

**Table 4-209. (Cont'd) Burnup and TH Feedback Parameters by 10 Axial Nodes for Assembly J1**

Assembly Number J1						
Statepoint 15 (94 EFPD Cy 14)				Statepoint 16 (211 EFPD Cy 14)		
Node No.	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )
EFPD	94 Cy 14	94 Cy 14	94 Cy 14	211 Cy 14	211 Cy 14	211 Cy 14
1	2.933	620.6	0.7396	3.703	640.1	0.7396
2	12.426	855.3	0.7375	15.624	925.6	0.7373
3	17.347	972.9	0.6735	21.330	1006.1	0.6741
4	17.890	1018.7	0.5412	21.847	1002.4	0.5439
5	18.177	1037.6	0.4321	22.086	995.2	0.4359
6	17.551	1014.0	0.3584	21.277	969.0	0.3626
7	16.556	992.3	0.2980	20.062	938.2	0.3023
8	14.576	955.3	0.2571	17.818	902.9	0.2615
9	9.366	795.6	0.2315	11.608	782.0	0.2356
10	2.406	611.5	0.2216	2.951	610.0	0.2255

Table 4-210. Burnup and TH Feedback Parameters by 10 Axial Nodes for Assembly J2

Assembly Number J2									
Node No.	Statepoint 9 (BOC Cy 13)			Statepoint 10 (10 EFPD Cy 13)			Statepoint 11 (113 EFPD Cy 13)		
	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )
EFPD	BOC Cy 13	BOC Cy 13	BOC Cy 13	10 Cy 13	10 Cy 13	10 Cy 13	113 Cy 13	113 Cy 13	113 Cy 13
1	0.000		0.7396	0.053	623.3	0.7396	0.683	634.6	0.7396
2	0.000		0.7396	0.213	856.6	0.7396	2.654	901.0	0.7396
3	0.000	Data Not	0.6982	0.312	954.9	0.6982	3.709	991.7	0.6884
4	0.000	Required	0.5838	0.342	1006.3	0.5838	3.925	1022.7	0.5655
5	0.000		0.4704	0.364	1044.3	0.4704	4.086	1047.0	0.4537
6	0.000		0.3893	0.347	1013.9	0.3893	3.900	1017.8	0.3762
7	0.000		0.3247	0.311	953.5	0.3247	3.543	964.5	0.3139
8	0.000		0.2832	0.260	874.6	0.2832	3.000	888.7	0.2733
9	0.000		0.2583	0.163	743.4	0.2583	1.894	752.4	0.2487
10	0.000		0.2490	0.043	606.0	0.2490	0.506	608.6	0.2395

Node No.	Statepoint 12 (224 EFPD Cy 13)			Statepoint 13 (325 EFPD Cy 13)			Statepoint 14 (BOC Cy 14)		
	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )
EFPD	224 Cy 13	224 Cy 13	224 Cy 13	325 Cy 13	325 Cy 13	325 Cy 13	BOC Cy 14	BOC Cy 14	BOC Cy 14
1	1.402	638.8	0.7396	2.060	640.2	0.7396	2.438	633.8	0.7396
2	5.616	953.5	0.7382	8.485	948.7	0.7369	10.114	907.0	0.7370
3	8.088	1105.0	0.6768	12.127	1123.7	0.6693	14.247	1008.2	0.6707
4	8.489	1137.2	0.5415	12.478	1113.9	0.5316	14.632	1018.0	0.5354
5	8.626	1132.9	0.4295	12.580	1107.2	0.4217	14.856	1052.8	0.4262
6	8.140	1081.3	0.3552	12.004	1090.1	0.3489	14.360	1076.6	0.3528
7	7.341	1009.6	0.2964	11.039	1059.4	0.2901	13.466	1097.9	0.2927
8	6.171	916.9	0.2582	9.394	976.5	0.2513	11.688	1058.5	0.2524
9	3.868	763.8	0.2352	5.930	802.4	0.2277	7.487	866.0	0.2275
10	1.030	610.7	0.2266	1.571	618.1	0.2191	1.979	630.4	0.2184

**Table 4-210. (Cont'd) Burnup and TH Feedback Parameters by 10 Axial Nodes for Assembly J2**

Assembly Number J2						
Statepoint 15 (94 EFPD Cy 14)				Statepoint 16 (211 EFPD Cy 14)		
Node No.	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )
EFPD	94 Cy 14	94 Cy 14	94 Cy 14	211 Cy 14	211 Cy 14	211 Cy 14
1	2.677	589.7	0.7396	3.349	629.3	0.7396
2	11.242	701.8	0.7381	14.029	868.6	0.7377
3	15.910	763.6	0.6791	19.307	923.4	0.6792
4	16.592	806.0	0.5561	19.946	917.6	0.5603
5	17.003	833.9	0.4528	20.443	929.2	0.4608
6	16.470	828.3	0.3788	19.898	927.5	0.3874
7	15.449	809.4	0.3163	18.679	901.2	0.3241
8	13.473	780.8	0.2746	16.388	860.9	0.2817
9	8.712	705.6	0.2488	10.664	749.7	0.2550
10	2.259	592.7	0.2360	2.724	602.8	0.2415

Table 4-211. Burnup and TH Feedback Parameters by 10 Axial Nodes for Assembly J3

Assembly Number J3									
Statepoint 9 (BOC Cy 13)			Statepoint 10 (10 EFPD Cy 13)			Statepoint 11 (113 EFPD Cy 13)			
Node No.	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )
EFPD	BOC Cy 13	BOC Cy 13	BOC Cy 13	10 Cy 13	10 Cy 13	10 Cy 13	113 Cy 13	113 Cy 13	113 Cy 13
1	0.000		0.7396	0.054	624.6	0.7396	0.669	632.7	0.7396
2	0.000		0.7396	0.219	865.7	0.7396	2.618	893.9	0.7396
3	0.000	Data Not	0.6962	0.314	959.8	0.6962	3.654	982.0	0.6903
4	0.000	Required	0.5813	0.341	1003.4	0.5813	3.875	1014.5	0.5694
5	0.000		0.4693	0.359	1036.3	0.4693	4.042	1040.1	0.4577
6	0.000		0.3895	0.341	1003.5	0.3895	3.861	1012.2	0.3797
7	0.000		0.3257	0.307	947.5	0.3257	3.523	961.9	0.3170
8	0.000		0.2841	0.262	878.0	0.2841	3.028	892.6	0.2757
9	0.000		0.2586	0.167	748.9	0.2586	1.946	758.4	0.2503
10	0.000		0.2490	0.044	607.0	0.2490	0.520	609.8	0.2408

Statepoint 12 (224 EFPD Cy 13)			Statepoint 13 (325 EFPD Cy 13)			Statepoint 14 (BOC Cy 14)			
Node No.	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )
EFPD	224 Cy 13	224 Cy 13	224 Cy 13	325 Cy 13	325 Cy 13	325 Cy 13	BOC Cy 14	BOC Cy 14	BOC Cy 14
1	1.374	637.2	0.7396	2.049	642.4	0.7396	2.450	638.6	0.7396
2	5.534	945.7	0.7385	8.470	960.4	0.7370	10.183	929.6	0.7370
3	7.962	1092.9	0.6791	12.069	1137.1	0.6702	14.271	1031.4	0.6706
4	8.396	1129.6	0.5456	12.440	1124.7	0.5328	14.657	1035.7	0.5349
5	8.555	1128.1	0.4333	12.551	1115.2	0.4225	14.882	1069.1	0.4251
6	8.073	1076.7	0.3586	11.949	1092.2	0.3494	14.356	1092.1	0.3516
7	7.285	1003.9	0.2993	10.955	1054.3	0.2906	13.415	1108.2	0.2916
8	6.164	911.8	0.2608	9.364	972.8	0.2520	11.675	1063.3	0.2516
9	3.900	761.5	0.2375	5.964	802.6	0.2284	7.539	870.1	0.2268
10	1.035	609.8	0.2287	1.577	618.3	0.2197	1.991	631.5	0.2177

**Table 4-211. (Cont'd) Burnup and TH Feedback Parameters by 10 Axial Nodes for Assembly J3**

Assembly Number J3						
Statepoint 15 (94 EFPD Cy 14)				Statepoint 16 (211 EFPD Cy 14)		
Node No.	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )
EFPD	94 Cy 14	94 Cy 14	94 Cy 14	211 Cy 14	211 Cy 14	211 Cy 14
1	2.678	588.3	0.7396	3.298	623.7	0.7396
2	11.222	689.8	0.7380	13.836	845.4	0.7378
3	15.790	743.8	0.6783	19.183	923.0	0.6790
4	16.538	794.6	0.5554	20.460	997.2	0.5595
5	17.073	840.6	0.4535	21.232	1032.5	0.4572
6	16.585	846.5	0.3799	20.687	1024.0	0.3824
7	15.528	828.7	0.3169	19.338	981.0	0.3184
8	13.516	788.9	0.2743	16.881	919.3	0.2754
9	8.699	697.4	0.2473	10.966	785.0	0.2480
10	2.244	589.7	0.2343	2.799	610.9	0.2350

Table 4-212. Burnup and TH Feedback Parameters by 10 Axial Nodes for Assembly J4

Assembly Number J4									
Statepoint 9 (BOC Cy 13)			Statepoint 10 (10 EFPD Cy 13)			Statepoint 11 (113 EFPD Cy 13)			
Node No.	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )
EFPD	BOC Cy 13	BOC Cy 13	BOC Cy 13	10 Cy 13	10 Cy 13	10 Cy 13	113 Cy 13	113 Cy 13	113 Cy 13
1	0.000		0.7396	0.041	608.3	0.7396	0.620	628.2	0.7396
2	0.000		0.7396	0.164	777.6	0.7396	2.406	867.4	0.7396
3	0.000	Data Not	0.7273	0.240	845.8	0.7273	3.349	944.8	0.6993
4	0.000	Required	0.6431	0.283	910.2	0.6431	3.651	986.5	0.5893
5	0.000		0.5319	0.345	1011.9	0.5319	3.931	1023.3	0.4794
6	0.000		0.4330	0.361	1038.4	0.4330	3.847	1006.5	0.3975
7	0.000		0.3531	0.326	978.2	0.3531	3.553	963.7	0.3302
8	0.000		0.3039	0.267	886.2	0.3039	2.991	886.3	0.2859
9	0.000		0.2755	0.165	746.4	0.2755	1.878	750.1	0.2595
10	0.000		0.2651	0.043	606.0	0.2651	0.497	607.6	0.2497

Statepoint 12 (224 EFPD Cy 13)			Statepoint 13 (325 EFPD Cy 13)			Statepoint 14 (BOC Cy 14)			
Node No.	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )
EFPD	224 Cy 13	224 Cy 13	224 Cy 13	325 Cy 13	325 Cy 13	325 Cy 13	BOC Cy 14	BOC Cy 14	BOC Cy 14
1	1.224	625.5	0.7396	1.824	632.7	0.7396	2.191	631.5	0.7396
2	4.852	870.5	0.7396	7.411	933.9	0.7395	8.965	887.5	0.7394
3	6.986	984.9	0.6960	10.708	1063.9	0.6872	12.783	995.8	0.6869
4	7.662	1043.4	0.5789	11.505	1086.2	0.5638	13.621	1007.0	0.5643
5	8.069	1064.2	0.4666	11.943	1091.8	0.4527	14.174	1039.6	0.4537
6	7.801	1034.1	0.3863	11.598	1077.6	0.3744	13.902	1060.9	0.3754
7	7.297	1001.0	0.3207	10.947	1050.5	0.3101	13.300	1075.6	0.3104
8	6.274	932.7	0.2770	9.469	972.0	0.2670	11.696	1038.8	0.2663
9	3.966	777.4	0.2507	6.031	802.6	0.2409	7.568	861.0	0.2392
10	1.046	613.1	0.2409	1.589	618.3	0.2312	1.995	630.2	0.2291

Table 4-212. (Cont'd) Burnup and TH Feedback Parameters by 10 Axial Nodes for Assembly J4

Assembly Number J4						
Statepoint 15 (94 EFPD Cy 14)				Statepoint 16 (211 EFPD Cy 14)		
Node No.	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )
EFPD	94 Cy 14	94 Cy 14	94 Cy 14	211 Cy 14	211 Cy 14	211 Cy 14
1	2.681	623.2	0.7396	3.170	609.6	0.7396
2	11.154	895.2	0.7396	13.177	792.4	0.7396
3	15.712	962.3	0.6889	18.222	811.6	0.6943
4	16.569	965.8	0.5687	19.220	828.3	0.5818
5	17.117	964.8	0.4595	19.942	849.6	0.4769
6	16.753	948.7	0.3817	19.583	850.1	0.3995
7	16.068	934.3	0.3170	18.856	845.0	0.3337
8	14.279	903.3	0.2729	16.999	836.7	0.2892
9	9.298	774.3	0.2454	11.378	763.4	0.2622
10	2.410	607.8	0.2347	2.927	607.5	0.2498

Table 4-213. Burnup and TH Feedback Parameters by 10 Axial Nodes for Assembly J5

Assembly Number J5									
Node No.	Statepoint 9 (BOC Cy 13)			Statepoint 10 (10 EFPD Cy 13)			Statepoint 11 (113 EFPD Cy 13)		
	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )
EFPD	BOC Cy 13	BOC Cy 13	BOC Cy 13	10 Cy 13	10 Cy 13	10 Cy 13	113 Cy 13	113 Cy 13	113 Cy 13
1	0.000		0.7396	0.047	615.8	0.7396	0.572	621.5	0.7396
2	0.000		0.7396	0.189	816.6	0.7396	2.263	840.4	0.7396
3	0.000	Data Not	0.7158	0.273	895.1	0.7158	3.236	922.0	0.7067
4	0.000	Required	0.6172	0.309	950.1	0.6172	3.597	973.5	0.5999
5	0.000		0.5055	0.338	998.0	0.5055	3.877	1015.4	0.4876
6	0.000		0.4195	0.326	979.2	0.4195	3.754	996.6	0.4040
7	0.000		0.3497	0.299	934.7	0.3497	3.462	953.4	0.3362
8	0.000		0.3036	0.262	877.4	0.3036	3.021	891.4	0.2914
9	0.000		0.2750	0.170	752.7	0.2750	1.961	759.9	0.2637
10	0.000		0.2642	0.045	608.6	0.2642	0.525	610.3	0.2531

Node No.	Statepoint 12 (224 EFPD Cy 13)			Statepoint 13 (325 EFPD Cy 13)			Statepoint 14 (BOC Cy 14)		
	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )
EFPD	224 Cy 13	224 Cy 13	224 Cy 13	325 Cy 13	325 Cy 13	325 Cy 13	BOC Cy 14	BOC Cy 14	BOC Cy 14
1	1.253	634.4	0.7396	1.972	648.2	0.7396	2.426	649.7	0.7396
2	5.067	927.1	0.7396	8.157	1035.2	0.7372	10.068	985.0	0.7365
3	7.421	1072.4	0.6880	11.734	1178.3	0.6716	14.149	1094.5	0.6688
4	8.109	1127.9	0.5617	12.323	1158.4	0.5374	14.687	1078.7	0.5344
5	8.433	1135.7	0.4488	12.557	1140.3	0.4279	15.001	1103.2	0.4255
6	8.007	1083.5	0.3709	12.002	1115.1	0.3533	14.523	1127.3	0.3511
7	7.231	1005.2	0.3092	11.013	1074.7	0.2933	13.605	1149.9	0.2903
8	6.120	906.9	0.2694	9.372	981.5	0.2542	11.810	1101.9	0.2500
9	3.868	756.0	0.2453	5.943	804.1	0.2306	7.601	890.7	0.2252
10	1.028	608.6	0.2362	1.578	619.0	0.2217	2.021	636.8	0.2160



Table 4-213. (Cont'd) Burnup and TH Feedback Parameters by 10 Axial Nodes for Assembly J5

Assembly Number J5						
Statepoint 15 (94 EFPD Cy 14)				Statepoint 16 (211 EFPD Cy 14)		
Node No.	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )
EFPD	94 Cy 14	94 Cy 14	94 Cy 14	211 Cy 14	211 Cy 14	211 Cy 14
1	2.719	596.8	0.7396	3.513	642.8	0.7396
2	11.403	730.8	0.7378	14.648	932.4	0.7368
3	16.049	797.2	0.6776	20.012	1003.2	0.6741
4	16.891	842.8	0.5542	20.921	1013.1	0.5514
5	17.420	876.3	0.4496	21.498	1020.3	0.4482
6	16.920	872.9	0.3741	20.869	1001.1	0.3736
7	15.865	851.2	0.3110	19.581	967.7	0.3112
8	13.781	807.7	0.2689	17.121	915.9	0.2693
9	8.840	707.6	0.2424	11.126	787.1	0.2425
10	2.296	592.1	0.2303	2.862	611.9	0.2303

Table 4-214. Burnup and TH Feedback Parameters by 10 Axial Nodes for Assembly J6

Assembly Number J6									
Statepoint 9 (BOC Cy 13)			Statepoint 10 (10 EFPD Cy 13)			Statepoint 11 (113 EFPD Cy 13)			
Node No.	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )
EFPD	BOC Cy 13	BOC Cy 13	BOC Cy 13	10 Cy 13	10 Cy 13	10 Cy 13	113 Cy 13	113 Cy 13	113 Cy 13
1	0.000		0.7396	0.042	609.6	0.7396	0.560	620.6	0.7396
2	0.000		0.7396	0.168	783.7	0.7396	2.176	829.7	0.7396
3	0.000	Data Not	0.7264	0.244	852.2	0.7264	3.093	904.7	0.7108
4	0.000	Required	0.6405	0.288	916.9	0.6405	3.490	959.6	0.6095
5	0.000		0.5304	0.332	989.5	0.5304	3.825	1007.4	0.4984
6	0.000		0.4373	0.333	989.8	0.4373	3.741	993.3	0.4127
7	0.000		0.3615	0.303	941.6	0.3615	3.436	948.6	0.3429
8	0.000		0.3132	0.253	864.8	0.3132	2.898	874.8	0.2974
9	0.000		0.2846	0.159	738.3	0.2846	1.826	744.4	0.2702
10	0.000		0.2738	0.043	605.4	0.2738	0.489	606.9	0.2601

Statepoint 12 (224 EFPD Cy 13)			Statepoint 13 (325 EFPD Cy 13)			Statepoint 14 (BOC Cy 14)			
Node No.	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )
EFPD	224 Cy 13	224 Cy 13	224 Cy 13	325 Cy 13	325 Cy 13	325 Cy 13	BOC Cy 14	BOC Cy 14	BOC Cy 14
1	1.187	628.1	0.7396	1.848	640.6	0.7396	2.266	642.1	0.7396
2	4.723	886.1	0.7396	7.553	984.5	0.7389	9.331	947.5	0.7382
3	6.936	1016.8	0.6975	11.033	1135.1	0.6819	13.369	1070.7	0.6790
4	7.775	1088.9	0.5788	11.920	1144.4	0.5537	14.231	1063.1	0.5501
5	8.245	1111.8	0.4648	12.350	1136.6	0.4422	14.741	1087.0	0.4395
6	7.918	1070.7	0.3836	11.899	1112.4	0.3647	14.361	1108.8	0.3622
7	7.211	1006.0	0.3185	10.975	1071.4	0.3017	13.495	1126.9	0.2989
8	6.050	914.1	0.2764	9.278	977.5	0.2608	11.641	1079.3	0.2569
9	3.781	761.6	0.2514	5.822	799.4	0.2363	7.427	877.6	0.2314
10	1.009	610.2	0.2421	1.551	618.2	0.2273	1.981	634.5	0.2220

Table 4-214. (Cont'd) Burnup and TH Feedback Parameters by 10 Axial Nodes for Assembly J6

Assembly Number J6						
Statepoint 15 (94 EFPD Cy 14)				Statepoint 16 (211 EFPD Cy 14)		
Node No.	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )
EFPD	94 Cy 14	94 Cy 14	94 Cy 14	211 Cy 14	211 Cy 14	211 Cy 14
1	2.893	642.1	0.7396	3.731	647.7	0.7396
2	12.110	968.2	0.7376	15.545	960.1	0.7370
3	17.011	1097.9	0.6753	21.206	1038.0	0.6737
4	17.873	1097.8	0.5445	22.011	1029.5	0.5435
5	18.378	1096.8	0.4347	22.485	1024.8	0.4347
6	17.855	1068.2	0.3588	21.794	999.7	0.3599
7	16.834	1038.0	0.2965	20.560	968.9	0.2983
8	14.691	984.4	0.2548	18.137	930.1	0.2568
9	9.419	812.8	0.2293	11.850	803.9	0.2312
10	2.467	615.9	0.2201	3.074	615.7	0.2217

Table 4-215. Burnup and TH Feedback Parameters by 10 Axial Nodes for Assembly J7

Assembly Number J7									
Node No.	Statepoint 9 (BOC Cy 13)			Statepoint 10 (10 EFPD Cy 13)			Statepoint 11 (113 EFPD Cy 13)		
	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )
EFPD	BOC Cy 13	BOC Cy 13	BOC Cy 13	10 Cy 13	10 Cy 13	10 Cy 13	113 Cy 13	113 Cy 13	113 Cy 13
1	0.000		0.7396	0.040	607.1	0.7396	0.481	611.2	0.7396
2	0.000		0.7396	0.160	770.7	0.7396	1.888	786.4	0.7396
3	0.000	Data Not	0.7294	0.231	857.7	0.7294	2.741	881.2	0.7270
4	0.000	Required	0.6522	0.270	889.8	0.6522	3.183	914.4	0.6402
5	0.000		0.5498	0.306	945.8	0.5498	3.556	967.3	0.5321
6	0.000		0.4596	0.301	937.8	0.4596	3.505	959.8	0.4423
7	0.000		0.3839	0.281	906.4	0.3839	3.287	928.7	0.3680
8	0.000		0.3324	0.255	867.5	0.3324	2.939	880.3	0.3181
9	0.000		0.2995	0.171	753.9	0.2995	1.964	760.0	0.2866
10	0.000		0.2869	0.046	609.6	0.2869	0.535	611.1	0.2744

Node No.	Statepoint 12 (224 EFPD Cy 13)			Statepoint 13 (325 EFPD Cy 13)			Statepoint 14 (BOC Cy 14)		
	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )
EFPD	224 Cy 13	224 Cy 13	224 Cy 13	325 Cy 13	325 Cy 13	325 Cy 13	BOC Cy 14	BOC Cy 14	BOC Cy 14
1	1.099	627.1	0.7396	1.815	647.8	0.7396	2.273	650.5	0.7396
2	4.390	879.2	0.7396	7.400	1019.3	0.7390	9.310	984.7	0.7379
3	6.518	1006.6	0.7049	10.759	1163.6	0.6829	13.199	1102.1	0.6778
4	7.391	1075.8	0.5941	11.558	1148.8	0.5594	13.925	1079.8	0.5522
5	7.889	1096.9	0.4829	11.953	1128.5	0.4515	14.388	1100.3	0.4449
6	7.578	1053.6	0.4005	11.476	1096.7	0.3740	13.983	1122.7	0.3680
7	6.898	980.8	0.3342	10.530	1047.4	0.3112	13.091	1139.7	0.3047
8	5.899	887.5	0.2914	9.007	957.5	0.2706	11.406	1089.7	0.2630
9	3.788	746.5	0.2651	5.778	792.3	0.2457	7.421	886.6	0.2372
10	1.020	607.1	0.2549	1.556	617.4	0.2362	2.001	637.3	0.2274

Table 4-215. (Cont'd) Burnup and TH Feedback Parameters by 10 Axial Nodes for Assembly J7

Assembly Number J7						
Statepoint 15 (94 EFPD Cy 14)				Statepoint 16 (211 EFPD Cy 14)		
Node No.	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )
EFPD	94 Cy 14	94 Cy 14	94 Cy 14	211 Cy 14	211 Cy 14	211 Cy 14
1	2.536	592.8	0.7396	3.029	610.0	0.7396
2	10.495	709.6	0.7391	12.529	793.9	0.7396
3	14.897	768.4	0.6860	17.420	813.1	0.6915
4	15.892	807.2	0.5713	18.487	821.6	0.5841
5	16.571	839.5	0.4694	19.299	837.7	0.4862
6	16.179	841.3	0.3923	18.926	840.0	0.4099
7	15.225	831.9	0.3274	17.922	833.9	0.3442
8	13.360	805.2	0.2842	15.894	814.5	0.3001
9	8.724	715.9	0.2568	10.499	730.3	0.2720
10	2.311	596.0	0.2441	2.743	599.8	0.2578

Table 4-216. Burnup and TH Feedback Parameters by 10 Axial Nodes for Assembly J8

Assembly Number J8									
Node No.	Statepoint 9 (BOC Cy 13)			Statepoint 10 (10 EFPD Cy 13)			Statepoint 11 (113 EFPD Cy 13)		
	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )
	EFPD BOC Cy 13	BOC Cy 13	BOC Cy 13	10 Cy 13	10 Cy 13	10 Cy 13	113 Cy 13	113 Cy 13	113 Cy 13
1	0.000		0.7396	0.036	602.1	0.7396	0.450	607.9	0.7396
2	0.000		0.7396	0.143	746.1	0.7396	1.760	769.7	0.7396
3	0.000	Data Not	0.7355	0.209	823.6	0.7355	2.551	855.5	0.7310
4	0.000	Required	0.6739	0.251	861.6	0.6739	2.994	888.8	0.6555
5	0.000		0.5765	0.293	925.1	0.5765	3.391	943.0	0.5528
6	0.000		0.4825	0.293	925.1	0.4825	3.362	938.4	0.4617
7	0.000		0.4026	0.270	890.2	0.4026	3.113	903.7	0.3852
8	0.000		0.3502	0.229	830.3	0.3502	2.653	843.1	0.3348
9	0.000		0.3184	0.150	727.4	0.3184	1.718	732.1	0.3043
10	0.000		0.3058	0.044	606.5	0.3058	0.471	604.9	0.2927

Node No.	Statepoint 12 (224 EFPD Cy 13)			Statepoint 13 (325 EFPD Cy 13)			Statepoint 14 (BOC Cy 14)		
	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )
	EFPD 224 Cy 13	224 Cy 13	224 Cy 13	325 Cy 13	325 Cy 13	325 Cy 13	BOC Cy 14	BOC Cy 14	BOC Cy 14
1	0.994	618.7	0.7396	1.619	635.9	0.7396	2.049	644.6	0.7396
2	3.949	831.9	0.7396	6.576	946.1	0.7396	8.377	996.9	0.7396
3	5.891	974.7	0.7178	9.760	1091.2	0.6984	12.158	1089.3	0.6913
4	6.864	1020.9	0.6196	10.849	1113.0	0.5851	13.198	1074.6	0.5746
5	7.482	1056.3	0.5098	11.434	1106.8	0.4765	13.843	1092.5	0.4666
6	7.246	1023.2	0.4237	11.062	1080.9	0.3951	13.540	1113.8	0.3861
7	6.585	959.9	0.3535	10.159	1036.8	0.3282	12.695	1132.0	0.3191
8	5.504	872.9	0.3081	8.543	946.2	0.2848	10.915	1081.9	0.2747
9	3.479	739.1	0.2813	5.393	782.1	0.2592	7.011	880.6	0.2480
10	0.940	605.5	0.2711	1.455	615.2	0.2496	1.899	636.9	0.2381

**Table 4-216. (Cont'd) Burnup and TH Feedback Parameters by 10 Axial Nodes for Assembly J8**

Assembly Number J8						
Statepoint 15 (94 EFPD Cy 14)				Statepoint 16 (211 EFPD Cy 14)		
Node No.	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )
EFPD	94 Cy 14	94 Cy 14	94 Cy 14	211 Cy 14	211 Cy 14	211 Cy 14
1	2.533	622.4	0.7396	2.899	596.6	0.7396
2	10.568	896.1	0.7396	12.122	732.3	0.7396
3	15.336	1007.5	0.6913	17.290	748.8	0.6950
4	16.365	1005.5	0.5742	18.446	762.6	0.5855
5	16.945	993.6	0.4666	19.204	782.5	0.4846
6	16.520	971.4	0.3875	18.823	787.7	0.4087
7	15.553	949.9	0.3215	17.851	787.0	0.3433
8	13.537	909.8	0.2777	15.784	781.2	0.2999
9	8.754	776.2	0.2511	10.774	756.2	0.2808
10	2.319	608.4	0.2406	2.868	610.4	0.2690

Table 4-217. Burnup and TH Feedback Parameters by 10 Axial Nodes for Assembly J9

Assembly Number J9									
Node No.	Statepoint 9 (BOC Cy 13)			Statepoint 10 (10 EFPD Cy 13)			Statepoint 11 (113 EFPD Cy 13)		
	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )
EFPD	BOC Cy 13	BOC Cy 13	BOC Cy 13	10 Cy 13	10 Cy 13	10 Cy 13	113 Cy 13	113 Cy 13	113 Cy 13
1	0.000		0.7396	0.039	605.8	0.7396	0.466	609.5	0.7396
2	0.000		0.7396	0.154	763.3	0.7396	1.846	780.9	0.7396
3	0.000	Data Not	0.7303	0.227	850.0	0.7303	2.703	876.0	0.7281
4	0.000	Required	0.6563	0.267	884.8	0.6563	3.157	911.0	0.6434
5	0.000		0.5554	0.303	941.7	0.5554	3.544	965.6	0.5360
6	0.000		0.4645	0.300	936.2	0.4645	3.495	958.4	0.4457
7	0.000		0.3880	0.278	901.4	0.3880	3.236	921.4	0.3710
8	0.000		0.3372	0.239	844.4	0.3372	2.778	859.3	0.3219
9	0.000		0.3060	0.158	737.0	0.3060	1.809	742.2	0.2919
10	0.000		0.2938	0.044	607.0	0.2938	0.496	607.4	0.2805

Node No.	Statepoint 12 (224 EFPD Cy 13)			Statepoint 13 (325 EFPD Cy 13)			Statepoint 14 (BOC Cy 14)		
	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )
EFPD	224 Cy 13	224 Cy 13	224 Cy 13	325 Cy 13	325 Cy 13	325 Cy 13	BOC Cy 14	BOC Cy 14	BOC Cy 14
1	1.074	626.0	0.7396	1.786	647.2	0.7396	2.249	651.6	0.7396
2	4.328	876.1	0.7396	7.351	1021.8	0.7389	9.292	993.9	0.7378
3	6.471	1045.3	0.7056	10.762	1173.8	0.6825	13.249	1116.3	0.6768
4	7.374	1077.3	0.5955	11.587	1158.1	0.5590	13.979	1087.4	0.5510
5	7.895	1100.0	0.4846	11.988	1134.2	0.4515	14.431	1102.9	0.4442
6	7.583	1056.1	0.4017	11.495	1099.2	0.3741	14.005	1123.7	0.3674
7	6.845	980.5	0.3352	10.470	1046.1	0.3112	13.035	1141.2	0.3043
8	5.705	883.1	0.2925	8.771	950.8	0.2707	11.177	1092.0	0.2625
9	3.605	743.3	0.2671	5.538	784.6	0.2466	7.186	887.9	0.2372
10	0.978	606.6	0.2575	1.497	615.8	0.2376	1.949	638.3	0.2277



Table 4-217. (Cont'd) Burnup and TH Feedback Parameters by 10 Axial Nodes for Assembly J9

Assembly Number J9						
Statepoint 15 (94 EFPD Cy 14)				Statepoint 16 (211 EFPD Cy 14)		
Node No.	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )
EFPD	94 Cy 14	94 Cy 14	94 Cy 14	211 Cy 14	211 Cy 14	211 Cy 14
1	2.805	632.2	0.7396	3.607	643.7	0.7396
2	11.724	904.9	0.7379	14.986	935.0	0.7375
3	16.448	1011.6	0.6776	20.461	1010.6	0.6766
4	17.344	1043.0	0.5519	21.463	1026.4	0.5511
5	17.959	1074.9	0.4444	22.191	1043.8	0.4436
6	17.493	1066.9	0.3675	21.639	1030.6	0.3672
7	16.352	1033.8	0.3042	20.287	999.2	0.3042
8	14.109	963.4	0.2622	17.670	945.9	0.2623
9	9.096	800.5	0.2366	11.551	806.9	0.2364
10	2.415	613.7	0.2271	3.029	616.3	0.2267

Table 4-218. Burnup and TH Feedback Parameters by 10 Axial Nodes for Assembly J10

Assembly Number J10									
Node No.	Statepoint 9 (BOC Cy 13)			Statepoint 10 (10 EFPD Cy 13)			Statepoint 11 (113 EFPD Cy 13)		
	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )
EFPD	BOC Cy 13	BOC Cy 13	BOC Cy 13	10 Cy 13	10 Cy 13	10 Cy 13	113 Cy 13	113 Cy 13	113 Cy 13
1	0.000		0.7396	0.039	605.8	0.7396	0.467	609.6	0.7396
2	0.000		0.7396	0.155	764.8	0.7396	1.852	781.6	0.7396
3	0.000	Data Not	0.7302	0.227	851.5	0.7302	2.711	877.0	0.7279
4	0.000	Required	0.6557	0.267	884.8	0.6557	3.165	912.2	0.6427
5	0.000		0.5545	0.304	942.5	0.5545	3.549	966.5	0.5350
6	0.000		0.4637	0.300	936.7	0.4637	3.501	959.3	0.4448
7	0.000		0.3873	0.278	901.4	0.3873	3.244	922.6	0.3701
8	0.000		0.3366	0.239	844.9	0.3366	2.791	861.1	0.3210
9	0.000		0.3054	0.158	737.0	0.3054	1.820	743.6	0.2911
10	0.000		0.2933	0.044	607.0	0.2933	0.499	607.7	0.2796

Node No.	Statepoint 12 (224 EFPD Cy 13)			Statepoint 13 (325 EFPD Cy 13)			Statepoint 14 (BOC Cy 14)		
	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )
EFPD	224 Cy 13	224 Cy 13	224 Cy 13	325 Cy 13	325 Cy 13	325 Cy 13	BOC Cy 14	BOC Cy 14	BOC Cy 14
1	1.078	626.3	0.7396	1.792	647.5	0.7396	2.250	650.5	0.7396
2	4.344	877.6	0.7396	7.374	1023.4	0.7389	9.299	989.0	0.7378
3	6.493	1047.6	0.7052	10.790	1175.3	0.6821	13.260	1111.1	0.6768
4	7.391	1078.9	0.5946	11.608	1158.9	0.5582	13.991	1084.5	0.5508
5	7.907	1101.0	0.4836	12.004	1135.0	0.4507	14.440	1100.8	0.4439
6	7.593	1056.7	0.4009	11.508	1099.8	0.3734	14.011	1121.6	0.3672
7	6.854	980.7	0.3345	10.482	1046.6	0.3107	13.039	1138.6	0.3040
8	5.720	883.3	0.2919	8.789	951.3	0.2702	11.185	1089.0	0.2624
9	3.618	743.4	0.2665	5.553	785.0	0.2462	7.194	886.1	0.2371
10	0.980	606.6	0.2568	1.502	616.0	0.2371	1.951	637.7	0.2277

Table 4-218. (Cont'd) Burnup and TH Feedback Parameters by 10 Axial Nodes for Assembly J10

Assembly Number J10						
Node No.	Statepoint 15 (94 EFPD Cy 14)			Statepoint 16 (211 EFPD Cy 14)		
	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )
EFPD	94 Cy 14	94 Cy 14	94 Cy 14	211 Cy 14	211 Cy 14	211 Cy 14
1	2.838	636.6	0.7396	3.636	643.2	0.7396
2	11.851	926.4	0.7377	15.100	932.9	0.7373
3	16.583	1034.9	0.6761	20.585	1009.0	0.6755
4	17.448	1060.8	0.5493	21.568	1026.6	0.5491
5	18.049	1091.2	0.4419	22.286	1044.6	0.4416
6	17.582	1083.5	0.3653	21.730	1031.0	0.3654
7	16.441	1050.1	0.3023	20.376	999.1	0.3026
8	14.195	977.3	0.2605	17.755	945.9	0.2609
9	9.159	808.7	0.2351	11.617	807.1	0.2351
10	2.434	615.7	0.2257	3.049	616.3	0.2256

Table 4-219. Burnup and TH Feedback Parameters by 10 Axial Nodes for Assembly J11

