

# ***Operations Performance Metrics Monthly Report***



## ***June 2013 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 July 10, 2013.

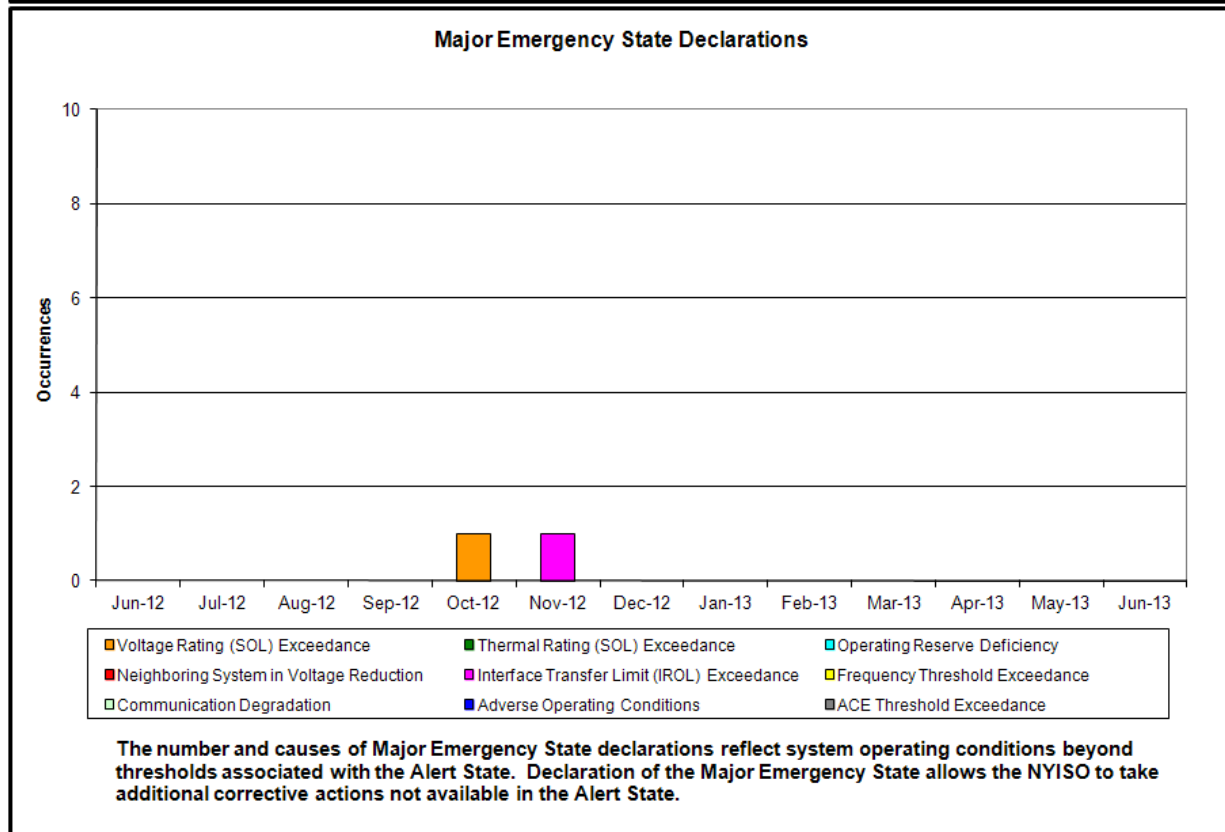
