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DOMINION ENERGY SOUTH CAROLINA, INC.
VIRGIL C. SUMMER NUCLEAR STATION UNIT 1
CORE OPERATING LIMITS REPORT (COLR) FOR CYCLE 26

In accordance with Section 6.9.1.11 of the Virgil C. Summer Nuclear Station Technical Specifications, Dominion Energy South Carolina, Inc., acting for itself and as an agent for South Carolina Public Service Authority, hereby submits the Core Operating Limits Report for Cycle 26.

Should you have any questions, please call Michael S. Moore at (803) 345-4752.

Sincerely,

Robin R. Haselden
General Manager, Organization Effectiveness
V. C. Summer Nuclear Station

Enclosure: Core Operating Limits Report for Cycle 26

Commitments made by this letter: None

w/o enclosure unless noted

cc: G. J. Lindamood – Santee Cooper
L. Dudes – NRC
S. A. Williams – NRC
NRC Resident Inspector

w/o enclosure unless noted

bc: R. R. Haselden – VCS
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James Roth – IN2SE
Kathryn Barret – IN2SE
W. S. Blair – RS
File: RR 5000
PRSF: SN-20-193 (w/ enclosure)

Concurrences:

See Correspondence Routing and Approval CHOP Sheet

Action Plan: None

Changes to the UFSAR, USAR, QA Topical Report, or ISFSI FSAR: None

DOMINION ENERGY SOUTH CAROLINA

VIRGIL C. SUMMER NUCLEAR STATION

UNIT 1

CORE OPERATING LIMITS REPORT

FOR

CYCLE 26

REVISION 0

APRIL 2020

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1.0 Core Operating Limits Report

This Core Operating Limits Report (COLR) for V. C. Summer Station Cycle 26 has been prepared in accordance with the requirements of Technical Specification 6.9.1.11.

The Technical Specifications affected by this report are listed below:

3.1.1.3	Moderator Temperature Coefficient
3.1.3.5	Shutdown Rod Insertion Limits
3.1.3.6	Control Rod Insertion Limits
3.2.1	Axial Flux Difference
3.2.2	Heat Flux Hot Channel Factor – $F_Q(z)$
3.2.3	RCS Flow Rate and Nuclear Enthalpy Rise Hot Channel Factor
3.3.3.11	Power Distribution Monitoring System (PDMS)

2.0 Operating Limits

The cycle-specific parameter limits for the specifications listed in Section 1.0 are presented in the subsections which follow. These limits have been developed using the NRC-approved methodologies specified in Technical Specification 6.9.1.11.

2.1 Moderator Temperature Coefficient (Specification 3.1.1.3):

2.1.1 The Moderator Temperature Coefficient (MTC) limits are:
The BOL/ARO-MTC shall be less positive than the limits shown in Figure 1.
The EOL/ARO/RTP-MTC shall be less negative than -4.8×10^{-4} $\Delta k/k/°F$ (-48 pcm/°F).
where: BOL stands for Beginning of Cycle Life
ARO stands for All Rods Out
RTP stands for RATED THERMAL POWER
EOL stands for End of Cycle Life

2.1.2 The MTC Surveillance limit is:
The 300 ppm/ARO/RTP-MTC should be less negative than or equal to -4.1×10^{-4} $\Delta k/k/°F$ (-41 pcm/°F).

2.1.3 The Revised Predicted near-EOL 300 ppm MTC shall be calculated using the following algorithm from Reference 2:

Revised Predicted MTC = Predicted MTC + AFD Correction*+ Predictive Correction**

*AFD Correction is 0.05 pcm/°F/%ΔAFD.

**Predictive Correction is -3 pcm/°F.

If the Revised Predicted MTC is less negative than the SR 4.1.1.3b limit of -4.1×10^{-4} $\Delta k/k/°F$, and all of the benchmark data contained in the surveillance procedure are met, then an MTC measurement in accordance with SR 4.1.1.3b is not required.

2.2 Shutdown Rod Insertion Limits (Specification 3.1.3.5):

The shutdown rods shall be withdrawn to at least 226 steps. The fully withdrawn position is 226 steps.

2.3 Control Rod Insertion Limits (Specification 3.1.3.6):

Control Bank A and B rods shall be withdrawn to at least 226 steps. Control Bank C and D Rod Insertion Limits are specified by Figure 2. Control rod overlap is 98 steps. The fully withdrawn position is 226 steps.

2.4 Axial Flux Difference (Specification 3.2.1):

2.4.1 The Axial Flux Difference (AFD) Limits for Relaxed Axial Offset Control (RAOC) operation for Cycle 26 are shown in Figure 3.

2.4.2 The Axial Flux Difference (AFD) target band during base load operations for Cycle 26 is: BOL - EOL (0 – 23,000 MWD/MTU): ±5% about a measured target value. The base load band will remain inside the RAOC band.

2.4.3 The Axial Flux Difference (AFD) Limits for Alternate Relaxed Axial Offset Control (RAOC) operation for Cycle 26 are shown in Figure 5.

2.4.4 The minimum allowable power level for base load operation, APL^{ND}, is 75% of RATED THERMAL POWER.

2.5 Heat Flux Hot Channel Factor - $F_Q(z)$ (Specification 3.2.2):

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

$$F_Q(Z) \le \frac{F_Q^{RTP}}{0.5} \times K(Z) \qquad \text{for } P \le 0.5 \qquad \text{where: } P = \frac{\text{Thermal Power}}{\text{Rated Thermal Power}}$$

2.5.1 $F_Q^{RTP} = 2.45$

2.5.2 K(z) is provided in Figure 4.

2.5.3 Elevation dependent W(z) values for RAOC operation at 150, 3000, 5000, 8000, 10000, 14000 and 20000 MWD/MTU are shown in Tables 1 through 2, respectively. This information is sufficient to determine W(z) versus core height in the range of 0 MWD/MTU to EOL burnup through the use of three point interpolation. Table 3 shows FQ margin decreases for RAOC operation that are greater than 2% per 31 Effective Full Power Days (EFPD). These values shall be used to increase $F_Q^M(z)$ as per Surveillance Requirement 4.2.2.2.e. A 2% penalty factor shall be used at all burnups that are outside the range of Table 3.

2.5.4 Elevation dependent W(z) values for Alternate RAOC operation at 150, 3000, 5000, 8000, 10000, 14000 and 20000 MWD/MTU are shown in Tables 4 through 5, respectively. This information is sufficient to determine W(z) versus core height in the range of 0 MWD/MTU to EOL burnup through the use of three point interpolation. Table 6 shows FQ margin decreases for RAOC operation that are greater than 2% per 31 Effective Full Power Days (EFPD). These values shall be used to increase $F_Q^M(z)$ as per Surveillance Requirement 4.2.2.2.e. A 2% penalty factor shall be used at all burnups that are outside the range of Table 6.

2.5.5 Elevation dependent $W(z)_{BL}$ values for Baseload operation between 75 and 100% of rated thermal power with the Section 2.4.2 specified target band about a measured target value at 150, 3000, 5000, 8000, 10000, 14000 and 20000 MWD/MTU are shown in Tables 7 through 8, respectively. This information is sufficient to determine $W(z)_{BL}$ versus core height for burnups in the range of 0 MWD/MTU to EOL burnup through the use of three point interpolation. Table 9 shows FQ margin decreases for base load operation that are greater than 2% per 31 Effective Full Power Days (EFPD). These values shall be used to increase $F_Q^M(z)$ as per Surveillance Requirement 4.2.2.4.e. A 2% penalty factor shall be used at all burnups that are outside the range of Table 9.

