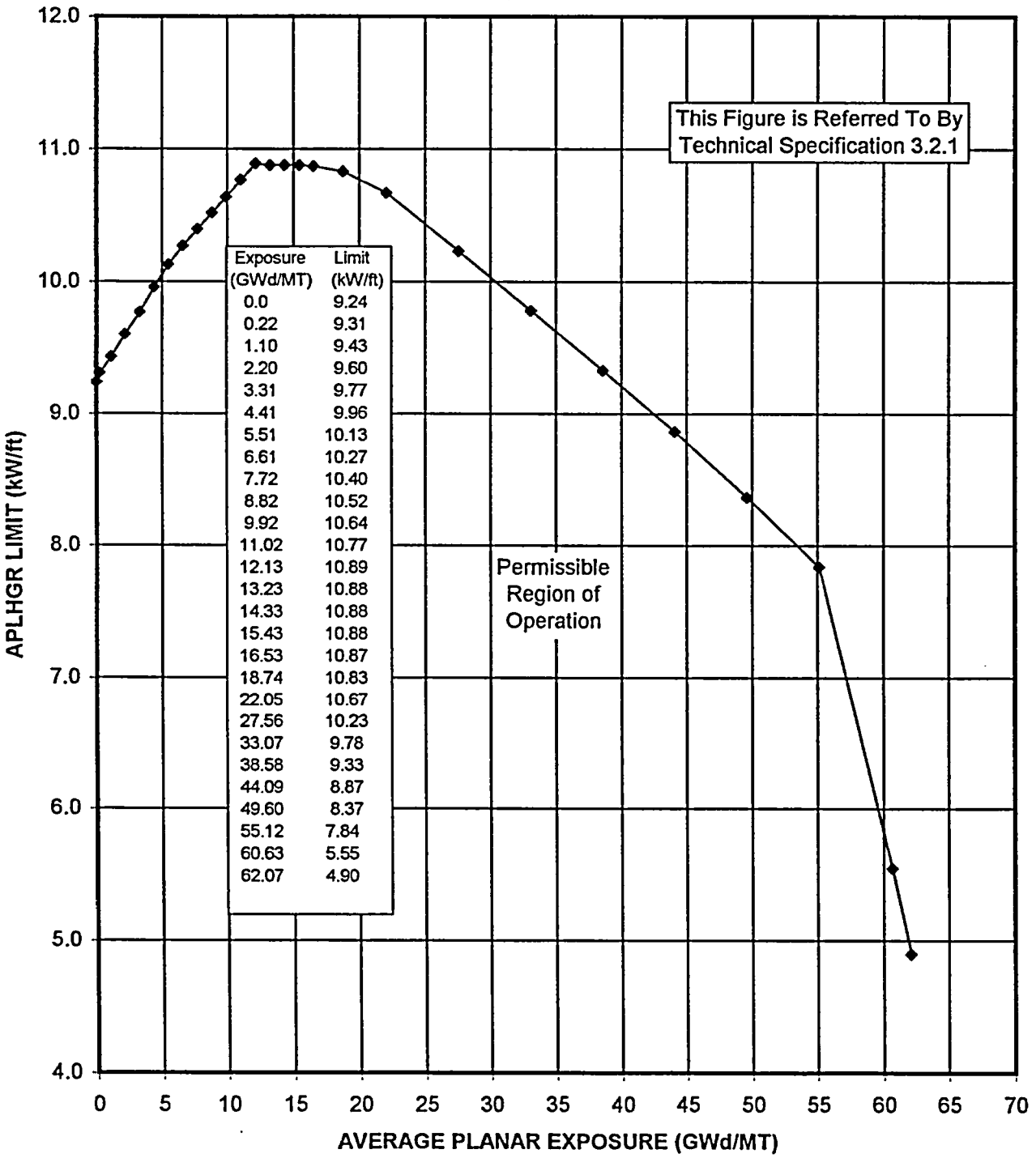


Exposure (GWd/MT)	Limit (kW/ft)
0.0	9.29
0.22	9.37
1.10	9.51
2.20	9.70
3.31	9.91
4.41	10.11
5.51	10.26
6.61	10.40
7.72	10.53
8.82	10.66
9.92	10.78
11.02	10.89
12.13	11.00
13.23	10.99
14.33	10.97
15.43	10.96
16.53	10.93
18.74	10.86
22.05	10.67
27.56	10.25
33.07	9.80
38.58	9.29
44.09	8.81
49.6	8.34
55.12	7.86
60.63	5.62
62.23	4.90

Figure 6

Progress Energy

Fuel Type GE14-P10DNAB419-6G7.0/7G6.0/3G2.0-100T-150-T-2573
(GE14)
Average Planar Linear Heat Generation Rate (APLHGR) Limit
Versus Average Planar Exposure

