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

Serial No. 16-220
NSS&L/MLC R0
Docket No. 50-423
License No. NPF-49

DOMINION NUCLEAR CONNECTICUT, INC.
MILLSTONE POWER STATION UNIT 3
CORE OPERATING LIMITS REPORT, CYCLE 18

In accordance with the Millstone Power Station Unit 3 (MPS3) Technical Specifications (TSs), Section 6.9.1.6.d, Dominion Nuclear Connecticut, Inc., hereby submits, as Enclosure 1, the Cycle 18 Core Operating Limits Report (COLR).

The MPS3 COLR has been revised to incorporate the following:

1) Editorial changes to increment the cycle number from 17 to 18.

2) Editorial changes to Item 2.13 "DNB Parameters" to match the wording of TS 3.2.5.

3) Cycle 18-specific changes to the W(Z) values.

4) Cycle 18-specific changes to the burnup penalties for incore ($F_Q(Z)$) surveillance.

The COLR has been incorporated into the MPS3 Technical Requirements Manual.

If you have any questions or require additional information, please contact Mr. Thomas G. Cleary at (860) 444-4377.

Sincerely,

B. L. Stanley
Director, Nuclear Station Safety and Licensing - Millstone

Enclosures: (1)

Commitments made in this letter: None.

A001
NRR

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Millstone Power Station

Serial No. 16-220
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ENCLOSURE 1

CORE OPERATING LIMITS REPORT, CYCLE 18

DOMINION NUCLEAR CONNECTICUT, INC.
MILLSTONE POWER STATION UNIT 3

TECHNICAL REQUIREMENTS MANUAL

APPENDIX 8.1

CORE OPERATING LIMITS REPORT

MILLSTONE UNIT 3

CYCLE 18

CORE OPERATING LIMITS REPORT

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Millstone Unit 3
Cycle 18
CORE OPERATING LIMITS REPORT

1.0 CORE OPERATING LIMITS REPORT

This CORE OPERATING LIMITS REPORT (COLR) for Millstone Unit 3 Cycle 18 has been prepared in accordance with the requirements of Technical Specification 6.9.1.6.a. The Technical Specifications affected by this report are listed below.

2.1.1	Safety Limits
2.2.1	Limiting Safety System Settings
3/4.1.1.1.1	SHUTDOWN MARGIN - MODE 1 and 2
3/4.1.1.1.2	SHUTDOWN MARGIN - MODES 3, 4 and 5 Loops Filled
3/4.1.1.2	SHUTDOWN MARGIN - MODE 5 Loops Not Filled
3/4.1.1.3	Moderator Temperature Coefficient
3/4.1.3.5	Shutdown Rod Insertion Limit
3/4.1.3.6	Control Rod Insertion Limits
3/4.2.1.1	AXIAL FLUX DIFFERENCE
3/4.2.2.1	Heat Flux Hot Channel Factor
3/4.2.3.1	RCS Total Flow Rate and Nuclear Enthalpy Rise Hot Channel Factor
3/4.2.5	DNB Parameters
3/4.3.5	Shutdown Margin Monitor Alarm Setpoint
3/4.9.1.1	REFUELING 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 the NRC-approved methodologies specified in Technical Specification 6.9.1.6.b.

2.1 Safety Limits (Specification 2.1.1)

2.1.1 Reactor Core

The combination of THERMAL POWER, Reactor Coolant System highest loop average temperature, and pressurizer pressure shall not exceed the limits shown in Figure 1.

2.2 Limiting Safety System Settings (Specification 2.2.1)

2.2.1 Overtemperature ΔT

2.2.1.1 $K_1 \leq 1.20$

2.2.1.2 $K_2 \geq 0.025$ / °F

2.2.1.3 $K_3 \geq 0.00113$ / psi

2.2.1.4 $\tau_1 \geq 8$ seconds

2.2.1.5 $\tau_2 \leq 3$ seconds

2.2.1.6 $\tau_4 \geq 20$ seconds

2.2.1.7 $\tau_5 \leq 4$ seconds

2.2.1.8 T' is loop specific indicated T_{avg} at RATED THERMAL POWER, ≤ 587.1°F

2.2.1.9 P' is nominal pressurizer pressure, ≥ 2250 psia

2.2.1.10 $f_1(\Delta I)$ is a function of the indicated difference between top and bottom detectors of the power range neutron ion chambers; with nominal gains to be selected based on measured instrument response during plant startup tests calibrations such that:

(1) For $q_t - q_b$ between -18% and +10%, $f_1(\Delta I) \geq 0$, where q_t and q_b are percent RATED THERMAL POWER in the upper and lower halves of the core, respectively, and $q_t + q_b$ is the total THERMAL POWER in percent RATED THERMAL POWER;

(2) For each percent that the magnitude of $q_t - q_b$ exceeds -18%, the ΔT Trip Setpoint shall be automatically reduced by ≥ 3.75% of its value at RATED THERMAL POWER.

(3) For each percent that the magnitude of $q_t - q_b$ exceeds +10%, the ΔT Trip Setpoint shall be automatically reduced by ≥ 2.14% of its value at RATED THERMAL POWER.

2.2.2 Overpower ΔT

2.2.2.1 $K_4 \leq 1.10$

2.2.2.2 Deleted

2.2.2.3 $K_6 \geq 0.0015$ / °F when T > T" and $K_6 \leq 0$ / °F when T≤ T"

2.2.2.4 $\tau_1 \geq 8$ seconds

2.2.2.5 $\tau_2 \leq 3$ seconds

2.2.2.6 Deleted

2.2.2.7 T" is loop specific indicated T_{avg} at RATED THERMAL POWER, ≤ 587.1°F

2.3 SHUTDOWN MARGIN - MODE 1 and 2 (Specification 3/4.1.1.1.1)

2.3.1 The SHUTDOWN MARGIN shall be greater than or equal to 1.3% Δk/k.

2.4 SHUTDOWN MARGIN - MODE 3, 4 and 5 Loops Filled (Specification 3/4.1.1.1.2)

2.4.1 The SHUTDOWN MARGIN shall be greater than or equal to the limits shown in Figures 2, 3 and 4.[1]

2.5 SHUTDOWN MARGIN - MODE 5 Loops Not Filled (Specification 3/4.1.1.2)

2.5.1 The SHUTDOWN MARGIN shall be greater than or equal to the limits shown in Figure 5 or the limits shown in Figure 4 with the chemical and volume control system (CVCS) aligned to preclude reactor coolant system boron concentration reduction.[1]

2.6 Moderator Temperature Coefficient (Specification 3/4.1.1.3)

2.6.1 The BOL/ARO/0% - 70% RTP MTC shall be less positive than + 0.5 x 10^{-4} Δk/k/°F. Above 70% RTP, the MTC limit is a linear ramp to 0 Δk/k/°F at 100% RTP.

2.6.2 The EOL/ARO/RTP MTC shall be less negative than - 5.65 x 10^{-4} Δk/k/°F.

2.6.3 The 300 ppm/ARO/RTP MTC should be less negative than or equal to - 4.9 x 10^{-4} Δk/k/°F,

where: BOL stands for Beginning Of Cycle Life

ARO stands for All Rods Out

[1]The SHUTDOWN MARGIN requirements in Figures 2, 3, 4 and 5 are based on cycle-specific boron dilution analyses performed by Dominion.

HZP stands for Hot Zero Power

EOL stands for End Of Cycle Life

RTP stands for RATED THERMAL POWER.

