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SOUTHERN COMPANY
Energy to Serve Your World℠

March 17, 2000

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Docket Nos.: 50-348
50-364

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

Joseph M. Farley Nuclear Plant
Unit 1 Cycle 16 Core Operating Limits Report – Revision 1 &
Unit 2 Cycle 14 Core Operating Limits Report – Revision 2

Ladies and Gentlemen:

In accordance with Technical Specification 5.6.5, Southern Nuclear Operating Company hereby submits Revision 1 to the Core Operating Limits Report (COLR) for Farley Nuclear Plant (FNP) Unit 1 Cycle 16 and Revision 2 to the COLR for FNP Unit 2 Cycle 14. These revisions reflect the editorial changes associated with implementation of the Improved Technical Specifications. There are no other changes in these reports.

If you have any questions, please advise.

Respectfully submitted,

Dave Morey

MGE/maf: colr02.doc

Attachments:
1. FNP Unit 1 Cycle 16 Core Operating Limits Report Revision 1
2. FNP Unit 2 Cycle 14 Core Operating Limits Report Revision 2

A001

cc: Southern Nuclear Operating Company
Mr. L. M. Stinson, General Manager – Farley

U. S. Nuclear Regulatory Commission, Washington, D. C.
Mr. L. M. Padovan, Licensing Project Manager – Farley

U. S. Nuclear Regulatory Commission, Region II
Mr. L. A. Reyes, Regional Administrator
Mr. T. P. Johnson, Senior Resident Inspector – Farley

ATTACHMENT 1

FNP Unit 1 Cycle 16 Core Operating Limits Report Revision 1

FARLEY NUCLEAR PLANT (FNP) UNIT 1 CYCLE 16

CORE OPERATING LIMITS REPORT REVISION 1

FEBRUARY 20000

APPROVED BY:

[signature] 1/31/00

OPERATIONS MANAGER DATE

1.0 CORE OPERATING LIMITS REPORT

This Core Operating Limits Report (COLR) for FNP UNIT 1 CYCLE 16 has been prepared in accordance with the requirements of Technical Specification 5.6.5.

The Technical Requirement affected by this report is listed below:

13.1.1	SHUTDOWN MARGIN - MODES 1 and 2 (with $k_{eff} \geq 1$)

The Technical Specifications affected by this report are listed below:

3.1.1	SHUTDOWN MARGIN - MODES 2 (with $k_{eff} < 1$), 3, 4 and 5
3.1.3	Moderator Temperature Coefficient
3.1.5	Shutdown Bank Insertion Limits
3.1.6	Control Bank Insertion Limits
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
3.9.1	Boron Concentration

2.0 OPERATING LIMITS

The cycle-specific parameter limits for the specifications listed in Section 1.0 are presented in the following subsections. These limits have been developed using NRC-approved methodologies, including those specified in Technical Specification 5.6.5.

2.1 SHUTDOWN MARGIN - MODES 1 AND 2 (with $k_{eff} \geq 1.0$) (Technical Requirement 13.1.1)

2.1.1 The SHUTDOWN MARGIN shall be greater than or equal to 1.77 percent $\Delta k/k$.

2.2 SHUTDOWN MARGIN - MODES 2 (with $k_{eff} < 1.0$), 3, 4 and 5 (Specification 3.1.1)

2.2.1 Modes 2 ($k_{eff} < 1.0$), 3 and 4 - The SHUTDOWN MARGIN shall be greater than or equal to 1.77 percent $\Delta k/k$.

2.2.2 Mode 5 - The SHUTDOWN MARGIN shall be greater than or equal to 1.0 percent $\Delta k/k$.

2.3 Moderator Temperature Coefficient (Specification 3.1.3)

2.3.1 The Moderator Temperature Coefficient (MTC) limits are:

The BOL/ARO/HZP-MTC shall be less than or equal to $+0.7 \times 10^{-4}$ $\Delta k/k/°F$ for power levels up to 70 percent RTP with a linear ramp to 0 $\Delta k/k/°F$ at 100 percent RTP.

The EOL/ARO/RTP-MTC shall be less negative than -4.3×10^{-4} $\Delta k/k/°F$.

2.3.2 The MTC Surveillance limits are:

The 300 ppm/ARO/RTP-MTC should be less negative than or equal to -3.65×10^{-4} $\Delta k/k/°F$.

The 100 ppm/ARO/RTP-MTC should be less negative than -4.0×10^{-4} $\Delta k/k/°F$.

where: BOL stands for Beginning of Cycle Life
ARO stands for All Rods Out
HZP stands for Hot Zero THERMAL POWER
EOL stands for End of Cycle Life
RTP stands for RATED THERMAL POWER

2.4 Shutdown Bank Insertion Limits (Specification 3.1.5)

2.4.1 The shutdown banks shall be withdrawn to a position greater than or equal to 225 steps.

2.5 Control Bank Insertion Limits (Specification 3.1.6)

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

2.6 Heat Flux Hot Channel Factor - $F_Q(Z)$ (Specification 3.2.1)

2.6.1 $$F_Q(Z) \leq \frac{F_Q^{RTP}}{P} \cdot K(Z) \quad for\ P > 0.5$$

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

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

2.6.2 $F_Q^{RTP} = 2.50$

2.6.3 K(Z) is provided in Figure 2.

2.6.4 $$F_Q(Z) \leq \frac{F_Q^{RTP} \cdot K(Z)}{P \cdot W(Z)} \quad for\ P > 0.5$$

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

2.6.5 W(Z) values are provided in Figures 4 through 7.

2.6.6 The $F_Q(Z)$ penalty factors are provided in Table 1.

2.7 Nuclear Enthalpy Rise Hot Channel Factor - $F^N_{\Delta H}$ (Specification 3.2.2)

2.7.1 $$F^N_{\Delta H} \leq F^{RTP}_{\Delta H} \cdot (1 + PF_{\Delta H} \cdot (1 - P))$$

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

2.7.2 $$F^{RTP}_{\Delta H} = 1.70$$

2.7.3 $$PF_{\Delta H} = 0.3$$

2.8 Axial Flux Difference (Specification 3.2.3)

2.8.1 The Axial Flux Difference (AFD) acceptable operation limits are provided in Figure 3.

2.9 Boron Concentration (Specification 3.9.1)

2.9.1 The boron concentration shall be greater than or equal to 2000 ppm.[1]

[1]This concentration bounds the condition of $k_{eff} \leq 0.95$ (all rods in less the most reactive rod) and subcriticality (all rods out) over the entire cycle. This concentration includes additional boron to address uncertainties and B^{10} depletion.