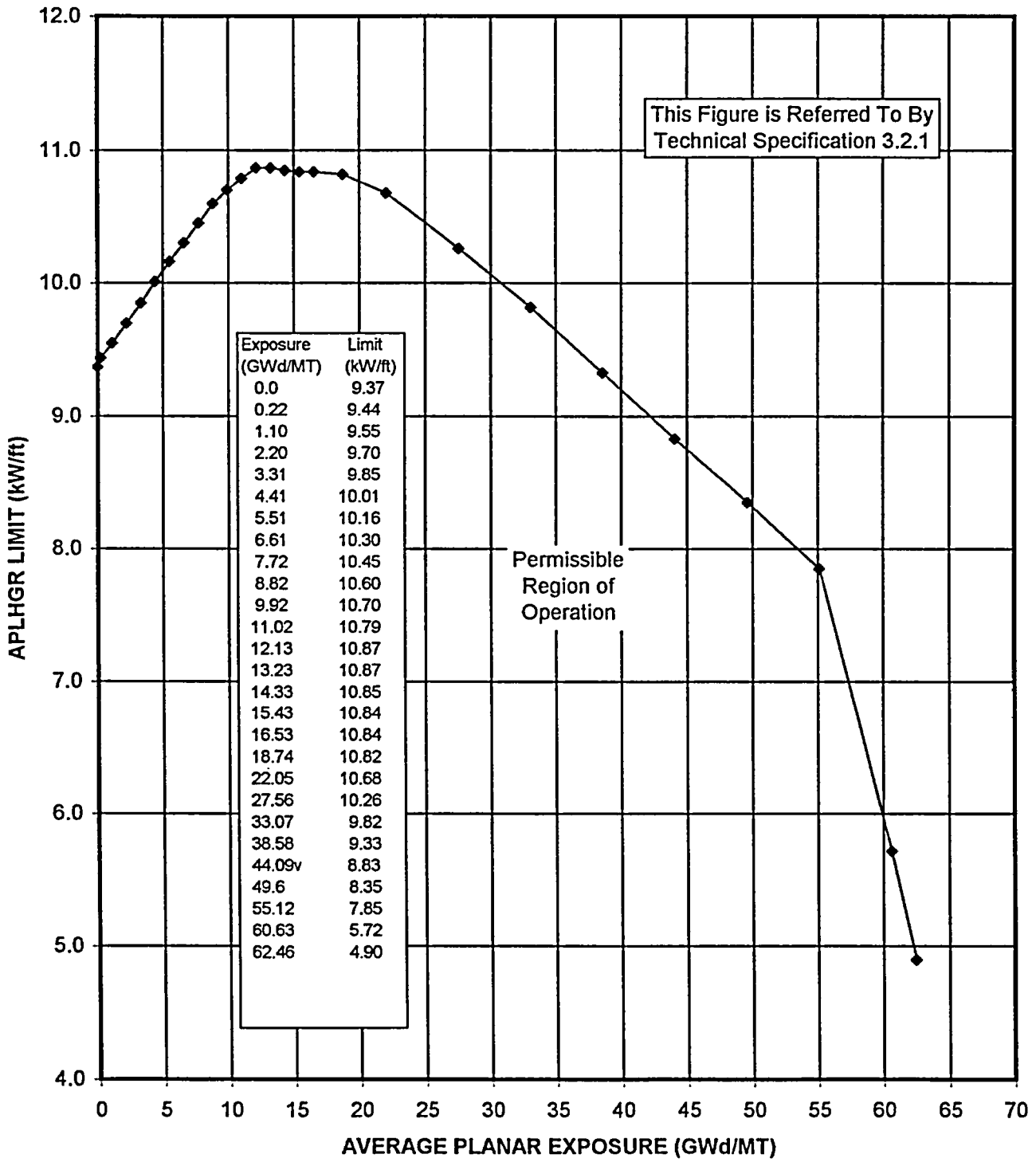


Exposure (GWd/MT)	Limit (kW/ft)
0.0	9.24
0.22	9.31
1.10	9.43
2.20	9.60
3.31	9.77
4.41	9.96
5.51	10.13
6.61	10.27
7.72	10.40
8.82	10.52
9.92	10.64
11.02	10.77
12.13	10.89
13.23	10.88
14.33	10.88
15.43	10.88
16.53	10.87
18.74	10.83
22.05	10.67
27.56	10.23
33.07	9.78
38.58	9.33
44.09	8.87
49.60	8.37
55.12	7.84
60.63	5.55
62.07	4.90

Figure 7

Progress Energy

Fuel Type GE14-P10DNAB425-3G7.0/14G6.0/1G2.0-100T-150-T-2574
(GE14)
Average Planar Linear Heat Generation Rate (APLHGR) Limit
Versus Average Planar Exposure

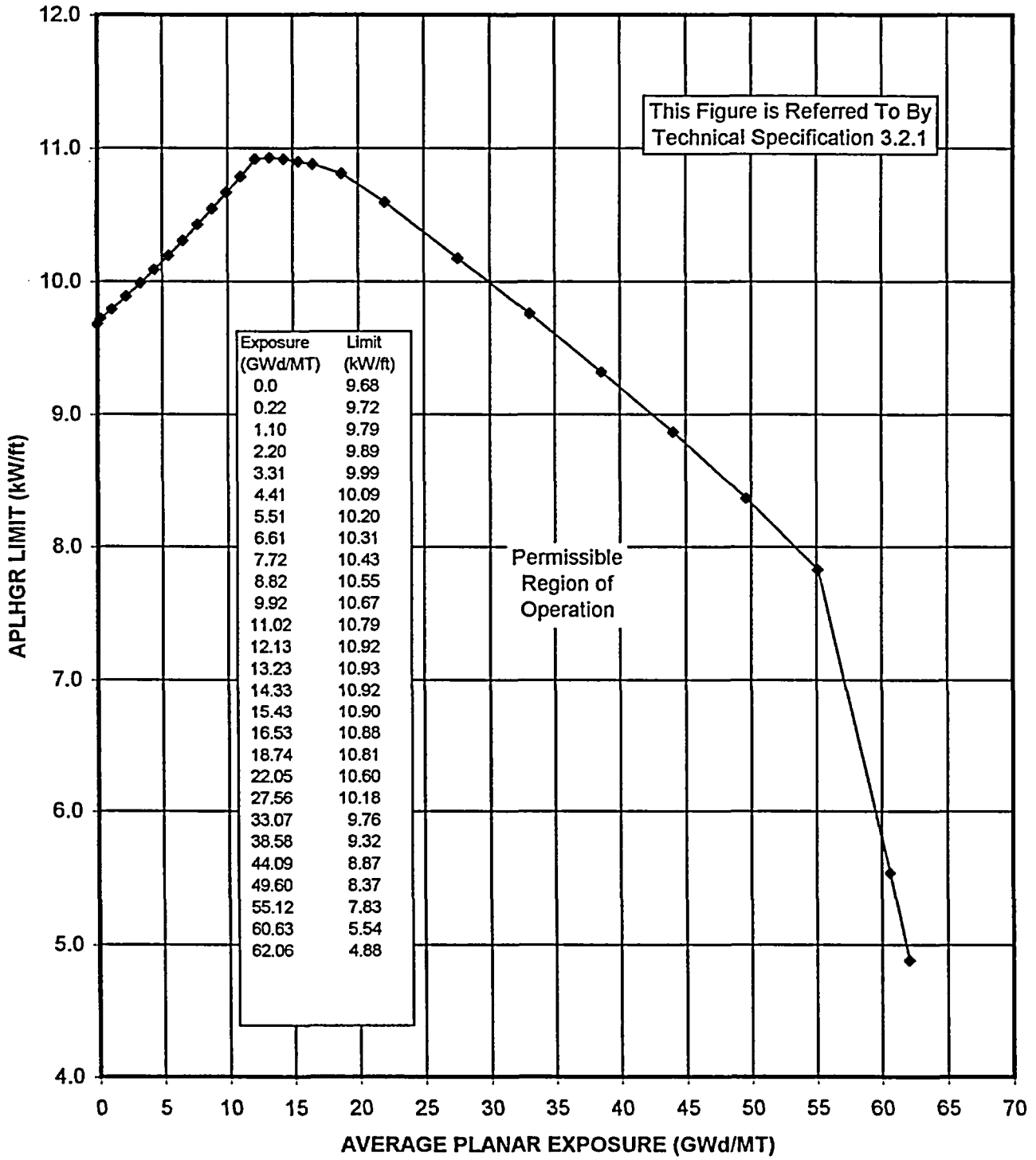


Exposure (GWd/MT)	Limit (kW/ft)
0.0	9.37
0.22	9.44
1.10	9.55
2.20	9.70
3.31	9.85
4.41	10.01
5.51	10.16
6.61	10.30
7.72	10.45
8.82	10.60
9.92	10.70
11.02	10.79
12.13	10.87
13.23	10.87
14.33	10.85
15.43	10.84
16.53	10.84
18.74	10.82
22.05	10.68
27.56	10.26
33.07	9.82
38.58	9.33
44.09v	8.83
49.6	8.35
55.12	7.85
60.63	5.72
62.46	4.90

