NPCC Regional Planning Forum
STATUS REPORT

NPCC Reliability Coordinating Committee

New York, NY
March 12, 2003
NPCC Regional Planning Forum

Study Objectives

• Explore innovative approaches to enhance the transmission grid from a Wide-Area, trans-Regional outlook
• Evaluate ways to better utilize the New York, New England, and Hydro-Quebec DC facilities
• Increase size of the largest single contingency NPCC can reliably withstand
Base Case Transfers - 2005/06 Time Frame

Generating Capacity by Area

<table>
<thead>
<tr>
<th>Area</th>
<th>All Generators</th>
<th>In Service Generators</th>
</tr>
</thead>
<tbody>
<tr>
<td>PJM</td>
<td>69319 MW</td>
<td>54594 MW</td>
</tr>
<tr>
<td>NYISO</td>
<td>51987 MW</td>
<td>32391 MW</td>
</tr>
<tr>
<td>OH</td>
<td>38497 MW</td>
<td>26125 MW</td>
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<tr>
<td>NEPOOL</td>
<td>58460 MW</td>
<td>43292 MW</td>
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<tr>
<td>HQ</td>
<td>34681 MW</td>
<td>30236 MW</td>
</tr>
<tr>
<td>NB</td>
<td>4364 MW</td>
<td>3156 MW</td>
</tr>
<tr>
<td>NS</td>
<td>2449 MW</td>
<td>1498 MW</td>
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</table>

NPCC RCC Meeting
March 12, 2003

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Status Report
Voltages near or violating 0.92 pu (blue) and 1.05 pu (red) limits are highlighted.
2005/06 Time Frame

Range of voltage change is +/- 5%

PJM Voltage Profile – Loss of Hydro-Quebec Phase II at 1,900 MW

NPCC RCC Meeting
March 12, 2003

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Status Report
Range of voltage change is +/- 5%

PJM Voltage Profile – Loss of Hydro-Quebec Phase II at 1,900 MW with Dynamic Reactive Compensation at 230 kV Oakdale, NY bus
PJM Voltage Profile – Loss of Hydro-Quebec Phase II at 1,900 MW with Dynamic Reactive Compensation at 345 kV New Scotland, NY bus
2005/06 Time Frame

Range of voltage change is 0.9 to 1.07 per unit

NY Voltage Profile – Loss of Hydro-Quebec Phase II at 1,900 MW
2005/06 Time Frame

NY Voltage Profile – Loss of Hydro-Quebec Phase II at 1,900 MW with Dynamic Reactive Compensation at 230 kV Oakdale, NY bus

Range of voltage change is 0.9 to 1.07 per unit
2005/06 Time Frame

NY Voltage Profile – Loss of Hydro-Quebec Phase II at 1,900 MW with Dynamic Reactive Compensation at 345 kV New Scotland, NY bus

Range of voltage change is 0.9 to 1.07 per unit

New Scotland 345 kV VAR compensator at 452 MVAR
## 2005/06 Time Frame

<table>
<thead>
<tr>
<th>Phase II Contingency</th>
<th>Marcy Pre</th>
<th>Marcy Post</th>
<th>Leeds Pre</th>
<th>Leeds Post</th>
<th>Fraser Pre</th>
<th>Fraser Post</th>
<th>Essex Pre</th>
<th>Essex Post</th>
<th>Oakdale Pre</th>
<th>Oakdale Post</th>
<th>New Scotland Pre</th>
<th>New Scotland Post</th>
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<tbody>
<tr>
<td>1500 MW</td>
<td>0.1</td>
<td>200</td>
<td>0.8</td>
<td>182.1</td>
<td>0.3</td>
<td>230.3</td>
<td>26.3</td>
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<td>1600 MW</td>
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<td>200</td>
<td>1.1</td>
<td>199.2</td>
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<td>253.6</td>
<td>26</td>
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<td>270</td>
<td>0.2</td>
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<td>75</td>
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<tr>
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<td>200</td>
<td>5.1</td>
<td>270</td>
<td>0</td>
<td>325</td>
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<td>325</td>
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<td>75.1</td>
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<td>-30.4</td>
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<td>75</td>
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<td>2000 MW w/ Oak Comp²</td>
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<td>270</td>
<td>0</td>
<td>325</td>
<td>25.2</td>
<td>75</td>
<td>0</td>
<td>104.8</td>
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<tr>
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<td>75</td>
<td>0</td>
<td>502.7</td>
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</table>

### Notes

1. Failed load flow solution
2. Oakdale 230kV dynamic compensation added (-200 MVAR to +200 MVAR)
3. New Scotland 345kV dynamic compensation added (-300 MVAR to +900 MVAR)
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Next Steps - 2005/06 Time Frame

• Continue Loss of Phase II analysis
  – Additional Marcy dynamic reactive support
  – Model PV-20 OMS operation
  – Review ECAR – MAAC transfers
  – Review Hydro-Quebec to Ontario transfers
  – Review New Brunswick to New England response

• Increase Hydro Quebec to New York flows:
  – 1,500 MW to 1,800 MW
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2005/06 Time Frame

• Consideration of proposed projects such as:
  – Phase I Neptune
  – TransEnergie Harbor Cable
  – 2,000 MW HVDC Empire Connection
  – Others