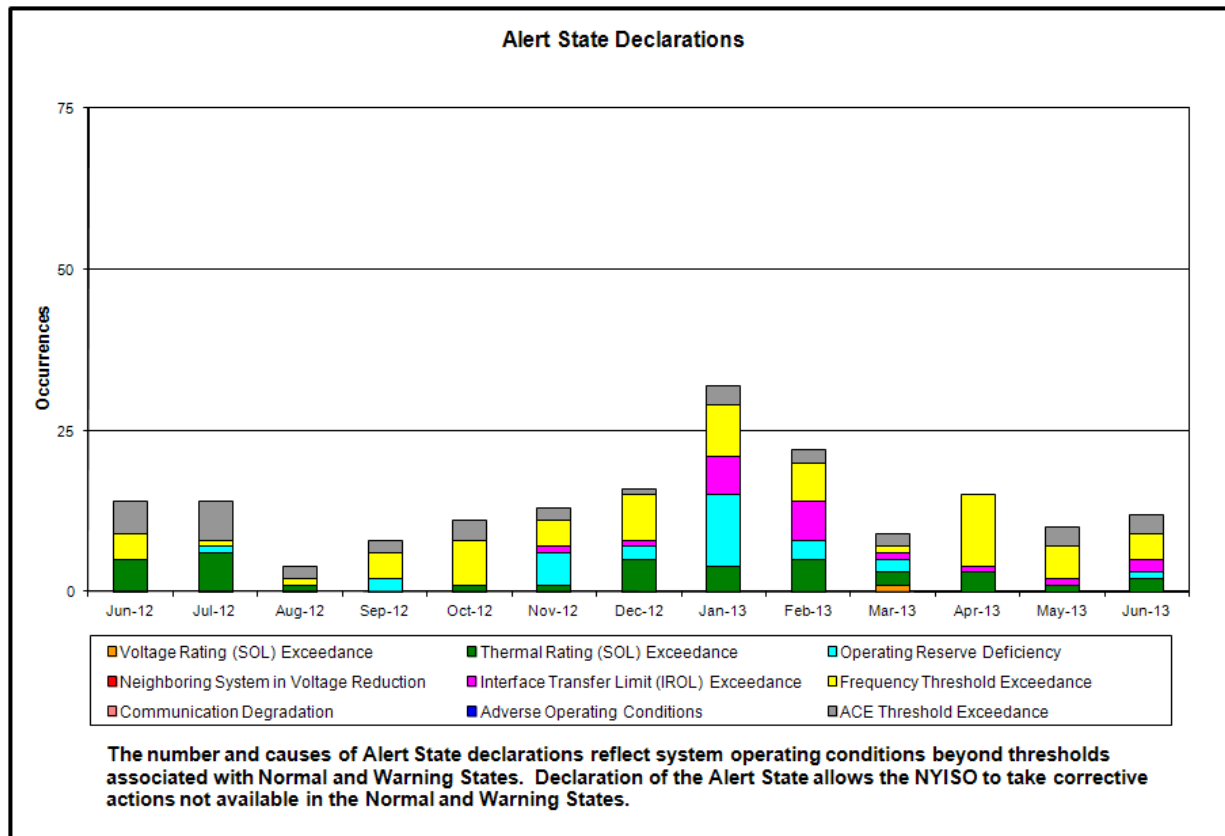
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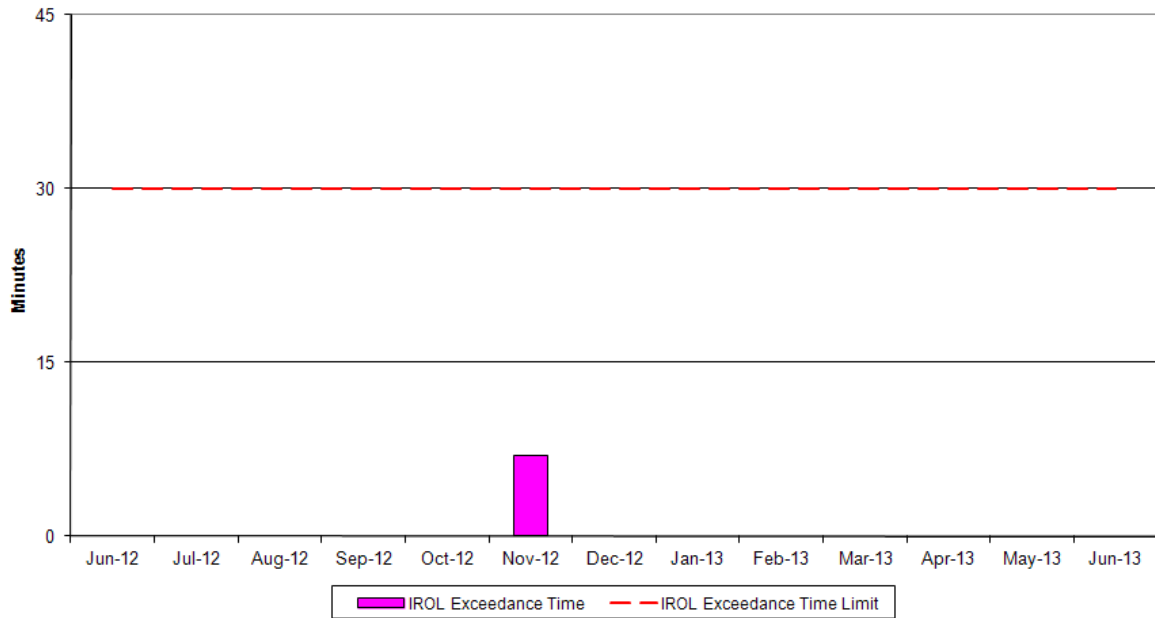
## **June 2013 Operations Performance Highlights**

