Pacific Gas and Electric Company®

Cary D. Harbor
Interim Senior Director
Engineering, Technical and
Emergency Services

Diablo Canyon Power Plant
Mail code 104/6/601
P.O. Box 56
Avila Beach, CA 93424

805.545.4102
Internal: 691.4102

April 22, 2019

PG&E Letter DCL-19-037

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

Docket No. 50-275, OL-DPR-80
Diablo Canyon Power Plant Unit 1
Core Operating Limits Report for Unit 1 Cycle 22

Dear Commissioners and Staff:

In accordance with Diablo Canyon Power Plant (DCPP) Technical Specification 5.6.5.d, enclosed is the Core Operating Limits Report (COLR) for DCPP Unit 1, Cycle 22.

Pacific Gas and Electric Company makes no new or revised regulatory commitments (as defined by NEI 99-04) in this letter.

If there are any questions regarding the COLR, please contact Mr. Shannon Conner at (805) 545-6171.

Sincerely,

Cary D. Harbor

rntt/4231
Enclosure
cc: Diablo Distribution
cc/enc: Scott A. Morris, NRC Region IV Administrator
Christopher W. Newport, NRC Senior Resident Inspector
Balwant K. Singal, NRR Senior Project Manager

DIABLO CANYON POWER PLANT
CORE OPERATING LIMITS REPORT
UNIT 1 CYCLE 22
EFFECTIVE DATE March 14, 2019

TITLE: COLR for Diablo Canyon Unit 1

03/14/19
EFFECTIVE DATE

CLASSIFICATION: QUALITY RELATED

1. CORE OPERATING LIMITS REPORT

1.1 This Core Operating Limits Report (COLR) for the Diablo Canyon Unit 1 Cycle 22 redesign has been prepared in accordance with the requirements of Technical Specification (TS) 5.6.5.

1.2 The Technical Specifications affected by this report are listed below:

- 3.1.1 - Shutdown Margin (MODE 2 with $k_{eff} < 1.0$, MODES 3, 4, and 5)
- 3.1.3 - Moderator Temperature Coefficient
- 3.1.4 - Rod Group Alignment Limits
- 3.1.5 - Shutdown Bank Insertion Limits
- 3.1.6 - Control Bank Insertion Limits
- 3.1.8 - PHYSICS TESTING Exceptions - MODE 2
- 3.2.1 - Heat Flux Hot Channel Factor - $F_Q(Z)$
- 3.2.2 - Nuclear Enthalpy Rise Hot Channel Factor - $F^N_{\Delta H}$
- 3.2.3 - Axial Flux Difference - (AFD)
- 3.4.1 - RCS Pressure, Temperature, and Flow Departure from Nucleate Boiling (DNB) Limits
- 3.9.1 - Boron Concentration

2. OPERATING LIMITS

The cycle-specific parameter limits for the TS listed in Section 1 are presented in the following subsections. These limits have been developed using the NRC-approved methodologies specified in TS 5.6.5.

2.1 Shutdown Margin (SDM) (TS 3.1.1, 3.1.4, 3.1.5, 3.1.6, 3.1.8)

The SDM limit for MODE 1, MODE 2, MODE 3 and MODE 4 is:

2.1.1 The shutdown margin shall be greater than or equal to 1.6% $\Delta k/k$.

2.1.2 In MODES 3 or 4 the shutdown margin with Safety Injection blocked shall be greater than or equal to 1.6% $\Delta k/k$ calculated at a temperature of 200°F.

The SDM limit for MODE 5 is:

2.1.3 The shutdown margin shall be greater than or equal to 1.6% $\Delta k/k$. This limit addresses the concerns of NSAL-02-014 (Reference 6.3) and the boron dilution analysis for RCS filled conditions.

In order to address RCS drained conditions for the boron dilution analysis, a minimum boron concentration of 1800 ppm shall be maintained whenever the RCS level is at or below the reactor vessel flange elevation (114 feet).

2.2 Moderator Temperature Coefficient (MTC) (TS 3.1.3)

The MTC limit for MODES 1, 2, and 3 is:

2.2.1 The MTC shall be less negative than -3.9×10^{-4} $\Delta k/k/°F$ for all rods withdrawn, end of cycle life (EOL), RATED THERMAL POWER condition.