Assembly Number J11									
Node No.	Statepoint 9 (BOC Cy 13)			Statepoint 10 (10 EFPD Cy 13)			Statepoint 11 (113 EFPD Cy 13)		
	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )
EFPD	BOC Cy 13	BOC Cy 13	BOC Cy 13	10 Cy 13	10 Cy 13	10 Cy 13	113 Cy 13	113 Cy 13	113 Cy 13
1	0.000		0.7396	0.035	600.9	0.7396	0.401	602.1	0.7396
2	0.000		0.7396	0.134	732.9	0.7396	1.536	738.3	0.7396
3	0.000	Data Not	0.7389	0.191	798.0	0.7389	2.220	809.2	0.7379
4	0.000	Required	0.6892	0.231	833.0	0.6892	2.708	850.4	0.6821
5	0.000		0.5998	0.275	897.2	0.5998	3.230	920.7	0.5858
6	0.000		0.5054	0.279	903.8	0.5054	3.295	930.0	0.4891
7	0.000		0.4222	0.261	876.7	0.4222	3.095	902.3	0.4058
8	0.000		0.3668	0.227	827.0	0.3668	2.671	845.9	0.3510
9	0.000		0.3324	0.151	728.2	0.3324	1.758	736.8	0.3175
10	0.000		0.3189	0.043	605.4	0.3189	0.493	607.2	0.3046

Node No.	Statepoint 12 (224 EFPD Cy 13)			Statepoint 13 (325 EFPD Cy 13)			Statepoint 14 (BOC Cy 14)		
	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )
EFPD	224 Cy 13	224 Cy 13	224 Cy 13	325 Cy 13	325 Cy 13	325 Cy 13	BOC Cy 14	BOC Cy 14	BOC Cy 14
1	0.916	615.4	0.7396	1.534	635.0	0.7396	1.885	628.2	0.7396
2	3.552	806.7	0.7396	6.109	933.3	0.7396	7.614	909.4	0.7396
3	5.267	929.1	0.7252	9.094	1083.5	0.7023	11.254	1019.7	0.6992
4	6.366	988.0	0.6391	10.396	1121.9	0.5962	12.578	1025.6	0.5904
5	7.281	1049.9	0.5337	11.277	1115.2	0.4916	13.485	1033.3	0.4856
6	7.230	1031.2	0.4430	11.007	1074.0	0.4085	13.250	1043.2	0.4035
7	6.609	966.3	0.3680	10.019	1008.1	0.3399	12.285	1049.8	0.3348
8	5.545	875.8	0.3199	8.380	913.9	0.2957	10.504	1009.7	0.2897
9	3.580	746.1	0.2911	5.363	764.6	0.2695	6.826	843.3	0.2624
10	1.000	609.1	0.2797	1.490	612.5	0.2593	1.893	629.8	0.2519

**Table 4-219. (Cont'd) Burnup and TH Feedback Parameters by 10 Axial Nodes for Assembly J11**

Assembly Number J11						
Statepoint 15 (94 EFPD Cy 14)				Statepoint 16 (211 EFPD Cy 14)		
Node No.	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )
EFPD	94 Cy 14	94 Cy 14	94 Cy 14	211 Cy 14	211 Cy 14	211 Cy 14
1	2.429	630.6	0.7396	3.129	632.4	0.7396
2	10.075	948.1	0.7396	13.020	924.0	0.7396
3	14.594	1038.0	0.6948	18.217	954.5	0.6938
4	15.875	1029.9	0.5830	19.462	949.5	0.5828
5	16.739	1021.7	0.4786	20.331	950.2	0.4793
6	16.380	998.5	0.3985	19.864	935.3	0.4004
7	15.346	986.0	0.3312	18.706	918.4	0.3338
8	13.398	956.4	0.2861	16.606	898.3	0.2888
9	8.726	799.0	0.2585	11.030	789.1	0.2607
10	2.346	612.1	0.2485	2.911	611.9	0.2501

Table 4-220. Burnup and TH Feedback Parameters by 10 Axial Nodes for Assembly J12

Assembly Number J12									
Node No.	Statepoint 9 (BOC Cy 13)			Statepoint 10 (10 EFPD Cy 13)			Statepoint 11 (113 EFPD Cy 13)		
	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )
EFPD	BOC Cy 13	BOC Cy 13	BOC Cy 13	10 Cy 13	10 Cy 13	10 Cy 13	113 Cy 13	113 Cy 13	113 Cy 13
1	0.000		0.7396	0.043	610.8	0.7396	0.535	617.4	0.7396
2	0.000		0.7396	0.174	792.2	0.7396	2.112	818.7	0.7396
3	0.000	Data Not	0.7247	0.252	863.8	0.7247	3.035	894.8	0.7160
4	0.000	Required	0.6357	0.292	923.1	0.6357	3.443	951.5	0.6167
5	0.000		0.5258	0.327	981.1	0.5258	3.775	999.9	0.5046
6	0.000		0.4360	0.321	970.3	0.4360	3.684	985.8	0.4180
7	0.000		0.3628	0.294	926.8	0.3628	3.388	942.4	0.3475
8	0.000		0.3151	0.250	860.4	0.3151	2.888	873.8	0.3016
9	0.000		0.2863	0.160	740.0	0.2863	1.844	746.4	0.2738
10	0.000		0.2753	0.044	607.0	0.2753	0.496	607.4	0.2633

Node No.	Statepoint 12 (224 EFPD Cy 13)			Statepoint 13 (325 EFPD Cy 13)			Statepoint 14 (BOC Cy 14)		
	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )
EFPD	224 Cy 13	224 Cy 13	224 Cy 13	325 Cy 13	325 Cy 13	325 Cy 13	BOC Cy 14	BOC Cy 14	BOC Cy 14
1	1.180	630.2	0.7396	1.874	644.9	0.7396	2.321	648.2	0.7396
2	4.747	900.1	0.7396	7.715	1011.2	0.7384	9.607	979.4	0.7376
3	6.997	1035.9	0.6967	11.222	1160.5	0.6787	13.652	1098.8	0.6747
4	7.821	1104.6	0.5768	12.012	1153.6	0.5491	14.376	1079.0	0.5441
5	8.262	1123.6	0.4631	12.375	1138.0	0.4388	14.808	1099.7	0.4346
6	7.896	1076.6	0.3825	11.879	1112.7	0.3622	14.388	1123.4	0.3585
7	7.128	1000.7	0.3184	10.893	1071.7	0.3002	13.479	1147.7	0.2960
8	5.953	902.0	0.2772	9.168	975.3	0.2601	11.603	1101.1	0.2547
9	3.728	753.3	0.2527	5.757	797.8	0.2362	7.416	890.6	0.2295
10	0.995	608.3	0.2435	1.535	617.9	0.2274	1.982	637.5	0.2203

**Table 4-220. (Cont'd) Burnup and TH Feedback Parameters by 10 Axial Nodes for Assembly J12**

Assembly Number J12						
Statepoint 15 (94 EFPD Cy 14)				Statepoint 16 (211 EFPD Cy 14)		
Node No.	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )
EFPD	94 Cy 14	94 Cy 14	94 Cy 14	211 Cy 14	211 Cy 14	211 Cy 14
1	2.808	622.8	0.7396	3.692	652.8	0.7396
2	11.789	862.0	0.7382	15.422	989.9	0.7369
3	16.710	985.7	0.6781	21.209	1085.7	0.6731
4	17.743	1043.3	0.5494	22.173	1074.7	0.5431
5	18.348	1077.4	0.4389	22.728	1066.7	0.4343
6	17.834	1058.8	0.3619	22.026	1037.6	0.3589
7	16.705	1016.5	0.2990	20.606	994.2	0.2972
8	14.435	945.6	0.2573	17.899	932.8	0.2562
9	9.244	788.6	0.2319	11.579	792.8	0.2308
10	2.430	611.6	0.2223	3.012	613.3	0.2214

Table 4-221. Burnup and TH Feedback Parameters by 10 Axial Nodes for Assembly J13

Assembly Number J13									
Node No.	Statepoint 9 (BOC Cy 13)			Statepoint 10 (10 EFPD Cy 13)			Statepoint 11 (113 EFPD Cy 13)		
	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )
EFPD	BOC Cy 13	BOC Cy 13	BOC Cy 13	10 Cy 13	10 Cy 13	10 Cy 13	113 Cy 13	113 Cy 13	113 Cy 13
1	0.000		0.7396	0.043	610.8	0.7396	0.537	617.7	0.7396
2	0.000		0.7396	0.175	793.8	0.7396	2.118	819.6	0.7396
3	0.000	Data Not	0.7245	0.253	864.6	0.7245	3.044	896.0	0.7156
4	0.000	Required	0.6351	0.293	924.7	0.6351	3.452	952.7	0.6159
5	0.000		0.5250	0.328	981.9	0.5250	3.783	1001.0	0.5037
6	0.000		0.4354	0.321	970.8	0.4354	3.690	986.7	0.4172
7	0.000		0.3623	0.294	927.3	0.3623	3.395	943.5	0.3469
8	0.000		0.3147	0.250	860.4	0.3147	2.900	875.4	0.3009
9	0.000		0.2859	0.161	740.4	0.2859	1.853	747.5	0.2731
10	0.000		0.2749	0.044	607.0	0.2749	0.498	607.7	0.2626

Node No.	Statepoint 12 (224 EFPD Cy 13)			Statepoint 13 (325 EFPD Cy 13)			Statepoint 14 (BOC Cy 14)		
	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )
EFPD	224 Cy 13	224 Cy 13	224 Cy 13	325 Cy 13	325 Cy 13	325 Cy 13	BOC Cy 14	BOC Cy 14	BOC Cy 14
1	1.184	630.5	0.7396	1.880	645.1	0.7396	2.325	647.8	0.7396
2	4.764	901.7	0.7396	7.741	1013.0	0.7384	9.623	976.9	0.7375
3	7.020	1038.1	0.6962	11.254	1162.3	0.6783	13.674	1096.0	0.6745
4	7.840	1106.5	0.5759	12.036	1154.6	0.5484	14.397	1078.1	0.5436
5	8.277	1124.8	0.4623	12.393	1138.8	0.4381	14.825	1099.4	0.4342
6	7.906	1077.3	0.3818	11.893	1113.5	0.3616	14.400	1123.0	0.3581
7	7.138	1001.0	0.3178	10.905	1072.2	0.2998	13.489	1146.9	0.2958
8	5.966	902.2	0.2767	9.183	975.8	0.2597	11.614	1099.7	0.2545
9	3.738	753.5	0.2522	5.770	798.2	0.2358	7.425	889.7	0.2294
10	0.998	608.3	0.2430	1.538	618.0	0.2269	1.984	637.4	0.2201



Table 4-221. (Cont'd) Burnup and TH Feedback Parameters by 10 Axial Nodes for Assembly J13

Assembly Number J13						
Statepoint 15 (94 EFPD Cy 14)				Statepoint 16 (211 EFPD Cy 14)		
Node No.	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )
EFPD	94 Cy 14	94 Cy 14	94 Cy 14	211 Cy 14	211 Cy 14	211 Cy 14
1	2.583	592.2	0.7396	3.314	635.8	0.7396
2	10.832	712.8	0.7387	13.855	901.0	0.7377
3	15.455	780.1	0.6829	19.131	961.8	0.6801
4	16.485	825.1	0.5633	20.082	950.8	0.5629
5	17.102	854.1	0.4588	20.766	960.0	0.4621
6	16.637	847.6	0.3819	20.267	955.5	0.3862
7	15.588	826.8	0.3174	18.994	924.6	0.3216
8	13.496	794.6	0.2750	16.550	878.5	0.2789
9	8.714	714.0	0.2489	10.750	758.9	0.2522
10	2.282	594.6	0.2362	2.769	604.8	0.2393

Table 4-222. Burnup and TH Feedback Parameters by 10 Axial Nodes for Assembly J14

Assembly Number J14									
Node No.	Statepoint 9 (BOC Cy 13)			Statepoint 10 (10 EFPD Cy 13)			Statepoint 11 (113 EFPD Cy 13)		
	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )
EFPD	BOC Cy 13	BOC Cy 13	BOC Cy 13	10 Cy 13	10 Cy 13	10 Cy 13	113 Cy 13	113 Cy 13	113 Cy 13
1	0.000		0.7396	0.049	618.3	0.7396	0.562	620.0	0.7396
2	0.000		0.7396	0.192	821.3	0.7396	2.164	823.9	0.7396
3	0.000	Data Not	0.7151	0.271	890.5	0.7151	3.030	891.3	0.7150
4	0.000	Required	0.6198	0.298	932.5	0.6198	3.333	933.1	0.6181
5	0.000		0.5130	0.319	967.8	0.5130	3.583	969.4	0.5102
6	0.000		0.4298	0.306	945.3	0.4298	3.470	953.6	0.4264
7	0.000		0.3614	0.280	905.4	0.3614	3.243	921.9	0.3569
8	0.000		0.3146	0.260	875.3	0.3146	2.974	884.5	0.3094
9	0.000		0.2837	0.178	762.6	0.2837	2.038	768.6	0.2785
10	0.000		0.2718	0.047	610.2	0.2718	0.548	612.4	0.2665

Node No.	Statepoint 12 (224 EFPD Cy 13)			Statepoint 13 (325 EFPD Cy 13)			Statepoint 14 (BOC Cy 14)		
	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )
EFPD	224 Cy 13	224 Cy 13	224 Cy 13	325 Cy 13	325 Cy 13	325 Cy 13	BOC Cy 14	BOC Cy 14	BOC Cy 14
1	1.129	621.3	0.7396	1.719	631.4	0.7396	2.116	637.7	0.7396
2	4.448	846.0	0.7396	6.938	921.2	0.7396	8.615	958.6	0.7396
3	6.461	954.0	0.7084	10.084	1045.9	0.6975	12.319	1040.8	0.6932
4	7.179	1017.0	0.6014	10.906	1064.5	0.5820	13.136	1039.6	0.5759
5	7.582	1041.5	0.4900	11.321	1066.7	0.4712	13.648	1067.7	0.4656
6	7.257	1007.7	0.4078	10.882	1046.0	0.3913	13.278	1088.5	0.3860
7	6.660	951.9	0.3413	10.086	1010.7	0.3261	12.519	1099.8	0.3203
8	5.873	879.1	0.2970	8.904	944.7	0.2829	11.177	1052.5	0.2764
9	3.868	747.1	0.2691	5.881	795.4	0.2557	7.441	866.6	0.2487
10	1.027	606.4	0.2585	1.561	617.3	0.2454	1.974	631.5	0.2382

Table 4-222. (Cont'd) Burnup and TH Feedback Parameters by 10 Axial Nodes for Assembly J14

Assembly Number J14						
Statepoint 15 (94 EFPD Cy 14)				Statepoint 16 (211 EFPD Cy 14)		
Node No.	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )
EFPD	94 Cy 14	94 Cy 14	94 Cy 14	211 Cy 14	211 Cy 14	211 Cy 14
1	2.557	616.5	0.7396	3.280	634.9	0.7396
2	10.646	866.7	0.7396	13.724	944.7	0.7396
3	15.212	956.1	0.6952	19.074	988.5	0.6925
4	16.242	994.1	0.5791	20.034	978.5	0.5770
5	16.847	1011.3	0.4688	20.582	970.3	0.4685
6	16.360	989.8	0.3892	19.929	947.0	0.3904
7	15.462	964.8	0.3234	18.827	919.1	0.3255
8	13.864	920.7	0.2792	16.949	882.4	0.2816
9	9.183	776.1	0.2511	11.304	768.3	0.2536
10	2.387	607.7	0.2403	2.900	607.1	0.2427

Table 4-223. Burnup and TH Feedback Parameters by 10 Axial Nodes for Assembly J15

Assembly Number J15									
Statepoint 9 (BOC Cy 13)			Statepoint 10 (10 EFPD Cy 13)			Statepoint 11 (113 EFPD Cy 13)			
Node No.	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )
EFPD	BOC Cy 13	BOC Cy 13	BOC Cy 13	10 Cy 13	10 Cy 13	10 Cy 13	113 Cy 13	113 Cy 13	113 Cy 13
1	0.000		0.7396	0.052	622.1	0.7396	0.722	639.6	0.7396
2	0.000		0.7396	0.216	860.9	0.7396	2.878	939.9	0.7379
3	0.000	Data Not	0.6963	0.314	959.8	0.6963	3.973	1036.0	0.6769
4	0.000	Required	0.5800	0.345	1011.5	0.5800	4.108	1054.2	0.5461
5	0.000		0.4648	0.379	1071.5	0.4648	4.240	1071.9	0.4355
6	0.000		0.3810	0.371	1056.4	0.3810	4.048	1039.3	0.3605
7	0.000		0.3148	0.331	986.7	0.3148	3.670	982.0	0.3004
8	0.000		0.2734	0.270	889.8	0.2734	3.067	897.3	0.2614
9	0.000		0.2492	0.165	745.6	0.2492	1.902	753.2	0.2380
10	0.000		0.2404	0.043	605.4	0.2404	0.497	607.6	0.2294

Statepoint 12 (224 EFPD Cy 13)			Statepoint 13 (325 EFPD Cy 13)			Statepoint 14 (BOC Cy 14)			
Node No.	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )
EFPD	224 Cy 13	224 Cy 13	224 Cy 13	325 Cy 13	325 Cy 13	325 Cy 13	BOC Cy 14	BOC Cy 14	BOC Cy 14
1	1.447	639.5	0.7396	2.103	639.9	0.7396	2.477	633.0	0.7396
2	5.906	924.4	0.7371	8.756	945.4	0.7361	10.354	898.9	0.7364
3	8.358	1106.0	0.6703	12.307	1106.4	0.6652	14.370	992.3	0.6677
4	8.640	1131.5	0.5318	12.590	1106.3	0.5260	14.711	1008.6	0.5314
5	8.752	1128.0	0.4207	12.708	1107.6	0.4167	14.960	1045.7	0.4227
6	8.287	1081.0	0.3476	12.176	1094.8	0.3445	14.507	1069.3	0.3498
7	7.551	1022.6	0.2895	11.300	1068.7	0.2860	13.704	1091.0	0.2900
8	6.381	937.2	0.2514	9.659	986.0	0.2470	11.948	1056.8	0.2496
9	3.985	776.9	0.2285	6.096	809.2	0.2233	7.669	869.6	0.2246
10	1.038	612.4	0.2200	1.586	618.8	0.2147	1.993	630.5	0.2153

**Table 4-223. (Cont'd) Burnup and TH Feedback Parameters by 10 Axial Nodes for Assembly J15**

Assembly Number J15						
Statepoint 15 (94 EFPD Cy 14)				Statepoint 16 (211 EFPD Cy 14)		
Node No.	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )
EFPD	94 Cy 14	94 Cy 14	94 Cy 14	211 Cy 14	211 Cy 14	211 Cy 14
1	2.691	586.4	0.7396	3.225	614.4	0.7396
2	11.342	682.8	0.7375	13.570	796.6	0.7381
3	15.797	731.6	0.6754	18.582	844.6	0.6809
4	16.399	767.0	0.5517	19.271	855.4	0.5641
5	16.831	793.0	0.4501	19.774	864.2	0.4651
6	16.386	794.1	0.3780	19.262	855.9	0.3931
7	15.828	831.1	0.3193	18.612	844.6	0.3336
8	14.581	911.4	0.2817	17.555	868.3	0.2972
9	9.464	783.9	0.2522	11.604	770.4	0.2664
10	2.400	606.9	0.2377	2.910	606.9	0.2506

Table 4-224. Burnup and TH Feedback Parameters by 10 Axial Nodes for Assembly J16

Assembly Number J16									
Statepoint 9 (BOC Cy 13)			Statepoint 10 (10 EFPD Cy 13)			Statepoint 11 (113 EFPD Cy 13)			
Node No.	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )
EFPD	BOC Cy 13	BOC Cy 13	BOC Cy 13	10 Cy 13	10 Cy 13	10 Cy 13	113 Cy 13	113 Cy 13	113 Cy 13
1	0.000		0.7396	0.037	603.4	0.7396	0.434	605.8	0.7396
2	0.000		0.7396	0.146	749.8	0.7396	1.676	756.8	0.7396
3	0.000	Data Not	0.7352	0.208	822.2	0.7352	2.409	834.3	0.7337
4	0.000	Required	0.6744	0.246	854.8	0.6744	2.880	872.9	0.6660
5	0.000		0.5793	0.288	916.5	0.5793	3.355	938.2	0.5650
6	0.000		0.4863	0.288	917.8	0.4863	3.383	942.4	0.4708
7	0.000		0.4064	0.268	887.2	0.4064	3.162	911.4	0.3911
8	0.000		0.3533	0.231	833.5	0.3533	2.722	852.5	0.3385
9	0.000		0.3203	0.155	732.8	0.3203	1.791	740.4	0.3065
10	0.000		0.3075	0.043	606.0	0.3075	0.494	607.3	0.2942

Statepoint 12 (224 EFPD Cy 13)			Statepoint 13 (325 EFPD Cy 13)			Statepoint 14 (BOC Cy 14)			
Node No.	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )
EFPD	224 Cy 13	224 Cy 13	224 Cy 13	325 Cy 13	325 Cy 13	325 Cy 13	BOC Cy 14	BOC Cy 14	BOC Cy 14
1	1.000	621.2	0.7396	1.652	639.4	0.7396	2.030	633.8	0.7396
2	3.910	838.4	0.7396	6.602	958.2	0.7396	8.194	934.0	0.7396
3	5.740	973.3	0.7172	9.637	1096.5	0.6962	11.809	1022.9	0.6934
4	6.749	1020.7	0.6214	10.746	1115.5	0.5846	12.916	1022.2	0.5800
5	7.525	1069.4	0.5133	11.473	1106.0	0.4784	13.695	1037.1	0.4739
6	7.389	1042.6	0.4256	11.145	1070.0	0.3971	13.425	1054.1	0.3933
7	6.724	973.5	0.3541	10.151	1011.0	0.3305	12.478	1068.0	0.3264
8	5.630	880.5	0.3081	8.504	919.8	0.2876	10.712	1033.4	0.2822
9	3.615	746.4	0.2806	5.432	769.1	0.2619	6.969	860.8	0.2552
10	0.993	608.2	0.2699	1.485	612.9	0.2520	1.906	633.0	0.2449

Table 4-224. (Cont'd) Burnup and TH Feedback Parameters by 10 Axial Nodes for Assembly J16

Assembly Number J16						
Statepoint 15 (94 EFPD Cy 14)				Statepoint 16 (211 EFPD Cy 14)		
Node No.	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )
EFPD	94 Cy 14	94 Cy 14	94 Cy 14	211 Cy 14	211 Cy 14	211 Cy 14
1	2.384	604.9	0.7396	3.032	626.7	0.7396
2	9.825	796.4	0.7396	12.557	892.2	0.7396
3	14.176	868.3	0.6991	17.566	922.4	0.6987
4	15.534	909.0	0.5908	18.878	916.2	0.5926
5	16.458	933.4	0.4855	19.826	919.5	0.4893
6	16.115	920.9	0.4043	19.410	909.7	0.4092
7	15.033	898.4	0.3367	18.193	892.1	0.3420
8	13.004	856.5	0.2918	15.915	860.4	0.2971
9	8.457	740.7	0.2638	10.444	753.4	0.2687
10	2.255	600.4	0.2522	2.731	603.8	0.2565

Table 4-225. Burnup and TH Feedback Parameters by 10 Axial Nodes for Assembly K1

Assembly Number K1									
Statepoint 9 (BOC Cy 13)			Statepoint 10 (10 EFPD Cy 13)			Statepoint 11 (113 EFPD Cy 13)			
Node No.	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )
EFPD	BOC Cy 13	BOC Cy 13	BOC Cy 13	10 Cy 13	10 Cy 13	10 Cy 13	113 Cy 13	113 Cy 13	113 Cy 13
1	0.000		0.7396	0.048	617.1	0.7396	0.573	621.6	0.7396
2	0.000		0.7396	0.220	867.8	0.7396	2.555	883.6	0.7396
3	0.000	Data Not	0.6957	0.313	957.1	0.6957	3.583	971.4	0.6923
4	0.000	Required	0.5804	0.339	1001.2	0.5804	3.844	1010.3	0.5723
5	0.000		0.4680	0.358	1034.3	0.4680	4.029	1038.8	0.4597
6	0.000		0.3880	0.342	1005.9	0.3880	3.868	1013.9	0.3806
7	0.000		0.3236	0.313	957.2	0.3236	3.588	972.0	0.3167
8	0.000		0.2802	0.289	919.4	0.2802	3.266	924.8	0.2737
9	0.000		0.2518	0.197	787.5	0.2518	2.231	791.7	0.2458
10	0.000		0.2411	0.046	609.2	0.2411	0.541	611.9	0.2352

Statepoint 12 (224 EFPD Cy 13)			Statepoint 13 (325 EFPD Cy 13)			Statepoint 14 (BOC Cy 14)			
Node No.	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )
EFPD	224 Cy 13	224 Cy 13	224 Cy 13	325 Cy 13	325 Cy 13	325 Cy 13	BOC Cy 14	BOC Cy 14	BOC Cy 14
1	1.217	630.2	0.7396	1.911	645.0	0.7396	2.366	650.0	0.7396
2	5.496	950.2	0.7385	8.657	1001.2	0.7363	10.608	997.5	0.7357
3	7.854	1087.5	0.6795	12.031	1151.6	0.6672	14.382	1075.8	0.6651
4	8.330	1124.2	0.5469	12.392	1129.0	0.5300	14.709	1065.9	0.5283
5	8.510	1123.3	0.4344	12.522	1119.3	0.4201	14.941	1096.2	0.4192
6	8.053	1072.8	0.3591	11.958	1098.7	0.3470	14.462	1122.6	0.3460
7	7.325	1000.8	0.2994	11.036	1062.3	0.2882	13.607	1144.0	0.2863
8	6.395	911.4	0.2604	9.660	984.1	0.2496	12.094	1101.5	0.2465
9	4.204	764.0	0.2358	6.377	817.9	0.2253	8.085	903.2	0.2212
10	1.018	606.2	0.2264	1.559	618.3	0.2158	1.992	635.0	0.2114



Table 4-225. (Cont'd) Burnup and TH Feedback Parameters by 10 Axial Nodes for Assembly K1

Assembly Number K1						
Statepoint 15 (94 EFPD Cy 14)				Statepoint 16 (211 EFPD Cy 14)		
Node No.	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )
EFPD	94 Cy 14	94 Cy 14	94 Cy 14	211 Cy 14	211 Cy 14	211 Cy 14
1	3.020	645.9	0.7396	3.714	631.8	0.7396
2	13.493	989.1	0.7354	16.296	871.4	0.7360
3	18.021	1098.0	0.6636	21.436	926.5	0.6683
4	18.266	1081.5	0.5267	21.764	937.7	0.5369
5	18.431	1068.4	0.4186	22.014	949.3	0.4303
6	17.809	1040.3	0.3463	21.306	937.5	0.3576
7	16.816	1013.9	0.2872	20.175	918.9	0.2976
8	15.044	966.9	0.2475	18.214	893.8	0.2571
9	10.085	814.0	0.2222	12.477	799.2	0.2317
10	2.460	613.9	0.2124	3.053	614.5	0.2214

Table 4-226. Burnup and TH Feedback Parameters by 10 Axial Nodes for Assembly K2

Assembly Number K2									
Node No.	Statepoint 9 (BOC Cy 13)			Statepoint 10 (10 EFPD Cy 13)			Statepoint 11 (113 EFPD Cy 13)		
	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )
EFPD	BOC Cy 13	BOC Cy 13	BOC Cy 13	10 Cy 13	10 Cy 13	10 Cy 13	113 Cy 13	113 Cy 13	113 Cy 13
1	0.000		0.7396	0.036	602.2	0.7396	0.427	605.2	0.7396
2	0.000		0.7396	0.164	778.6	0.7396	1.909	789.2	0.7396
3	0.000	Data Not	0.7282	0.237	842.5	0.7282	2.766	858.2	0.7263
4	0.000	Required	0.6473	0.276	899.3	0.6473	3.210	918.1	0.6381
5	0.000		0.5427	0.310	953.6	0.5427	3.586	972.0	0.5290
6	0.000		0.4524	0.307	948.0	0.4524	3.551	967.0	0.4388
7	0.000		0.3773	0.283	910.6	0.3773	3.290	929.3	0.3645
8	0.000		0.3279	0.242	849.1	0.3279	2.824	866.0	0.3159
9	0.000		0.2972	0.166	746.7	0.2972	1.890	751.6	0.2860
10	0.000		0.2850	0.044	607.1	0.2850	0.474	605.2	0.2745

Node No.	Statepoint 12 (224 EFPD Cy 13)			Statepoint 13 (325 EFPD Cy 13)			Statepoint 14 (BOC Cy 14)		
	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )
EFPD	224 Cy 13	224 Cy 13	224 Cy 13	325 Cy 13	325 Cy 13	325 Cy 13	BOC Cy 14	BOC Cy 14	BOC Cy 14
1	0.993	621.2	0.7396	1.666	642.2	0.7396	2.095	644.5	0.7396
2	4.452	885.9	0.7396	7.499	1026.5	0.7388	9.358	971.0	0.7380
3	6.507	1001.5	0.7042	10.634	1141.7	0.6833	12.910	1053.9	0.6797
4	7.337	1063.0	0.5942	11.351	1119.7	0.5621	13.565	1035.8	0.5574
5	7.848	1085.8	0.4834	11.766	1101.0	0.4549	14.047	1055.0	0.4508
6	7.587	1048.3	0.4005	11.350	1071.9	0.3772	13.716	1080.2	0.3736
7	6.870	976.8	0.3336	10.368	1024.1	0.3139	12.821	1106.7	0.3098
8	5.754	883.9	0.2907	8.738	937.8	0.2728	11.104	1080.7	0.2672
9	3.741	749.6	0.2649	5.668	784.0	0.2482	7.359	898.7	0.2410
10	0.934	604.6	0.2548	1.423	612.5	0.2385	1.867	637.0	0.2306

Table 4-226. (Cont'd) Burnup and TH Feedback Parameters by 10 Axial Nodes for Assembly K2

Assembly Number K2						
Statepoint 15 (94 EFPD Cy 14)				Statepoint 16 (211 EFPD Cy 14)		
Node No.	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )
EFPD	94 Cy 14	94 Cy 14	94 Cy 14	211 Cy 14	211 Cy 14	211 Cy 14
1	2.484	609.6	0.7396	3.106	624.0	0.7396
2	11.150	799.6	0.7391	13.759	845.3	0.7394
3	15.359	881.7	0.6862	18.570	899.1	0.6892
4	16.258	921.9	0.5696	19.496	902.8	0.5766
5	16.880	946.0	0.4636	20.153	907.4	0.4725
6	16.478	933.8	0.3855	19.663	895.8	0.3948
7	15.480	916.3	0.3208	18.539	879.4	0.3300
8	13.558	882.6	0.2775	16.411	853.5	0.2864
9	9.018	764.4	0.2502	11.057	759.2	0.2588
10	2.239	603.2	0.2385	2.715	603.8	0.2465

Table 4-227. Burnup and TH Feedback Parameters by 10 Axial Nodes for Assembly K3

Assembly Number K3									
Statepoint 9 (BOC Cy 13)			Statepoint 10 (10 EFPD Cy 13)			Statepoint 11 (113 EFPD Cy 13)			
Node No.	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )
EFPD	BOC Cy 13	BOC Cy 13	BOC Cy 13	10 Cy 13	10 Cy 13	10 Cy 13	113 Cy 13	113 Cy 13	113 Cy 13
1	0.000		0.7396	0.045	613.3	0.7396	0.524	615.9	0.7396
2	0.000		0.7396	0.201	836.2	0.7396	2.333	850.1	0.7396
3	0.000	Data Not	0.7061	0.285	913.2	0.7061	3.322	934.2	0.7017
4	0.000	Required	0.6022	0.318	966.0	0.6022	3.701	989.8	0.5901
5	0.000		0.4906	0.347	1015.0	0.4906	4.001	1035.8	0.4762
6	0.000		0.4061	0.338	1000.1	0.4061	3.906	1021.0	0.3927
7	0.000		0.3371	0.314	958.8	0.3371	3.639	980.3	0.3249
8	0.000		0.2912	0.281	906.6	0.2912	3.218	918.9	0.2802
9	0.000		0.2621	0.189	777.6	0.2621	2.154	782.5	0.2522
10	0.000		0.2511	0.046	609.2	0.2511	0.529	610.7	0.2415

Statepoint 12 (224 EFPD Cy 13)			Statepoint 13 (325 EFPD Cy 13)			Statepoint 14 (BOC Cy 14)			
Node No.	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )
EFPD	224 Cy 13	224 Cy 13	224 Cy 13	325 Cy 13	325 Cy 13	325 Cy 13	BOC Cy 14	BOC Cy 14	BOC Cy 14
1	1.218	636.0	0.7396	1.994	655.8	0.7396	2.442	648.5	0.7396
2	5.484	985.8	0.7378	8.983	1064.6	0.7342	10.887	984.1	0.7341
3	7.851	1132.0	0.6752	12.320	1211.5	0.6568	14.602	1055.5	0.6573
4	8.407	1163.4	0.5431	12.616	1158.3	0.5197	14.851	1041.8	0.5212
5	8.689	1160.3	0.4321	12.777	1134.0	0.4133	15.095	1066.1	0.4152
6	8.287	1106.2	0.3565	12.221	1104.1	0.3416	14.624	1091.7	0.3433
7	7.522	1023.7	0.2964	11.204	1057.2	0.2839	13.692	1117.7	0.2847
8	6.408	920.0	0.2578	9.583	969.2	0.2464	11.995	1094.5	0.2457
9	4.152	766.9	0.2340	6.215	802.6	0.2233	7.939	907.2	0.2211
10	1.020	607.6	0.2247	1.536	615.5	0.2142	1.977	636.6	0.2114

**Table 4-227. (Cont'd) Burnup and TH Feedback Parameters by 10 Axial Nodes for Assembly K3**

Assembly Number K3						
Statepoint 15 (94 EFPD Cy 14)				Statepoint 16 (211 EFPD Cy 14)		
Node No.	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )
EFPD	94 Cy 14	94 Cy 14	94 Cy 14	211 Cy 14	211 Cy 14	211 Cy 14
1	2.902	619.2	0.7396	3.735	647.2	0.7396
2	12.979	847.5	0.7353	16.374	954.7	0.7351
3	17.495	956.7	0.6643	21.665	1035.0	0.6644
4	18.053	1012.7	0.5326	22.156	1024.8	0.5339
5	18.439	1039.6	0.4256	22.499	1018.3	0.4279
6	17.851	1017.4	0.3521	21.750	994.5	0.3550
7	16.713	979.4	0.2922	20.365	959.1	0.2953
8	14.684	921.7	0.2523	17.964	908.4	0.2554
9	9.735	784.1	0.2271	12.001	784.9	0.2301
10	2.391	607.8	0.2169	2.934	609.9	0.2197

Table 4-228. Burnup and TH Feedback Parameters by 10 Axial Nodes for Assembly K4

Assembly Number K4									
	Statepoint 9 (BOC Cy 13)			Statepoint 10 (10 EFPD Cy 13)			Statepoint 11 (113 EFPD Cy 13)		
Node No.	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )
EFPD	BOC Cy 13	BOC Cy 13	BOC Cy 13	10 Cy 13	10 Cy 13	10 Cy 13	113 Cy 13	113 Cy 13	113 Cy 13
1	0.000		0.7396	0.043	610.9	0.7396	0.510	614.4	0.7396
2	0.000		0.7396	0.197	828.9	0.7396	2.279	842.0	0.7396
3	0.000	Data Not	0.7098	0.280	904.8	0.7098	3.246	923.2	0.7053
4	0.000	Required	0.6082	0.314	958.9	0.6082	3.637	979.9	0.5968
5	0.000		0.4967	0.343	1008.1	0.4967	3.951	1027.9	0.4831
6	0.000		0.4113	0.335	993.8	0.4113	3.866	1014.7	0.3986
7	0.000		0.3417	0.308	949.1	0.3417	3.574	970.6	0.3300
8	0.000		0.2963	0.265	883.4	0.2963	3.077	899.9	0.2853
9	0.000		0.2681	0.178	762.2	0.2681	2.034	768.4	0.2579
10	0.000		0.2573	0.044	607.1	0.2573	0.502	608.1	0.2475

