Issues Tracking
• Open Issues
  – None

• New Issues
Interregional Planning Update
• Upcoming Order 1000 Compliance

  – Interregional Compliance filing – April 2013 (6 months after Regional filing)

  – Initial contacts with neighbors
    • MISO
    • TVA
    • NY/NE
    • NC Collaborative

  – Review and input from IPSAC and TEAC
• Review PJM impacts of approved MVP
  – Recently approved in MTEP
  – MISO supporting analysis assumes future generation
  – PJM will set up future state model
    • Light load analysis compared to 2011 RTEP
    • Kincaid stability analysis

• Joint analysis of cross border flowgates
  – MISO analysis of recent market congestion
  – A few issues are on the seam with PJM
  – Potential for cross-border PJM projects
  – PJM market efficiency analysis
• Joint PJM and NCTPC wind integration study

• Reliability analysis of 3 scenarios
  – 3000 MW off shore wind
    • 2 x 1000 MW injections in NC
    • 1000 MW injection at DOM Landstown and transmitted to NC
  – 5000 MW off shore wind
    • 2 x 1500 MW injections in NC
    • 2000 MW injection at DOM Landstown integrated to PJM
  – 8000 MW off shore wind
    • 2 x 1000 MW injections in NC
    • 6000 MW injection at DOM Landstown
      – 1000 transmitted to NC
      – 5000 integrated to PJM
• Joint short circuit analysis of northern NJ and Coned

• Fault duty approaching limit of technology
  – 80 kA on some breakers
  – Large contributions from synchronous ties with NY
  – NY in similar situation

• Study Scope
  – Compare Regional short circuit practices
  – Set up joint analysis model
  – Run prescribed faults in each region using Regional practice
  – Review results and address issues
• Moving from stakeholder scenario construction to transmission design
• Principal Investigators to lead
• Result – A set of transmission options for each scenario
• January 10-11 initial TOTF
• Next 5 weeks
  – Construct power flows for each scenario (2030)
  – Interact with stakeholders
  – Perform gap analyses and develop initial transmission concepts
• TOTF 2/22-23
Generation Retirements
<table>
<thead>
<tr>
<th>Unit</th>
<th>Capacity</th>
<th>Trans Zone</th>
<th>Age (Years)</th>
<th>Official Owner Request</th>
<th>Requested Deactivation Date</th>
<th>Projected Deactivation Date</th>
<th>PJM Reliability Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chesapeake 3</td>
<td>147</td>
<td>DOM</td>
<td>52</td>
<td>11/15/2011</td>
<td>12/31/2015</td>
<td>12/31/2015</td>
<td>Reliability Analysis Underway</td>
</tr>
<tr>
<td>Chesapeake 4</td>
<td>207</td>
<td>DOM</td>
<td>49</td>
<td>11/15/2011</td>
<td>12/31/2015</td>
<td>12/31/2015</td>
<td>Reliability Analysis Underway</td>
</tr>
<tr>
<td>Yorktown 1</td>
<td>159</td>
<td>DOM</td>
<td>54</td>
<td>11/15/2011</td>
<td>12/31/2014</td>
<td>12/31/2014</td>
<td>Reliability Analysis Underway</td>
</tr>
<tr>
<td>National Park 1</td>
<td>21</td>
<td>PSEG</td>
<td>42</td>
<td>12/1/2011</td>
<td>6/1/2015</td>
<td>6/1/2015</td>
<td>Reliability Analysis Underway</td>
</tr>
</tbody>
</table>
Current analysis

• Initial analysis completed and awaiting Generation Owner response

• Initial analysis identified the need for transmission upgrades

• Upgrades include existing baseline projects as well as new upgrades
  – New EHV being considered to address issues in the Dominion Transmission Zone

• TO’s believe that construction of facilities in timely fashion is possible to allow retirements
  – One reinforcement that involves accelerating an existing baseline may be slightly delayed leading to the need for SPS in the interim
2012 RTEP Cycle

Year 0
- Develop assumptions and build Year 5 base case
- Reliability criteria analysis for years 5-15
- Identify and evaluate solution options
- Final review with TEAC and approval by Board

