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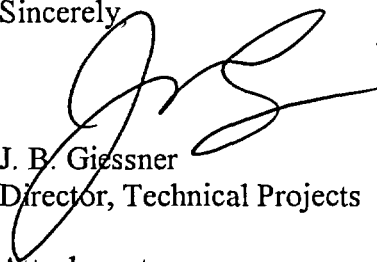
Donald C. Cook Nuclear Plant Unit 2
CORE OPERATING LIMITS REPORT

Indiana Michigan Power Company, the licensee for Donald C. Cook Nuclear Plant Unit 2, is submitting the Core Operating Limits Report (COLR) for Unit 2, Cycle 14, in accordance with Technical Specification 6.9.1.9.4.

The Unit 2 Cycle 14, Revision 1 COLR is provided as an attachment to this letter. Revision 1 of the COLR has been made to address the potential for an Axial Offset Deviation. Revision 1 changes have not been identified by revision bars because Revision 0 was never issued into the Technical Specification Books.

No new commitments are made in this submittal. Should you have any questions, please contact Mr. Brian A. McIntyre, Manager of Regulatory Affairs, at (269) 697-5806.

Sincerely,



J. B. Giessner
Director, Technical Projects

Attachment

DB/rdw

A001

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c: K. D. Curry, Ft. Wayne AEP
J. E. Dyer, NRC Region III
J. T. King, MPSC
MDEQ - DW & RPD
NRC Resident Inspector
J. F. Stang, Jr., NRC Washington, DC

bc: A. C. Bakken III
 M. J. Finissi
 J. B. Giessner
 D. W. Jenkins, w/o attachment
 G. John
 J. A. Kobyra, w/o attachment
 D. H. Malin
 B. A. McIntyre, w/o attachment
 J. E. Newmiller
 J. E. Pollock, w/o attachment
 D. J. Poupard
 M. K. Scarpello, w/o attachment
 T. K. Woods, w/o attachment

Donald C. Cook Nuclear Plant Unit 2 Cycle 14

Core Operating Limits Report Revision 1

SUMMARY OF REVISION

Revision 1 of the Core Operating Limits Report (COLR) has been made to address the potential for an Axial Offset Deviation (AOD). Revision 1 changes have not been identified by revision bars because Revision 0 was never issued into the Technical Specification Books.

Plants with AOD typically have a large number of integral fuel burnable absorber (IFBA) rods in their cores. AOD is primarily caused by the redistribution of ZrB_2 during loading of IFBA coated pellets into the fuel rod. Cores with AOD typically have axial offset more negative than predicted at the beginning of the cycle.

Westinghouse has calculated the effect of the AOD on the plant parameters assuming the deviation between the measured and predicted AOD would be in the -10% range at beginning of cycle life. This primarily affects the heat flux hot channel factor, F_Q , through the $K(Z)$, and $V(Z)$ functions. The limitations on these parameters are given in the COLR.

1.0 CORE OPERATING LIMITS REPORT

This Core Operating Limits Report for the Donald C. Cook Nuclear Plant Unit 2 Cycle 14 has been prepared in accordance with the requirements of Technical Specification 6.9.1.9.

The Technical Specifications affected by this report are listed below:

3/4.1.1.4	Moderator Temperature Coefficient (MTC)
3/4.1.3.1	Movable Control Assemblies Group Height
3/4.1.3.4	Rod Drop Time
3/4.1.3.5	Shutdown Rod Insertion Limit
3/4.1.3.6	Control Rod Insertion Limits
3/4.2.1	Axial Flux Difference (AFD)
3/4.2.2	Heat Flux Hot Channel Factor ($F_Q(Z)$)
3/4.2.3	Nuclear Enthalpy Hot Channel Factor - ($F_{\Delta H}$)
3/4.2.6	Allowable Power Level (APL)

2.0 OPERATING LIMITS

The cycle-specific parameter limits 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 6.9.1.9.

2.1 Moderator Temperature Coefficient (Technical Specification 3/4.1.1.4)

2.1.1 The Moderator Temperature Coefficient (MTC) limits are:

The BOL/ARO-MTC shall be less positive than or equal to the value given in Figure 1.

The EOL/ARO/RTP-MTC shall be less negative than or equal to $-4.10\text{E-}4 \Delta\text{k/k/}^\circ\text{F}$.

This limit is based on a T_{avg} program with HFP vessel T_{avg} of 571 to 576 °F where:

ARO stands for All Rods Out

BOL stands for Beginning of Cycle Life

EOL stands for End of Cycle Life

RTP stands for Rated Thermal Power

HFP stands for Hot Full Thermal Power

2.1.2 The MTC Surveillance limit is:

The 300 ppm/ARO/RTP-MTC should be less negative or equal to $-3.20\text{E-}4 \Delta\text{k/k/}^\circ\text{F}$ at a HFP vessel T_{avg} of 571 to 576 °F

2.2 Rod Drop Time Drop Height (Specification 3/4.1.3.4)

2.2.1 All rods shall be dropped from 228 steps.

2.3 Shutdown Rod Insertion Limit (Specification 3/4.1.3.5)

2.3.1 The shutdown rods shall be withdrawn to at least 228 steps.

2.4 Control Rod Insertion Limits (Specifications 3/4.1.3.6 and 3/4.1.3.1)

2.4.1 The control rod banks shall be limited in physical insertion as shown in Figure 2.

2.4.2 Successive Control Banks shall overlap by 100 steps. The sequence for Control Bank withdrawal shall be Control Bank A, Control Bank B, Control Bank C, and Control Bank D.

2.5 Axial Flux Difference (Specification 3/4.2.1)

2.5.1 The Allowable Operation Limits are provided in Figure 3.

2.5.2 These Axial Flux Difference (AFD) target bands ($\pm 5\%$, $\pm 3\%$ and $+3\%/-8\%$) are permitted for a cycle average accumulated burnup ≥ 0.0 MWD/MTU

2.6 Heat Flux Hot Channel Factor - $F_Q(Z)$ (Specification 3.2.2)

$$F_Q(Z) \leq \frac{CF_Q}{P} * K(Z) \quad \text{for } P > 0.5$$

$$F_Q(Z) \leq 2 * CF_Q * K(Z) \quad \text{for } P \leq 0.5$$

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

2.6.1 $CF_Q = 2.452$ for cycle burnups ≤ 2000 MWD/MTU and $CF_Q = 2.335$ for cycle burnups > 2000 MWD/MTU.

2.6.2 $K(Z)$ is provided in Figure 4A for cycle burnups ≤ 2000 MWD/MTU and Figure 4B for cycle burnups > 2000 MWD/MTU.

2.7 Nuclear Enthalpy Rise Hot Channel Factor – $F_{\Delta H}^N$ (Specification 3/4.2.3)

$$F_{\Delta H}^N \leq CF_{\Delta H} * (1 + PF_{\Delta H} * (1-P))$$

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

$$2.7.1 \quad CF_{\Delta H} = 1.58$$

$$2.7.2 \quad PF_{\Delta H} = 0.3$$

2.8 Allowable Power Level - APL (Specification 3.2.6)

$$\text{APL} = \min \text{ over } Z \text{ for } \frac{\text{CF}_Q * \text{K}(Z)}{\text{F}_Q(Z) * \text{V}(Z) * \text{F}_P} * 100\%$$

2.8.1 V(Z) is provided in Tables 1-3 for AFD target bands of $\pm 5\%$, $\pm 3\%$ and $+3\%/-8\%$.

2.8.2 CF_Q and $\text{K}(Z)$ are provided in COLR Sections 2.6.1 and 2.6.2, respectively

2.8.3 The following table shows F_P values which correspond to F_Q margin decreases that are greater than 2% per 31 Effective Full Power Days (EFPD). These values shall be used to adjust APL as per Surveillance Requirement 4.2.6.2. A 1.02 penalty factor shall be used at all cycle burnups that are outside this range.