- Peak load of 30,026 MW occurred on 6/24/2013 HB 14
- All-time summer capability period peak load of 33,939 MW occurred on 8/2/2006 HB13
- 31 hours of Thunder Storm Alerts were declared
- 1 hour of NERC TLR level 3 curtailment
- Bidding and Settlement for Order 755, Regulation Movement implemented 6/26
- HTP commercial operation as of 6/3
- Replacement of the LIPA New Bridge Road transformer was completed on June 30 and Neptune rating was restored from 375 MW to 660 MW

## Reliability Performance Metrics

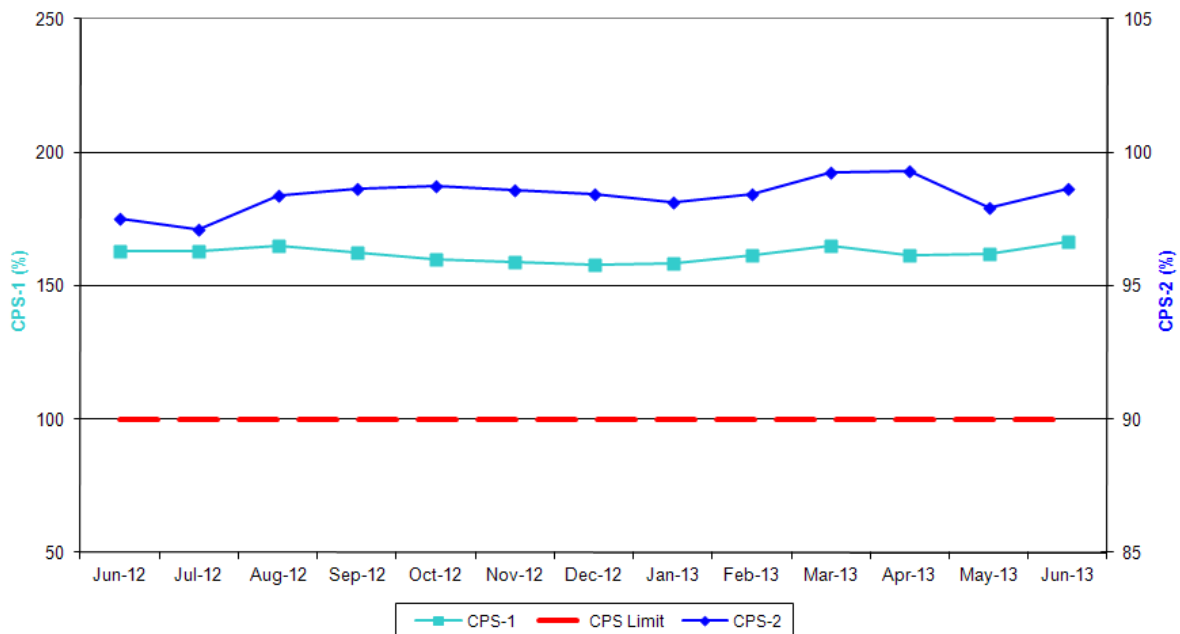