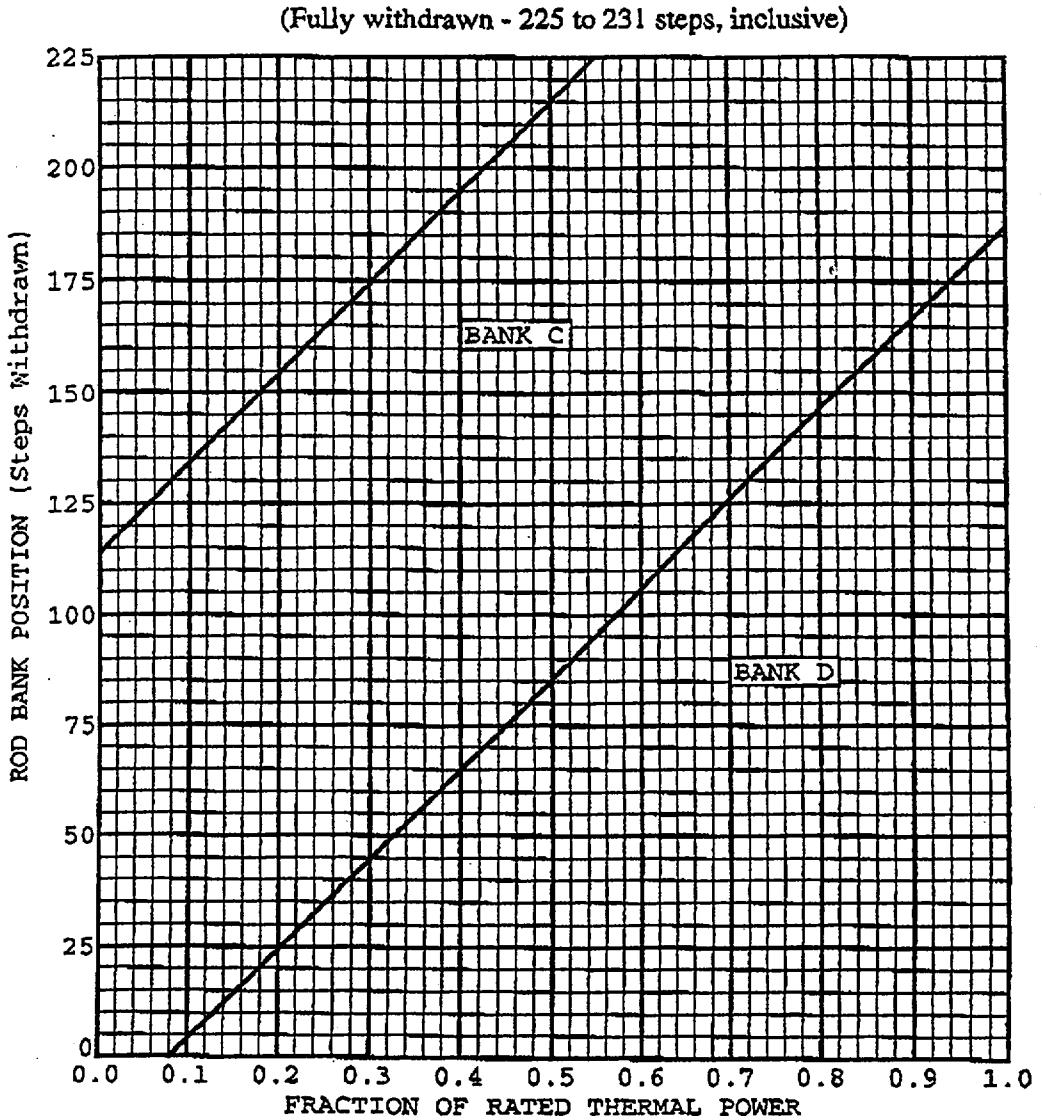
Table 1
$F_Q(Z)$ PENALTY FACTOR

Cycle Burnup (MWD/MTU)	$F_Q(Z)$ Penalty Factor
All Burnups	1.0200

Notes:

1. The Penalty Factor, to be applied to $F_Q(Z)$ in accordance with SR 3.2.1.2, is the maximum factor by which $F_Q(Z)$ is expected to increase over a 39 EFPD interval (surveillance interval of 31 EFPD plus the maximum allowable extension not to exceed 25% of the surveillance interval per SR 3.0.2) starting from the burnup at which the $F_Q(Z)$ was determined.

Figure 1
Rod Bank Insertion Limits versus Rated Thermal Power



Fully Withdrawn shall be the condition where control rods are at a position within the interval ≥ 225 and ≤ 231 steps withdrawn.

NOTE: The Rod Bank Insertion Limits are based on the control bank withdrawal sequence A, B, C, D and a control bank tip-to-tip distance of 128 steps.

Figure 2
K(Z) - Normalized $F_Q(Z)$ as a Function of Core Height

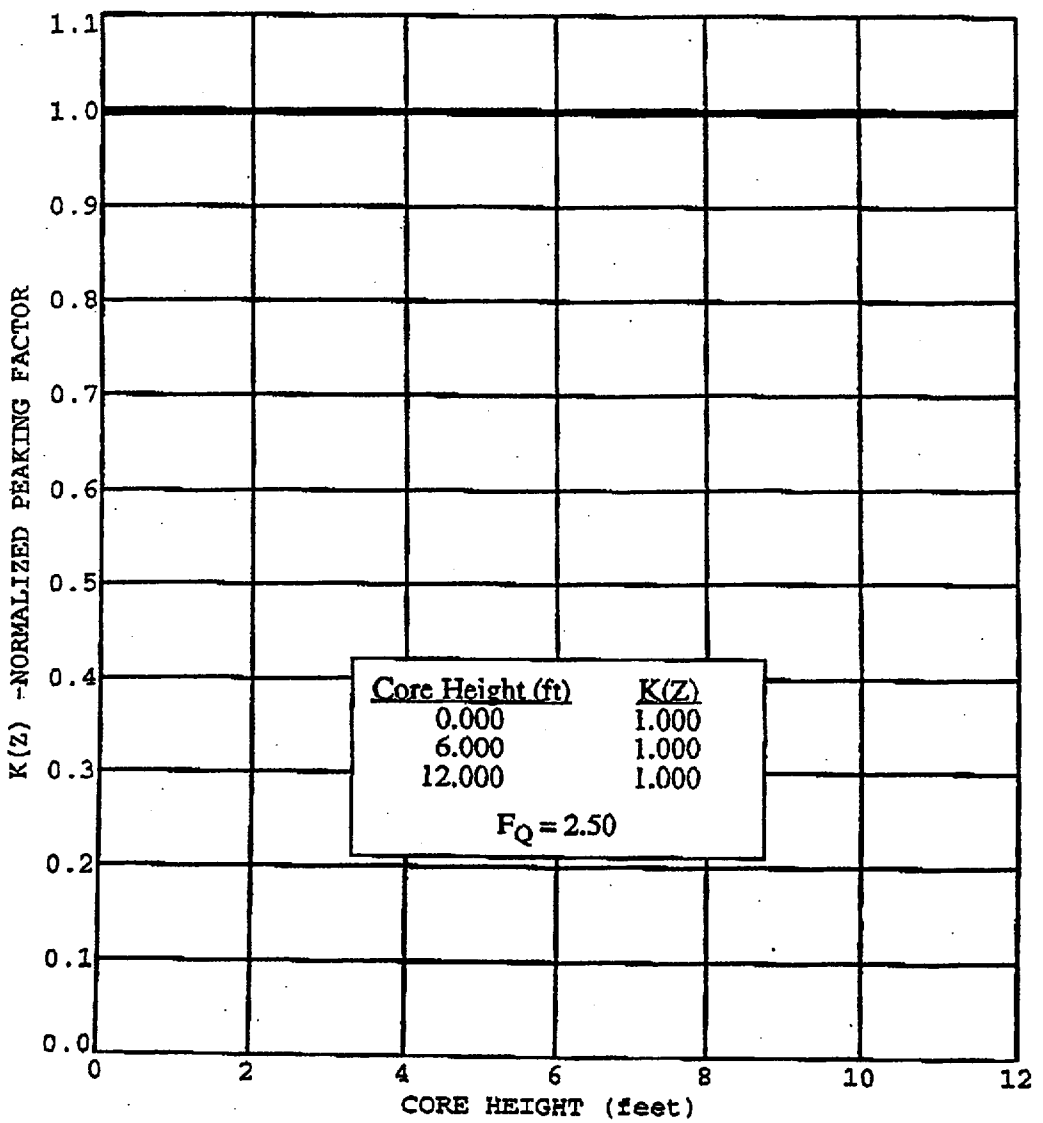


Figure 3
Axial Flux Difference Limits as a Function of Rated Thermal Power for RAOC