Cycle Burnup (MWD/MTU)	$\pm 5\%$ F_P Penalty Mult.	$\pm 3\%$ F_P Penalty Mult.	$+3\%/-8\%$ F_P Penalty Mult.
150	1.0200	1.0216	1.0207
317	1.0219	1.0274	1.0238
483	1.0269	1.0328	1.0270
650	1.0314	1.0378	1.0297
817	1.0354	1.0423	1.0319
983	1.0357	1.0384	1.0339
1150	1.0321	1.0345	1.0349
1317	1.0288	1.0311	1.0316
1483	1.0262	1.0283	1.0289
1650	1.0244	1.0265	1.0273
1817	1.0239	1.0258	1.0268
1983	1.0244	1.0261	1.0276
2150	1.0257	1.0273	1.0293
2317	1.0272	1.0289	1.0312
2484	1.0285	1.0302	1.0328
2650	1.0291	1.0307	1.0336
2817	1.0287	1.0301	1.0329
2984	1.0269	1.0282	1.0307
3150	1.0238	1.0250	1.0268
3317	1.0200	1.0207	1.0219
6817	1.0200	1.0200	1.0200
6984	1.0218	1.0218	1.0216
7151	1.0234	1.0239	1.0200
7317	1.0242	1.0247	1.0200
7484	1.0255	1.0227	1.0200
7651	1.0257	1.0208	1.0200
7817	1.0238	1.0200	1.0200
7984	1.0217	1.0200	1.0200
8151	1.0200	1.0200	1.0200

The burnup range only covers where F_P exceeds 1.02. Linear interpolation is adequate for intermediate cycle burnups.

