Operations Performance Metrics
Monthly Report

December 2011 Report
Operations & Reliability Department
New York Independent System Operator

Prepared by NYISO Operations Analysis and Services, based on settlements initial invoice data collected on or before January 10, 2011.
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December 2011 Operations Performance Highlights

- Peak load of 22,880 MW occurred on 12/19/2011 HB 17
- All-time winter capability period peak load of 25,541 MW occurred on 12/20/2004 HB 17
- 0 hours of Thunder Storm Alerts were declared.
- **Average Lake Erie Loop Flows are Clockwise**
  - 87 hours of NERC TLR level 3 curtailments
Reliability Performance Metrics

Alert State Declarations

The number and causes of Alert State declarations reflect system operating conditions beyond thresholds associated with Normal and Warning States. Declaration of the Alert State allows the NYISO to take corrective actions not available in the Normal and Warning States.

Major Emergency State Declarations

The number and causes of Major Emergency State declarations reflect system operating conditions beyond thresholds associated with the Alert State. Declaration of the Major Emergency State allows the NYISO to take additional corrective actions not available in the Alert State.
For IROL exceedances leading to Major Emergency State declarations, the maximum IROL exceedence time is identified. IROL exceedences of less than thirty minutes are considered NERC compliant.

The values of NERC Control Performance Standards (CPS-1 and CPS-2) are indicators of the NYISO Area resource and demand balancing. Values exceeding the identified thresholds are NERC compliant.
NYISO Reserve Activations are indicators of the need to respond to unexpected operational conditions within the NYISO Area or to assist a neighboring Area (Shared Activation of Reserves) by activating an immediate resource and demand balancing operation.

For NYISO initiated Reportable Disturbances, the maximum ACE recovery time is identified. Recovery times of less than 15 minutes are considered NERC compliant.
Load Forecast Performance

Hourly Error MW - Absolute value of the difference between the hourly average actual load demand and the average hour ahead forecast load demand.
Average Hourly Error % - Average value of the ratio of hourly average error magnitude to hourly average actual load demand.
Day-Ahead Average Hourly Error % - Average across all hours of the month of the absolute value of the difference between actual load demand and the Day-Ahead forecast load demand, divided by the actual load demand.

Wind Forecast Performance
Hour Ahead MW Error

Hourly Error MW - Absolute value of the difference between the hourly average actual wind generation and the average hour ahead forecast wind generation.
Wind Forecast Performance
Hour Ahead Percent Error
Wind capacity 1381MW

MAE Forecast - Avg [actual wind generation - hour ahead forecast wind generation]/ Wind Capacity
MAE Persistence - Avg [actual wind generation - hour ahead actual wind generation]/ Wind Capacity
Bias - Avg (actual wind generation - hour ahead forecast wind generation)/ Wind Capacity

Wind Forecast Performance
Hour Ahead Mean Absolute Percent Error
Ramp Events - Hourly Changes That Exceed 20% (276MW) of Wind Capacity (1381MW)

MAE Forecast - Avg [actual wind generation - hour ahead forecast wind generation]/ Wind Capacity
MAE Persistence - Avg [actual wind generation - hour ahead actual wind generation]/ Wind Capacity
Wind Forecast Performance
Day Ahead Absolute Percent Error
Wind capacity 1381MW

**MAE Forecast** - Avg (actual wind generation - Day Ahead forecast wind generation) / Wind Capacity

**Bias** - Avg (actual wind generation - Day Ahead forecast wind generation) / Wind Capacity
Interchange schedules with positive values aggravate clockwise Lake Erie Circulation.

Interchange schedules with positive values aggravate clockwise Lake Erie Circulation.
Market Performance Metrics

Balancing Market Congestion Residual Report
Monthly Uplift Cost Categories


- Not Investigated
- Unscheduled Transmission Outage
- Interface Derate - NYISO Security
- Interface Derate - External Security
- Unscheduled Loop Flows
- Cost not categorized
- Storm Watch Costs

Balancing Market Congestion Residual Report
Daily Uplift Cost Categories


- Storm Watch Costs
- Interface Derate - External Security
- Unscheduled Transmission Outage
- Interface Derate - NYISO Security
- Unscheduled Loop Flows
- Cost not categorized
- Not Investigated
Day's investigated in December: 21

