Offshore Wind Injection Assessment

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ESPWG

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Background

- This assessment was conducted by the NYISO pursuant to a confidential request by the New York State Department of Public Service (DPS)

- The DPS request asked for a power flow assessment related to the injection of 2,400 MW of offshore wind into various locations in Zone J (New York City) and K (Long Island)
  - The intent of the study was to determine a sample set of injection points that can accommodate the injection of 2,400 MW of offshore wind with a focus on thermal violations
Considerations Outside the Scope of Assessment

- This is NOT an interconnection study. System and substation specific upgrades will be identified based on project proposals in the interconnection process.
- The assessment did not review:
  - (i) thermal impacts to non-BPTF facilities,
  - (ii) voltage or stability impacts,
  - (iii) deliverability of year-round energy or capacity to loads,
  - (iv) operability and expandability of the transmission system, or
  - (v) impact to the New York system reserve margin.
Study Assumptions

- Injection locations in New York City and Long Island were selected by DPS Staff and NYSERDA to serve as proxy injection points for this assessment.

- The assessment only evaluated the impact of injecting offshore wind on Bulk Power Transmission Facilities (BPTF) with a focus on thermal violations.
Study Assumptions – cont.

- The models for this assessment were developed from the NYISO 2016 Reliability Needs Assessment representation of year 2022.
- Transmission and generation resources were modified based on DPS/NYSERDA inputs (see next page) to approximate Year 2030.
- Summer peak and summer light load conditions.
  - Load forecast based on 2016 Gold Book.

<table>
<thead>
<tr>
<th>Load Period</th>
<th>NYCA</th>
<th>Zone J</th>
<th>Zone K</th>
</tr>
</thead>
<tbody>
<tr>
<td>Summer Peak</td>
<td>33,650</td>
<td>11,785</td>
<td>5,414</td>
</tr>
<tr>
<td>Light Load</td>
<td>14,025</td>
<td>4,950</td>
<td>2,270</td>
</tr>
</tbody>
</table>
## Study Assumptions - cont

<table>
<thead>
<tr>
<th>Transmission Resource Modifications</th>
<th>Generation Resource Modifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>AC transmission public policy project(^1)</td>
<td>In-Service</td>
</tr>
<tr>
<td>PSEG/Con Edison Non-Conforming Wheeling Service</td>
<td>0 MW</td>
</tr>
<tr>
<td>Q#363 Poseidon Transmission</td>
<td>Out-of-Service</td>
</tr>
<tr>
<td>R.E. Ginna</td>
<td></td>
</tr>
<tr>
<td>Q# 251 CPV Valley Energy Center</td>
<td></td>
</tr>
</tbody>
</table>

Note:
1. A generic upgrade not specific to any proposal is assumed for this analysis.
Dispatch Options

- To inject 2,400 MW into the various points of Zones J and K, the power output from existing generators must be reduced to maintain the balance of generation and load within the model. Dispatch options were developed and are summarized below:

<table>
<thead>
<tr>
<th>Dispatch</th>
<th>Priority</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>New York City and Long Island gas turbines commissioned prior to 1990</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Priority 1 plus New York City and Long Island steam-only turbines. Steam units, if committed, were not allowed to be turned off. They could be dispatched down to their respective minimum generation levels if needed.</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Priority 2 plus New York City and Long Island combined cycle units. Combined cycle units treated the same as steam units (see above)</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Priority 3 plus New York City and Long Island gas turbines commissioned in or after 1990</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Priority 4 plus imports into SENY from Upstate NY</td>
<td></td>
</tr>
</tbody>
</table>
Study Methodology

- The transmission security assessment, including N-0, N-1, and N-1-1 thermal analysis
- Monitored BPTF elements in Zones I, J, and K
- Contingencies evaluated included all events in Zones I, J, and K that are impactful to the BPTF system in those areas
- Two different methodologies were developed for N-1-1 offshore wind injection analysis
Offshore Wind Dispatch Methodology #1

- **Flexible Off-Shore Wind Dispatch**
  - MW amounts adjusted among the injection points provided the sum total is greater than or equal to 2,400 MW
  - Evaluated whether 2,400 MW of offshore wind could be maintained for all event combinations
  - Assessment was performed using the Priority 2 dispatch for the summer peak load conditions and Priority 5 dispatch for the summer light load conditions
Offshore Wind Dispatch Methodology #2

- Fixed Offshore Wind Dispatch
  - MW level changes among the injection points were not allowed
  - Assessment was performed using the Priority 5 dispatch for both summer peak and summer light load cases
Conclusions

- Sample combinations of injections points were identified by both the first and second method that would not cause thermal violations on BPTF.
- Other combinations are also possible.
- Analysis supports the conclusion that it is feasible to accommodate the injection of 2,400 MW of offshore wind from a thermal bulk transmission security perspective.
The Mission of the New York Independent System Operator is to:

- Serve the public interest and
- Provide benefit to stakeholders by
  - Maintaining and enhancing regional reliability
  - Operating open, fair and competitive wholesale electricity markets
  - Planning the power system for the future
  - Providing factual information to policy makers, stakeholders and investors in the power system

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