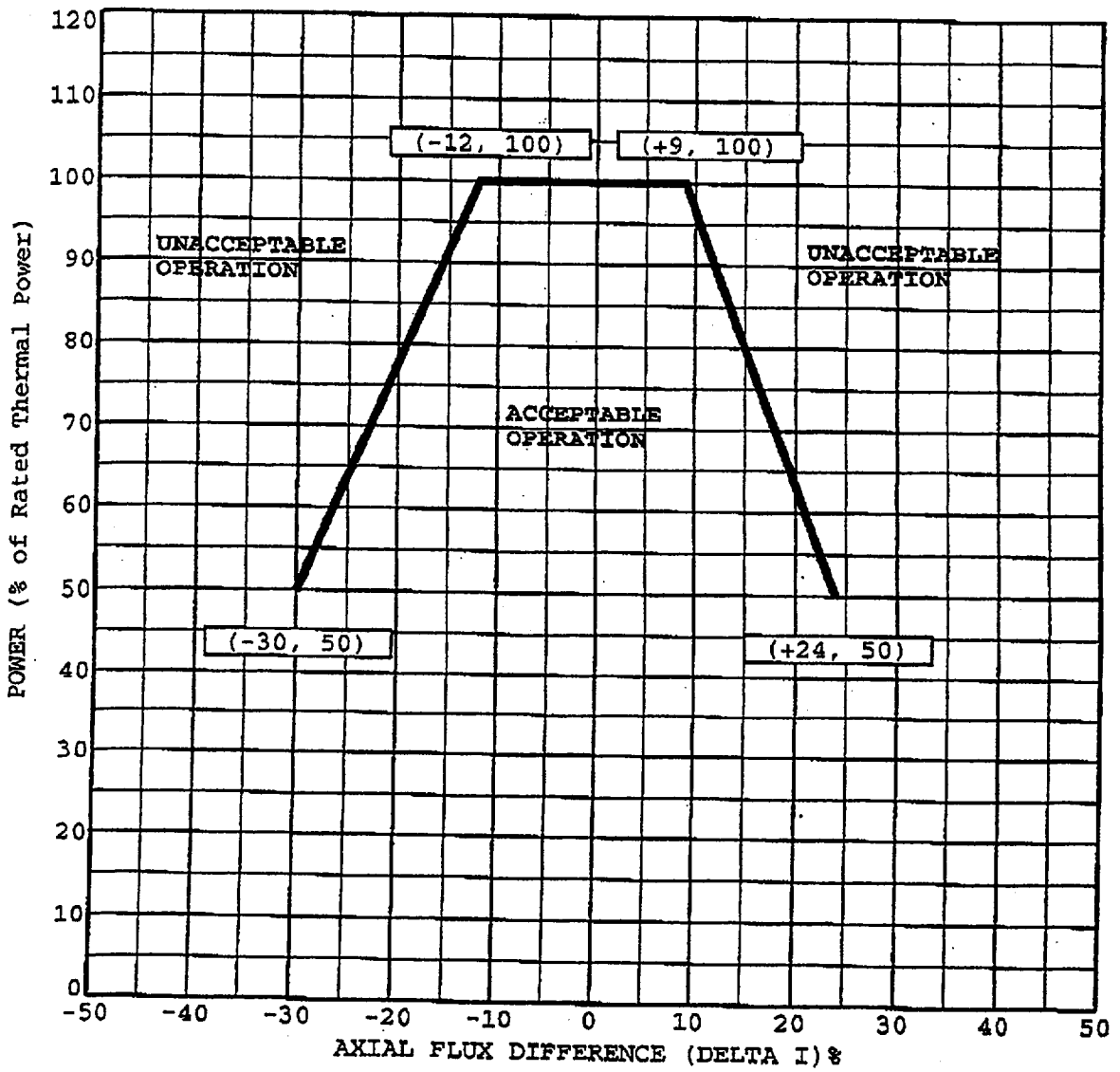
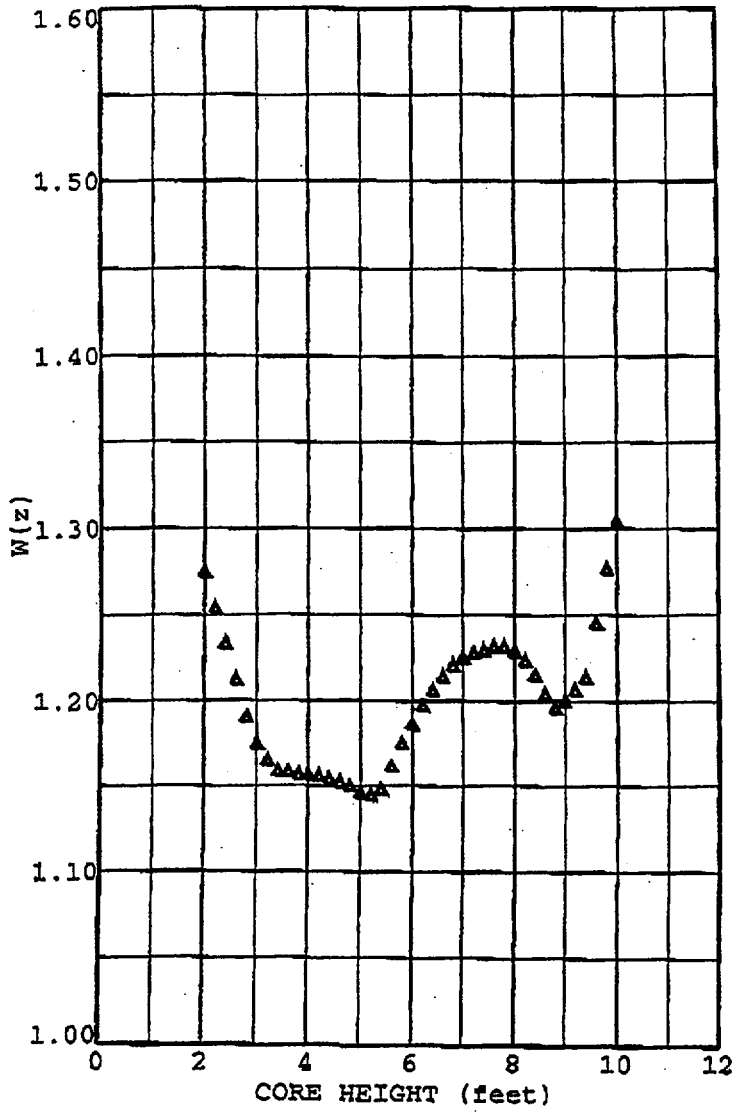


Figure 4
RAOC W(Z) at 150 MWD/MTU

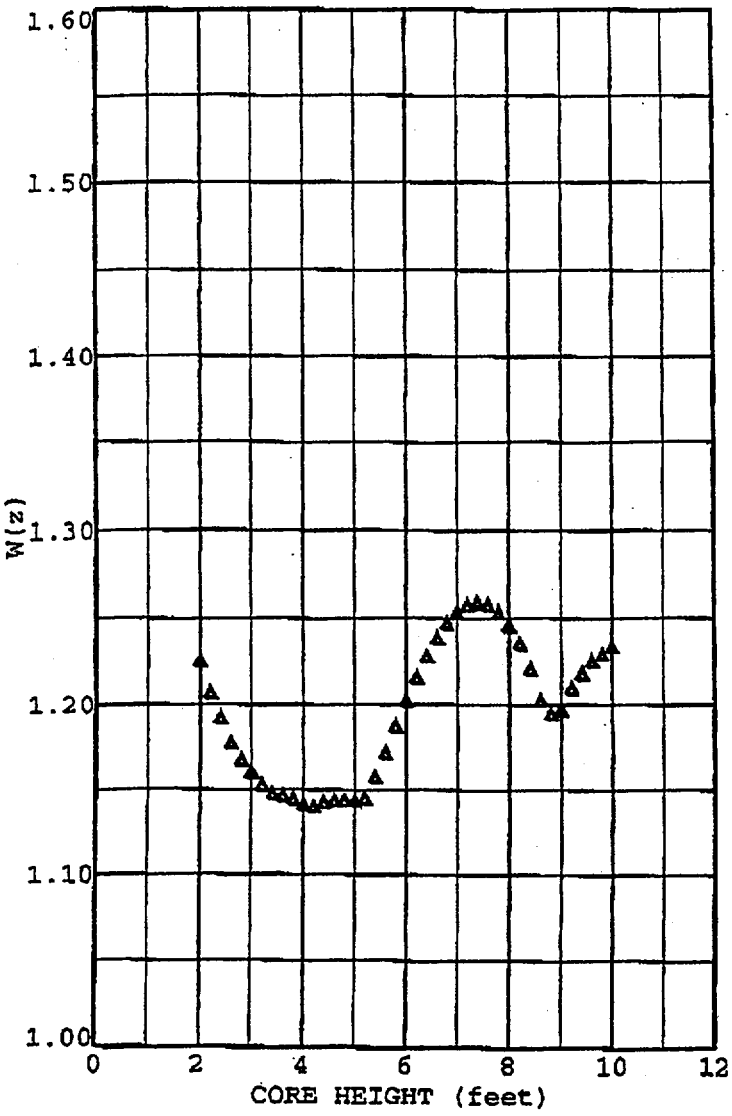


This figure is referred to by Technical Specification B3.2.1

	Axial Point	Elevation (feet)	BOL W(Z)
*	1	12.00	1.0000
*	2	11.80	1.0000
*	3	11.60	1.0000
*	4	11.40	1.0000
*	5	11.20	1.0000
*	6	11.00	1.0000
*	7	10.80	1.0000
*	8	10.60	1.0000
*	9	10.40	1.0000
*	10	10.20	1.0000
	11	10.00	1.3046
	12	9.80	1.2771
	13	9.60	1.2454
	14	9.40	1.2139
	15	9.20	1.2065
	16	9.00	1.2001
	17	8.80	1.1963
	18	8.60	1.2042
	19	8.40	1.2154
	20	8.20	1.2237
	21	8.00	1.2290
	22	7.80	1.2319
	23	7.60	1.2320
	24	7.40	1.2300
	25	7.20	1.2282
	26	7.00	1.2256
	27	6.80	1.2210
	28	6.60	1.2147
	29	6.40	1.2067
	30	6.20	1.1973
	31	6.00	1.1866
	32	5.80	1.1751
	33	5.60	1.1618
	34	5.40	1.1480
	35	5.20	1.1446
	36	5.00	1.1459
	37	4.80	1.1499
	38	4.60	1.1524
	39	4.40	1.1544
	40	4.20	1.1561
	41	4.00	1.1565
	42	3.80	1.1572
	43	3.60	1.1587
	44	3.40	1.1593
	45	3.20	1.1654
	46	3.00	1.1748
	47	2.80	1.1906
	48	2.60	1.2127
	49	2.40	1.2336
	50	2.20	1.2545
	51	2.00	1.2752
*	52	1.80	1.0000
*	53	1.60	1.0000
*	54	1.40	1.0000
*	55	1.20	1.0000
*	56	1.00	1.0000
*	57	0.80	1.0000
*	58	0.60	1.0000
*	59	0.40	1.0000
*	60	0.20	1.0000
*	61	0.00	1.0000