### NERC IROL Time Over Limit



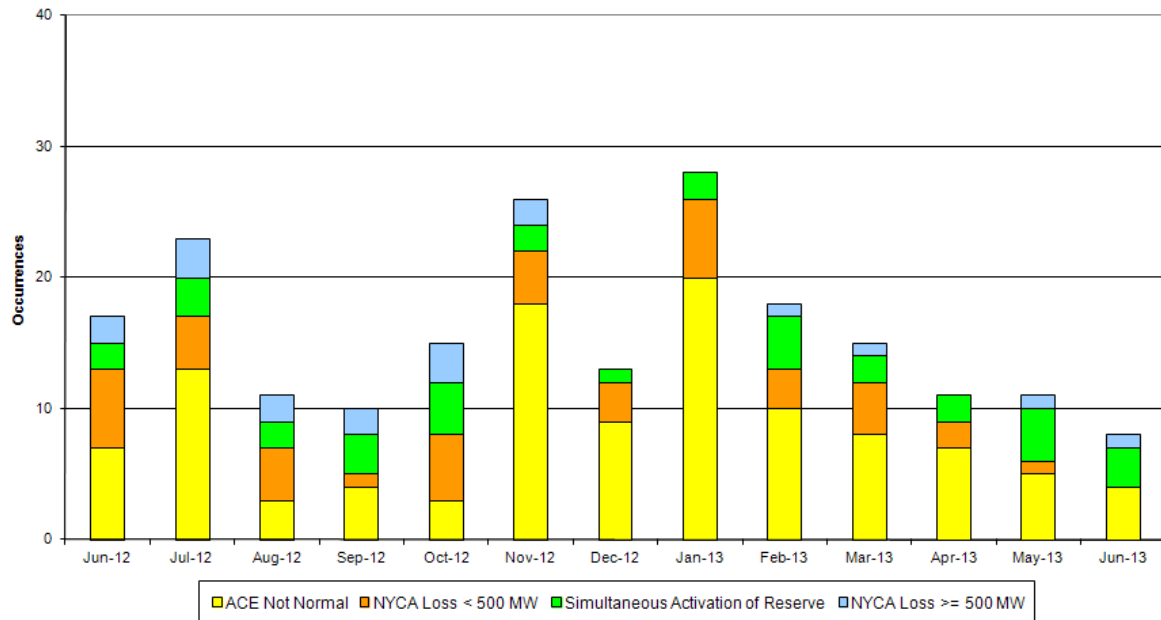
For IROL exceedances leading to Major Emergency State declarations, the maximum IROL exceedance time is identified. IROL exceedances of less than thirty minutes are considered NERC compliant.

### NERC Control Performance Standards



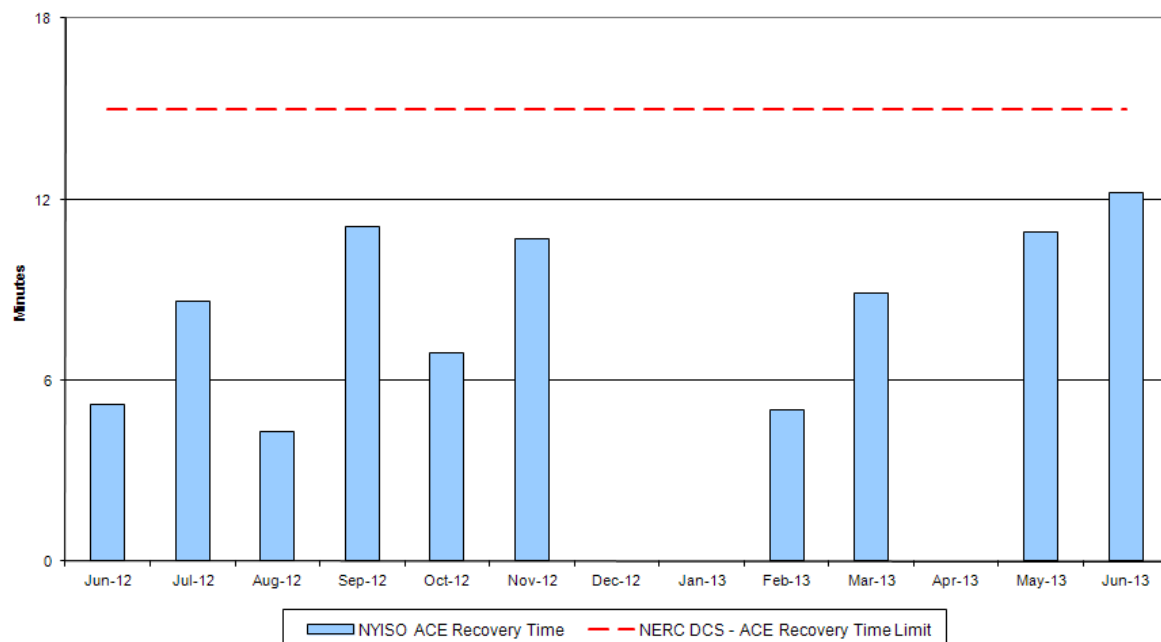
The values of NERC Control Performance Standards (CPS-1 and CPS-2) are indicators of the NYISO Area resource and demand balancing. Values exceeding the identified thresholds are NERC compliant.