2.6 RCS Flow Rate and Nuclear Enthalpy Rise Hot Channel Factor - $F_{\Delta H}^N$ (Specification 3.2.3):

$$R = \frac{F_{\Delta H}^N}{F_{\Delta H}^{RTP} \times \left(1 + PF_{\Delta H}^N \times (1 - P)\right)} \qquad \text{where: } P = \frac{\text{Thermal Power}}{\text{Rated Thermal Power}}$$

2.6.1 $F_{\Delta H}^{RTP} = 1.62$

2.6.2 $PF_{\Delta H} = 0.3$

2.6.3 The Acceptable Operation Region from the combination of Reactor Coolant System total flow and R is provided in Figure 6.

2.7 Power Distribution Measurement Uncertainty (Specifications 3.2.2 and 3.2.3):

If the Power Distribution Monitoring System (PDMS) is OPERABLE, as defined in Technical Specification 3.3.3.11, 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 1 or 4.0, whichever is larger.

If the Power Distribution Monitoring System is OPERABLE, as defined in Technical Specification 3.3.3.11, the uncertainty, U_{FQ}, to be applied to the Heat Flux Hot Channel Factor $F_Q(z)$ shall be calculated by the following formula:

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

where: U_Q = Uncertainty for $F_Q(z)$ = 5.0 when confirming $F_Q(z)$ for RAOC or Base Load operation, or as defined in equation (5-19) in Reference 1 for all other purposes.

U_e = Engineering uncertainty factor.

= 1.03

If the Power Distribution Monitoring System is INOPERABLE, as defined in Technical Specification 3.3.3.11, 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:

$$U_{F\Delta H} = U_{F\Delta Hm}$$

where: $U_{F\Delta Hm}$ = Base $F_{\Delta H}$ measurement uncertainty.

= 1.04

If the Power Distribution Monitoring System is INOPERABLE, as defined in Technical Specification 3.3.3.11, the uncertainty, U_{FQ}, to be applied to the Heat Flux Hot Channel Factor $F_Q(z)$ shall be calculated by the following formula:

$$U_{FQ} = U_{qu} \cdot U_e$$

where: U_{qu} = Base F_Q measurement uncertainty.

= 1.05

U_e = Engineering uncertainty factor.

= 1.03

3.0 References

The analytical methods used to determine the core operating limits shall be those previously reviewed and approved by the NRC. These methods are listed in Technical Specification Section 6.9.1.11.

1) WCAP-12472-P-A, "BEACON Core Monitoring and Operations Support System," August, 1994, (W Proprietary)
WCAP-12472-P-A, Addendum 1-A, "BEACON Core Monitoring and Operations Support System," January 2000, (W Proprietary).

2) WCAP-13749-P-A, "Safety Evaluation Supporting the Conditional Exemption of the Most Negative EOL Moderator Temperature Coefficient," March 1997, (W Proprietary).

Figure 1. Moderator Temperature Coefficient Versus Power Level
V. C. Summer – Cycle 26

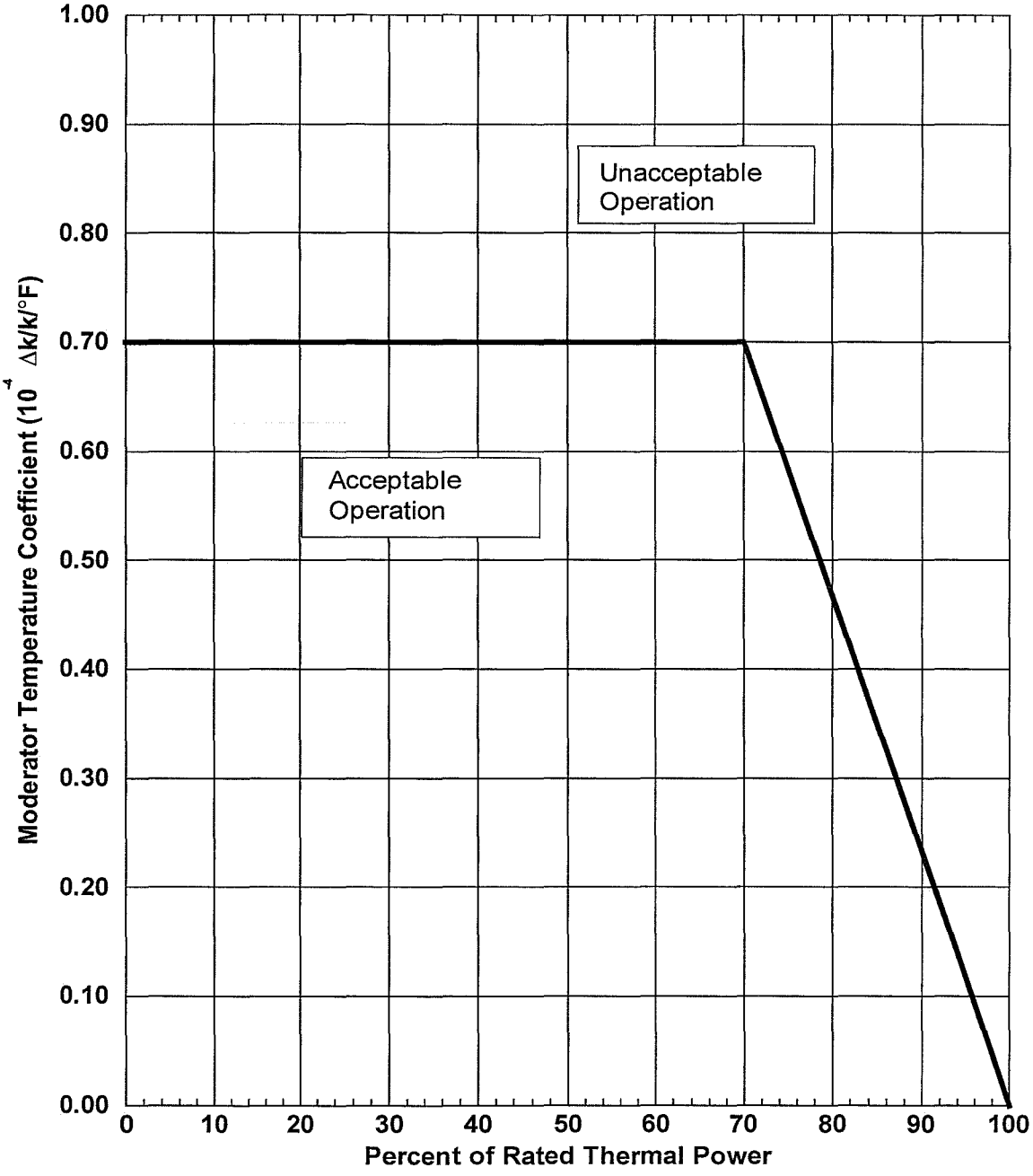


Figure 2. Rod Group Insertion Limits Versus Thermal Power for Three Loop Operation V. C. Summer - Cycle 26