* Top and Bottom 15% Excluded per Technical Specification B3.2.1

Figure 5
RAOC W(Z) at 4000 MWD/MTU

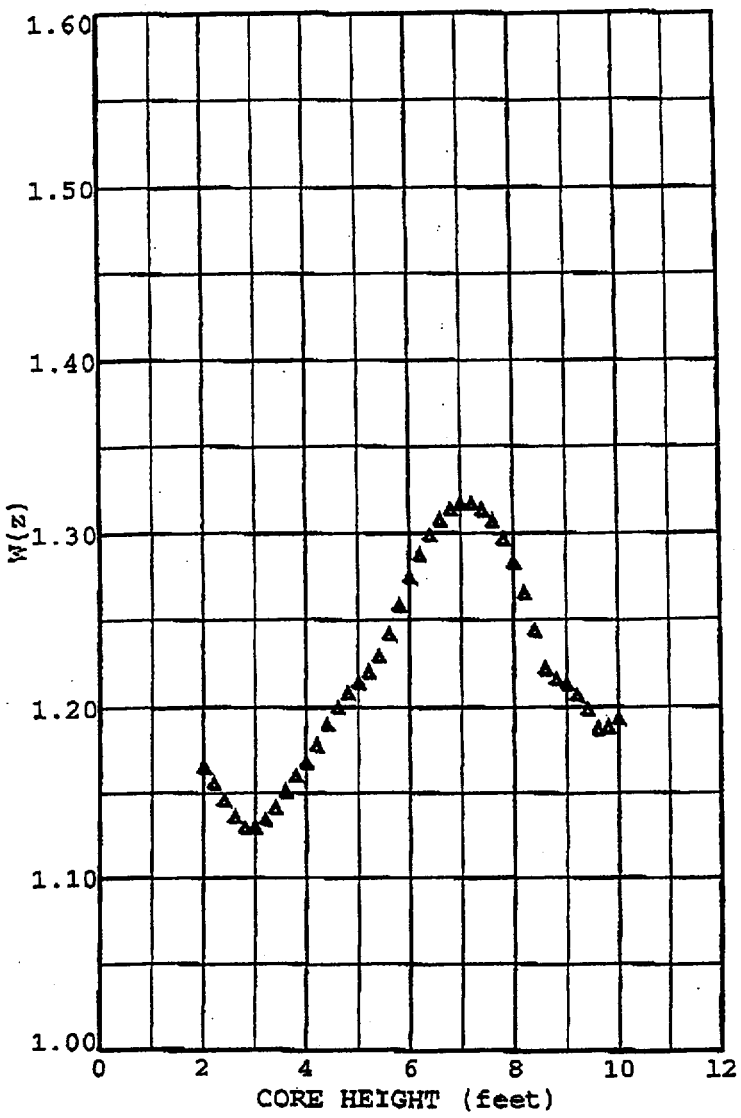


	Axial Point	Elevation (feet)	MOL-1 W(Z)
*	1	12.00	1.0000
*	2	11.80	1.0000
*	3	11.60	1.0000
*	4	11.40	1.0000
*	5	11.20	1.0000
*	6	11.00	1.0000
*	7	10.80	1.0000
*	8	10.60	1.0000
*	9	10.40	1.0000
*	10	10.20	1.0000
	11	10.00	1.2334
	12	9.80	1.2291
	13	9.60	1.2251
	14	9.40	1.2182
	15	9.20	1.2097
	16	9.00	1.1972
	17	8.80	1.1948
	18	8.60	1.2026
	19	8.40	1.2210
	20	8.20	1.2354
	21	8.00	1.2460
	22	7.80	1.2535
	23	7.60	1.2578
	24	7.40	1.2590
	25	7.20	1.2575
	26	7.00	1.2533
	27	6.80	1.2468
	28	6.60	1.2383
	29	6.40	1.2278
	30	6.20	1.2157
	31	6.00	1.2023
	32	5.80	1.1872
	33	5.60	1.1716
	34	5.40	1.1571
	35	5.20	1.1448
	36	5.00	1.1430
	37	4.80	1.1438
	38	4.60	1.1434
	39	4.40	1.1424
	40	4.20	1.1398
	41	4.00	1.1410
	42	3.80	1.1446
	43	3.60	1.1465
	44	3.40	1.1475
	45	3.20	1.1524
	46	3.00	1.1598
	47	2.80	1.1672
	48	2.60	1.1768
	49	2.40	1.1921
	50	2.20	1.2067
	51	2.00	1.2252
*	52	1.80	1.0000
*	53	1.60	1.0000
*	54	1.40	1.0000
*	55	1.20	1.0000
*	56	1.00	1.0000
*	57	0.80	1.0000
*	58	0.60	1.0000
*	59	0.40	1.0000
*	60	0.20	1.0000
*	61	0.00	1.0000

This figure is referred to by Technical Specification B3.2.1

* Top and Bottom 15% Excluded per Technical Specification B3.2.1

Figure 6
RAOC W(Z) at 10000 MWD/MTU

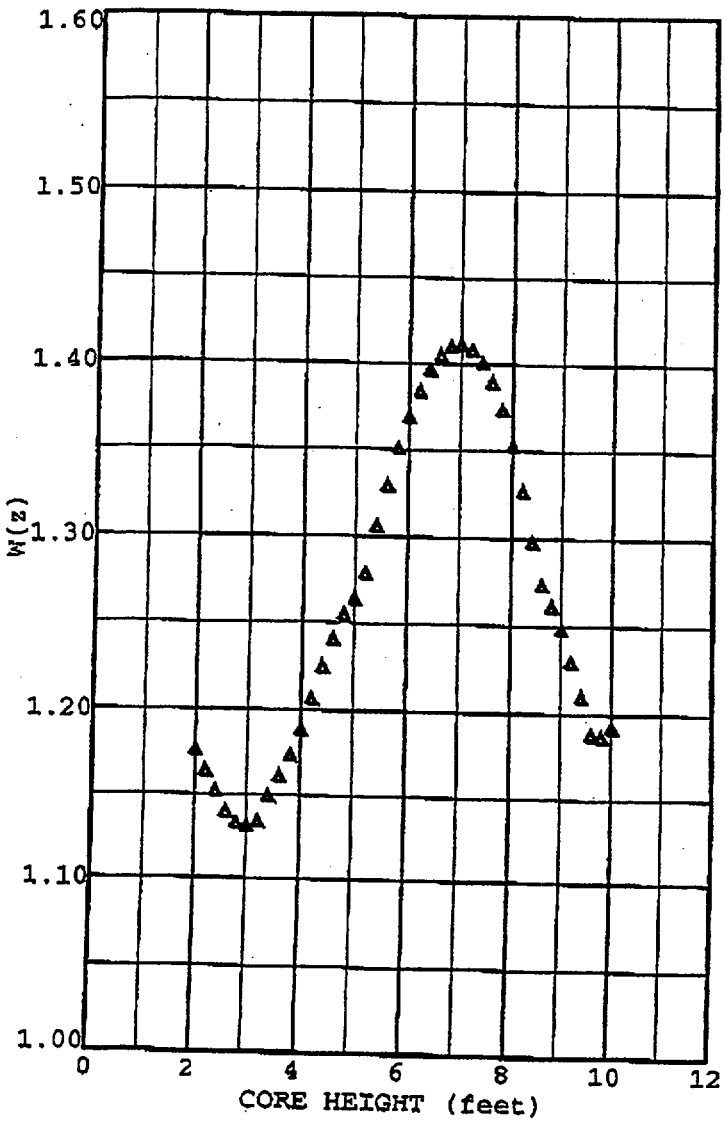


This figure is referred to by Technical Specification B3.2.1

	Axial Point	Elevation (feet)	MOL-2 W(Z)
*	1	12.00	1.0000
*	2	11.80	1.0000
*	3	11.60	1.0000
*	4	11.40	1.0000
*	5	11.20	1.0000
*	6	11.00	1.0000
*	7	10.80	1.0000
*	8	10.60	1.0000
*	9	10.40	1.0000
*	10	10.20	1.0000
	11	10.00	1.1931
	12	9.80	1.1884
	13	9.60	1.1874
	14	9.40	1.1983
	15	9.20	1.2066
	16	9.00	1.2133
	17	8.80	1.2158
	18	8.60	1.2219
	19	8.40	1.2437
	20	8.20	1.2650
	21	8.00	1.2824
	22	7.80	1.2964
	23	7.60	1.3066
	24	7.40	1.3133
	25	7.20	1.3165
	26	7.00	1.3165
	27	6.80	1.3133
	28	6.60	1.3073
	29	6.40	1.2986
	30	6.20	1.2874
	31	6.00	1.2742
	32	5.80	1.2581
	33	5.60	1.2415
	34	5.40	1.2292
	35	5.20	1.2202
	36	5.00	1.2141
	37	4.80	1.2079
	38	4.60	1.1996
	39	4.40	1.1897
	40	4.20	1.1778
	41	4.00	1.1679
	42	3.80	1.1600
	43	3.60	1.1512
	44	3.40	1.1413
	45	3.20	1.1344
	46	3.00	1.1297
	47	2.80	1.1293
	48	2.60	1.1356
	49	2.40	1.1456
	50	2.20	1.1555
	51	2.00	1.1653
*	52	1.80	1.0000
*	53	1.60	1.0000
*	54	1.40	1.0000
*	55	1.20	1.0000
*	56	1.00	1.0000
*	57	0.80	1.0000
*	58	0.60	1.0000
*	59	0.40	1.0000
*	60	0.20	1.0000
*	61	0.00	1.0000