	Statepoint 12 (224 EFPD Cy 13)			Statepoint 13 (325 EFPD Cy 13)			Statepoint 14 (BOC Cy 14)		
Node No.	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )
EFPD	224 Cy 13	224 Cy 13	224 Cy 13	325 Cy 13	325 Cy 13	325 Cy 13	BOC Cy 14	BOC Cy 14	BOC Cy 14
1	1.182	633.4	0.7396	1.926	651.5	0.7396	2.355	644.5	0.7396
2	5.315	966.0	0.7387	8.667	1036.7	0.7353	10.500	963.5	0.7352
3	7.604	1102.4	0.6806	11.949	1185.7	0.6630	14.170	1037.4	0.6634
4	8.228	1142.8	0.5520	12.373	1145.4	0.5287	14.558	1027.4	0.5301
5	8.573	1148.3	0.4403	12.609	1124.1	0.4213	14.877	1051.2	0.4234
6	8.203	1098.7	0.3632	12.084	1094.1	0.3483	14.437	1076.5	0.3502
7	7.417	1017.4	0.3019	11.037	1046.0	0.2895	13.479	1103.4	0.2905
8	6.223	913.8	0.2626	9.326	957.3	0.2513	11.703	1083.7	0.2508
9	4.012	764.6	0.2388	6.017	794.6	0.2282	7.724	902.8	0.2260
10	0.990	607.3	0.2296	1.493	614.1	0.2191	1.933	636.4	0.2163

Table 4-228. (Cont'd) Burnup and TH Feedback Parameters by 10 Axial Nodes for Assembly K4

Assembly Number K4						
Statepoint 15 (94 EFPD Cy 14)				Statepoint 16 (211 EFPD Cy 14)		
Node No.	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )
EFPD	94 Cy 14	94 Cy 14	94 Cy 14	211 Cy 14	211 Cy 14	211 Cy 14
1	2.625	593.8	0.7396	3.215	620.5	0.7396
2	11.766	721.4	0.7365	14.230	826.7	0.7372
3	15.934	778.0	0.6726	18.983	878.3	0.6776
4	16.539	809.4	0.5502	19.649	885.9	0.5604
5	16.986	828.4	0.4480	20.146	892.5	0.4601
6	16.513	823.5	0.3743	19.589	881.6	0.3866
7	15.790	860.3	0.3154	18.763	868.5	0.3270
8	14.537	946.2	0.2774	17.701	893.1	0.2899
9	9.706	811.5	0.2482	12.030	791.6	0.2593
10	2.369	610.3	0.2344	2.918	610.5	0.2445

Table 4-229. Burnup and TH Feedback Parameters by 10 Axial Nodes for Assembly L1

Assembly Number L1									
	Statepoint 14 (BOC Cy 14)			Statepoint 15 (94 EFPD Cy 14)			Statepoint 16 (211 EFPD Cy 14)		
Node No.	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )
EFPD	BOC Cy 14	BOC Cy 14	BOC Cy 14	94 Cy 14	94 Cy 14	94 Cy 14	211 Cy 14	211 Cy 14	211 Cy 14
1	0.000		0.7396	0.395	610.1	0.7396	1.125	635.4	0.7396
2	0.000		0.7396	1.827	828.7	0.7396	5.051	966.6	0.7384
3	0.000	Data Not	0.7075	2.766	932.5	0.7075	7.285	1086.1	0.6802
4	0.000	Required	0.5945	3.252	1019.2	0.5945	7.943	1113.6	0.5502
5	0.000		0.4748	3.601	1086.5	0.4748	8.369	1126.5	0.4362
6	0.000		0.3870	3.514	1069.3	0.3870	8.035	1086.5	0.3574
7	0.000		0.3172	3.256	1019.8	0.3172	7.377	1024.3	0.2949
8	0.000		0.2724	2.827	942.9	0.2724	6.365	941.1	0.2544
9	0.000		0.2453	1.838	788.6	0.2453	4.145	788.5	0.2295
10	0.000		0.2349	0.428	609.1	0.2349	0.984	610.8	0.2199



Table 4-230. Burnup and TH Feedback Parameters by 10 Axial Nodes for Assembly L2

Assembly Number L2									
	Statepoint 14 (BOC Cy 14)			Statepoint 15 (94 EFPD Cy 14)			Statepoint 16 (211 EFPD Cy 14)		
Node No.	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )
EFPD	BOC Cy 14	BOC Cy 14	BOC Cy 14	94 Cy 14	94 Cy 14	94 Cy 14	211 Cy 14	211 Cy 14	211 Cy 14
1	0.000		0.7396	0.442	616.4	0.7396	1.222	640.9	0.7396
2	0.000		0.7396	2.092	876.1	0.7396	5.642	1020.5	0.7363
3	0.000	Data Not	0.6944	3.138	998.0	0.6944	8.075	1154.9	0.6661
4	0.000	Required	0.5680	3.447	1056.3	0.5680	8.210	1125.8	0.5290
5	0.000		0.4507	3.610	1088.6	0.4507	8.196	1096.6	0.4203
6	0.000		0.3706	3.431	1053.2	0.3706	7.674	1042.8	0.3482
7	0.000		0.3068	3.173	1004.4	0.3068	7.022	984.4	0.2908
8	0.000		0.2647	2.781	935.0	0.2647	6.120	914.3	0.2525
9	0.000		0.2390	1.769	778.8	0.2390	3.927	771.6	0.2286
10	0.000		0.2295	0.410	607.1	0.2295	0.919	606.6	0.2197

Table 4-231. Burnup and TH Feedback Parameters by 10 Axial Nodes for Assembly M1

Assembly Number M1									
Statepoint 14 (BOC Cy 14)			Statepoint 15 (94 EFPD Cy 14)			Statepoint 16 (211 EFPD Cy 14)			
Node No.	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )
EFPD	BOC Cy 14	BOC Cy 14	BOC Cy 14	94 Cy 14	94 Cy 14	94 Cy 14	211 Cy 14	211 Cy 14	211 Cy 14
1	0.000		0.7396	0.445	616.8	0.7396	1.080	624.9	0.7396
2	0.000		0.7396	1.869	835.3	0.7396	4.583	888.0	0.7396
3	0.000	Data Not	0.7043	2.614	906.1	0.7043	6.572	999.7	0.6927
4	0.000	Required	0.5994	2.964	966.0	0.5994	7.367	1066.7	0.5721
5	0.000		0.4899	3.319	1030.7	0.4899	7.957	1104.3	0.4583
6	0.000		0.4039	3.357	1037.9	0.4039	7.867	1083.7	0.3763
7	0.000		0.3315	3.226	1013.4	0.3315	7.416	1034.0	0.3093
8	0.000		0.2833	2.866	949.0	0.2833	6.509	954.9	0.2652
9	0.000		0.2531	1.929	801.4	0.2531	4.388	805.6	0.2375
10	0.000		0.2409	0.477	614.7	0.2409	1.095	616.3	0.2266

Table 4-232. Burnup and TH Feedback Parameters by 10 Axial Nodes for Assembly M2

Assembly Number M2									
	Statepoint 14 (BOC Cy 14)			Statepoint 15 (94 EFPD Cy 14)			Statepoint 16 (211 EFPD Cy 14)		
Node No.	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )
EFPD	BOC Cy 14	BOC Cy 14	BOC Cy 14	94 Cy 14	94 Cy 14	94 Cy 14	211 Cy 14	211 Cy 14	211 Cy 14
1	0.000		0.7396	0.533	628.7	0.7396	1.338	643.5	0.7396
2	0.000		0.7394	2.295	879.0	0.7394	5.735	957.8	0.7360
3	0.000	Data Not	0.6854	3.197	1008.0	0.6854	7.917	1117.6	0.6657
4	0.000	Required	0.5588	3.378	1041.9	0.5588	8.089	1116.1	0.5286
5	0.000		0.4463	3.498	1065.4	0.4463	8.135	1104.0	0.4199
6	0.000		0.3692	3.369	1040.4	0.3692	7.745	1062.5	0.3478
7	0.000		0.3067	3.143	998.0	0.3067	7.165	1008.8	0.2898
8	0.000		0.2652	2.745	928.3	0.2652	6.272	938.9	0.2510
9	0.000		0.2395	1.791	781.6	0.2395	4.200	799.8	0.2262
10	0.000		0.2298	0.429	609.2	0.2298	1.033	615.0	0.2166

Table 4-233. Burnup and TH Feedback Parameters by 10 Axial Nodes for Assembly M3

Assembly Number M3									
	Statepoint 14 (BOC Cy 14)			Statepoint 15 (94 EFPD Cy 14)			Statepoint 16 (211 EFPD Cy 14)		
Node No.	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )
EFPD	BOC Cy 14	BOC Cy 14	BOC Cy 14	94 Cy 14	94 Cy 14	94 Cy 14	211 Cy 14	211 Cy 14	211 Cy 14
1	0.000		0.7396	0.417	613.0	0.7396	1.054	625.1	0.7396
2	0.000		0.7396	1.763	817.0	0.7396	4.473	887.2	0.7396
3	0.000	Data Not	0.7116	2.476	883.6	0.7116	6.385	992.6	0.6960
4	0.000	Required	0.6138	2.837	943.7	0.6138	7.189	1058.8	0.5793
5	0.000		0.5058	3.196	1007.6	0.5058	7.797	1098.3	0.4663
6	0.000		0.4183	3.233	1014.7	0.4183	7.709	1078.1	0.3837
7	0.000		0.3441	3.097	989.6	0.3441	7.242	1027.3	0.3159
8	0.000		0.2946	2.744	928.0	0.2946	6.344	949.0	0.2713
9	0.000		0.2637	1.841	788.6	0.2637	4.267	801.9	0.2432
10	0.000		0.2510	0.447	611.1	0.2510	1.049	614.9	0.2320

Table 4-234. Burnup and TH Feedback Parameters by 10 Axial Nodes for Assembly M4

Assembly Number M4									
	Statepoint 14 (BOC Cy 14)			Statepoint 15 (94 EFPD Cy 14)			Statepoint 16 (211 EFPD Cy 14)		
Node No.	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )
EFPD	BOC Cy 14	BOC Cy 14	BOC Cy 14	94 Cy 14	94 Cy 14	94 Cy 14	211 Cy 14	211 Cy 14	211 Cy 14
1	0.000		0.7396	0.354	604.6	0.7396	1.006	626.8	0.7396
2	0.000		0.7396	1.514	775.4	0.7396	4.253	891.4	0.7396
3	0.000	Data Not	0.7148	2.126	829.1	0.7148	5.982	984.8	0.6967
4	0.000	Required	0.6332	2.439	877.7	0.6332	6.652	1037.3	0.5878
5	0.000		0.5413	2.748	928.4	0.5413	7.178	1070.8	0.4827
6	0.000		0.4594	2.784	934.5	0.4594	7.089	1051.5	0.4032
7	0.000		0.3836	2.663	914.2	0.3836	6.652	1004.0	0.3352
8	0.000		0.3312	2.352	864.0	0.3312	5.826	931.8	0.2894
9	0.000		0.2979	1.567	750.2	0.2979	3.904	791.5	0.2602
10	0.000		0.2798	0.366	602.0	0.2798	0.943	612.6	0.2463

Table 4-235. Burnup and TH Feedback Parameters by 10 Axial Nodes for Assembly M5

Assembly Number M5									
	Statepoint 14 (BOC Cy 14)			Statepoint 15 (94 EFPD Cy 14)			Statepoint 16 (211 EFPD Cy 14)		
Node No.	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )
EFPD	BOC Cy 14	BOC Cy 14	BOC Cy 14	94 Cy 14	94 Cy 14	94 Cy 14	211 Cy 14	211 Cy 14	211 Cy 14
1	0.000		0.7396	0.435	615.4	0.7396	1.192	638.2	0.7396
2	0.000		0.7396	1.871	835.7	0.7396	5.047	958.0	0.7385
3	0.000	Data Not	0.7096	2.671	915.5	0.7096	7.043	1062.0	0.6822
4	0.000	Required	0.6040	3.020	975.9	0.6040	7.557	1087.8	0.5573
5	0.000		0.4903	3.301	1027.3	0.4903	7.903	1098.5	0.4468
6	0.000		0.4044	3.261	1019.8	0.4044	7.678	1069.0	0.3687
7	0.000		0.3339	3.066	984.0	0.3339	7.147	1017.7	0.3054
8	0.000		0.2874	2.676	916.7	0.2874	6.227	942.2	0.2636
9	0.000		0.2588	1.756	776.6	0.2588	4.139	796.8	0.2372
10	0.000		0.2479	0.420	608.2	0.2479	1.012	613.9	0.2270

Table 4-236. Burnup and TH Feedback Parameters by 10 Axial Nodes for Assembly M6

Assembly Number M6									
	Statepoint 14 (BOC Cy 14)			Statepoint 15 (94 EFPD Cy 14)			Statepoint 16 (211 EFPD Cy 14)		
Node No.	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )
EFPD	BOC Cy 14	BOC Cy 14	BOC Cy 14	94 Cy 14	94 Cy 14	94 Cy 14	211 Cy 14	211 Cy 14	211 Cy 14
1	0.000		0.7396	0.454	618.0	0.7396	1.241	641.5	0.7396
2	0.000		0.7396	1.974	854.0	0.7396	5.303	982.7	0.7374
3	0.000	Data Not	0.7034	2.838	944.0	0.7034	7.416	1094.6	0.6749
4	0.000	Required	0.5899	3.175	1003.8	0.5899	7.834	1107.7	0.5449
5	0.000		0.4745	3.404	1046.9	0.4745	8.042	1104.1	0.4349
6	0.000		0.3912	3.314	1029.9	0.3912	7.710	1065.6	0.3594
7	0.000		0.3235	3.097	989.6	0.3235	7.139	1011.9	0.2986
8	0.000		0.2790	2.707	921.8	0.2790	6.234	938.9	0.2582
9	0.000		0.2515	1.772	778.8	0.2515	4.149	796.1	0.2326
10	0.000		0.2413	0.421	608.2	0.2413	1.008	613.6	0.2228

**Table 4-237. Burnup and TH Feedback Parameters by 10 Axial Nodes for Assembly M7**

<b>Assembly Number M7</b>									
	<b>Statepoint 14 (BOC Cy 14)</b>			<b>Statepoint 15 (94 EFPD Cy 14)</b>			<b>Statepoint 16 (211 EFPD Cy 14)</b>		
<b>Node No.</b>	<b>Burnup (GWd/MTU)</b>	<b>Fuel Temp. (K)</b>	<b>Mod. Dens. (g/cm<sup>3</sup>)</b>	<b>Burnup (GWd/MTU)</b>	<b>Fuel Temp. (K)</b>	<b>Mod. Dens. (g/cm<sup>3</sup>)</b>	<b>Burnup (GWd/MTU)</b>	<b>Fuel Temp. (K)</b>	<b>Mod. Dens. (g/cm<sup>3</sup>)</b>
<b>EFPD</b>	<b>BOC Cy 14</b>	<b>BOC Cy 14</b>	<b>BOC Cy 14</b>	<b>94 Cy 14</b>	<b>94 Cy 14</b>	<b>94 Cy 14</b>	<b>211 Cy 14</b>	<b>211 Cy 14</b>	<b>211 Cy 14</b>
1	0.000		0.7396	0.299	597.4	0.7396	0.937	625.3	0.7396
2	0.000		0.7396	1.286	738.9	0.7396	3.987	885.9	0.7396
3	0.000	Data Not	0.7259	1.840	787.3	0.7259	5.697	985.0	0.6986
4	0.000	Required	0.6558	2.177	836.9	0.6558	6.477	1050.8	0.5912
5	0.000		0.5704	2.519	890.4	0.5704	7.080	1091.8	0.4877
6	0.000		0.4902	2.585	901.1	0.4902	7.022	1072.1	0.4091
7	0.000		0.4129	2.486	885.0	0.4129	6.580	1019.6	0.3413
8	0.000		0.3576	2.201	840.6	0.3576	5.748	941.7	0.2952
9	0.000		0.3219	1.463	736.1	0.3219	3.841	796.2	0.2654
10	0.000		0.3018	0.338	598.9	0.3018	0.926	613.6	0.2503



Table 4-238. Burnup and TH Feedback Parameters by 10 Axial Nodes for Assembly M8

Assembly Number M8									
Node No.	Statepoint 14 (BOC Cy 14)			Statepoint 15 (94 EFPD Cy 14)			Statepoint 16 (211 EFPD Cy 14)		
	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )
EFPD	BOC Cy 14	BOC Cy 14	BOC Cy 14	94 Cy 14	94 Cy 14	94 Cy 14	211 Cy 14	211 Cy 14	211 Cy 14
1	0.000		0.7396	0.387	609.0	0.7396	1.099	633.3	0.7396
2	0.000		0.7396	1.669	801.1	0.7396	4.674	931.6	0.7396
3	0.000	Data Not	0.7189	2.417	874.2	0.7189	6.635	1038.4	0.6895
4	0.000	Required	0.6262	2.816	940.1	0.6262	7.311	1081.2	0.5707
5	0.000		0.5164	3.151	999.4	0.5164	7.777	1102.2	0.4606
6	0.000		0.4268	3.136	996.7	0.4268	7.586	1074.2	0.3801
7	0.000		0.3524	2.953	963.9	0.3524	7.046	1019.5	0.3146
8	0.000		0.3033	2.580	900.7	0.3033	6.119	940.7	0.2714
9	0.000		0.2729	1.696	768.1	0.2729	4.060	794.6	0.2442
10	0.000		0.2612	0.403	606.3	0.2612	0.989	613.4	0.2335

Table 4-239. Burnup and TH Feedback Parameters by 10 Axial Nodes for Assembly M9

Assembly Number M9									
	Statepoint 14 (BOC Cy 14)			Statepoint 15 (94 EFPD Cy 14)			Statepoint 16 (211 EFPD Cy 14)		
Node No.	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )
EFPD	BOC Cy 14	BOC Cy 14	BOC Cy 14	94 Cy 14	94 Cy 14	94 Cy 14	211 Cy 14	211 Cy 14	211 Cy 14
1	0.000		0.7396	0.410	612.1	0.7396	1.133	634.5	0.7396
2	0.000		0.7396	1.808	824.9	0.7396	4.872	940.8	0.7394
3	0.000	Data Not	0.7101	2.713	922.8	0.7101	7.012	1050.7	0.6864
4	0.000	Required	0.5997	3.172	1003.5	0.5997	7.658	1079.7	0.5613
5	0.000		0.4814	3.477	1061.1	0.4814	7.996	1085.2	0.4480
6	0.000		0.3941	3.403	1046.9	0.3941	7.706	1051.2	0.3688
7	0.000		0.3239	3.175	1003.9	0.3239	7.128	998.8	0.3052
8	0.000		0.2785	2.773	933.1	0.2785	6.200	925.3	0.2635
9	0.000		0.2507	1.830	787.2	0.2507	4.121	786.2	0.2375
10	0.000		0.2400	0.439	610.3	0.2400	1.003	611.4	0.2276

Table 4-240. Burnup and TH Feedback Parameters by 10 Axial Nodes for Assembly M10

Assembly Number M10									
Node No.	Statepoint 14 (BOC Cy 14)			Statepoint 15 (94 EFPD Cy 14)			Statepoint 16 (211 EFPD Cy 14)		
	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )
EFPD	BOC Cy 14	BOC Cy 14	BOC Cy 14	94 Cy 14	94 Cy 14	94 Cy 14	211 Cy 14	211 Cy 14	211 Cy 14
1	0.000		0.7396	0.525	627.6	0.7396	1.334	644.0	0.7396
2	0.000		0.7390	2.319	883.1	0.7390	5.827	967.8	0.7357
3	0.000	Data Not	0.6810	3.324	1032.1	0.6810	8.188	1141.4	0.6626
4	0.000	Required	0.5473	3.562	1078.0	0.5473	8.364	1131.1	0.5207
5	0.000		0.4322	3.694	1104.6	0.4322	8.357	1108.1	0.4109
6	0.000		0.3551	3.543	1074.3	0.3551	7.909	1061.0	0.3395
7	0.000		0.2934	3.307	1028.6	0.2934	7.304	1005.2	0.2824
8	0.000		0.2526	2.911	957.0	0.2526	6.412	935.3	0.2443
9	0.000		0.2275	1.896	796.7	0.2275	4.245	793.0	0.2203
10	0.000		0.2180	0.456	612.3	0.2180	1.035	612.7	0.2113

Table 4-241. Burnup and TH Feedback Parameters by 10 Axial Nodes for Assembly M11

Assembly Number M11									
	Statepoint 14 (BOC Cy 14)			Statepoint 15 (94 EFPD Cy 14)			Statepoint 16 (211 EFPD Cy 14)		
Node No.	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )
EFPD	BOC Cy 14	BOC Cy 14	BOC Cy 14	94 Cy 14	94 Cy 14	94 Cy 14	211 Cy 14	211 Cy 14	211 Cy 14
1	0.000		0.7396	0.464	619.3	0.7396	1.231	639.3	0.7396
2	0.000		0.7396	2.095	876.1	0.7396	5.454	988.1	0.7373
3	0.000	Data Not	0.6927	3.150	999.6	0.6927	7.907	1123.8	0.6712
4	0.000	Required	0.5639	3.503	1066.3	0.5639	8.218	1116.9	0.5332
5	0.000		0.4454	3.675	1100.7	0.4454	8.226	1090.2	0.4219
6	0.000		0.3649	3.519	1069.6	0.3649	7.756	1041.2	0.3485
7	0.000		0.3008	3.283	1024.0	0.3008	7.143	985.3	0.2900
8	0.000		0.2586	2.904	955.7	0.2586	6.274	917.7	0.2511
9	0.000		0.2327	1.896	796.7	0.2327	4.134	780.4	0.2267
10	0.000		0.2229	0.456	612.2	0.2229	1.002	609.8	0.2175

Table 4-242. Burnup and TH Feedback Parameters by 10 Axial Nodes for Assembly M12

Assembly Number M12									
Node No.	Statepoint 14 (BOC Cy 14)			Statepoint 15 (94 EFPD Cy 14)			Statepoint 16 (211 EFPD Cy 14)		
	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )
EFPD	BOC Cy 14	BOC Cy 14	BOC Cy 14	94 Cy 14	94 Cy 14	94 Cy 14	211 Cy 14	211 Cy 14	211 Cy 14
1	0.000		0.7396	0.372	607.0	0.7396	1.110	636.1	0.7396
2	0.000		0.7396	1.649	797.8	0.7396	4.812	956.4	0.7388
3	0.000	Data Not	0.7213	2.470	882.7	0.7213	6.942	1077.9	0.6836
4	0.000	Required	0.6244	2.933	960.5	0.6244	7.654	1117.6	0.5595
5	0.000		0.5093	3.271	1021.7	0.5093	8.050	1127.4	0.4486
6	0.000		0.4188	3.217	1011.7	0.4188	7.757	1088.5	0.3695
7	0.000		0.3455	2.989	970.2	0.3455	7.109	1023.6	0.3061
8	0.000		0.2978	2.585	901.6	0.2978	6.106	938.2	0.2647
9	0.000		0.2687	1.683	766.3	0.2687	4.003	789.7	0.2389
10	0.000		0.2578	0.397	605.6	0.2578	0.965	611.8	0.2288

Table 4-243. Burnup and TH Feedback Parameters by 10 Axial Nodes for Assembly M13

Assembly Number M13									
Statepoint 14 (BOC Cy 14)			Statepoint 15 (94 EFPD Cy 14)			Statepoint 16 (211 EFPD Cy 14)			
Node No.	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )
EFPD	BOC Cy 14	BOC Cy 14	BOC Cy 14	94 Cy 14	94 Cy 14	94 Cy 14	211 Cy 14	211 Cy 14	211 Cy 14
1	0.000		0.7396	0.438	615.8	0.7396	1.202	639.0	0.7396
2	0.000		0.7396	2.017	862.2	0.7396	5.407	993.4	0.7374
3	0.000	Data Not	0.6967	3.092	989.1	0.6967	7.907	1133.5	0.6715
4	0.000	Required	0.5706	3.461	1058.0	0.5706	8.180	1117.5	0.5349
5	0.000		0.4519	3.627	1091.0	0.4519	8.141	1084.2	0.4244
6	0.000		0.3707	3.460	1058.0	0.3707	7.638	1032.2	0.3514
7	0.000		0.3061	3.216	1011.4	0.3061	7.006	975.3	0.2930
8	0.000		0.2635	2.837	944.0	0.2635	6.130	907.6	0.2542
9	0.000		0.2375	1.834	787.8	0.2375	3.993	771.4	0.2299
10	0.000		0.2277	0.438	610.2	0.2277	0.960	607.6	0.2208

Table 4-244. Burnup and TH Feedback Parameters by 10 Axial Nodes for Assembly M14

Assembly Number M14									
Statepoint 14 (BOC Cy 14)			Statepoint 15 (94 EFPD Cy 14)			Statepoint 16 (211 EFPD Cy 14)			
Node No.	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )
EFPD	BOC Cy 14	BOC Cy 14	BOC Cy 14	94 Cy 14	94 Cy 14	94 Cy 14	211 Cy 14	211 Cy 14	211 Cy 14
1	0.000		0.7396	0.420	613.4	0.7396	1.216	642.5	0.7396
2	0.000		0.7396	1.878	837.2	0.7396	5.320	1001.6	0.7369
3	0.000	Data Not	0.7055	2.821	941.1	0.7055	7.651	1136.0	0.6707
4	0.000	Required	0.5909	3.251	1018.1	0.5909	8.116	1141.7	0.5370
5	0.000		0.4727	3.523	1070.1	0.4727	8.297	1126.5	0.4268
6	0.000		0.3872	3.420	1050.2	0.3872	7.900	1078.9	0.3518
7	0.000		0.3190	3.159	1001.0	0.3190	7.212	1013.6	0.2919
8	0.000		0.2749	2.725	925.0	0.2749	6.182	929.5	0.2529
9	0.000		0.2481	1.766	778.1	0.2481	4.024	782.6	0.2286
10	0.000		0.2380	0.425	608.7	0.2380	0.979	610.5	0.2195

Table 4-245. Burnup and TH Feedback Parameters by 10 Axial Nodes for Assembly M15

Assembly Number M15									
Statepoint 14 (BOC Cy 14)			Statepoint 15 (94 EFPD Cy 14)			Statepoint 16 (211 EFPD Cy 14)			
Node No.	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )
EFPD	BOC Cy 14	BOC Cy 14	BOC Cy 14	94 Cy 14	94 Cy 14	94 Cy 14	211 Cy 14	211 Cy 14	211 Cy 14
1	0.000		0.7396	0.404	611.3	0.7396	1.169	639.1	0.7396
2	0.000		0.7396	1.824	827.9	0.7396	5.138	980.8	0.7379
3	0.000	Data Not	0.7081	2.803	938.0	0.7081	7.491	1112.5	0.6765
4	0.000	Required	0.5939	3.253	1018.5	0.5939	7.949	1113.6	0.5459
5	0.000		0.4750	3.513	1068.2	0.4750	8.090	1094.2	0.4355
6	0.000		0.3892	3.397	1045.7	0.3892	7.682	1048.6	0.3597
7	0.000		0.3206	3.138	997.1	0.3206	7.022	988.8	0.2990
8	0.000		0.2765	2.721	924.2	0.2765	6.044	911.5	0.2593
9	0.000		0.2495	1.772	778.9	0.2495	3.943	772.6	0.2347
10	0.000		0.2392	0.427	608.9	0.2392	0.956	608.3	0.2254



Table 4-246. Burnup and TH Feedback Parameters by 10 Axial Nodes for Assembly M16

Assembly Number M16									
	Statepoint 14 (BOC Cy 14)			Statepoint 15 (94 EFPD Cy 14)			Statepoint 16 (211 EFPD Cy 14)		
Node No.	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )	Burnup (GWd/MTU)	Fuel Temp. (K)	Mod. Dens. (g/cm <sup>3</sup> )
EFPD	BOC Cy 14	BOC Cy 14	BOC Cy 14	94 Cy 14	94 Cy 14	94 Cy 14	211 Cy 14	211 Cy 14	211 Cy 14
1	0.000		0.7396	0.420	613.4	0.7396	1.196	640.3	0.7396
2	0.000		0.7396	1.931	846.7	0.7396	5.353	998.7	0.7371
3	0.000	Data Not	0.7011	2.974	968.0	0.7011	7.810	1136.7	0.6711
4	0.000	Required	0.5800	3.384	1043.2	0.5800	8.128	1121.6	0.5367
5	0.000		0.4611	3.585	1082.4	0.4611	8.143	1091.3	0.4270
6	0.000		0.3781	3.429	1051.9	0.3781	7.663	1040.8	0.3533
7	0.000		0.3122	3.156	1000.5	0.3122	6.987	981.1	0.2944
8	0.000		0.2695	2.740	927.5	0.2695	6.029	906.9	0.2557
9	0.000		0.2434	1.773	779.1	0.2434	3.913	769.3	0.2316
10	0.000		0.2335	0.424	608.5	0.2335	0.940	607.2	0.2226

**Table 4-247. Heavy Metal Uranium Weights  
(grams per node)**

	SAS2H Nodes	Node Length		Type 6 A Fuel (g)	Type 7 B Fuel (g)	Type 9 C Fuel (g)	Type 10 D Fuel (g)
		(in.)	(cm)				
Top	10	6	15.24	7285.6	7275.9	6122.1	6352.0
	9	24	60.96	29142.4	29103.4	28809.8	28764.0
	8	18	45.72	21856.8	21827.6	21607.4	21573.0
	7	18	45.72	21856.8	21827.6	21607.4	21573.0
	6	18	45.72	21856.8	21827.6	21607.4	21573.0
	5	12	30.48	14571.2	14551.7	14404.9	14382.0
	4	18	45.72	21856.8	21827.6	21607.4	21573.0
	3	12	30.48	14571.2	14551.7	14404.9	14382.0
	2	12	30.48	14571.2	14551.7	14404.9	14382.0
Bottom	1	6	15.24	7285.6	7275.9	7202.5	7191.0
Linear Weight U – g/cm/rod				7.7106	7.7003	7.8767	7.8642
Bundle Weight – kg of heavy metal				174.85	174.62	171.78	171.74

	SAS2H Nodes	Node Length		Type 12 F Fuel (g)	Type 14 E Fuel (g)	Type 15 K Fuel (g)	Type 16 J Fuel (g)	Type 17 G Fuel (g)	Type 18 H Fuel (g)	Type 1 L Fuel (g)	Type 2 M Fuel (g)
		(in.)	(cm)								
Top	10	6	15.24	5907.3	6146.8	6380.3	6012.3	6146.9	6380.4	6347.3	6219.6
		6	15.24	7233.4	7231.5	7223.0	7214.8	7231.6	7223.1	7185.6	7176.5
	9	18	45.72	21700.1	21694.4	21668.9	21644.4	21694.8	21669.3	21556.8	21529.5
	8	18	45.72	21700.1	21694.4	21668.9	21644.4	21694.8	21669.3	21556.8	21529.5
	7	18	45.72	21700.1	21694.4	21668.9	21644.4	21694.8	21669.3	21556.8	21529.5
	6	18	45.72	21700.1	21694.4	21668.9	21644.4	21694.8	21669.3	21556.8	21529.5
	5	12	30.48	14466.8	14463.0	14445.9	14429.6	14463.2	14446.2	14371.2	14353.0
	4	18	45.72	21700.1	21694.4	21668.9	21644.4	21694.8	21669.3	21556.8	21529.5
	3	12	30.48	14466.8	14463.0	14445.9	14429.6	14463.2	14446.2	14371.2	14353.0
	2	12	30.48	14466.8	14463.0	14445.9	14429.6	14463.2	14446.2	14371.2	14353.0
Bottom	1	6	15.24	7233.4	7231.5	7223.0	7214.8	7231.6	7223.1	7185.6	7176.5
Linear Weight U – g/cm/rod				7.9105	7.9084	7.8991	7.8902	7.9086	7.8993	7.8583	7.8483
Bundle Weight – kg of heavy metal				172.27	172.47	172.51	171.95	172.47	172.51	171.62	171.28

**Table 4-248. Not used  
Table 4-249. Not Used**

Control of reactivity is accomplished by a combination of CRB movement and integral burnable absorbers. 177 CRBs are used in the reactivity control system. These movable CRBs are used to control the fission rate and fission density. Figures 2-1 and 2-5 show the cross sectional view of the CRB. This section provides the CRB history for those fuel assemblies where CRBs were inserted during core operation.

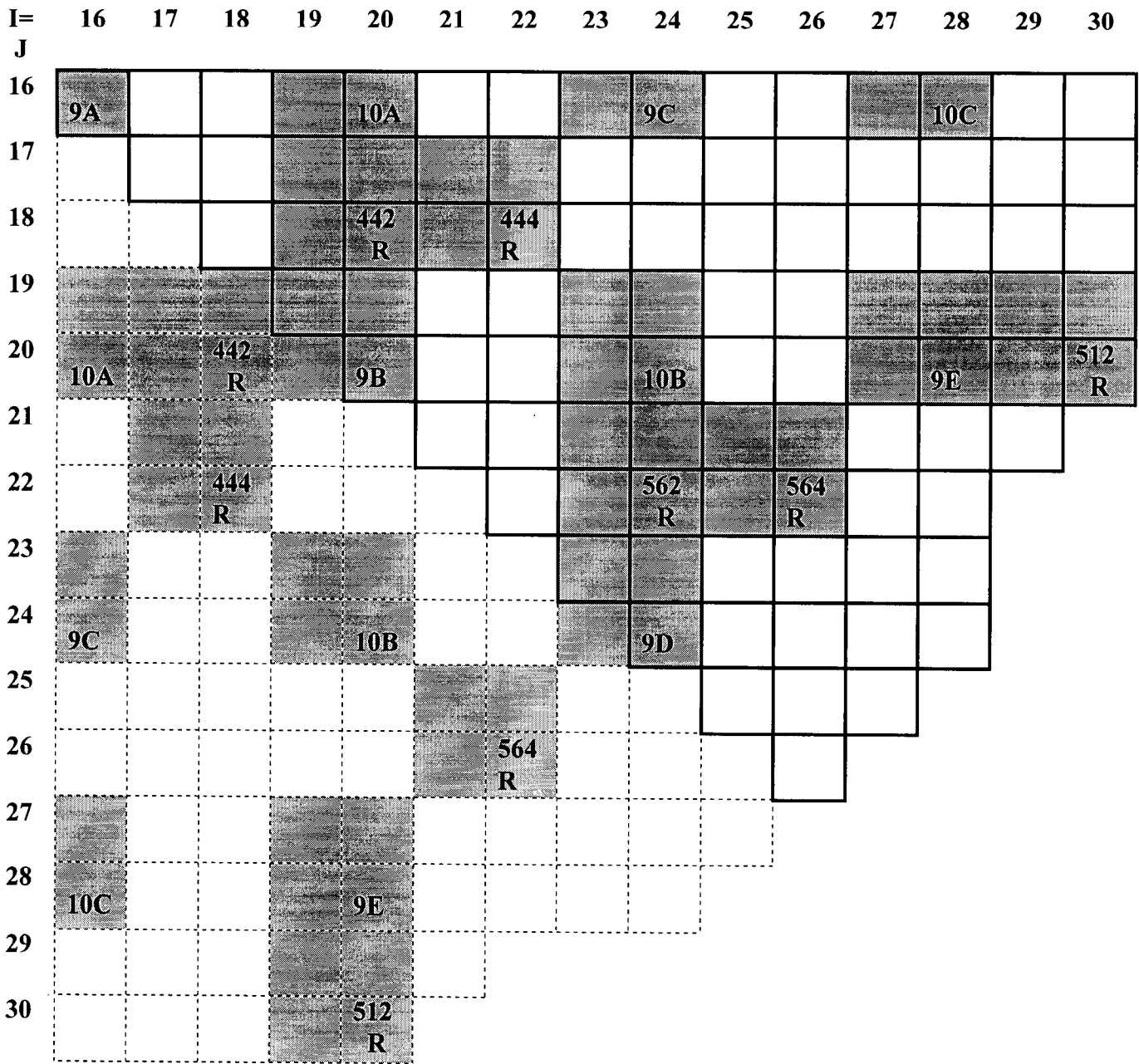
Figure 4-1 shows the control blade maps for a quarter-core configuration. This map shows locations for CRB groups 9A, 9B, 9C, 9D, 9E, 10A, 10B, and 10C. There are 177 movable CRBs. For locations of CRBs where the blade group is not specified, the lower right-hand fuel location number in that block is used as a control group number. For convenience, the fuel assembly location number in the lower 1/8 quadrant is kept the same as the upper 1/8 quadrant to reflect blade symmetric insertion. For the majority of the time, the CRBs are moved in 1/8 core symmetry. Full core CRB maps are provided where the CRB motion is not symmetric.