Figure 1
MODERATOR TEMPERATURE COEFFICIENT (MTC) LIMITS

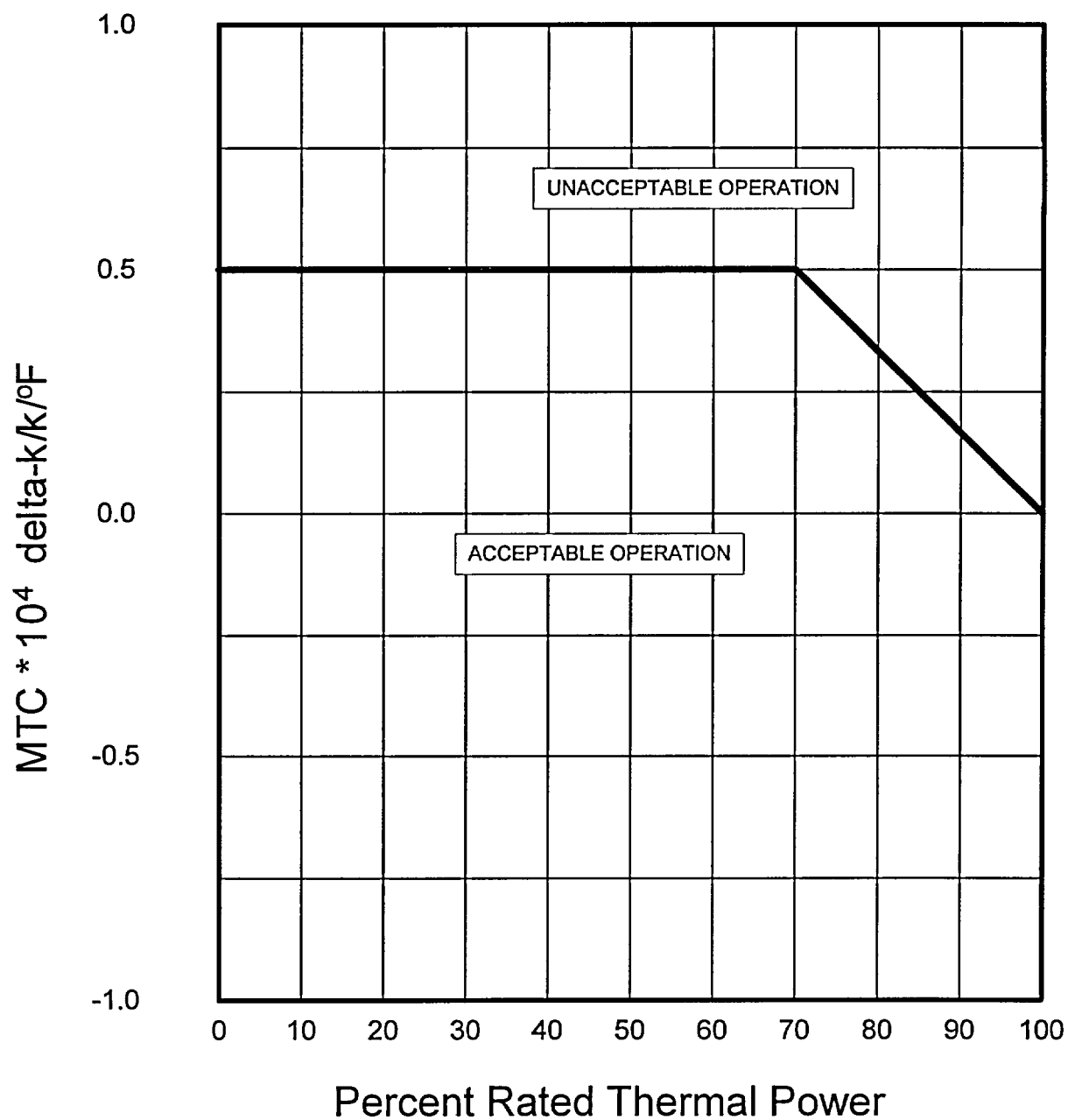


Figure 2
**ROD BANK INSERTION LIMITS VERSUS THERMAL POWER FOUR-
LOOP OPERATION**

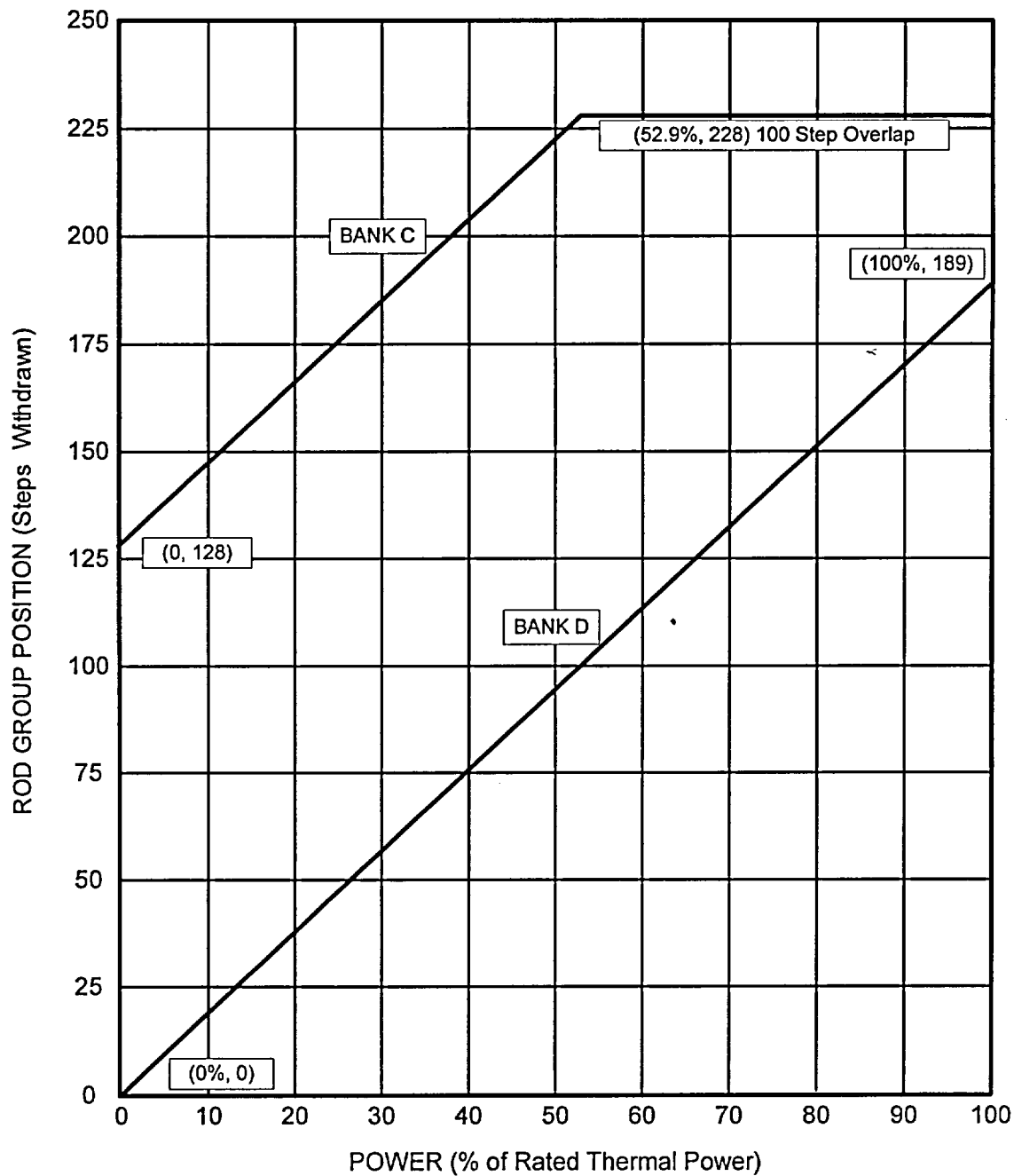