Year 1
- Develop assumptions and build Year 8 base case
- Perform criteria analysis for years 8 - 15
- Perform reliability and market efficiency analyses for Year 8 - 15
- Identify proposed solutions
- Develop assumptions and build Year 7 base case
- Re-tool of analysis for years 7 - 15 including solution options
- Independent consultant reviews of buildability
- Adjustments to solution options by PJM based on analysis
- Develop assumptions and build Year 5 base case
- Reliability criteria analysis for years 5-15
- Identify and evaluate solution options
- Final review with TEAC and approval by Board
2012 RTEP Assumptions
(continued from 12/2011 TEAC)
• 12/2011 TEAC meeting review of typical RTEP assumptions
  – Case development
  – Load forecast
  – Interchange
  – Generation assumptions
SUMMER PEAK DEMAND FOR EASTERN MID-ATLANTIC GEOGRAPHIC ZONE

YEAR

LOAD(MW)

- Uncontracted Peaks
- Weather Normalized Peaks
- 2011 Forecast
- 2012 Forecast
• 2017 base case development started in December

• 2017 base case development in progress

• Initial focus on study year 2017 analyses
• Incorporating topology updates from transmission owners
  – Please forward any remaining updates to PJM

• Currently working on applying the updates and updating queue generation

• Expect to have a draft case back to the TO’s with updated topology and generation in the third week of January

• Anticipated 2017 RTEP case finalized in early February
• Next Steps

- Complete 2017 Summer RTEP Case
- Create 2020 Summer Case
- Create 2017 Light Load Case
2012 RTEP

Scenario and Sensitivity Analyses
FYI Process - Scenario and Sensitivity Analysis

Decision Framework

- Baseline Reliability Upgrades
- Market Efficiency Upgrades
- Proactive Build Approach
- Critical Mass Approach
- State Sponsored Upgrades
- Public Policy Upgrades
- State Agreement Approach

FYI Process

- Review of Evaluation of Solution Options
- Suggestion Solution Options
- Review of Analysis Results
- Input to and Review of Assumptions and Scenarios for Analysis
• Renewable Portfolio Standards (RPS)
  – 0 GW offshore
  – 10 GW offshore – perform SCOPF and develop transmission overlay
  – Source a portion of RPS from neighboring entities

• High load growth scenario

• At-risk generation
  – RPM
  – Regulatory
• RPS scenario analyses were completed as part of the 2011 RTEP
  – Identified RPS requirements
  – Developed sourcing strategy to meet all PJM state’s RPS requirements with resources located in PJM
    • 4 GW Offshore with 38 GW Onshore
    • 20 GW Offshore with 28 GW Onshore
    • Both scenarios included solar carve out consistent with state RPS requirements
  – Developed transmission overlays based on a combination of reliability analysis and production cost simulations
• 2012 RTEP RPS scenario analyses will build on the work completed as part of the 2011 RTEP

  – Utilize the same source for RPS requirements as 2011 RTEP – updated to include latest RPS policies

  – Utilize similar analytic approach as 2011 RTEP
    • Production Cost Analysis
    • Reliability Analysis
      – Generation Deliverability
      – Light Load Simulation using SCOPF
• 2012 RTEP RPS Scenario Sourcing Strategy
  – 10 GW Offshore (discussed last year but was not completed due to resource limitations)

  – O GW Offshore

• 40% External Resource Strategy
  • Utilize same source distribution within PJM for 60% of the total renewables required
  • Assume HVDC injections into PJM for 40% of the resources
    – Utilize wind profiles for resources further west of PJM
• Develop a high growth load forecast based on a more optimistic economic projection

• Update the 2017 RTEP base case with a high growth load forecast

• Perform reliability analyses using the updated base cases
  – Generation Deliverability
  – Load Deliverability (with initial focus on historically constrained areas)
  – 15 year analyses
• 2012 RTEP “AT-Risk” scenario analyses will build on the work completed in 2011

• Utilize “Coal Capacity at Risk for Retirement in PJM” report

• Perform reliability analysis on potential impact
• Reliability Analysis Scope

  – Load Deliverability analysis of select LDAs
    • MAAC
    • EMAAC
    • SWMAAC
    • Others

  – Area CETO will be increased based on the amount of “at-risk” generation located within the area

  – Additional analyses will be done focusing on potential regional issues
PJM Baseline Reliability Update
• Project replacement

• Replace existing Monocacy – Ringgold – Carroll (MRC) with alternative upgrades

• Continued on next slide…
• Replace existing Monocacy – Ringgold – Carroll (MRC) with alternative upgrades continued...