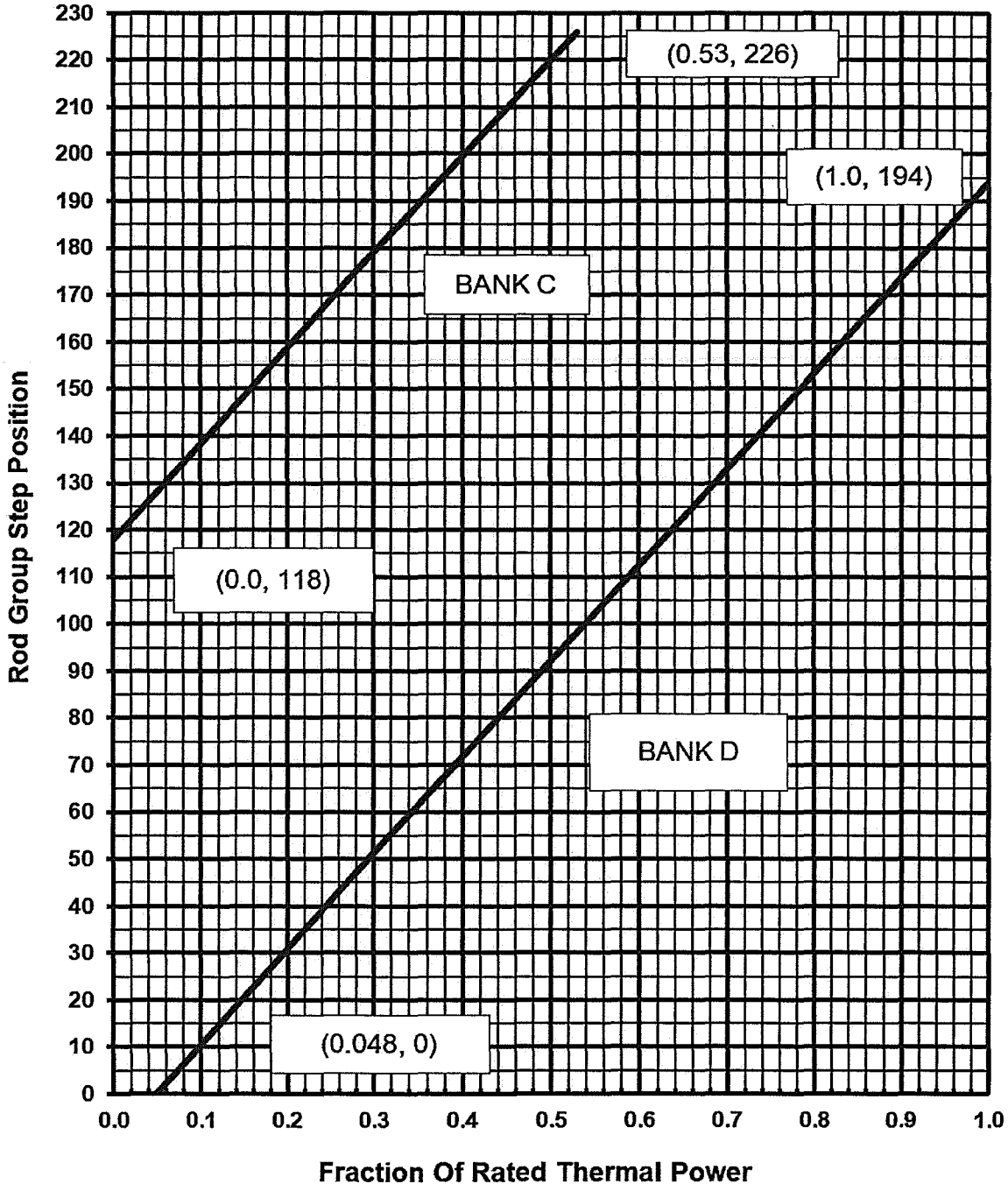


Figure 3. Axial Flux Difference Limits as a Function of Rated Thermal Power V. C. Summer – Cycle 26

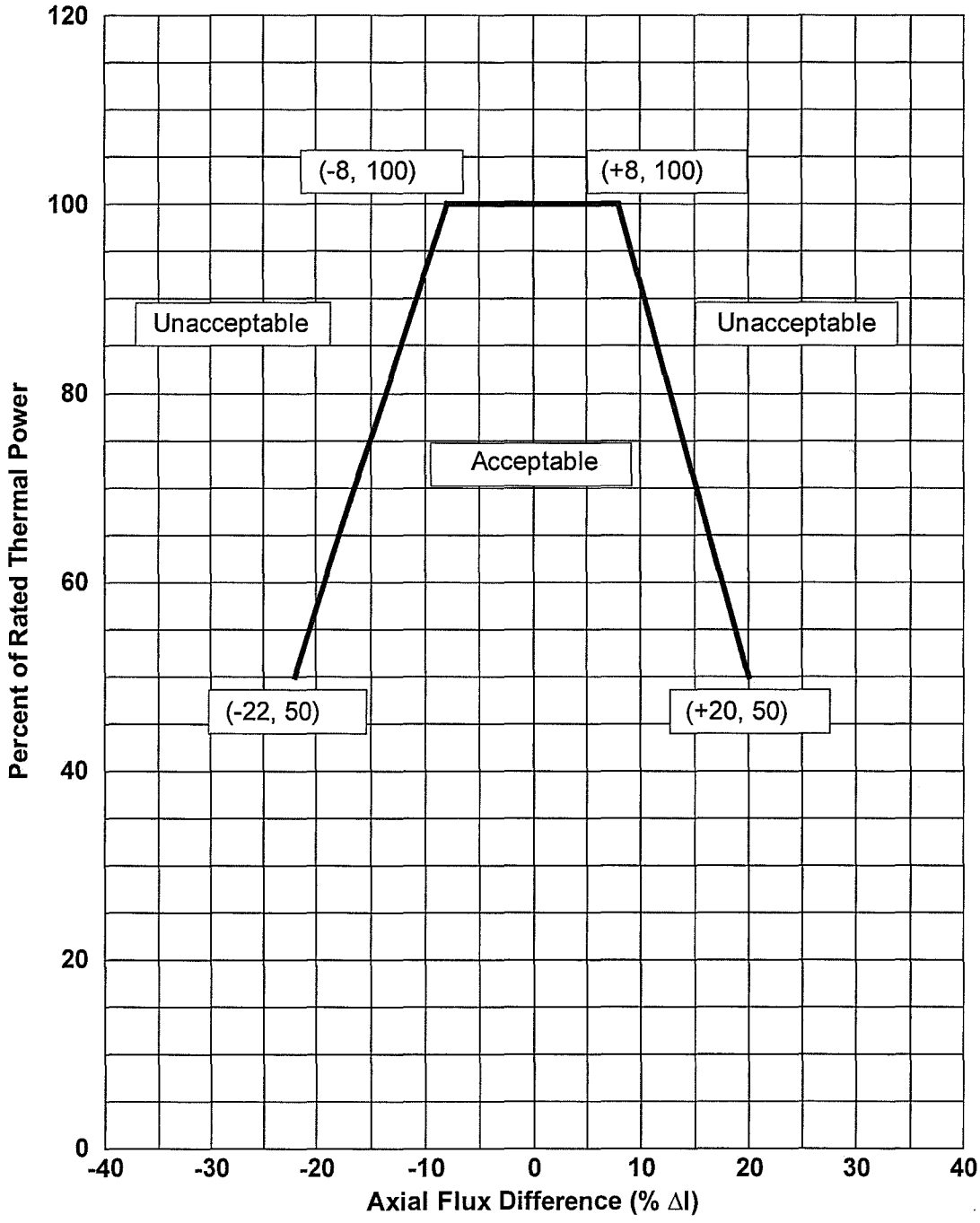


Figure 4. K(z) - Normalized $F_Q(z)$ as a Function of Core Height
V. C. Summer – Cycle 26