Figure 8

Progress Energy

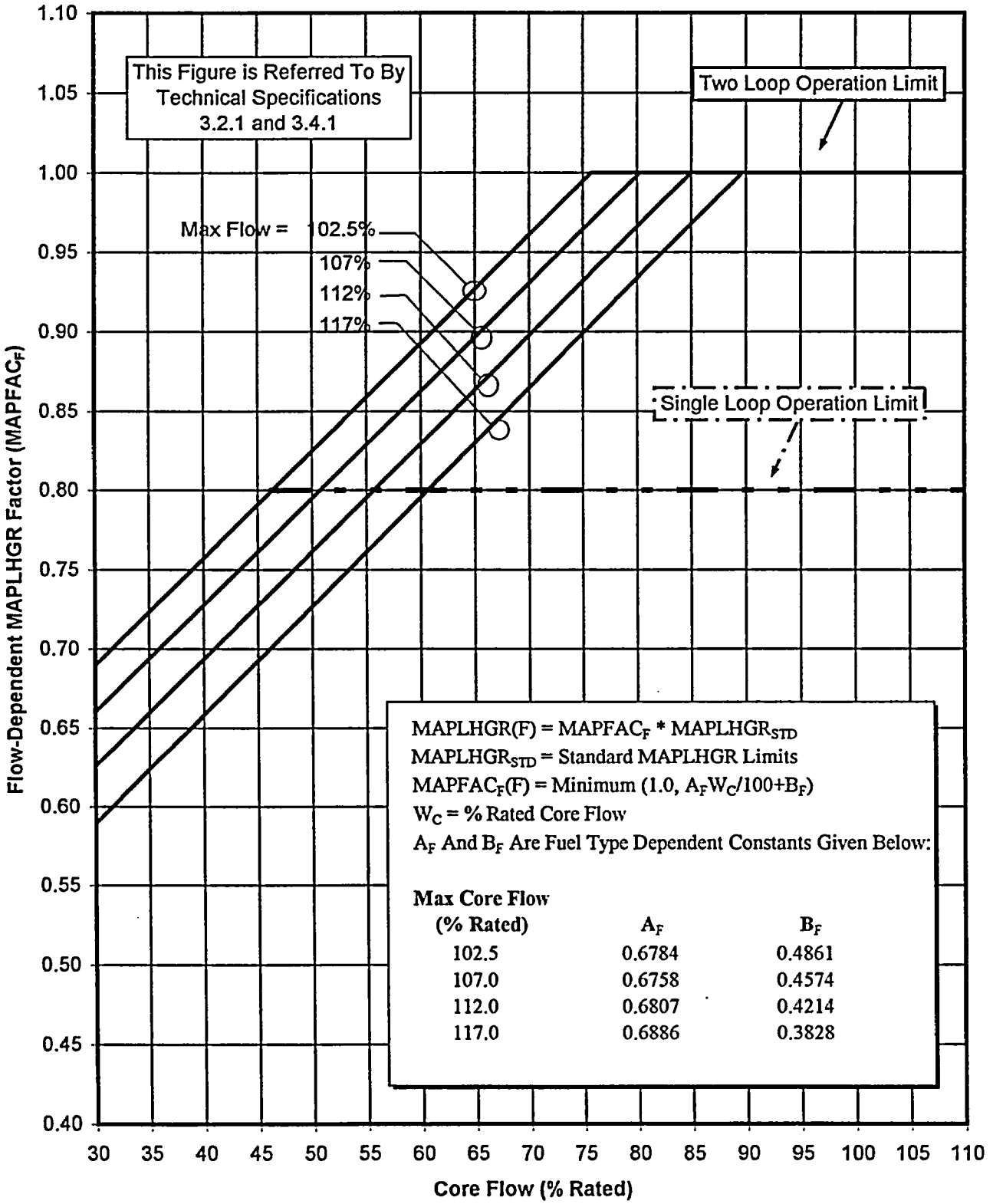
Fuel Type GE14-P10DNAB439-12G6.0-100T-150-T-2575 (GE14)
Average Planar Linear Heat Generation Rate (APLHGR) Limit
Versus Average Planar Exposure



Progress Energy

Figure 9

Flow-Dependent MAPLHGR Limit, MAPLHGR(F)



MAPLHGR(F) = MAPFAC$_F$ * MAPLHGR$_{STD}$
MAPLHGR$_{STD}$ = Standard MAPLHGR Limits
MAPFAC$_F$(F) = Minimum (1.0, $A_F W_C/100+B_F$)
W_C = % Rated Core Flow
A_F And B_F Are Fuel Type Dependent Constants Given Below:

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

Progress Energy

Power-Dependent MAPLHGR Limit, MAPLHGR (P)

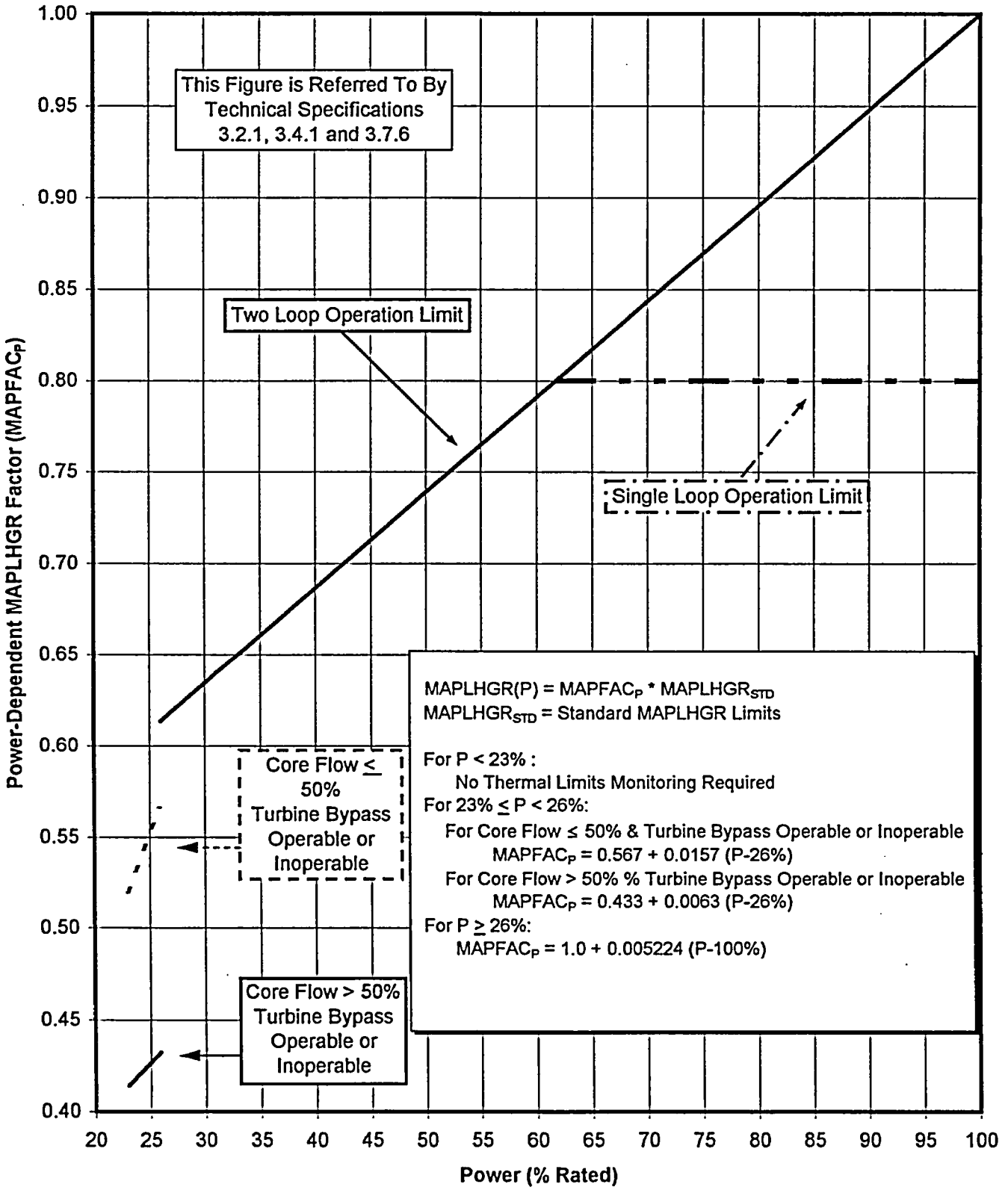


Figure 11

Progress Energy

GE13 and GE14 Flow-Dependent MCPR Limit, MCPR(F)

