2015 RTEP Assumptions
• Load Flow Modeling

  – Power flow models for world load, capacity and topology will be based on the 2020 summer peak case from the 2014 ERAG MMWG series power flow base case

  – Update of adjacent areas with latest topology

  – PJM topology will be based on the 2019 RTEP case that was used in the 2014 RTEP
    • Include all PJM Board approved upgrades through the November 2014 PJM Board of Manager approvals as well as all anticipated February 2015 PJM Board approvals
Locational Deliverability Areas (LDAs)

- Includes the existing 27 LDAs
- Total of 27 LDAs
  - All 27 to be evaluated for the 2018/2019 delivery year RPM base residual auction planning parameters
  - Also evaluated for the 2020 Summer RTEP case

<table>
<thead>
<tr>
<th>LDA</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>EMAAC</td>
<td>Global area - PJM 500, JCPL, PECO, PSEG, AE, DPL, RECO</td>
</tr>
<tr>
<td>SWMAAC</td>
<td>Global area - BGE and PEPCO</td>
</tr>
<tr>
<td>MAAC</td>
<td>Global area - PJM 500, Penelec, Meted, JCPL, PPL, PECO, PSEG, BGE, Pepco, AE, DPL, UGI, RECO</td>
</tr>
<tr>
<td>PPL</td>
<td>PPL &amp; UGI</td>
</tr>
<tr>
<td>PJM WEST</td>
<td>APS, AEP, Dayton, DUQ, Comed, ATSI, DEO&amp;K, EKPC, Cleveland</td>
</tr>
<tr>
<td>WMAAC</td>
<td>PJM 500, Penelec, Meted, PPL, UGI</td>
</tr>
<tr>
<td>PENELEC</td>
<td>Pennsylvania Electric</td>
</tr>
<tr>
<td>METED</td>
<td>Metropolitan Edison</td>
</tr>
<tr>
<td>JCPL</td>
<td>Jersey Central Power and Light</td>
</tr>
<tr>
<td>PECO</td>
<td>PECO</td>
</tr>
<tr>
<td>PSEG</td>
<td>Public Service Electric and Gas</td>
</tr>
<tr>
<td>BGE</td>
<td>Baltimore Gas and Electric</td>
</tr>
<tr>
<td>PEPCO</td>
<td>Potomac Electric Power Company</td>
</tr>
<tr>
<td>AE</td>
<td>Atlantic City Electric</td>
</tr>
<tr>
<td>DPL</td>
<td>Delmarva Power and Light</td>
</tr>
<tr>
<td>DPLSOUTH</td>
<td>Southern Portion of DPL</td>
</tr>
<tr>
<td>PSNORTH</td>
<td>Northern Portion of PSEG</td>
</tr>
<tr>
<td>VAP</td>
<td>Dominion Virginia Power</td>
</tr>
<tr>
<td>APS</td>
<td>Allegheny Power</td>
</tr>
<tr>
<td>AEP</td>
<td>American Electric Power</td>
</tr>
<tr>
<td>DAYTON</td>
<td>Dayton Power and Light</td>
</tr>
<tr>
<td>DLCO</td>
<td>Duquesne Light Company</td>
</tr>
<tr>
<td>Comed</td>
<td>Commonwealth Edison</td>
</tr>
<tr>
<td>ATSI</td>
<td>American Transmission Systems, Incorporated</td>
</tr>
<tr>
<td>DEO&amp;K</td>
<td>Duke Energy Ohio and Kentucky</td>
</tr>
<tr>
<td>EKPC</td>
<td>Eastern Kentucky Power Cooperative</td>
</tr>
<tr>
<td>Cleveland</td>
<td>Cleveland Area</td>
</tr>
</tbody>
</table>
• New TPL-001-4 Requirement
  – 1.1. System models shall represent:
    – 1.1.1. Existing Facilities
    – 1.1.2. Known outage(s) of generation or Transmission Facility(ies) with a duration of at least six months.
    – 1.1.3. New planned Facilities and changes to existing Facilities
    – 1.1.4. Real and reactive Load forecasts
    – 1.1.5. Known commitments for Firm Transmission Service and Interchange
    – 1.1.6. Resources (supply or demand side) required for Load