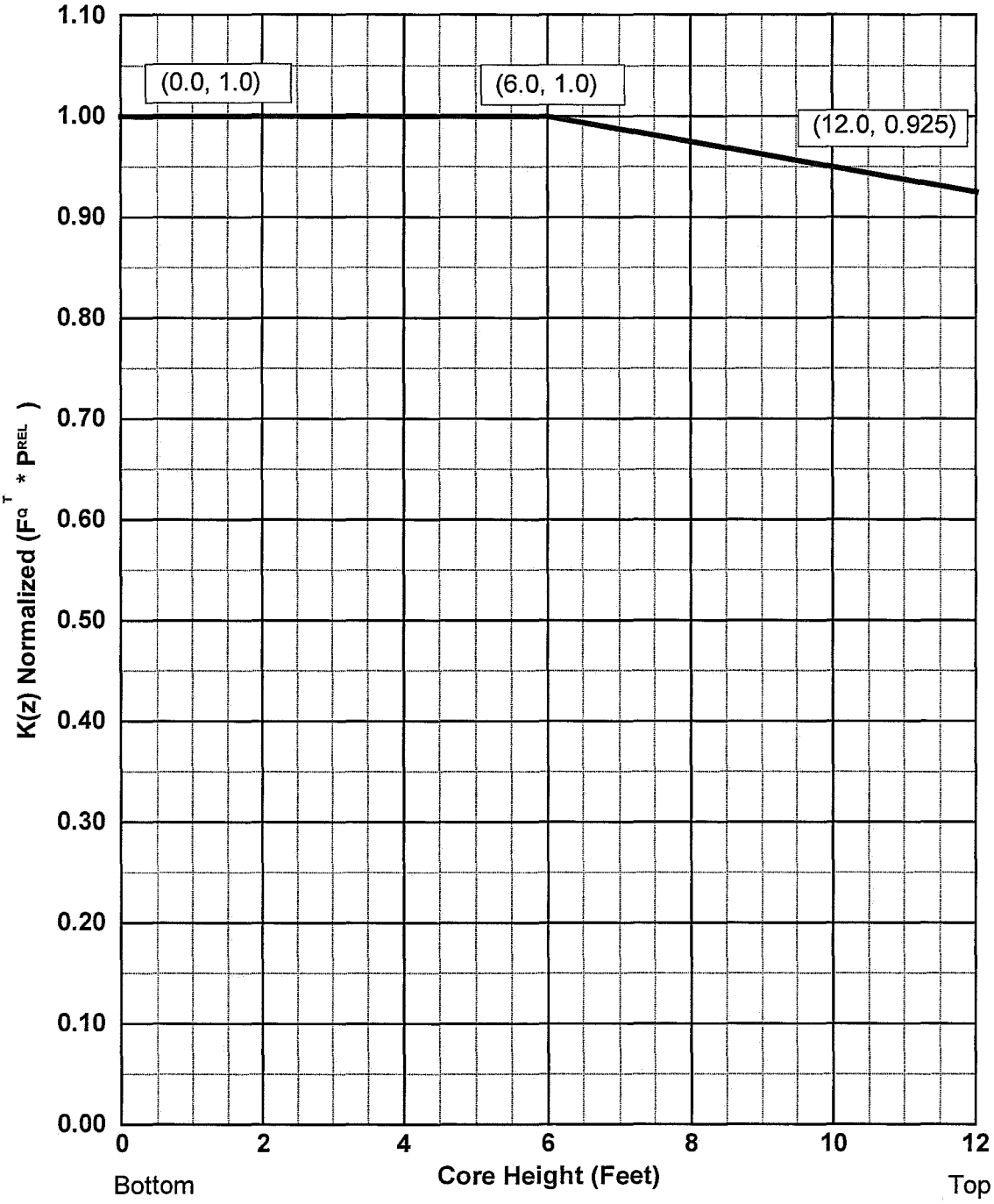


Figure 5. Axial Flux Difference Limit as a Function of Rated Thermal Power (Alternate RAOC)
V. C. Summer - Cycle 26