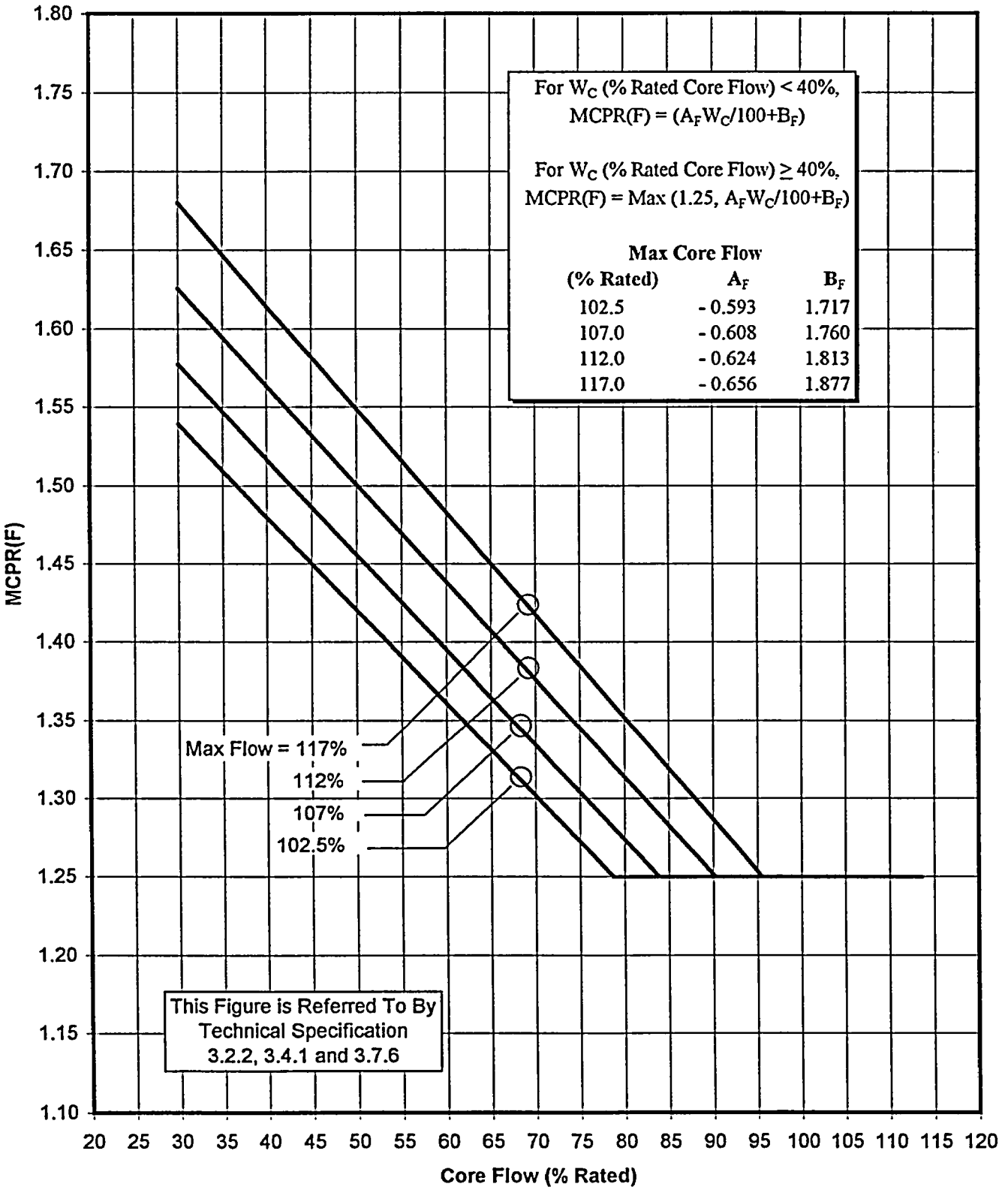


Figure 11a

Progress Energy

Atrium-10 Flow-Dependent MCPR Limit, MCPR(F)