2.2.2 The MTC 300 ppm surveillance limit is -3.0×10^{-4} $\Delta k/k/°F$ (all rods withdrawn, RATED THERMAL POWER condition).

2.2.3 The MTC 60 ppm surveillance limit is -3.72×10^{-4} $\Delta k/k/°F$ (all rods withdrawn, RATED THERMAL POWER condition).

2.3 Shutdown Bank Insertion Limits (TS 3.1.5)

2.3.1 Each shutdown bank shall be withdrawn to at least 225 steps.

2.4 Control Bank Insertion Limits (TS 3.1.6)

2.4.1 The control banks shall be limited in physical insertion as shown in Figure 1.

2.5 Heat Flux Hot Channel Factor - $F_Q(Z)$ (TS 3.2.1)

2.5.1 $$F_Q(Z) < \frac{F_Q^{RTP}}{P} * K(Z) \quad \text{for } P > 0.5$$

$$F_Q(Z) < \frac{F_Q^{RTP}}{0.5} * K(Z) \quad \text{for } P \leq 0.5$$

where: $$P = \frac{THERMAL\ POWER}{RATED\ THERMAL\ POWER}$$

$F_Q^{RTP} = 2.58$

K(Z) = 1.0

<u>NOTE</u>: The W(Z) data is appropriate for use only if the predicted axial offset is within ±3% of the measured value.

2.5.2 The W(Z) data for Relaxed Axial Offset Control (RAOC) operation, provided in Tables 2A, 2B and 2C are sufficient to determine the RAOC W(Z) versus core height for burnups through the end of full power reactivity plus a power coast down of up to 1200 MWD/MTU.

For W(Z) data at a desired burnup not listed in the table, but less than the maximum listed burnup, values at 3 or more burnup steps should be used to interpolate the W(Z) data to the desired burnup with a polynomial type fit that uses the W(Z) data for the nearest three burnup steps.

For W(Z) data at a desired burnup outside of the listed burnup steps, a linear extrapolation of the W(Z) data for the nearest two burnup steps can be used. If data are listed for only 2 burnup steps, a linear fit can be used for both interpolation and extrapolation.

The W(Z) values are generated assuming that they will be used for full power surveillance. When using a flux map instead of the Power Distribution Monitoring System (PDMS) for part power surveillance, the W(Z) values must be increased by the factor 1/P (P > 0.5) or 1/0.5 (P ≤ 0.5), where P is the core relative power during the surveillance, to account for the increase in the $F_Q(Z)$ limit at reduced power levels.

Table 1 shows F_Q margin decreases that are greater than 2% per 31 Effective Full Power Days (EFPD). These values shall be used to increase $F_Q^W(Z)$ per SR 3.2.1.2. A 2% penalty factor shall be used at all cycle burnups that are outside the range of Table 1.

2.5.3 $F_Q(Z)$ shall be evaluated to determine if it is within its limits by verifying that $F_Q^C(Z)$ and $F_Q^W(Z)$ satisfy the following:

a. Using the moveable incore detectors to obtain a power distribution map in MODE 1.

b. Increasing the measured $F_Q(Z)$ component of the power distribution map by 3% to account for manufacturing tolerances and further increasing the value by 5% to account for measurement uncertainties.

c. Satisfying the following relationship:

$$F_Q^C(Z) < \frac{F_Q^{RTP} * K(Z)}{P} \quad \text{for } P > 0.5$$

$$F_Q^C(Z) \leq \frac{F_Q^{RTP} * K(Z)}{0.5} \quad \text{for } P \leq 0.5$$

$$F_Q^W(Z) < \frac{F_Q^{RTP}}{P} * K(Z) \quad \text{for } P > 0.5$$

$$F_Q^W(Z) \leq \frac{F_Q^{RTP}}{0.5} * K(Z) \quad \text{for } P \leq 0.5$$

where:

$F_Q^C(Z)$ is the measured $F_Q(Z)$ increased by the allowances for manufacturing tolerances and measurement uncertainty.

F_Q^{RTP} is the F_Q limit

K(Z) is the normalized $F_Q(Z)$ as a function of core height

P is the relative THERMAL POWER, and

$F_Q^W(Z)$ is the total peaking factor, $F_Q^C(Z)$, multiplied by W(Z) which gives the maximum $F_Q(Z)$ calculated to occur in normal operation.