2.7 Shutdown Rod Insertion Limit (Specification 3/4.1.3.5)

2.7.1 The shutdown rods shall be at least 220 steps withdrawn (inclusive).

2.8 Control Rod Insertion Limits (Specification 3/4.1.3.6)

2.8.1 The control rod banks shall be limited in physical insertion as shown in Figure 6, and

2.8.2 Control bank A shall be at least 220 steps withdrawn.

2.9 AXIAL FLUX DIFFERENCE (Specification 3/4.2.1.1)

2.9.1 The AXIAL FLUX DIFFERENCE (AFD) limits are provided in Figure 7.

2.9.2 The AFD target band during base load operation is ± 5%.

2.9.3 The minimum allowable (nuclear design) power level for base load operation (APL^{ND}) is 80% of RATED THERMAL POWER.

2.10 Heat Flux Hot Channel Factor - $F_Q(Z)$ (Specification 3/4.2.2.1)

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

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

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

2.10.1 $F^{RTP}_Q = 2.60$.

2.10.2 K(Z) is provided in Figure 8.

2.11 Heat Flux Hot Channel Factor Surveillance - $F_Q(Z)$ (Specification 3/4.2.2.1.2)

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

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

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

2.11.1 $F^{RTP}_Q = 2.60$.

2.11.2 K(Z) is provided in Figure 8.

2.11.3 W(Z) values for RAOC operation are provided in Table 1. Note that the W(Z) values at Axial Mesh 1 are at the top of the core. The Cycle 18 burnup dependent RAOC W(Z) values are valid over the range of burnup from 0 to 21,600 MWD/MTU.

2.11.4 W(Z) values for Base Load (BL) operation are provided in Table 2. Note that the W(Z) values at Axial Mesh 1 are at the top of the core. The Cycle 18 burnup dependent BL W(Z) values are valid over the range of burnup from 0 to 21,600 MWD/MTU.

2.11.5 W(Z) values for Part Power operation are provided in Table 3. Note that the W(Z) values at Axial Mesh 1 are at the top of the core. The Cycle 18 burnup dependent Part Power W(Z) values are valid over the range of burnup from 0 to 150 MWD/MTU.

2.11.6 The factors in Table 4 shall be used for surveillance requirements 4.2.2.1.2 and 4.2.2.1.4. A 2% factor shall be used outside of the burnup range shown in Table 4.

2.12 RCS Total Flow Rate and Nuclear Enthalpy Rise Hot Channel Factor - $F^N_{\Delta H}$ (Specification 3/4.2.3.1)

2.12.1 The RCS Total Flow Rate shall be greater than or equal to 379,200 gpm.

2.12.2 $F^N_{\Delta H} \leq F^{RTP}_{\Delta H} \times (1 + PF_{\Delta H} \times [1 - P])$

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

2.12.2.1 $F^{RTP}_{\Delta H}$ = 1.586 for Robust Fuel Assemblies (RFA) and (RFA-2)

2.12.2.2 $PF_{\Delta H}$ = 0.3 for P < 1.0.

2.13 DNB Parameters (Specification 3/4.2.5)

The following DNB-related parameters shall be maintained within the limits specified below:

2.13.1 Reactor Coolant System T_{avg} shall be maintained ≤ 593.5°F.

2.13.2 Pressurizer Pressure shall be maintained ≥ 2204 psia [2].

2.14 Shutdown Margin Monitor Alarm Setpoint (Specification 3/4.3.5)[3]

2.14.1 The Shutdown Margin Monitor (SMM) minimum count rate and Alarm Ratio Setting to meet Limiting Condition for Operation (LCO) 3.3.5 shall be as shown below.

Tech. Spec. LCO	SMM Alarm Ratio Setting	Min. Count Rate (counts/sec)
3.3.5.a	1.50	1.0
	1.25	0.6
3.3.5.b.1	1.50	0.50
	1.25	0.35
3.3.5.b.2	1.50	0.35
	1.25	0.25

The combination of the SMM Alarm Ratio setting and minimum count rate accounts for the time lag between the indicated and actual count rates, as well as other uncertainties. The specified SMM Alarm Ratio setting ensures that the assumption that an alarm is generated at flux doubling in the Boron Dilution Event analysis remains valid. The count rate is displayed on the SMM.

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[2] Limit not applicable during either a THERMAL POWER ramp in excess of 5% of RATED THERMAL POWER per minute or a THERMAL POWER step in excess of 10% of RATED THERMAL POWER.

[3] Section 2.14 is based on cycle-specific boron dilution analyses performed by Dominion.

2.15 Refueling Boron Concentration (Specification 3/4.9.1.1)

2.15.1 The boron concentration of all filled portions of the Reactor Coolant System and the refueling cavity shall be maintained at a boron concentration of greater than or equal to 2600 ppm.[4]

[4] This boron concentration bounds the condition of $k_{eff} \leq 0.95$ (all rods in less the most reactive two rods) and subcriticality ($k_{eff} \leq 1.0$ with all rods out).