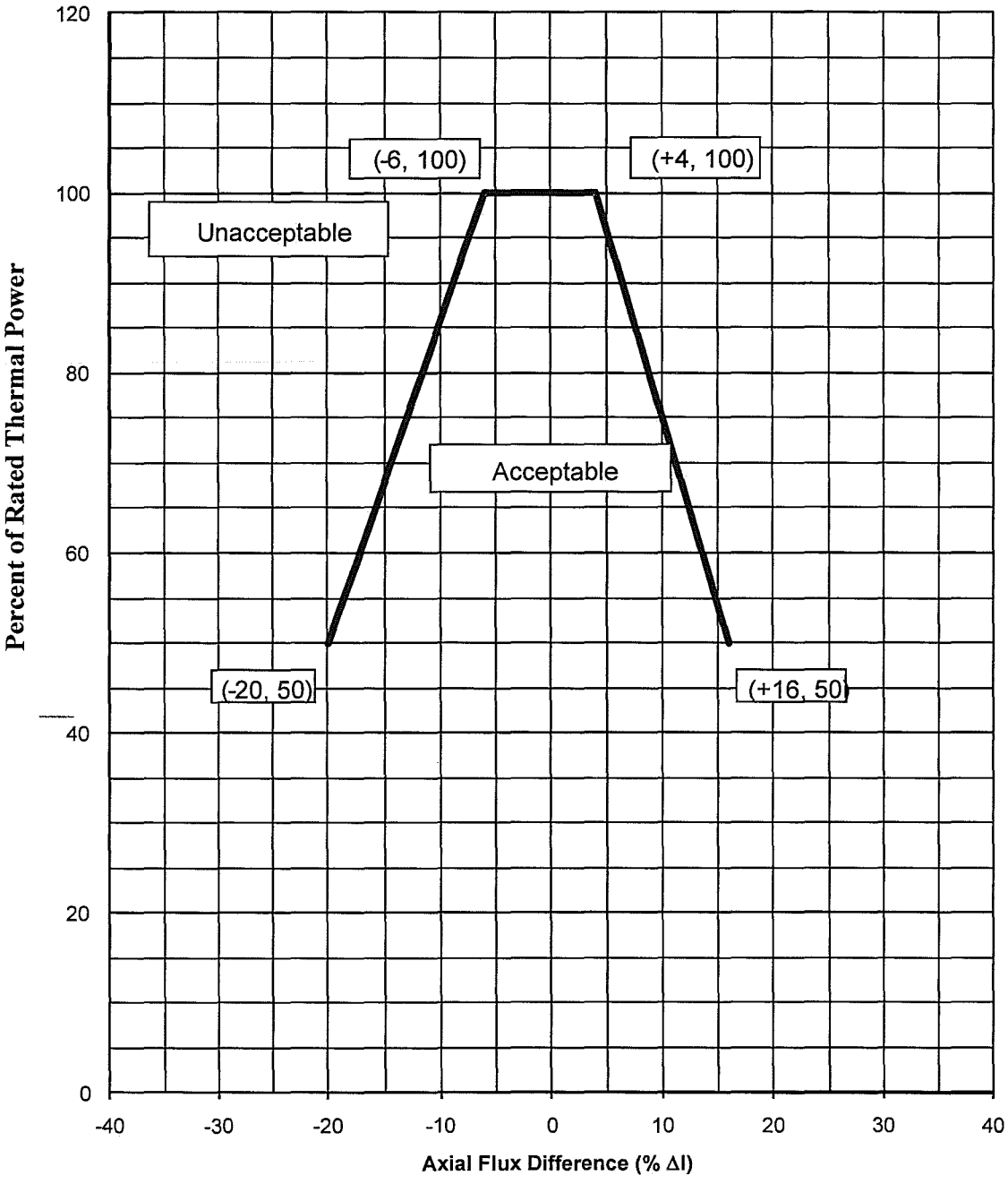


Table 1. RAOC W(z) at 150, 3000, 5000, 8000 MWD/MTU
V. C. Summer – Cycle 26

Core Height (ft)	W(z) 150 MWd/ MTU	W(z) 3000 MWd/ MTU	W(z) 5000 MWd/ MTU	W(z) 8000 MWd/ MTU	Core Height (ft)	W(z) 150 MWd/ MTU	W(z) 3000 MWd/ MTU	W(z) 5000 MWd/ MTU	W(z) 8000 MWd/ MTU
0.000	1.273	1.434	1.369	1.297	6.177	1.141	1.108	1.102	1.109
0.141	1.275	1.435	1.370	1.298	6.317	1.146	1.112	1.107	1.117
0.281	1.278	1.436	1.371	1.299	6.458	1.151	1.115	1.113	1.126
0.422	1.287	1.442	1.376	1.305	6.597	1.155	1.118	1.119	1.134
0.561	1.302	1.451	1.385	1.315	6.738	1.158	1.121	1.124	1.141
0.702	1.304	1.449	1.383	1.315	6.878	1.161	1.123	1.129	1.148
0.842	1.298	1.440	1.375	1.308	7.019	1.164	1.124	1.133	1.155
0.983	1.292	1.429	1.365	1.300	7.159	1.166	1.125	1.137	1.161
1.123	1.284	1.416	1.353	1.290	7.300	1.167	1.126	1.141	1.167
1.264	1.275	1.401	1.339	1.279	7.439	1.168	1.127	1.144	1.172
1.403	1.265	1.385	1.325	1.266	7.580	1.168	1.126	1.146	1.175
1.544	1.254	1.368	1.310	1.252	7.720	1.167	1.125	1.147	1.178
1.684	1.242	1.350	1.295	1.238	7.861	1.166	1.124	1.148	1.181
1.825	1.230	1.330	1.280	1.222	8.001	1.163	1.121	1.149	1.183
1.965	1.217	1.310	1.263	1.206	8.142	1.161	1.119	1.149	1.184
2.106	1.204	1.290	1.247	1.190	8.282	1.157	1.116	1.148	1.185
2.246	1.191	1.269	1.230	1.173	8.422	1.153	1.112	1.147	1.185
2.386	1.178	1.248	1.213	1.157	8.563	1.147	1.108	1.145	1.184
2.527	1.165	1.228	1.196	1.141	8.703	1.143	1.104	1.143	1.182
2.667	1.151	1.209	1.180	1.126	8.844	1.143	1.107	1.142	1.183
2.808	1.142	1.188	1.163	1.110	8.984	1.145	1.112	1.141	1.184
2.948	1.140	1.171	1.149	1.099	9.124	1.145	1.117	1.139	1.185
3.088	1.137	1.166	1.144	1.095	9.264	1.144	1.121	1.135	1.183
3.228	1.134	1.163	1.141	1.094	9.405	1.142	1.126	1.138	1.181
3.369	1.131	1.158	1.138	1.093	9.545	1.139	1.130	1.146	1.183
3.509	1.127	1.153	1.134	1.091	9.686	1.136	1.134	1.153	1.193
3.650	1.124	1.149	1.130	1.090	9.826	1.131	1.137	1.160	1.201
3.790	1.119	1.143	1.126	1.089	9.966	1.127	1.139	1.167	1.209
3.930	1.115	1.138	1.122	1.089	10.106	1.128	1.140	1.173	1.216
4.070	1.114	1.133	1.117	1.089	10.247	1.131	1.140	1.179	1.223
4.211	1.114	1.127	1.112	1.088	10.388	1.134	1.142	1.184	1.229
4.352	1.113	1.121	1.108	1.088	10.528	1.136	1.146	1.188	1.234
4.492	1.112	1.115	1.104	1.087	10.669	1.138	1.151	1.192	1.238
4.633	1.110	1.111	1.101	1.087	10.808	1.140	1.154	1.194	1.241
4.772	1.109	1.108	1.099	1.086	10.949	1.141	1.157	1.194	1.241
4.913	1.107	1.104	1.097	1.085	11.089	1.142	1.159	1.195	1.243
5.053	1.107	1.101	1.094	1.084	11.230	1.142	1.160	1.195	1.243
5.194	1.107	1.097	1.091	1.083	11.370	1.142	1.159	1.190	1.237
5.334	1.107	1.094	1.088	1.082	11.511	1.135	1.154	1.177	1.226
5.475	1.110	1.093	1.086	1.081	11.650	1.118	1.139	1.159	1.211
5.614	1.117	1.093	1.088	1.082	11.791	1.103	1.125	1.145	1.196
5.755	1.124	1.096	1.092	1.085	11.931	1.092	1.115	1.135	1.186
5.895	1.130	1.100	1.095	1.092	12.072	1.081	1.104	1.125	1.175
6.036	1.136	1.104	1.098	1.100					

Table 2. RAOC W(z) at 10000, 14000, 20000 MWD/MTU
V. C. Summer – Cycle 26

Core Height (ft)	W(z) 10000 MWd/ MTU	W(z) 14000 MWd/ MTU	W(z) 20000 MWd/ MTU	Core Height (ft)	W(z) 10000 MWd/ MTU	W(z) 14000 MWd/ MTU	W(z) 20000 MWd/ MTU
0.000	1.258	1.194	1.206	6.177	1.119	1.128	1.194
0.141	1.260	1.197	1.207	6.317	1.128	1.135	1.202
0.281	1.261	1.199	1.209	6.458	1.138	1.142	1.209
0.422	1.268	1.207	1.217	6.597	1.147	1.148	1.216
0.561	1.279	1.221	1.232	6.738	1.155	1.154	1.221
0.702	1.279	1.224	1.235	6.878	1.163	1.159	1.226
0.842	1.274	1.221	1.232	7.019	1.170	1.164	1.230
0.983	1.268	1.217	1.227	7.159	1.177	1.168	1.232
1.123	1.259	1.212	1.221	7.300	1.184	1.172	1.235
1.264	1.249	1.205	1.213	7.439	1.189	1.175	1.236
1.403	1.238	1.197	1.205	7.580	1.193	1.176	1.234
1.544	1.226	1.188	1.196	7.720	1.197	1.177	1.232
1.684	1.213	1.179	1.186	7.861	1.200	1.177	1.230
1.825	1.199	1.169	1.176	8.001	1.202	1.177	1.226
1.965	1.185	1.159	1.165	8.142	1.203	1.176	1.222
2.106	1.171	1.149	1.155	8.282	1.204	1.174	1.216
2.246	1.156	1.138	1.144	8.422	1.204	1.172	1.210
2.386	1.141	1.127	1.132	8.563	1.203	1.169	1.203
2.527	1.127	1.117	1.120	8.703	1.202	1.167	1.195
2.667	1.113	1.106	1.109	8.844	1.199	1.169	1.187
2.808	1.100	1.096	1.098	8.984	1.196	1.172	1.178
2.948	1.090	1.089	1.089	9.124	1.192	1.176	1.175
3.088	1.088	1.089	1.091	9.264	1.185	1.179	1.175
3.228	1.087	1.090	1.096	9.405	1.189	1.182	1.175
3.369	1.085	1.090	1.100	9.545	1.198	1.187	1.176
3.509	1.084	1.090	1.104	9.686	1.205	1.192	1.181
3.650	1.083	1.091	1.108	9.826	1.213	1.196	1.187
3.790	1.081	1.091	1.112	9.966	1.220	1.200	1.193
3.930	1.080	1.091	1.116	10.106	1.227	1.204	1.199
4.070	1.078	1.091	1.118	10.247	1.233	1.207	1.204
4.211	1.076	1.093	1.120	10.388	1.239	1.213	1.209
4.352	1.074	1.096	1.124	10.528	1.243	1.219	1.213
4.492	1.071	1.098	1.130	10.669	1.246	1.224	1.217
4.633	1.072	1.100	1.136	10.808	1.249	1.229	1.222
4.772	1.073	1.102	1.141	10.949	1.249	1.231	1.223
4.913	1.075	1.104	1.145	11.089	1.250	1.233	1.224
5.053	1.076	1.105	1.149	11.230	1.249	1.233	1.223
5.194	1.078	1.107	1.153	11.370	1.244	1.232	1.221
5.334	1.079	1.108	1.156	11.511	1.234	1.225	1.212
5.475	1.080	1.108	1.158	11.650	1.220	1.208	1.193
5.614	1.082	1.108	1.161	11.791	1.206	1.193	1.176
5.755	1.089	1.110	1.166	11.931	1.195	1.182	1.164
5.895	1.099	1.114	1.175	12.072	1.184	1.171	1.152
6.036	1.109	1.120	1.185				

Table 3. RAOC FQ Margin Decrease in Excess of 2% Per 31 EFPD – Cycle 26

Cycle Burnup (MWD/MTU)	Maximum Decrease in FQ Margin
1009	1.0200
1224	1.0261
1439	1.0353
1654	1.0485
1868	1.0539
2083	1.0516
2298	1.0605
2513	1.0658
2728	1.0683
2942	1.0672
2728	1.0683
2942	1.0672
3157	1.0663
3372	1.0642
3587	1.0527
3801	1.0455
4016	1.0382
4231	1.0318
4446	1.0283
4661	1.0271
4875	1.0239
5090	1.0200
11104	1.0200
11319	1.0219
11534	1.0262
11749	1.0298
11964	1.0324
12178	1.0343
12393	1.0363
12608	1.0370
12823	1.0371
13038	1.0290
13252	1.0278
13467	1.0322
13682	1.0304
13897	1.0281
14112	1.0254
14326	1.0222
14541	1.0200

Note: All cycle burnups outside the range of this table shall use a 1.020 decrease in margin for compliance with Specification 4.2.2.2.e. Linear interpolation is adequate for intermediate cycle burnups.