W(Z) is the cycle dependent function that accounts for power distribution transients encountered during normal operation.

F_Q^{RTP} and K(Z) are specified in 2.5.1 and W(Z) is specified in 2.5.2.

2.6 Nuclear Enthalpy Rise Hot Channel Factor - $F^{N}_{\Delta H}$ (TS 3.2.2)

$$F^{N}_{\Delta H} \leq F^{RTP}_{\Delta H} *[1 + PF_{\Delta H} * (1-P)]$$

where:

$$P = \frac{THERMAL\ POWER}{RATED\ THERMAL\ POWER}$$

$F^{N}_{\Delta H}$ = Measured values of $F^{N}_{\Delta H}$ obtained by using the moveable incore detectors to obtain a power distribution map.

$F^{RTP}_{\Delta H}$ = 1.586 (prior to including 4% uncertainty)

$PF_{\Delta H}$ = 0.3 = Power Factor Multiplier

2.7 Power Distribution Measurement Uncertainty (TS 3.2.1. and TS 3.2.2):

If the PDMS is OPERABLE, the uncertainty, $U_{F\Delta H}$, to be applied to the Nuclear Enthalpy Rise Hot Channel Factor, $F^{N}_{\Delta H}$, shall be calculated by the following formula:

$$U_{F\Delta H} = 1.0 + \frac{U_{\Delta H}}{100.0}$$

where: $U_{\Delta H}$ = Uncertainty for enthalpy rise as defined in equation (5-19) in Reference 6.2. However, if the uncertainty is less than 4.0, the uncertainty should be set equal to 4.0. $F^{RTP}_{\Delta H}$ = 1.65 for PDMS (in the above Section 2.6 equation).

If the PDMS is OPERABLE, the uncertainty, U_{FQ}, to be applied to the Heat Flux Hot Channel Factor, $F_Q(Z)$, shall be calculated by the following formula:

$$U_{FQ} = \left(1.0 + \frac{U_Q}{100.0}\right) * U_e$$

where: U_Q = Uncertainty for power peaking factor as defined in equation (5-19) in Reference 6.2.

U_e = Engineering uncertainty factor
= 1.03

If the PDMS is inoperable, the Nuclear Enthalpy Rise Hot Channel Factor, $F^{N}_{\Delta H}$, shall be calculated as specified in Section 2.6.

If the PDMS is inoperable, the Heat Flux Hot Channel Factor, $F_Q(Z)$, shall be calculated as specified in Section 2.5.

2.8 Axial Flux Difference (TS 3.2.3)

2.8.1 The Axial Flux Difference (AFD) Limits are provided in Figure 2.

2.9 Boron Concentration (TS 3.9.1)

The refueling boron concentration of the Reactor Coolant System, the refueling canal, and the refueling cavity shall be maintained within the more restrictive of the following limits:

2.9.1 A k_{eff} of 0.95 or less, with the most reactive control rod assembly completely withdrawn, or

2.9.2 A boron concentration of greater than or equal to 2000 ppm.

2.10 RCS Pressure, Temperature and Flow Departure from Nucleate Boiling (DNB) Limit (TS 3.4.1)

2.10.1 Pressurizer pressure is greater than or equal to 2175 psig.

2.10.2 RCS average temperature is less than or equal to 581.7°F.

2.10.3 RCS total flow rate is greater than or equal to 359,200 gpm.

NOTE: The DNB RCS T_{AVG} limit is based on the slightly lower and bounding value associated with Unit 1 in order to have the same surveillance limits for both Unit 1 and Unit 2.