<table>
<thead>
<tr>
<th>Event</th>
<th>Date (yyyy/mm/dd)</th>
<th>Hours</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>12/21/2011</td>
<td>0-1</td>
<td>Forced outage Gowanus-GoethalsN 345kV (#25), Gowanus-Farragut 345kV (#41), Greenwood-Gowanus 138kV (#42231)</td>
</tr>
<tr>
<td></td>
<td>12/21/2011</td>
<td>20-22</td>
<td>Forced outage Sprainbrook CB 345kV (#RNS3)</td>
</tr>
<tr>
<td></td>
<td>12/21/2011</td>
<td>18,23</td>
<td>NYCA DNI Ramp Limit</td>
</tr>
<tr>
<td></td>
<td>12/21/2011</td>
<td>11</td>
<td>Derate Astoria West/Queensbridge</td>
</tr>
<tr>
<td></td>
<td>12/21/2011</td>
<td>14,17</td>
<td>Uprate Freshkills-Willowbrook 138kV (29211-2)</td>
</tr>
<tr>
<td></td>
<td>12/21/2011</td>
<td>20</td>
<td>Derate Greenwood/Staten Island</td>
</tr>
<tr>
<td></td>
<td>12/21/2011</td>
<td>19</td>
<td>Uprate West 49th St-Sprainbrook 345kV (#M51) for Sprainbrook RS4 w/RNS3</td>
</tr>
<tr>
<td></td>
<td>12/21/2011</td>
<td>23</td>
<td>HQ, Chateauguay DNI Ramp Limit</td>
</tr>
</tbody>
</table>

**Real-Time Balancing Market Congestion Residual (Uplift Cost) Categories**

<table>
<thead>
<tr>
<th>Category</th>
<th>Cost Assignment</th>
<th>Events Types</th>
<th>Event Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Storm Watch</td>
<td>Zone J</td>
<td>Thunderstorm Alert (TSA)</td>
<td>TSA Activations</td>
</tr>
<tr>
<td>Unscheduled Transmission Outage</td>
<td>Market-wide</td>
<td>Reduction in DAM to RTM transfers related to unscheduled transmission outage</td>
<td>Forced Line Outage, Unit AVR Outages</td>
</tr>
<tr>
<td>Interface Derate - NYISO Security</td>
<td>Market-wide</td>
<td>Reduction in DAM to RTM transfers not related to transmission outage</td>
<td>Interface Derates due to RTM voltages</td>
</tr>
<tr>
<td>Interface Derate - External Security</td>
<td>Market-wide</td>
<td>Reduction in DAM to RTM transfers related to External Control Area Security Events</td>
<td>TLR Events, External Transaction Curtailments</td>
</tr>
<tr>
<td>Unscheduled Loop Flows</td>
<td>Market-wide</td>
<td>Changes in DAM to RTM unscheduled loop flows impacting NYISO Interface transmission constraints</td>
<td>DAM to RTM Clockwise Lake Erie Loop Flows greater than 125 MW</td>
</tr>
</tbody>
</table>

**Monthly Balancing Market Congestion Report Assumptions/Notes**

1) Storm Watch Costs are identified as daily total uplift costs
2) At a minimum those days with $100K/HR, shortfall of $200K/Day or more, or surplus of $100K/Day or more are investigated
3) Uplift costs associated with multiple event types are apportioned equally by hour
4) Investigations began with Dec 2008, Prior months are reported as Not Investigated.
<table>
<thead>
<tr>
<th>Category</th>
<th>Cost Assignment</th>
<th>Events Types</th>
<th>Event Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>NYTO Outage Allocation</td>
<td>Responsible TO</td>
<td>Direct allocation to NYTO’s responsible for transmission equipment status change.</td>
<td>DAM scheduled outage for equipment modeled in-service for the TCC Auction.</td>
</tr>
<tr>
<td>Unscheduled Loop Flows</td>
<td>All TO by Monthly Allocation Factor</td>
<td>Residual impact of Lake Erie circulation, MW difference between the DAM and TCC Auction.</td>
<td>Lake Erie Loop Flow Assumptions</td>
</tr>
<tr>
<td>External Outage Allocation</td>
<td>All TO by Monthly Allocation Factor</td>
<td>Direct allocation to transmission equipment status change caused by change in status of external equipment.</td>
<td>Tie line required out-of-service by TO of neighboring control area.</td>
</tr>
<tr>
<td>Central East Commitment Derate</td>
<td>All TO by Monthly Allocation Factor</td>
<td>Reductions in the DAM Central East VC limit as compared to the TCC Auction limit, which are not associated with transmission line outages.</td>
<td></td>
</tr>
</tbody>
</table>
Local Reliability Cost
Monthly RT BPCG, DAM BPCG & DAMAP Costs

Local Reliability Commitment Hours
December 2011 DARU & SRE Hours

Applications of Reliability Rule (ARR) are identified at