Figure 3
AXIAL FLUX DIFFERENCE LIMITS AS A FUNCTION OF RATED
THERMAL POWER (RTP)

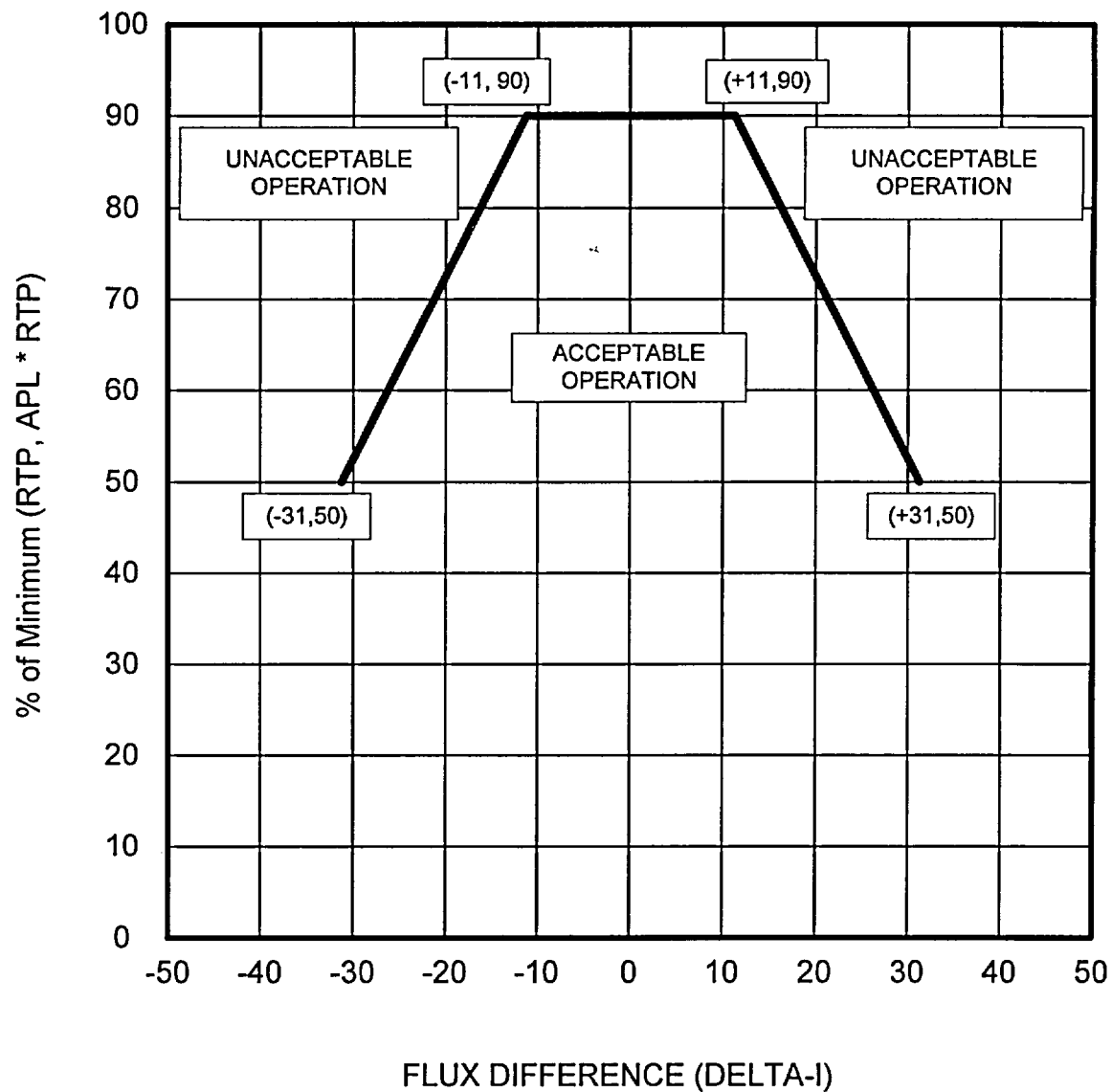


Figure 4A
K(Z) - NORMALIZED $F_Q(Z)$ AS A FUNCTION OF CORE HEIGHT
Cycle Burnups ≤ 2000 MWD/MTU