* Top and Bottom 15% Excluded per Technical Specification B3.2.1

Figure 7
RAOC W(Z) at 16000 MWD/MTU



This figure is referred to by Technical Specification B3.2.1

	Axial Point	Elevation (feet)	EOL W(Z)
*	1	12.00	1.0000
*	2	11.80	1.0000
*	3	11.60	1.0000
*	4	11.40	1.0000
*	5	11.20	1.0000
*	6	11.00	1.0000
*	7	10.80	1.0000
*	8	10.60	1.0000
*	9	10.40	1.0000
*	10	10.20	1.0000
	11	10.00	1.1922
	12	9.80	1.1867
	13	9.60	1.1881
	14	9.40	1.2096
	15	9.20	1.2295
	16	9.00	1.2479
	17	8.80	1.2611
	18	8.60	1.2734
	19	8.40	1.2975
	20	8.20	1.3266
	21	8.00	1.3524
	22	7.80	1.3731
	23	7.60	1.3893
	24	7.40	1.4010
	25	7.20	1.4082
	26	7.00	1.4111
	27	6.80	1.4099
	28	6.60	1.4049
	29	6.40	1.3962
	30	6.20	1.3842
	31	6.00	1.3689
	32	5.80	1.3505
	33	5.60	1.3294
	34	5.40	1.3055
	35	5.20	1.2786
	36	5.00	1.2637
	37	4.80	1.2546
	38	4.60	1.2405
	39	4.40	1.2246
	40	4.20	1.2061
	41	4.00	1.1882
	42	3.80	1.1734
	43	3.60	1.1613
	44	3.40	1.1493
	45	3.20	1.1344
	46	3.00	1.1315
	47	2.80	1.1336
	48	2.60	1.1399
	49	2.40	1.1521
	50	2.20	1.1642
	51	2.00	1.1762
*	52	1.80	1.0000
*	53	1.60	1.0000
*	54	1.40	1.0000
*	55	1.20	1.0000
*	56	1.00	1.0000
*	57	0.80	1.0000
*	58	0.60	1.0000
*	59	0.40	1.0000
*	60	0.20	1.0000
*	61	0.00	1.0000

* Top and Bottom 15% Excluded per Technical Specification B3.2.1

ATTACHMENT 2

FNP Unit 2 Cycle 14 Core Operating Limits Report Revision 2

FARLEY NUCLEAR PLANT (FNP) UNIT 2 CYCLE 14

CORE OPERATING LIMITS REPORT REVISION 2

FEBRUARY 20000

APPROVED BY:

OPERATIONS MANAGER DATE

1.0 CORE OPERATING LIMITS REPORT

This Core Operating Limits Report (COLR) for FNP UNIT 2 CYCLE 14 has been prepared in accordance with the requirements of Technical Specification 5.6.5.

The Technical Requirement affected by this report is listed below:

13.1.1	SHUTDOWN MARGIN - MODES 1 and 2 (with $k_{eff} \geq 1$)

The Technical Specifications affected by this report are listed below:

3.1.1	SHUTDOWN MARGIN - MODES 2 (with $k_{eff} < 1$), 3, 4 and 5
3.1.3	Moderator Temperature Coefficient
3.1.5	Shutdown Bank Insertion Limits
3.1.6	Control Bank Insertion Limits
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
3.9.1	Boron Concentration

2.0 OPERATING LIMITS

The cycle-specific parameter limits for the specifications listed in Section 1.0 are presented in the following subsections. These limits have been developed using NRC-approved methodologies, including those specified in Technical Specification 5.6.5.

2.1 SHUTDOWN MARGIN - MODES 1 AND 2 (with $k_{eff} \geq 1.0$) (Technical Requirement 13.1.1)

2.1.1 The SHUTDOWN MARGIN shall be greater than or equal to 1.77 percent $\Delta k/k$.

2.2 SHUTDOWN MARGIN - MODES 2 (with $k_{eff} < 1.0$), 3, 4 and 5 (Specification 3.1.1)

2.2.1 Modes 2 ($k_{eff} < 1.0$), 3 and 4 - The SHUTDOWN MARGIN shall be greater than or equal to 1.77 percent $\Delta k/k$.

2.2.2 Mode 5 - The SHUTDOWN MARGIN shall be greater than or equal to 1.0 percent $\Delta k/k$.

2.3 Moderator Temperature Coefficient (Specification 3.1.3)

2.3.1 The Moderator Temperature Coefficient (MTC) limits are:

The BOL/ARO/HZP-MTC shall be less than or equal to $+0.7 \times 10^{-4}$ $\Delta k/k/°F$ for power levels up to 70 percent RTP with a linear ramp to 0 $\Delta k/k/°F$ at 100 percent RTP.

The EOL/ARO/RTP-MTC shall be less negative than -4.3×10^{-4} $\Delta k/k/°F$.

2.3.2 The MTC Surveillance limits are:

The 300 ppm/ARO/RTP-MTC should be less negative than or equal to -3.65×10^{-4} $\Delta k/k/°F$.

The 100 ppm/ARO/RTP-MTC should be less negative than -4.0×10^{-4} $\Delta k/k/°F$.

where: BOL stands for Beginning of Cycle Life
ARO stands for All Rods Out
HZP stands for Hot Zero THERMAL POWER
EOL stands for End of Cycle Life
RTP stands for RATED THERMAL POWER

2.4 Shutdown Bank Insertion Limits (Specification 3.1.5)

2.4.1 The shutdown banks shall be withdrawn to a position greater than or equal to 225 steps.

2.5 Control Bank Insertion Limits (Specification 3.1.6)

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

2.6 Heat Flux Hot Channel Factor - $F_Q(Z)$ (Specification 3.2.1)

2.6.1 $$F_Q(Z) \le \frac{F_Q^{RTP}}{P} \cdot K(Z) \quad for\ P > 0.5$$

$$F_Q(Z) \le \frac{F_Q^{RTP}}{0.5} \cdot K(Z) \quad for\ P \le 0.5$$

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

2.6.2 $F_Q^{RTP} = 2.50$

2.6.3 K(Z) is provided in Figure 2.

2.6.4 $$F_Q(Z) \le \frac{F_Q^{RTP} \cdot K(Z)}{P \cdot W(Z)} \quad for\ P > 0.5$$

$$F_Q(Z) \le \frac{F_Q^{RTP} \cdot K(Z)}{0.5 \cdot W(Z)} \quad for\ P \le 0.5$$

2.6.5 W(Z) values are provided in Figures 4 through 7.

2.6.6 The $F_Q(Z)$ penalty factors are provided in Table 1.

2.7 Nuclear Enthalpy Rise Hot Channel Factor - $F^N_{\Delta H}$ (Specification 3.2.2)

2.7.1 $$F^N_{\Delta H} \leq F^{RTP}_{\Delta H} \cdot (1 + PF_{\Delta H} \cdot (1 - P))$$

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

2.7.2 $$F^{RTP}_{\Delta H} = 1.70$$

2.7.3 $$PF_{\Delta H} = 0.3$$

2.8 Axial Flux Difference (Specification 3.2.3)

2.8.1 The Axial Flux Difference (AFD) acceptable operation limits are provided in Figure 3.

2.9 Boron Concentration (Specification 3.9.1)

2.9.1 The boron concentration shall be greater than or equal to 2000 ppm.[1]

[1]This concentration bounds the condition of $k_{eff} \leq 0.95$ (all rods in less the most reactive rod) and subcriticality (all rods out) over the entire cycle. This concentration includes additional boron to address uncertainties and B^{10} depletion.