3. TABLES

3.1 Table 1, "F_Q Margin Decreases in Excess of 2% Per 31 EFPD"

3.2 Table 2A, "Load Follow W(Z) Factors at 150 and 4000 MWD/MTU as a Function of Core Height"

3.3 Table 2B, "Load Follow W(Z) Factors at 8000 and 12000MWD/MTU as a Function of Core Height"

3.4 Table 2C, "Load Follow W(Z) Factors at 16000 and 20000 MWD/MTU as a Function of Core Height"

4. FIGURES

4.1 Figure 1, "Control Bank Insertion Limits Versus Rated Thermal Power"

4.2 Figure 2, "AFD Limits as a Function of Rated Thermal Power"

5. RECORDS

None

6. REFERENCES

6.1 NF-PGE-19-028, "Diablo Canyon Unit 1 Cycle 22 Redesign Reload Evaluation and Core Operating Limits Report," March 2019

6.2 WCAP-12472-P-A, Addendum 4, "BEACON Core Monitoring and Operation Support System, Addendum 4," September 2012

6.3 Westinghouse Nuclear Safety Advisory Letter NSAL-02-14, Revision 2, "Steam Line Break During Mode 3 for Westinghouse NSSS Plants," August 4, 2005

7. ANALYTICAL METHODS

The analytical methods used to determine the core operating limits shall be those previously reviewed and approved by the NRC, specifically those described in the following documents:

7.1 WCAP-10216-P-A, Revision 1A, "Relaxation of Constant Axial Offset Control F_Q Surveillance Technical Specification," February 1994.

7.2 WCAP-9272-P-A, "Westinghouse Reload Safety Evaluation Methodology," July 1985.

7.3 WCAP-8385, "Power Distribution Control and Load Following Procedures," September 1974. Approved by NRC Safety Evaluation dated January 31, 1978.

7.4 WCAP-10054-P-A, "Westinghouse Small Break ECCS Evaluation Model Using the NOTRUMP Code," August 1985.

7.5 WCAP-10054-P-A, Addendum 2, Revision 1, "Addendum to the Westinghouse Small Break ECCS Evaluation Model Using the NOTRUMP Code: Safety Injection Into the Broken Loop and COSI Condensation Model," July 1997.

7.6 WCAP-12945-P-A, Volume 1 (Revision 2) and Volumes 2 - 5 (Revision 1), "Code Qualification Document for Best-Estimate LOCA Analysis," March 1998.

7.7 WCAP-12945-P-A, Addendum 1-A, Revision 0, "Method for Satisfying 10 CFR 50.46 Reanalysis Requirements for Best Estimate LOCA Evaluation Models," December 2004.

7.8 WCAP-8567-P-A, "Improved Thermal Design Procedure," February 1989.

7.9 WCAP-16045-P-A, "Qualification of the Two-Dimensional Transport Code PARAGON," August 2004.

7.10 WCAP-16045-P-A, Addendum 1-A, "Qualification of the NEXUS Nuclear Data Methodology," August 2007.

Table 1: F_Q Margin Decreases in Excess of 2% Per 31 EFPD

Cycle Burnup (MWD/MTU)	Max. % Decrease in F_Q Margin
0	2.97
150	2.97
354	3.91
558	4.34
762	4.33
967	4.08
1171	3.61
1375	3.02
1579	2.43
1783	2.00
7499	2.00
7704	2.20
7908	2.41
8112	2.60
8316	2.33
8520	2.00

NOTE: All cycle burnups outside the range of this table shall use a 2% decrease in F_Q margin for compliance with SR 3.2.1.2. Linear interpolation is adequate for intermediate cycle burnups.

Table 2A: Load Follow W(Z) Factors at 150 and 4000 MWD/MTU as a Function of Core Height

HEIGHT (INCHES)	150 MWD/MTU W(Z)	HEIGHT (INCHES)	4000 MWD/MTU W(Z)
*0.0	1.5415	*0.0	1.5598
*2.4	1.5334	*2.4	1.5523
*4.8	1.5255	*4.8	1.5450
*7.2	1.5148	*7.2	1.5352
*9.6	1.5002	*9.6	1.5208
12.1	1.4818	12.1	1.5019
14.5	1.4621	14.5	1.4812
16.9	1.4406	16.9	1.4583
19.3	1.4175	19.3	1.4333
21.7	1.3932	21.7	1.4067
24.1	1.3674	24.1	1.3784
26.5	1.3412	26.5	1.3497
28.9	1.3149	28.9	1.3212
31.4	1.2877	31.4	1.2990
33.8	1.2606	33.8	1.2832
36.2	1.2364	36.2	1.2659
38.6	1.2243	38.6	1.2500
41.0	1.2185	41.0	1.2374
43.4	1.2111	43.4	1.2266
45.8	1.2027	45.8	1.2179
48.2	1.1935	48.2	1.2077
50.8	1.1837	50.8	1.1965
53.2	1.1752	53.2	1.1864
55.6	1.1668	55.6	1.1773
58.0	1.1579	58.0	1.1675
60.4	1.1481	60.4	1.1571
62.8	1.1388	62.8	1.1464
65.2	1.1348	65.2	1.1347
67.6	1.1418	67.6	1.1237
70.0	1.1502	70.0	1.1288

