

## MERC

Comparison of Peak Day Regression Results Using Significant Non-Weather Independent Variables and AHDD65 (1) or WCHDD65 (2) Showing Impact on NMU and PNG Peak Day Estimates of Changing the Confidence Level from 0.975 to 0.999 Volumes in Dth

	NMU Centra	NMU TRF	NMU GLGT	NMU NNG	NMU VGT	Total NMU	PNG GLGT	PNG NNG	PNG VGT	Total PNG	Total MERC
<b>Sigma (3)</b>											
3yr-S+AHDD65 (1)	733	298	1,227	1,143	1,046	4,447	558	9,336	525	10,419	14,867
3yr-S+WCHDD65 (2)	720	316	1,277	1,225	1,051	4,589	632	9,564	536	10,732	15,322
Difference	-13	19	50	81	5	142	74	228	11	313	455
Percent Difference	-1.8%	6.2%	4.1%	7.1%	0.5%	3.2%	13.3%	2.4%	2.0%	3.0%	3.1%

<b>Adj. R-Squared (4)</b>											
3yr-S+AHDD65 (1)	0.763	0.862	0.707	0.892	0.620	0.784	0.894	0.915	0.841	0.883	0.827
3yr-S+WCHDD65 (2)	0.772	0.844	n.a.	0.876	0.617	0.777	0.863	0.910	0.834	0.869	0.817
Difference	0.008	-0.018		-0.016	-0.004	-0.007	-0.030	-0.004	-0.007	-0.014	-0.010
Percent Difference	1.1%	-2.1%		-1.8%	-0.6%	-0.9%	-3.4%	-0.5%	-0.8%	-1.5%	-1.2%

<b>Peak Day Point Estimate</b>											
3yr-S+AHDD65 (1)	10,491	5,818	14,644	26,992	12,181	70,126	12,193	249,184	9,567	270,944	341,071
3yr-S+WCHDD65 (2)	10,689	5,842	14,866	26,974	11,963	70,334	12,165	249,895	9,387	271,446	341,781
Difference	198	24	222	-19	-218	208	-29	710	-180	502	710
Percent Difference	1.9%	0.4%	1.5%	-0.1%	-1.8%	0.3%	-0.2%	0.3%	-1.9%	0.2%	0.2%

<b>Peak Day Volume Risk Confidence Level: 0.9750 (5)</b>											
3yr-S+AHDD65 (1)	1,437	584	2,405	2,241	2,051	8,717	1,095	18,298	1,030	20,422	29,139
3yr-S+WCHDD65 (2)	1,411	620	2,502	2,401	2,060	8,995	1,240	18,745	1,051	21,035	30,030
Difference	-25	36	98	160	10	278	145	447	21	613	892
Percent Difference	-1.8%	6.2%	4.1%	7.1%	0.5%	3.2%	13.3%	2.4%	2.0%	3.0%	3.1%

<b>Daily Volume Peak Day Estimate Before Adjustments for Interruptible, Transport, and Joint Firm at 0.975 Confidence Level</b>											
3yr-S+AHDD65 (1)	11,928	6,402	17,049	29,234	14,232	78,843	13,288	267,482	10,597	291,366	370,209
3yr-S+WCHDD65 (2)	12,100	6,462	17,368	29,375	14,024	79,329	13,404	268,639	10,438	292,482	371,811
Difference	172	61	320	141	-208	486	117	1,158	-159	1,115	1,602
Percent Difference	1.4%	0.9%	1.9%	0.5%	-1.5%	0.6%	0.9%	0.4%	-1.5%	0.4%	0.4%

<b>Peak Day Volume Risk Confidence Level: 0.9990 (5)</b>											
3yr-S+AHDD65 (1)	2,265	921	3,791	3,533	3,233	13,743	1,726	28,849	1,623	32,199	45,942
3yr-S+WCHDD65 (2)	2,225	978	3,945	3,785	3,249	14,182	1,954	29,555	1,657	33,166	47,348
Difference	-40	57	154	252	16	439	229	705	33	967	1,406
Percent Difference	-1.8%	6.2%	4.1%	7.1%	0.5%	3.2%	13.3%	2.4%	2.0%	3.0%	3.1%

<b>Daily Volume Peak Day Estimate Before Adjustments for Interruptible, Transport, and Joint Firm at 0.999 Confidence Level</b>											
3yr-S+AHDD65 (1)	12,756	6,738	18,435	30,526	15,414	83,870	13,919	278,033	11,190	303,143	387,013
3yr-S+WCHDD65 (2)	12,914	6,820	18,811	30,759	15,212	84,516	14,119	279,449	11,044	304,612	389,128
Difference	158	82	376	233	-202	646	200	1,416	-147	1,469	2,116
Percent Difference	1.2%	1.2%	2.0%	0.8%	-1.3%	0.8%	1.4%	0.5%	-1.3%	0.5%	0.5%

Sales Growth Rate (6)	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	-4.0%	-1.6%	-5.7%	-1.8%	-1.2%
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<b>Change in Daily Volume Peak Day Estimate From Changing 0.975 to 0.999 Confidence Levels After Applying Sales Growth Rate</b>											
3yr-S+AHDD65 (1)	841	342	1,407	1,311	1,200	<b>5,101</b>	606	10,382	560	<b>11,562</b>	16,604
3yr-S+WCHDD65 (2)	826	363	1,464	1,405	1,206	<b>5,264</b>	686	10,635	572	<b>11,909</b>	17,112

- Notes:**
- Using 3 years of data including AHDD65: the traditional MERC weather variable,  $=(\text{MAX}(0,65-\text{avgtemp})) \times ((100+\text{Windmph})/100)$ .
  - Using 3 years of data including WCHDD65: heading degree days based on wind chill,  $=\text{MAX}(0, 65 - \text{wind chill})$ .
  - Sigma, or the standard error of the regression is one goodness of fit measure. Smaller is better.
  - Adj. R- Squared is a goodness of fit measure taking number of variables into account. Larger is better and 1.0 is the best.
  - Enter desired Confidence Level that actual daily metered load under design weather conditions will not exceed the forecast.
  - General Service Customers (2009 - 2010) from FCST 200904

- Conclusions:**
- Switching to a wind chill based variable provides a better statistical fit for two of the eight MERC forecasting areas.
  - Switching to a wind chill based variable increases both the volume risk and the peak day estimate for NMU.
  - Switching to a wind chill based variable decreases the volume risk and increases the peak day estimate for PNG.
  - Changing the Confidence Level from 0.975 to 0.999 changes the NMU Peak Day by about 5 Mdth.
  - Changing the Confidence Level from 0.975 to 0.999 changes the PNG Peak Day by about 12 Mdth.