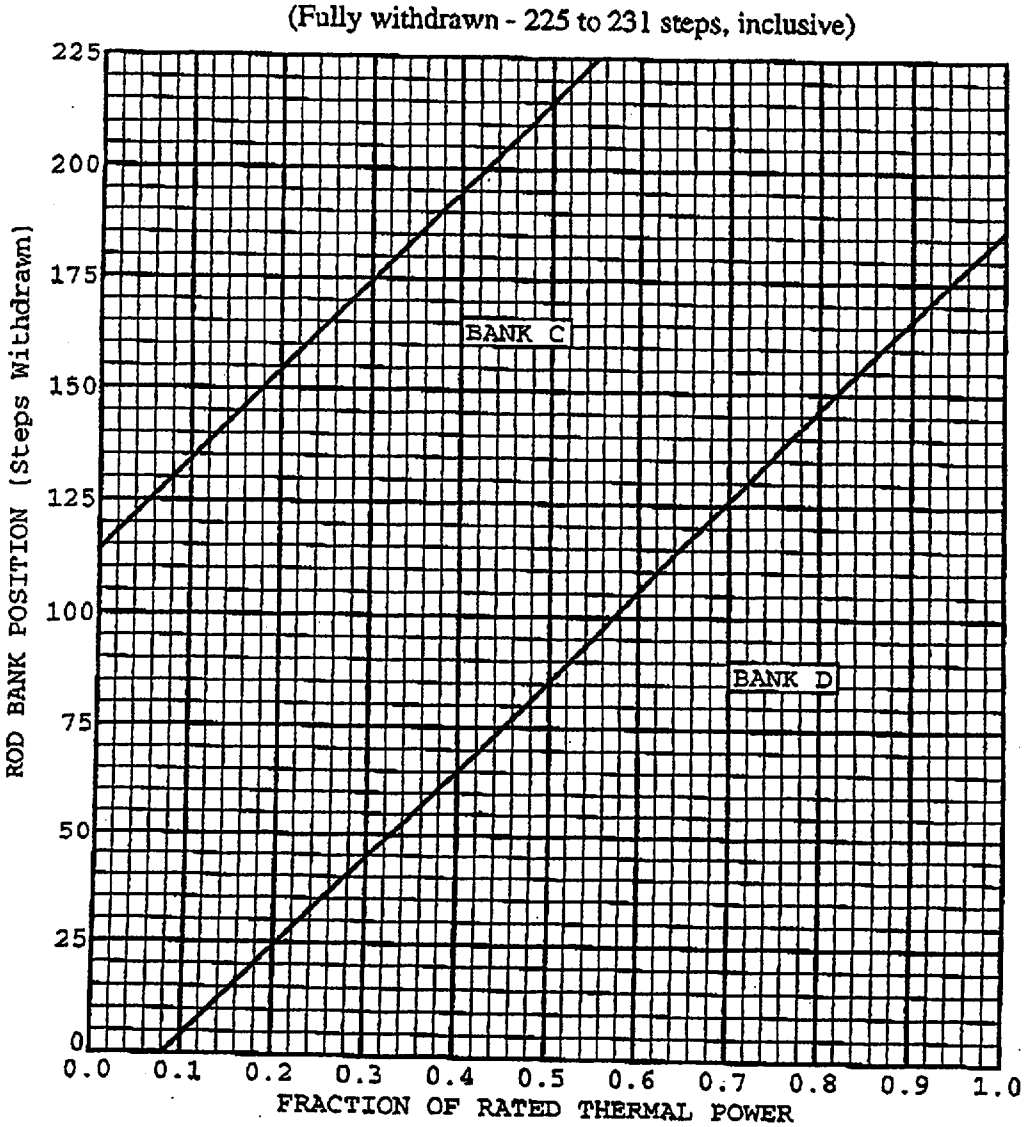
Table 1
$F_Q(Z)$ PENALTY FACTOR

Cycle Burnup (MWD/MTU)	$F_Q(Z)$ Penalty Factor
All Burnups	1.0200

Notes:

1. The Penalty Factor, to be applied to $F_Q(Z)$ in accordance with SR 3.2.1.2, is the maximum factor by which $F_Q(Z)$ is expected to increase over a 39 EFPD interval (surveillance interval of 31 EFPD plus the maximum allowable extension not to exceed 25% of the surveillance interval per SR 3.0.2) starting from the burnup at which the $F_Q(Z)$ was determined.

Figure 1
Rod Bank Insertion Limits versus Rated Thermal Power



Fully Withdrawn shall be the condition where control rods are at a position within the interval ≥ 225 and ≤ 231 steps withdrawn.

NOTE: The Rod Bank Insertion Limits are based on the control bank withdrawal sequence A, B, C, D and a control bank tip-to-tip distance of 128 steps.

Figure 2
K(Z) - Normalized $F_Q(Z)$ as a Function of Core Height

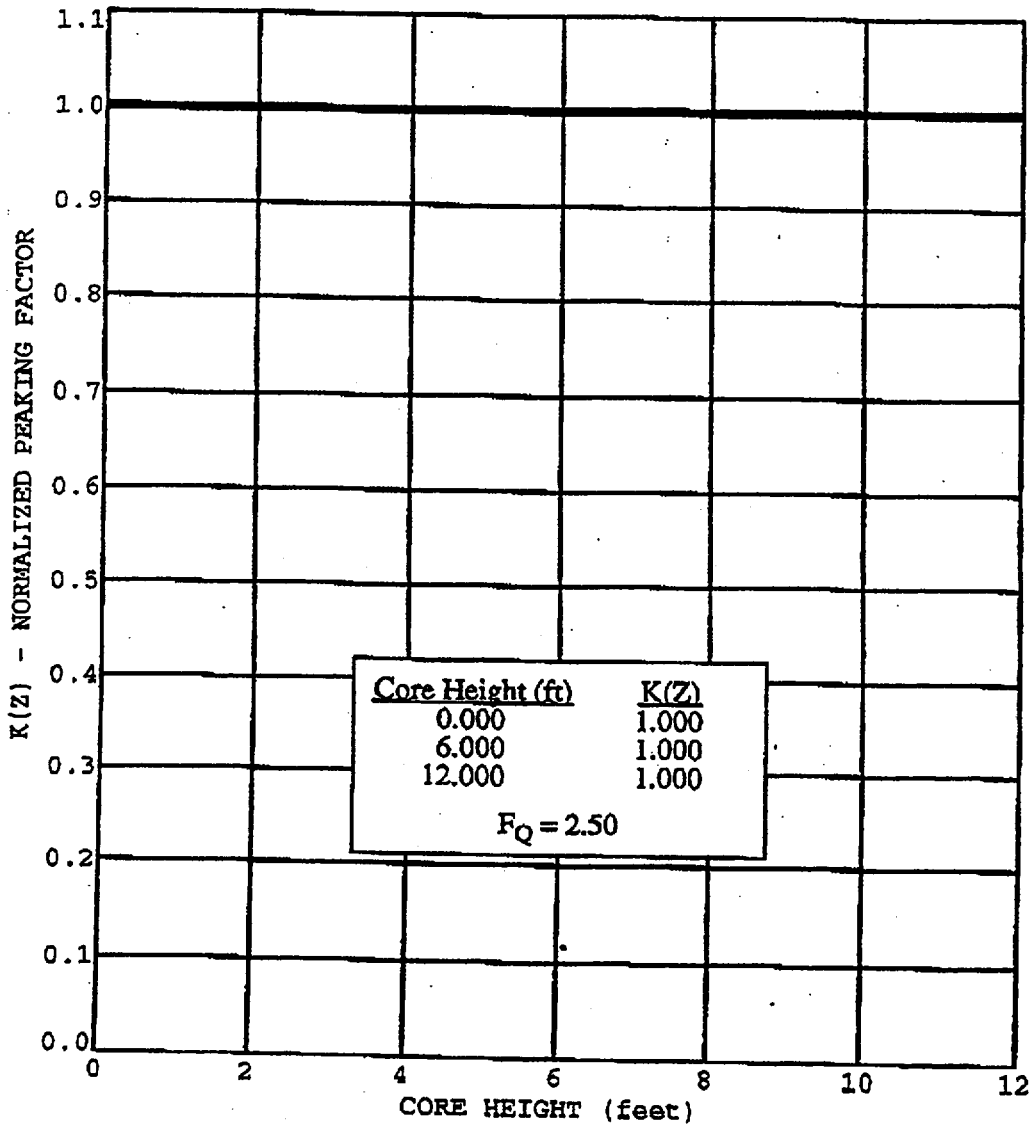


Figure 3
Axial Flux Difference Limits as a Function of
Rated Thermal Power for RAOC