Figure 1 Reactor Core Safety Limit

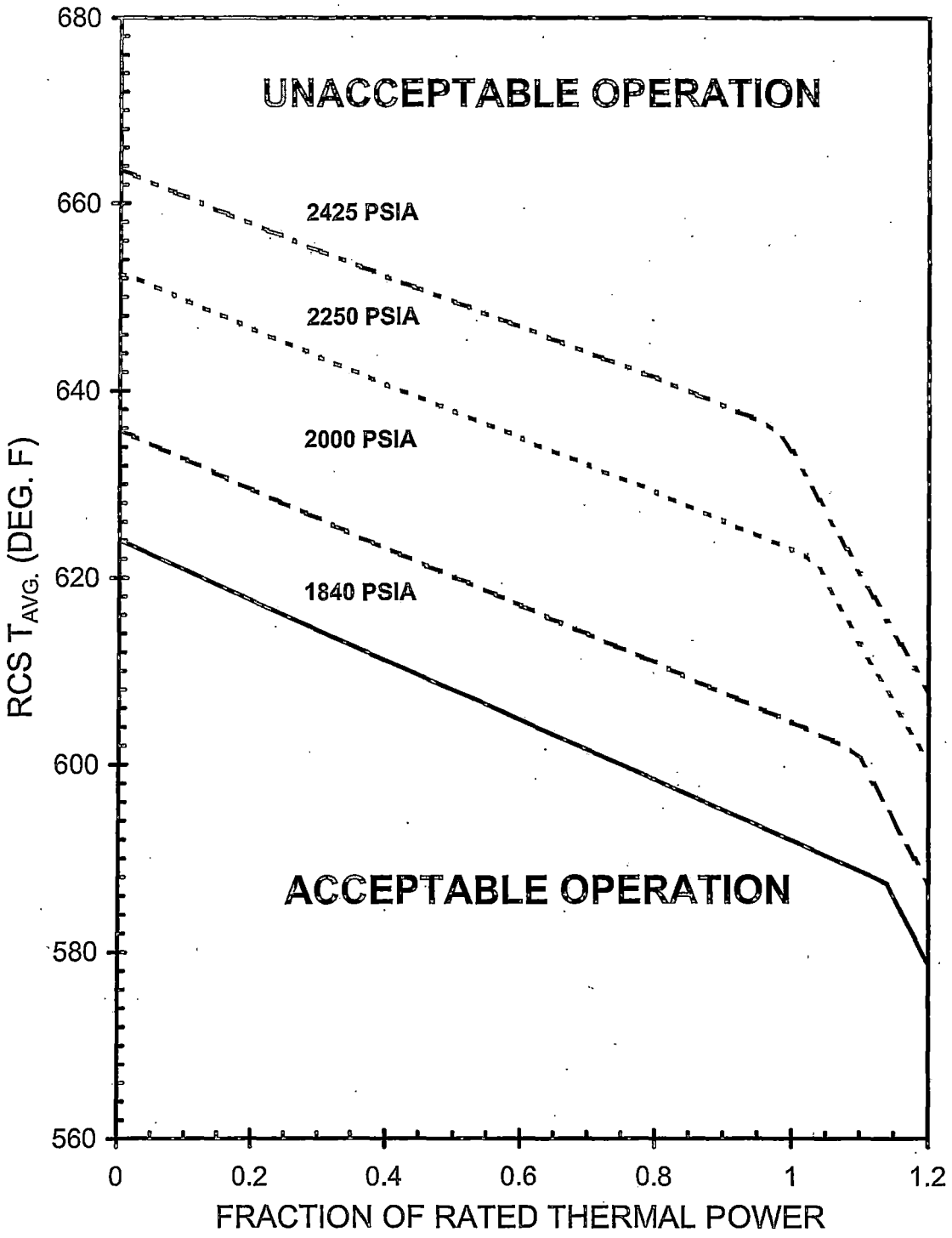

Figure 2 Required SHUTDOWN MARGIN for MODE 3

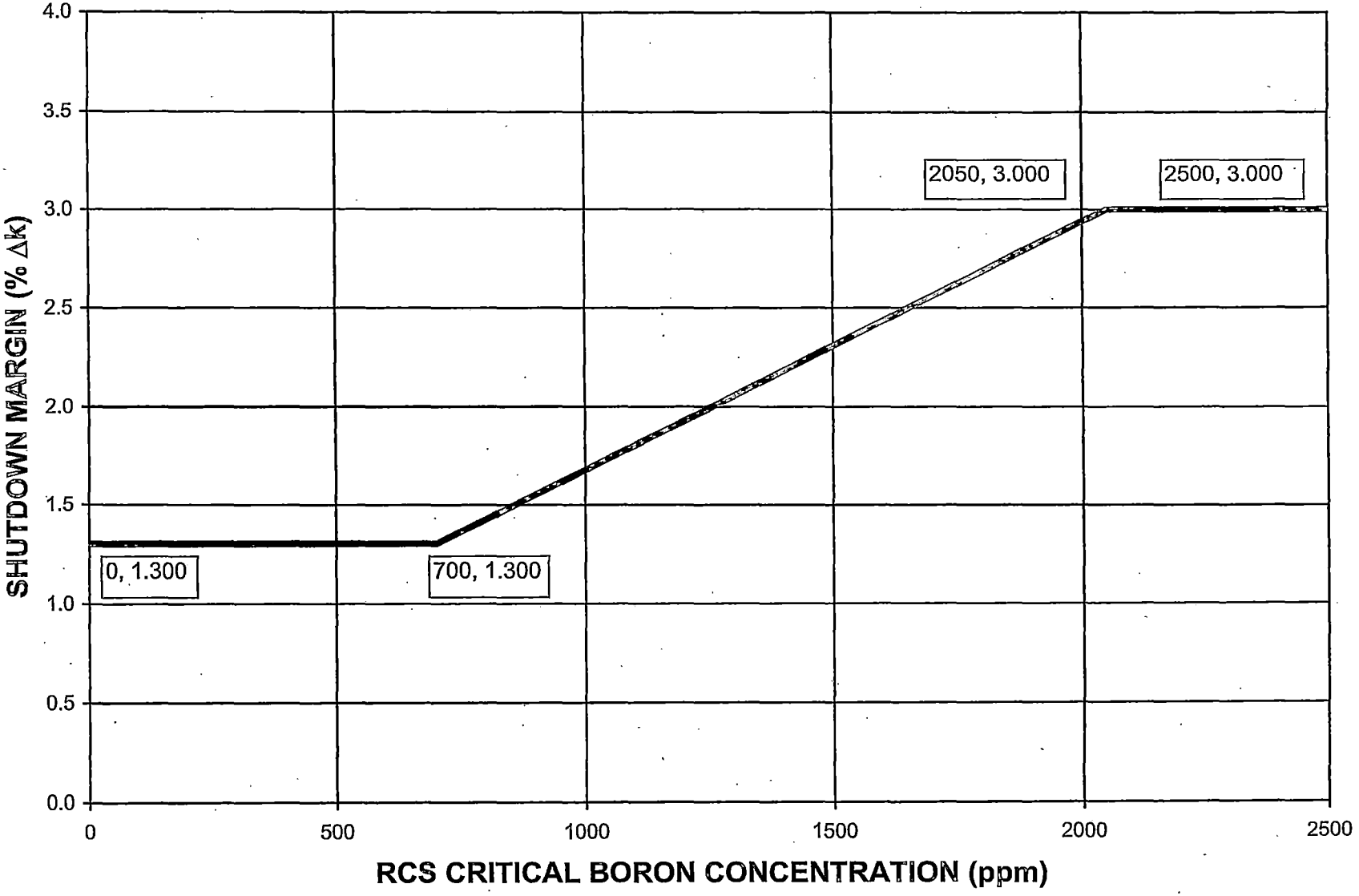

Figure 3 Required SHUTDOWN MARGIN for MODE 4

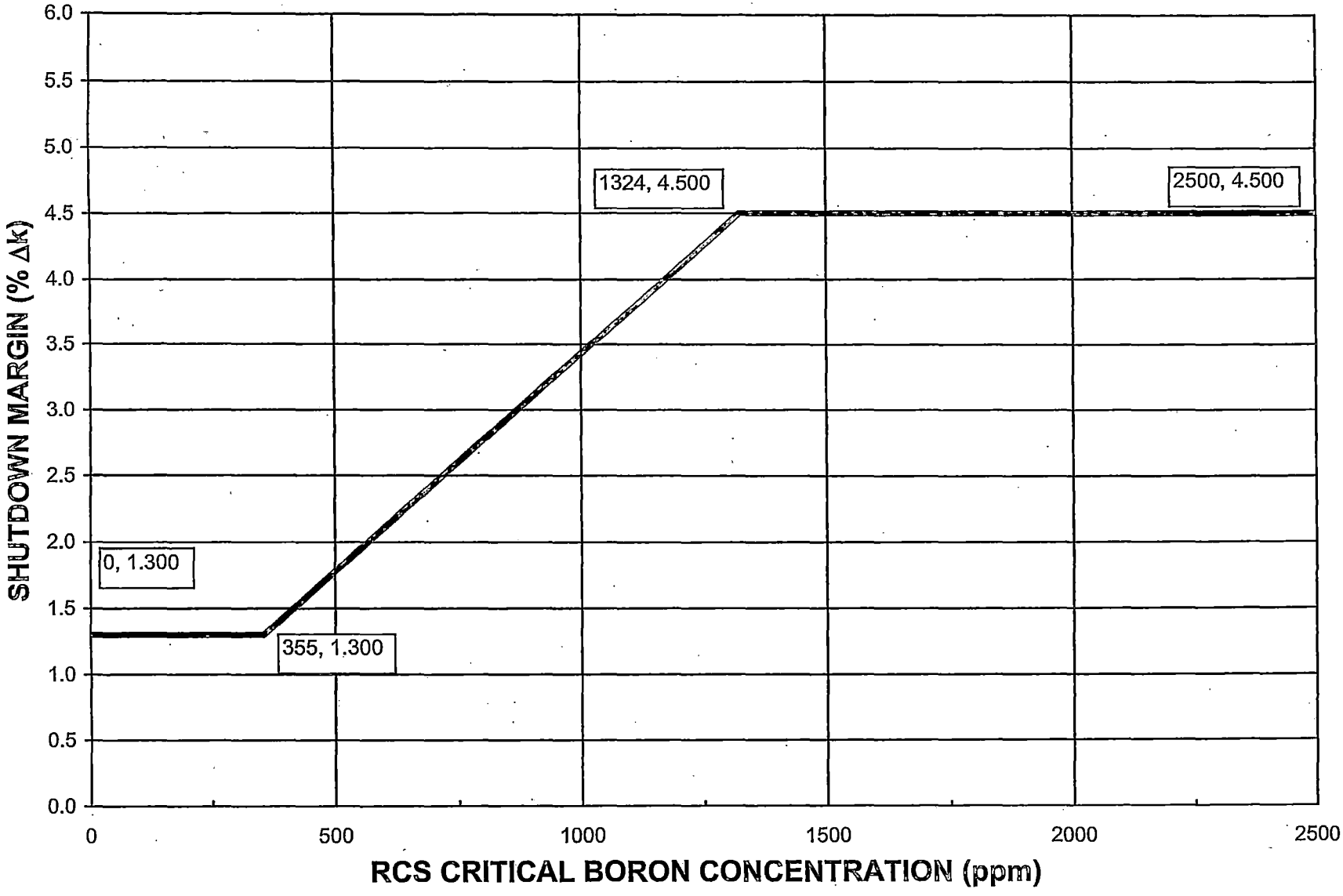

Figure 4 Required SHUTDOWN MARGIN for MODE 5 with RCS Loops Filled

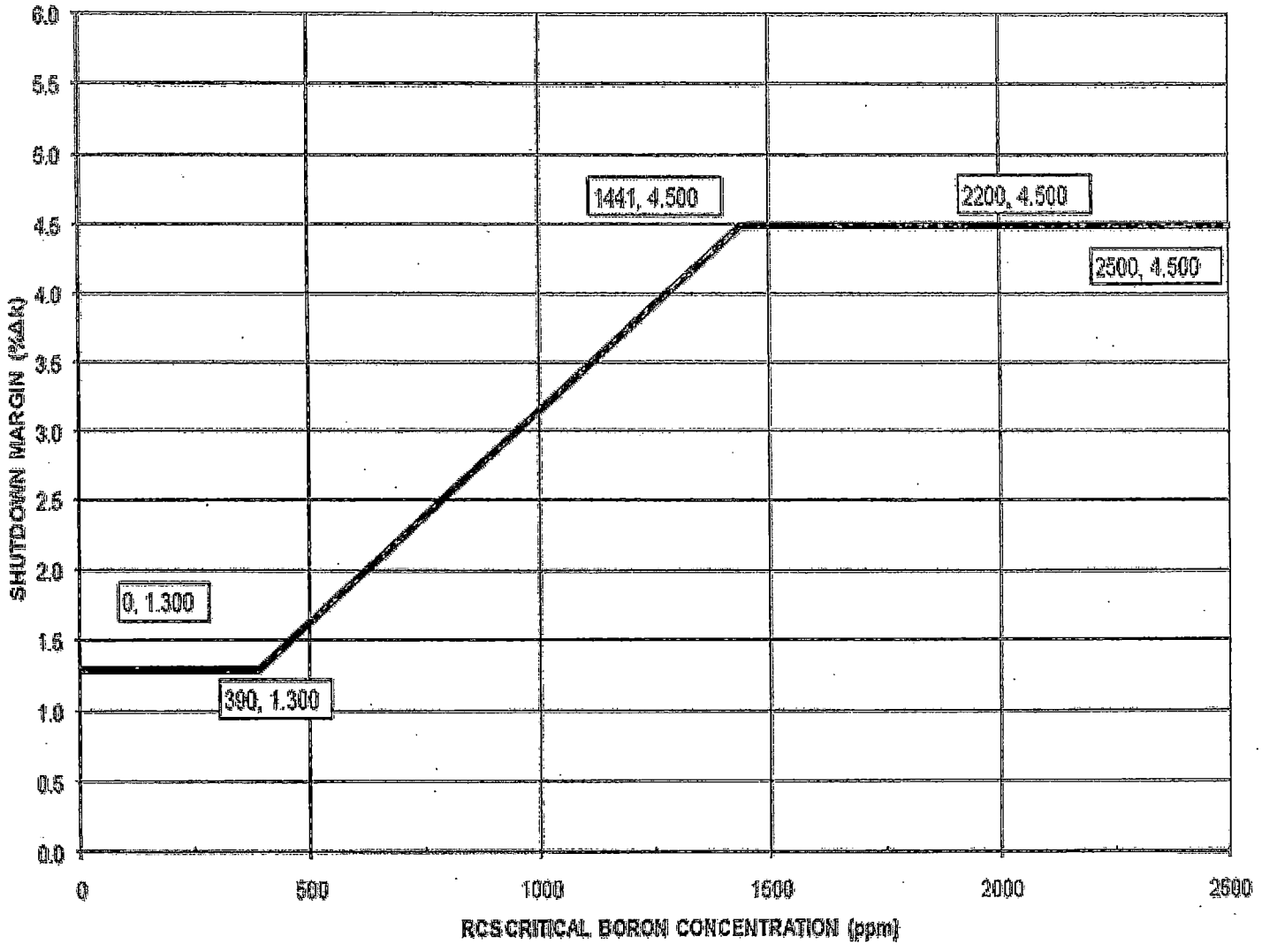

Figure 5 Required SHUTDOWN MARGIN for MODE 5 with RCS Loops Not Filled

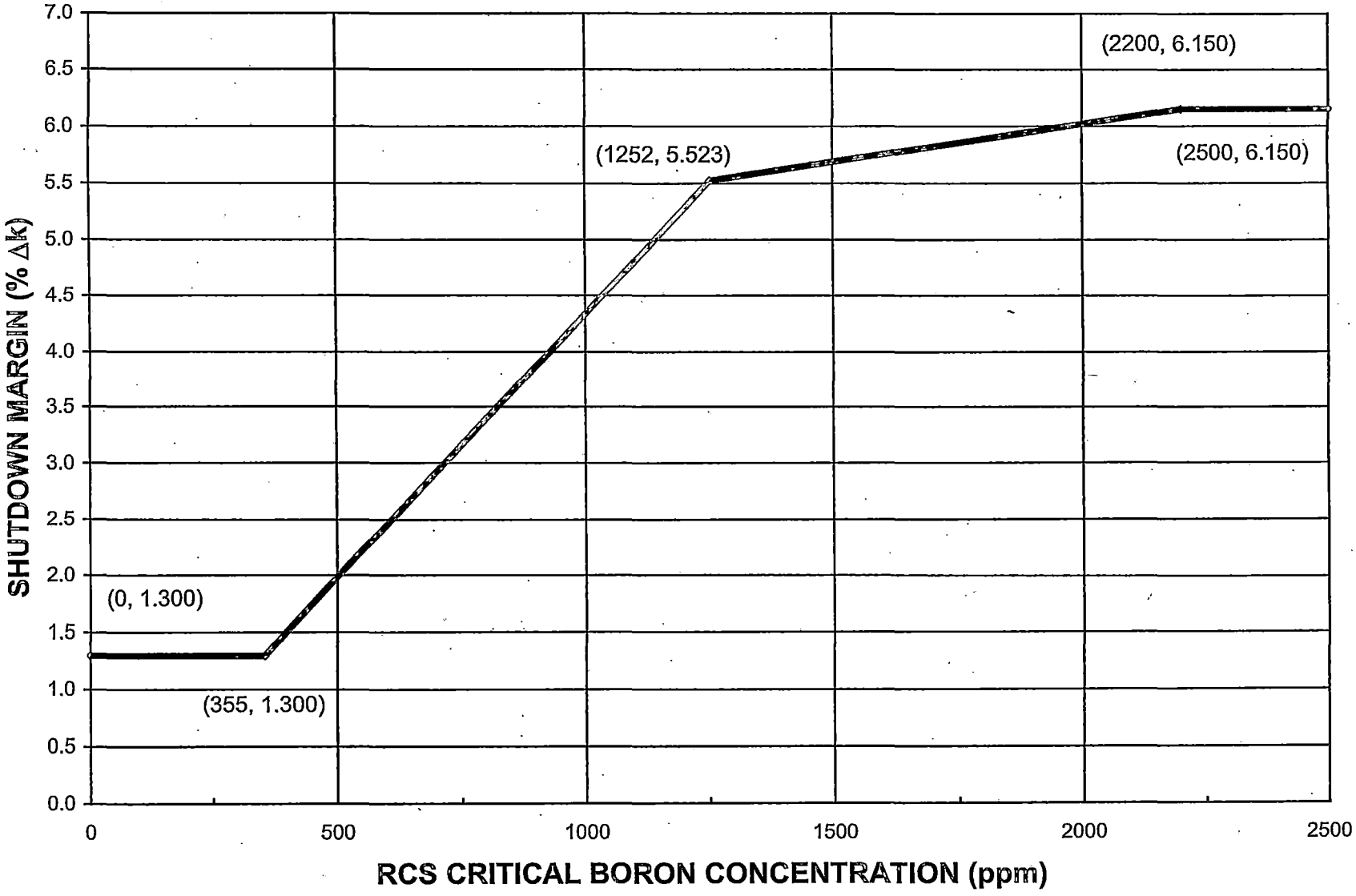

Figure 6 Control Rod Bank Insertion Limits versus THERMAL POWER

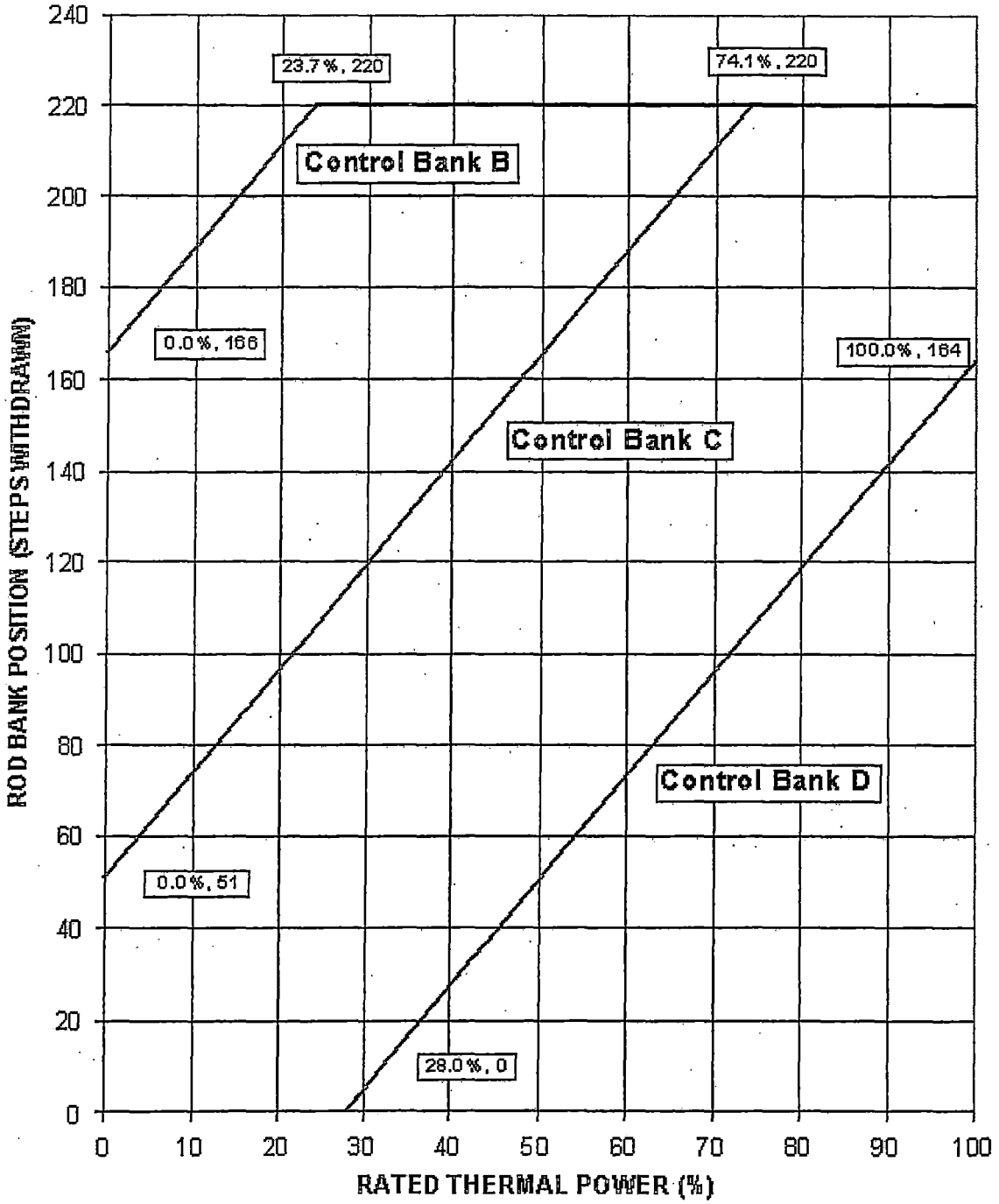

Figure 7 AXIAL FLUX DIFFERENCE Limits as a Function of RATED THERMAL POWER