* Top and Bottom 8% Excluded

Table 2A: Load Follow W(Z) Factors at 150 and 4000 MWD/MTU as a Function of Core Height (continued)

HEIGHT (INCHES)	150 MWD/MTU W(Z)	HEIGHT (INCHES)	4000 MWD/MTU W(Z)
72.5	1.1595	72.5	1.1374
74.9	1.1671	74.9	1.1466
77.3	1.1738	77.3	1.1556
79.7	1.1796	79.7	1.1636
82.1	1.1845	82.1	1.1707
84.5	1.1877	84.5	1.1761
86.9	1.1898	86.9	1.1803
89.3	1.1902	89.3	1.1828
91.8	1.1881	91.8	1.1824
94.2	1.1845	94.2	1.1807
96.6	1.1780	96.6	1.1761
99.0	1.1695	99.0	1.1696
101.4	1.1630	101.4	1.1609
103.8	1.1559	103.8	1.1490
106.2	1.1510	106.2	1.1472
108.6	1.1500	108.6	1.1467
111.1	1.1545	111.1	1.1503
113.5	1.1640	113.5	1.1665
115.9	1.1690	115.9	1.1805
118.3	1.1706	118.3	1.1908
120.7	1.1718	120.7	1.2007
123.1	1.1687	123.1	1.2012
125.5	1.1690	125.5	1.2123
127.9	1.1665	127.9	1.2042
130.3	1.1775	130.3	1.2040
132.8	1.1812	132.8	1.2174
*135.2	1.1996	*135.2	1.2235
*137.6	1.2168	*137.6	1.2261
*140.0	1.2271	*140.0	1.2272
*142.4	1.2269	*142.4	1.2275
*144.8	1.2346	*144.8	1.2284

* Top and Bottom 8% Excluded

Table 2B: Load Follow W(Z) Factors at 8000 and 12000 MWD/MTU as a Function of Core Height

HEIGHT (INCHES)	8000 MWD/MTU W(Z)	HEIGHT (INCHES)	12000 MWD/MTU W(Z)
*0.0	1.3804	*0.0	1.2711
*2.4	1.3764	*2.4	1.2698
*4.8	1.3717	*4.8	1.2666
*7.2	1.3664	*7.2	1.2639
*9.6	1.3571	*9.6	1.2578
12.1	1.3441	12.1	1.2484
14.5	1.3300	14.5	1.2386
16.9	1.3145	16.9	1.2281
19.3	1.2977	19.3	1.2169
21.7	1.2802	21.7	1.2057
24.1	1.2619	24.1	1.1945
26.5	1.2433	26.5	1.1829
28.9	1.2239	28.9	1.1699
31.4	1.2040	31.4	1.1587
33.8	1.1846	33.8	1.1546
36.2	1.1673	36.2	1.1492
38.6	1.1600	38.6	1.1472
41.0	1.1591	41.0	1.1507
43.4	1.1572	43.4	1.1559
45.8	1.1550	45.8	1.1637
48.2	1.1516	48.2	1.1697
50.8	1.1474	50.8	1.1741
53.2	1.1444	53.2	1.1773
55.6	1.1420	55.6	1.1794
58.0	1.1393	58.0	1.1806
60.4	1.1347	60.4	1.1798
62.8	1.1332	62.8	1.1804
65.2	1.1398	65.2	1.1892
67.6	1.1505	67.6	1.2085
70.0	1.1646	70.0	1.2262

* Top and Bottom 8% Excluded

Table 2B: Load Follow W(Z) Factors at 8000 and 12000 MWD/MTU as a Function of Core Height (continued)

