



# Light Load Operational Performance

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12/8/2010

- Analysis was performed to test the potential impact of a light load criteria test on an RTEP case
- Modified generator deliverability tool to test the sensitivity of new variables
  - Ramping impact of wind generation above peak case levels
  - Wind impacts from neighboring systems
- Generator deliverability test

<b>Network Model</b>	2014 RTEP Light Load Case
<b>Load Model</b>	Light Load (50% of 50/50 Summer Peak)
<b>Base Generation Dispatch (Online in base case)</b>	<p>Coal &gt; 500MW = 60%</p> <p>Coal &lt; 500 MW = 45%</p> <p>Natural Gas = 5%</p> <p>Nuclear = (1-EEFORD) = approximately 92%</p> <p>Wind = 40%</p>
<b>External Transfers (Interchange)</b>	Yearly Long Term Firm
<b>Notes:</b>	Scale coal generation to balance the case to meet load + losses + interchange
<b>Contingencies</b>	NERC Category A, B, C (except C3)
<b>Monitored Facilities</b>	All PJM market monitored facilities

- Model the variability of wind generation during the light load period through the ramping impact of the generator deliverability test
- Also consider impact of neighboring systems

<b>Test Methodology</b>	Generator Deliverability, Common Mode Outage Procedure
<b>Ramping Limits for Generator Deliverability test methodology</b>	Wind 40% capacity factor in base case ramping up to 80%
<b>Generation Participation from Neighboring Systems</b>	DFAX cutoff (0%, 3%, and 5% was studied)

- PJM Existing wind generation included (~3800 MW)
- PJM FSA and ISA wind generation included (~2300 MW)
- MISO Existing wind generation included (~6000 MW)

Figure 1: PJM Queued Generation Added

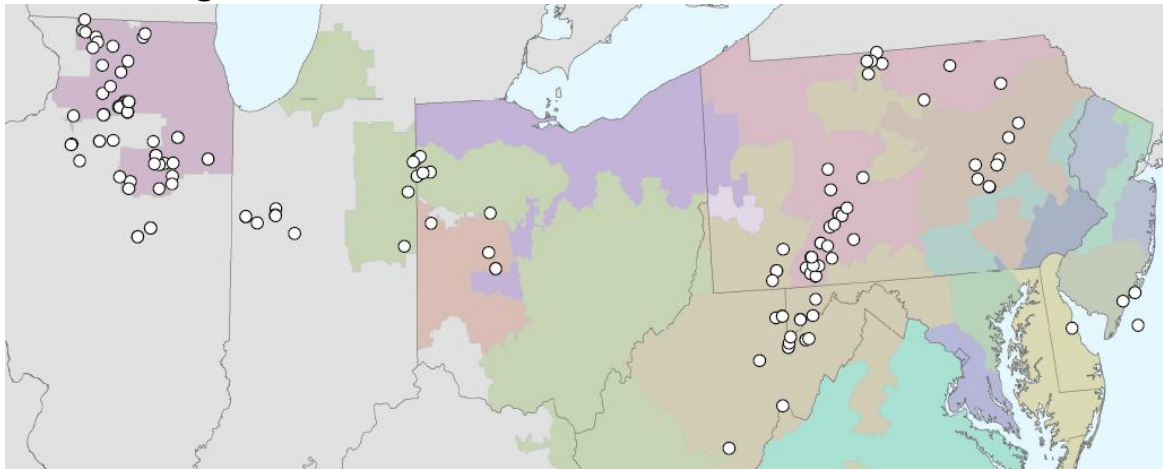


Table 1: Sum of Existing + Queued Generation by Zone

TO Zone	Sum of Pmax (MW)
COMED	2967
PENELEC	890
APS	831
AEP	580
DP&L	450
PL	326
BGE	16
PEPCO	2
<b>Grand Total</b>	<b>6063</b>

- Number of new discrete elements that are overloaded in this analysis that are not overloaded in the 2014 Summer Peak RTEP case
- A number of the overloads can be attributed to running the generator deliverability test on a light load case with the modified base dispatch
- Many of the overloads can be attributed to the ramping impact of the wind generation
- 3% and 5% MISO DFAX cutoff yielded almost identical results
- The outside Wind does not have significant impact unless the MISO DFAX cutoff is 0%

		MISO Wind DFAX Cutoff / PJM Wind Ramping Limit			
Area	Voltage	0% / 100%	0% / 80%	3% / 80%	5% / 80%
AEP	345/500	2	2	0	0
	138/138	3	2	0	0
APS	138/138	7	6	5	5
COMED	345/345	3	1	1	1
	345/138	1	0	0	0
	138/345	1	0	0	0
	138/138	30	15	9	9
DOMINION	500/500	2	2	2	2
	138/115	1	1	1	1
PECO	500/230	1	1	1	1
	230/230	1	1	0	0
	138/138	1	1	1	1
PECO/BGE TIE	230/230	1	1	0	0
PENELEC	115/115	1	1	1	1
	1/230	2	2	2	2
PL	230/230	1	1	0	0
PL/BGE TIE	230/230	1	1	0	0
	115/115	1	1	0	0
PL/JCPL TIE	69/18	2	2	0	0
PL/UGI TIE	69/69	1	1	1	1
PSEG	345/345	2	2	2	2
	230/230	1	1	1	1
	17.5/345	3	3	3	3
<b>TOTAL</b>		<b>69</b>	<b>48</b>	<b>30</b>	<b>30</b>

\* Ramping limit was applied to both PJM and MISO wind

- Distribute preliminary results to TO's
- Criteria
- Assumptions
- Methodology