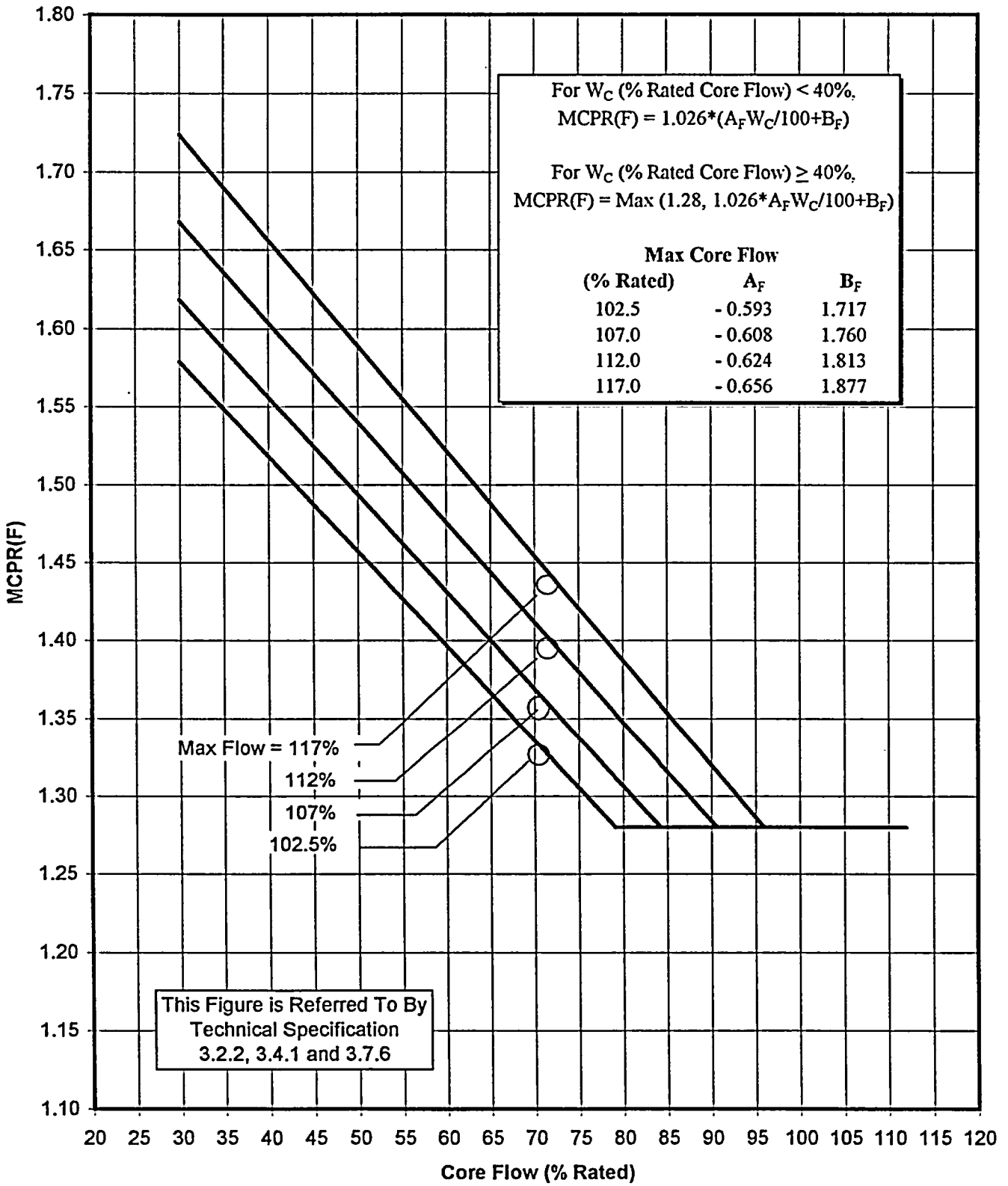
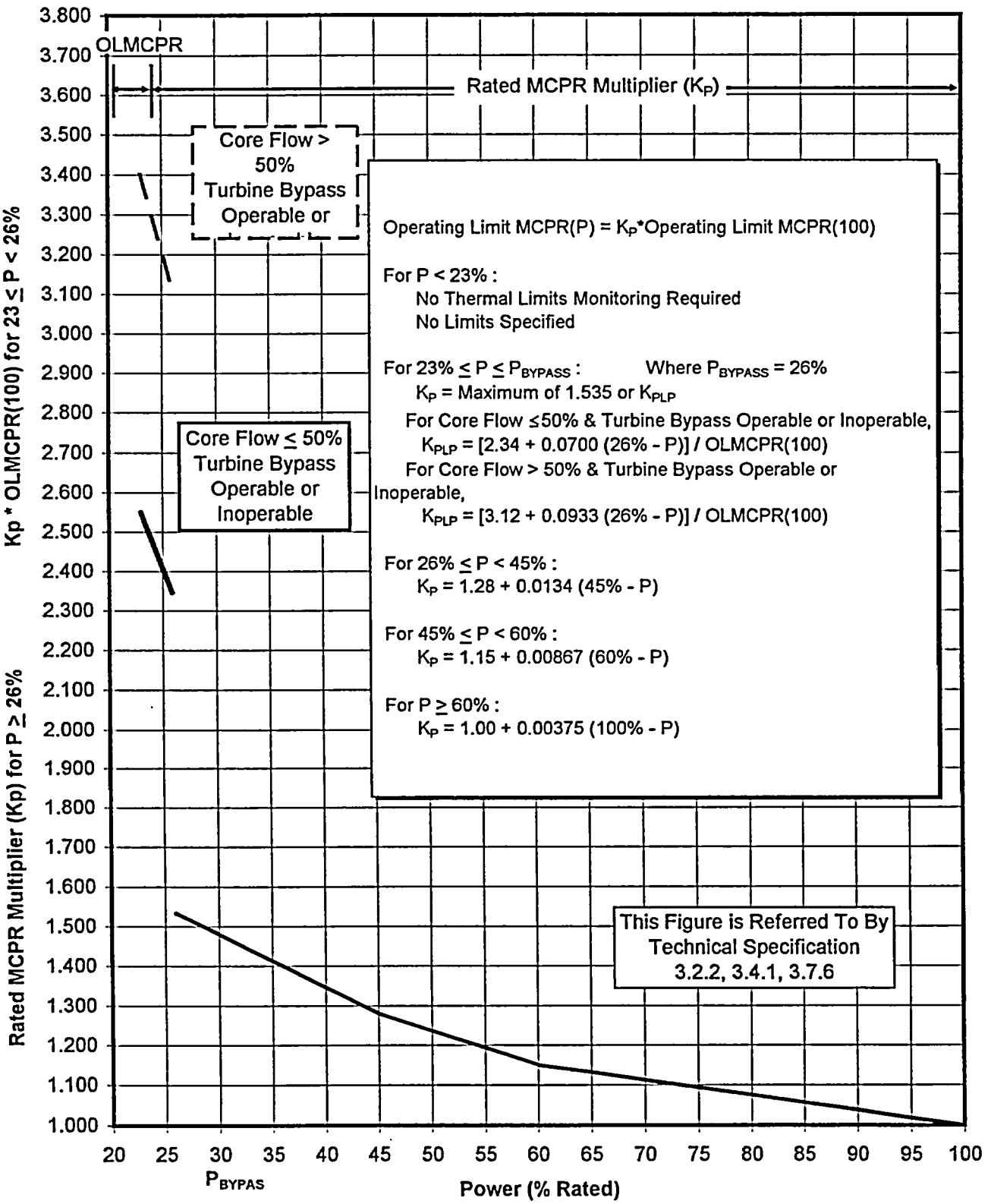


Figure 12

Progress Energy

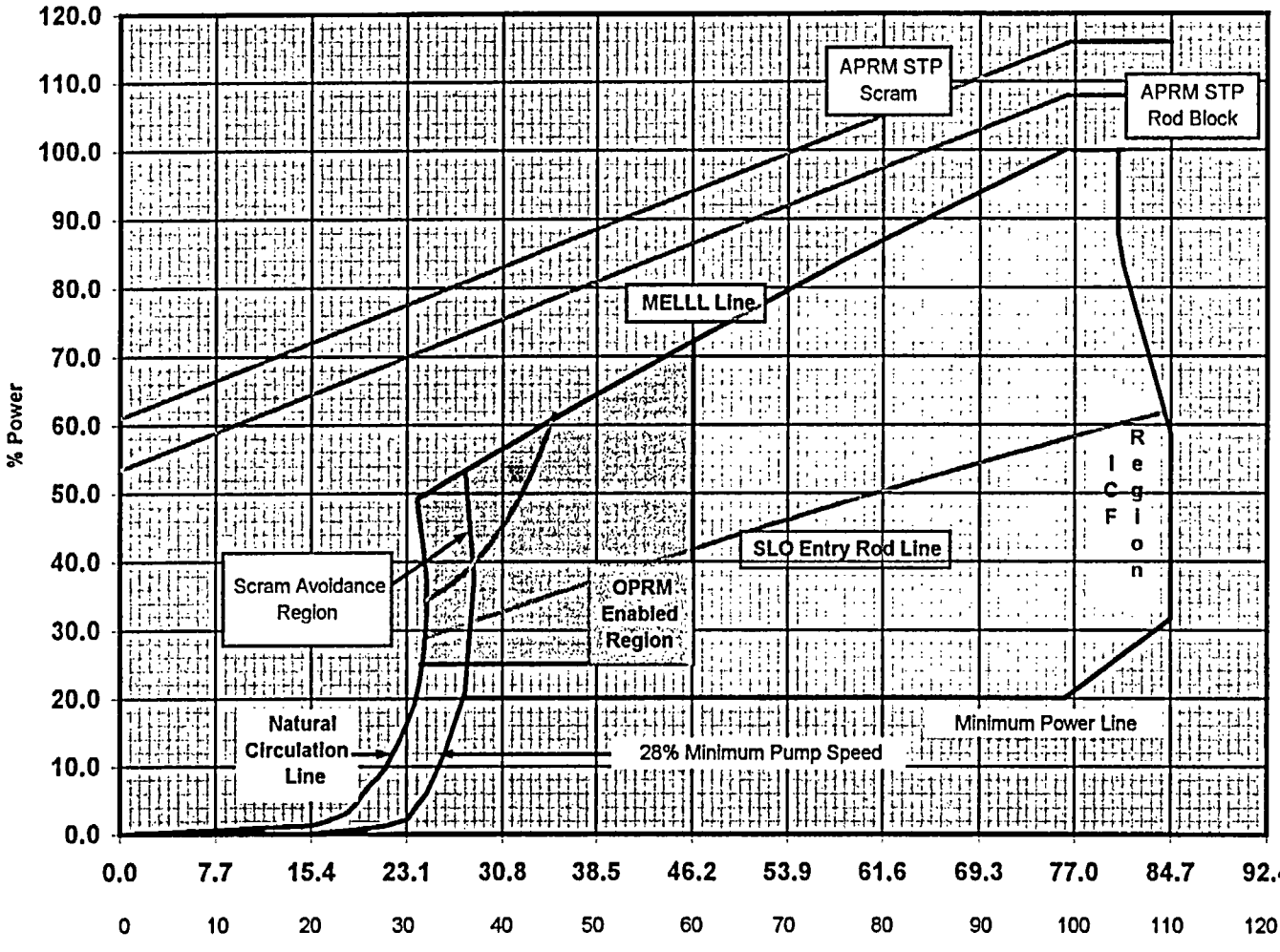
Power - Dependent MCPR Limit, MCPR (P)