HEIGHT (INCHES)	8000 MWD/MTU W(Z)	HEIGHT (INCHES)	12000 MWD/MTU W(Z)
72.5	1.1791	72.5	1.2433
74.9	1.1921	74.9	1.2580
77.3	1.2040	77.3	1.2710
79.7	1.2145	79.7	1.2817
82.1	1.2236	82.1	1.2902
84.5	1.2307	84.5	1.2963
86.9	1.2370	86.9	1.3009
89.3	1.2409	89.3	1.3023
91.8	1.2411	91.8	1.2989
94.2	1.2394	94.2	1.2935
96.6	1.2346	96.6	1.2846
99.0	1.2272	99.0	1.2727
101.4	1.2172	101.4	1.2573
103.8	1.2025	103.8	1.2413
106.2	1.1999	106.2	1.2434
108.6	1.2258	108.6	1.2502
111.1	1.2527	111.1	1.2553
113.5	1.2758	113.5	1.2761
115.9	1.2992	115.9	1.2988
118.3	1.3195	118.3	1.3193
120.7	1.3403	120.7	1.3413
123.1	1.3567	123.1	1.3568
125.5	1.3795	125.5	1.3783
127.9	1.3900	127.9	1.3876
130.3	1.4031	130.3	1.3989
132.8	1.4125	132.8	1.4093
*135.2	1.4182	*135.2	1.4093
*137.6	1.4220	*137.6	1.4186
*140.0	1.4222	*140.0	1.4186
*142.4	1.4204	*142.4	1.4183
*144.8	1.4195	*144.8	1.4182

* Top and Bottom 8% Excluded

Table 2C: Load Follow W(Z) Factors at 16000 and 20000 MWD/MTU as a Function of Core Height

HEIGHT (INCHES)	16000 MWD/MTU W(Z)	HEIGHT (INCHES)	20000 MWD/MTU W(Z)
*0.0	1.3091	*0.0	1.3386
*2.4	1.3078	*2.4	1.3368
*4.8	1.3030	*4.8	1.3299
*7.2	1.2992	*7.2	1.3242
*9.6	1.2918	*9.6	1.3143
12.1	1.2808	12.1	1.3005
14.5	1.2697	14.5	1.2869
16.9	1.2581	16.9	1.2727
19.3	1.2460	19.3	1.2581
21.7	1.2342	21.7	1.2438
24.1	1.2227	24.1	1.2299
26.5	1.2105	26.5	1.2152
28.9	1.1969	28.9	1.1985
31.4	1.1828	31.4	1.1810
33.8	1.1689	33.8	1.1664
36.2	1.1573	36.2	1.1605
38.6	1.1575	38.6	1.1648
41.0	1.1644	41.0	1.1814
43.4	1.1732	43.4	1.1957
45.8	1.1852	45.8	1.2099
48.2	1.1948	48.2	1.2216
50.8	1.2024	50.8	1.2304
53.2	1.2082	53.2	1.2370
55.6	1.2125	55.6	1.2419
58.0	1.2161	58.0	1.2454
60.4	1.2166	60.4	1.2471
62.8	1.2210	62.8	1.2540
65.2	1.2440	65.2	1.2825
67.6	1.2643	67.6	1.3067
70.0	1.2795	70.0	1.3247

* Top and Bottom 8% Excluded

Table 2C: Load Follow W(Z) Factors at 16000 and 20000 MWD/MTU as a Function of Core Height (continued)

HEIGHT (INCHES)	16000 MWD/MTU W(Z)	HEIGHT (INCHES)	20000 MWD/MTU W(Z)
72.5	1.2936	72.5	1.3413
74.9	1.3050	74.9	1.3550
77.3	1.3141	77.3	1.3662
79.7	1.3203	79.7	1.3737
82.1	1.3238	82.1	1.3780
84.5	1.3248	84.5	1.3793
86.9	1.3237	86.9	1.3785
89.3	1.3190	89.3	1.3732
91.8	1.3087	91.8	1.3612
94.2	1.2966	94.2	1.3471
96.6	1.2810	96.6	1.3289
99.0	1.2621	99.0	1.3069
101.4	1.2388	101.4	1.2816
103.8	1.2229	103.8	1.2538
106.2	1.2236	106.2	1.2330
108.6	1.2239	108.6	1.2168
111.1	1.2231	111.1	1.2032
113.5	1.2267	113.5	1.1989
115.9	1.2273	115.9	1.1998
118.3	1.2316	118.3	1.2101
120.7	1.2443	120.7	1.2245
123.1	1.2549	123.1	1.2417
125.5	1.2720	125.5	1.2548
127.9	1.2828	127.9	1.2665
130.3	1.2944	130.3	1.2782
132.8	1.3019	132.8	1.2874
*135.2	1.3083	*135.2	1.2972
*137.6	1.3180	*137.6	1.3039
*140.0	1.3215	*140.0	1.3100
*142.4	1.3203	*142.4	1.3148
*144.8	1.3230	*144.8	1.3182

