

RULE 20:10:13:98
 STATEMENT O WORKPAPER - Tab ALO-5 (Probability of Peak)
 Probability of Peak Workpaper
 Test Year Ending December 31, 2013
 Utility: MidAmerican Energy Company
 Docket No. EL14-XXX

Individual Responsible: Charles Rea

Probability of Peak

Line	Season	Day Type	Hour	Average Load	St. Dev.	Genr. Z-Score	Genr. Prob. Of Peak	Genr. Weight	Genr. Prob. Of Peak	Trans. Z-Score	Trans. Prob. Of Peak	Trans. Weight	Trans. Prob. Of Peak	TOU Period
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)
1	0	0	1	2,293	223	10.72	-	0.19048	-	6.39	0.000000000	0.19048	0.000000000	5
2	0	0	2	2,235	219	11.17	-	0.19048	-	6.76	0.000000000	0.19048	0.000000000	5
3	0	0	3	2,211	226	10.97	-	0.19048	-	6.69	0.000000000	0.19048	0.000000000	5
4	0	0	4	2,205	226	10.97	-	0.19048	-	6.69	0.000000000	0.19048	0.000000000	5
5	0	0	5	2,208	236	10.49	-	0.19048	-	6.40	0.000000000	0.19048	0.000000000	5
6	0	0	6	2,255	246	9.90	-	0.19048	-	5.96	0.000000001	0.19048	0.000000000	5
7	0	0	7	2,336	254	9.25	-	0.19048	-	5.45	0.000000026	0.19048	0.000000005	5
8	0	0	8	2,421	260	8.72	-	0.19048	-	5.00	0.000000290	0.19048	0.000000055	5
9	0	0	9	2,489	250	8.79	-	0.19048	-	4.92	0.000000433	0.19048	0.000000083	4
10	0	0	10	2,536	236	9.10	-	0.19048	-	5.01	0.000000279	0.19048	0.000000053	4
11	0	0	11	2,560	237	8.99	-	0.19048	-	4.90	0.000000482	0.19048	0.000000092	4
12	0	0	12	2,556	231	9.23	-	0.19048	-	5.04	0.000000232	0.19048	0.000000044	4
13	0	0	13	2,530	231	9.35	-	0.19048	-	5.15	0.000000127	0.19048	0.000000024	4
14	0	0	14	2,508	228	9.56	-	0.19048	-	5.32	0.000000052	0.19048	0.000000010	4
15	0	0	15	2,483	234	9.41	-	0.19048	-	5.28	0.000000064	0.19048	0.000000012	4
16	0	0	16	2,480	238	9.27	-	0.19048	-	5.21	0.000000096	0.19048	0.000000018	4
17	0	0	17	2,522	272	7.97	-	0.19048	-	4.41	0.000005260	0.19048	0.000001002	4
18	0	0	18	2,616	322	6.43	0.000000000	0.19048	0.000000000	3.43	0.000304732	0.19048	0.000058044	4
19	0	0	19	2,644	320	6.37	0.000000000	0.19048	0.000000000	3.36	0.000395815	0.19048	0.000075393	4
20	0	0	20	2,656	293	6.93	0.000000000	0.19048	0.000000000	3.63	0.000141583	0.19048	0.000026968	4
21	0	0	21	2,642	256	7.97	-	0.19048	-	4.20	0.000013250	0.19048	0.000002524	4
22	0	0	22	2,573	245	8.64	-	0.19048	-	4.69	0.000001385	0.19048	0.000000264	4