### Reserve Activations



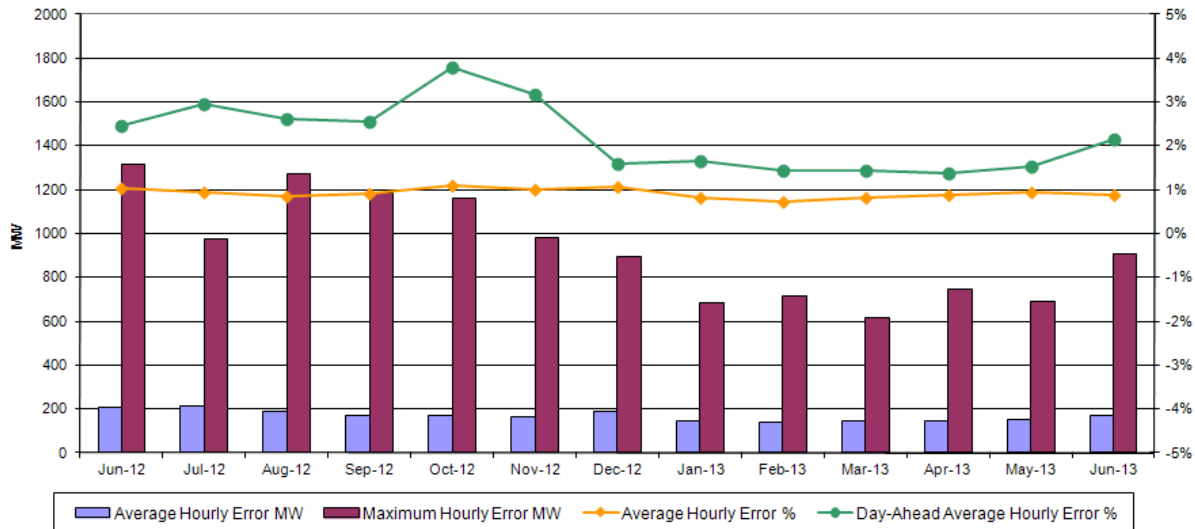
NYISO Reserve Activations are indicators of the need to respond to unexpected operational conditions within the NYISO Area or to assist a neighboring Area (Shared Activation of Reserves) by activating an immediate resource and demand balancing operation.