* Top and Bottom 8% Excluded

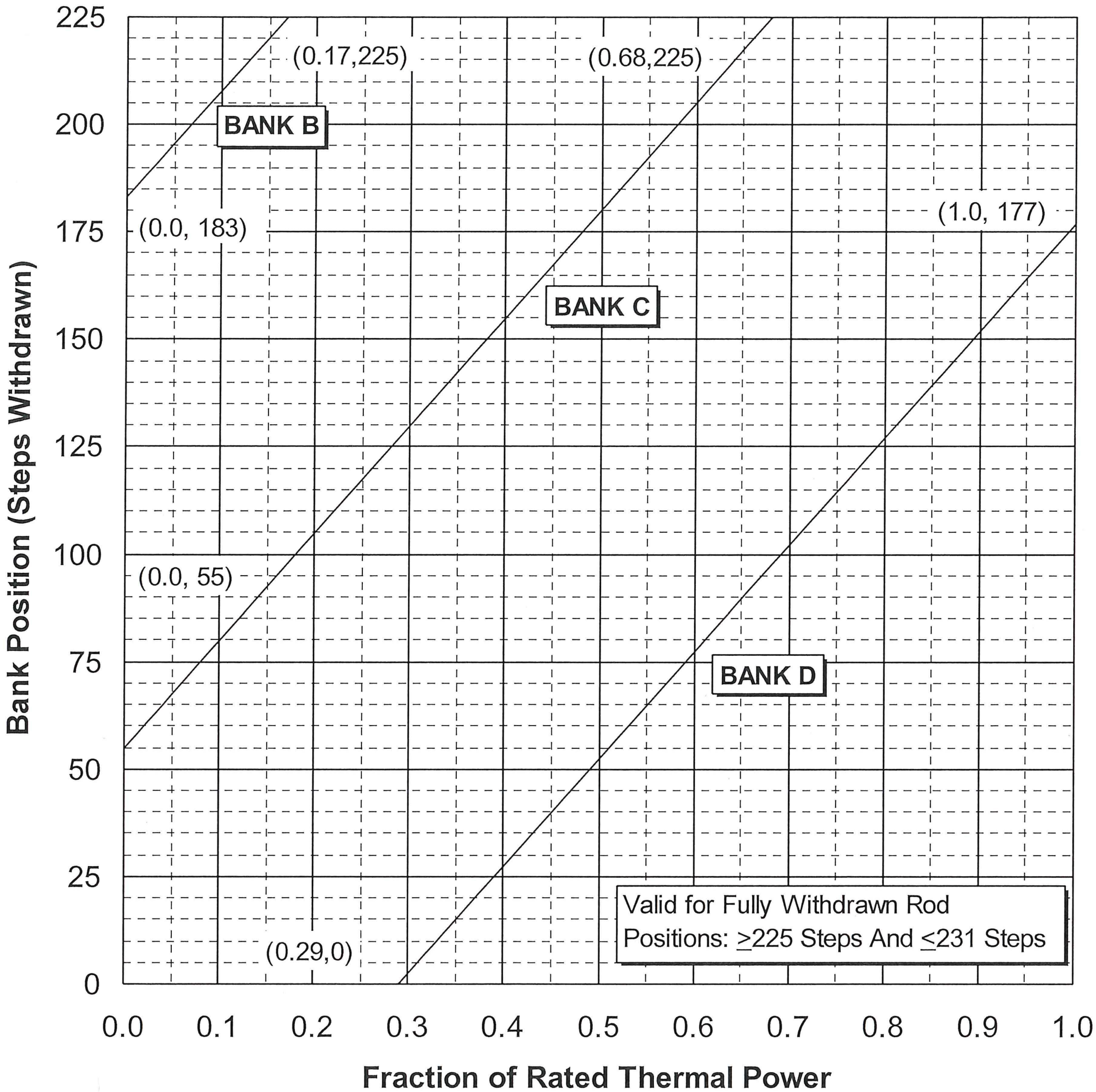

Figure 1: Control Bank Insertion Limits Versus