23	0	0	23	2,449	237	9.44	-	0.19048	-	5.36	0.000000041	0.19048	0.000000008	5
24	0	0	24	2,327	234	10.10	-	0.19048	-	5.96	0.000000001	0.19048	0.000000000	5
25	0	1	1	2,385	217	10.59	-	0.47619	-	6.14	0.000000000	0.47619	0.000000000	5
26	0	1	2	2,340	218	10.74	-	0.47619	-	6.31	0.000000000	0.47619	0.000000000	5
27	0	1	3	2,321	220	10.76	-	0.47619	-	6.36	0.000000000	0.47619	0.000000000	5
28	0	1	4	2,322	229	10.33	-	0.47619	-	6.11	0.000000001	0.47619	0.000000000	5
29	0	1	5	2,367	233	9.96	-	0.47619	-	5.81	0.000000003	0.47619	0.000000002	5
30	0	1	6	2,508	242	8.99	-	0.47619	-	5.00	0.000000291	0.47619	0.000000139	5
31	0	1	7	2,752	253	7.64	0.000000000	0.47619	0.000000000	3.82	0.000067367	0.47619	0.000032080	5
32	0	1	8	2,894	246	7.29	0.000000000	0.47619	0.000000000	3.36	0.000394765	0.47619	0.000187983	5
33	0	1	9	2,917	221	7.99	-	0.47619	-	3.62	0.000144653	0.47619	0.000068882	4
34	0	1	10	2,927	199	8.83	-	0.47619	-	3.97	0.000035223	0.47619	0.000016773	4
35	0	1	11	2,944	190	9.17	-	0.47619	-	4.08	0.000022496	0.47619	0.000010712	4
36	0	1	12	2,932	182	9.66	-	0.47619	-	4.34	0.000007253	0.47619	0.000003454	4
37	0	1	13	2,908	184	9.65	-	0.47619	-	4.40	0.000005381	0.47619	0.000002562	4
38	0	1	14	2,903	191	9.35	-	0.47619	-	4.28	0.000009376	0.47619	0.000004465	4
39	0	1	15	2,882	199	9.06	-	0.47619	-	4.20	0.000013144	0.47619	0.000006259	4
40	0	1	16	2,865	208	8.76	-	0.47619	-	4.11	0.000019947	0.47619	0.000009499	4
41	0	1	17	2,883	228	7.89	-	0.47619	-	3.66	0.000126130	0.47619	0.000060062	4
42	0	1	18	2,935	274	6.39	0.000000000	0.47619	0.000000000	2.86	0.002121207	0.47619	0.001010098	4
43	0	1	19	2,947	277	6.27	0.000000000	0.47619	0.000000000	2.79	0.002672073	0.47619	0.001272416	4
44	0	1	20	2,939	254	6.88	0.000000000	0.47619	0.000000000	3.07	0.001063845	0.47619	0.000506593	4
45	0	1	21	2,913	221	8.02	-	0.47619	-	3.64	0.000134064	0.47619	0.000063840	4
46	0	1	22	2,819	207	9.03	-	0.47619	-	4.35	0.000006804	0.47619	0.000003240	4
47	0	1	23	2,648	198	10.32	-	0.47619	-	5.42	0.000000029	0.47619	0.000000014	5
48	0	1	24	2,494	197	11.14	-	0.47619	-	6.23	0.000000000	0.47619	0.000000000	5
49	1	0	1	2,426	301	7.52	0.000000000	0.09524	0.000000000	7.52	0.000000000	0.09524	0.000000000	3