• MRC Summary
  – b0675.1 Convert Monocacy - Walkersville 138 kV to 230 kV
  – b0675.2 Convert Walkersville - Catoctin 138 kV to 230 kV
  – b0675.3 Convert Ringgold - Catoctin 138 kV to 230 kV
  – b0675.4 Convert Catoctin - Carroll 138 kV to 230 kV
  – b0675.5 Convert portion of Ringgold Substation from 138 kV to 230 kV
  – b0675.6 Convert Catoctin Substation from 138 kV to 230 kV
  – b0675.7 Convert portion of Carroll Substation from 138 kV to 230 kV
  – b0675.8 Convert Monocacy Substation from 138 kV to 230 kV
  – b0675.9 Convert Walkersville Substation from 138 kV to 230 kV

• Recommended Solution to replace MRC with:
  – Replace relaying at the Mt. Airy substation on the Carroll - Mt. Airy 230 kV Line. (B1816.1) - $0.1M
  – Adjust control settings of all existing capacitors served by Potomac Edison’s Eastern 230 kV network to ensure that all units will be on during the identified N-1-1 contingencies. (B1816.2) - $0.05M
  – Replace existing unidirectional LTC controller on the No. 4, 230/138kV transformer at Carroll Substation with a bidirectional unit. (B1816.3) - $0.05M
  – Isolate & bypass the 138 kV reactor at Germantown Substation (B1816.4) - $0.05M
  – Replace SCCIR (Sub-conductor) at Hunterstown Substation on the No.1, 230/115 kV transformer. (B1816.5) - $0.1M
  – Replace 336.4 ACSR conductor on the Catoctin-Carroll 138 kV line (Section CUB) using 556.6 ACSR (26/7) or equivalent on existing structures (12.7 miles). Replace 800 A wave traps at Carroll and Catoctin with 1200 A units and replace 556.5 ACSR SCCIR (subconductor) line risers and bus taps at Carroll with 795 ACSR or equivalent. (B1816.6) - $4.3M

• Expected IS date: 6/1/2013
• N-1-1 Thermal Violation

• The loading on the Concord – Jackson Road 138 kV line can not be dispatched below normal rating after the loss of the Cook - East Elkhart – Hiple 345KV line and the East Elkhart 345/138KV transformer #2

• Recommended Solution: Install (3) 345 kV circuit breakers at East Elkhart station in ring bus designed as a breaker and half scheme. (B1817)

• Estimated Project Cost: $6M

• Expected IS date: 6/01/2016
• Proposed change to scope and associated cost

• Original:
  ✓ B1663: Install a new 765/138 kV transformer at Jackson Ferry substation
  ✓ B1663.1: Establish a new 10 mile double circuit 138 kV line between Jackson Ferry and Wythe
  ✓ Estimated Project Cost: $40M

• Continued on next slide…
• Cost change and scope split change

• Original Scope:
  – B1663: Install a new 765/138 kV transformer at Jackson Ferry substation
  – B1663.1: Establish a new 10 mile double circuit 138 kV line between Jackson Ferry and Wythe
  – Estimated Project Cost: $40M

• New Proposed Scope:
  – Jackson’s Ferry 765 kV
    • Install two 765kV circuit breakers
    • Install breaker disconnect switches and associated bus work for the new 765kV breakers
    • Install new relays for the 765kV breakers at Jackson’s Ferry (B1663.2)
    • Estimated project cost: $8M
  – Jackson’s Ferry 138 kV
    • Install a new 765/138kV 750 MVA transformer (4-250 MVA single phase units including a spare) Build a new ~14 mile 138kV double circuit from Jackson's Ferry to Wythe
    • Install 6 new 138kV breakers at Jackson's Ferry
    • Install breaker disconnect switches and associated bus work for the new 138kV breakers at Jackson's Ferry
    • Install 2 new 138kV breakers at Wythe
    • Install breaker disconnect switches and associated bus work for new 138kV breakers at Wythe
    • Install new line relays for new 138kV line and 138kV breakers at Wythe and Jackson's Ferry (B1663) -$37M
    – Cancel B1663.1

• Expected IS Date: 6/1/2015
• Cost change and scope split

• Original scope:
  – b1659 Establish Sorenson 345/138 kV station as a 765/345 kV station - $85M

• New proposed scope:
  – Build approximately 14 miles of 765 kV line from existing Dumont - Marysville line (B1659.14)
    • Estimated Project Cost: $35M
  – Establish 765 kV yard at Sorenson and install four 765 kV breakers (B1659.13)
    • Estimated Project Cost: $20M
  – Sorenson 765/345 kV transformer and 345 kV work at Sorenson (B1659)
    • Estimated Project Cost: $45M

• Expected IS date: 6/1/2015
• N-1-1 Thermal Violation
• Thermal Overloads:
  – County Road – Robison Park 138 kV for the loss of Butler – Woods Road 138 kV line and the Albion – Kendallville 138 kV line
  – Illinois Road – Sorenson 138 kV line cannot be dispatched below normal rating for the loss of Allen – Sorenson 345 kV line
  – The Concord – Jackson Road 138kV line cannot be dispatched below normal rating for the loss of the Cook- Hiple 345kV line
  – Continued on next slide…
• Continued from previous slide...