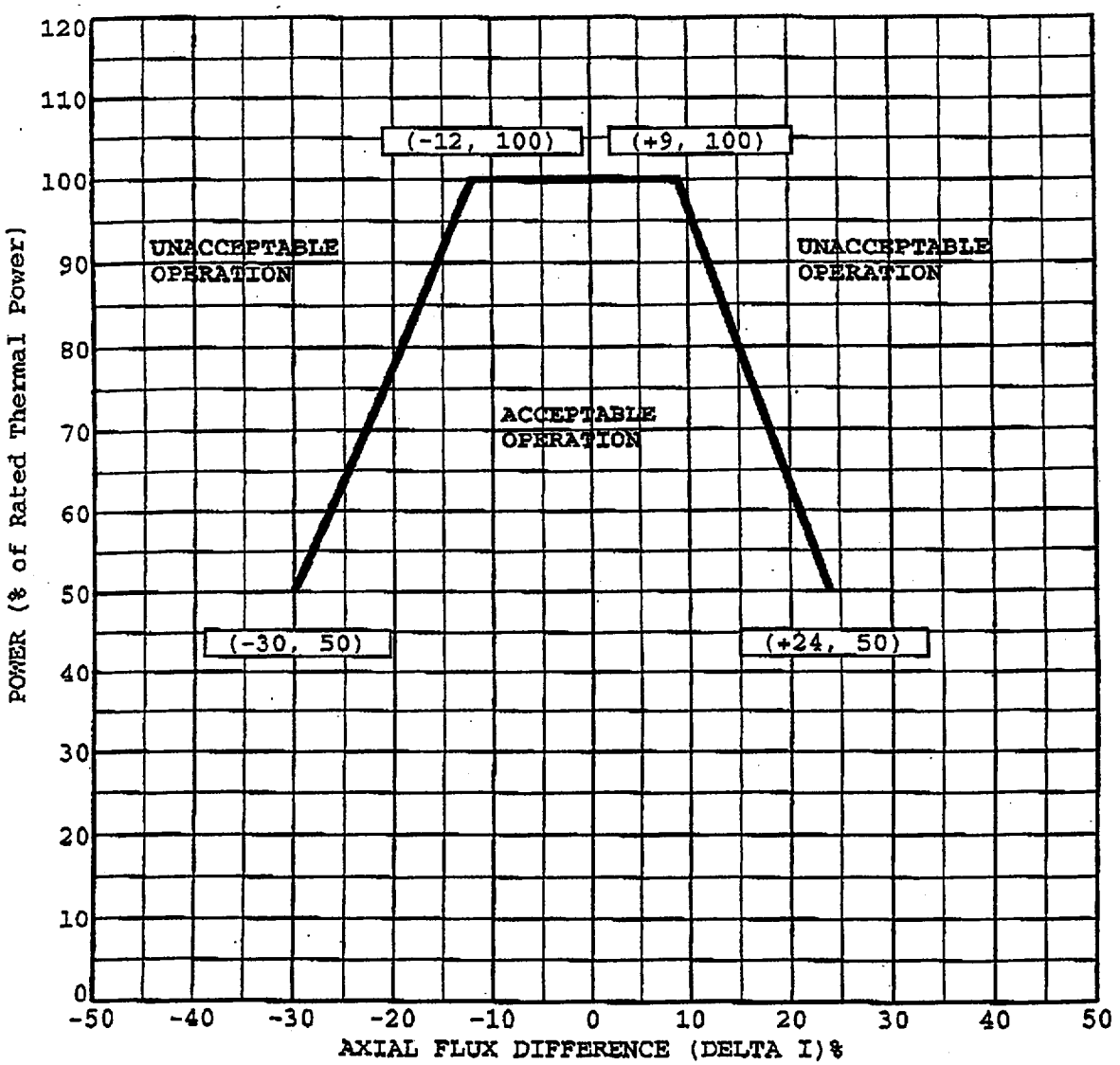
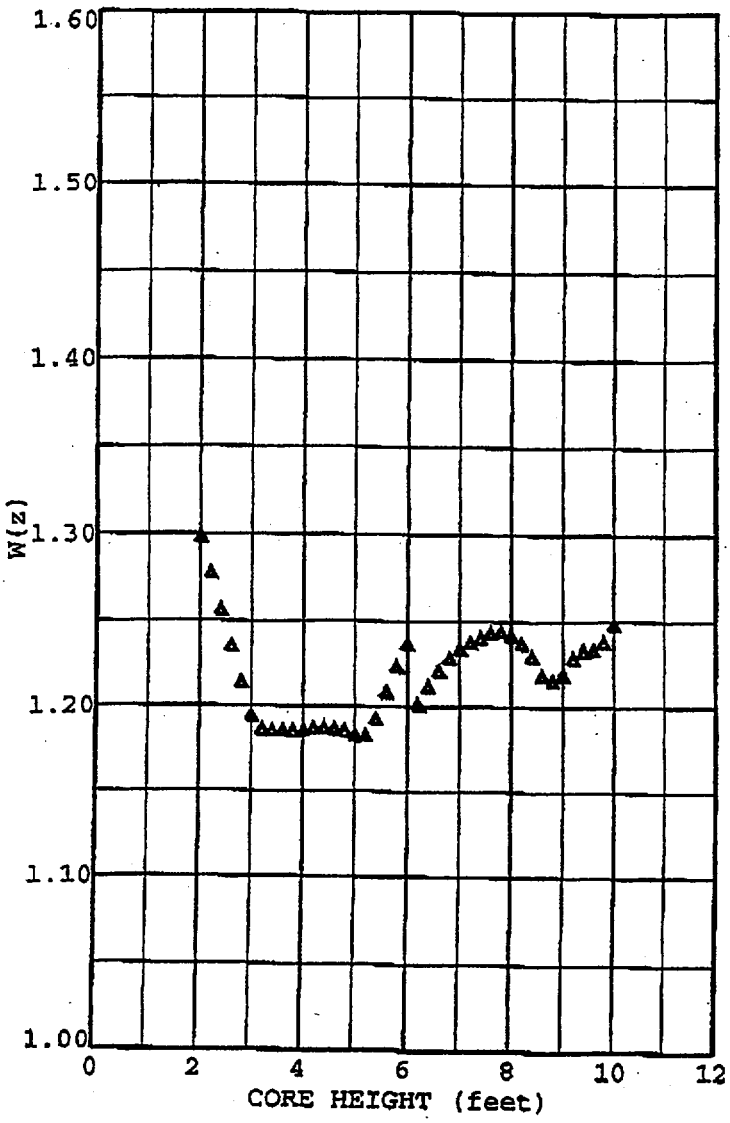


Figure 4
RAOC W(Z) at 150 MWD/MTU

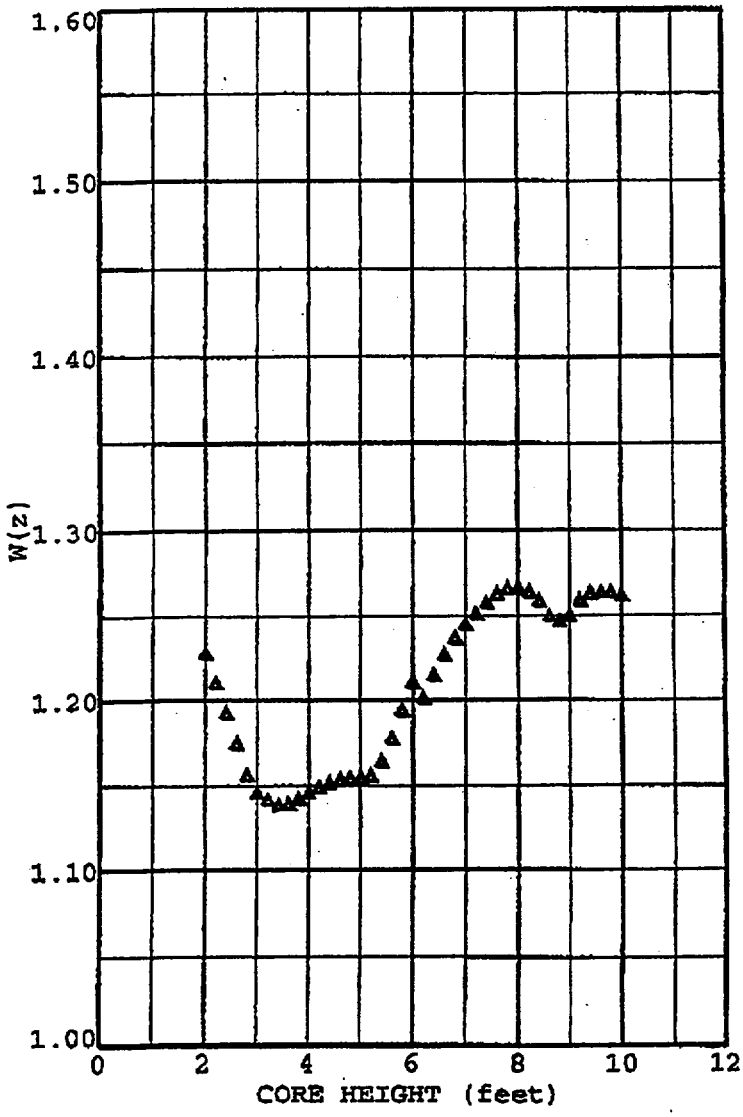


	Axial Point	Elevation (feet)	BOL W(Z)
*	1	12.00	1.0000
*	2	11.80	1.0000
*	3	11.60	1.0000
*	4	11.40	1.0000
*	5	11.20	1.0000
*	6	11.00	1.0000
*	7	10.80	1.0000
*	8	10.60	1.0000
*	9	10.40	1.0000
	10	10.20	1.0000
	11	10.00	1.2487
	12	9.80	1.2380
	13	9.60	1.2335
	14	9.40	1.2328
	15	9.20	1.2283
	16	9.00	1.2188
	17	8.80	1.2151
	18	8.60	1.2182
	19	8.40	1.2292
	20	8.20	1.2370
	21	8.00	1.2417
	22	7.80	1.2439
	23	7.60	1.2433
	24	7.40	1.2403
	25	7.20	1.2374
	26	7.00	1.2336
	27	6.80	1.2281
	28	6.60	1.2206
	29	6.40	1.2115
	30	6.20	1.2009
	31	6.00	1.2365
	32	5.80	1.2230
	33	5.60	1.2081
	34	5.40	1.1923
	35	5.20	1.1828
	36	5.00	1.1827
	37	4.80	1.1857
	38	4.60	1.1867
	39	4.40	1.1873
	40	4.20	1.1870
	41	4.00	1.1857
	42	3.80	1.1851
	43	3.60	1.1854
	44	3.40	1.1853
	45	3.20	1.1861
	46	3.00	1.1944
	47	2.80	1.2136
	48	2.60	1.2350
	49	2.40	1.2561
	50	2.20	1.2773
	51	2.00	1.2983
*	52	1.80	1.0000
*	53	1.60	1.0000
*	54	1.40	1.0000
*	55	1.20	1.0000
*	56	1.00	1.0000
*	57	0.80	1.0000
*	58	0.60	1.0000
*	59	0.40	1.0000
*	60	0.20	1.0000
*	61	0.00	1.0000