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Probability of Peak

Line	Season	Day Type	Hour	Average Load	St. Dev.	Genr. Z-Score	Genr. Prob. Of Peak	Genr. Weight	Genr. Prob. Of Peak	Trans. Z-Score	Trans. Prob. Of Peak	Trans. Weight	Trans. Prob. Of Peak	TOU Period
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)
50	1	0	2	2,311	264	9.00	-	0.09524	-	9.00	-	0.09524	-	3
51	1	0	3	2,225	238	10.35	-	0.09524	-	10.35	-	0.09524	-	3
52	1	0	4	2,176	223	11.24	-	0.09524	-	11.24	-	0.09524	-	3
53	1	0	5	2,150	210	12.09	-	0.09524	-	12.09	-	0.09524	-	3
54	1	0	6	2,154	198	12.76	-	0.09524	-	12.76	-	0.09524	-	3
55	1	0	7	2,176	203	12.35	-	0.09524	-	12.35	-	0.09524	-	3
56	1	0	8	2,274	205	11.76	-	0.09524	-	11.76	-	0.09524	-	3
57	1	0	9	2,441	242	9.29	-	0.09524	-	9.29	-	0.09524	-	2
58	1	0	10	2,598	277	7.54	0.000000000	0.09524	0.000000000	7.54	0.000000000	0.09524	0.000000000	2
59	1	0	11	2,722	323	6.08	0.000000001	0.09524	0.000000000	6.08	0.000000001	0.09524	0.000000000	2
60	1	0	12	2,829	369	5.03	0.000000246	0.09524	0.000000023	5.03	0.000000246	0.09524	0.000000023	2
61	1	0	13	2,898	417	4.29	0.000008978	0.09524	0.000000855	4.29	0.000008978	0.09524	0.000000855	2
62	1	0	14	2,953	463	3.75	0.000089382	0.09524	0.000008513	3.75	0.000089382	0.09524	0.000008513	2
63	1	0	15	2,999	499	3.38	0.000360999	0.09524	0.000034381	3.38	0.000360999	0.09524	0.000034381	2
64	1	0	16	3,040	518	3.18	0.000737692	0.09524	0.000070256	3.18	0.000737692	0.09524	0.000070256	2
65	1	0	17	3,074	521	3.09	0.000989242	0.09524	0.000094214	3.09	0.000989242	0.09524	0.000094214	2
66	1	0	18	3,081	520	3.09	0.001013023	0.09524	0.000096478	3.09	0.001013023	0.09524	0.000096478	2
67	1	0	19	3,034	498	3.32	0.000451281	0.09524	0.000042979	3.32	0.000451281	0.09524	0.000042979	2
68	1	0	20	2,985	456	3.73	0.000094587	0.09524	0.000009008	3.73	0.000094587	0.09524	0.000009008	2
69	1	0	21	2,943	432	4.03	0.000027305	0.09524	0.000002600	4.03	0.000027305	0.09524	0.000002600	2
70	1	0	22	2,871	402	4.52	0.000003106	0.09524	0.000000296	4.52	0.000003106	0.09524	0.000000296	2
71	1	0	23	2,694	363	5.49	0.000000020	0.09524	0.000000002	5.49	0.000000020	0.09524	0.000000002	3
72	1	0	24	2,505	318	6.86	0.000000000	0.09524	0.000000000	6.86	0.000000000	0.09524	0.000000000	3
73	1	1	1	2,563	320	6.64	0.000000000	0.23810	0.000000000	6.64	0.000000000	0.23810	0.000000000	3
74	1	1	2	2,444	290	7.72	0.000000000	0.23810	0.000000000	7.72	0.000000000	0.23810	0.000000000	3
75	1	1	3	2,369	262	8.85	-	0.23810	-	8.85	-	0.23810	-	3
76	1	1	4	2,328	247	9.57	-	0.23810	-	9.57	-	0.23810	-	3
77	1	1	5	2,331	235	10.02	-	0.23810	-	10.02	-	0.23810	-	3
78	1	1	6	2,448	236	9.50	-	0.23810	-	9.50	-	0.23810	-	3
79	1	1	7	2,653	258	7.89	-	0.23810	-	7.89	-	0.23810	-	3
80	1	1	8	2,847	277	6.64	0.000000000	0.23810	0.000000000	6.64	0.000000000	0.23810	0.000000000	3
81	1	1	9	2,996	295	5.72	0.000000005	0.23810	0.000000001	5.72	0.000000005	0.23810	0.000000001	2
82	1	1	10	3,126	330	4.73	0.000001143	0.23810	0.000000272	4.73	0.000001143	0.23810	0.000000272	2
83	1	1	11	3,272	374	3.78	0.000077073	0.23810	0.000018351	3.78	0.000077073	0.23810	0.000018351	2
84	1	1	12	3,383	416	3.13	0.000859583	0.23810	0.000204663	3.13	0.000859583	0.23810	0.000204663	2
85	1	1	13	3,456	453	2.72	0.003302648	0.23810	0.000786345	2.72	0.003302648	0.23810	0.000786345	2
86	1	1	14	3,545	484	2.36	0.009124102	0.23810	0.002172405	2.36	0.009124102	0.23810	0.002172405	1
87	1	1	15	3,596	507	2.15	0.015797852	0.23810	0.003761393	2.15	0.015797852	0.23810	0.003761393	1
88	1	1	16	3,626	528	2.01	0.022356115	0.23810	0.005322885	2.01	0.022356115	0.23810	0.005322885	1
89	1	1	17	3,631	540	1.95	0.025422762	0.23810	0.006053039	1.95	0.025422762	0.23810	0.006053039	1
90	1	1	18	3,584	540	2.04	0.020666895	0.23810	0.004920689	2.04	0.020666895	0.23810	0.004920689	1
91	1	1	19	3,510	521	2.25	0.012069776	0.23810	0.002873756	2.25	0.012069776	0.23810	0.002873756	2
92	1	1	20	3,433	485	2.58	0.004895540	0.23810	0.001165605	2.58	0.004895540	0.23810	0.001165605	2
93	1	1	21	3,361	463	2.86	0.002110133	0.23810	0.000502413	2.86	0.002110133	0.23810	0.000502413	2
94	1	1	22	3,258	428	3.33	0.000430875	0.23810	0.000102589	3.33	0.000430875	0.23810	0.000102589	2
95	1	1	23	3,018	384	4.34	0.000006987	0.23810	0.000001664	4.34	0.000006987	0.23810	0.000001664	3
96	1	1	24	2,771	339	5.65	0.000000008	0.23810	0.000000002	5.65	0.000000008	0.23810	0.000000002	3
97								Total:	0.028245677			Winter:	0.003423672	
98												Summer:	0.028245677	