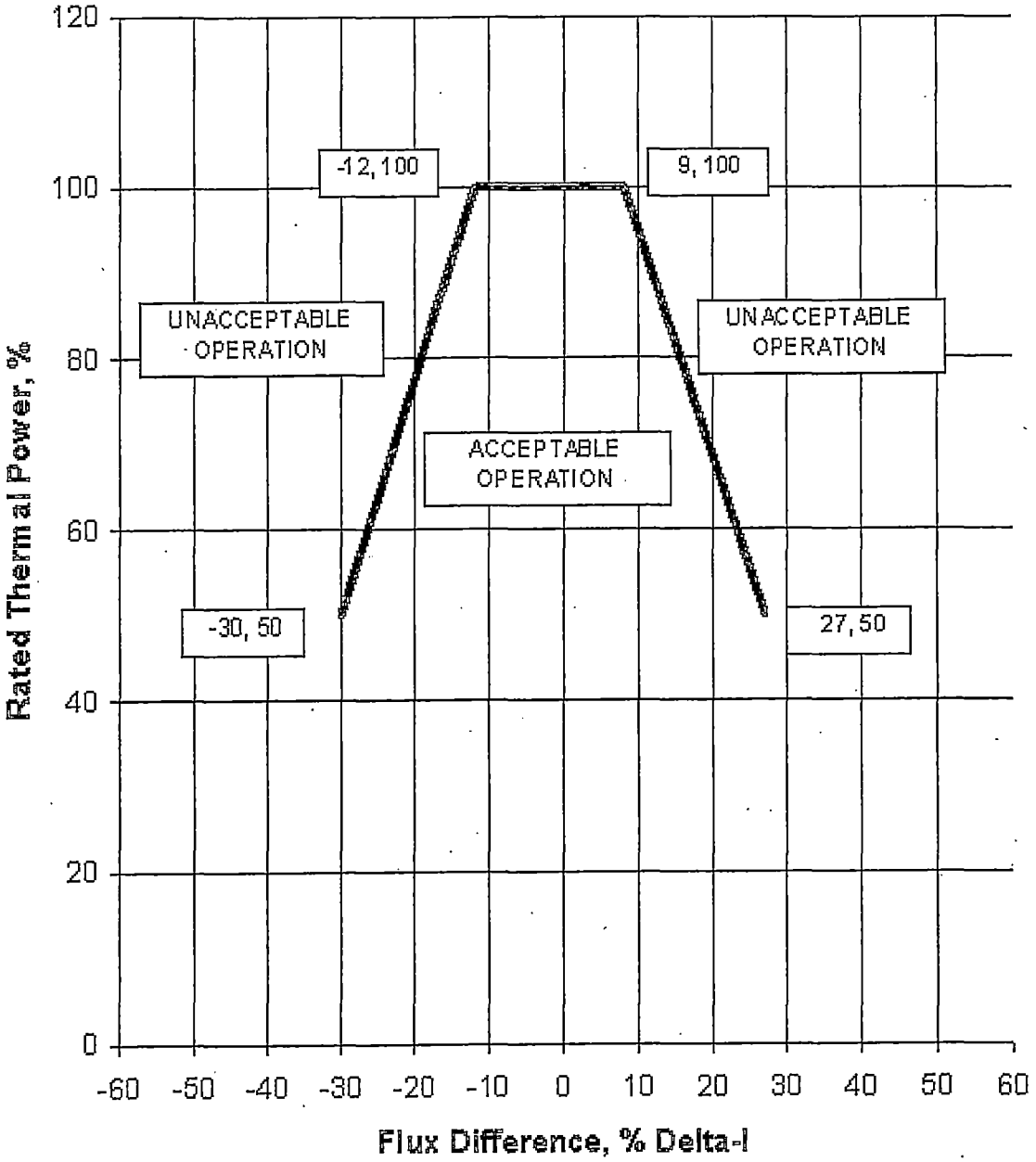

Figure 8 K(Z) - Normalized $F_Q(Z)$ as a Function of Core Height

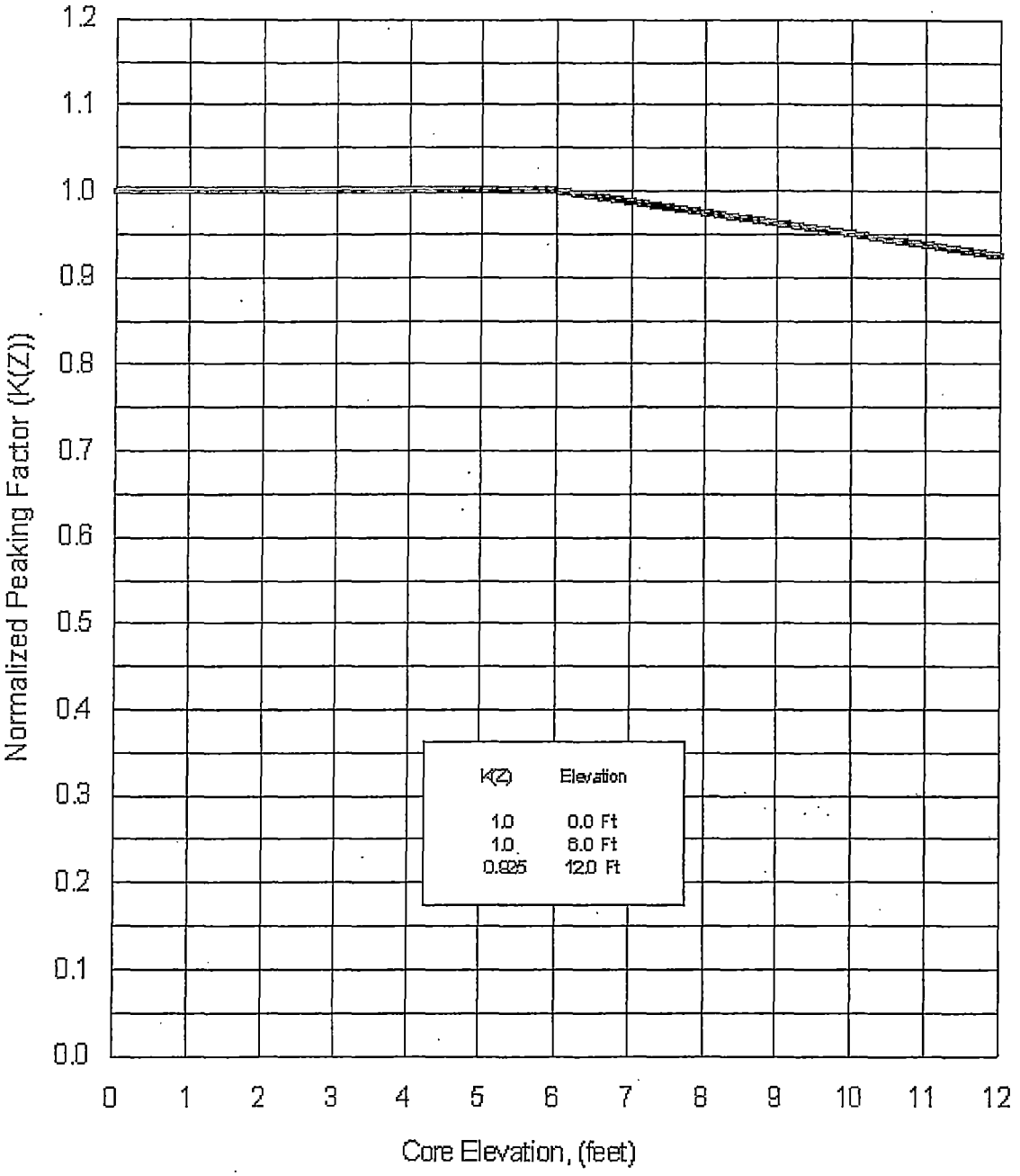

Table 1
RAOC W(Z) Function, Millstone Unit 3 - Cycle 18
-12/+9 AFD at 100% RTP

		Burnup Step (MWD/MTU)			
Mesh No.	Height*	150	3000	10000	18000
1	12.0778	1.0000	1.0000	1.0000	1.0000
2	11.9100	1.0000	1.0000	1.0000	1.0000
3	11.7423	1.0000	1.0000	1.0000	1.0000
4	11.5745	1.0000	1.0000	1.0000	1.0000
5	11.4068	1.0000	1.0000	1.0000	1.0000
6	11.2390	1.0000	1.0000	1.0000	1.0000
7	11.0713	1.3602	1.3804	1.4268	1.3239
8	10.9035	1.3481	1.3708	1.4224	1.3165