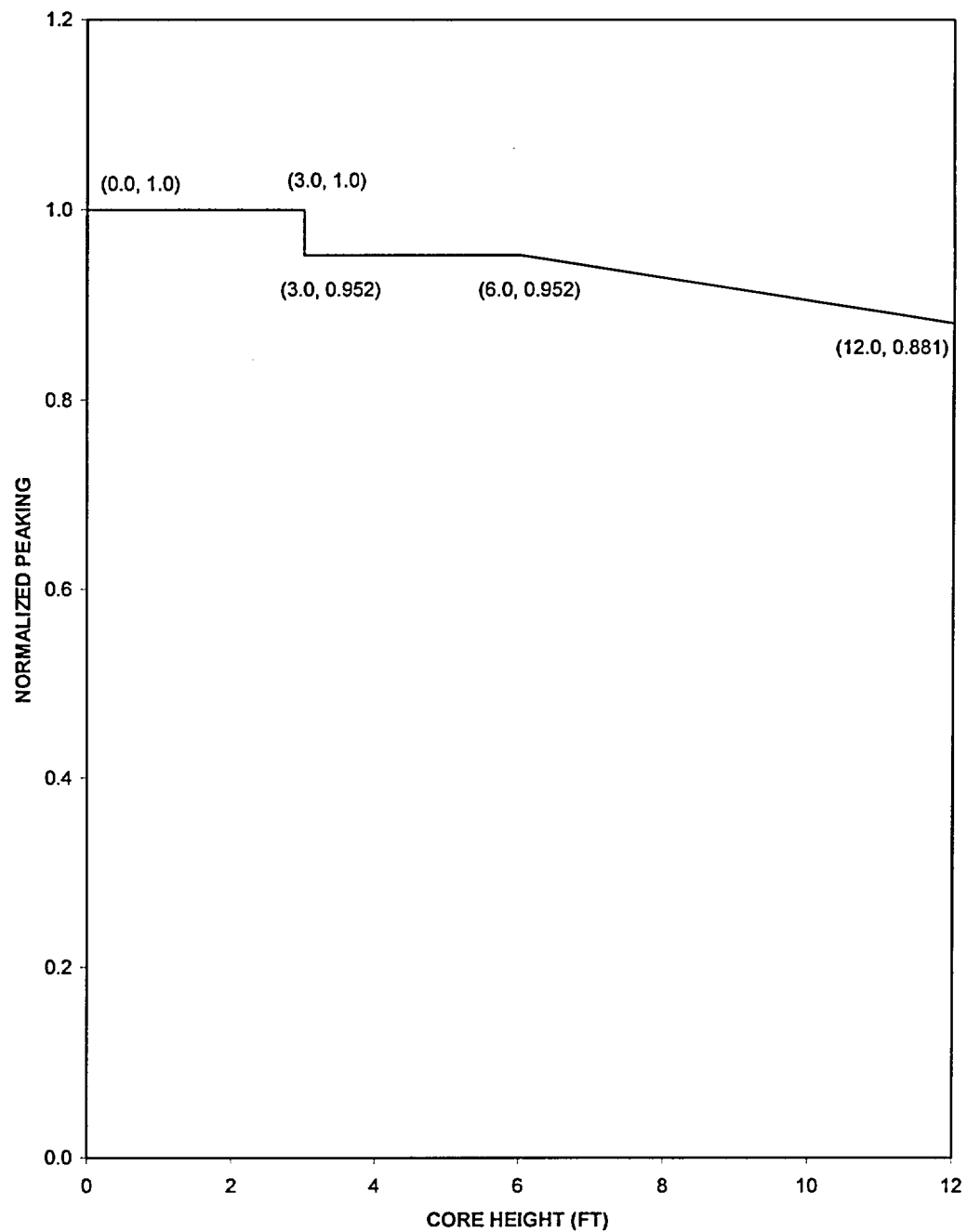


Figure 4B
K(Z) - NORMALIZED $F_Q(Z)$ AS A FUNCTION OF CORE HEIGHT
Cycle Burnups > 2000 MWD/MTU

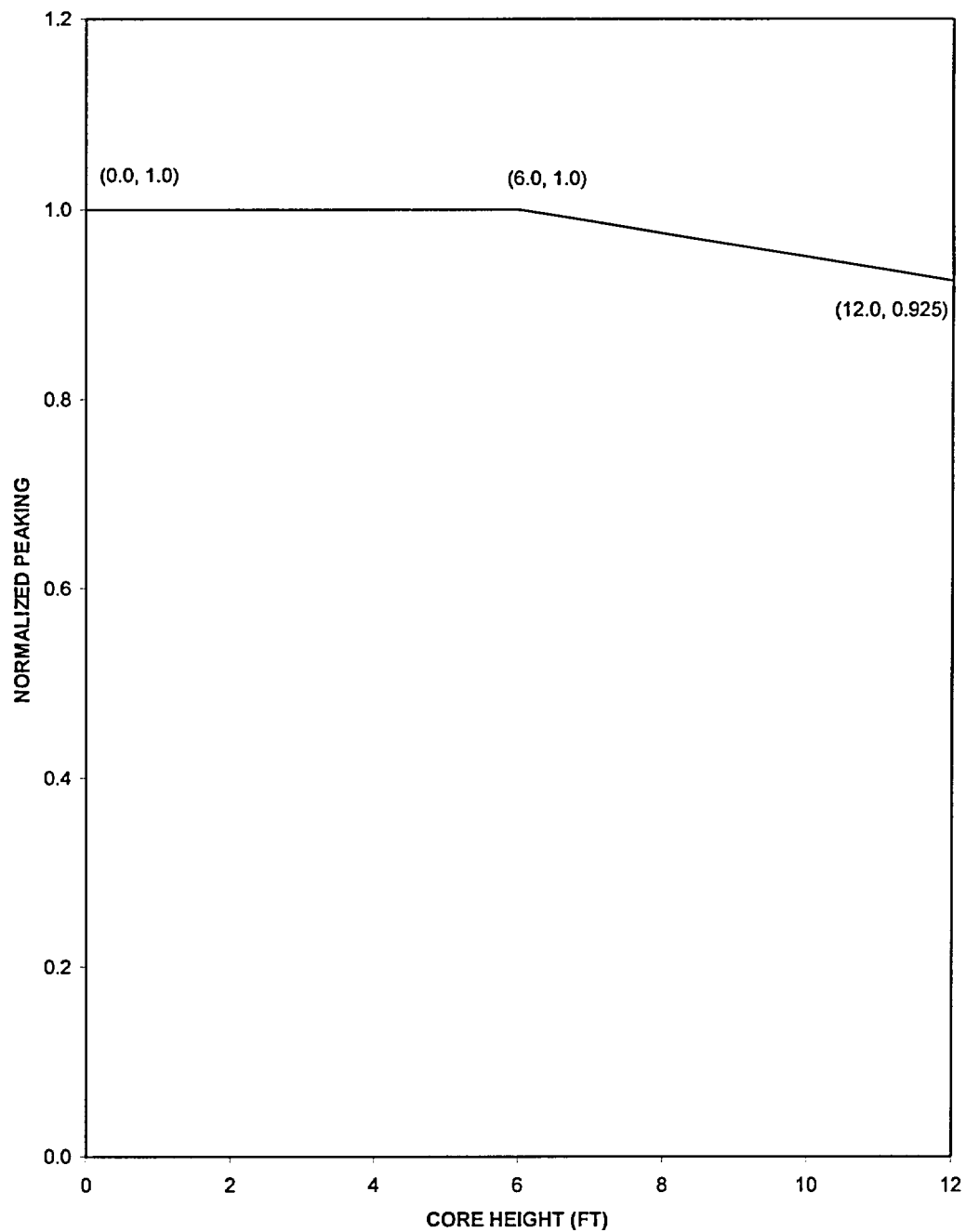


Table 1
D. C. Cook Unit 2, Cycle 14
IRI Mitigation LP, 3468 MWt, As-Burned Cycle 13
V(Z) Function for a $\pm 5\%$ AFD Target Band