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	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)

Line	Season	Day Type	Allocator	TOU Period	Annual Allocator
	(a)	(b)	(c)	(d)	(e)
99	0	0	0.0% winter weekend	1	78.7% summer on-peak
100	0	1	0.0% winter weekday	2	21.3% summer normal
101	1	0	1.3% summer weekend	3	0.0% summer off-peak
102	1	1	98.7% summer weekday	4	0.0% winter normal
103			100.0%	5	0.0% winter off-peak
					100.0%
104	Summer Peak:		4,686		Summer
105	Winter Peak:		3,719	TOU Period	Allocator
106				1	78.7% summer on-peak
107				2	21.3% summer normal
108				3	0.0% summer off-peak
109					100.0%
					Winter
				TOU Period	Allocator
110				4	93.6% winter normal
111				5	6.4% winter off-peak
112					100.0%

Notes:

Columns (d) and (e) contain means and standard deviations of MidAmerican system load data for the 2013 test year. Systems loads are sorted by season, day type (weekday and weekend) and hour, and the mean and standard deviation of those loads are provided in Column (d) and (e).

Columns (f) through (i) calculate the probability of setting a system peak for each combination of season, day type, and hour based on the mean and standard deviations of loads in that hour and MidAmerican's 2013 system peak. Columns (f) and (g) calculate the probability of achieving a system peak for a particular combination of season, day type, and hour, and Columns (h) and (i) weight each combination of season, day type, and hour by the percentage of time each combination occurs during the year to achieve a weighted probability of peak.

Columns (j) through (m) calculate the probability of setting a seasonal peak for each combination of season, day type, and hour based on the mean and standard deviations of loads in that hour and MidAmerican's 2013 summer and winter peaks. Lines 1 through 48, Columns (j) through (m) calculate the probability of achieving a winter peak for a particular combination of day type, and hour in the winter. Lines 49 through 96, Columns (j) through (m) calculate the probability of achieving a summer peak for a combination of day type, and hour in the summer. Columns (j) and (k) calculate the probability of achieving a seasonal peak for a particular combination of season, day type, and hour, and Columns (l) and (m) weight each combination of season, day type, and hour by the percentage of time each combination occurs during the year to achieve a weighted probability of peak.