9	10.7358	1.3308	1.3535	1.4140	1.3045
10	10.5680	1.3111	1.3343	1.4012	1.2921
11	10.4003	1.2906	1.3140	1.3844	1.2781
12	10.2325	1.2724	1.2932	1.3656	1.2611
13	10.0648	1.2558	1.2757	1.3449	1.2511
14	9.8971	1.2394	1.2584	1.3221	1.2469
15	9.7293	1.2223	1.2398	1.2983	1.2403
16	9.5616	1.2048	1.2236	1.2770	1.2363
17	9.3938	1.1874	1.2088	1.2601	1.2327
18	9.2261	1.1694	1.1934	1.2470	1.2255
19	9.0583	1.1482	1.1780	1.2342	1.2156
20	8.8906	1.1361	1.1661	1.2233	1.2039
21	8.7228	1.1364	1.1601	1.2166	1.2005
22	8.5551	1.1396	1.1565	1.2126	1.2047
23	8.3873	1.1431	1.1533	1.2085	1.2105
24	8.2196	1.1459	1.1505	1.2038	1.2152
25	8.0518	1.1481	1.1502	1.2033	1.2187
26	7.8841	1.1494	1.1508	1.2033	1.2212
27	7.7163	1.1498	1.1504	1.2013	1.2222
28	7.5486	1.1491	1.1489	1.1979	1.2219
29	7.3809	1.1476	1.1464	1.1933	1.2201
30	7.2131	1.1452	1.1429	1.1873	1.2171
31	7.0454	1.1417	1.1385	1.1801	1.2127
32	6.8776	1.1382	1.1331	1.1718	1.2069
33	6.7099	1.1357	1.1268	1.1624	1.1999
34	6.5421	1.1329	1.1214	1.1520	1.1932
35	6.3744	1.1296	1.1172	1.1408	1.1867
36	6.2066	1.1255	1.1136	1.1289	1.1795
37	6.0389	1.1202	1.1084	1.1180	1.1710
38	5.8711	1.1163	1.1058	1.1097	1.1619

* Distance from bottom of active core (feet)

Note: Surveillance exclusion zone is 8% top, 8% bottom.