• Recommended Solution: Expand the Allen station by installing a second 345/138 kV transformer and adding four 138 kV exists by cutting in the Lincoln – Sterling and Milan – Timber Switch 138 kV double circuit tower line. (B1818)

• Estimated Project Cost: $45M

• Expected IS date: 6/1/2016
• **N-1-1 Thermal Violations**

• **Thermal Overloads:**
  - The GM Truck – McKinley 138 kV line is overloaded for the loss of Sorenson – Industrial Park 138 kV line plus Sorenson – McKinley 138 kV line
  - The Illinois Road – Industrial Park 138 kV line is overloaded for the loss of the Allen – Sorenson 345 kV line plus Coventry – Eagle Ridge – McKinley 138 kV line or the loss of the Allen – Sorenson 345 kV line with Allen 345/138 kV transformer plus Coventry – Eagle Ridge – McKinley 138 kV line
  - The Illinois Road – Sorenson 138 kV can not be dispatched below normal rating for loss of Allen – Sorenson 345 kV line or the loss of the Allen – Sorenson 345 kV line with Allen 345/138 kV transformer
  - The Industrial Park – McKinley 138 kV for loss of Sorenson – Industrial Park 138 kV line plus Convoy – Robison Park 345 kV line plus Robison Park 345/138 kV transformer #5
  - The Coventry – Sorenson 138 kV line is overloaded for the loss of Allen – Sorenson 345 kV line plus Allen 345/138 kV transformer #1 or for the loss of Allen – Sorenson 345 kV line plus Sorenson – Industrial Park 138 kV line

• Continued on next slide…
• Continued from previous slide…

• Rebuild the Robison Park – Sorenson 138 kV line corridor as a 345 kV double circuit line with one side operated at 345 kV and one side at 138 kV. (B1819)

• Estimated Cost: $55M

• Expected IS date: 6/1/2016
N-1-1 Reactive Upgrades
<table>
<thead>
<tr>
<th>Location</th>
<th>Reinforcement Recommended to PJM Board – December 2011</th>
<th>PJM Board Status – December 2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Altoona 230 kV</td>
<td>250 MVAR SVC</td>
<td></td>
</tr>
<tr>
<td>Doubs 500 kV</td>
<td>300 MVAR switched shunt and an increase (~50 MVAR) in size of existing switched shunt</td>
<td>Approved for inclusion in the RTEP</td>
</tr>
<tr>
<td>Loudoun 500 kV</td>
<td>450 MVAR SVC and 300 MVAR switched shunt</td>
<td></td>
</tr>
<tr>
<td>Pleasant View 500 kV</td>
<td>150 MVAR switched shunt</td>
<td></td>
</tr>
<tr>
<td>Mansfield 345 kV</td>
<td>100 MVAR FSS and two 100 MVAR switched shunt</td>
<td></td>
</tr>
<tr>
<td>Hunterstown 500 kV</td>
<td>500 MVAR SVC</td>
<td>Decision Deferred Until Next PJM Board Meeting in February 2012</td>
</tr>
<tr>
<td>Meadow Brook 500 kV</td>
<td>600 MVAR SVC</td>
<td></td>
</tr>
<tr>
<td>Mt. Storm - Valley 500 kV</td>
<td>250 MVAR SVC</td>
<td></td>
</tr>
</tbody>
</table>
### Reactive Reinforcement Technology