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

Progress Energy

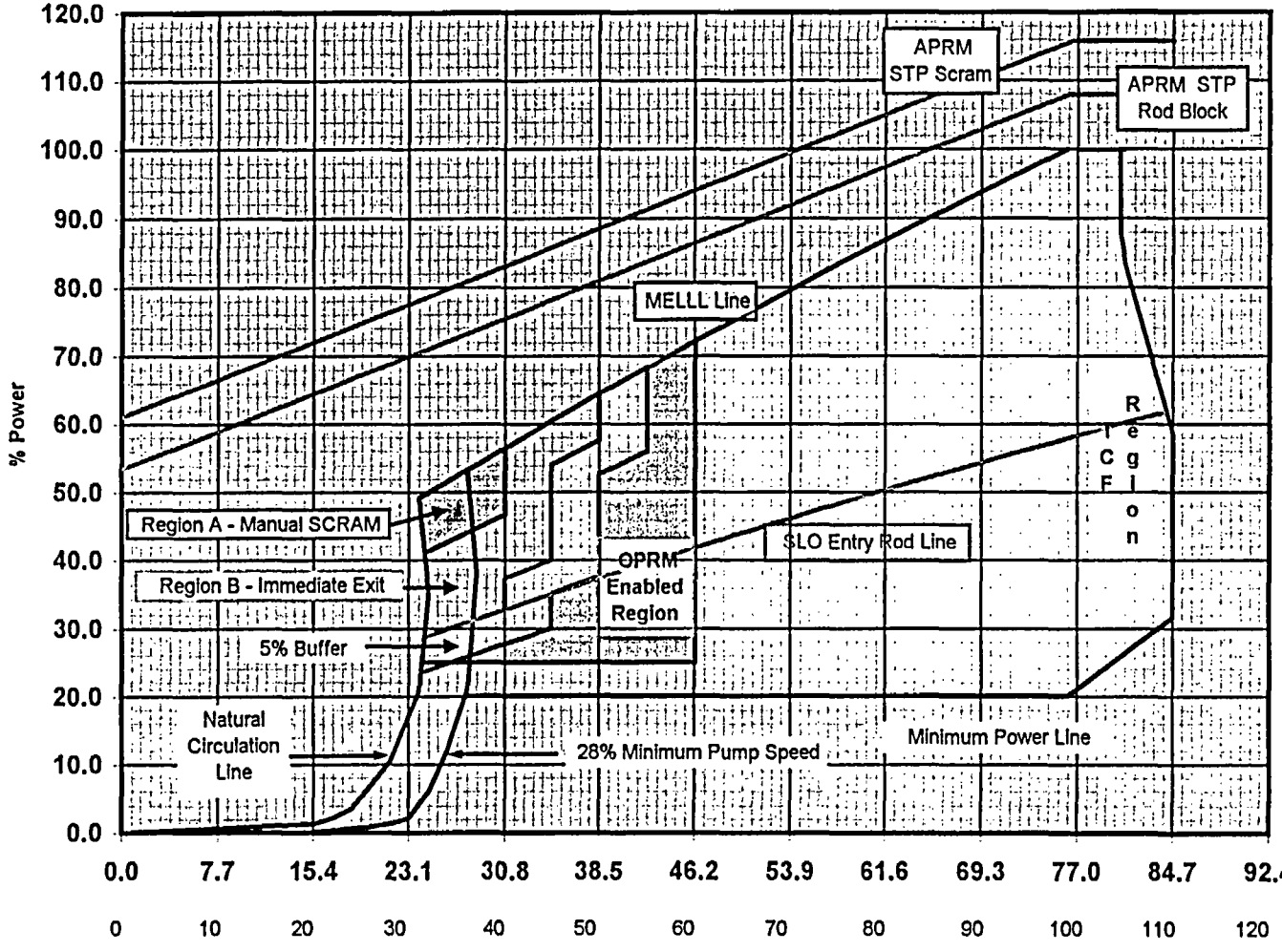


Power %	Minimum (MELLL) Core Flow, Mlbs/hr	Maximum (ICF) Core Flow, Mlbs/hr
100	76.19	80.47
99	75.04	80.47
98	73.89	80.47
97	72.75	80.47
96	71.61	80.47
95	70.49	80.47
94	69.36	80.47
93	68.25	80.47
92	67.13	80.47
91	66.03	80.47
90	64.93	80.47
89	63.83	80.47
88	62.74	80.47
87	61.66	80.51
86	60.58	80.60
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

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

Progress Energy



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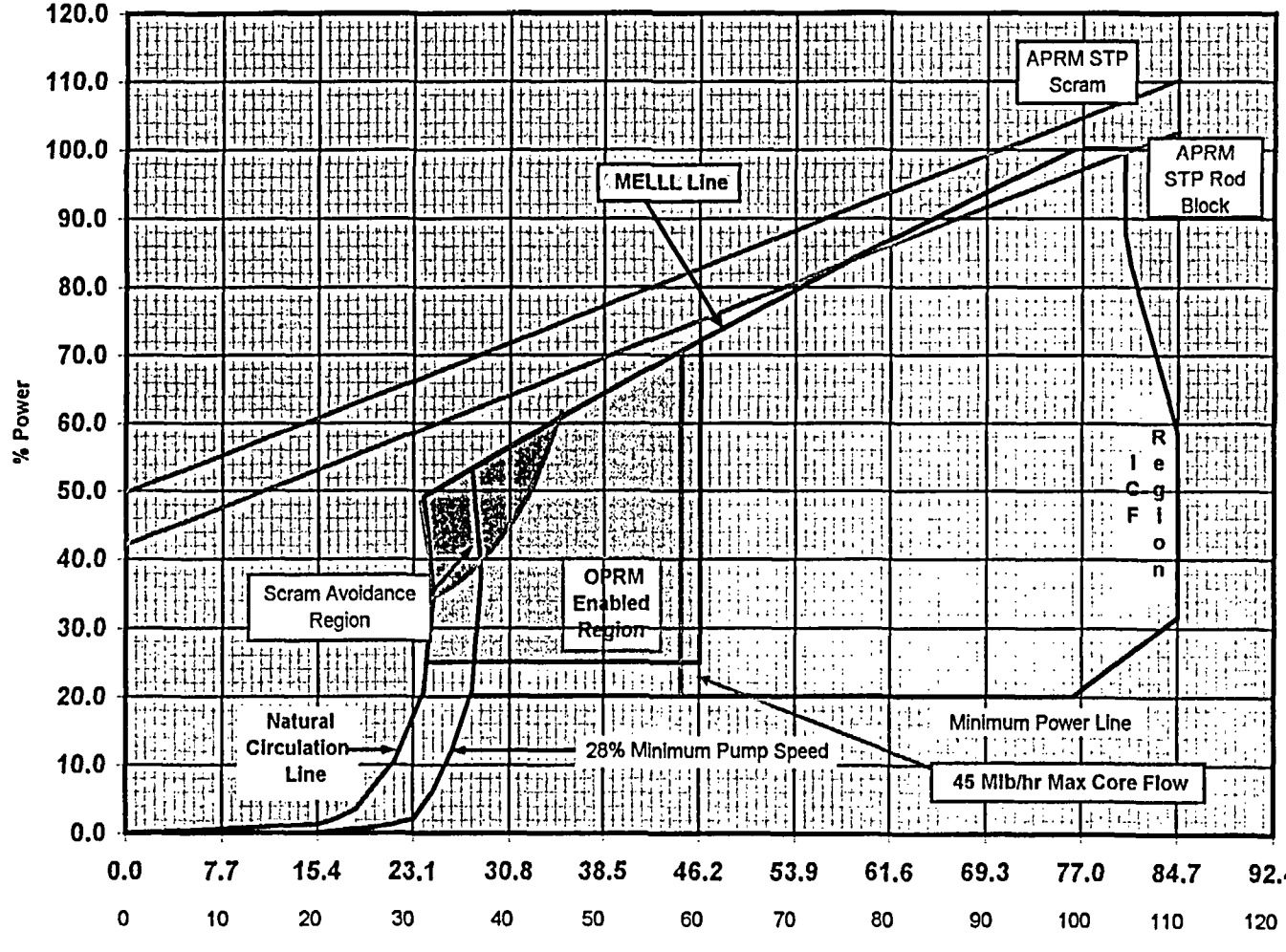
80	54.20	81.36
79	53.16	81.52
78	52.12	81.67
77	51.08	81.83
76	50.05	81.98
75	49.02	82.13
74	48.00	82.29
73	46.98	82.44
72	45.96	82.60
71	44.95	82.75
70	43.94	82.91
69	42.94	83.06
68	41.94	83.21
67	40.95	83.37
66	39.96	83.52
65	38.97	83.68
64	37.99	83.83
63	37.01	83.99
62	36.04	84.14
61	35.06	84.29
60	34.10	84.45
59	33.13	84.60
58	32.17	84.70

