Update on Winter Season Resource Adequacy Analysis

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Planning Committee
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Winter Risk

Winter Season Resource Adequacy and Capacity Requirements

Issue Charge is posted at:

http://www.pjm.com/~/media/committees-groups/committees/mrc/20161117/20161117-item-09-winter-reliability-requirement-ps-ic-clean.ashx

The Issue Charge has three Key Work Activities

• Winter peak load forecasting
• Winter season resource adequacy
• Winter season reliability requirements
Areas of Investigation

- Accuracy of the winter peak forecast from the PJM load forecast model (see next slide)
- Monthly load profile across the year
- Load uncertainty during the peak winter weeks
  - Current procedure to select the load model for LOLE studies considers only CP1 day in summer
Winter 10 CP Model Error by Forecast Vintage
0 Year Out Forecast
Areas of Investigation

- Generator Maintenance Scheduling
  - PRISM schedule vs. PJM Ops schedule
- Correlation of EFORd with winter load
  - Potential need for seasonal EFORd’s
- Common mode generator forced outages
- Solar and wind output during winter peak hours
Preliminary Results - Generator Performance

- 9-year average historical data (DY 2007- DY 2015)
- Table below shows the average percent of generation forced out and the standard deviation forced out during the Summer and Winter peak weeks over the 2007 – 2015 period.

<table>
<thead>
<tr>
<th>Season</th>
<th>Mean</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Summer</td>
<td>7.3%</td>
<td>1.7%</td>
</tr>
<tr>
<td>Winter</td>
<td>8.3%</td>
<td>4.0%</td>
</tr>
</tbody>
</table>
Weekly Effective Forced Outage Factor

Plot of Mean with Band of +/- One Standard Deviation
Areas of Investigation

• Transmission system maintenance outages
  – A maximum of 181 transmission elements (lines or transformers) were on planned maintenance at some point in January 2017
  – Could these transmission maintenance outages result in winter deliverability problems?
• Analysis will be coordinated through the Planning Committee and the RAAS
• May require input from LAS and the Operating Committee
• First meeting to review analysis results:
  – RAAS on March 31 from 2:00 – 4:00 PM