• PJM will compile and assess (as a sensitivity) planned outages of generation or Transmission with a duration of at least six months
2015 RTEP Assumptions

• Firm Commitments
  – Long term firm transmission service will be consistent with operations

• Outage Rates
  – Generation outage rates will be based on the most recent Reserve Requirement Study (RRS) performed by PJM
  – Generation outage rates for future PJM units will be estimated based on class average rates
2015 RTEP Load Modeling

• Peak Load
  – Load will be modeled consistent with the 2015 PJM Load Forecast Report
  – The final load forecast data is expected to be available late December 2014
  – Include Demand Response (DR) and Energy Efficiency (EE) that cleared in the 2017/18 BRA

• Light Load
  – Modeled at 50% of the Peak Load forecast per M14B
  – The Light Load Reliability Criteria case will be modeled consistent with the procedure defined in M14B

• Load Management, where applicable, will be modeled consistent with the 2015 Load Forecast Report
  – Used in LDA under study in load deliverability analysis
2015 RTEP Generation Assumptions

- All existing generation expected to be in service for the year being studied will be modeled.

- Future generation with a signed Interconnection Service Agreement, or that cleared in the 2017/18 BRA, will be modeled along with any associated network upgrades.
  - Generation with a signed ISA will contribute to and be allowed to back-off problems.

- Generation with an executed Facility Study Agreement (FSA) will be modeled along with any associated network upgrades.
2015 RTEP Generation Assumptions

• Generation with an FSA will be modeled consistent with the procedures noted in manual 14B

• Generation with an executed FSA will be modeled off-line but will be allowed to contribute to problems in the generation deliverability testing.
  – Generation with an executed FSA will not be allowed to back-off problems.

• Additional generation information (i.e. machine lists) are posted to the TEAC page.
Deactivation Notification Generation

• Generation that has officially notified PJM of deactivation will be modeled offline in RTEP base cases for all study years after the intended deactivation date

• RTEP baseline upgrades associated with generation deactivations will be modeled

• Retired units capacity interconnection rights are maintained in RTEP base cases for 1 year after deactivation at which point they will be removed unless claimed by a queue project
• All PJM bulk electric system facilities, all tie lines to neighboring systems and all lower voltage facilities operated by PJM will be monitored.

• Contingency analysis will include all bulk electric system facilities, all tie lines to neighboring systems and all lower voltage facilities operated by PJM.

• Thermal and voltage limits will be consistent with those used in operations.
As part of the 24-month RTEP cycle, a year 7 (2022) base case will be developed and evaluated as part of the 2015 RTEP.

The year 7 case will be based on the 2022 case that was developed as part of this year’s 2014 RTEP.
- The case will be updated to be consistent with the 2014 RTEP assumptions.

Purpose: To identify and develop longer lead time transmission upgrades.
Year 2020 Summer RTEP Model Assumptions

• Machine list
  – Updated Capacity Interconnection Rights (CIR’s) for existing units
  – Queues with an executed FSA or higher as of 12/11/2014 will be included in the base model
    • Consult posted machine list for exact modeling assumption
    • FSA will be turned off but allowed to contribute to problems in Generator Deliverability
    • Any identified network upgrades driven by included queue projects will also be modeled
    • Any exceptions will be reviewed with TEAC
  – Units that cleared in previous RPM auctions that do not yet have an executed FSA or higher will be modeled
  – 2020 RTEP machine list will be presented at February 2015 TEAC
• All TO’s provided feedback for final case review
• PJM currently exercising the case for quality control and benchmarking
• Final contingency file review
• Machine List
  – 2020 RTEP machine list is posted with the February 2015 TEAC materials
    • http://pjm.com/~/media/committees-groups/committees/teac/20150212/20150212-year-2020-machine-list-for-2015-rtep-analysis.ashx
  – Stakeholders are encouraged to examine the list and provide PJM feedback
Questions, input or suggestions
– Email RTEP@pjm.com