Out of 177 movable CRBs, only a few CRBs are inserted during cycle operation. Figures 4-2 through 4-7 provide the location of fuel and active CRBs during Cycles 9 through 14 operation. Shaded areas indicate the areas where CRBs were inserted. The same information is summarized in Table 4-250. These figures and table show the bladed fuel assembly and CRB group number. A total of 68 bladed fuel assemblies are considered.

Tables 4-251 through 4-256 summarized the CRB history for Cycles 9 through 14. The table provides the duration and notches withdrawn for each active CRB group. The zero (0) notch withdrawn means fully inserted CRB. The 48 notches withdrawn means fully withdrawn CRB with no absorber present in the active fuel region of the assembly. This condition is identified as double hyphen (--). The 48 notch withdrawn means 144 inch withdrawn. Each notch is 3 inches (7.62 cm) long. For a duration when the particular CRB group is not symmetric, it is identified with an asterisk (\*) in CRB position tables. Also, the full core maps are provided in Figures 4-8 through 4-12 showing duration and control blade location and notches withdrawn when they are not symmetric. Note that during Cycle 9 operation, CRBs were symmetric for the entire cycle of operation.

Table 4-257 summarizes the 'step length' in EFPD for SAS2H depletion calculations. Table 4-258 summarizes the control blade insertion history for each 'step' and specifies the nodes exposed to a blade. It specifies the top and bottom node seeing a blade. If any node is exposed to a blade, the bottom node is always 1. The node is identified as seeing a blade if the actual node is exposed to a blade more than one-half of the total step EFPD. If the blade exposure is equal or less than half, the step is considered as non-bladed. The blade insertion history is provided for all bladed fuel assemblies in Table 4-250.

CRB insertion is modeled in the burnup calculations for those assemblies where blades are inserted.





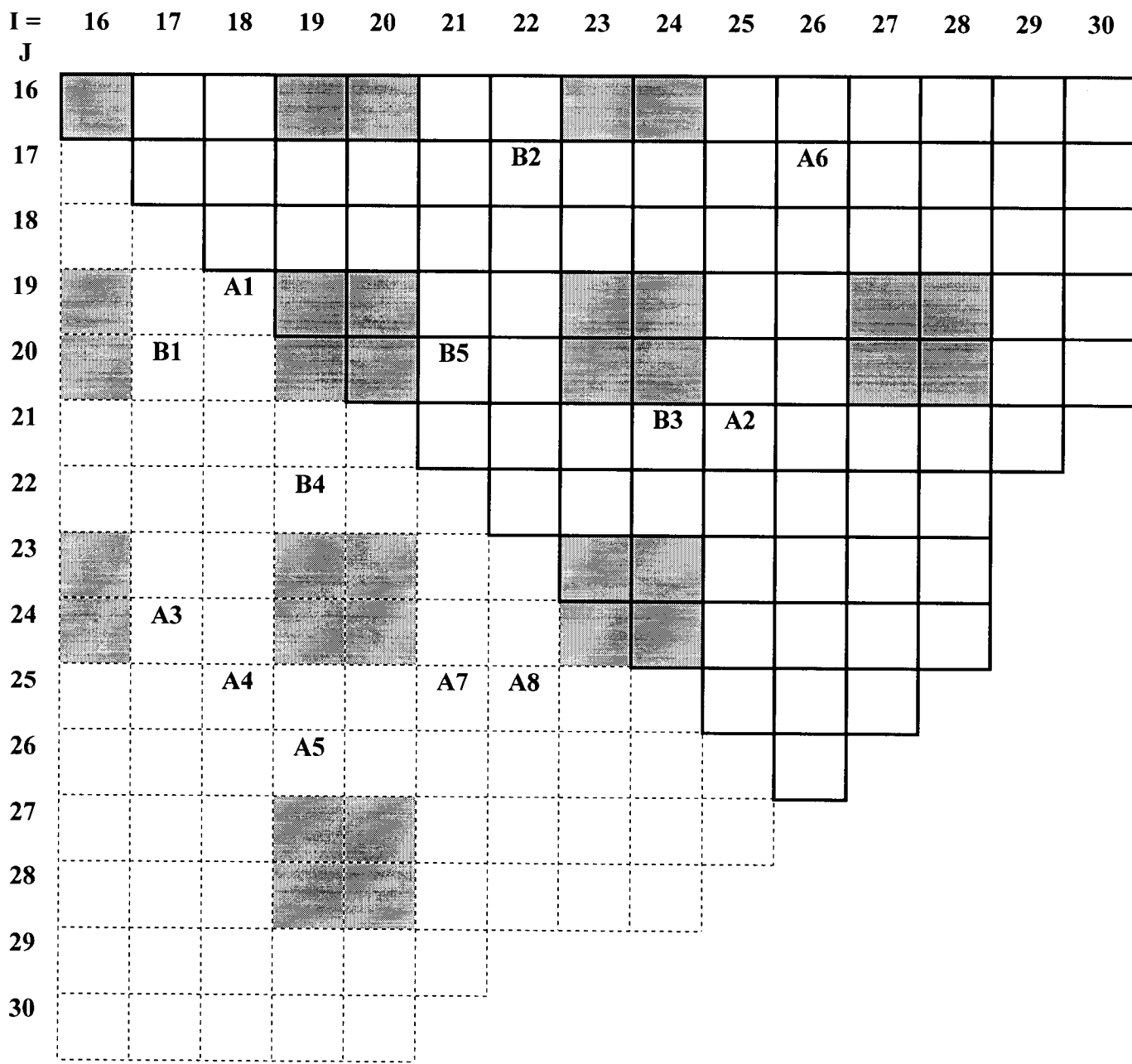

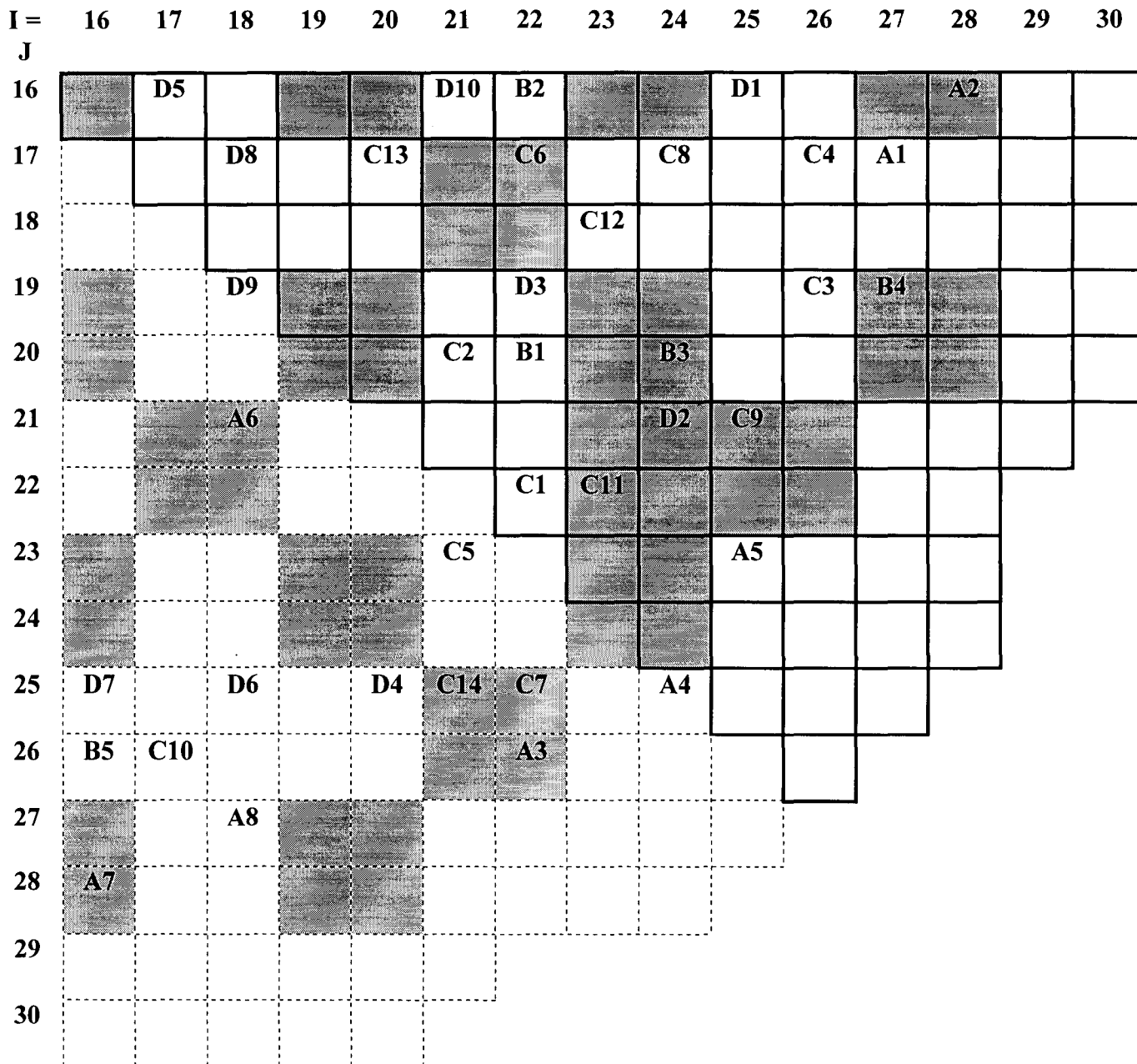
 Active Control Blade Region  
 Control Blade Group Number


Figure 4-1. Control Blade Group Locations for QC2 Cycles 9 to 14



 Active Control Blade Region  
 No fuel assemblies of interest are in active control blade regions in Cycle 9

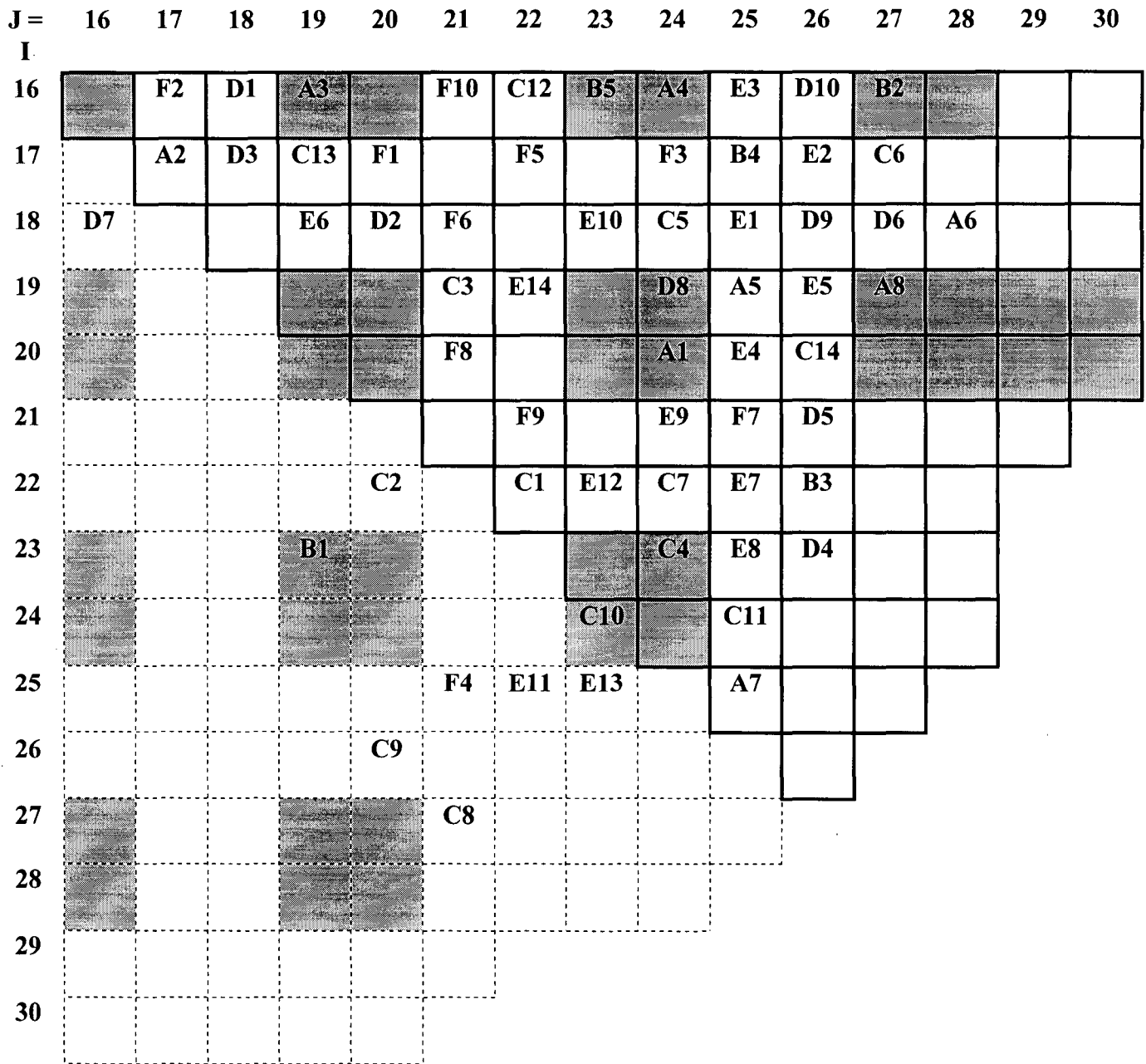
**Figure 4-2. Cycle 9 Active Control Blade Locations QC2**



 Active Control Blade Region

**Bladed Fuel Assemblies:** A2, A3, A6, A7  
 B3, B4  
 C6, C7, C9, C11, C14 and D2

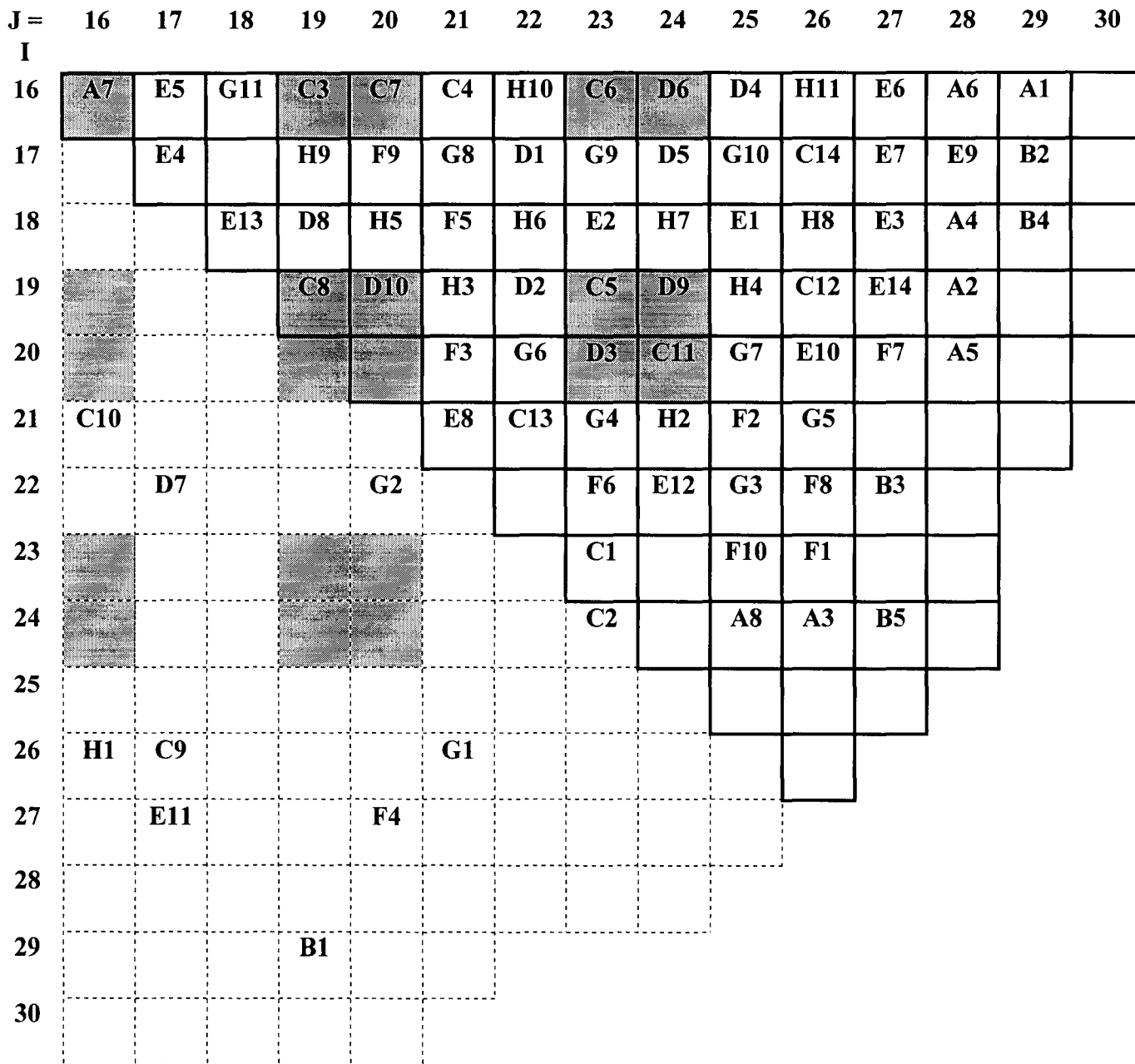
Figure 4-3. Cycle 10 Active Control Blade Locations QC2



Active Control Blade Region

Bladed Fuel Assemblies: A1, A3, A4, A8  
 B1, B2, B5  
 C4, C10  
 D8

Figure 4-4. Cycle 11 Active Control Blade Locations QC2



 Active Control Blade Region

Bladed Fuel Assemblies: A7  
 C3, C5, C6, C7, C8, C11  
 D3, D6, D9, D10

Figure 4-5. Cycle 12 Active Control Blade Locations QC2



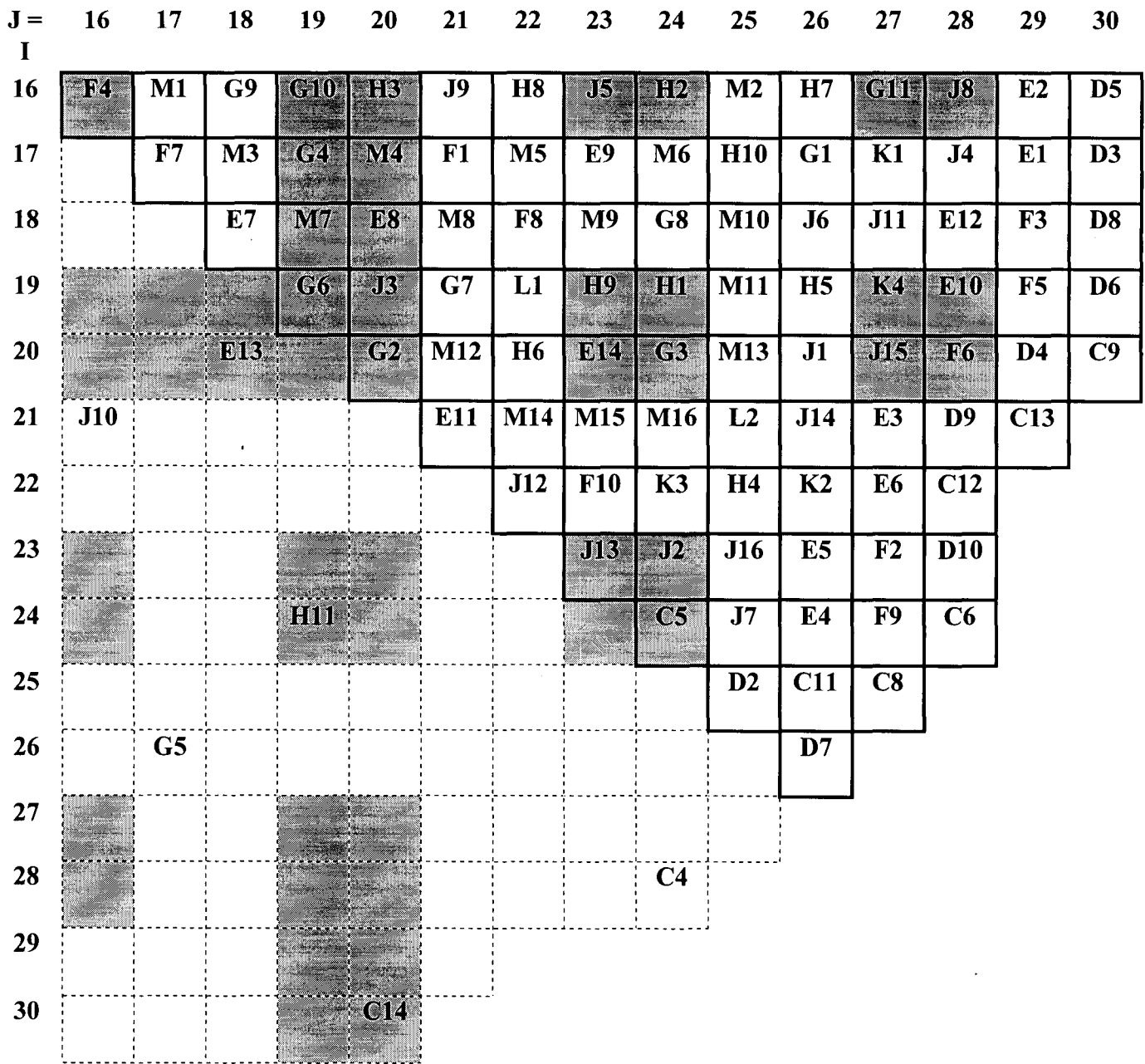
J=	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
I															
16	C4	J11	F3	G9	F8	K3	F6	H7	F5	J14	E6	E5	H8	D8	A4
17		E8	J16	C6	K4	C3	J7	C2	K1	E4	G2	C8	G3	D2	B2
18			C10	K2	G8	J10	H6	J5	H5	J3	E3	G10	F4	D4	B3
19				C9	F10	C7	J13	F2	E12	J2	E10	H11	D6	D3	A3
20					C14	J8	H10	E2	H4	J1	E1	G1	D10	C5	B4
21			J9			E13	J6	F9	J15	H3	G4	H9	A8	A5	
22				J12			C1	J4	H2	E9	E14	C11	A6		
23								E7	F1	G7	D5	D9	B5		
24									E11	G11	D1	C12	A2		
25										A7	C13	A1			
26		G6									B1				
27				H1	G5										
28			F7												
29															
30															



Active Control Blade Region

- Bladed Fuel Assemblies: C4, C9, C14  
D6, D10  
E2, E7, E11, E12  
F1, F2, F5, F8, F10  
G1, G5, G9  
H1, H4, H7, H11

Figure 4-6. Cycle 13 Active Control Blade Locations QC2



Active Control Blade Region

Bladed Fuel Assemblies: C5, C14  
 E8, E10, E13, E14  
 F4, F6  
 G2, G3, G4, G6, G10, G11  
 H1, H2, H3, H9, H11  
 J2, J3, J5, J8, J13, J15, K4, M4 and M7

Figure 4-7. Cycle 14 Active Control Blade Locations QC2

Table 4-250. Bladed Fuel Assemblies and Control Group

Fuel Assembly	Cycle 10	Cycle 11	Cycle 12	Cycle 13	Cycle 14
A1		10B			
A2	10C				
A3	564R	10A			
A4		9C			
A6	444R				
A7	10C		9A		
A8		9E			
B1		10B			
B2		10C			
B3	10B				
B4	9E				
B5		9C			
C3			10A		
C4		9D		9A	
C5			10B		9D
C6	444R		9C		
C7	564R		10A		
C8			9B		
C9	564R			9B	
C10		9D			
C11	562R		10B		
C14	564R			9B	512R
D2	562R				
D3			10B		
D6			9C	9E	
D8		10B			
D9			10B		
D10			9B	9E	
E2				10B	
E7				9D	
E8					442R
E10					9E
E11				9D	
E12				10B	
E13					442R
E14					10B
F1				9D	
F2				10B	
F4					9A
F5				9C	
F6					9E
F8				10A	
F10				9B	

Table 4-250. Bladed Fuel Assemblies and Control Group (cont.)

Fuel Assembly	Cycle 10	Cycle 11	Cycle 12	Cycle 13	Cycle 14
G1				9E	
G2					9B
G3					10B
G4					442R
G5				9E	
G6					9B
G9				10A	
G10					10A
G11					10C
H1				9E	10B
H2					9C
H3					10A
H4				10B	
H7				9C	
H9					10B
H11				9E	10B
J2					9D
J3					9B
J5					9C
J8					10C
J13					9D
J15					9E
K4					9E
M4					442R
M7					442R

**Table 4-251. Control Blade Position Cycle 9  
Control Blade Configuration in Notches Withdrawn**

Exposure From - To MWd/Short Ton		Blade Location Region Number							
		378	382	386	390	502	506	510	614
		Control Blade Group Number							
		9A	10A	9C	10C	9B	10B	9E	9D
0	-75.4	0	26	0	--	0	38	--	6
75.4	-841.1	12	26	8	--	6	38	--	12
841.1	-979.3	12	26	8	--	0	38	--	12
979.3	-1049.0	12	26	8	--	4	38	--	12
1049.0	-1181.4	12	26	8	--	2	38	--	12
1181.4	-1417.4	12	26	8	--	0	38	--	12
1417.4	-1925.6	12	26	6	--	0	38	--	12
1925.6	-2237.9	12	26	4	--	0	38	--	12
2237.9	-2517.4	12	26	0	--	0	38	--	12
2517.4	-2644.3	0	26	0	--	0	38	--	10
2644.3	-2764.7	12	26	0	--	0	38	--	12
2764.7	-2831.4	0	26	0	--	0	38	--	10
2831.4	-2985.9	8	26	0	--	0	38	--	12
2985.9	-3248.7	0	26	0	--	0	32	--	12
3248.7	-3421.3	8	26	0	--	0	32	--	12
3421.3	-3759.1	12	26	0	--	0	32	42	12
3759.1	-3856.5	12	26	4	--	0	32	42	12
3856.5	-4184.7	12	26	4	--	0	32	--	12
4184.7	-4353.9	12	26	8	--	6	32	--	12
4353.9	-4449.4	12	0	34	--	28	6	--	40
4449.4	-4519.5	12	6	24	--	28	10	--	40
4519.5	-4869.7	16	8	24	--	28	10	--	40
4869.7	-5104.4	24	42	12	--	6	34	--	10
5104.4	-5169.6	24	42	12	--	8	34	--	10
5169.6	-5304.6	24	--	14	--	4	34	--	18
5304.6	-5405.2	24	--	14	--	8	34	--	18
5405.2	-5506.7	24	--	14	--	10	34	--	18
5506.7	-5659.6	40	--	18	--	4	42	--	34
5659.6	-5723.5	40	--	10	--	0	42	--	34
5723.5	-5836.4	40	--	18	--	6	42	--	34
5836.4	-5901.1	42	--	18	--	10	--	--	34
5901.1	-6000.2	42	--	18	--	6	--	--	34
6000.2	-6127.5	--	--	36	--	4	--	--	--
6127.5	-6212.4	--	--	--	--	10	--	--	--

**Table 4-252. Control Blade Position Cycle 10  
Control Blade Configuration in Notches Withdrawn**

Exposure From - To MWd/Short Ton		Blade Location Region Number										
		378	382	386	390	502	506	510	614	444	564	562
		Control Blade Group Number										
9A	10A	9C	10C	9B	10B	9E	9D					
0	-30.3	0	12	0	42	0	20	12	0	--	--	--
30.3	-79.1	0	12	0	--	6	34	--	6	--	--	--
79.1	-139.9	6	24	6	--	10	34	--	10	--	--	--
139.9	-186.0	0	12	0	--	6	34	--	6	--	--	--
186.0	-235.7	10	24	6	--	10	34	--	14	--	--	--
235.7	-270.4	0	8	0	12	0	8	0	0	24	30	--
270.4	-315.8	0	24	0	--	6	34	--	12	--	--	--
315.8	-359.6	0	12	0	30	0	12	0	0	36	42	--
359.6	-416.9	0	24	0	--	6	34	36	10	--	--	--
416.9	-581.1	10	24	4	--	10	34	--	14	--	--	--
581.1	-660.9	10	24	6	--	10	34	--	14	--	--	--
660.9	-723.6	6	24	0	--	10	34	--	14	--	--	--
723.6	-1040.2	10	24	6	--	10	34	--	14	--	--	--
1040.2	-1120.2	10	24	2	--	10	34	--	14	--	--	--
1120.2	-1444.5	10	24	0	--	10	34	--	14	--	--	--
1444.5	-1578.3	0	24	0	--	8	34	--	14	--	--	--
1578.3	-1763.6	0	24	0	--	6	34	--	14	--	--	--
1763.6	-2281.2	0	24	0	--	6	34	--	12	--	--	--
2281.2	-2505.5	0	22	0	--	6	34	--	6	--	--	--
2505.5	-2582.9	30	0	38	16	24	8*	--	30	--	--	--
2582.9	-3329.1	30	0	38	16	24	6	--	30	--	--	--
3329.1	-3462.1	30	0	38	16	24	4	--	30	--	--	--
3462.1	-3591.1	30	0	38	16	24	6*	--	30	--	--	--
3591.1	-3709.1	30	0	38	16	24	8	--	30	--	--	--
3709.1	-3852.1	30	0	38	16	24	0	--	30	--	--	--
3852.1	-3985.1	30	0	38	16	24	6	--	30	--	--	--
3985.1	-4261.1	30	0	38	16	24	6	--	30	--	--	--
4261.1	-4421.1	30	0	38	16	24	6*	--	30	--	--	--
4421.1	-4501.1	30	0	38	16	24	4	--	30	--	--	--
4501.1	-4744.1	30	0	38	16	24	8*	--	30	--	--	--
4744.1	-4816.1	30	0	30	16	24	6	--	30	--	--	--
4816.1	-4874.1	0	30	0	42	0	12	10	0	36	42	--
4874.1	-4945.1	12	30	0	--	0	30	--	0	--	--	--
4945.1	-5041.1	8	30	0	--	0	30	--	0	42	42	--
5041.1	-5118.1	12	30	0	--	0	30	--	8	42	--	0*
5118.1	-5322.1	12	30	0	--	0	30	--	6	--	--	--
5322.1	-5362.1	0	8	0	12	0	8*	0	0	24	30	--
5362.1	-5530.1	12	30	0	--	0	30	--	6	--	--	--
5530.1	-5610.1	20	30	4	--	4	30	--	10	--	--	--
5610.1	-5744.1	20	40	12	--	4	30	--	16	--	--	--
5744.1	-5929.1	20	40	10	--	4	36	--	12	--	--	--
5929.1	-6019.1	20	40	12	--	4	36	--	18	--	--	--
6019.1	-6298.1	20	--	18	--	4	36	--	12*	--	--	--

**Table 4-252. Control Blade Position Cycle 10 (cont.)  
Control Blade Configuration in Notches Withdrawn**

Exposure From - To MWd/Short Ton		Blade Location Region Number										
		378	382	386	390	502	506	510	614	444	564	562
		Control Blade Group Number										
		9A	10A	9C	10C	9B	10B	9E	9D			
6298.1	-6530.1	28	--	18	--	6	42	--	20	--	--	--
6530.1	-6673.1	28	--	18	--	10	--	--	20	--	--	--
6673.1	-6775.1	28	--	18	--	14	--	--	20	--	--	--
6775.1	-6920.1	28	--	18	--	14	--	--	40	--	--	--
6920.1	-7021.1	42	--	36	--	20	--	--	40	--	--	--
7021.1	-7101.1	42	--	24	--	20	--	--	--	--	--	--
7101.1	-7183.1	--	--	36	--	30	--	--	--	--	--	--
7183.1	-7251.1	--	--	42	--	36	--	--	--	--	--	--
7251.1	-7301.1	--	--	--	--	36	--	--	--	--	--	--
7301.1	-7365.1	42	--	--	--	--	--	--	--	--	--	--
7365.1	-8374.1	--	--	--	--	--	--	--	--	--	--	--

\* Control blade positions are 1/8 core symmetric except at these locations.

**Table 4-253. Control Blade Position Cycle 11  
Control Blade Configuration in Notches Withdrawn**

Exposure From - To MWd/Metric Ton		Blade Location Region Number								
		378	382	386	390	502	506	510	614	512
		Control Blade Group Number								
9A	10A	9C	10C	9B	10B	9E	9D			
0	-107.70	0	38	12	--	0	36	--	22	--
107.70	-237.99	0	38	16	--	6	36	--	22	--
237.99	-374.12	6	38	16	--	8	36	--	22	--
374.12	-686.62	6	38	16	--	10	36	--	22	--
686.62	-830.36	6	38	16	--	8*	36	--	22	--
830.36	-1147.27	0	38	16	--	0	36	--	22	--
1147.27	-1338.41	0	38	10*	--	0	36	--	22	--
1338.41	-1618.73	0	38	10	--	0	36	--	22	--
1618.73	-1844.92	0	38	12	--	0	36	--	22	--
1844.92	-2028.35	0	38	4	--	0	36	--	22	--
2028.35	-2507.41	34	4	38	20	40	12	--	--	--
2507.41	-2712.77	34	0	36	20	36	10	--	--	--
2712.77	-2873.93	34	0	36	20	30	12	--	42	--
2873.93	-3006.20	34	0	36	20	36	10	--	--	--
3006.20	-3284.21	34	0	36	20	36	8	--	42	--
3284.21	-3482.29	34	0	30	20	34	8	36	38	--
3482.29	-3554.16	34	0	36	20	30	10	38	34	--
3554.16	-3660.31	34	0	36	20	30	10	38	34	--
3660.31	-3832.05	34	0	36	20	30	8	40	34	--
3832.05	-4049.10	34	0	36	20	34	8	40	34	--
4049.10	-4144.45	38	0	30	20	34	8	38	34	--
4144.45	-4350.91	38	0	36	20	34	8	40	34	--
4350.91	-4831.08	38	0	38	20	30	10	40	34	--
4831.08	-5002.49	40	4	38	20	38	10	--	36	--
5002.49	-5192.30	42	4	40	20	38	10	--	36	--
5192.30	-5343.76	44	8	42	20	38	10	--	36	--
5343.76	-5525.42	0	42	8	--	0	38	--	14	--
5525.42	-5729.46	0	42	6	--	0	38	--	20	--
5729.46	-5843.88	0	42	8	--	0	40	--	20	--
5843.88	-5988.06	0	44	8	--	0	42	--	20	--
5988.06	-6247.77	0	--	12	--	6	42	--	20	--
6247.77	-6452.79	0	--	12	--	10	--	--	20	--
6452.79	-6595.98	0	--	12	--	8	--	--	32	--
6595.98	-6756.37	0	--	12	--	10	--	--	42	--
6756.37	-6917.31	0	--	14	--	8	--	--	--	--
6917.31	-6992.71	4	--	14	--	12	--	--	--	--
6992.71	-7100.18	0	--	14	--	12	--	--	--	0*
7100.18	-7188.70	0	--	20	--	8*	--	--	--	0*
7188.70	-7303.56	0	--	20	--	14	--	--	--	--
7303.56	-7450.96	0	--	--	--	14	--	--	--	--
7450.96	-7668.86	0	--	--	--	18	--	--	--	--
7668.86	-7738.86	6	--	--	--	--	--	--	--	--
7738.86	-9544.11	--	--	--	--	--	--	--	--	--

\* Control blade positions are 1/8 core symmetric except at these locations.