This figure is referred to by Technical Specification B3.2.1

* Top and Bottom 15% Excluded per Technical Specification B3.2.1

Figure 5
RAOC W(Z) at 4000 MWD/MTU

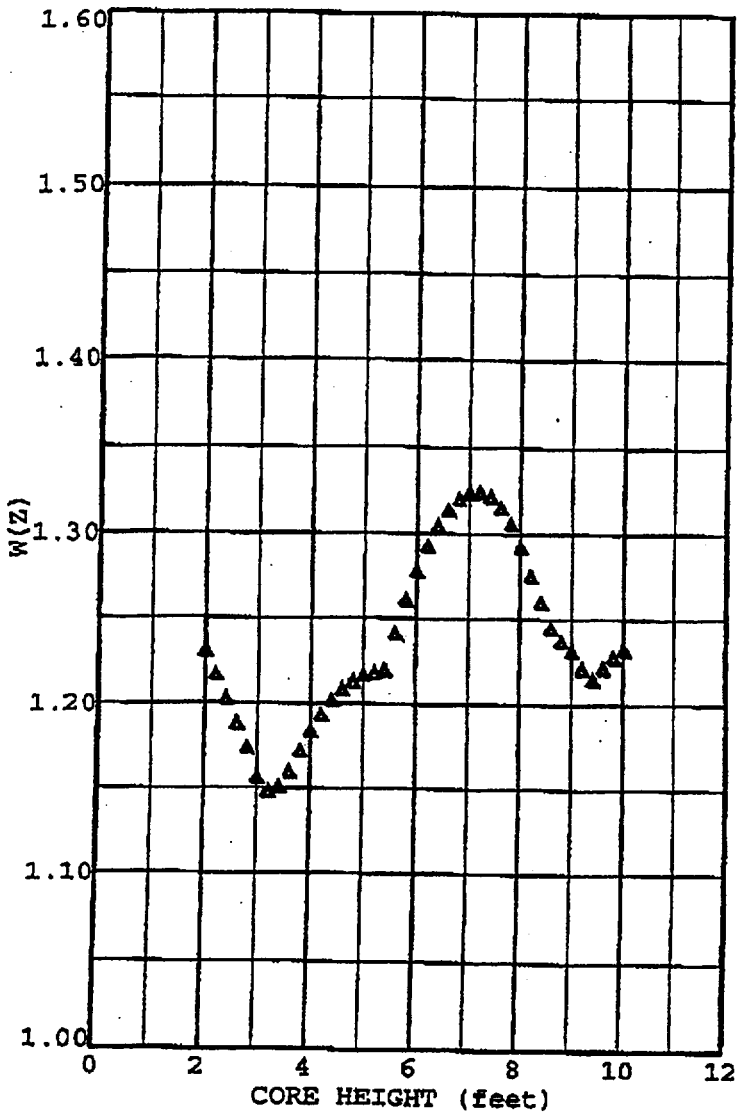


This figure is referred to by Technical Specification B3.2.1

	Axial Point	Elevation (feet)	MOL-1 W(Z)
*	1	12.00	1.0000
*	2	11.80	1.0000
*	3	11.60	1.0000
*	4	11.40	1.0000
*	5	11.20	1.0000
*	6	11.00	1.0000
*	7	10.80	1.0000
*	8	10.60	1.0000
*	9	10.40	1.0000
*	10	10.20	1.0000
	11	10.00	1.2618
	12	9.80	1.2641
	13	9.60	1.2638
	14	9.40	1.2633
	15	9.20	1.2592
	16	9.00	1.2500
	17	8.80	1.2467
	18	8.60	1.2499
	19	8.40	1.2587
	20	8.20	1.2642
	21	8.00	1.2665
	22	7.80	1.2662
	23	7.60	1.2630
	24	7.40	1.2574
	25	7.20	1.2512
	26	7.00	1.2446
	27	6.80	1.2366
	28	6.60	1.2264
	29	6.40	1.2146
	30	6.20	1.2012
	31	6.00	1.2104
	32	5.80	1.1941
	33	5.60	1.1776
	34	5.40	1.1643
	35	5.20	1.1556
	36	5.00	1.1541
	37	4.80	1.1542
	38	4.60	1.1531
	39	4.40	1.1514
	40	4.20	1.1488
	41	4.00	1.1456
	42	3.80	1.1418
	43	3.60	1.1387
	44	3.40	1.1378
	45	3.20	1.1411
	46	3.00	1.1454
	47	2.80	1.1560
	48	2.60	1.1748
	49	2.40	1.1924
	50	2.20	1.2100
	51	2.00	1.2278
*	52	1.80	1.0000
*	53	1.60	1.0000
*	54	1.40	1.0000
*	55	1.20	1.0000
*	56	1.00	1.0000
*	57	0.80	1.0000
*	58	0.60	1.0000
*	59	0.40	1.0000
*	60	0.20	1.0000
*	61	0.00	1.0000

* Top and Bottom 15% Excluded per Technical Specification B3.2.1

Figure 6
RAOC W(Z) at 10000 MWD/MTU



	Axial Point	Elevation (feet)	MOL-2 W(Z)
*	1	12.00	1.0000
*	2	11.80	1.0000
*	3	11.60	1.0000
*	4	11.40	1.0000
*	5	11.20	1.0000
*	6	11.00	1.0000
*	7	10.80	1.0000
*	8	10.60	1.0000
*	9	10.40	1.0000
*	10	10.20	1.0000
	11	10.00	1.2324
	12	9.80	1.2281
	13	9.60	1.2215
	14	9.40	1.2148
	15	9.20	1.2214
	16	9.00	1.2312
	17	8.80	1.2371
	18	8.60	1.2447
	19	8.40	1.2596
	20	8.20	1.2749
	21	8.00	1.2917
	22	7.80	1.3053
	23	7.60	1.3151
	24	7.40	1.3215
	25	7.20	1.3243
	26	7.00	1.3238
	27	6.80	1.3201
	28	6.60	1.3135
	29	6.40	1.3040
	30	6.20	1.2920
	31	6.00	1.2773
	32	5.80	1.2610
	33	5.60	1.2411
	34	5.40	1.2198
	35	5.20	1.2180
	36	5.00	1.2170
	37	4.80	1.2131
	38	4.60	1.2083
	39	4.40	1.2016
	40	4.20	1.1931
	41	4.00	1.1833
	42	3.80	1.1717
	43	3.60	1.1597
	44	3.40	1.1508
	45	3.20	1.1480
	46	3.00	1.1559
	47	2.80	1.1733
	48	2.60	1.1878
	49	2.40	1.2024
	50	2.20	1.2167
	51	2.00	1.2308
*	52	1.80	1.0000
*	53	1.60	1.0000
*	54	1.40	1.0000
*	55	1.20	1.0000
*	56	1.00	1.0000
*	57	0.80	1.0000
*	58	0.60	1.0000
*	59	0.40	1.0000
*	60	0.20	1.0000
*	61	0.00	1.0000

This figure is referred to by Technical Specification B3.2.1

* Top and Bottom 15% Excluded per Technical Specification B3.2.1

Figure 7
RAOC W(Z) at 16000 MWD/MTU

	Axial Point	Elevation (feet)	EOL W(Z)
*	1	12.00	1.0000
*	2	11.80	1.0000
*	3	11.60	1.0000
*	4	11.40	1.0000
*	5	11.20	1.0000
*	6	11.00	1.0000
*	7	10.80	1.0000
*	8	10.60	1.0000
*	9	10.40	1.0000
*	10	10.20	1.0000
	11	10.00	1.2002
	12	9.80	1.1902
	13	9.60	1.1873
	14	9.40	1.1922
	15	9.20	1.2087
	16	9.00	1.2238
	17	8.80	1.2418
	18	8.60	1.2598
	19	8.40	1.2827
	20	8.20	1.3092
	21	8.00	1.3326
	22	7.80	1.3513
	23	7.60	1.3659
	24	7.40	1.3763
	25	7.20	1.3826
	26	7.00	1.3849
	27	6.80	1.3834
	28	6.60	1.3783
	29	6.40	1.3697
	30	6.20	1.3580
	31	6.00	1.9431
	32	5.80	1.3269
	33	5.60	1.3135
	34	5.40	1.2973
	35	5.20	1.2790
	36	5.00	1.2689
	37	4.80	1.2623
	38	4.60	1.2513
	39	4.40	1.2383
	40	4.20	1.2231
	41	4.00	1.2055
	42	3.80	1.1895
	43	3.60	1.1744
	44	3.40	1.1622
	45	3.20	1.1482
	46	3.00	1.1381
	47	2.80	1.1468
	48	2.60	1.1620
	49	2.40	1.1768
	50	2.20	1.1913
	51	2.00	1.2056
*	52	1.80	1.0000
*	53	1.60	1.0000
*	54	1.40	1.0000
*	55	1.20	1.0000
*	56	1.00	1.0000
*	57	0.80	1.0000
*	58	0.60	1.0000
*	59	0.40	1.0000
*	60	0.20	1.0000
*	61	0.00	1.0000

This figure is referred to by Technical Specification B3.2.1

* Top and Bottom 15% Excluded per Technical Specification B3.2.1