Light Load Reliability Criteria Methodology Update

PJM Planning Committee
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6/8/2017
• Light Load Reliability Analysis criteria established in Revision 18 of M14B (07/20/2011)

  – Added Light Load Reliability Analysis criteria and created a new Attachment D-2 to contain the criterion

  – The historical data available at the time was reviewed with the PJM PC as part of the criteria development process
• “Light Load Period”
  – November 1st – April 30th, Hours Ending 01:00 – 05:00

• Historical Data Review
  – Reviewed the data to determine how well the current study parameters correlate to the observed data

• Key Parameters
  – Load magnitude is currently set to 50% of the Peak Summer Load
  – Wind Generation is currently ramped up to 80% of Pmax
  – Natural Gas Generation is offline
Light Load Period - Load Data
Light Load Actual Loads as a % of Forecasted Peak
Light Load Actual Loads as a % of Forecasted Peak
Several PJM zones experience light load conditions of less than 35% of peak load during a significant number of hours.

Potential Recommendation: Decrease the load modeling assumption, as a % of forecasted summer peak, from the current 50% to a new, lower percentage of the summer peak forecast.
Update Manual 14B - D-2.2 Light Load Reliability Analysis Procedure

Change the load modeling assumption from 50% of summer peak to a new percentage of summer peak
Light Load Period - Generation Data
RTO Hourly Maximum Wind Capacity Factor 2012 - 2013
RTO Hourly Maximum Wind Capacity Factor 2013 - 2014
Light Load Reliability Criteria – Wind Modeling Recommendation

• Looking at three years of historical data, the PJM RTO has a significant number of annual hours during the light load period when the wind capacity factor is 100%.

• Potential Recommendation: Increase the maximum wind ramping to from 80% to 100%
  – Consistent with the modeling of wind in the neighboring MISO system
• Update Manual 14B - D-2.2 Light Load Reliability Analysis Procedure

• Change the deliverability ramping limit from 80% to 100% of nameplate for Wind Generation

<table>
<thead>
<tr>
<th>Fuel Type</th>
<th>Ramping Limits (% of Pmax)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nuclear</td>
<td>100%</td>
</tr>
<tr>
<td>Wind</td>
<td>New non-zero percentage based on Statistical Data 80%</td>
</tr>
<tr>
<td>Natural Gas</td>
<td>Establish ramping limit based on Statistical Data</td>
</tr>
<tr>
<td>Coal &gt;=500 MW</td>
<td>60%</td>
</tr>
<tr>
<td>Coal &lt; 500 MW</td>
<td>45%</td>
</tr>
<tr>
<td>All other resources</td>
<td>0% (not ramped)</td>
</tr>
</tbody>
</table>
• Next Steps

  – Propose to PC
    • Updated Light load demand percentage value (as a % of peak – currently 50% of peak)
    • Natural Gas modeling parameters (currently offline)
    • Wind maximum % ramping (currently 80%)

  – First read of corresponding M14B updates