**Table 4-254. Control Blade Position Cycle 12  
Control Blade Configuration in Notches Withdrawn**

Exposure From - To MWd/Metric Ton		Blade Location Region Number							
		378	382	386	390	502	506	510	614
		Control Blade Group Number							
		9A	10A	9C	10C	9B	10B	9E	9D
0	-228.18	0	--	--	--	18	--	--	--
228.18	-422.85	8	--	--	--	22	--	--	--
422.85	-784.83	0	--	--	--	20	--	--	--
784.83	-981.94	6	--	--	--	22	--	--	--
981.94	-1167.13	0	--	--	--	22	--	--	--
1167.13	-1328.06	0	--	--	--	16	--	--	--
1328.06	-1562.63	0	--	--	--	20	--	--	--
1562.63	-1935.99	0	--	--	--	18	--	--	--
1935.99	-2084.25	0	--	--	--	16	42	--	--
2084.25	-2220.16	0	--	--	--	18	42	--	--
2220.16	-2390.58	0	--	--	--	16	--	--	--
2390.58	-2564.41	0	--	--	--	14*	--	--	--
2564.41	-2738.69	0	--	--	--	14	38	--	--
2738.69	-2820.04	0	--	--	--	12	38	--	--
2820.04	-2840.98	0	--	--	--	12	38	--	--
2840.98	-2903.15	0	42	38	--	0	32	--	--
2903.15	-3036.86	0	--	--	--	12	34	--	--
3036.86	-3230.87	0	42	--	--	12	38	--	--
3230.87	-3383.98	0	42	--	--	16	28	--	--
3383.98	-3583.06	--	16	--	--	42	20	--	--
3583.06	-3933.48	--	18	--	--	42	20	--	--
3933.48	-4062.45	--	18	--	--	38	20	--	--
4062.45	-4160.34	--	20	--	--	38	20	--	--
4160.34	-4266.16	--	16	--	--	38	24	--	--
4266.16	-4403.95	4	38	--	--	20	30	--	--
4403.95	-4462.15	0	--	42	--	16	38	--	--
4462.15	-4569.52	0	--	42	--	18	38	--	--
4569.52	-4762.31	0	--	42	--	20	38	--	--
4762.31	-4860.08	8	--	--	--	24	38	--	--
4860.08	-4958.30	12	--	--	--	24	42	--	--
4958.30	-5036.67	18	--	--	--	24	42	--	--
5036.67	-5174.02	24	--	--	--	28	--	--	--
5174.02	-5229.25	30	--	--	--	34	--	--	--

\* Control blade positions are 1/8 core symmetric except at these locations.

**Table 4-255. Control Blade Position Cycle 13  
Control Blade Configuration in Notches Withdrawn**

Exposure From - To MWd/Metric Ton		Blade Location Region Number							
		378	382	386	390	502	506	510	614
		Control Blade Group Number							
		9A	10A	9C	10C	9B	10B	9E	9D
0	-201.61	--	--	14	--	6	--	42	30
201.61	-341.05	--	--	14	--	8	--	42	36
341.05	-442.03	--	--	12	--	0	--	42	36
442.03	-609.03	--	--	14	--	10	--	--	42
609.03	-764.56	--	--	14	--	10	--	--	--
764.56	-1061.52	--	--	18	--	0	--	--	24
1061.52	-1293.89	--	--	14	--	0	--	--	--
1293.89	-1823.99	--	--	12*	--	0	--	--	--
1823.99	-1901.26	--	--	10	--	0	--	--	--
1901.26	-2129.88	--	--	8*	--	0	--	--	--
2129.88	-2205.83	--	--	6*	--	0	--	--	--
2205.83	-2257.20	--	--	0	--	0	--	--	--
2257.20	-2431.70	--	--	16	--	0	--	--	12
2431.70	-2546.78	--	--	6	--	0	--	--	--
2546.78	-2638.71	--	--	4	--	0	--	--	--
2638.71	-2733.18	12	--	0	--	0	--	--	--
2733.18	-2925.75	24	--	0	--	0	--	--	--
2925.75	-3234.18	10	--	0	--	0	--	--	--
3234.18	-3885.75	--	--	0	--	0	--	--	20
3885.75	-4169.38	--	--	0	--	0	--	--	18*
4169.38	-4417.84	--	--	0	--	0	--	--	20
4417.84	-4484.31	--	--	0	--	0	--	--	22
4484.31	-4831.53	--	--	0	--	0	--	--	22
4831.53	-4903.95	--	--	0	--	0	--	--	30
4903.95	-4997.70	--	--	6	--	0	--	--	42
4997.70	-5225.55	--	--	0	--	0	--	--	42
5225.55	-5380.53	--	--	8	--	0	--	--	--
5380.53	-5538.82	--	--	10	--	0	--	--	--
5538.82	-5677.83	--	--	12	--	0	--	--	--
5677.83	-5801.95	--	--	14	--	0	--	--	--
5801.95	-6092.73	--	0	--	--	--	22	--	--
6092.73	-6247.94	--	0	--	--	--	24	--	--
6247.94	-6365.45	--	0	--	--	--	26	--	--
6365.45	-6489.46	--	0	--	--	--	30	--	--
6489.46	-6705.29	--	0	--	--	--	18	--	--
6705.29	-6887.06	--	0	--	--	--	24	--	--
6887.06	-7078.42	--	12	--	--	--	--	--	--
7078.42	-7227.45	--	16	--	--	--	--	--	--
7227.45*	-7735.18*	--	--	--	--	--	--	--	--

\* Control blade positions are 1/8 core symmetric except at these locations. Note that the asymmetric blade pattern is only part of the exposure interval specified. The duration of asymmetry is specified in control blade maps, Figure 4-11.

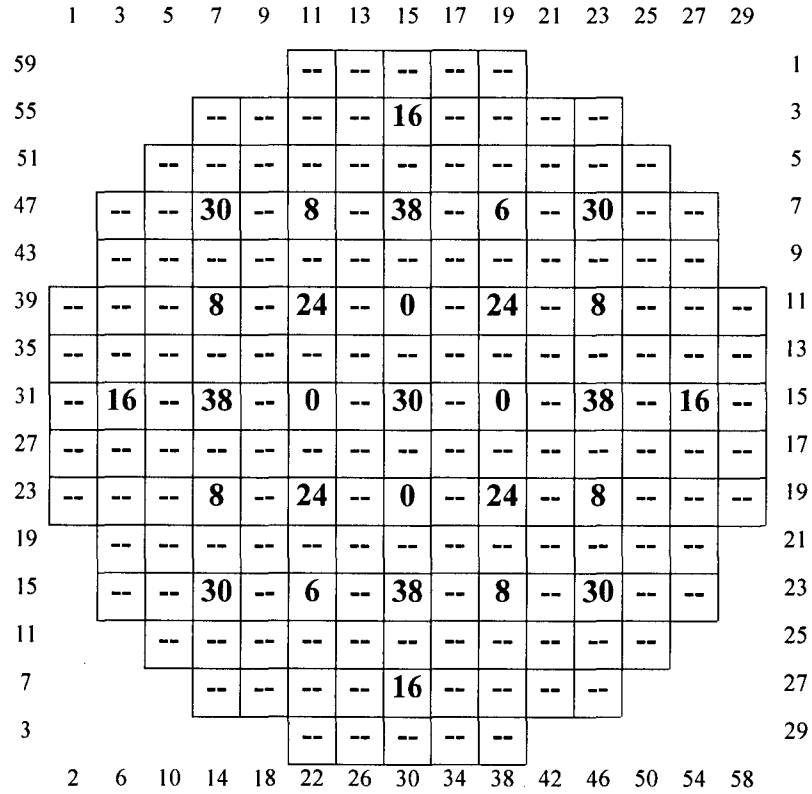
**Table 4-256. Control Blade Position Cycle 14  
Control Blade Configuration in Notches Withdrawn**

Exposure From - To MWd/Metric Ton		Blade Location Region Number									
		378	382	386	390	502	506	510	614	442	724
		Control Blade Group Number									
		9A	10A	9C	10C	9B	10B	9E	9D		512
0	-56.55	0	12	0	12	0	12*	0	0	--	0*
56.55	-136.46	0	24	0	42	0	12	0	0	--	--
136.46	-263.89	--	--	0	42	0	36*	0	0	0*	--
263.89	-501.77	--	--	0	42	0	36	12*	0	--	--
501.77	-679.02	--	--	0	--	0	42	18	8*	--	--
679.02	-775.47	--	--	0	--	0	30	0	0	--	--
775.47	-962.86	--	--	0	--	0	42	20	12	0	--
962.86	-1300.05	--	--	0	--	0	42	16*	0	--	--
1300.05	-1638.57	--	--	0	--	0	42	18	0	--	--
1638.57	-1764.89	--	--	0	--	0	--	16*	0	--	--
1764.89	-1878.65	--	--	0	--	0	--	18*	0	--	--
1878.65	-1920.98	--	--	0	--	0	--	18*	0	--	--
1920.98	-2619.73	--	--	0	--	0	--	16*	0	--	--
2619.73	-2775.81	--	0	--	10	--	0	--	30	--	--
2775.81	-2930.69	--	0	--	10*	--	0	--	--	--	--
2930.69	-3019.42	--	0	38	8	--	0	--	30	--	--
3019.42	-3099.45	--	0	--	8*	--	0	--	40	--	--
3099.45	-3177.93	--	0	--	8*	--	0	--	--	--	--
3177.93	-3278.13	--	0	--	6	--	0	--	--	--	--
3278.13	-3617.75	--	0	--	8*	--	0	--	--	--	--
3617.75	-3717.95	--	0	--	6*	38	0	--	--	--	--
3717.95	-3794.56	--	0	--	0	38	0	--	--*	--	--
3794.56	-3872.16	--	0	--	6	30	0	--	--	--	--
3872.16	-3971.48	--	0	--	8*	30	0	--	--	--	--
3971.48	-4010.83	--	0	--	4	38	0	--	--	--	--
4010.83	-4070.79	--	0	--	6*	38	0	--	--	--	--
4070.79	-4238.45	--	0	--	8	38	0	--	--	--	--

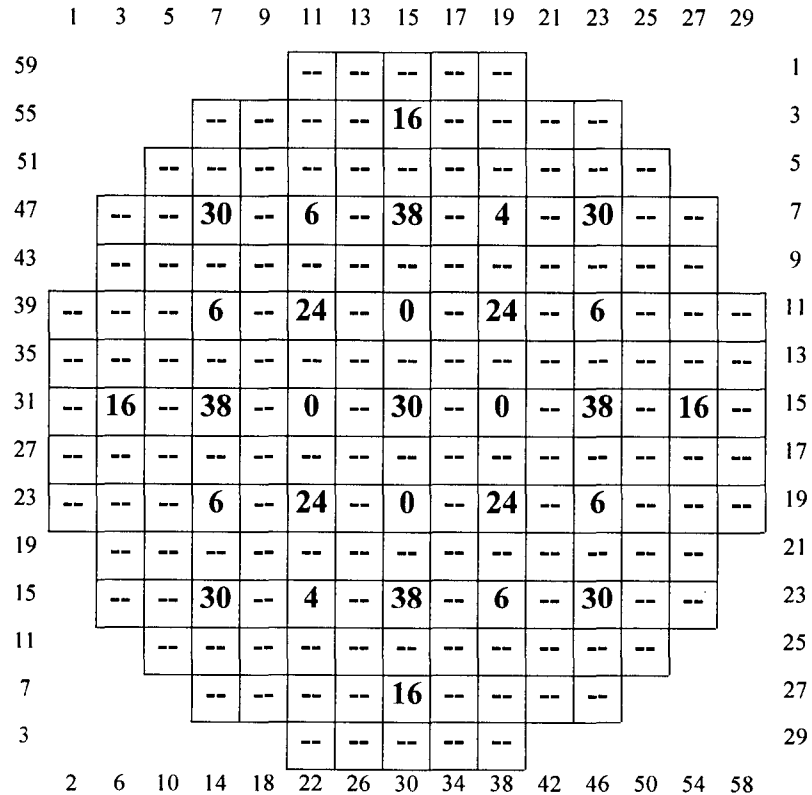
\* Control blade positions are 1/8 core symmetric except at these locations. Note that the asymmetric blade pattern is only part of the exposure interval specified. The duration of asymmetry is specified in control blade maps, Figure 4-12.

**Figure 4-8. Cycle 10 Asymmetric Control Blade Configuration in Notches Withdrawn**

Cycle 10, Exposure 2505.5 to 2582.9 MWd/STU



Cycle 10, Exposure 3462.1 to 3591.1 MWd/STU



**Figure 4-8. Cycle 10 Asymmetric Control Blade Configuration  
in Notches Withdrawn (cont.)**

Cycle 10, Exposure 4261.1 to 4421.1 MWd/STU

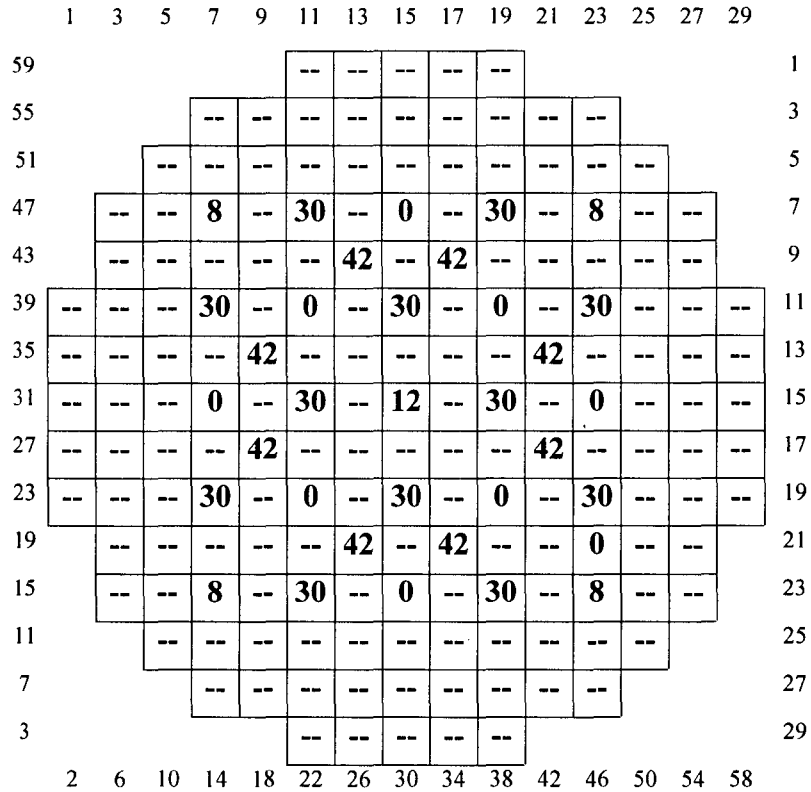
	1	3	5	7	9	11	13	15	17	19	21	23	25	27	29	
59						--	--	--	--	--						1
55				--	--	--	--	<b>16</b>	--	--	--	--				3
51			--	--	--	--	--	--	--	--	--	--	--			5
47		--	--	<b>30</b>	--	<b>6</b>	--	<b>38</b>	--	<b>4</b>	--	<b>30</b>	--	--		7
43		--	--	--	--	--	--	--	--	--	--	--	--	--		9
39	--	--	--	<b>6</b>	--	<b>24</b>	--	<b>0</b>	--	<b>24</b>	--	<b>6</b>	--	--	--	11
35	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	13
31	--	<b>16</b>	--	<b>38</b>	--	<b>0</b>	--	<b>30</b>	--	<b>0</b>	--	<b>38</b>	--	<b>16</b>	--	15
27	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	17
23	--	--	--	<b>6</b>	--	<b>24</b>	--	<b>0</b>	--	<b>24</b>	--	<b>6</b>	--	--	--	19
19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	21
15		--	--	<b>30</b>	--	<b>4</b>	--	<b>38</b>	--	<b>6</b>	--	<b>30</b>	--	--		23
11		--	--	--	--	--	--	--	--	--	--	--	--			25
7			--	--	--	--	--	<b>16</b>	--	--	--	--				27
3						--	--	--	--	--						29
	2	6	10	14	18	22	26	30	34	38	42	46	50	54	58	

Cycle 10, Exposure 4501.1 to 4744.1 MWd/STU

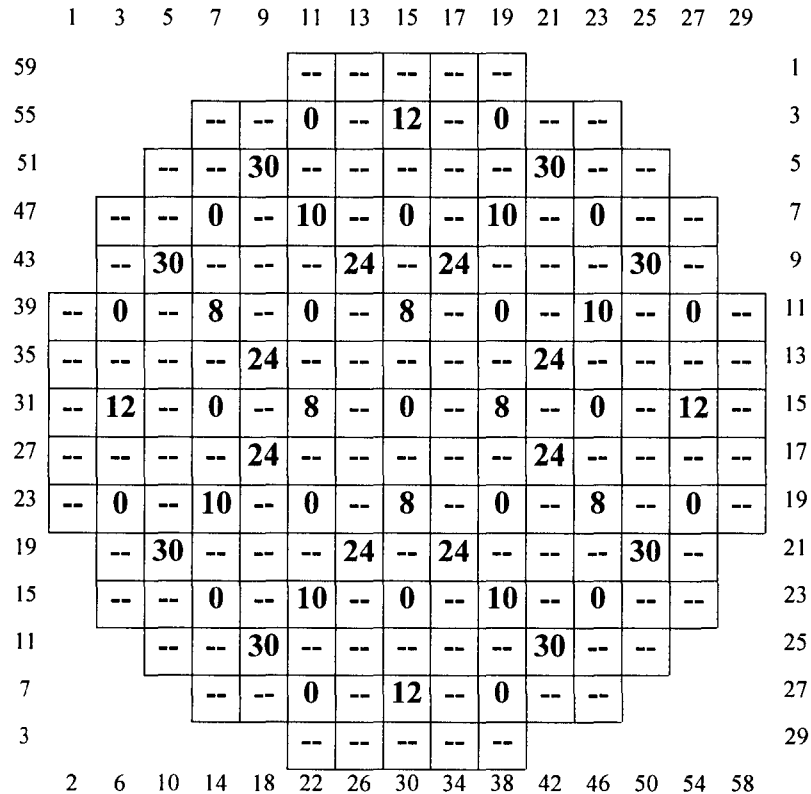
	1	3	5	7	9	11	13	15	17	19	21	23	25	27	29	
59						--	--	--	--	--						1
55				--	--	--	--	<b>16</b>	--	--	--	--				3
51			--	--	--	--	--	--	--	--	--	--	--			5
47		--	--	<b>30</b>	--	<b>6</b>	--	<b>38</b>	--	<b>6</b>	--	<b>30</b>	--	--		7
43		--	--	--	--	--	--	--	--	--	--	--	--	--		9
39	--	--	--	<b>8</b>	--	<b>24</b>	--	<b>0</b>	--	<b>24</b>	--	<b>8</b>	--	--	--	11
35	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	13
31	--	<b>16</b>	--	<b>38</b>	--	<b>0</b>	--	<b>30</b>	--	<b>0</b>	--	<b>38</b>	--	<b>16</b>	--	15
27	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	17
23	--	--	--	<b>8</b>	--	<b>24</b>	--	<b>0</b>	--	<b>24</b>	--	<b>8</b>	--	--	--	19
19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	21
15		--	--	<b>30</b>	--	<b>6</b>	--	<b>38</b>	--	<b>6</b>	--	<b>30</b>	--	--		23
11		--	--	--	--	--	--	--	--	--	--	--	--			25
7			--	--	--	--	--	<b>16</b>	--	--	--	--				27
3						--	--	--	--	--						29
	2	6	10	14	18	22	26	30	34	38	42	46	50	54	58	

**Figure 4-8. Cycle 10 Asymmetric Control Blade Configuration  
in Notches Withdrawn (cont.)**

Cycle 10, Exposure 5041.1 to 5118.1 MWd/STU



Cycle 10, Exposure 5322.1 to 5362.1 MWd/STU



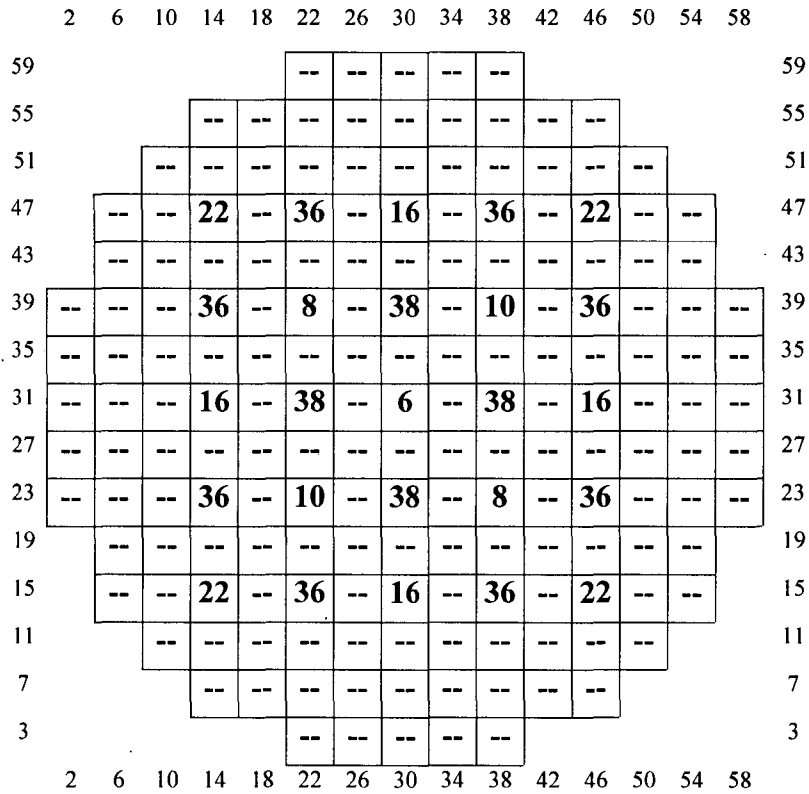
**Figure 4-8. Cycle 10 Asymmetric Control Blade Configuration  
in Notches Withdrawn (cont.)**

Cycle 10, Exposure 6019.1 to 6298.1 MWd/STU

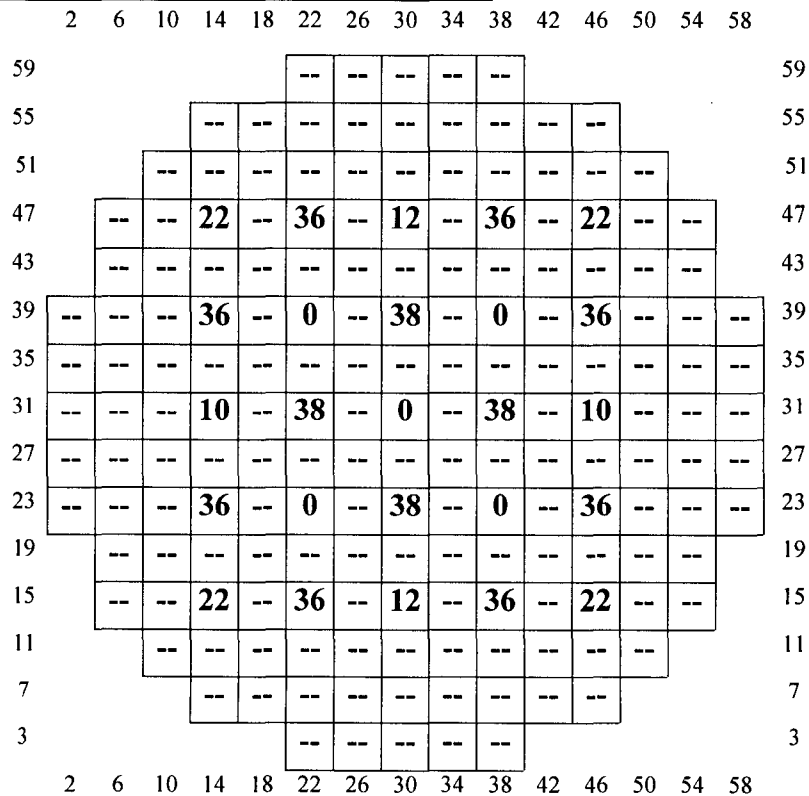
	1	3	5	7	9	11	13	15	17	19	21	23	25	27	29	
59						--	--	--	--	--						1
55			--	--	--	--	--	--	--	--	--	--	--			3
51		--	--	--	--	--	--	--	--	--	--	--	--	--		5
47	--	--	<b>12</b>	--	<b>36</b>	--	<b>18</b>	--	<b>36</b>	--	<b>14</b>	--	--			7
43	--	--	--	--	--	--	--	--	--	--	--	--	--	--		9
39	--	--	--	<b>36</b>	--	<b>4</b>	--	--	--	<b>4</b>	--	<b>36</b>	--	--	--	11
35	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	13
31	--	--	--	<b>18</b>	--	--	--	<b>20</b>	--	--	--	<b>18</b>	--	--	--	15
27	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	17
23	--	--	--	<b>36</b>	--	<b>4</b>	--	--	--	<b>4</b>	--	<b>36</b>	--	--	--	19
19	--	--	--	--	--	--	--	--	--	--	--	--	--	--		21
15	--	--	<b>14</b>	--	<b>36</b>	--	<b>18</b>	--	<b>36</b>	--	<b>12</b>	--	--			23
11	--	--	--	--	--	--	--	--	--	--	--	--	--			25
7		--	--	--	--	--	--	--	--	--	--					27
3						--	--	--	--	--						29
	2	6	10	14	18	22	26	30	34	38	42	46	50	54	58	

**Figure 4-9. Cycle 11 Asymmetric Control Blade Configuration  
In Notches Withdrawn**

Cycle 11, Exposure 686.62 to 830.36 MWd/MTU



Cycle 11, Exposure 1147.27 to 1338.41 MWd/MTU





**Figure 4-9. Cycle 11 Asymmetric Control Blade Configuration  
in Notches Withdrawn (cont.)**

Cycle 11, Exposure 6992.71 to 7100.18 MWd/MTU

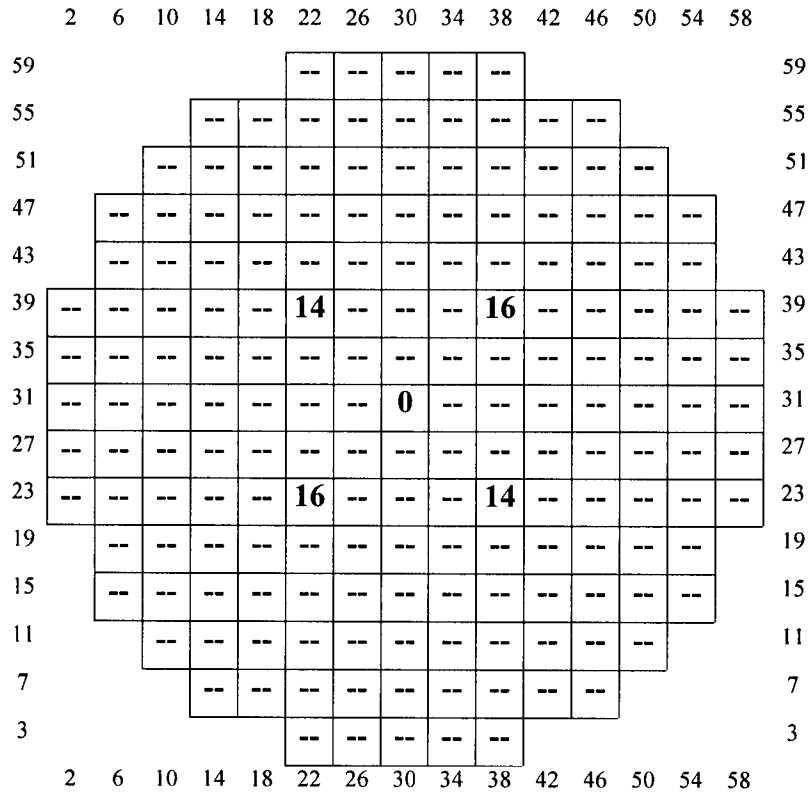
	2	6	10	14	18	22	26	30	34	38	42	46	50	54	58	
59						--	--	--	--	--						59
55				--	--	--	--	--	--	--	--	--				55
51			--	--	--	--	--	--	--	--	--	--	--			51
47		--	--	--	--	--	--	<b>14</b>	--	--	--	--	--	--		47
43		--	--	--	--	--	--	--	--	--	--	--	--	--		43
39	--	--	--	--	--	<b>12</b>	--	--	--	<b>12</b>	--	--	--	--	--	39
35	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	35
31	--	--	--	<b>14</b>	--	--	--	<b>0</b>	--	--	--	<b>14</b>	--	--	--	31
27	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	27
23	--	--	--	--	--	<b>12</b>	--	--	--	<b>12</b>	--	--	--	--	<b>0</b>	23
19		--	--	--	--	--	--	--	--	--	--	--	--	--		19
15		--	--	--	--	--	--	<b>14</b>	--	--	--	--	--	--		15
11			--	--	--	--	--	--	--	--	--	--	--			11
7				--	--	--	--	--	--	--	--	--				7
3						--	--	--	--	--						3
	2	6	10	14	18	22	26	30	34	38	42	46	50	54	58	

Cycle 11, Exposure 7100.18 to 7188.7 MWd/MTU

	2	6	10	14	18	22	26	30	34	38	42	46	50	54	58	
59						--	--	--	--	--						59
55				--	--	--	--	--	--	--	--	--				55
51			--	--	--	--	--	--	--	--	--	--	--			51
47		--	--	--	--	--	--	<b>20</b>	--	--	--	--	--	--		47
43		--	--	--	--	--	--	--	--	--	--	--	--	--		43
39	--	--	--	--	--	<b>8</b>	--	--	--	<b>6</b>	--	--	--	--	--	39
35	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	35
31	--	--	--	<b>20</b>	--	--	--	<b>0</b>	--	--	--	<b>20</b>	--	--	--	31
27	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	27
23	--	--	--	--	--	<b>8</b>	--	--	--	<b>8</b>	--	--	--	--	<b>0</b>	23
19		--	--	--	--	--	--	--	--	--	--	--	--	--		19
15		--	--	--	--	--	--	<b>20</b>	--	--	--	--	--	--		15
11			--	--	--	--	--	--	--	--	--	--	--			11
7				--	--	--	--	--	--	--	--	--				7
3						--	--	--	--	--						3
	2	6	10	14	18	22	26	30	34	38	42	46	50	54	58	

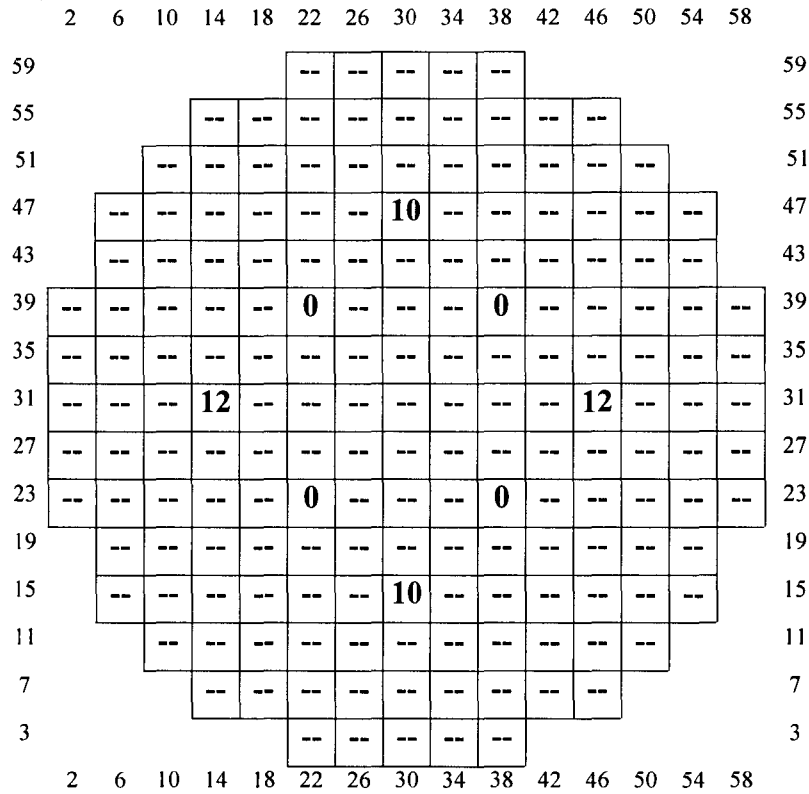
**Figure 4-10. Cycle 12 Asymmetric Control Blade Configuration in Notches Withdrawn (cont.)**

Cycle 12, Exposure 2390.58 to 2564.41 MWd/MTU

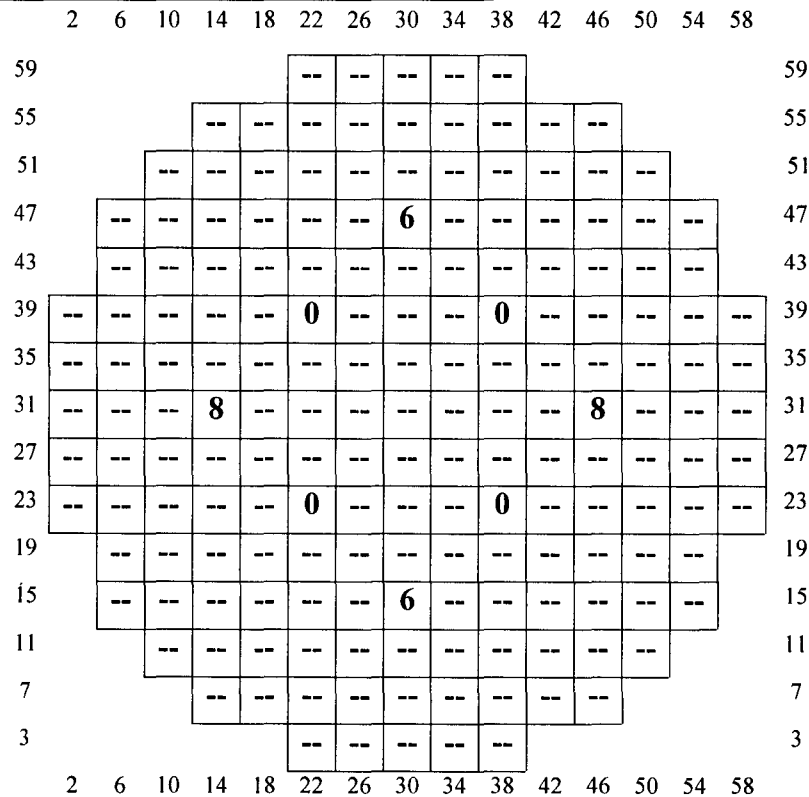


**Figure 4-11. Cycle 13 Asymmetric Control Blade Configuration in Notches Withdrawn**

Cycle 13, Exposure 1380.75 to 1823.99 MWd/MTU

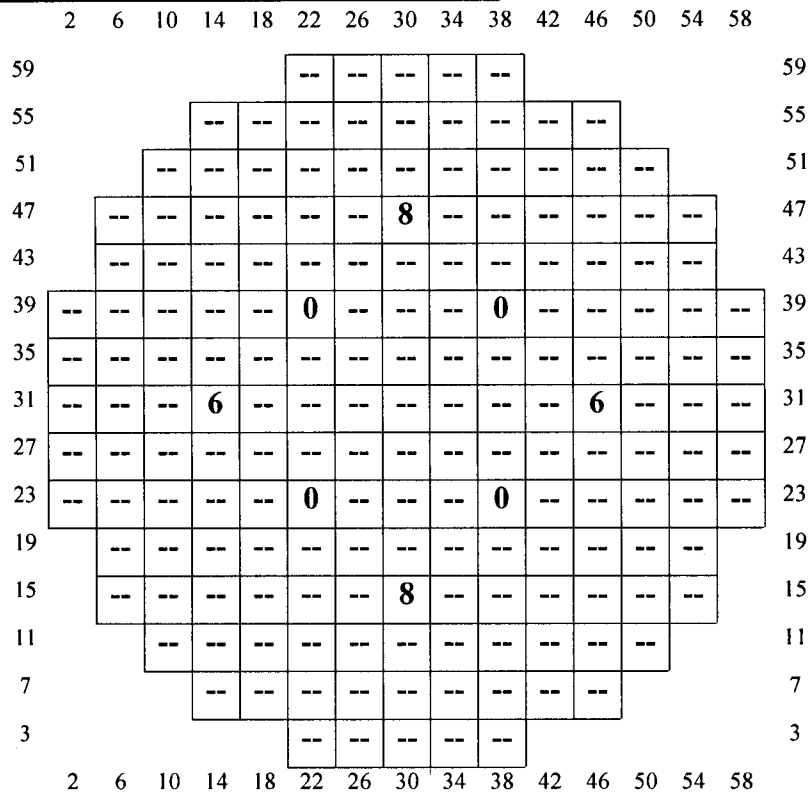


Cycle 13, Exposure 1901.26 to 2052.94 MWd/MTU



**Figure 4-11. Cycle 13 Asymmetric Control Blade Configuration  
in Notches Withdrawn (cont.)**

Cycle 13, Exposure 2129.88 to 2205.83 MWd/MTU



Cycle 13, Exposure 4014.83 to 4169.38 MWd/MTU

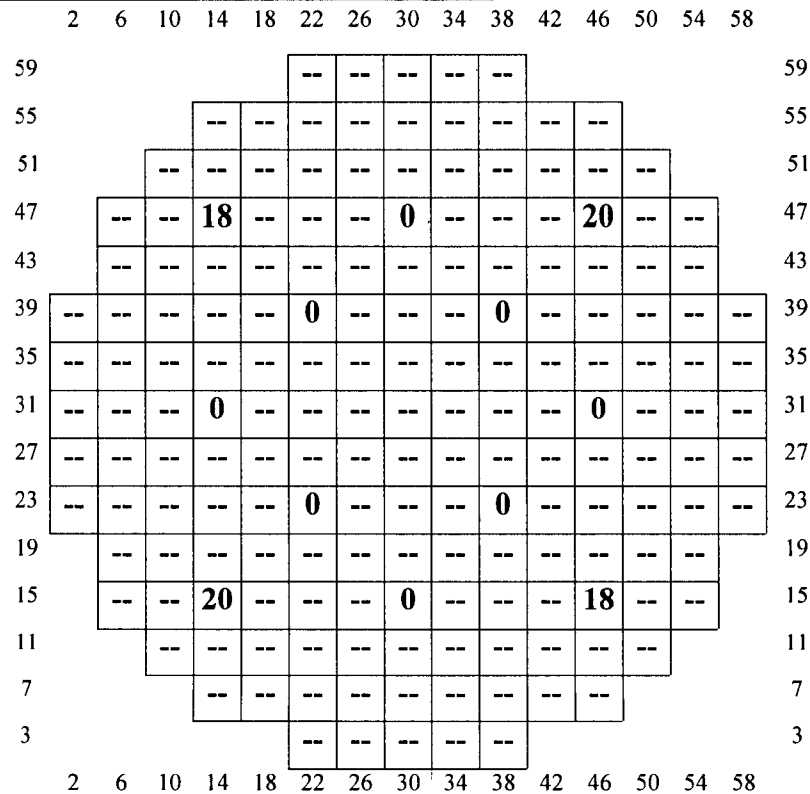
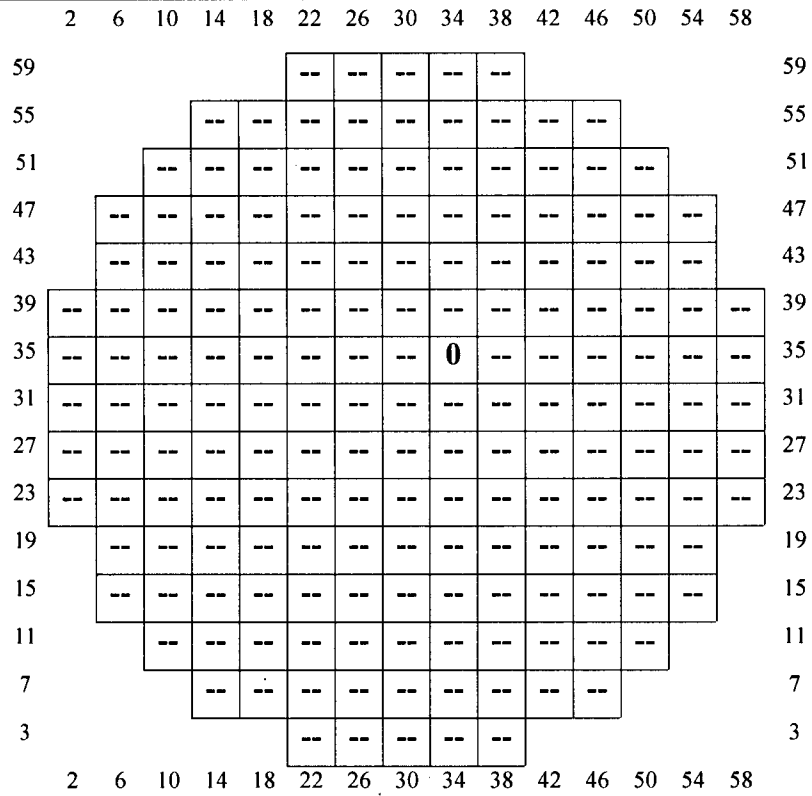


Figure 4-11. Cycle 13 Asymmetric Control Blade Configuration in Notches Withdrawn (cont.)