Table 1 (Continued)
RAOC W(Z) Function, Millstone Unit 3 - Cycle 18
-12/+9 AFD at 100% RTP

		Burnup Step (MWD/MTU)			
Mesh No.	Height*	150	3000	10000	18000
39	5.7034	1.1157	1.1071	1.1052	1.1541
40	5.5356	1.1204	1.1125	1.1049	1.1524
41	5.3679	1.1289	1.1185	1.1064	1.1522
42	5.2001	1.1357	1.1236	1.1076	1.1523
43	5.0324	1.1420	1.1283	1.1085	1.1516
44	4.8647	1.1481	1.1326	1.1100	1.1502
45	4.6969	1.1537	1.1365	1.1129	1.1479
46	4.5292	1.1589	1.1400	1.1154	1.1450
47	4.3614	1.1636	1.1430	1.1174	1.1416
48	4.1937	1.1679	1.1458	1.1193	1.1376
49	4.0259	1.1719	1.1482	1.1210	1.1327
50	3.8582	1.1754	1.1503	1.1229	1.1305
51	3.6904	1.1786	1.1521	1.1279	1.1317
52	3.5227	1.1823	1.1536	1.1327	1.1333
53	3.3549	1.1878	1.1567	1.1372	1.1336
54	3.1872	1.1956	1.1639	1.1414	1.1341
55	3.0194	1.2035	1.1766	1.1453	1.1368
56	2.8517	1.2097	1.1919	1.1505	1.1456
57	2.6839	1.2160	1.2067	1.1586	1.1582
58	2.5162	1.2300	1.2211	1.1688	1.1712
59	2.3485	1.2484	1.2373	1.1797	1.1839
60	2.1807	1.2657	1.2566	1.1902	1.1966
61	2.0130	1.2826	1.2758	1.2005	1.2091
62	1.8452	1.2993	1.2942	1.2105	1.2211
63	1.6775	1.3152	1.3119	1.2200	1.2327
64	1.5097	1.3300	1.3285	1.2287	1.2434
65	1.3420	1.3436	1.3437	1.2365	1.2532
66	1.1742	1.3555	1.3570	1.2430	1.2617
67	1.0065	1.3645	1.3673	1.2472	1.2675
68	0.8387	1.0000	1.0000	1.0000	1.0000
69	0.6710	1.0000	1.0000	1.0000	1.0000
70	0.5032	1.0000	1.0000	1.0000	1.0000
71	0.3355	1.0000	1.0000	1.0000	1.0000
72	0.1678	1.0000	1.0000	1.0000	1.0000
73	0.0000	1.0000	1.0000	1.0000	1.0000

* Distance from bottom of active core (feet)

Note: Surveillance exclusion zone is 8% top, 8% bottom.

Table 2
Base Load W(Z) Function
Millstone Unit 3 - Cycle 18

		Burnup Step (MWD/MTU)			
Mesh No.	Height*	150	3000	10000	18000
1	12.0778	1.0000	1.0000	1.0000	1.0000
2	11.9100	1.0000	1.0000	1.0000	1.0000
3	11.7423	1.0000	1.0000	1.0000	1.0000
4	11.5745	1.0000	1.0000	1.0000	1.0000
5	11.4068	1.0000	1.0000	1.0000	1.0000
6	11.2390	1.0000	1.0000	1.0000	1.0000
7	11.0713	1.1831	1.2070	1.2291	1.1767
8	10.9035	1.1783	1.2077	1.2302	1.1702
9	10.7358	1.1708	1.2009	1.2281	1.1645
10	10.5680	1.1623	1.1942	1.2227	1.1602
11	10.4003	1.1539	1.1887	1.2154	1.1574
12	10.2325	1.1489	1.1819	1.2078	1.1574
13	10.0648	1.1473	1.1736	1.2029	1.1580
14	9.8971	1.1457	1.1651	1.1967	1.1574
15	9.7293	1.1418	1.1575	1.1864	1.1549
16	9.5616	1.1383	1.1502	1.1761	1.1525
17	9.3938	1.1330	1.1417	1.1642	1.1488
18	9.2261	1.1245	1.1315	1.1485	1.1425
19	9.0583	1.1185	1.1225	1.1330	1.1337
20	8.8906	1.1164	1.1124	1.1183	1.1232
21	8.7228	1.1163	1.1058	1.1127	1.1239
22	8.5551	1.1171	1.1060	1.1163	1.1324
23	8.3873	1.1186	1.1071	1.1201	1.1416
24	8.2196	1.1205	1.1082	1.1241	1.1493
25	8.0518	1.1248	1.1120	1.1273	1.1562
26	7.8841	1.1296	1.1169	1.1298	1.1624
27	7.7163	1.1337	1.1207	1.1314	1.1674
28	7.5486	1.1367	1.1234	1.1321	1.1712
29	7.3809	1.1385	1.1251	1.1320	1.1739
30	7.2131	1.1393	1.1259	1.1310	1.1755
31	7.0454	1.1391	1.1257	1.1294	1.1759
32	6.8776	1.1378	1.1247	1.1267	1.1752
33	6.7099	1.1357	1.1228	1.1233	1.1733
34	6.5421	1.1329	1.1203	1.1212	1.1709
35	6.3744	1.1296	1.1173	1.1196	1.1687
36	6.2066	1.1254	1.1136	1.1172	1.1666
37	6.0389	1.1203	1.1088	1.1143	1.1636
38	5.8711	1.1154	1.1044	1.1102	1.1593

* Distance from bottom of active core (feet)

Note: Surveillance exclusion zone is 8% top, 8% bottom.

Table 2 (Continued)
Base Load W(Z) Function
Millstone Unit 3 - Cycle 18

		Burnup Step (MWD/MTU)			
Mesh No.	Height*	150	3000	10000	18000
39	5.7034	1.1123	1.1015	1.1056	1.1541
40	5.5356	1.1105	1.0990	1.1037	1.1504
41	5.3679	1.1095	1.0972	1.1034	1.1480
42	5.2001	1.1083	1.0964	1.1022	1.1456
43	5.0324	1.1066	1.0954	1.1006	1.1423
44	4.8647	1.1046	1.0939	1.0987	1.1382
45	4.6969	1.1022	1.0922	1.0964	1.1334
46	4.5292	1.0995	1.0903	1.0940	1.1281
47	4.3614	1.0966	1.0881	1.0913	1.1221
48	4.1937	1.0934	1.0858	1.0885	1.1157
49	4.0259	1.0900	1.0845	1.0856	1.1090
50	3.8582	1.0864	1.0843	1.0828	1.1019
51	3.6904	1.0828	1.0848	1.0826	1.0947
52	3.5227	1.0799	1.0853	1.0840	1.0878
53	3.3549	1.0780	1.0852	1.0854	1.0811
54	3.1872	1.0777	1.0852	1.0867	1.0797
55	3.0194	1.0826	1.0893	1.0877	1.0809
56	2.8517	1.0928	1.0998	1.0903	1.0862
57	2.6839	1.1040	1.1145	1.0982	1.0954
58	2.5162	1.1156	1.1296	1.1097	1.1049
59	2.3485	1.1274	1.1447	1.1210	1.1142
60	2.1807	1.1392	1.1600	1.1325	1.1237
61	2.0130	1.1510	1.1752	1.1439	1.1333
62	1.8452	1.1625	1.1901	1.1551	1.1426
63	1.6775	1.1736	1.2044	1.1657	1.1516
64	1.5097	1.1840	1.2177	1.1756	1.1601
65	1.3420	1.1935	1.2300	1.1847	1.1679
66	1.1742	1.2016	1.2407	1.1923	1.1745
67	1.0065	1.2076	1.2488	1.1976	1.1789
68	0.8387	1.0000	1.0000	1.0000	1.0000
69	0.6710	1.0000	1.0000	1.0000	1.0000
70	0.5032	1.0000	1.0000	1.0000	1.0000
71	0.3355	1.0000	1.0000	1.0000	1.0000
72	0.1678	1.0000	1.0000	1.0000	1.0000
73	0.0000	1.0000	1.0000	1.0000	1.0000

* Distance from bottom of active core (feet)

Note: Surveillance exclusion zone is 8% top, 8% bottom.

