Winter Season
Resource Adequacy Analysis

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Intermittent Resource Subcommittee
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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

• Winter Load Forecast Accuracy
  – Monthly load profile and forecast distribution

• Winter Generation Performance
  – Common mode failures
  – Correlation with load level
  – Maintenance scheduling
Description of Curves Plotted on Slides 6 and 7

- **PRISM Curve** - Based on individual unit EFORd’s that are assumed to be mutually independent.
- **History Curve** – Based on system-wide forced outages from the five weekdays of the peak load week of each of the winters over the 9-yr period (DY2007/08-DY2015/16). (45 data points.)
- **History Mod Curve** – Same as History Curve but removes Winter 2014/15 peak week data (first polar vortex) and replaces it with Winter 2015/16 peak week data (second polar vortex).
PJM - Forced Outages (Peak Winter Week)
MAAC - Forced Outages (Peak Winter Week)
The table below shows the summer and winter reliability requirements for the RTO and for three LDAs. The requirements are shown under four different allocations of LOLE risk between the summer and winter seasons. The analysis includes generator performance data from both the 2014 and 2015 Polar Vortex events.

**Conclusion:** The RTO winter requirement must be equal to the RTO summer requirement to satisfy the “1 in 10” LOLE criterion under both the 100/0 and 90/10 seasonal risk allocations.
The table below shows the summer and winter reliability requirements for the RTO and for three LDAs. The requirements are shown under four different allocations of LOLE risk between the summer and winter seasons. The analysis excludes generator performance data from the 2014 Polar Vortex event.

<table>
<thead>
<tr>
<th>Zone</th>
<th>100 / 0 Allocation</th>
<th>90 / 10 Allocation</th>
<th>80 / 20 Allocation</th>
<th>70 / 30 Allocation</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Delta Summer RelReq</td>
<td>Delta Winter RelReq</td>
<td>Delta Summer RelReq</td>
<td>Delta Winter RelReq</td>
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<tr>
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<td>0</td>
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<td>913</td>
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<td>SWMAAC</td>
<td>15486</td>
<td>0</td>
<td>40</td>
<td>90</td>
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</tbody>
</table>

All numbers are in UCAP MW

**Conclusion:** The RTO winter requirement must be equal to the RTO summer requirement to satisfy the “1 in 10” LOLE criterion under the 100/0 seasonal risk allocation. If the RTO summer requirement is increased by 433 MW, the RTO winter requirement could be reduced by 9,202 MW (90/10 Risk Allocation).
Next Steps

- Review summer and winter reliability requirements with the MRC on 9/28.
- Continue to evaluate operational risks in winter such as increasing penetration of gas generation.
- Continue to investigate winter load forecast model.
- Finalize Deliverables for the 10/26 MRC meeting.