Cycle 13, Exposure **7227.45 to 7735.18** MWd/MTU



**Figure 4-12. Cycle 14 Asymmetric Control Blade Configuration  
in Notches Withdrawn**

Cycle 14, Exposure 0.0 to 56.55 MWd/MTU

	2	6	10	14	18	22	26	30	34	38	42	46	50	54	58	
59						--	--	--	--	--						59
55				--	--	<b>0</b>	--	<b>12</b>	--	<b>0</b>	--	--				55
51			--	--	--	--	--	--	--	--	--	--	--			51
47		--	--	<b>0</b>	--	<b>8</b>	--	<b>0</b>	--	<b>8</b>	--	<b>0</b>	--	--		47
43		--	--	--	--	--	--	--	--	--	--	--	--	--		43
39	--	<b>0</b>	--	<b>12</b>	--	<b>0</b>	--	<b>12</b>	--	<b>0</b>	--	<b>12</b>	--	<b>0</b>	--	39
35	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	35
31	--	<b>12</b>	--	<b>0</b>	--	<b>12</b>	--	<b>0</b>	--	<b>12</b>	--	<b>0</b>	--	<b>12</b>	--	31
27	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	27
23	--	<b>0</b>	--	<b>12</b>	--	<b>0</b>	--	<b>12</b>	--	<b>0</b>	--	<b>12</b>	--	<b>0</b>	--	23
19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	19
15	--	--	<b>0</b>	--	<b>8</b>	--	<b>0</b>	--	<b>8</b>	--	<b>0</b>	--	--			15
11	--	--	--	--	--	--	--	--	--	--	--	--	--	--		11
7	--	--	--	<b>0</b>	--	<b>12</b>	--	<b>0</b>	--	--						7
3	--	--	--	--	--	--	--	<b>0</b>								3

Cycle 14, Exposure 136.46 to 263.89 MWd/MTU

	2	6	10	14	18	22	26	30	34	38	42	46	50	54	58	
59						--	--	--	--	--						59
55				--	--	<b>0</b>	--	<b>42</b>	--	<b>0</b>	--	--				55
51			--	--	--	--	--	--	--	--	--	--	--			51
47		--	--	<b>0</b>	--	<b>24</b>	--	<b>0</b>	--	<b>24</b>	--	<b>0</b>	--	--		47
43		--	--	--	--	--	--	--	--	--	--	--	--	--		43
39	--	<b>0</b>	--	<b>36</b>	--	<b>0</b>	--	--	--	<b>0</b>	--	<b>36</b>	--	<b>0</b>	--	39
35	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	35
31	--	<b>42</b>	--	<b>0</b>	--	--	--	--	--	--	--	<b>0</b>	--	<b>42</b>	--	31
27	--	--	--	--	--	--	--	--	--	<b>0</b>	--	--	--	--	--	27
23	--	<b>0</b>	--	<b>36</b>	--	<b>0</b>	--	--	--	<b>0</b>	--	<b>36</b>	--	<b>0</b>	--	23
19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	19
15	--	--	<b>0</b>	--	<b>24</b>	--	<b>0</b>	--	<b>24</b>	--	<b>0</b>	--	--			15
11	--	--	--	--	--	--	--	--	--	--	--	--	--	--		11
7	--	--	--	<b>0</b>	--	<b>42</b>	--	<b>0</b>	--	--						7
3	--	--	--	--	--	--	--	--								3

**Figure 4-12. Cycle 14 Asymmetric Control Blade Configuration  
in Notches Withdrawn (cont.)**

Cycle 14, Exposure 263.89 to 394.84 MWd/MTU

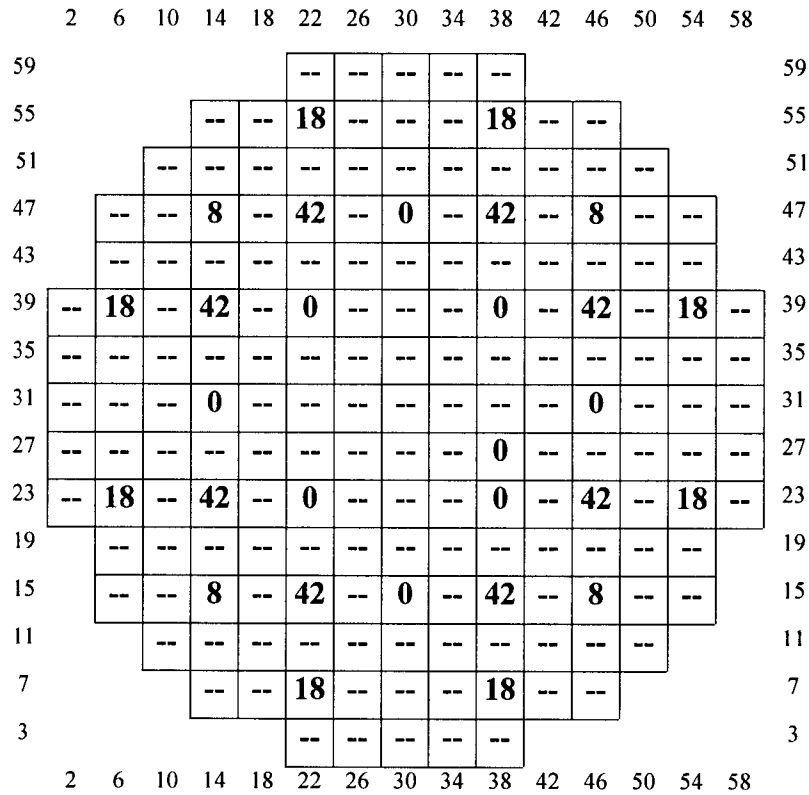
	2	6	10	14	18	22	26	30	34	38	42	46	50	54	58	
59						--	--	--	--	--						59
55				--	--	14	--	42	--	14	--	--				55
51			--	--	--	--	--	--	--	--	--	--	--			51
47		--	--	0	--	36	--	0	--	36	--	0	--	--		47
43		--	--	--	--	--	--	--	--	--	--	--	--	--		43
39	--	14	--	36	--	0	--	--	--	0	--	36	--	14	--	39
35	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	35
31	--	42	--	0	--	--	--	--	--	--	--	0	--	42	--	31
27	--	--	--	--	--	--	--	--	--	0	--	--	--	--	--	27
23	--	12	--	36	--	0	--	--	--	0	--	36	--	12	--	23
19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	19
15	--	--	0	--	36	--	0	--	36	--	0	--	--	--		15
11	--	--	--	--	--	--	--	--	--	--	--	--	--	--		11
7			--	--	14	--	42	--	14	--	--					7
3						--	--	--	--	--						3

Cycle 14, Exposure 394.84 to 501.77 MWd/MTU

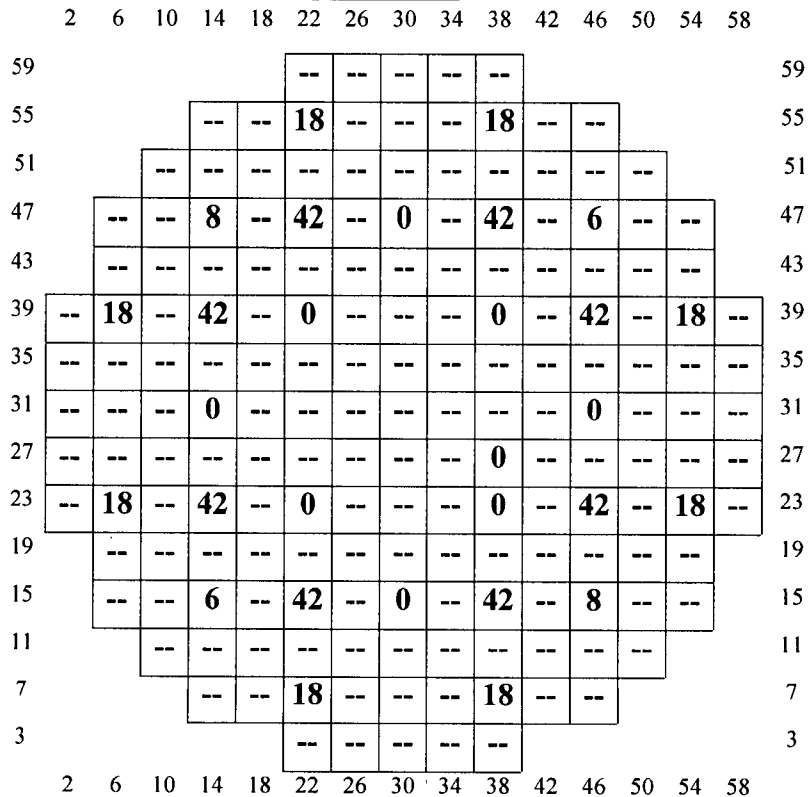
	2	6	10	14	18	22	26	30	34	38	42	46	50	54	58	
59						--	--	--	--	--						59
55				--	--	12	--	42	--	12	--	--				55
51			--	--	--	--	--	--	--	--	--	--	--			51
47		--	--	0	--	36	--	0	--	36	--	0	--	--		47
43		--	--	--	--	--	--	--	--	--	--	--	--	--		43
39	--	12	--	36	--	0	--	--	--	0	--	36	--	12	--	39
35	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	35
31	--	42	--	0	--	--	--	--	--	--	--	0	--	42	--	31
27	--	--	--	--	--	--	--	--	--	0	--	--	--	--	--	27
23	--	12	--	36	--	0	--	--	--	0	--	36	--	12	--	23
19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	19
15	--	--	0	--	36	--	0	--	36	--	0	--	--	--		15
11	--	--	--	--	--	--	--	--	--	--	--	--	--	--		11
7			--	--	12	--	42	--	12	--	--					7
3						--	--	--	--	--						3

**Figure 4-12. Cycle 14 Asymmetric Control Blade Configuration  
in Notches Withdrawn (cont.)**

Cycle 14, Exposure 501.77 to 593.26 MWd/MTU



Cycle 14, Exposure 593.26 to 679.02 MWd/MTU





**Figure 4-12. Cycle 14 Asymmetric Control Blade Configuration  
in Notches Withdrawn (cont.)**

Cycle 14, Exposure 679.02 to 775.47 MWd/MTU

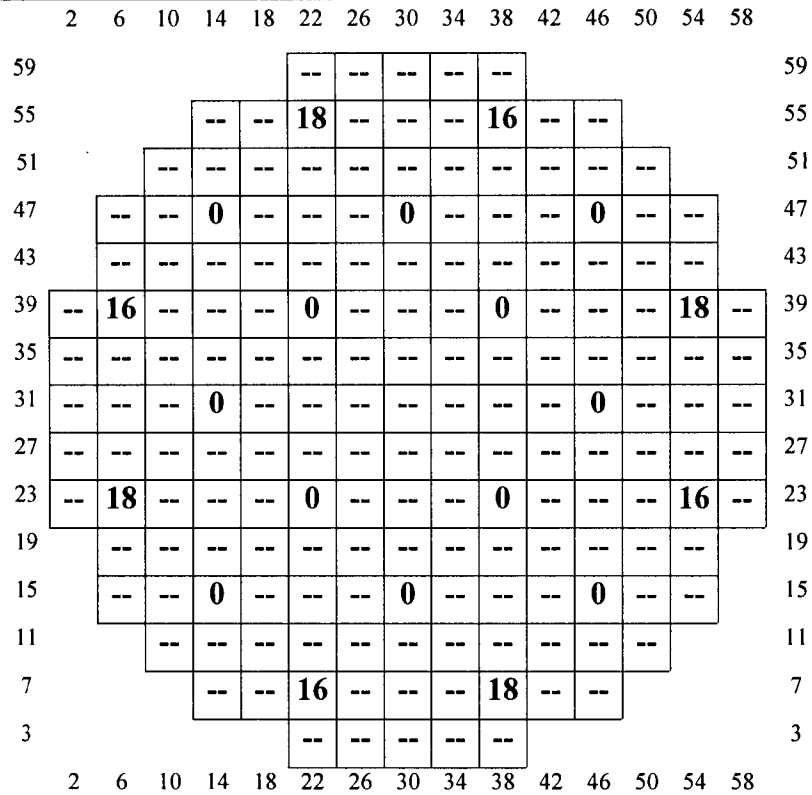
	2	6	10	14	18	22	26	30	34	38	42	46	50	54	58	
59						--	--	--	--	--						59
55				--	--	0	--	--	--	0	--	--				55
51			--	--	--	--	--	--	--	--	--	--	--			51
47		--	--	0	--	30	--	0	--	30	--	0	--	--		47
43		--	--	--	--	--	--	--	--	--	--	--	--	--		43
39	--	0	--	30	--	0	--	--	--	0	--	30	--	0	--	39
35	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	35
31	--	--	--	0	--	--	--	--	--	--	--	0	--	--	--	31
27	--	--	--	--	--	--	--	--	--	0	--	--	--	--	--	27
23	--	0	--	30	--	0	--	--	--	0	--	30	--	0	--	23
19	--	--	--	--	--	--	--	--	--	--	--	--	--	--		19
15	--	--	0	--	30	--	0	--	30	--	0	--	--			15
11	--	--	--	--	--	--	--	--	--	--	--	--	--			11
7			--	--	0	--	--	--	0	--	--					7
3						--	--	--	--	--						3

Cycle 14, Exposure 962.86 to 1300.05 MWd/MTU

	2	6	10	14	18	22	26	30	34	38	42	46	50	54	58	
59						--	--	--	--	--						59
55				--	--	18	--	--	--	16	--	--				55
51			--	--	--	--	--	--	--	--	--	--	--			51
47		--	--	0	--	42	--	0	--	42	--	0	--	--		47
43		--	--	--	--	--	--	--	--	--	--	--	--	--		43
39	--	16	--	42	--	0	--	--	--	0	--	42	--	18	--	39
35	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	35
31	--	--	--	0	--	--	--	--	--	--	--	0	--	--	--	31
27	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	27
23	--	18	--	42	--	0	--	--	--	0	--	42	--	16	--	23
19	--	--	--	--	--	--	--	--	--	--	--	--	--	--		19
15	--	--	0	--	42	--	0	--	42	--	0	--	--			15
11	--	--	--	--	--	--	--	--	--	--	--	--	--			11
7			--	--	16	--	--	--	18	--	--					7
3						--	--	--	--	--						3

**Figure 4-12. Cycle 14 Asymmetric Control Blade Configuration  
in Notches Withdrawn (cont.)**

Cycle 14, Exposure 1638.57 to 1764.89 MWd/MTU



Cycle 14, Exposure 1764.89 to 1920.98 MWd/MTU

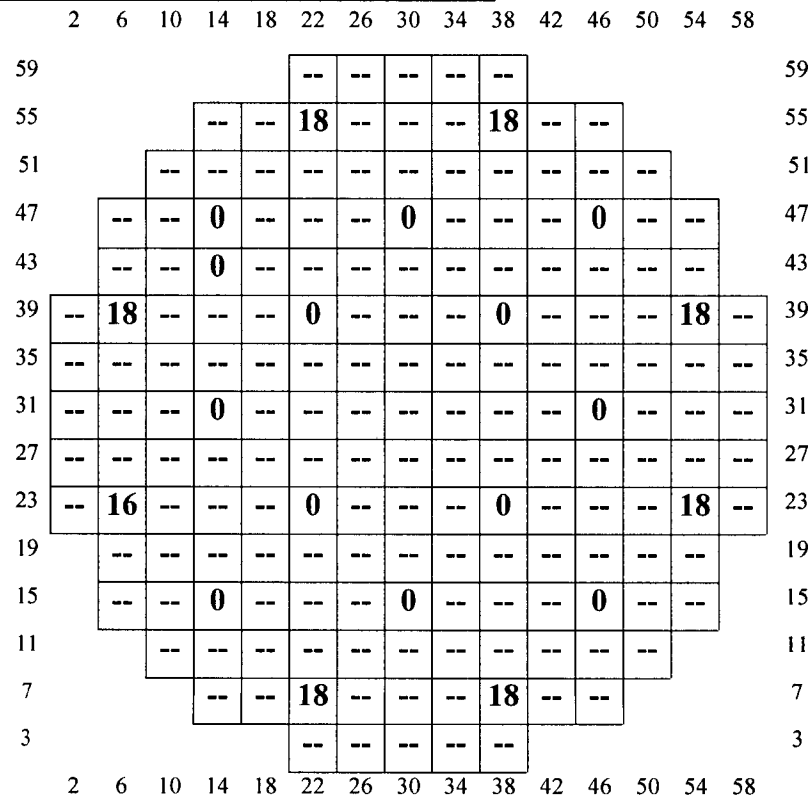


Figure 4-12. Cycle 14 Asymmetric Control Blade Configuration in Notches Withdrawn (cont.)

Cycle 14, Exposure 1920.98 to 2619.73 MWd/MTU

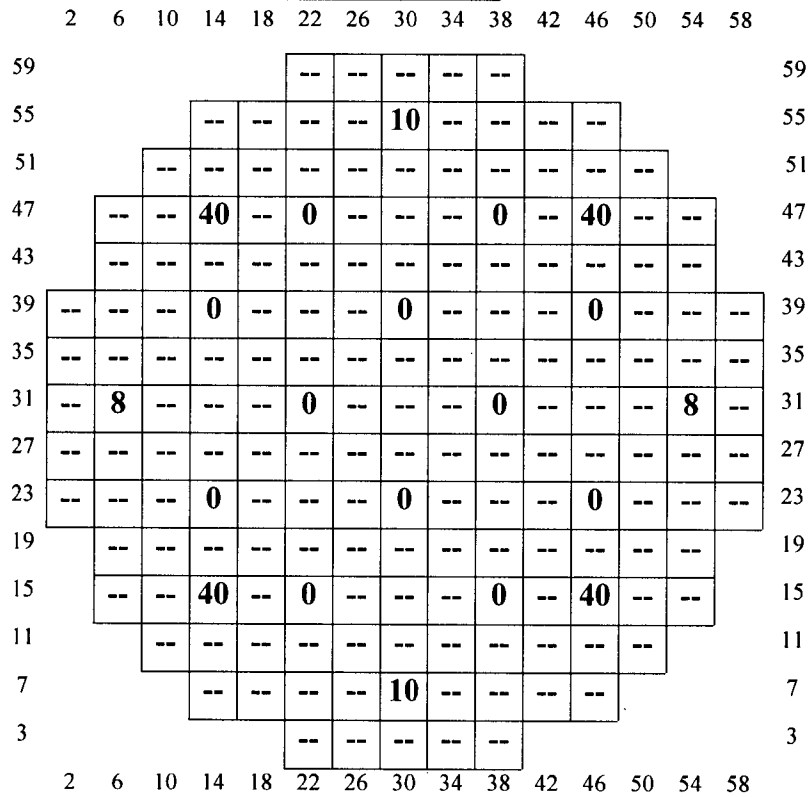
	2	6	10	14	18	22	26	30	34	38	42	46	50	54	58	
59						--	--	--	--	--						59
55				--	--	<b>16</b>	--	--	--	<b>16</b>	--	--				55
51			--	--	--	--	--	--	--	--	--	--	--			51
47		--	--	<b>0</b>	--	--	--	<b>0</b>	--	--	--	<b>0</b>	--	--		47
43		--	--	--	--	--	--	--	--	--	--	--	--	--		43
39	--	<b>16</b>	--	--	--	<b>0</b>	--	--	--	<b>0</b>	--	--	--	<b>16</b>	--	39
35	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	35
31	--	--	--	<b>0</b>	--	--	--	--	--	--	--	<b>0</b>	--	--	--	31
27	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	27
23	--	<b>16</b>	--	--	--	<b>0</b>	--	--	--	<b>0</b>	--	--	--	<b>16</b>	--	23
19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	19
15	--	--	<b>0</b>	--	--	--	<b>0</b>	--	--	--	<b>0</b>	--	--	--	--	15
11	--	--	--	--	--	--	--	--	--	--	--	--	--	--		11
7			--	--	<b>16</b>	--	--	--	<b>18</b>	--	--					7
3						--	--	--	--	--						3

Cycle 14, Exposure 2775.81 to 2930.69 MWd/MTU

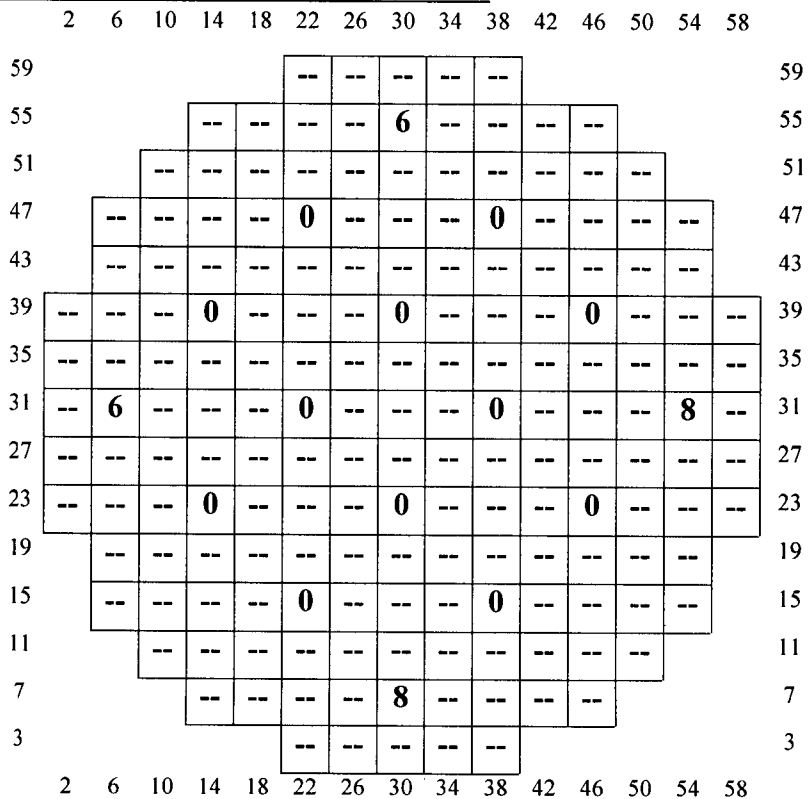
	2	6	10	14	18	22	26	30	34	38	42	46	50	54	58	
59						--	--	--	--	--						59
55				--	--	--	--	<b>8</b>	--	--	--	--				55
51			--	--	--	--	--	--	--	--	--	--	--			51
47		--	--	--	--	<b>0</b>	--	--	--	<b>0</b>	--	--	--	--		47
43		--	--	--	--	--	--	--	--	--	--	--	--	--		43
39	--	--	--	<b>0</b>	--	--	--	<b>0</b>	--	--	--	<b>0</b>	--	--	--	39
35	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	35
31	--	<b>10</b>	--	--	--	<b>0</b>	--	--	--	<b>0</b>	--	--	--	<b>10</b>	--	31
27	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	27
23	--	--	--	<b>0</b>	--	--	--	<b>0</b>	--	--	--	<b>0</b>	--	--	--	23
19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	19
15	--	--	--	--	<b>0</b>	--	--	--	<b>0</b>	--	--	--	--	--	--	15
11	--	--	--	--	--	--	--	--	--	--	--	--	--	--		11
7			--	--	--	--	<b>8</b>	--	--	--	--					7
3						--	--	--	--	--						3

**Figure 4-12. Cycle 14 Asymmetric Control Blade Configuration  
in Notches Withdrawn (cont.)**

Cycle 14, Exposure 3019.42 to 3099.45 MWd/MTU

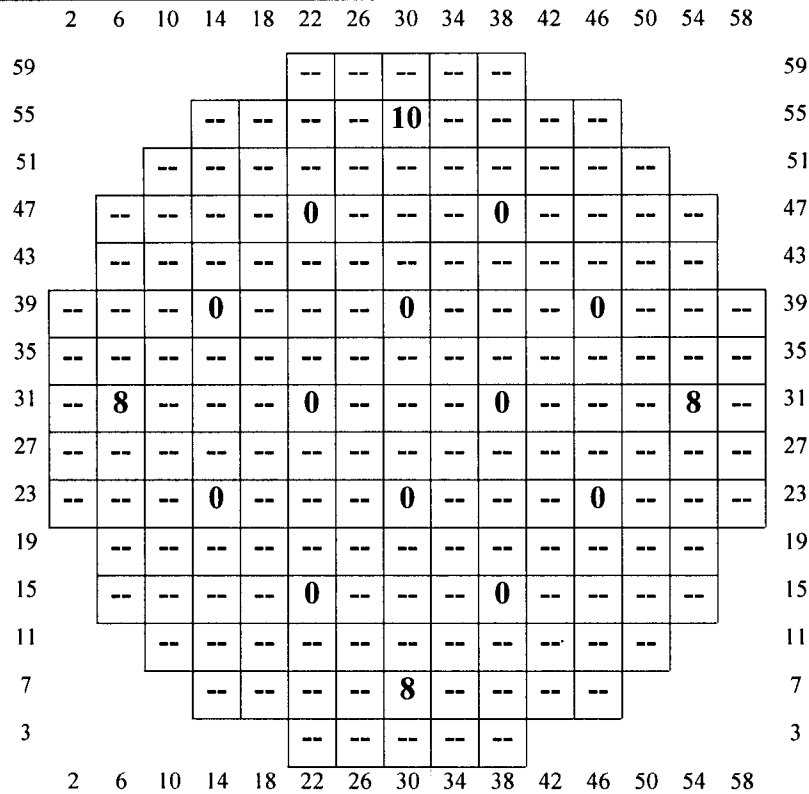


Cycle 14, Exposure 3099.45 to 3177.93 MWd/MTU

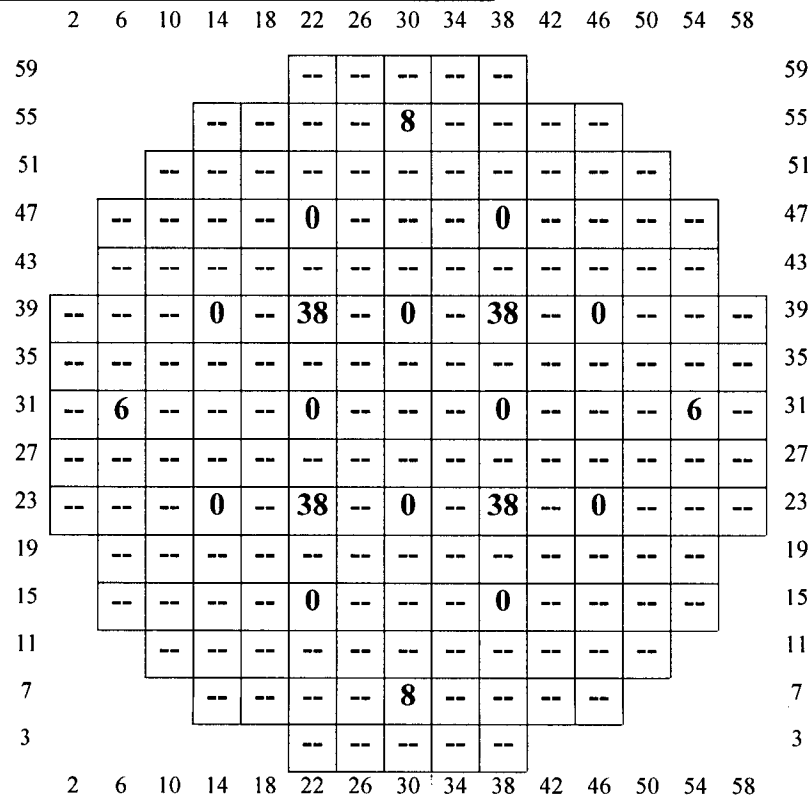


**Figure 4-12. Cycle 14 Asymmetric Control Blade Configuration  
in Notches Withdrawn (cont.)**

Cycle 14, Exposure 3518.32 to 3617.75 MWd/MTU



Cycle 14, Exposure 3617.75 to 3717.95 MWd/MTU



**Figure 4-12. Cycle 14 Asymmetric Control Blade Configuration  
in Notches Withdrawn (cont.)**

Cycle 14, Exposure 3717.95 to 3794.56 MWd/MTU

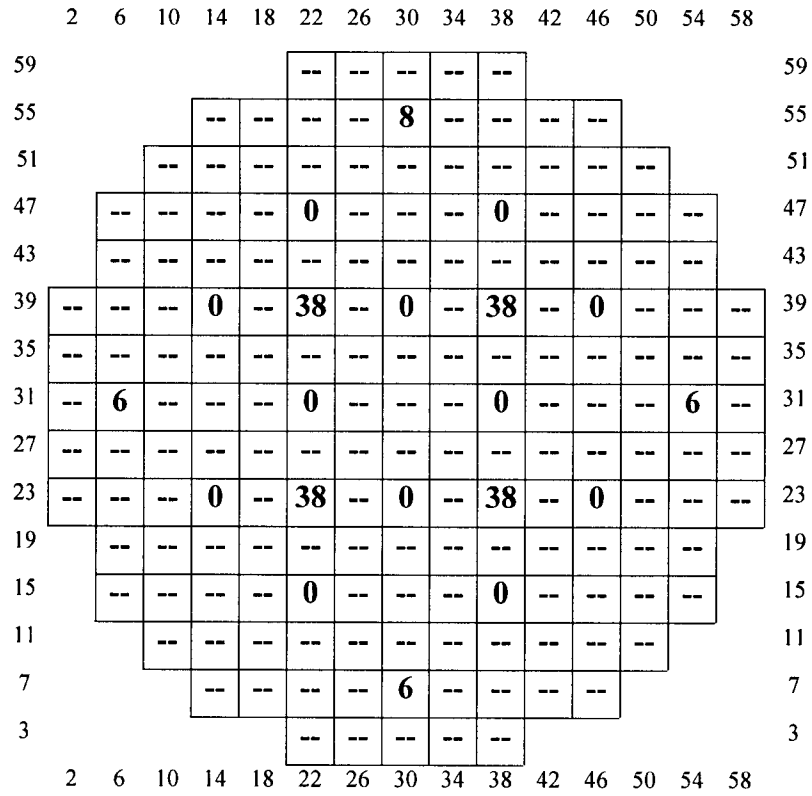
	2	6	10	14	18	22	26	30	34	38	42	46	50	54	58	
59						--	--	--	--	--						59
55				--	--	--	--	<b>0</b>	--	--	--	--				55
51			--	--	--	--	--	--	--	--	--	--	--			51
47		--	--	--	--	<b>0</b>	--	--	--	<b>0</b>	--	<b>20</b>	--	--		47
43		--	--	--	--	--	--	--	--	--	--	--	--	--		43
39	--	--	--	<b>0</b>	--	<b>38</b>	--	<b>0</b>	--	<b>38</b>	--	<b>0</b>	--	--	--	39
35	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	35
31	--	<b>0</b>	--	--	--	<b>0</b>	--	--	--	<b>0</b>	--	--	--	<b>0</b>	--	31
27	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	27
23	--	--	--	<b>0</b>	--	<b>38</b>	--	<b>0</b>	--	<b>38</b>	--	<b>0</b>	--	--	--	23
19		--	--	--	--	--	--	--	--	--	--	--	--	--		19
15		--	--	<b>18</b>	--	<b>0</b>	--	--	--	<b>0</b>	--	--	--	--		15
11		--	--	--	--	--	--	--	--	--	--	--	--	--		11
7			--	--	--	--	<b>0</b>	--	--	--	--	--				7
3						--	--	--	--	--						3
	2	6	10	14	18	22	26	30	34	38	42	46	50	54	58	

Cycle 14, Exposure 3872.16 to 3971.48 MWd/MTU

	2	6	10	14	18	22	26	30	34	38	42	46	50	54	58	
59						--	--	--	--	--						59
55				--	--	--	--	<b>10</b>	--	--	--	--				55
51			--	--	--	--	--	--	--	--	--	--	--			51
47		--	--	--	--	<b>0</b>	--	--	--	<b>0</b>	--	--	--	--		47
43		--	--	--	--	--	--	--	--	--	--	--	--	--		43
39	--	--	--	<b>0</b>	--	<b>30</b>	--	<b>0</b>	--	<b>30</b>	--	<b>0</b>	--	--	--	39
35	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	35
31	--	<b>8</b>	--	--	--	<b>0</b>	--	--	--	<b>0</b>	--	--	--	<b>8</b>	--	31
27	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	27
23	--	--	--	<b>0</b>	--	<b>30</b>	--	<b>0</b>	--	<b>30</b>	--	<b>0</b>	--	--	--	23
19		--	--	--	--	--	--	--	--	--	--	--	--	--		19
15		--	--	--	--	<b>0</b>	--	--	--	<b>0</b>	--	--	--	--		15
11		--	--	--	--	--	--	--	--	--	--	--	--	--		11
7			--	--	--	--	<b>10</b>	--	--	--	--	--				7
3						--	--	--	--	--						3
	2	6	10	14	18	22	26	30	34	38	42	46	50	54	58	

**Figure 4-12. Cycle 14 Asymmetric Control Blade Configuration  
in Notches Withdrawn (cont.)**

Cycle 14, Exposure 4010.83 to 4070.79 MWd/MTU



**Table 4-257. Step Lengths for SAS2H Depletion Calculations**

Cycle	Range of EFPD	Relative Datapoint or Statepoint	Number of Steps In Datapoint or Statepoint	Step Length EFPD
9	0.0 to 167.47	1	3	55.82
9	167.47 to 348.44	2	3	60.32
10	0.0 to 222.47	1	4	55.62
10	222.47 to 467.48	2	4	61.25
11	0.0 to 180.30	1	3	60.10
11	180.30 to 484.20	2	5	60.78
12	0.0 to 142.20	1	3	47.40
12	142.20 to 263.70	2	2	60.75
13	0.0 to 10.10	1	1	10.10
13	10.10 to 112.94	2	2	51.42
13	112.94 to 224.40	3	2	55.73
13	224.40 to 324.73	4	2	50.17
13	324.73 to 387.07	5	1	62.34
14	0.0 to 93.56	1	2	46.78
14	93.56 to 211.09	2	2	58.76

**Table 4-258. Control Blade Insertion History**

Description of the data given in the following table is provided for fuel assembly A1. The similar description applies to all the bladed fuel assemblies.