Table 3
Part Power (74% RTP, 150 MWD/MTU) RAOC W(Z) Function
Millstone Unit 3 - Cycle 18

Mesh No	Height (ft)*	W(z)
1	12.0778	1.0000
2	11.9100	1.0000
3	11.7423	1.0000
4	11.5745	1.0000
5	11.4068	1.0000
6	11.2390	1.0000
7	11.0713	1.2272
8	10.9035	1.2102
9	10.7358	1.1918
10	10.5680	1.1742
11	10.4003	1.1566
12	10.2325	1.1424
13	10.0648	1.1307
14	9.8970	1.1190
15	9.7293	1.1066
16	9.5616	1.0937
17	9.3938	1.0808
18	9.2261	1.0669
19	9.0583	1.0498
20	8.8906	1.0419
21	8.7228	1.0482
22	8.5551	1.0584
23	8.3873	1.0706
24	8.2196	1.0802
25	8.0518	1.0869
26	7.8841	1.0928
27	7.7163	1.0977
28	7.5486	1.1016
29	7.3808	1.1048
30	7.2131	1.1072
31	7.0454	1.1084
32	6.8776	1.1097
33	6.7099	1.1120
34	6.5421	1.1140
35	6.3744	1.1154
36	6.2066	1.1161
37	6.0389	1.1157
38	5.8711	1.1165

* Distance from bottom of active core (feet)

Note: Surveillance exclusion zone is 8% top, 8% bottom.

Table 3 (Continued)
Part Power (74% RTP, 150 MWD/MTU) RAOC W(Z) Function
Millstone Unit 3 - Cycle 18

Mesh No	Height (ft)*	W(z)
39	5.7034	1.1207
40	5.5356	1.1301
41	5.3679	1.1433
42	5.2001	1.1548
43	5.0324	1.1657
44	4.8646	1.1765
45	4.6969	1.1868
46	4.5292	1.1965
47	4.3614	1.2061
48	4.1937	1.2151
49	4.0259	1.2237
50	3.8582	1.2320
51	3.6904	1.2398
52	3.5227	1.2481
53	3.3549	1.2583
54	3.1872	1.2711
55	3.0194	1.2841
56	2.8517	1.2955
57	2.6839	1.3067
58	2.5162	1.3263
59	2.3485	1.3508
60	2.1807	1.3740
61	2.0130	1.3967
62	1.8452	1.4196
63	1.6775	1.4416
64	1.5097	1.4627
65	1.3420	1.4827
66	1.1742	1.5012
67	1.0065	1.5173
68	0.8387	1.0000
69	0.6710	1.0000
70	0.5032	1.0000
71	0.3355	1.0000
72	0.1677	1.0000
73	0.0000	1.0000

* Distance from bottom of active core (feet)

Note: Surveillance exclusion zone is 8% top, 8% bottom.

Table 4
Burnup Penalty for Incore
Millstone Unit 3 - Cycle 18 *

Burnup (MWD/MTU)	Penalty
150	1.020
471	1.027
632	1.031
793	1.033
954	1.033
1450	1.020
8350	1.020
8669	1.024
8829	1.027
8990	1.025
9151	1.024
9500	1.020

*Note: A Penalty of 1.02 shall be used outside of the burnup range shown in Table 4.

3.0 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.

3.1 WCAP-9272-P-A, "Westinghouse Reload Safety Evaluation Methodology," July 1985 (Westinghouse Proprietary). (Methodology for Specifications 2.1.1.1—Departure from Nucleate Boiling Ratio, 2.1.1.2—Peak Fuel Centerline Temperature, 3.1.1.3—Moderator Temperature Coefficient, 3.1.3.5—Shutdown Bank Insertion Limit, 3.1.3.6—Control Bank Insertion Limits, 3.2.1—AXIAL FLUX DIFFERENCE, 3.2.2—Heat Flux Hot Channel Factor, 3.2.3—Nuclear Enthalpy Rise Hot Channel Factor, 3.1.1.1.1, 3.1.1.1.2, 3.1.1.2—SHUTDOWN MARGIN, 3.9.1.1—Boron Concentration.)

3.2 WCAP-10216-P-A-R1A, "Relaxation of Constant Axial Offset Control FQ Surveillance Technical Specification," Rev. 1, February 1994 (Westinghouse Proprietary). (Methodology for Specifications 3.2.1—AXIAL FLUX DIFFERENCE [Relaxed Axial Offset Control] and 3.2.2—Heat Flux Hot Channel Factor [W(Z) surveillance requirements for FQ Methodology].)

3.3 WCAP-12945-P-A, Volume 1 (Revision 2) and Volumes 2 through 5 (Revision 1), "Code Qualification Document for Best Estimate LOCA Analysis," March 1998 (Westinghouse Proprietary. (Methodology for Specifications 3.2.2—Heat Flux Hot Channel Factor.)

3.4 WCAP-16009-P-A, "Realistic Large-Break LOCA Evaluation Methodology Using the Automated Statistical Treatment of Uncertainty Method (ASTRUM)," January 2005 (Westinghouse Proprietary). (Methodology for Specifications 3.2.2—Heat Flux Hot Channel Factor.)

3.5 WCAP-11946, "Safety Evaluation Supporting a More Negative EOL Moderator Temperature Coefficient Technical Specification for the Millstone Nuclear Power Station Unit 3," September 1988 (Westinghouse Proprietary).

3.6 WCAP-10054-P-A, "Westinghouse Small Break ECCS Evaluation Model Using the NOTRUMP Code," August 1985 (Westinghouse Proprietary). (Methodology for Specification 3.2.2—Heat Flux Hot Channel Factor.)

3.7 WCAP-10079-P-A, "NOTRUMP - A Nodal Transient Small Break and General Network Code," August 1985 (Westinghouse Proprietary). (Methodology for Specification 3.2.2-Heat Flux Hot Channel Factor.)

3.8 WCAP-12610-P-A, "VANTAGE+ Fuel Assembly Report," April 1995 (Westinghouse Proprietary). (Methodology for Specification 3.2.2—Heat Flux Hot Channel Factor.)

3.9 WCAP-8301, "LOCTA-IV Program: Loss-of Coolant Transient Analysis," June 1974 (Westinghouse Proprietary).

3.10 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 (Westinghouse Proprietary).

3.11 WCAP-8745-P-A, "Design Bases for the Thermal Overpower ΔT and Thermal Overtemperature ΔT Trip Functions," September 1986 (Westinghouse Proprietary). (Methodology for Specifications 2.1.1 and 2.2.1.)

3.12 WCAP-12610-P-A & CENPD-404-P-A, Addendum 1-A, "Optimized ZIRLO™," July 2006 (Westinghouse Proprietary). (Methodology for Specification 3.2.2—Heat Flux Hot Channel Factor.)