<table>
<thead>
<tr>
<th></th>
<th>SVC</th>
<th>Fast Switched Shunt</th>
<th>Static Capacitor</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Voltage Support</strong></td>
<td>Dynamic</td>
<td>Static</td>
<td></td>
</tr>
<tr>
<td><strong>Control</strong></td>
<td>Linear</td>
<td>Discrete (On/Off)</td>
<td></td>
</tr>
<tr>
<td><strong>Reactive Envelope</strong></td>
<td>Absorb and Produce MVAR</td>
<td>Produce MVAR</td>
<td></td>
</tr>
<tr>
<td><strong>Reaction Time</strong></td>
<td>Cycles</td>
<td>Seconds</td>
<td>Operator Control</td>
</tr>
<tr>
<td><strong>Operations</strong></td>
<td>Linear support of pre and post contingency voltage</td>
<td>Discrete voltage support, automatically switched post contingency</td>
<td>Discrete voltage support, manually switched</td>
</tr>
<tr>
<td><strong>Ancillary Benefits</strong></td>
<td>system dynamic stability, coordination, control, operations</td>
<td>Can be automatically switched</td>
<td></td>
</tr>
</tbody>
</table>
## SVC Utilization - Performance of Solution Alternatives

### Output (MVAR) of reactive devices under N-1-1 conditions

<table>
<thead>
<tr>
<th>N-1-1 500 kV Contingency*</th>
<th>Meadow Brook SVC</th>
<th>Loudoun SVC</th>
<th>Hunterstown SVC</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N-0 Base Case</td>
<td>N-1 Collapse Point</td>
<td>N-1-1 Collapse Point</td>
</tr>
<tr>
<td>Contingency Pair #1</td>
<td>63</td>
<td>370</td>
<td>600</td>
</tr>
<tr>
<td>Contingency Pair #2</td>
<td>53</td>
<td>410</td>
<td>500</td>
</tr>
<tr>
<td>Contingency Pair #3</td>
<td>53</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Contingency Pair #4</td>
<td>53</td>
<td>127</td>
<td>500</td>
</tr>
<tr>
<td>Contingency Pair #5</td>
<td>53</td>
<td>167</td>
<td>500</td>
</tr>
<tr>
<td>Contingency Pair #6</td>
<td>53</td>
<td>190</td>
<td>500</td>
</tr>
<tr>
<td>Contingency Pair #7</td>
<td>53</td>
<td>156</td>
<td>500</td>
</tr>
<tr>
<td>Contingency Pair #8</td>
<td>53</td>
<td>132</td>
<td>500</td>
</tr>
<tr>
<td>Contingency Pair #9</td>
<td>53</td>
<td>132</td>
<td>500</td>
</tr>
<tr>
<td>Contingency Pair #10</td>
<td>53</td>
<td>459</td>
<td>500</td>
</tr>
<tr>
<td>Contingency Pair #11</td>
<td>53</td>
<td>468</td>
<td>500</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>N-1-1 500 kV Contingency*</th>
<th>Altoona SVC</th>
<th>Mansfield FSS</th>
<th>Mt. Storm - Valley SVC</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N-0 Base Case</td>
<td>N-1 Collapse Point</td>
<td>N-1-1 Collapse Point</td>
</tr>
<tr>
<td>Contingency Pair #1</td>
<td>7</td>
<td>60</td>
<td>122</td>
</tr>
<tr>
<td>Contingency Pair #2</td>
<td>7</td>
<td>64</td>
<td>120</td>
</tr>
<tr>
<td>Contingency Pair #3</td>
<td>7</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Contingency Pair #4</td>
<td>7</td>
<td>57</td>
<td>250</td>
</tr>
<tr>
<td>Contingency Pair #5</td>
<td>7</td>
<td>81</td>
<td>260</td>
</tr>
<tr>
<td>Contingency Pair #6</td>
<td>7</td>
<td>89</td>
<td>187</td>
</tr>
<tr>
<td>Contingency Pair #7</td>
<td>7</td>
<td>41</td>
<td>217</td>
</tr>
<tr>
<td>Contingency Pair #8</td>
<td>7</td>
<td>55</td>
<td>250</td>
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<td>Contingency Pair #9</td>
<td>7</td>
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<td>250</td>
</tr>
<tr>
<td>Contingency Pair #10</td>
<td>7</td>
<td>36</td>
<td>118</td>
</tr>
<tr>
<td>Contingency Pair #11</td>
<td>7</td>
<td>40</td>
<td>118</td>
</tr>
</tbody>
</table>

* The specific contingency pairs are considered CEiL
PJM Voltage Recovery Criteria

– Voltage must recover to 0.7 p.u. within 20 cycles (1/3 of a second) after the fault is cleared

– Voltage must recover to 0.9 p.u. within 60 cycles (1 second) after the fault is cleared
- Voltage Recovery Analysis

- 2015 MAAC peak load stability case

- Performance
  - Fast Switched Shunt
  - SVC

* Post contingency voltage for an N-1 initial condition with an additional N-1 fault (combination CEII)
• Voltage Recovery Analysis under a stressed import