Table 4. Alternate RAOC W(z) at 150, 3000, 5000, 8000 MWD/MTU
V. C. Summer – Cycle 26

Core Height (ft)	W(z) 150 MWd/ MTU	W(z) 3000 MWd/ MTU	W(z) 5000 MWd/ MTU	W(z) 8000 MWd/ MTU	Core Height (ft)	W(z) 150 MWd/ MTU	W(z) 3000 MWd/ MTU	W(z) 5000 MWd/ MTU	W(z) 8000 MWd/ MTU
0.000	1.250	1.400	1.369	1.273	6.177	1.121	1.102	1.101	1.101
0.141	1.252	1.401	1.370	1.274	6.317	1.122	1.104	1.104	1.106
0.281	1.254	1.403	1.371	1.276	6.458	1.123	1.106	1.106	1.111
0.422	1.263	1.408	1.376	1.281	6.597	1.124	1.107	1.108	1.115
0.561	1.278	1.418	1.385	1.292	6.738	1.125	1.108	1.109	1.119
0.702	1.281	1.417	1.383	1.291	6.878	1.125	1.108	1.111	1.122
0.842	1.276	1.408	1.375	1.285	7.019	1.124	1.109	1.112	1.125
0.983	1.269	1.397	1.365	1.278	7.159	1.123	1.108	1.112	1.127
1.123	1.262	1.385	1.353	1.268	7.300	1.122	1.108	1.112	1.130
1.264	1.254	1.371	1.340	1.257	7.439	1.120	1.107	1.112	1.131
1.403	1.245	1.356	1.325	1.245	7.580	1.118	1.105	1.110	1.132
1.544	1.234	1.339	1.309	1.231	7.720	1.115	1.103	1.109	1.132
1.684	1.224	1.322	1.291	1.217	7.861	1.112	1.100	1.107	1.132
1.825	1.213	1.303	1.273	1.202	8.001	1.108	1.097	1.104	1.131
1.965	1.201	1.284	1.255	1.187	8.142	1.103	1.093	1.101	1.129
2.106	1.189	1.264	1.236	1.171	8.282	1.098	1.089	1.098	1.128
2.246	1.177	1.244	1.217	1.155	8.422	1.092	1.085	1.094	1.125
2.386	1.165	1.225	1.198	1.139	8.563	1.086	1.080	1.089	1.122
2.527	1.154	1.205	1.179	1.124	8.703	1.079	1.074	1.084	1.118
2.667	1.142	1.186	1.161	1.109	8.844	1.077	1.074	1.084	1.117
2.808	1.130	1.168	1.143	1.094	8.984	1.077	1.074	1.088	1.118
2.948	1.119	1.151	1.127	1.081	9.124	1.078	1.074	1.091	1.123
3.088	1.112	1.139	1.115	1.067	9.264	1.077	1.073	1.093	1.126
3.228	1.111	1.133	1.109	1.062	9.405	1.077	1.072	1.096	1.131
3.369	1.110	1.132	1.108	1.062	9.545	1.076	1.070	1.099	1.138
3.509	1.110	1.130	1.106	1.063	9.686	1.074	1.069	1.101	1.144
3.650	1.109	1.128	1.104	1.064	9.826	1.073	1.070	1.103	1.150
3.790	1.108	1.126	1.102	1.066	9.966	1.075	1.076	1.110	1.157
3.930	1.107	1.124	1.099	1.068	10.106	1.081	1.084	1.117	1.162
4.070	1.106	1.121	1.096	1.070	10.247	1.085	1.091	1.124	1.167
4.211	1.105	1.119	1.093	1.071	10.388	1.090	1.098	1.130	1.172
4.352	1.104	1.116	1.090	1.073	10.528	1.094	1.104	1.136	1.176
4.492	1.104	1.114	1.087	1.074	10.669	1.098	1.110	1.142	1.178
4.633	1.105	1.111	1.085	1.075	10.808	1.101	1.115	1.147	1.181
4.772	1.106	1.108	1.084	1.077	10.949	1.103	1.119	1.151	1.180
4.913	1.107	1.104	1.083	1.078	11.089	1.105	1.123	1.154	1.183
5.053	1.107	1.101	1.084	1.079	11.230	1.106	1.125	1.155	1.187
5.194	1.107	1.097	1.085	1.080	11.370	1.106	1.126	1.156	1.189
5.334	1.107	1.094	1.086	1.080	11.511	1.099	1.122	1.152	1.185
5.475	1.107	1.093	1.086	1.081	11.650	1.083	1.108	1.138	1.173
5.614	1.111	1.093	1.089	1.081	11.791	1.068	1.096	1.126	1.162
5.755	1.114	1.095	1.092	1.085	11.931	1.057	1.086	1.116	1.153
5.895	1.116	1.098	1.095	1.091	12.072	1.047	1.077	1.107	1.144
6.036	1.119	1.100	1.098	1.096					

Table 5. Alternate RAOC W(z) at 10000, 14000, 20000 MWD/MTU
V. C. Summer – Cycle 26

Core Height (ft)	W(z) 10000 MWd/ MTU	W(z) 14000 MWd/ MTU	W(z) 20000 MWd/ MTU	Core Height (ft)	W(z) 10000 MWd/ MTU	W(z) 14000 MWd/ MTU	W(z) 20000 MWd/ MTU
0.000	1.195	1.155	1.164	6.177	1.105	1.126	1.178
0.141	1.197	1.158	1.166	6.317	1.111	1.130	1.181
0.281	1.199	1.160	1.168	6.458	1.116	1.135	1.183
0.422	1.206	1.168	1.176	6.597	1.121	1.139	1.184
0.561	1.217	1.182	1.191	6.738	1.126	1.142	1.185
0.702	1.218	1.185	1.195	6.878	1.130	1.145	1.185
0.842	1.213	1.183	1.192	7.019	1.133	1.147	1.184
0.983	1.208	1.180	1.188	7.159	1.136	1.149	1.182
1.123	1.200	1.175	1.183	7.300	1.140	1.151	1.180
1.264	1.191	1.168	1.175	7.439	1.142	1.152	1.176
1.403	1.181	1.161	1.167	7.580	1.142	1.150	1.171
1.544	1.170	1.153	1.159	7.720	1.143	1.150	1.165
1.684	1.159	1.145	1.150	7.861	1.143	1.148	1.159
1.825	1.147	1.136	1.141	8.001	1.143	1.146	1.152
1.965	1.135	1.127	1.131	8.142	1.142	1.143	1.145
2.106	1.123	1.118	1.122	8.282	1.140	1.140	1.137
2.246	1.110	1.108	1.111	8.422	1.138	1.136	1.128
2.386	1.098	1.098	1.100	8.563	1.135	1.131	1.124
2.527	1.086	1.089	1.090	8.703	1.132	1.126	1.124
2.667	1.075	1.080	1.079	8.844	1.129	1.126	1.123
2.808	1.063	1.071	1.070	8.984	1.129	1.129	1.123
2.948	1.053	1.064	1.067	9.124	1.134	1.131	1.123
3.088	1.053	1.065	1.069	9.264	1.137	1.133	1.123
3.228	1.054	1.068	1.072	9.405	1.141	1.135	1.127
3.369	1.055	1.069	1.075	9.545	1.145	1.136	1.133
3.509	1.056	1.072	1.080	9.686	1.150	1.139	1.140
3.650	1.058	1.073	1.088	9.826	1.155	1.147	1.147
3.790	1.061	1.075	1.096	9.966	1.160	1.155	1.153
3.930	1.063	1.077	1.105	10.106	1.165	1.162	1.159
4.070	1.065	1.078	1.111	10.247	1.169	1.169	1.165
4.211	1.066	1.079	1.118	10.388	1.172	1.175	1.171
4.352	1.068	1.080	1.124	10.528	1.174	1.181	1.176
4.492	1.070	1.080	1.130	10.669	1.177	1.186	1.181
4.633	1.072	1.083	1.136	10.808	1.182	1.191	1.185
4.772	1.073	1.087	1.141	10.949	1.187	1.194	1.188
4.913	1.075	1.091	1.145	11.089	1.191	1.196	1.189
5.053	1.076	1.095	1.149	11.230	1.194	1.197	1.188
5.194	1.078	1.098	1.153	11.370	1.195	1.196	1.186
5.334	1.079	1.101	1.156	11.511	1.191	1.190	1.179
5.475	1.080	1.104	1.158	11.650	1.179	1.174	1.160
5.614	1.082	1.107	1.161	11.791	1.167	1.160	1.144
5.755	1.087	1.110	1.165	11.931	1.157	1.149	1.133
5.895	1.094	1.114	1.170	12.072	1.148	1.138	1.121
6.036	1.100	1.120	1.174				