PT	Height	Burnup (MWD/MTU)													
	(Ft.)	150	1000	2000	3000	4000	6000	8000	10000	12000	14000	16000	18000	20000	20450
1	0.00	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
2	0.20	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
3	0.40	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
4	0.60	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
5	0.80	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
6	1.00	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
7	1.20	1.1272	1.1191	1.1110	1.1048	1.1012	1.0996	1.1040	1.1121	1.1196	1.1264	1.1334	1.1409	1.1481	1.1497
8	1.40	1.1249	1.1174	1.1101	1.1044	1.1006	1.0991	1.1045	1.1123	1.1193	1.1256	1.1318	1.1386	1.1452	1.1467
9	1.60	1.1219	1.1153	1.1088	1.1038	1.1005	1.0995	1.1047	1.1121	1.1186	1.1243	1.1297	1.1357	1.1415	1.1429
10	1.80	1.1183	1.1125	1.1070	1.1027	1.1000	1.0996	1.1047	1.1116	1.1174	1.1223	1.1269	1.1319	1.1369	1.1381
11	2.00	1.1139	1.1092	1.1047	1.1013	1.0991	1.0993	1.1042	1.1106	1.1158	1.1199	1.1235	1.1273	1.1315	1.1324
12	2.20	1.1090	1.1054	1.1019	1.0994	1.0980	1.0988	1.1035	1.1092	1.1136	1.1169	1.1195	1.1221	1.1253	1.1260
13	2.40	1.1038	1.1015	1.0993	1.0976	1.0967	1.0980	1.1024	1.1075	1.1111	1.1134	1.1149	1.1163	1.1185	1.1190
14	2.60	1.0991	1.0978	1.0967	1.0959	1.0955	1.0968	1.1010	1.1054	1.1082	1.1096	1.1100	1.1102	1.1114	1.1117
15	2.80	1.0945	1.0941	1.0939	1.0939	1.0941	1.0953	1.0993	1.1029	1.1049	1.1054	1.1047	1.1036	1.1038	1.1039
16	3.00	1.0891	1.0899	1.0908	1.0916	1.0925	1.0941	1.0973	1.1001	1.1012	1.1007	1.0989	1.0965	1.0956	1.0954
17	3.20	1.0855	1.0870	1.0886	1.0900	1.0911	1.0927	1.0947	1.0968	1.0972	1.0959	1.0932	1.0899	1.0882	1.0878
18	3.40	1.0866	1.0866	1.0880	1.0893	1.0902	1.0911	1.0916	1.0935	1.0937	1.0923	1.0897	1.0867	1.0852	1.0850
19	3.60	1.0939	1.0919	1.0899	1.0900	1.0900	1.0895	1.0897	1.0921	1.0930	1.0927	1.0914	1.0901	1.0908	1.0909
20	3.80	1.1011	1.0970	1.0929	1.0911	1.0902	1.0883	1.0881	1.0911	1.0931	1.0940	1.0944	1.0959	1.0985	1.0990
21	4.00	1.1080	1.1019	1.0958	1.0919	1.0902	1.0874	1.0863	1.0900	1.0930	1.0953	1.0975	1.1013	1.1054	1.1063
22	4.20	1.1145	1.1066	1.0986	1.0921	1.0897	1.0864	1.0852	1.0888	1.0928	1.0964	1.1003	1.1063	1.1114	1.1126
23	4.40	1.1206	1.1109	1.1011	1.0930	1.0888	1.0852	1.0848	1.0880	1.0929	1.0976	1.1030	1.1109	1.1169	1.1183
24	4.60	1.1261	1.1150	1.1037	1.0945	1.0877	1.0838	1.0842	1.0880	1.0935	1.0991	1.1061	1.1149	1.1218	1.1234
25	4.80	1.1309	1.1186	1.1060	1.0957	1.0878	1.0828	1.0837	1.0880	1.0941	1.1004	1.1086	1.1183	1.1260	1.1277
26	5.00	1.1350	1.1215	1.1077	1.0964	1.0878	1.0821	1.0832	1.0880	1.0946	1.1015	1.1105	1.1210	1.1293	1.1312
27	5.20	1.1382	1.1237	1.1090	1.0969	1.0876	1.0815	1.0828	1.0876	1.0947	1.1020	1.1118	1.1228	1.1317	1.1336
28	5.40	1.1406	1.1253	1.1098	1.0971	1.0873	1.0807	1.0824	1.0877	1.0945	1.1027	1.1127	1.1238	1.1329	1.1349
29	5.60	1.1419	1.1262	1.1102	1.0970	1.0869	1.0797	1.0816	1.0874	1.0944	1.1027	1.1127	1.1239	1.1330	1.1351
30	5.80	1.1422	1.1261	1.1098	1.0963	1.0859	1.0783	1.0805	1.0865	1.0937	1.1020	1.1119	1.1230	1.1321	1.1341
31	6.00	1.1413	1.1252	1.1088	1.0953	1.0849	1.0765	1.0790	1.0853	1.0925	1.1007	1.1103	1.1211	1.1301	1.1321
32	6.20	1.1394	1.1237	1.1078	1.0945	1.0843	1.0743	1.0769	1.0831	1.0903	1.0982	1.1076	1.1180	1.1268	1.1287
33	6.40	1.1375	1.1225	1.1071	1.0942	1.0842	1.0736	1.0744	1.0806	1.0875	1.0952	1.1041	1.1140	1.1224	1.1243
34	6.60	1.1375	1.1225	1.1070	1.0940	1.0838	1.0724	1.0738	1.0810	1.0883	1.0956	1.1037	1.1126	1.1205	1.1223
35	6.80	1.1370	1.1222	1.1068	1.0939	1.0835	1.0712	1.0732	1.0819	1.0896	1.0965	1.1036	1.1113	1.1195	1.1216
36	7.00	1.1350	1.1209	1.1062	1.0937	1.0836	1.0712	1.0733	1.0826	1.0903	1.0965	1.1024	1.1088	1.1165	1.1186
37	7.20	1.1320	1.1187	1.1050	1.0932	1.0836	1.0718	1.0748	1.0837	1.0906	1.0958	1.1003	1.1053	1.1116	1.1135
38	7.40	1.1278	1.1155	1.1026	1.0917	1.0828	1.0719	1.0756	1.0840	1.0902	1.0943	1.0976	1.1011	1.1054	1.1069
39	7.60	1.1224	1.1110	1.0991	1.0892	1.0811	1.0717	1.0759	1.0836	1.0892	1.0927	1.0952	1.0979	1.1015	1.1023
40	7.80	1.1160	1.1055	1.0947	1.0857	1.0785	1.0707	1.0758	1.0827	1.0875	1.0902	1.0918	1.0936	1.0963	1.0970
41	8.00	1.1073	1.0985	1.0895	1.0820	1.0761	1.0702	1.0746	1.0810	1.0855	1.0880	1.0896	1.0914	1.0940	1.0949
42	8.20	1.1000	1.0928	1.0855	1.0796	1.0751	1.0711	1.0742	1.0802	1.0846	1.0874	1.0893	1.0915	1.0943	1.0949
43	8.40	1.1001	1.0935	1.0869	1.0815	1.0776	1.0746	1.0782	1.0832	1.0867	1.0888	1.0901	1.0914	1.0934	1.0939
44	8.60	1.1005	1.0943	1.0882	1.0833	1.0797	1.0791	1.0831	1.0879	1.0913	1.0932	1.0943	1.0954	1.0975	1.0981
45	8.80	1.1002	1.0951	1.0900	1.0860	1.0832	1.0836	1.0878	1.0926	1.0960	1.0980	1.0991	1.1002	1.1025	1.1031
46	9.00	1.1008	1.0969	1.0931	1.0900	1.0879	1.0879	1.0922	1.0969	1.1001	1.1020	1.1029	1.1037	1.1061	1.1067
47	9.20	1.1055	1.1017	1.0979	1.0949	1.0927	1.0918	1.0961	1.1009	1.1040	1.1057	1.1063	1.1068	1.1092	1.1098
48	9.40	1.1123	1.1080	1.1037	1.1002	1.0976	1.0955	1.0997	1.1044	1.1075	1.1090	1.1094	1.1098	1.1121	1.1127
49	9.60	1.1187	1.1140	1.1092	1.1053	1.1023	1.0995	1.1028	1.1074	1.1105	1.1121	1.1128	1.1135	1.1156	1.1162
50	9.80	1.1245	1.1194	1.1142	1.1099	1.1066	1.1034	1.1061	1.1109	1.1142	1.1159	1.1168	1.1177	1.1197	1.1203
51	10.00	1.1299	1.1244	1.1188	1.1141	1.1106	1.1071	1.1097	1.1148	1.1182	1.1201	1.1211	1.1219	1.1237	1.1241
52	10.20	1.1347	1.1289	1.1229	1.1180	1.1142	1.1104	1.1129	1.1181	1.1217	1.1237	1.1249	1.1260	1.1280	1.1284
53	10.40	1.1389	1.1328	1.1265	1.1214	1.1173	1.1133	1.1157	1.1209	1.1246	1.1267	1.1281	1.1294	1.1316	1.1320
54	10.60	1.1422	1.1359	1.1294	1.1241	1.1199	1.1156	1.1179	1.1230	1.1267	1.1290	1.1305	1.1321	1.1343	1.1348
55	10.80	1.1449	1.1385	1.1318	1.1263	1.1219	1.1174	1.1195	1.1246	1.1283	1.1307	1.1324	1.1342	1.1366	1.1371
56	11.00	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
57	11.20	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
58	11.40	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
59	11.60	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
60	11.80	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
61	12.00	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