• 2015 MAAC peak load stability case with stressed import

• Performance
  – Fast Switched Shunt
  – SVC

* Post contingency voltage for an N-1 initial condition with an additional N-1 fault (combination CEII)
Hunterstown Reactive
• Previous recommendation to PJM Board for a 500 MVAR SVC at Hunterstown 500 kV

• Stakeholder suggestion for a 250 MVAR Fast Switched Shunt at Hunterstown 500 kV

• Board decision deferred

• Continuing Evaluation
Meadowbrook Reactive
• Previous Recommendation to PJM Board for a 500 MVAR SVC

• Stakeholder suggestion for a 300 MVAR capacitor and an increase of the existing capacitor from 200 to 300 MVAR

• Board decision deferred

• Continuing Evaluation
• Existing Configuration

• Proposed Configuration to tap existing Mt. Storm – Meadowbrook 500 kV and Greenland Gap – Meadowbrook 500 kV
Mt. Storm – Valley Reactive
Mt. Storm - Valley Reactive Upgrade Status

- Previous Recommendation to PJM Board for a 250 MVAR SVC on Mt. Storm - Valley

- Stakeholder suggestion to locate the SVC at Mt. Storm

- Board decision deferred

- Continuing Evaluation
Transfer Capability increase into PJM due to SVC Installation at Mt. Storm or Mt. Storm - Valley

<table>
<thead>
<tr>
<th>N-1 Contingency</th>
<th>Mt. Storm SVC (1.05 pu) improvement over No SVC</th>
<th>Mt. Storm - Valley SVC (1.05 pu) improvement over No SVC</th>
</tr>
</thead>
<tbody>
<tr>
<td>N-1-1 Outage #1</td>
<td>703</td>
<td>703</td>
</tr>
<tr>
<td>N-1-1 Outage #2</td>
<td>707</td>
<td>719</td>
</tr>
<tr>
<td>N-1-1 Outage #3</td>
<td>320</td>
<td>358</td>
</tr>
<tr>
<td>N-1-1 Outage #4</td>
<td>284</td>
<td>340</td>
</tr>
<tr>
<td>N-1-1 Outage #5</td>
<td>512</td>
<td>495</td>
</tr>
<tr>
<td>N-1-1 Outage #6</td>
<td>368</td>
<td>500</td>
</tr>
<tr>
<td>N-1-1 Outage #7</td>
<td>506</td>
<td>512</td>
</tr>
<tr>
<td>N-1-1 Outage #8</td>
<td>377</td>
<td>363</td>
</tr>
</tbody>
</table>
Transfer Capability increase into PJM due to SVC Installation at Mt. Storm or Mt. Storm - Valley
<table>
<thead>
<tr>
<th>Criteria Violation Performance</th>
<th>Effective</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coordination of Mt. Storm Generation, exiting Mt. Storm capacitors, and proposed SVC</td>
<td>Coordinate across multiple sites</td>
</tr>
<tr>
<td>Land &amp; ROW</td>
<td>New</td>
</tr>
<tr>
<td>CPCN</td>
<td>Required</td>
</tr>
<tr>
<td>Cost</td>
<td>SVC + additional site</td>
</tr>
</tbody>
</table>
• Continue dynamic voltage analysis

• Continue evaluation of interaction of SVC control with generator voltage regulation
Short Circuit Upgrades
- The Pleasant Valley 137kV breaker ‘194-B-3’ is overstressed
- Proposed Solution: Replace Pleasant Valley 138 kV breaker ‘194-B-3’ (b1814)
- Estimated Project Cost: $180 K per breaker
- Expected IS Date: 6/1/2015
• The West Ravenna 138kV breaker ’59-B-15’ is overstressed
• Proposed Solution: Replace West Ravenna 138 kV breaker 59-B-15 (b1815)
• Estimated Project Cost: $180 K per breaker
• Expected IS Date: 6/1/2015
• The Brambleton 137kV breakers ‘22702’ and ‘227T2094’ are overstressed
• Proposed Solution: Replace Brambleton 230 kV breakers '22702', and '227T2094' (b1809-b1810)
• Estimated Project Cost: $220 K per breaker
• Expected IS Date: 4/30/2015
Supplemental Projects
• Supplemental Projects: Install two single phase 500/230 kV transformers at Waugh Chapel substation as a result of a BGE spare equipment requirement (not a PJM PRA spare transformer)

• Estimated Project Cost: $10.9 M

• Expected IS Date: 9/1/2012
Questions?

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