Table 6. Alternate RAOC FQ Margin Decrease in Excess of 2% Per 31 EFPD – Cycle 26

Cycle Burnup (MWD/MTU)	Maximum Decrease in FQ Margin
1009	1.0200
1224	1.0365
1439	1.0515
1654	1.0600
1868	1.0574
2083	1.0523
2298	1.0473
2513	1.0491
2728	1.0500
2942	1.0501
3157	1.0490
3372	1.0467
3587	1.0433
3801	1.0388
4016	1.0327
4231	1.0269
4446	1.0209
4661	1.0200
10460	1.0200
10675	1.0244
10890	1.0295
11104	1.0307
11319	1.0316
11534	1.0309
11749	1.0300
11964	1.0289
12178	1.0200

Note: All cycle burnups outside the range of this table shall use a 1.020 decrease in margin for compliance with Specification 4.2.2.2.e. Linear interpolation is adequate for intermediate cycle burnups.

Table 7. Baseload W(z) at 150, 3000, 5000, 8000 MWD/MTU
V. C. Summer – Cycle 26

Core Height (ft)	W(z) 150 MWd/ MTU	W(z) 3000 MWd/ MTU	W(z) 5000 MWd/ MTU	W(z) 8000 MWd/ MTU	Core Height (ft)	W(z) 150 MWd/ MTU	W(z) 3000 MWd/ MTU	W(z) 5000 MWd/ MTU	W(z) 8000 MWd/ MTU
0.000	1.130	1.113	1.110	1.113	6.177	1.054	1.052	1.051	1.052
0.141	1.130	1.113	1.110	1.113	6.317	1.054	1.051	1.050	1.051
0.281	1.130	1.114	1.110	1.114	6.458	1.056	1.050	1.050	1.051
0.422	1.131	1.115	1.111	1.115	6.597	1.058	1.050	1.050	1.050
0.561	1.132	1.116	1.113	1.117	6.738	1.061	1.050	1.049	1.050
0.702	1.132	1.116	1.113	1.117	6.878	1.063	1.050	1.049	1.051
0.842	1.131	1.116	1.113	1.117	7.019	1.065	1.051	1.049	1.053
0.983	1.129	1.116	1.113	1.117	7.159	1.067	1.053	1.051	1.056
1.123	1.128	1.115	1.113	1.117	7.300	1.069	1.056	1.054	1.058
1.264	1.126	1.115	1.112	1.116	7.439	1.071	1.058	1.056	1.060
1.403	1.124	1.114	1.112	1.115	7.580	1.073	1.060	1.058	1.062
1.544	1.122	1.113	1.111	1.114	7.720	1.074	1.062	1.060	1.063
1.684	1.120	1.112	1.110	1.113	7.861	1.076	1.064	1.062	1.065
1.825	1.117	1.111	1.109	1.112	8.001	1.077	1.066	1.064	1.067
1.965	1.114	1.109	1.108	1.110	8.142	1.079	1.068	1.066	1.069
2.106	1.111	1.108	1.107	1.109	8.282	1.080	1.070	1.068	1.070
2.246	1.108	1.106	1.105	1.107	8.422	1.081	1.072	1.070	1.072
2.386	1.105	1.104	1.104	1.105	8.563	1.082	1.074	1.072	1.073
2.527	1.102	1.103	1.102	1.103	8.703	1.083	1.076	1.074	1.075
2.667	1.099	1.101	1.100	1.101	8.844	1.084	1.077	1.075	1.076
2.808	1.095	1.098	1.098	1.098	8.984	1.085	1.079	1.077	1.077
2.948	1.092	1.096	1.096	1.096	9.124	1.086	1.081	1.079	1.079
3.088	1.088	1.094	1.094	1.093	9.264	1.087	1.082	1.080	1.080
3.228	1.085	1.091	1.092	1.090	9.405	1.087	1.084	1.082	1.081
3.369	1.082	1.089	1.089	1.087	9.545	1.088	1.085	1.083	1.082
3.509	1.080	1.086	1.087	1.084	9.686	1.089	1.086	1.084	1.083
3.650	1.077	1.084	1.084	1.082	9.826	1.090	1.088	1.086	1.084
3.790	1.075	1.082	1.082	1.080	9.966	1.090	1.089	1.087	1.085
3.930	1.074	1.080	1.080	1.079	10.106	1.091	1.091	1.089	1.086
4.070	1.072	1.078	1.079	1.077	10.247	1.091	1.092	1.090	1.087
4.211	1.071	1.076	1.077	1.076	10.388	1.092	1.093	1.091	1.088
4.352	1.069	1.074	1.075	1.074	10.528	1.093	1.094	1.092	1.089
4.492	1.068	1.072	1.073	1.073	10.669	1.093	1.096	1.094	1.090
4.633	1.066	1.071	1.071	1.071	10.808	1.094	1.097	1.095	1.092
4.772	1.064	1.069	1.069	1.070	10.949	1.094	1.098	1.096	1.092
4.913	1.063	1.068	1.067	1.068	11.089	1.095	1.099	1.097	1.093
5.053	1.061	1.066	1.066	1.066	11.230	1.095	1.099	1.098	1.094
5.194	1.059	1.065	1.064	1.065	11.370	1.095	1.100	1.098	1.095
5.334	1.058	1.063	1.062	1.063	11.511	1.095	1.100	1.099	1.095
5.475	1.056	1.061	1.060	1.061	11.650	1.095	1.100	1.098	1.094
5.614	1.054	1.060	1.058	1.059	11.791	1.094	1.100	1.098	1.094
5.755	1.053	1.058	1.056	1.057	11.931	1.094	1.100	1.099	1.095
5.895	1.052	1.056	1.055	1.055	12.072	1.094	1.100	1.099	1.095
6.036	1.053	1.054	1.053	1.053					