Fuel Assembly: A1					
Bladed Cycle: 11					
Number of Irradiation Steps: 6					
Relative Cycle for Fuel Assy	Relative Cycle Datapoint or Statepoint	Relative Step Number	Nodes Exposed to a Blade		SAS2H Material Identifier
			Bottom Node No.	Top Node No.	
3	1	1	1	3	11
3	1	2	1	3	11
3	1	3	1	8	11
3	2	1	1	7	11
3	2	2	1	8	11
3	2	3	1	2	11





**Table 4-258. Control Blade Insertion History (cont.)**

SPACE INPUT-CRB INSERTION SECTION (COLLAPSED):

0 : Number of irradiation steps with CRB inserted

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (UNCOLLAPSED):

0 : Number of irradiation steps with CRB inserted

ASSEMBLY: A3

BLADED CYCLE: 11

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (COLLAPSED):

4 : Number of irradiation steps with CRB inserted  
 1 : Number of axial sections with CRB inserted in step  
 3 1 2 1 3 11 : Insertion history statement  
 1 : Number of axial sections with CRB inserted in step  
 3 1 3 1 9 11 : Insertion history statement  
 1 : Number of axial sections with CRB inserted in step  
 3 2 1 1 5 11 : Insertion history statement  
 1 : Number of axial sections with CRB inserted in step  
 3 2 2 1 10 11 : Insertion history statement

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (UNCOLLAPSED):

4 : Number of irradiation steps with CRB inserted  
 1 : Number of axial sections with CRB inserted in step  
 3 1 2 1 5 11 : Insertion history statement  
 1 : Number of axial sections with CRB inserted in step  
 3 1 3 1 22 11 : Insertion history statement  
 1 : Number of axial sections with CRB inserted in step  
 3 2 1 1 10 11 : Insertion history statement  
 1 : Number of axial sections with CRB inserted in step  
 3 2 2 1 24 11 : Insertion history statement

ASSEMBLY: A4

BLADED CYCLE: 11

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (COLLAPSED):

7 : Number of irradiation steps with CRB inserted  
 1 : Number of axial sections with CRB inserted in step  
 3 1 1 1 7 11 : Insertion history statement  
 1 : Number of axial sections with CRB inserted in step  
 3 1 2 1 8 11 : Insertion history statement  
 1 : Number of axial sections with CRB inserted in step  
 3 1 3 1 3 11 : Insertion history statement  
 1 : Number of axial sections with CRB inserted in step  
 3 2 1 1 3 11 : Insertion history statement  
 1 : Number of axial sections with CRB inserted in step  
 3 2 2 1 3 11 : Insertion history statement  
 1 : Number of axial sections with CRB inserted in step  
 3 2 3 1 8 11 : Insertion history statement  
 1 : Number of axial sections with CRB inserted in step  
 3 2 4 1 3 11 : Insertion history statement

\*\*\*\*\*

Table 4-258. Control Blade Insertion History (cont.)

SPACE INPUT-CRB INSERTION SECTION (UNCOLLAPSED):

```

7           : Number of irradiation steps with CRB inserted
1           : Number of axial sections with CRB inserted in step
3 1 1 1 16 11 : Insertion history statement
1           : Number of axial sections with CRB inserted in step
3 1 2 1 18 11 : Insertion history statement
1           : Number of axial sections with CRB inserted in step
3 1 3 1 6 11  : Insertion history statement
1           : Number of axial sections with CRB inserted in step
3 2 1 1 6 11  : Insertion history statement
1           : Number of axial sections with CRB inserted in step
3 2 2 1 6 11  : Insertion history statement
1           : Number of axial sections with CRB inserted in step
3 2 3 1 18 11 : Insertion history statement
1           : Number of axial sections with CRB inserted in step
3 2 4 1 12 11 : Insertion history statement

```

ASSEMBLY: A6  
BLADED CYCLE: 10

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (COLLAPSED):

0 : Number of irradiation steps with CRB inserted

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (UNCOLLAPSED):

0 : Number of irradiation steps with CRB inserted

ASSEMBLY: A7  
BLADED CYCLE: 10

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (COLLAPSED):

```

1           : Number of irradiation steps with CRB inserted
1           : Number of axial sections with CRB inserted in step
2 2 2 1 7 11 : Insertion history statement

```

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (UNCOLLAPSED):

```

1           : Number of irradiation steps with CRB inserted
1           : Number of axial sections with CRB inserted in step
2 2 2 1 16 11 : Insertion history statement

```

ASSEMBLY: A7  
BLADED CYCLE: 12

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (COLLAPSED):

```

2           : Number of irradiation steps with CRB inserted
1           : Number of axial sections with CRB inserted in step
4 1 1 1 8 11 : Insertion history statement
1           : Number of axial sections with CRB inserted in step

```

**Table 4-258. Control Blade Insertion History (cont.)**

4 1 3 1 8 11 : Insertion history statement

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (UNCOLLAPSED):

2 : Number of irradiation steps with CRB inserted  
 1 : Number of axial sections with CRB inserted in step  
 4 1 1 1 20 11 : Insertion history statement  
 1 : Number of axial sections with CRB inserted in step  
 4 1 3 1 20 11 : Insertion history statement

ASSEMBLY: A8  
 BLADED CYCLE: 11

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (COLLAPSED):

2 : Number of irradiation steps with CRB inserted  
 1 : Number of axial sections with CRB inserted in step  
 3 2 1 1 3 11 : Insertion history statement  
 1 : Number of axial sections with CRB inserted in step  
 3 2 2 1 3 11 : Insertion history statement

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (UNCOLLAPSED):

2 : Number of irradiation steps with CRB inserted  
 1 : Number of axial sections with CRB inserted in step  
 3 2 1 1 4 11 : Insertion history statement  
 1 : Number of axial sections with CRB inserted in step  
 3 2 2 1 4 11 : Insertion history statement

ASSEMBLY: B1  
 BLADED CYCLE: 11

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (COLLAPSED):

6 : Number of irradiation steps with CRB inserted  
 1 : Number of axial sections with CRB inserted in step  
 3 1 1 1 3 11 : Insertion history statement  
 1 : Number of axial sections with CRB inserted in step  
 3 1 2 1 3 11 : Insertion history statement  
 1 : Number of axial sections with CRB inserted in step  
 3 1 3 1 8 11 : Insertion history statement  
 1 : Number of axial sections with CRB inserted in step  
 3 2 1 1 6 11 : Insertion history statement  
 1 : Number of axial sections with CRB inserted in step  
 3 2 2 1 8 11 : Insertion history statement  
 1 : Number of axial sections with CRB inserted in step  
 3 2 3 1 2 11 : Insertion history statement

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (UNCOLLAPSED):

6 : Number of irradiation steps with CRB inserted  
 1 : Number of axial sections with CRB inserted in step  
 3 1 1 1 6 11 : Insertion history statement  
 1 : Number of axial sections with CRB inserted in step  
 3 1 2 1 6 11 : Insertion history statement

**Table 4-258. Control Blade Insertion History (cont.)**

```

1          : Number of axial sections with CRB inserted in step
3 1 3 1 18 11 : Insertion history statement
1          : Number of axial sections with CRB inserted in step
3 2 1 1 13 11 : Insertion history statement
1          : Number of axial sections with CRB inserted in step
3 2 2 1 19 11 : Insertion history statement
1          : Number of axial sections with CRB inserted in step
3 2 3 1 3 11  : Insertion history statement

```

ASSEMBLY: B2  
 BLADED CYCLE: 11

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (COLLAPSED):

```

4          : Number of irradiation steps with CRB inserted
1          : Number of axial sections with CRB inserted in step
3 1 2 1 4 11 : Insertion history statement
1          : Number of axial sections with CRB inserted in step
3 1 3 1 6 11 : Insertion history statement
1          : Number of axial sections with CRB inserted in step
3 2 1 1 6 11 : Insertion history statement
1          : Number of axial sections with CRB inserted in step
3 2 2 1 6 11 : Insertion history statement

```

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (UNCOLLAPSED):

```

4          : Number of irradiation steps with CRB inserted
1          : Number of axial sections with CRB inserted in step
3 1 2 1 9 11 : Insertion history statement
1          : Number of axial sections with CRB inserted in step
3 1 3 1 14 11 : Insertion history statement
1          : Number of axial sections with CRB inserted in step
3 2 1 1 14 11 : Insertion history statement
1          : Number of axial sections with CRB inserted in step
3 2 2 1 14 11 : Insertion history statement

```

ASSEMBLY: B3  
 BLADED CYCLE: 10

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (COLLAPSED):

```

5          : Number of irradiation steps with CRB inserted
1          : Number of axial sections with CRB inserted in step
2 1 3 1 1 11 : Insertion history statement
1          : Number of axial sections with CRB inserted in step
2 1 4 1 9 11 : Insertion history statement
1          : Number of axial sections with CRB inserted in step
2 2 1 1 8 11 : Insertion history statement
1          : Number of axial sections with CRB inserted in step
2 2 2 1 5 11 : Insertion history statement
1          : Number of axial sections with CRB inserted in step
2 2 3 1 1 11 : Insertion history statement

```

\*\*\*\*\*

**Table 4-258. Control Blade Insertion History (cont.)**

**SPACE INPUT-CRB INSERTION SECTION (UNCOLLAPSED):**

```

5           : Number of irradiation steps with CRB inserted
1           : Number of axial sections with CRB inserted in step
2 1 3 1 1 11 : Insertion history statement
1           : Number of axial sections with CRB inserted in step
2 1 4 1 21 11 : Insertion history statement
1           : Number of axial sections with CRB inserted in step
2 2 1 1 20 11 : Insertion history statement
1           : Number of axial sections with CRB inserted in step
2 2 2 1 9 11 : Insertion history statement
1           : Number of axial sections with CRB inserted in step
2 2 3 1 1 11 : Insertion history statement
    
```

ASSEMBLY: B4  
 BLADED CYCLE: 10

\*\*\*\*\*

**SPACE INPUT-CRB INSERTION SECTION (COLLAPSED):**

```

0           : Number of irradiation steps with CRB inserted
    
```

\*\*\*\*\*

**SPACE INPUT-CRB INSERTION SECTION (UNCOLLAPSED):**

```

0           : Number of irradiation steps with CRB inserted
    
```

ASSEMBLY: B5  
 BLADED CYCLE: 11

\*\*\*\*\*

**SPACE INPUT-CRB INSERTION SECTION (COLLAPSED):**

```

6           : Number of irradiation steps with CRB inserted
1           : Number of axial sections with CRB inserted in step
3 1 1 1 7 11 : Insertion history statement
1           : Number of axial sections with CRB inserted in step
3 1 2 1 8 11 : Insertion history statement
1           : Number of axial sections with CRB inserted in step
3 1 3 1 3 11 : Insertion history statement
1           : Number of axial sections with CRB inserted in step
3 2 1 1 3 11 : Insertion history statement
1           : Number of axial sections with CRB inserted in step
3 2 2 1 3 11 : Insertion history statement
1           : Number of axial sections with CRB inserted in step
3 2 3 1 8 11 : Insertion history statement
    
```

\*\*\*\*\*

**SPACE INPUT-CRB INSERTION SECTION (UNCOLLAPSED):**

```

6           : Number of irradiation steps with CRB inserted
1           : Number of axial sections with CRB inserted in step
3 1 1 1 16 11 : Insertion history statement
1           : Number of axial sections with CRB inserted in step
3 1 2 1 18 11 : Insertion history statement
1           : Number of axial sections with CRB inserted in step
3 1 3 1 6 11 : Insertion history statement
    
```

**Table 4-258. Control Blade Insertion History (cont.)**

```

1          : Number of axial sections with CRB inserted in step
3 2 1 1 6 11 : Insertion history statement
1          : Number of axial sections with CRB inserted in step
3 2 2 1 5 11 : Insertion history statement
1          : Number of axial sections with CRB inserted in step
3 2 3 1 18 11 : Insertion history statement
    
```

ASSEMBLY: C3  
 BLADED CYCLE: 12

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (COLLAPSED):

```

1          : Number of irradiation steps with CRB inserted
1          : Number of axial sections with CRB inserted in step
3 2 2 1 3 11 : Insertion history statement
    
```

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (UNCOLLAPSED):

```

1          : Number of irradiation steps with CRB inserted
1          : Number of axial sections with CRB inserted in step
3 2 2 1 5 11 : Insertion history statement
    
```

ASSEMBLY: C4  
 BLADED CYCLE: 11

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (COLLAPSED):

```

6          : Number of irradiation steps with CRB inserted
1          : Number of axial sections with CRB inserted in step
2 1 1 1 6 11 : Insertion history statement
1          : Number of axial sections with CRB inserted in step
2 1 2 1 6 11 : Insertion history statement
1          : Number of axial sections with CRB inserted in step
2 1 3 1 2 11 : Insertion history statement
1          : Number of axial sections with CRB inserted in step
2 2 1 1 3 11 : Insertion history statement
1          : Number of axial sections with CRB inserted in step
2 2 2 1 4 11 : Insertion history statement
1          : Number of axial sections with CRB inserted in step
2 2 3 1 6 11 : Insertion history statement
    
```

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (UNCOLLAPSED):

```

6          : Number of irradiation steps with CRB inserted
1          : Number of axial sections with CRB inserted in step
2 1 1 1 13 11 : Insertion history statement
1          : Number of axial sections with CRB inserted in step
2 1 2 1 13 11 : Insertion history statement
1          : Number of axial sections with CRB inserted in step
2 1 3 1 3 11 : Insertion history statement
1          : Number of axial sections with CRB inserted in step
2 2 1 1 6 11 : Insertion history statement
1          : Number of axial sections with CRB inserted in step
    
```

**Table 4-258. Control Blade Insertion History (cont.)**

2 2 2 1 7 11 : Insertion history statement  
1 : Number of axial sections with CRB inserted in step  
2 2 3 1 14 11 : Insertion history statement

ASSEMBLY: C4  
BLADED CYCLE: 13

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (COLLAPSED):

1 : Number of irradiation steps with CRB inserted  
1 : Number of axial sections with CRB inserted in step  
4 3 1 1 5 11 : Insertion history statement

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (UNCOLLAPSED):

1 : Number of irradiation steps with CRB inserted  
1 : Number of axial sections with CRB inserted in step  
4 3 1 1 10 11 : Insertion history statement

ASSEMBLY: C5  
BLADED CYCLE: 12

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (COLLAPSED):

2 : Number of irradiation steps with CRB inserted  
1 : Number of axial sections with CRB inserted in step  
3 2 1 1 3 11 : Insertion history statement  
1 : Number of axial sections with CRB inserted in step  
3 2 2 1 6 11 : Insertion history statement

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (UNCOLLAPSED):

2 : Number of irradiation steps with CRB inserted  
1 : Number of axial sections with CRB inserted in step  
3 2 1 1 5 11 : Insertion history statement  
1 : Number of axial sections with CRB inserted in step  
3 2 2 1 14 11 : Insertion history statement

ASSEMBLY: C5  
BLADED CYCLE: 14

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (COLLAPSED):

0 : Number of irradiation steps with CRB inserted

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (UNCOLLAPSED):

0 : Number of irradiation steps with CRB inserted



Table 4-258. Control Blade Insertion History (cont.)

ASSEMBLY: C6  
BLADED CYCLE: 10

\*\*\*\*\*  
SPACE INPUT-CRB INSERTION SECTION (COLLAPSED):  
0 : Number of irradiation steps with CRB inserted

\*\*\*\*\*  
SPACE INPUT-CRB INSERTION SECTION (UNCOLLAPSED):  
0 : Number of irradiation steps with CRB inserted

ASSEMBLY: C6  
BLADED CYCLE: 12

\*\*\*\*\*  
SPACE INPUT-CRB INSERTION SECTION (COLLAPSED):  
0 : Number of irradiation steps with CRB inserted

\*\*\*\*\*  
SPACE INPUT-CRB INSERTION SECTION (UNCOLLAPSED):  
0 : Number of irradiation steps with CRB inserted

ASSEMBLY: C7  
BLADED CYCLE: 10

\*\*\*\*\*  
SPACE INPUT-CRB INSERTION SECTION (COLLAPSED):  
0 : Number of irradiation steps with CRB inserted

\*\*\*\*\*  
SPACE INPUT-CRB INSERTION SECTION (UNCOLLAPSED):  
0 : Number of irradiation steps with CRB inserted

ASSEMBLY: C7  
BLADED CYCLE: 12

\*\*\*\*\*  
SPACE INPUT-CRB INSERTION SECTION (COLLAPSED):  
1 : Number of irradiation steps with CRB inserted  
1 : Number of axial sections with CRB inserted in step  
3 2 2 1 3 11 : Insertion history statement

\*\*\*\*\*  
SPACE INPUT-CRB INSERTION SECTION (UNCOLLAPSED):

**Table 4-258. Control Blade Insertion History (cont.)**

1 : Number of irradiation steps with CRB inserted  
 1 : Number of axial sections with CRB inserted in step  
 3 2 2 1 5 11 : Insertion history statement

ASSEMBLY: C8  
 BLADED CYCLE: 12

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (COLLAPSED):

5 : Number of irradiation steps with CRB inserted  
 1 : Number of axial sections with CRB inserted in step  
 3 1 1 1 6 11 : Insertion history statement  
 1 : Number of axial sections with CRB inserted in step  
 3 1 2 1 6 11 : Insertion history statement  
 1 : Number of axial sections with CRB inserted in step  
 3 1 3 1 7 11 : Insertion history statement  
 1 : Number of axial sections with CRB inserted in step  
 3 2 1 1 2 11 : Insertion history statement  
 1 : Number of axial sections with CRB inserted in step  
 3 2 2 1 6 11 : Insertion history statement

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (UNCOLLAPSED):

5 : Number of irradiation steps with CRB inserted  
 1 : Number of axial sections with CRB inserted in step  
 3 1 1 1 14 11 : Insertion history statement  
 1 : Number of axial sections with CRB inserted in step  
 3 1 2 1 13 11 : Insertion history statement  
 1 : Number of axial sections with CRB inserted in step  
 3 1 3 1 15 11 : Insertion history statement  
 1 : Number of axial sections with CRB inserted in step  
 3 2 1 1 3 11 : Insertion history statement  
 1 : Number of axial sections with CRB inserted in step  
 3 2 2 1 12 11 : Insertion history statement

ASSEMBLY: C9  
 BLADED CYCLE: 10

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (COLLAPSED):

0 : Number of irradiation steps with CRB inserted

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (UNCOLLAPSED):

0 : Number of irradiation steps with CRB inserted

ASSEMBLY: C9  
 BLADED CYCLE: 13

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (COLLAPSED):

6 : Number of irradiation steps with CRB inserted  
 1 : Number of axial sections with CRB inserted in step  
 4 1 1 1 9 11 : Insertion history statement

**Table 4-258. Control Blade Insertion History (cont.)**

```

1          : Number of axial sections with CRB inserted in step
4 2 1 1 8 11 : Insertion history statement
1          : Number of axial sections with CRB inserted in step
4 2 2 1 10 11 : Insertion history statement
1          : Number of axial sections with CRB inserted in step
4 3 1 1 10 11 : Insertion history statement
1          : Number of axial sections with CRB inserted in step
4 3 2 1 10 11 : Insertion history statement
1          : Number of axial sections with CRB inserted in step
4 4 2 1 10 11 : Insertion history statement

```

\*\*\*\*\*

**SPACE INPUT-CRB INSERTION SECTION (UNCOLLAPSED):**

```

6          : Number of irradiation steps with CRB inserted
1          : Number of axial sections with CRB inserted in step
4 1 1 1 21 11 : Insertion history statement
1          : Number of axial sections with CRB inserted in step
4 2 1 1 19 11 : Insertion history statement
1          : Number of axial sections with CRB inserted in step
4 2 2 1 24 11 : Insertion history statement
1          : Number of axial sections with CRB inserted in step
4 3 1 1 24 11 : Insertion history statement
1          : Number of axial sections with CRB inserted in step
4 3 2 1 24 11 : Insertion history statement
1          : Number of axial sections with CRB inserted in step
4 4 2 1 24 11 : Insertion history statement

```

**ASSEMBLY: C10**  
**BLADED CYCLE: 11**

\*\*\*\*\*

**SPACE INPUT-CRB INSERTION SECTION (COLLAPSED):**

```

6          : Number of irradiation steps with CRB inserted
1          : Number of axial sections with CRB inserted in step
2 1 1 1 6 11 : Insertion history statement
1          : Number of axial sections with CRB inserted in step
2 1 2 1 6 11 : Insertion history statement
1          : Number of axial sections with CRB inserted in step
2 1 3 1 2 11 : Insertion history statement
1          : Number of axial sections with CRB inserted in step
2 2 1 1 3 11 : Insertion history statement
1          : Number of axial sections with CRB inserted in step
2 2 2 1 4 11 : Insertion history statement
1          : Number of axial sections with CRB inserted in step
2 2 3 1 6 11 : Insertion history statement

```

\*\*\*\*\*

**SPACE INPUT-CRB INSERTION SECTION (UNCOLLAPSED):**

```

6          : Number of irradiation steps with CRB inserted
1          : Number of axial sections with CRB inserted in step
2 1 1 1 13 11 : Insertion history statement
1          : Number of axial sections with CRB inserted in step
2 1 2 1 13 11 : Insertion history statement
1          : Number of axial sections with CRB inserted in step
2 1 3 1 3 11 : Insertion history statement
1          : Number of axial sections with CRB inserted in step
2 2 1 1 6 11 : Insertion history statement
1          : Number of axial sections with CRB inserted in step

```

**Table 4-258. Control Blade Insertion History (cont.)**

2 2 2 1 7 11 : Insertion history statement  
1 : Number of axial sections with CRB inserted in step  
2 2 3 1 14 11 : Insertion history statement

ASSEMBLY: C11  
BLADED CYCLE: 10

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (COLLAPSED):

0 : Number of irradiation steps with CRB inserted

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (UNCOLLAPSED):

0 : Number of irradiation steps with CRB inserted

ASSEMBLY: C11  
BLADED CYCLE: 12

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (COLLAPSED):

2 : Number of irradiation steps with CRB inserted  
1 : Number of axial sections with CRB inserted in step  
3 2 1 1 3 11 : Insertion history statement  
1 : Number of axial sections with CRB inserted in step  
3 2 2 1 6 11 : Insertion history statement

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (UNCOLLAPSED):

2 : Number of irradiation steps with CRB inserted  
1 : Number of axial sections with CRB inserted in step  
3 2 1 1 5 11 : Insertion history statement  
1 : Number of axial sections with CRB inserted in step  
3 2 2 1 14 11 : Insertion history statement

ASSEMBLY: C14  
BLADED CYCLE: 10

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (COLLAPSED):

0 : Number of irradiation steps with CRB inserted

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (UNCOLLAPSED):

0 : Number of irradiation steps with CRB inserted

ASSEMBLY: C14  
BLADED CYCLE: 13

**Table 4-258. Control Blade Insertion History (cont.)**

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (COLLAPSED):

```

6           : Number of irradiation steps with CRB inserted
1           : Number of axial sections with CRB inserted in step
4 1 1 1 9 11 : Insertion history statement
1           : Number of axial sections with CRB inserted in step
4 2 1 1 8 11 : Insertion history statement
1           : Number of axial sections with CRB inserted in step
4 2 2 1 10 11 : Insertion history statement
1           : Number of axial sections with CRB inserted in step
4 3 1 1 10 11 : Insertion history statement
1           : Number of axial sections with CRB inserted in step
4 3 2 1 10 11 : Insertion history statement
1           : Number of axial sections with CRB inserted in step
4 4 2 1 10 11 : Insertion history statement
    
```

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (UNCOLLAPSED):

```

6           : Number of irradiation steps with CRB inserted
1           : Number of axial sections with CRB inserted in step
4 1 1 1 21 11 : Insertion history statement
1           : Number of axial sections with CRB inserted in step
4 2 1 1 19 11 : Insertion history statement
1           : Number of axial sections with CRB inserted in step
4 2 2 1 24 11 : Insertion history statement
1           : Number of axial sections with CRB inserted in step
4 3 1 1 24 11 : Insertion history statement
1           : Number of axial sections with CRB inserted in step
4 3 2 1 24 11 : Insertion history statement
1           : Number of axial sections with CRB inserted in step
4 4 2 1 24 11 : Insertion history statement
    
```

ASSEMBLY: C14  
 BLADED CYCLE: 14

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (COLLAPSED):

```

0           : Number of irradiation steps with CRB inserted
    
```

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (UNCOLLAPSED):

```

0           : Number of irradiation steps with CRB inserted
    
```

ASSEMBLY: D2  
 BLADED CYCLE: 10

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (COLLAPSED):

```

0           : Number of irradiation steps with CRB inserted
    
```

Table 4-258. Control Blade Insertion History (cont.)

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (UNCOLLAPSED):

0 : Number of irradiation steps with CRB inserted

ASSEMBLY: D3

BLADED CYCLE: 12

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (COLLAPSED):

3 : Number of irradiation steps with CRB inserted  
1 : Number of axial sections with CRB inserted in step  
3 1 3 1 2 11 : Insertion history statement  
1 : Number of axial sections with CRB inserted in step  
3 2 1 1 3 11 : Insertion history statement  
1 : Number of axial sections with CRB inserted in step  
3 2 2 1 6 11 : Insertion history statement

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (UNCOLLAPSED):

3 : Number of irradiation steps with CRB inserted  
1 : Number of axial sections with CRB inserted in step  
3 1 3 1 3 11 : Insertion history statement  
1 : Number of axial sections with CRB inserted in step  
3 2 1 1 5 11 : Insertion history statement  
1 : Number of axial sections with CRB inserted in step  
3 2 2 1 14 11 : Insertion history statement

ASSEMBLY: D6

BLADED CYCLE: 12

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (COLLAPSED):

0 : Number of irradiation steps with CRB inserted

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (UNCOLLAPSED):

0 : Number of irradiation steps with CRB inserted

ASSEMBLY: D6

BLADED CYCLE: 13

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (COLLAPSED):

1 : Number of irradiation steps with CRB inserted  
1 : Number of axial sections with CRB inserted in step  
4 1 1 1 2 11 : Insertion history statement

Table 4-258. Control Blade Insertion History (cont.)

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (UNCOLLAPSED):

1 : Number of irradiation steps with CRB inserted  
1 : Number of axial sections with CRB inserted in step  
4 1 1 1 3 11 : Insertion history statement

ASSEMBLY: D8  
BLADED CYCLE: 11

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (COLLAPSED):

4 : Number of irradiation steps with CRB inserted  
1 : Number of axial sections with CRB inserted in step  
2 1 2 1 3 11 : Insertion history statement  
1 : Number of axial sections with CRB inserted in step  
2 1 3 1 8 11 : Insertion history statement  
1 : Number of axial sections with CRB inserted in step  
2 2 1 1 5 11 : Insertion history statement  
1 : Number of axial sections with CRB inserted in step  
2 2 2 1 7 11 : Insertion history statement

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (UNCOLLAPSED):

4 : Number of irradiation steps with CRB inserted  
1 : Number of axial sections with CRB inserted in step  
2 1 2 1 6 11 : Insertion history statement  
1 : Number of axial sections with CRB inserted in step  
2 1 3 1 18 11 : Insertion history statement  
1 : Number of axial sections with CRB inserted in step  
2 2 1 1 10 11 : Insertion history statement  
1 : Number of axial sections with CRB inserted in step  
2 2 2 1 16 11 : Insertion history statement

ASSEMBLY: D9  
BLADED CYCLE: 12

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (COLLAPSED):

3 : Number of irradiation steps with CRB inserted  
1 : Number of axial sections with CRB inserted in step  
3 1 3 1 2 11 : Insertion history statement  
1 : Number of axial sections with CRB inserted in step  
3 2 1 1 3 11 : Insertion history statement  
1 : Number of axial sections with CRB inserted in step  
3 2 2 1 6 11 : Insertion history statement

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (UNCOLLAPSED):

3 : Number of irradiation steps with CRB inserted  
1 : Number of axial sections with CRB inserted in step  
3 1 3 1 3 11 : Insertion history statement  
1 : Number of axial sections with CRB inserted in step  
3 2 1 1 5 11 : Insertion history statement  
1 : Number of axial sections with CRB inserted in step

**Table 4-258. Control Blade Insertion History (cont.)**

3 2 2 1 14 11 : Insertion history statement

ASSEMBLY: D10  
BLADED CYCLE: 12

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (COLLAPSED):

5 : Number of irradiation steps with CRB inserted  
1 : Number of axial sections with CRB inserted in step  
3 1 1 1 6 11 : Insertion history statement  
1 : Number of axial sections with CRB inserted in step  
3 1 2 1 6 11 : Insertion history statement  
1 : Number of axial sections with CRB inserted in step  
3 1 3 1 7 11 : Insertion history statement  
1 : Number of axial sections with CRB inserted in step  
3 2 1 1 7 11 : Insertion history statement  
1 : Number of axial sections with CRB inserted in step  
3 2 2 1 6 11 : Insertion history statement

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (UNCOLLAPSED):

5 : Number of irradiation steps with CRB inserted  
1 : Number of axial sections with CRB inserted in step  
3 1 1 1 14 11 : Insertion history statement  
1 : Number of axial sections with CRB inserted in step  
3 1 2 1 14 11 : Insertion history statement  
1 : Number of axial sections with CRB inserted in step  
3 1 3 1 16 11 : Insertion history statement  
1 : Number of axial sections with CRB inserted in step  
3 2 1 1 16 11 : Insertion history statement  
1 : Number of axial sections with CRB inserted in step  
3 2 2 1 12 11 : Insertion history statement

ASSEMBLY: D10  
BLADED CYCLE: 13

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (COLLAPSED):

1 : Number of irradiation steps with CRB inserted  
1 : Number of axial sections with CRB inserted in step  
4 1 1 1 2 11 : Insertion history statement

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (UNCOLLAPSED):

1 : Number of irradiation steps with CRB inserted  
1 : Number of axial sections with CRB inserted in step  
4 1 1 1 3 11 : Insertion history statement



Table 4-258. Control Blade Insertion History (cont.)

ASSEMBLY: E2  
BLADED CYCLE: 13

```

*****
SPACE INPUT-CRB INSERTION SECTION (COLLAPSED):
  1 : Number of irradiation steps with CRB inserted
1  : Number of axial sections with CRB inserted in step
 3 4 2 1 5 11 : Insertion history statement

```

```

*****
SPACE INPUT-CRB INSERTION SECTION (UNCOLLAPSED):
  1 : Number of irradiation steps with CRB inserted
1  : Number of axial sections with CRB inserted in step
 3 4 2 1 9 11 : Insertion history statement

```

ASSEMBLY: E7  
BLADED CYCLE: 13

```

*****
SPACE INPUT-CRB INSERTION SECTION (COLLAPSED):
  4 : Number of irradiation steps with CRB inserted
1  : Number of axial sections with CRB inserted in step
 3 1 1 1 5 11 : Insertion history statement
1  : Number of axial sections with CRB inserted in step
 3 2 1 1 2 11 : Insertion history statement
1  : Number of axial sections with CRB inserted in step
 3 3 2 1 6 11 : Insertion history statement
1  : Number of axial sections with CRB inserted in step
 3 4 1 1 2 11 : Insertion history statement

```

```

*****
SPACE INPUT-CRB INSERTION SECTION (UNCOLLAPSED):
  4 : Number of irradiation steps with CRB inserted
1  : Number of axial sections with CRB inserted in step
 3 1 1 1 9 11 : Insertion history statement
1  : Number of axial sections with CRB inserted in step
 3 2 1 1 3 11 : Insertion history statement
1  : Number of axial sections with CRB inserted in step
 3 3 2 1 14 11 : Insertion history statement
1  : Number of axial sections with CRB inserted in step
 3 4 1 1 3 11 : Insertion history statement

```

ASSEMBLY: E8  
BLADED CYCLE: 14

```

*****
SPACE INPUT-CRB INSERTION SECTION (COLLAPSED):
  1 : Number of irradiation steps with CRB inserted
1  : Number of axial sections with CRB inserted in step
 4 1 2 1 10 11 : Insertion history statement

```

\*\*\*\*\*

**Table 4-258. Control Blade Insertion History (cont.)**

**SPACE INPUT-CRB INSERTION SECTION (UNCOLLAPSED):**

1 : Number of irradiation steps with CRB inserted  
1 : Number of axial sections with CRB inserted in step  
4 1 2 1 24 11 : Insertion history statement

**ASSEMBLY: E10**  
**BLADED CYCLE: 14**

\*\*\*\*\*

**SPACE INPUT-CRB INSERTION SECTION (COLLAPSED):**

3 : Number of irradiation steps with CRB inserted  
1 : Number of axial sections with CRB inserted in step  
4 1 1 1 7 11 : Insertion history statement  
1 : Number of axial sections with CRB inserted in step  
4 1 2 1 7 11 : Insertion history statement  
1 : Number of axial sections with CRB inserted in step  
4 2 1 1 5 11 : Insertion history statement

\*\*\*\*\*

**SPACE INPUT-CRB INSERTION SECTION (UNCOLLAPSED):**

3 : Number of irradiation steps with CRB inserted  
1 : Number of axial sections with CRB inserted in step  
4 1 1 1 15 11 : Insertion history statement  
1 : Number of axial sections with CRB inserted in step  
4 1 2 1 15 11 : Insertion history statement  
1 : Number of axial sections with CRB inserted in step  
4 2 1 1 9 11 : Insertion history statement

**ASSEMBLY: E11**  
**BLADED CYCLE: 13**

\*\*\*\*\*

**SPACE INPUT-CRB INSERTION SECTION (COLLAPSED):**

4 : Number of irradiation steps with CRB inserted  
1 : Number of axial sections with CRB inserted in step  
3 1 1 1 5 11 : Insertion history statement  
1 : Number of axial sections with CRB inserted in step  
3 2 1 1 2 11 : Insertion history statement  
1 : Number of axial sections with CRB inserted in step  
3 3 2 1 6 11 : Insertion history statement  
1 : Number of axial sections with CRB inserted in step  
3 4 1 1 2 11 : Insertion history statement

\*\*\*\*\*

**SPACE INPUT-CRB INSERTION SECTION (UNCOLLAPSED):**

4 : Number of irradiation steps with CRB inserted  
1 : Number of axial sections with CRB inserted in step  
3 1 1 1 9 11 : Insertion history statement  
1 : Number of axial sections with CRB inserted in step  
3 2 1 1 3 11 : Insertion history statement  
1 : Number of axial sections with CRB inserted in step  
3 3 2 1 14 11 : Insertion history statement  
1 : Number of axial sections with CRB inserted in step  
3 4 1 1 3 11 : Insertion history statement

Table 4-258. Control Blade Insertion History (cont.)