Rated Thermal Power

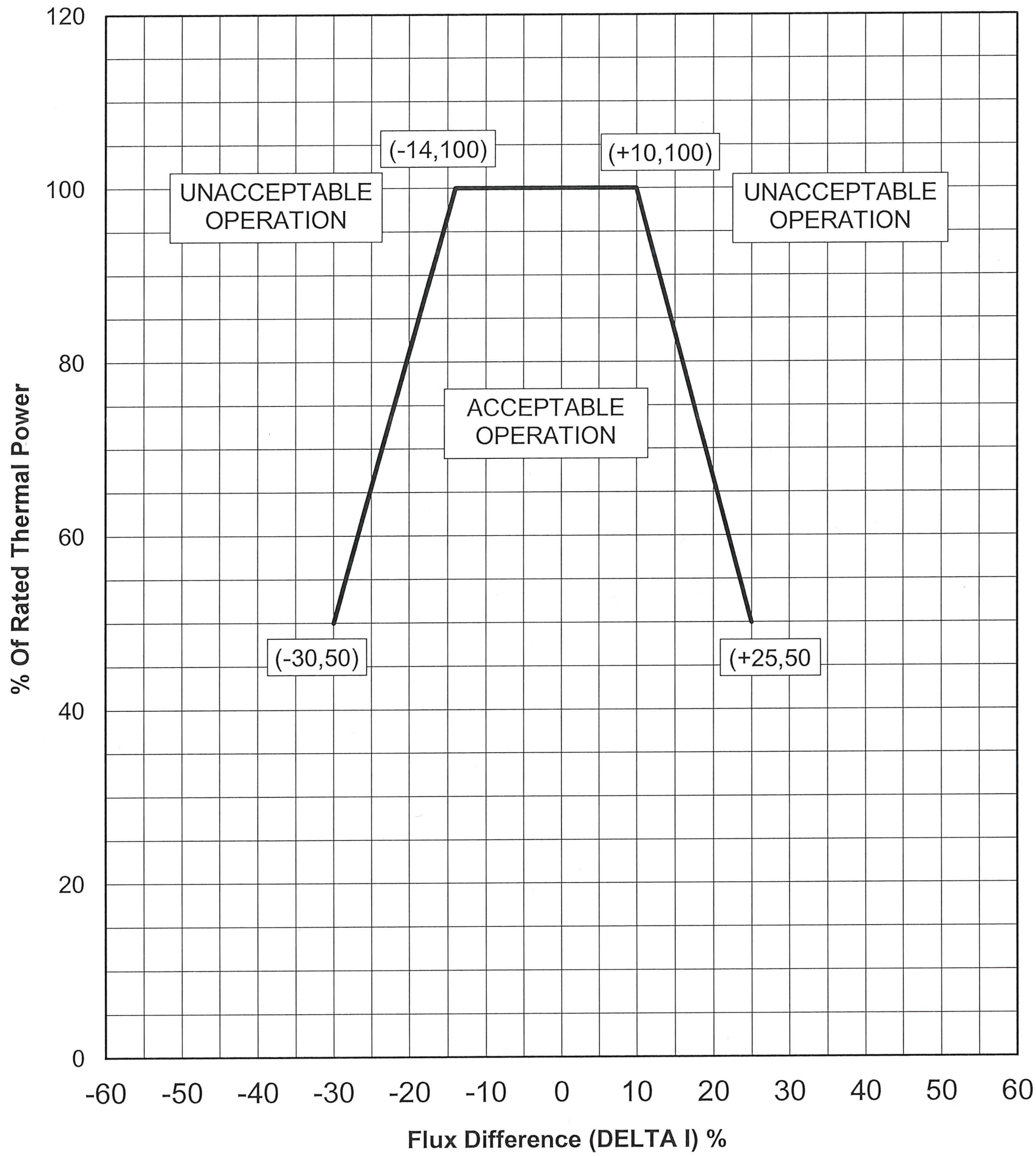

Figure 2: AFD Limits as a Function of Rated Thermal Power