Table 8. Baseload W(z) at 10000, 14000, 20000 MWD/MTU
V. C. Summer – Cycle 26

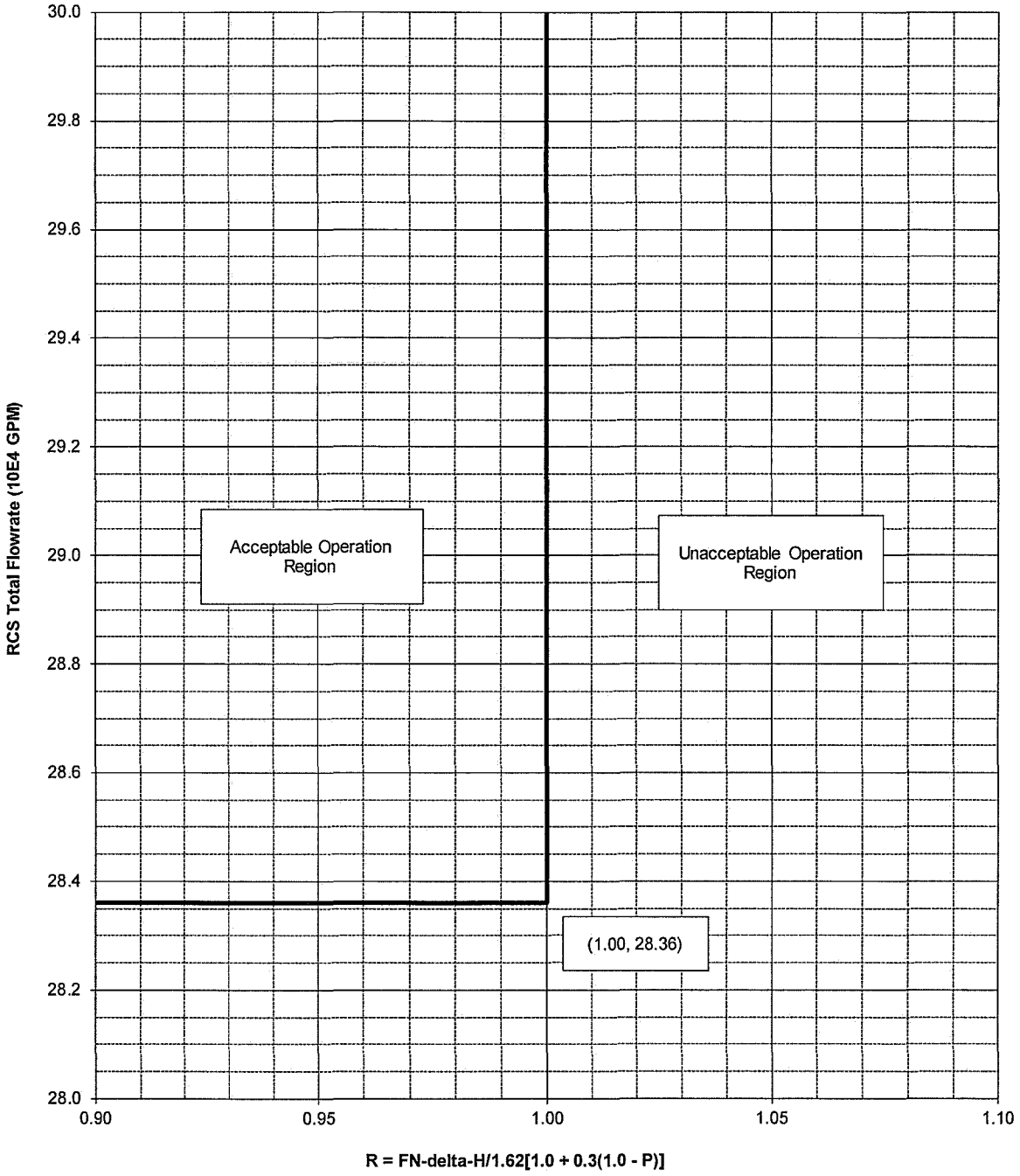
Core Height (ft)	W(z) 10000 MWd/ MTU	W(z) 14000 MWd/ MTU	W(z) 20000 MWd/ MTU		Core Height (ft)	W(z) 10000 MWd/ MTU	W(z) 14000 MWd/ MTU	W(z) 20000 MWd/ MTU
0.000	1.118	1.129	1.155		6.177	1.053	1.054	1.069
0.141	1.119	1.129	1.156		6.317	1.052	1.056	1.071
0.281	1.119	1.130	1.156		6.458	1.051	1.058	1.073
0.422	1.120	1.131	1.157		6.597	1.051	1.060	1.075
0.561	1.122	1.132	1.158		6.738	1.053	1.062	1.076
0.702	1.122	1.132	1.158		6.878	1.056	1.064	1.077
0.842	1.122	1.132	1.157		7.019	1.058	1.066	1.078
0.983	1.122	1.132	1.155		7.159	1.060	1.067	1.079
1.123	1.121	1.131	1.153		7.300	1.062	1.069	1.080
1.264	1.121	1.130	1.151		7.439	1.064	1.071	1.080
1.403	1.120	1.128	1.148		7.580	1.065	1.072	1.081
1.544	1.118	1.127	1.145		7.720	1.067	1.073	1.081
1.684	1.117	1.125	1.142		7.861	1.068	1.074	1.081
1.825	1.115	1.122	1.138		8.001	1.070	1.074	1.081
1.965	1.114	1.120	1.134		8.142	1.071	1.075	1.080
2.106	1.111	1.117	1.129		8.282	1.073	1.076	1.080
2.246	1.109	1.114	1.124		8.422	1.074	1.077	1.080
2.386	1.107	1.111	1.118		8.563	1.075	1.077	1.079
2.527	1.105	1.107	1.113		8.703	1.076	1.078	1.079
2.667	1.102	1.104	1.108		8.844	1.077	1.078	1.078
2.808	1.099	1.100	1.102		8.984	1.078	1.078	1.078
2.948	1.096	1.096	1.096		9.124	1.079	1.079	1.077
3.088	1.093	1.092	1.090		9.264	1.080	1.079	1.077
3.228	1.089	1.087	1.085		9.405	1.081	1.079	1.079
3.369	1.086	1.083	1.082		9.545	1.082	1.079	1.082
3.509	1.083	1.081	1.080		9.686	1.083	1.080	1.085
3.650	1.081	1.080	1.078		9.826	1.083	1.080	1.088
3.790	1.079	1.079	1.075		9.966	1.084	1.080	1.090
3.930	1.078	1.077	1.073		10.106	1.085	1.081	1.092
4.070	1.076	1.076	1.071		10.247	1.086	1.082	1.094
4.211	1.075	1.075	1.068		10.388	1.087	1.084	1.096
4.352	1.074	1.073	1.066		10.528	1.088	1.084	1.097
4.492	1.072	1.072	1.063		10.669	1.088	1.085	1.098
4.633	1.071	1.070	1.063		10.808	1.089	1.086	1.100
4.772	1.069	1.068	1.063		10.949	1.090	1.086	1.100
4.913	1.068	1.066	1.063		11.089	1.091	1.086	1.101
5.053	1.066	1.065	1.063		11.230	1.091	1.087	1.101
5.194	1.064	1.063	1.063		11.370	1.092	1.086	1.102
5.334	1.062	1.061	1.062		11.511	1.092	1.087	1.108
5.475	1.060	1.059	1.062		11.650	1.092	1.089	1.113
5.614	1.058	1.057	1.061		11.791	1.092	1.090	1.112
5.755	1.056	1.056	1.062		11.931	1.092	1.090	1.106
5.895	1.054	1.056	1.064		12.072	1.092	1.091	1.100
6.036	1.054	1.055	1.067					

Table 9. BASELOAD FQ Margin Decrease in Excess of 2% Per 31 EFPD – Cycle 26

Cycle Burnup (MWD/MTU)	Maximum Decrease in FQ Margin
794	1.0200
1009	1.0333
1224	1.0432
1439	1.0514
1654	1.0569
1868	1.0595
2083	1.0592
2298	1.0538
2513	1.0496
2728	1.0509
2942	1.0503
3157	1.0474
3372	1.0425
3587	1.0364
3801	1.0297
4016	1.0228
4231	1.0200

Note: All cycle burnups outside the range of this table shall use a 1.020 decrease in margin for compliance with Specification 4.2.2.4.e. Linear interpolation is adequate for intermediate cycle burnups.

Figure 6. RCS Total Flowrate vs. R for Three Loop Operation
V. C. Summer - Cycle 26



Measurement Uncertainty of 2.1% for Flow (includes 0.1% for feedwater venturi fouling) is included in this figure.