Table 2
D. C. Cook Unit 2, Cycle 14
IRI Mitigation LP, 3468 MWt, As-Burned Cycle 13
V(Z) Function for a $\pm 3\%$ AFD Target Band

PT	Height	Burnup (MWD/MTU)													
	(Ft.)	150	1000	2000	3000	4000	6000	8000	10000	12000	14000	16000	18000	20000	20450
1	0.00	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
2	0.20	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
3	0.40	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
4	0.60	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
5	0.80	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
6	1.00	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
7	1.20	1.0996	1.0916	1.0873	1.0854	1.0836	1.0808	1.0789	1.0856	1.0918	1.0962	1.1000	1.1042	1.1105	1.1119
8	1.40	1.0977	1.0901	1.0851	1.0829	1.0811	1.0788	1.0782	1.0830	1.0890	1.0937	1.0981	1.1029	1.1086	1.1100
9	1.60	1.0954	1.0886	1.0827	1.0803	1.0786	1.0769	1.0773	1.0803	1.0858	1.0907	1.0957	1.1012	1.1064	1.1075
10	1.80	1.0924	1.0866	1.0808	1.0777	1.0760	1.0748	1.0763	1.0793	1.0830	1.0876	1.0929	1.0987	1.1038	1.1050
11	2.00	1.0888	1.0840	1.0792	1.0753	1.0732	1.0726	1.0750	1.0787	1.0824	1.0862	1.0904	1.0955	1.1001	1.1011
12	2.20	1.0847	1.0809	1.0771	1.0741	1.0720	1.0709	1.0737	1.0777	1.0813	1.0845	1.0877	1.0916	1.0953	1.0962
13	2.40	1.0802	1.0774	1.0746	1.0725	1.0711	1.0707	1.0728	1.0765	1.0795	1.0821	1.0843	1.0873	1.0901	1.0907
14	2.60	1.0752	1.0735	1.0719	1.0707	1.0700	1.0702	1.0723	1.0749	1.0771	1.0790	1.0807	1.0826	1.0845	1.0849
15	2.80	1.0707	1.0699	1.0692	1.0688	1.0686	1.0695	1.0715	1.0736	1.0752	1.0763	1.0770	1.0777	1.0787	1.0789
16	3.00	1.0668	1.0669	1.0670	1.0673	1.0676	1.0688	1.0706	1.0721	1.0729	1.0731	1.0728	1.0723	1.0724	1.0724
17	3.20	1.0644	1.0651	1.0658	1.0665	1.0671	1.0682	1.0695	1.0703	1.0705	1.0699	1.0687	1.0673	1.0665	1.0663
18	3.40	1.0679	1.0675	1.0671	1.0671	1.0678	1.0685	1.0685	1.0690	1.0689	1.0681	1.0667	1.0650	1.0641	1.0639
19	3.60	1.0750	1.0728	1.0706	1.0688	1.0688	1.0684	1.0676	1.0689	1.0694	1.0692	1.0684	1.0684	1.0689	1.0689
20	3.80	1.0819	1.0780	1.0740	1.0707	1.0698	1.0682	1.0670	1.0689	1.0702	1.0710	1.0715	1.0733	1.0752	1.0757
21	4.00	1.0886	1.0830	1.0772	1.0724	1.0708	1.0682	1.0664	1.0689	1.0710	1.0728	1.0747	1.0780	1.0814	1.0822
22	4.20	1.0951	1.0877	1.0801	1.0739	1.0715	1.0681	1.0656	1.0688	1.0718	1.0745	1.0776	1.0826	1.0872	1.0883
23	4.40	1.1011	1.0920	1.0828	1.0752	1.0719	1.0679	1.0651	1.0685	1.0723	1.0759	1.0802	1.0867	1.0923	1.0936
24	4.60	1.1066	1.0960	1.0851	1.0762	1.0719	1.0676	1.0650	1.0680	1.0726	1.0771	1.0824	1.0904	1.0968	1.0982
25	4.80	1.1116	1.0994	1.0869	1.0766	1.0716	1.0672	1.0653	1.0674	1.0727	1.0781	1.0844	1.0935	1.1004	1.1019
26	5.00	1.1159	1.1026	1.0890	1.0778	1.0710	1.0666	1.0657	1.0675	1.0724	1.0784	1.0864	1.0959	1.1030	1.1046
27	5.20	1.1195	1.1057	1.0915	1.0797	1.0705	1.0658	1.0659	1.0687	1.0735	1.0800	1.0883	1.0978	1.1050	1.1066
28	5.40	1.1223	1.1080	1.0933	1.0811	1.0714	1.0648	1.0658	1.0697	1.0750	1.0816	1.0897	1.0989	1.1062	1.1078
29	5.60	1.1242	1.1097	1.0946	1.0820	1.0721	1.0636	1.0655	1.0704	1.0762	1.0827	1.0906	1.0993	1.1065	1.1081
30	5.80	1.1253	1.1105	1.0953	1.0825	1.0724	1.0622	1.0650	1.0708	1.0769	1.0834	1.0907	1.0989	1.1059	1.1075
31	6.00	1.1254	1.1106	1.0953	1.0825	1.0723	1.0607	1.0641	1.0708	1.0772	1.0835	1.0902	1.0976	1.1044	1.1061
32	6.20	1.1245	1.1099	1.0947	1.0820	1.0718	1.0602	1.0630	1.0704	1.0770	1.0829	1.0890	1.0957	1.1024	1.1043
33	6.40	1.1226	1.1083	1.0934	1.0809	1.0709	1.0594	1.0621	1.0695	1.0760	1.0817	1.0873	1.0935	1.1001	1.1018
34	6.60	1.1197	1.1058	1.0914	1.0792	1.0695	1.0584	1.0610	1.0682	1.0744	1.0797	1.0849	1.0906	1.0968	1.0985
35	6.80	1.1161	1.1026	1.0888	1.0771	1.0677	1.0569	1.0596	1.0664	1.0723	1.0771	1.0818	1.0869	1.0928	1.0944
36	7.00	1.1116	1.0987	1.0855	1.0743	1.0654	1.0551	1.0577	1.0642	1.0696	1.0740	1.0781	1.0826	1.0878	1.0892
37	7.20	1.1060	1.0939	1.0815	1.0710	1.0627	1.0535	1.0553	1.0614	1.0663	1.0701	1.0736	1.0775	1.0817	1.0829
38	7.40	1.0993	1.0883	1.0770	1.0675	1.0601	1.0522	1.0530	1.0584	1.0626	1.0658	1.0685	1.0717	1.0750	1.0757
39	7.60	1.0922	1.0821	1.0717	1.0631	1.0565	1.0500	1.0520	1.0565	1.0598	1.0621	1.0641	1.0663	1.0688	1.0694
40	7.80	1.0843	1.0760	1.0675	1.0606	1.0553	1.0510	1.0530	1.0563	1.0585	1.0596	1.0604	1.0612	1.0625	1.0627
41	8.00	1.0765	1.0704	1.0643	1.0593	1.0561	1.0544	1.0555	1.0584	1.0603	1.0608	1.0606	1.0606	1.0612	1.0614
42	8.20	1.0719	1.0679	1.0640	1.0608	1.0585	1.0578	1.0593	1.0612	1.0628	1.0636	1.0642	1.0650	1.0659	1.0662
43	8.40	1.0717	1.0687	1.0657	1.0633	1.0616	1.0613	1.0629	1.0645	1.0658	1.0669	1.0678	1.0686	1.0697	1.0699
44	8.60	1.0712	1.0693	1.0674	1.0658	1.0647	1.0643	1.0660	1.0677	1.0690	1.0701	1.0711	1.0720	1.0731	1.0734
45	8.80	1.0714	1.0703	1.0693	1.0685	1.0679	1.0674	1.0688	1.0707	1.0721	1.0733	1.0742	1.0751	1.0766	1.0769
46	9.00	1.0744	1.0736	1.0727	1.0720	1.0713	1.0705	1.0715	1.0734	1.0749	1.0760	1.0770	1.0779	1.0797	1.0801
47	9.20	1.0800	1.0787	1.0773	1.0761	1.0751	1.0734	1.0742	1.0759	1.0773	1.0784	1.0795	1.0806	1.0826	1.0831
48	9.40	1.0850	1.0834	1.0816	1.0800	1.0786	1.0762	1.0767	1.0780	1.0793	1.0806	1.0820	1.0834	1.0857	1.0862
49	9.60	1.0897	1.0877	1.0856	1.0836	1.0819	1.0789	1.0788	1.0797	1.0810	1.0826	1.0845	1.0867	1.0893	1.0899
50	9.80	1.0940	1.0916	1.0891	1.0869	1.0849	1.0815	1.0811	1.0818	1.0832	1.0852	1.0879	1.0908	1.0935	1.0942
51	10.00	1.0978	1.0951	1.0923	1.0898	1.0875	1.0840	1.0834	1.0840	1.0856	1.0881	1.0914	1.0952	1.0979	1.0986
52	10.20	1.1011	1.0981	1.0950	1.0922	1.0898	1.0862	1.0853	1.0857	1.0874	1.0903	1.0943	1.0987	1.1020	1.1027
53	10.40	1.1038	1.1006	1.0973	1.0943	1.0918	1.0880	1.0868	1.0870	1.0888	1.0920	1.0966	1.1017	1.1054	1.1062
54	10.60	1.1061	1.1028	1.0994	1.0964	1.0938	1.0898	1.0884	1.0887	1.0906	1.0939	1.0986	1.1039	1.1077	1.1085
55	10.80	1.1079	1.1045	1.1011	1.0980	1.0953	1.0913	1.0899	1.0902	1.0922	1.0955	1.1002	1.1055	1.1093	1.1102
56	11.00	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
57	11.20	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
58	11.40	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
59	11.60	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
60	11.80	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
61	12.00	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

Table 3
D. C. Cook Unit 2, Cycle 14
IRI Mitigation LP, 3468 MWt, As-Burned Cycle 13
V(Z) Function for a + 3%/-8% AFD Target Band