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

Progress Energy



Power %	Minimum (MELLL) Core Flow, Mlbs/hr	Maximum (ICF) Core Flow, Mlbs/hr
100	76.19	80.47
99	75.04	80.47
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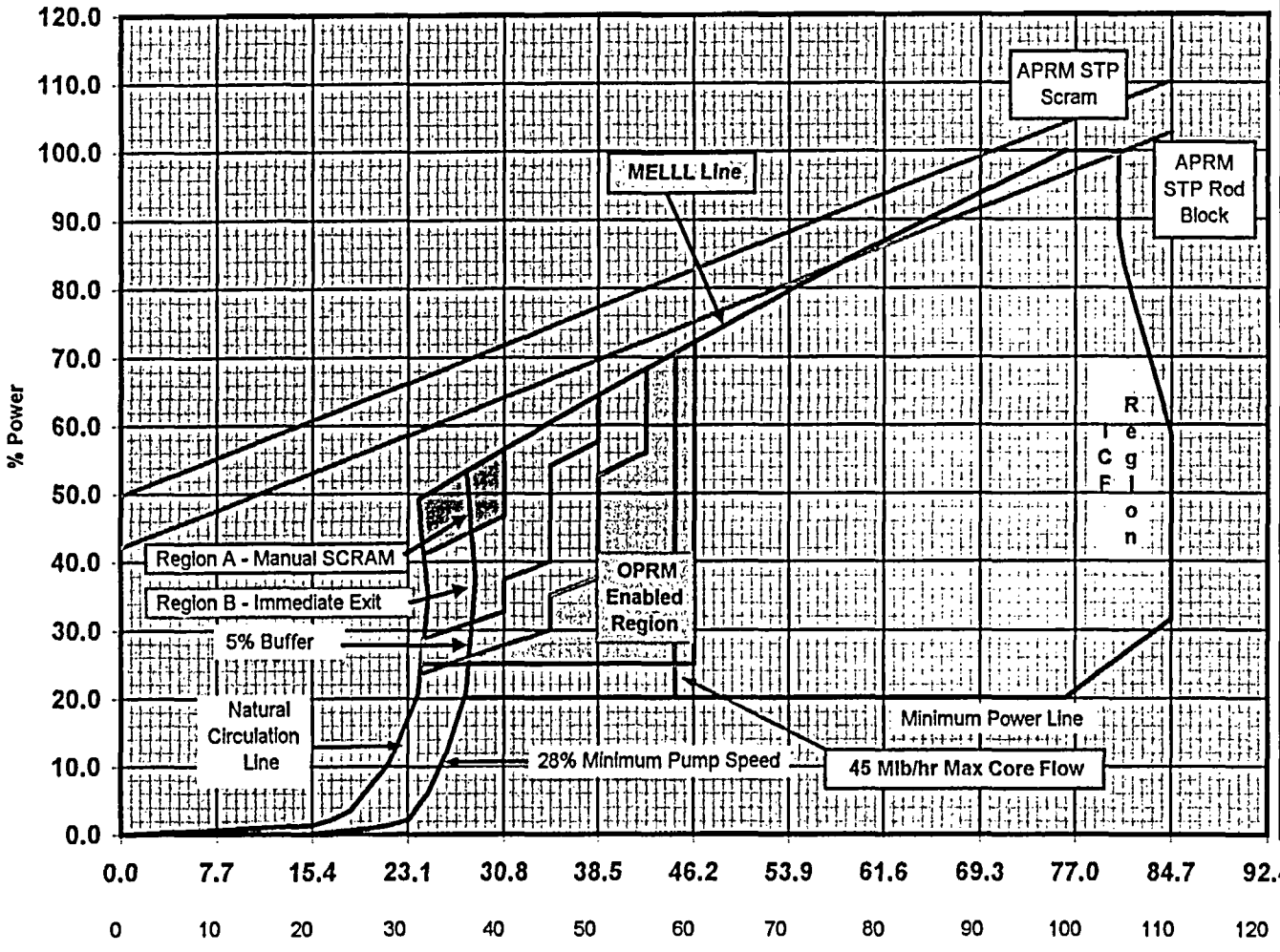
78	52.12	81.67
77	51.08	81.83
76	50.05	81.98
75	49.02	82.13
74	48.00	82.29
73	46.98	82.44
72	45.96	82.60
71	44.95	82.75
70	43.94	82.91
69	42.94	83.06
68	41.94	83.21
67	40.95	83.37
66	39.96	83.52
65	38.97	83.68
64	37.99	83.83
63	37.01	83.99
62	36.04	84.14
61	35.06	84.29
60	34.10	84.45
59	33.13	84.60
58	32.17	84.70