ASSEMBLY: E12  
BLADED CYCLE: 13

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (COLLAPSED):

1 : Number of irradiation steps with CRB inserted  
1 : Number of axial sections with CRB inserted in step  
3 4 2 1 5 11 : Insertion history statement

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (UNCOLLAPSED):

1 : Number of irradiation steps with CRB inserted  
1 : Number of axial sections with CRB inserted in step  
3 4 2 1 9 11 : Insertion history statement

ASSEMBLY: E13  
BLADED CYCLE: 14

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (COLLAPSED):

0 : Number of irradiation steps with CRB inserted

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (UNCOLLAPSED):

0 : Number of irradiation steps with CRB inserted

ASSEMBLY: E14  
BLADED CYCLE: 14

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (COLLAPSED):

2 : Number of irradiation steps with CRB inserted  
1 : Number of axial sections with CRB inserted in step  
4 1 1 1 3 11 : Insertion history statement  
1 : Number of axial sections with CRB inserted in step  
4 2 2 1 9 11 : Insertion history statement

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (UNCOLLAPSED):

2 : Number of irradiation steps with CRB inserted  
1 : Number of axial sections with CRB inserted in step  
4 1 1 1 6 11 : Insertion history statement  
1 : Number of axial sections with CRB inserted in step  
4 2 2 1 21 11 : Insertion history statement

ASSEMBLY: F1  
BLADED CYCLE: 13

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (COLLAPSED):

Table 4-258. Control Blade Insertion History (cont.)

4 : Number of irradiation steps with CRB inserted  
1 : Number of axial sections with CRB inserted in step  
3 1 1 1 5 11 : Insertion history statement  
1 : Number of axial sections with CRB inserted in step  
3 3 1 1 6 11 : Insertion history statement  
1 : Number of axial sections with CRB inserted in step  
3 3 2 1 6 11 : Insertion history statement  
1 : Number of axial sections with CRB inserted in step  
3 4 1 1 4 11 : Insertion history statement

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (UNCOLLAPSED):

4 : Number of irradiation steps with CRB inserted  
1 : Number of axial sections with CRB inserted in step  
3 1 1 1 9 11 : Insertion history statement  
1 : Number of axial sections with CRB inserted in step  
3 3 1 1 13 11 : Insertion history statement  
1 : Number of axial sections with CRB inserted in step  
3 3 2 1 14 11 : Insertion history statement  
1 : Number of axial sections with CRB inserted in step  
3 4 1 1 7 11 : Insertion history statement

ASSEMBLY: F2  
BLADED CYCLE: 13

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (COLLAPSED):

1 : Number of irradiation steps with CRB inserted  
1 : Number of axial sections with CRB inserted in step  
3 4 2 1 5 11 : Insertion history statement

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (UNCOLLAPSED):

1 : Number of irradiation steps with CRB inserted  
1 : Number of axial sections with CRB inserted in step  
3 4 2 1 11 11 : Insertion history statement

ASSEMBLY: F4  
BLADED CYCLE: 14

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (COLLAPSED):

0 : Number of irradiation steps with CRB inserted

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (UNCOLLAPSED):

0 : Number of irradiation steps with CRB inserted

ASSEMBLY: F5  
BLADED CYCLE: 13

**Table 4-258. Control Blade Insertion History (cont.)**

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (COLLAPSED):

```

7           : Number of irradiation steps with CRB inserted
1           : Number of axial sections with CRB inserted in step
3 1 1 1 7 11 : Insertion history statement
1           : Number of axial sections with CRB inserted in step
3 2 1 1 7 11 : Insertion history statement
1           : Number of axial sections with CRB inserted in step
3 2 2 1 8 11 : Insertion history statement
1           : Number of axial sections with CRB inserted in step
3 3 1 1 10 11 : Insertion history statement
1           : Number of axial sections with CRB inserted in step
3 3 2 1 10 11 : Insertion history statement
1           : Number of axial sections with CRB inserted in step
3 4 1 1 10 11 : Insertion history statement
1           : Number of axial sections with CRB inserted in step
3 4 2 1 3 11  : Insertion history statement
    
```

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (UNCOLLAPSED):

```

7           : Number of irradiation steps with CRB inserted
1           : Number of axial sections with CRB inserted in step
3 1 1 1 17 11 : Insertion history statement
1           : Number of axial sections with CRB inserted in step
3 2 1 1 17 11 : Insertion history statement
1           : Number of axial sections with CRB inserted in step
3 2 2 1 18 11 : Insertion history statement
1           : Number of axial sections with CRB inserted in step
3 3 1 1 24 11 : Insertion history statement
1           : Number of axial sections with CRB inserted in step
3 3 2 1 24 11 : Insertion history statement
1           : Number of axial sections with CRB inserted in step
3 4 1 1 24 11 : Insertion history statement
1           : Number of axial sections with CRB inserted in step
3 4 2 1 6 11  : Insertion history statement
    
```

ASSEMBLY: F6  
 BLADED CYCLE: 14

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (COLLAPSED):

```

3           : Number of irradiation steps with CRB inserted
1           : Number of axial sections with CRB inserted in step
4 1 1 1 10 11 : Insertion history statement
1           : Number of axial sections with CRB inserted in step
4 1 2 1 7 11  : Insertion history statement
1           : Number of axial sections with CRB inserted in step
4 2 1 1 7 11  : Insertion history statement
    
```

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (UNCOLLAPSED):

```

3           : Number of irradiation steps with CRB inserted
1           : Number of axial sections with CRB inserted in step
4 1 1 1 24 11 : Insertion history statement
    
```

**Table 4-258. Control Blade Insertion History (cont.)**

```

1           : Number of axial sections with CRB inserted in step
4 1 2 1 16 11 : Insertion history statement
1           : Number of axial sections with CRB inserted in step
4 2 1 1 16 11 : Insertion history statement

```

ASSEMBLY: F8  
 BLADED CYCLE: 13

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (COLLAPSED):

```

2           : Number of irradiation steps with CRB inserted
1           : Number of axial sections with CRB inserted in step
3 4 2 1 10 11 : Insertion history statement
1           : Number of axial sections with CRB inserted in step
3 5 1 1 8 11 : Insertion history statement

```

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (UNCOLLAPSED):

```

2           : Number of irradiation steps with CRB inserted
1           : Number of axial sections with CRB inserted in step
3 4 2 1 24 11 : Insertion history statement
1           : Number of axial sections with CRB inserted in step
3 5 1 1 18 11 : Insertion history statement

```

ASSEMBLY: F10  
 BLADED CYCLE: 13

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (COLLAPSED):

```

7           : Number of irradiation steps with CRB inserted
1           : Number of axial sections with CRB inserted in step
3 1 1 1 9 11 : Insertion history statement
1           : Number of axial sections with CRB inserted in step
3 2 1 1 10 11 : Insertion history statement
1           : Number of axial sections with CRB inserted in step
3 2 2 1 10 11 : Insertion history statement
1           : Number of axial sections with CRB inserted in step
3 3 1 1 10 11 : Insertion history statement
1           : Number of axial sections with CRB inserted in step
3 3 2 1 10 11 : Insertion history statement
1           : Number of axial sections with CRB inserted in step
3 4 1 1 10 11 : Insertion history statement
1           : Number of axial sections with CRB inserted in step
3 4 2 1 10 11 : Insertion history statement

```

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (UNCOLLAPSED):

```

7           : Number of irradiation steps with CRB inserted
1           : Number of axial sections with CRB inserted in step
3 1 1 1 21 11 : Insertion history statement
1           : Number of axial sections with CRB inserted in step
3 2 1 1 24 11 : Insertion history statement
1           : Number of axial sections with CRB inserted in step

```

**Table 4-258. Control Blade Insertion History (cont.)**

```

3 2 2 1 24 11      : Insertion history statement
1                   : Number of axial sections with CRB inserted in step
3 3 1 1 24 11      : Insertion history statement
1                   : Number of axial sections with CRB inserted in step
3 3 2 1 24 11      : Insertion history statement
1                   : Number of axial sections with CRB inserted in step
3 4 1 1 24 11      : Insertion history statement
1                   : Number of axial sections with CRB inserted in step
3 4 2 1 24 11      : Insertion history statement

```

ASSEMBLY: G1  
 BLADED CYCLE: 13

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (COLLAPSED):

```

1                   : Number of irradiation steps with CRB inserted
1                   : Number of axial sections with CRB inserted in step
2 1 1 1 2 11       : Insertion history statement

```

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (UNCOLLAPSED):

```

1                   : Number of irradiation steps with CRB inserted
1                   : Number of axial sections with CRB inserted in step
2 1 1 1 3 11       : Insertion history statement

```

ASSEMBLY: G2  
 BLADED CYCLE: 14

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (COLLAPSED):

```

4                   : Number of irradiation steps with CRB inserted
1                   : Number of axial sections with CRB inserted in step
3 1 1 1 10 11      : Insertion history statement
1                   : Number of axial sections with CRB inserted in step
3 1 2 1 10 11      : Insertion history statement
1                   : Number of axial sections with CRB inserted in step
3 2 1 1 10 11      : Insertion history statement
1                   : Number of axial sections with CRB inserted in step
3 2 2 1 3 11       : Insertion history statement

```

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (UNCOLLAPSED):

```

4                   : Number of irradiation steps with CRB inserted
1                   : Number of axial sections with CRB inserted in step
3 1 1 1 24 11      : Insertion history statement
1                   : Number of axial sections with CRB inserted in step
3 1 2 1 24 11      : Insertion history statement
1                   : Number of axial sections with CRB inserted in step
3 2 1 1 23 11      : Insertion history statement
1                   : Number of axial sections with CRB inserted in step
3 2 2 1 5 11       : Insertion history statement

```

**Table 4-258. Control Blade Insertion History (cont.)**

ASSEMBLY: G3  
 BLADED CYCLE: 14

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (COLLAPSED):

4							: Number of irradiation steps with CRB inserted
1							: Number of axial sections with CRB inserted in step
3	1	1	1	8	11		: Insertion history statement
1							: Number of axial sections with CRB inserted in step
3	1	2	1	2	11		: Insertion history statement
1							: Number of axial sections with CRB inserted in step
3	2	1	1	10	11		: Insertion history statement
1							: Number of axial sections with CRB inserted in step
3	2	2	1	10	11		: Insertion history statement

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (UNCOLLAPSED):

4							: Number of irradiation steps with CRB inserted
1							: Number of axial sections with CRB inserted in step
3	1	1	1	18	11		: Insertion history statement
1							: Number of axial sections with CRB inserted in step
3	1	2	1	3	11		: Insertion history statement
1							: Number of axial sections with CRB inserted in step
3	2	1	1	24	11		: Insertion history statement
1							: Number of axial sections with CRB inserted in step
3	2	2	1	24	11		: Insertion history statement

ASSEMBLY: G4  
 BLADED CYCLE: 14

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (COLLAPSED):

0							: Number of irradiation steps with CRB inserted
---	--	--	--	--	--	--	---

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (UNCOLLAPSED):

0							: Number of irradiation steps with CRB inserted
---	--	--	--	--	--	--	---

ASSEMBLY: G5

BLADED CYCLE: 13

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (COLLAPSED):

1							: Number of irradiation steps with CRB inserted
1							: Number of axial sections with CRB inserted in step
2	1	1	1	2	11		: Insertion history statement

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (UNCOLLAPSED):



**Table 4-258. Control Blade Insertion History (cont.)**

1 : Number of irradiation steps with CRB inserted  
 1 : Number of axial sections with CRB inserted in step  
 2 1 1 1 3 11 : Insertion history statement

ASSEMBLY: G6  
 BLADED CYCLE: 14

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (COLLAPSED):

4 : Number of irradiation steps with CRB inserted  
 1 : Number of axial sections with CRB inserted in step  
 3 1 1 1 10 11 : Insertion history statement  
 1 : Number of axial sections with CRB inserted in step  
 3 1 2 1 10 11 : Insertion history statement  
 1 : Number of axial sections with CRB inserted in step  
 3 2 1 1 9 11 : Insertion history statement  
 1 : Number of axial sections with CRB inserted in step  
 3 2 2 1 3 11 : Insertion history statement

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (UNCOLLAPSED):

4 : Number of irradiation steps with CRB inserted  
 1 : Number of axial sections with CRB inserted in step  
 3 1 1 1 24 11 : Insertion history statement  
 1 : Number of axial sections with CRB inserted in step  
 3 1 2 1 24 11 : Insertion history statement  
 1 : Number of axial sections with CRB inserted in step  
 3 2 1 1 22 11 : Insertion history statement  
 1 : Number of axial sections with CRB inserted in step  
 3 2 2 1 5 11 : Insertion history statement

ASSEMBLY: G9  
 BLADED CYCLE: 13

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (COLLAPSED):

0 : Number of irradiation steps with CRB inserted

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (UNCOLLAPSED):

0 : Number of irradiation steps with CRB inserted

ASSEMBLY: G10  
 BLADED CYCLE: 14

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (COLLAPSED):

2 : Number of irradiation steps with CRB inserted  
 1 : Number of axial sections with CRB inserted in step  
 3 2 1 1 4 11 : Insertion history statement  
 1 : Number of axial sections with CRB inserted in step  
 3 2 2 1 10 11 : Insertion history statement

Table 4-258. Control Blade Insertion History (cont.)

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (UNCOLLAPSED):

2 : Number of irradiation steps with CRB inserted  
1 : Number of axial sections with CRB inserted in step  
3 2 1 1 7 11 : Insertion history statement  
1 : Number of axial sections with CRB inserted in step  
3 2 2 1 24 11 : Insertion history statement

ASSEMBLY: G11  
BLADED CYCLE: 14

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (COLLAPSED):

1 : Number of irradiation steps with CRB inserted  
1 : Number of axial sections with CRB inserted in step  
3 2 2 1 8 11 : Insertion history statement

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (UNCOLLAPSED):

1 : Number of irradiation steps with CRB inserted  
1 : Number of axial sections with CRB inserted in step  
3 2 2 1 20 11 : Insertion history statement

Table 4-258. Control Blade Insertion History (cont.)

ASSEMBLY: H1  
BLADED CYCLE: 13

\*\*\*\*\*  
SPACE INPUT-CRB INSERTION SECTION (COLLAPSED):  
1 : Number of irradiation steps with CRB inserted  
1 : Number of axial sections with CRB inserted in step  
2 1 1 1 2 11 : Insertion history statement

\*\*\*\*\*  
SPACE INPUT-CRB INSERTION SECTION (UNCOLLAPSED):  
1 : Number of irradiation steps with CRB inserted  
1 : Number of axial sections with CRB inserted in step  
2 1 1 1 3 11 : Insertion history statement

ASSEMBLY: H1  
BLADED CYCLE: 14

\*\*\*\*\*  
SPACE INPUT-CRB INSERTION SECTION (COLLAPSED):  
2 : Number of irradiation steps with CRB inserted  
1 : Number of axial sections with CRB inserted in step  
3 1 1 1 3 11 : Insertion history statement  
1 : Number of axial sections with CRB inserted in step  
3 2 2 1 10 11 : Insertion history statement

\*\*\*\*\*  
SPACE INPUT-CRB INSERTION SECTION (UNCOLLAPSED):  
2 : Number of irradiation steps with CRB inserted  
1 : Number of axial sections with CRB inserted in step  
3 1 1 1 6 11 : Insertion history statement  
1 : Number of axial sections with CRB inserted in step  
3 2 2 1 24 11 : Insertion history statement

ASSEMBLY: H2  
BLADED CYCLE: 14

\*\*\*\*\*  
SPACE INPUT-CRB INSERTION SECTION (COLLAPSED):  
3 : Number of irradiation steps with CRB inserted  
1 : Number of axial sections with CRB inserted in step  
3 1 1 1 10 11 : Insertion history statement  
1 : Number of axial sections with CRB inserted in step  
3 1 2 1 10 11 : Insertion history statement  
1 : Number of axial sections with CRB inserted in step  
3 2 1 1 10 11 : Insertion history statement

\*\*\*\*\*  
SPACE INPUT-CRB INSERTION SECTION (UNCOLLAPSED):  
3 : Number of irradiation steps with CRB inserted  
1 : Number of axial sections with CRB inserted in step  
3 1 1 1 24 11 : Insertion history statement

**Table 4-258. Control Blade Insertion History (cont.)**

```

1          : Number of axial sections with CRB inserted in step
3 1 2 1 24 11 : Insertion history statement
1          : Number of axial sections with CRB inserted in step
3 2 1 1 24 11 : Insertion history statement
  
```

ASSEMBLY: H3  
 BLADED CYCLE: 14

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (COLLAPSED):

```

2          : Number of irradiation steps with CRB inserted
1          : Number of axial sections with CRB inserted in step
3 2 1 1 3 11 : Insertion history statement
1          : Number of axial sections with CRB inserted in step
3 2 2 1 10 11 : Insertion history statement
  
```

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (UNCOLLAPSED):

```

2          : Number of irradiation steps with CRB inserted
1          : Number of axial sections with CRB inserted in step
3 2 1 1 5 11 : Insertion history statement
1          : Number of axial sections with CRB inserted in step
3 2 2 1 24 11 : Insertion history statement
  
```

ASSEMBLY: H4  
 BLADED CYCLE: 13

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (COLLAPSED):

```

1          : Number of irradiation steps with CRB inserted
1          : Number of axial sections with CRB inserted in step
2 4 2 1 5 11 : Insertion history statement
  
```

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (UNCOLLAPSED):

```

1          : Number of irradiation steps with CRB inserted
1          : Number of axial sections with CRB inserted in step
2 4 2 1 9 11 : Insertion history statement
  
```

ASSEMBLY: H7  
 BLADED CYCLE: 13

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (COLLAPSED):

```

6          : Number of irradiation steps with CRB inserted
1          : Number of axial sections with CRB inserted in step
2 1 1 1 7 11 : Insertion history statement
1          : Number of axial sections with CRB inserted in step
2 2 1 1 7 11 : Insertion history statement
1          : Number of axial sections with CRB inserted in step
  
```

**Table 4-258. Control Blade Insertion History (cont.)**

```

2 2 2 1 8 11 : Insertion history statement
1 : Number of axial sections with CRB inserted in step
2 3 1 1 1 11 : Insertion history statement
1 : Number of axial sections with CRB inserted in step
2 3 2 1 10 11 : Insertion history statement
1 : Number of axial sections with CRB inserted in step
2 4 1 1 8 11 : Insertion history statement

```

\*\*\*\*\*

**SPACE INPUT-CRB INSERTION SECTION (UNCOLLAPSED):**

```

6 : Number of irradiation steps with CRB inserted
1 : Number of axial sections with CRB inserted in step
2 1 1 1 17 11 : Insertion history statement
1 : Number of axial sections with CRB inserted in step
2 2 1 1 17 11 : Insertion history statement
1 : Number of axial sections with CRB inserted in step
2 2 2 1 18 11 : Insertion history statement
1 : Number of axial sections with CRB inserted in step
2 3 1 1 1 11 : Insertion history statement
1 : Number of axial sections with CRB inserted in step
2 3 2 1 24 11 : Insertion history statement
1 : Number of axial sections with CRB inserted in step
2 4 1 1 20 11 : Insertion history statement

```

ASSEMBLY: H9  
 BLADED CYCLE: 14

\*\*\*\*\*

**SPACE INPUT-CRB INSERTION SECTION (COLLAPSED):**

```

2 : Number of irradiation steps with CRB inserted
1 : Number of axial sections with CRB inserted in step
3 1 1 1 3 11 : Insertion history statement
1 : Number of axial sections with CRB inserted in step
3 2 2 1 10 11 : Insertion history statement

```

\*\*\*\*\*

**SPACE INPUT-CRB INSERTION SECTION (UNCOLLAPSED):**

```

2 : Number of irradiation steps with CRB inserted
1 : Number of axial sections with CRB inserted in step
3 1 1 1 6 11 : Insertion history statement
1 : Number of axial sections with CRB inserted in step
3 2 2 1 24 11 : Insertion history statement

```

ASSEMBLY: H11  
 BLADED CYCLE: 13

\*\*\*\*\*

**SPACE INPUT-CRB INSERTION SECTION (COLLAPSED):**

```

1 : Number of irradiation steps with CRB inserted
1 : Number of axial sections with CRB inserted in step
2 1 1 1 2 11 : Insertion history statement

```

\*\*\*\*\*

Table 4-258. Control Blade Insertion History (cont.)

SPACE INPUT-CRB INSERTION SECTION (UNCOLLAPSED):

1 : Number of irradiation steps with CRB inserted  
1 : Number of axial sections with CRB inserted in step  
2 1 1 1 3 11 : Insertion history statement

ASSEMBLY: H11

BLADED CYCLE: 14

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (COLLAPSED):

2 : Number of irradiation steps with CRB inserted  
1 : Number of axial sections with CRB inserted in step  
3 1 1 1 3 11 : Insertion history statement  
1 : Number of axial sections with CRB inserted in step  
3 2 2 1 10 11 : Insertion history statement

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (UNCOLLAPSED):

2 : Number of irradiation steps with CRB inserted  
1 : Number of axial sections with CRB inserted in step  
3 1 1 1 6 11 : Insertion history statement  
1 : Number of axial sections with CRB inserted in step  
3 2 2 1 24 11 : Insertion history statement

ASSEMBLY: J2

BLADED CYCLE: 14

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (COLLAPSED):

1 : Number of irradiation steps with CRB inserted  
1 : Number of axial sections with CRB inserted in step  
2 1 2 1 10 11 : Insertion history statement

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (UNCOLLAPSED):

1 : Number of irradiation steps with CRB inserted  
1 : Number of axial sections with CRB inserted in step  
2 1 2 1 24 11 : Insertion history statement

ASSEMBLY: J3

BLADED CYCLE: 14

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (COLLAPSED):

1 : Number of irradiation steps with CRB inserted  
1 : Number of axial sections with CRB inserted in step  
2 1 2 1 10 11 : Insertion history statement

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (UNCOLLAPSED):

1 : Number of irradiation steps with CRB inserted

**Table 4-258. Control Blade Insertion History (cont.)**

1 : Number of axial sections with CRB inserted in step  
2 1 2 1 24 11 : Insertion history statement  
ASSEMBLY: J5  
BLADED CYCLE: 14

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (COLLAPSED):

1 : Number of irradiation steps with CRB inserted  
1 : Number of axial sections with CRB inserted in step  
2 1 2 1 10 11 : Insertion history statement

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (UNCOLLAPSED):

1 : Number of irradiation steps with CRB inserted  
1 : Number of axial sections with CRB inserted in step  
2 1 2 1 24 11 : Insertion history statement

ASSEMBLY: J8  
BLADED CYCLE: 14

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (COLLAPSED):

2 : Number of irradiation steps with CRB inserted  
1 : Number of axial sections with CRB inserted in step  
2 2 1 1 7 11 : Insertion history statement  
1 : Number of axial sections with CRB inserted in step  
2 2 2 1 8 11 : Insertion history statement

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (UNCOLLAPSED):

2 : Number of irradiation steps with CRB inserted  
1 : Number of axial sections with CRB inserted in step  
2 2 1 1 16 11 : Insertion history statement  
1 : Number of axial sections with CRB inserted in step  
2 2 2 1 20 11 : Insertion history statement

ASSEMBLY: J13  
BLADED CYCLE: 14

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (COLLAPSED):

1 : Number of irradiation steps with CRB inserted  
1 : Number of axial sections with CRB inserted in step  
2 1 2 1 10 11 : Insertion history statement

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (UNCOLLAPSED):

1 : Number of irradiation steps with CRB inserted  
1 : Number of axial sections with CRB inserted in step  
2 1 2 1 24 11 : Insertion history statement

Table 4-258. Control Blade Insertion History (cont.)

ASSEMBLY: J15  
BLADED CYCLE: 14

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (COLLAPSED):

1 : Number of irradiation steps with CRB inserted  
1 : Number of axial sections with CRB inserted in step  
2 1 2 1 7 11 : Insertion history statement

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (UNCOLLAPSED):

1 : Number of irradiation steps with CRB inserted  
1 : Number of axial sections with CRB inserted in step  
2 1 2 1 15 11 : Insertion history statement

ASSEMBLY: K4  
BLADED CYCLE: 14

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (COLLAPSED):

1 : Number of irradiation steps with CRB inserted  
1 : Number of axial sections with CRB inserted in step  
2 1 2 1 7 11 : Insertion history statement

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (UNCOLLAPSED):

1 : Number of irradiation steps with CRB inserted  
1 : Number of axial sections with CRB inserted in step  
2 1 2 1 15 11 : Insertion history statement

ASSEMBLY: M4  
BLADED CYCLE: 14

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (COLLAPSED):

0 : Number of irradiation steps with CRB inserted

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (UNCOLLAPSED):

0 : Number of irradiation steps with CRB inserted



**Table 4-258. Control Blade Insertion History (cont.)**

ASSEMBLY: M7

BLADED CYCLE: 14

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (COLLAPSED):

0 : Number of irradiation steps with CRB inserted

\*\*\*\*\*

SPACE INPUT-CRB INSERTION SECTION (UNCOLLAPSED):

0 : Number of irradiation steps with CRB inserted

## 4.2 STATEPOINT CRITICAL CONDITION MEASUREMENTS

Measured critical conditions for 6 reactor startups (statepoints) are provided in Table 4-259. The data includes the BOC of reload Cycle 13 and three restarts during Cycle 13 and BOC Cycle 14 and one restart during Cycle 14. The cycle and statepoint number, along with the EFPDs during the cycle for which the startup occurred, is provided. The elapsed time (in hours) since the reactor was shutdown (downtime) prior to the startup is also given for each statepoint. In addition, Figure 4-13 provides the blade positions, period, and moderator temperature (Modr. Temp.) for each statepoint when criticality was achieved. In Figure 4-13 data that is not available is represented by "N/A".

Table 4-259 provides startup dates for each statepoint. The down time prior to startup is also provided.

**Table 4-259. QC2 Critical Configuration at Statepoints**

Point	Critical Number	Date Month-Day-Year	Burnup MWd/MTU	EFPD	$k_{eff}$	Moderator Temperature (°F)	Period (second)
Cycle 13							
SP9	291	5/26/1993	0	0	1.00848	183.8	196
SP10	293	7/8/1993	201.61	10.1	1.00820	179	163
SP11	297	1/25/1994	2257.20	122.94	1.00606	181.1	98
DP12	299	7/12/1994	4997.20	250.1	1.00899	184.0	142
SP13	AAA <sup>1</sup>	12/15/1994	6489.46	324.73	1.01045	170	138
Cycle 14							
SP14	302	7/20/1995	0	0	1.00006	154.1	176
DP15 <sup>2</sup>	N/A	N/A	1878.65	93.56	N/A	N/A	N/A
SP16	309	8/14/1996	4238.45	211.09	1.00606	168.5	94

<sup>1</sup>Core critical report number not available.

<sup>2</sup>Core follow data for an intended statepoint critical was not available. This point became a datapoint.

### Shutdown History Prior to Statepoints

SP10	Cycle 13 @ 201.61 MWd/MTU burnup	400 hr or 16.7 days
SP11	Cycle 13 @ 2257.2 MWd/MTU burnup	400 hr or 16.7 days
DP12	Cycle 13 @ 4997.2 MWd/MTU burnup	314 hr or 13.1 days
SP13	Cycle 13 @ 6489.46 MWd/MTU burnup	400 hr or 16.7 days
SP14	BOC Cycle 14	136 days
DP15	Cycle 14 @ 1878.65 MWd/MTU burnup	Not available
SP16	Cycle 13 @ 4238.45 MWd/MTU burnup	400 hr or 16.7 days

**Figure 4-13. QC2 Critical Control Blade Configuration in Notches Withdrawn**

**Critical Configuration, Statepoint 9, Cycle 13**

Exposure 0.00 MWD/MTU Cy 13, Critical No. 291, Modr. Temp. 183.8°F, Period 196 sec.

	2	6	10	14	18	22	26	30	34	38	42	46	50	54	58	
59						--	0	8	0	--						59
55				0	--	0	--	0	--	0	--	0				55
51			0	--	0	4	0	--	0	8	0	--	0			51
47		0	--	0	--	0	--	0	--	0	--	0	--	0		47
43		--	0	4	0	--	0	4	0	--	0	8	0	--		43
39	--	0	--	0	--	0	--	0	--	0	--	0	--	0	--	39
35	0	6	0	--	0	4	0	--	0	4	0	0	0	8	0	35
31	--	0	--	0	--	0	--	0	--	0	--	0	--	0	--	31
27	0	8	0	--	0	4	0	--	0	4	0	--	0	8	0	27
23	--	0	--	0	--	0	--	0	--	0	--	0	--	0	--	23
19		--	0	8	0	--	0	4	0	--	0	8	0	--		19
15		0	--	0	--	0	--	0	--	0	--	0	--	0		15
11			0	--	0	8	0	--	0	8	0	--	0			11
7				0	--	0	--	0	--	0	--	0				7
3					--	0	8	0	--							3

**Critical Configuration, Statepoint 10, Cycle 13**

Exposure 201.61 MWD/MTU Cy 13, Critical No. 293, Modr. Temp. 179°F, Period 163 sec.

	2	6	10	14	18	22	26	30	34	38	42	46	50	54	58	
59						--	0	8	0	--						59
55				0	--	0	--	0	--	0	--	0				55
51			0	--	0	4	0	--	0	8	0	--	0			51
47		0	--	0	--	0	--	0	--	0	--	0	--	0		47
43		--	0	4	0	--	0	4	0	--	0	8	0	--		43
39	--	0	--	0	--	0	--	0	--	0	--	0	--	0	--	39
35	0	4	0	--	0	4	0	--	0	4	0	--	0	8	0	35
31	--	0	--	0	--	0	--	0	--	0	--	0	--	0	--	31
27	0	6	0	--	0	4	0	--	0	4	0	--	0	8	0	27
23	--	0	--	0	--	0	--	0	--	0	--	0	--	0	--	23
19		--	0	8	0	--	0	4	0	--	0	8	0	--		19
15		0	--	0	--	0	--	0	--	0	--	0	--	0		15
11			0	--	0	8	0	--	0	8	0	--	0			11
7				0	--	0	--	0	--	0	--	0				7
3					--	0	8	0	--							3

**Figure 4-13. QC2 Critical Control Blade Configuration in Notches Withdrawn (cont.)**

**Critical Configuration, Statepoint 11, Cycle 13**

Exposure 2257.2 MWd/MTU Cy 13, Critical No. 297, Modr. Temp. 181.1°F, Period 98 sec.

	2	6	10	14	18	22	26	30	34	38	42	46	50	54	58
59						--	0	8	0	--					
55			0	--	0	--	0	--	0	--	0	--	0		
51			0	--	0	4	0	--	0	8	0	--	0		
47			0	--	0	--	0	--	0	--	0	--	0	--	0
43			--	0	4	0	--	0	4	0	--	0	8	0	--
39	--	0	--	0	--	0	--	0	--	0	--	0	--	0	--
35	0	8	0	--	0	4	0	--	0	4	0	--	0	8	0
31	--	0	--	0	--	0	--	0	--	0	--	0	--	0	--
27	0	8	0	--	0	4	0	--	0	4	0	--	0	8	0
23	--	0	--	0	--	0	--	0	--	0	--	0	--	0	--
19			--	0	8	0	--	0	4	0	--	0	8	0	--
15			0	--	0	--	0	--	0	--	0	--	0	--	0
11			0	--	0	8	0	--	0	8	0	--	0		
7			0	--	0	--	0	--	0	--	0				
3						--	0	8	0	--					

**Critical Configuration, Statepoint 12, Cycle 13, (Not Used)**

Exposure 4484.31 MWd/MTU Cy 13, Critical No. 299, Modr. Temp. 184°F, Period 142 sec.

	2	6	10	14	18	22	26	30	34	38	42	46	50	54	58
59						--	0	0	0	--					
55			0	--	0	--	0	--	0	--	0	--	0		
51			0	--	0	0	0	--	0	0	0	--	0		
47			0	--	0	--	0	--	0	--	0	--	0	--	0
43			--	0	0	0	12	0	0	0	--	0	0	0	--
39	--	0	--	0	--	0	--	0	--	0	--	0	--	0	--
35	0	0	0	12	0	0	0	12	0	0	0	--	0	0	0
31	--	0	--	0	--	0	--	0	--	0	--	0	--	0	--
27	0	0	0	12	0	0	0	12	0	0	0	26	0	0	0
23	--	0	--	0	--	0	--	0	--	0	--	0	--	0	--
19			--	0	0	0	12	0	0	0	12	0	0	0	--
15			0	--	0	--	0	--	0	--	0	--	0	--	0
11			0	--	0	0	0	12	0	0	0	--	0		
7			0	--	0	--	0	--	0	--	0				
3						--	0	0	0	--					

Figure 4-13. QC2 Critical Control Blade Configuration in Notches Withdrawn (cont.)

**Critical Configuration, Statepoint 13, Cycle 13**

Exposure 6489.46 MWd/MTU Cy 13, Critical No. AAA, Modr. Temp. N/A, Period N/A.

	2	6	10	14	18	22	26	30	34	38	42	46	50	54	58
59						--	0	0	0	--					
55			0	--	0	--	0	--	0	--	0				
51			0	--	0	0	0	--	0	0	0	--	0		
47			0	--	0	--	0	--	0	--	0	--	0	--	0
43			--	0	0	0	12	0	0	0	--	0	0	0	--
39	--	0	--	0	--	0	--	0	--	0	--	0	--	0	--
35	0	0	0	12	0	0	0	12	0	0	0	--	0	0	0
31	--	0	--	0	--	0	--	0	--	0	--	0	--	0	--
27	0	0	0	22	0	0	0	12	0	0	0	--	0	0	0
23	--	0	--	0	--	0	--	0	--	0	--	0	--	0	--
19			--	0	0	0	--	0	0	0	--	0	0	0	--
15			0	--	0	--	0	--	0	--	0	--	0	--	0
11			0	--	0	0	0	--	0	0	0	--	0		
7			0	--	0	--	0	--	0	--	0				
3						--	0	0	0	--					

**Critical Configuration, Statepoint 14, Cycle 14**

Exposure 0 MWd/MTU Cy 14, Critical No. 302, Modr. Temp. 154.1°F, Period 176 sec.

	2	6	10	14	18	22	26	30	34	38	42	46	50	54	58
59						0	0	0	0	0					
55			0	--	0	--	0	18	0	--	0				
51			0	0	0	0	0	0	0	0	0	0	0		
47			0	--	0	--	0	--	0	--	0	--	0	--	0
43			0	0	0	0	0	0	0	0	0	0	0	0	0
39	--	0	--	0	--	0	--	0	--	0	--	0	--	0	--
35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
31	0	0	--	0	0	0	--	0	--	0	0	0	--	0	0
27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23	--	0	--	0	--	0	--	0	--	0	--	0	--	0	--
19			0	0	0	0	0	0	0	0	0	0	0	0	0
15			0	--	0	--	0	--	0	--	0	--	0	--	0
11			0	0	0	0	0	0	0	0	0	0	0	0	
7			0	--	0	0	0	0	0	--	0				
3						0	0	0	0	0					

Figure 4-13. QC2 Critical Control Blade Configuration in Notches Withdrawn (cont.)

**Critical Configuration, Statepoint 16, Cycle 14.**

Exposure 4238.45 MWd/MTU Cy 14, Critical No. 309, Modr. Temp. 168.5°F,  
Period 94 sec.

	2	6	10	14	18	22	26	30	34	38	42	46	50	54	58	
59						8	0	0	0	8						59
55			0	--	0	--	0	--	0	--	0					55
51			0	8	0	0	0	4	0	0	0	8	0			51
47		0	--	0	--	0	--	0	--	0	--	0	--	0		47
43		4	0	0	0	8	0	0	0	8	0	0	0	4		43
39	--	0	--	0	--	0	--	0	--	0	--	0	--	0	--	39
35	0	0	0	8	0	0	0	4	0	0	0	8	0	0	0	35
31	--	0	--	0	--	0	--	0	--	0	--	0	--	0	--	31
27	0	0	0	6	0	0	0	4	0	0	0	8	0	0	0	27
23	--	0	--	0	--	0	--	0	--	0	--	0	--	0	--	23
19		4	0	0	0	8	0	0	0	8	0	0	0	4		19
15		0	--	0	--	0	--	0	--	0	--	0	--	0		15
11			0	8	0	0	0	4	0	0	0	8	0			11
7			0	--	0	--	0	--	0	--	0					7
3						8	0	0	0	8						3
	2	6	10	14	18	22	26	30	34	38	42	46	50	54	58	

## 5. CONCLUSIONS

This summary report contains the detailed information necessary to perform CRC analyses for the Quad Cities Unit 2 reactor. CRC analyses based on the data contained in this report may be used to develop parts of the disposal criticality analysis methodology. The data reported herein has been identified with TBV-1349. Release of the TBV governing this data is required prior to its use in quality affecting activities and for use in analyses affecting procurement, construction, or fabrication.

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