PT	Height	Burnup (MWD/MTU)													
	(Ft.)	150	1000	2000	3000	4000	6000	8000	10000	12000	14000	16000	18000	20000	20450
1	0.00	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
2	0.20	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
3	0.40	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
4	0.60	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
5	0.80	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
6	1.00	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
7	1.20	1.1590	1.1609	1.1627	1.1636	1.1637	1.1600	1.1539	1.1604	1.1659	1.1705	1.1747	1.1790	1.1865	1.1883
8	1.40	1.1566	1.1579	1.1591	1.1597	1.1597	1.1568	1.1517	1.1566	1.1622	1.1671	1.1718	1.1767	1.1834	1.1850
9	1.60	1.1538	1.1546	1.1553	1.1557	1.1556	1.1534	1.1497	1.1526	1.1581	1.1632	1.1683	1.1738	1.1795	1.1809
10	1.80	1.1504	1.1508	1.1512	1.1514	1.1513	1.1498	1.1475	1.1507	1.1561	1.1607	1.1651	1.1697	1.1745	1.1758
11	2.00	1.1464	1.1467	1.1469	1.1470	1.1470	1.1462	1.1449	1.1494	1.1542	1.1580	1.1613	1.1647	1.1687	1.1698
12	2.20	1.1420	1.1421	1.1423	1.1424	1.1425	1.1423	1.1425	1.1473	1.1512	1.1542	1.1566	1.1590	1.1621	1.1630
13	2.40	1.1371	1.1373	1.1376	1.1379	1.1381	1.1386	1.1409	1.1449	1.1479	1.1500	1.1514	1.1526	1.1548	1.1554
14	2.60	1.1319	1.1328	1.1338	1.1347	1.1354	1.1362	1.1390	1.1420	1.1440	1.1452	1.1455	1.1455	1.1467	1.1471
15	2.80	1.1263	1.1284	1.1305	1.1322	1.1335	1.1346	1.1367	1.1387	1.1398	1.1399	1.1392	1.1380	1.1380	1.1382
16	3.00	1.1200	1.1234	1.1268	1.1295	1.1315	1.1329	1.1340	1.1352	1.1352	1.1343	1.1324	1.1300	1.1287	1.1287
17	3.20	1.1151	1.1193	1.1235	1.1269	1.1293	1.1307	1.1311	1.1317	1.1309	1.1291	1.1260	1.1223	1.1200	1.1198
18	3.40	1.1145	1.1185	1.1224	1.1255	1.1276	1.1285	1.1283	1.1286	1.1275	1.1253	1.1217	1.1176	1.1153	1.1150
19	3.60	1.1166	1.1199	1.1232	1.1256	1.1271	1.1268	1.1256	1.1259	1.1251	1.1236	1.1211	1.1183	1.1181	1.1180
20	3.80	1.1195	1.1215	1.1241	1.1260	1.1269	1.1254	1.1231	1.1235	1.1233	1.1226	1.1215	1.1206	1.1217	1.1220
21	4.00	1.1243	1.1232	1.1246	1.1260	1.1264	1.1239	1.1204	1.1210	1.1215	1.1217	1.1219	1.1228	1.1251	1.1256
22	4.20	1.1288	1.1260	1.1247	1.1254	1.1254	1.1222	1.1173	1.1183	1.1194	1.1206	1.1221	1.1246	1.1279	1.1286
23	4.40	1.1327	1.1284	1.1242	1.1244	1.1235	1.1203	1.1146	1.1157	1.1175	1.1195	1.1220	1.1259	1.1298	1.1307
24	4.60	1.1360	1.1301	1.1241	1.1229	1.1219	1.1180	1.1124	1.1128	1.1152	1.1180	1.1215	1.1266	1.1311	1.1322
25	4.80	1.1387	1.1313	1.1237	1.1210	1.1195	1.1152	1.1099	1.1096	1.1126	1.1161	1.1204	1.1267	1.1318	1.1329
26	5.00	1.1406	1.1318	1.1228	1.1186	1.1167	1.1121	1.1071	1.1063	1.1099	1.1139	1.1189	1.1261	1.1317	1.1329
27	5.20	1.1416	1.1317	1.1215	1.1157	1.1135	1.1086	1.1038	1.1033	1.1072	1.1116	1.1170	1.1248	1.1307	1.1321
28	5.40	1.1417	1.1308	1.1197	1.1123	1.1097	1.1047	1.1003	1.1004	1.1047	1.1092	1.1147	1.1227	1.1289	1.1303
29	5.60	1.1408	1.1291	1.1171	1.1087	1.1059	1.1006	1.0964	1.0971	1.1017	1.1063	1.1117	1.1198	1.1260	1.1275
30	5.80	1.1389	1.1265	1.1138	1.1046	1.1016	1.0962	1.0922	1.0935	1.0982	1.1027	1.1079	1.1160	1.1223	1.1238
31	6.00	1.1356	1.1227	1.1096	1.1001	1.0968	1.0913	1.0874	1.0894	1.0943	1.0986	1.1035	1.1111	1.1173	1.1187
32	6.20	1.1319	1.1187	1.1052	1.0953	1.0917	1.0859	1.0824	1.0848	1.0900	1.0947	1.1000	1.1078	1.1144	1.1158
33	6.40	1.1300	1.1162	1.1020	1.0904	1.0860	1.0804	1.0783	1.0798	1.0857	1.0916	1.0985	1.1082	1.1154	1.1170
34	6.60	1.1281	1.1137	1.0990	1.0870	1.0791	1.0748	1.0759	1.0799	1.0851	1.0913	1.0989	1.1075	1.1144	1.1159
35	6.80	1.1251	1.1115	1.0976	1.0861	1.0772	1.0707	1.0742	1.0805	1.0866	1.0924	1.0987	1.1057	1.1120	1.1134
36	7.00	1.1210	1.1089	1.0964	1.0861	1.0780	1.0693	1.0728	1.0803	1.0867	1.0921	1.0973	1.1031	1.1103	1.1120
37	7.20	1.1158	1.1049	1.0937	1.0844	1.0772	1.0695	1.0721	1.0794	1.0854	1.0903	1.0949	1.1034	1.1107	1.1124
38	7.40	1.1093	1.0999	1.0902	1.0822	1.0760	1.0698	1.0726	1.0778	1.0828	1.0877	1.0952	1.1049	1.1126	1.1143
39	7.60	1.1018	1.0947	1.0874	1.0815	1.0769	1.0726	1.0742	1.0780	1.0824	1.0883	1.0964	1.1055	1.1127	1.1144
40	7.80	1.0924	1.0883	1.0842	1.0809	1.0784	1.0759	1.0768	1.0801	1.0841	1.0895	1.0970	1.1053	1.1118	1.1133
41	8.00	1.0858	1.0840	1.0822	1.0808	1.0797	1.0786	1.0797	1.0825	1.0861	1.0904	1.0969	1.1043	1.1101	1.1114
42	8.20	1.0844	1.0835	1.0825	1.0818	1.0813	1.0808	1.0820	1.0843	1.0873	1.0911	1.0961	1.1025	1.1075	1.1086
43	8.40	1.0838	1.0834	1.0831	1.0828	1.0827	1.0824	1.0835	1.0855	1.0881	1.0912	1.0949	1.1000	1.1040	1.1050
44	8.60	1.0860	1.0856	1.0851	1.0847	1.0844	1.0838	1.0844	1.0862	1.0883	1.0907	1.0935	1.0966	1.0997	1.1004
45	8.80	1.0889	1.0881	1.0873	1.0866	1.0859	1.0847	1.0847	1.0861	1.0877	1.0892	1.0910	1.0929	1.0945	1.0949
46	9.00	1.0908	1.0897	1.0886	1.0875	1.0866	1.0849	1.0845	1.0858	1.0868	1.0877	1.0886	1.0894	1.0904	1.0908
47	9.20	1.0926	1.0911	1.0895	1.0881	1.0868	1.0845	1.0839	1.0852	1.0861	1.0867	1.0871	1.0875	1.0887	1.0891
48	9.40	1.0944	1.0926	1.0906	1.0888	1.0871	1.0842	1.0833	1.0842	1.0850	1.0857	1.0864	1.0871	1.0882	1.0885
49	9.60	1.0975	1.0953	1.0931	1.0909	1.0890	1.0854	1.0840	1.0843	1.0851	1.0861	1.0875	1.0891	1.0909	1.0914
50	9.80	1.1019	1.0996	1.0971	1.0947	1.0925	1.0883	1.0860	1.0864	1.0874	1.0888	1.0908	1.0930	1.0955	1.0961
51	10.00	1.1068	1.1043	1.1017	1.0992	1.0968	1.0921	1.0882	1.0891	1.0904	1.0921	1.0944	1.0969	1.0994	1.1000
52	10.20	1.1111	1.1088	1.1061	1.1036	1.1010	1.0958	1.0909	1.0913	1.0926	1.0944	1.0968	1.0996	1.1019	1.1026
53	10.40	1.1155	1.1131	1.1104	1.1077	1.1050	1.0991	1.0944	1.0947	1.0955	1.0968	1.0988	1.1011	1.1031	1.1037
54	10.60	1.1196	1.1169	1.1139	1.1110	1.1081	1.1021	1.0966	1.0969	1.0982	1.1000	1.1026	1.1055	1.1078	1.1085
55	10.80	1.1232	1.1202	1.1169	1.1137	1.1107	1.1047	1.0993	1.0989	1.1003	1.1024	1.1052	1.1086	1.1110	1.1115
56	11.00	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
57	11.20	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
58	11.40	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
59	11.60	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
60	11.80	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
61	12.00	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000