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

Progress Energy



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76	50.05	81.98
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74	48.00	82.29
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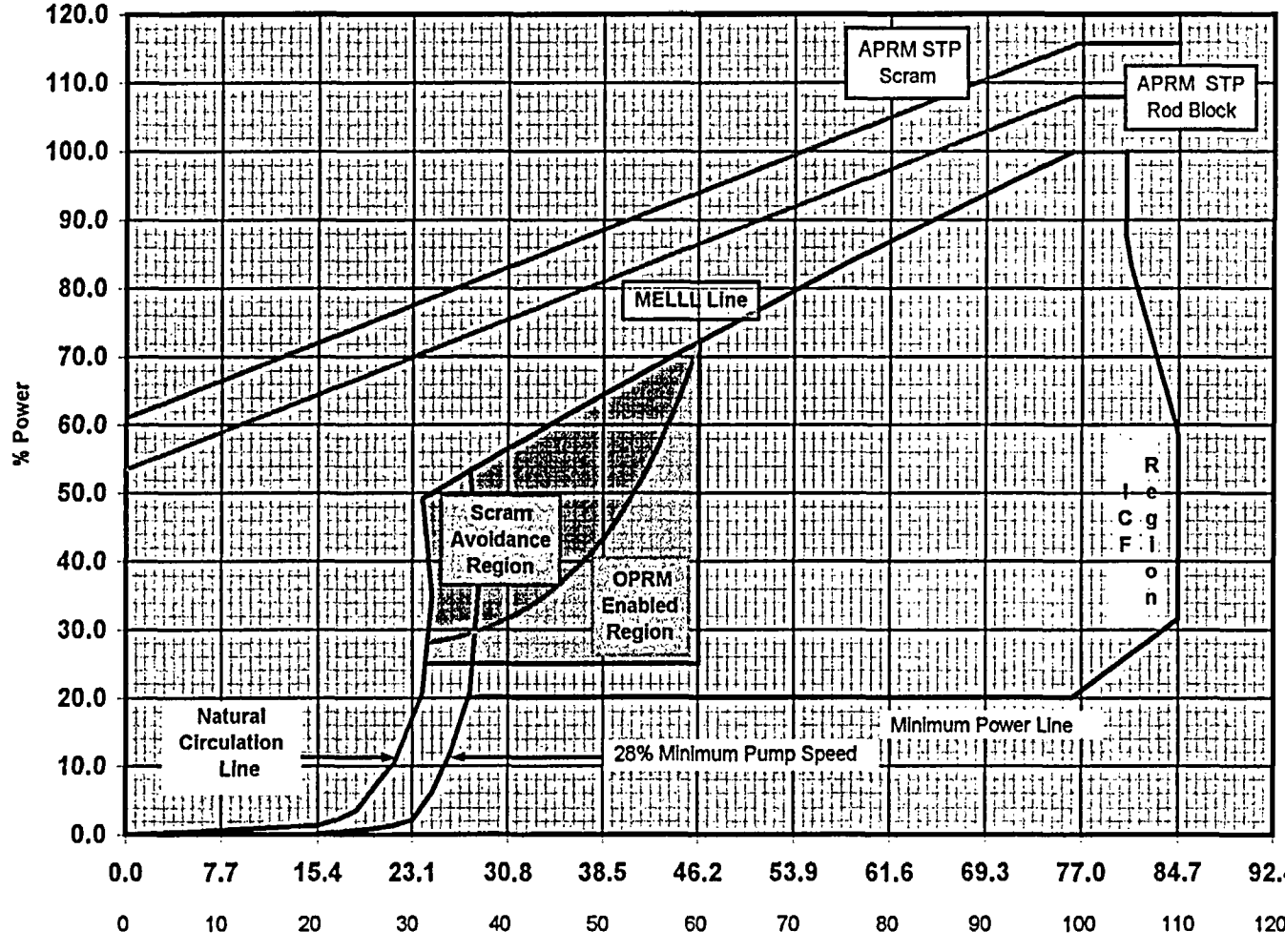
72	45.96	82.60
71	44.95	82.75
70	43.94	82.91
69	42.94	83.06
68	41.94	83.21
67	40.95	83.37
66	39.96	83.52
65	38.97	83.68
64	37.99	83.83
63	37.01	83.99
62	36.04	84.14
61	35.06	84.29
60	34.10	84.45
59	33.13	84.60
58	32.17	84.70

OPRM Operable, FWTR, 2923 MWt

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

Progress Energy



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100	76.19	80.47
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65	38.97	83.68
64	37.99	83.83
63	37.01	83.99
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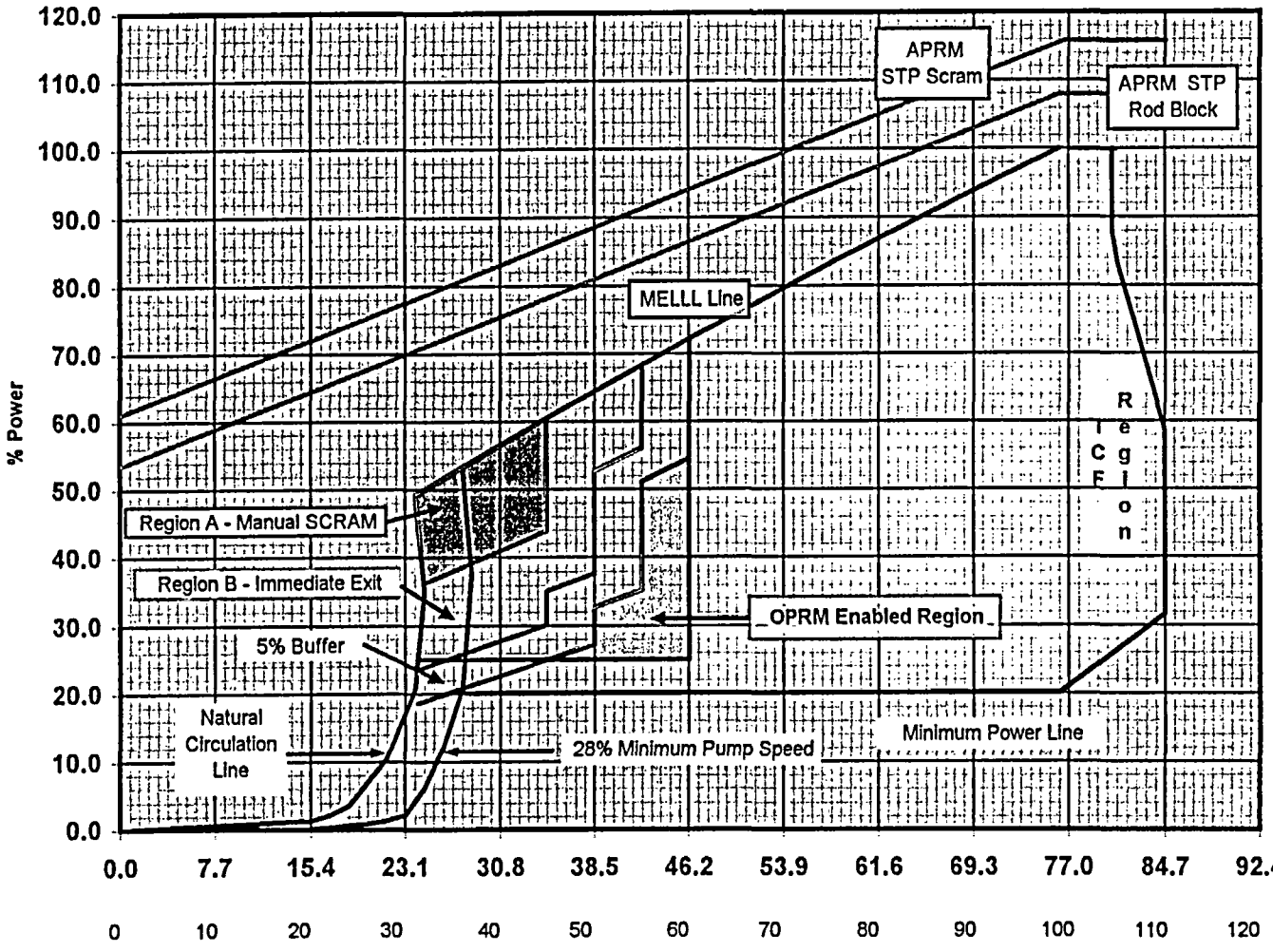
60	34.10	84.45
59	33.13	84.60
58	32.17	84.70

OPRM Inoperable, FWTR, 2923 MWt

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

Progress Energy



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