### DCS Event Time to ACE Recovery



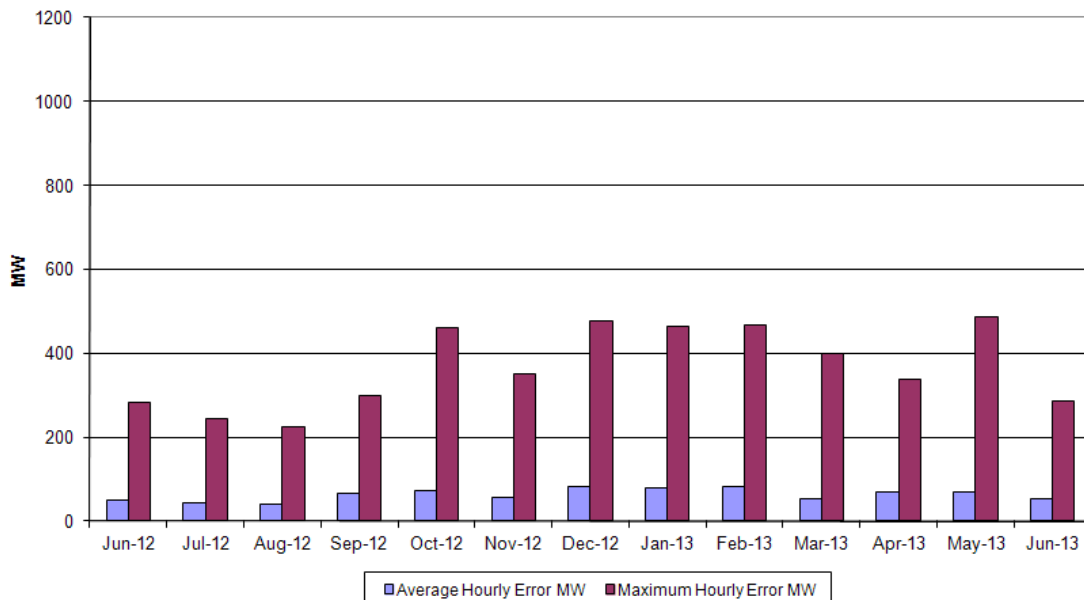
For NYISO initiated Reportable Disturbances, the maximum ACE recovery time is identified. Recovery times of less than 15 minutes are considered NERC compliant.

### Load Forecast Performance



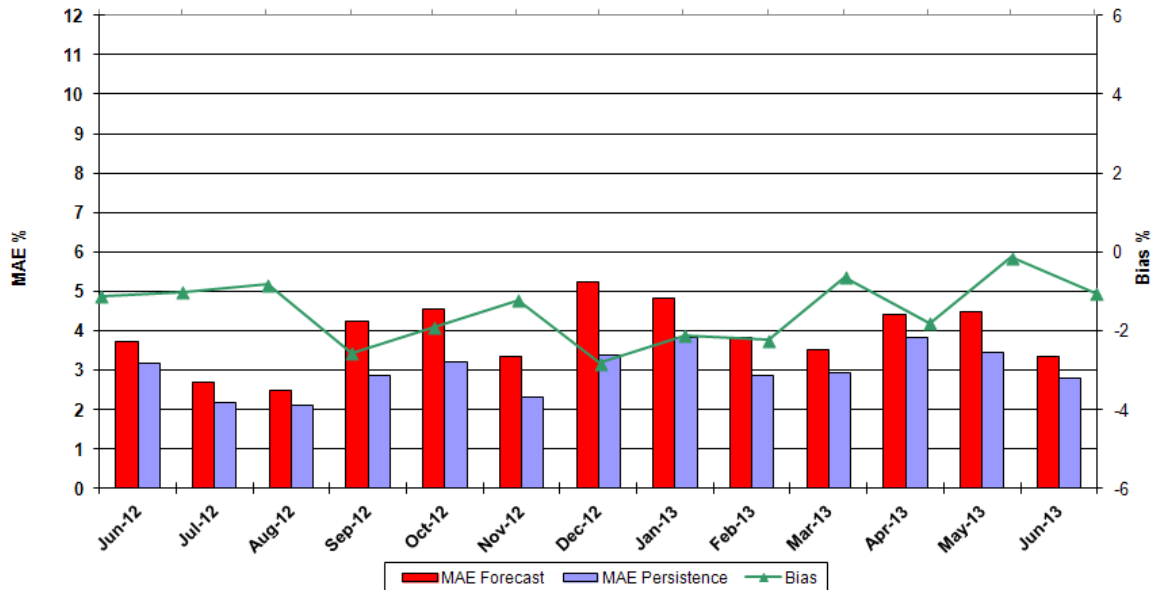
**Hourly Error MW** - Absolute value of the difference between the hourly average actual load demand and the average hour ahead forecast load demand.  
**Average Hourly Error %** - Average value of the ratio of hourly average error magnitude to hourly average actual load demand.  
**Day-Ahead Average 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



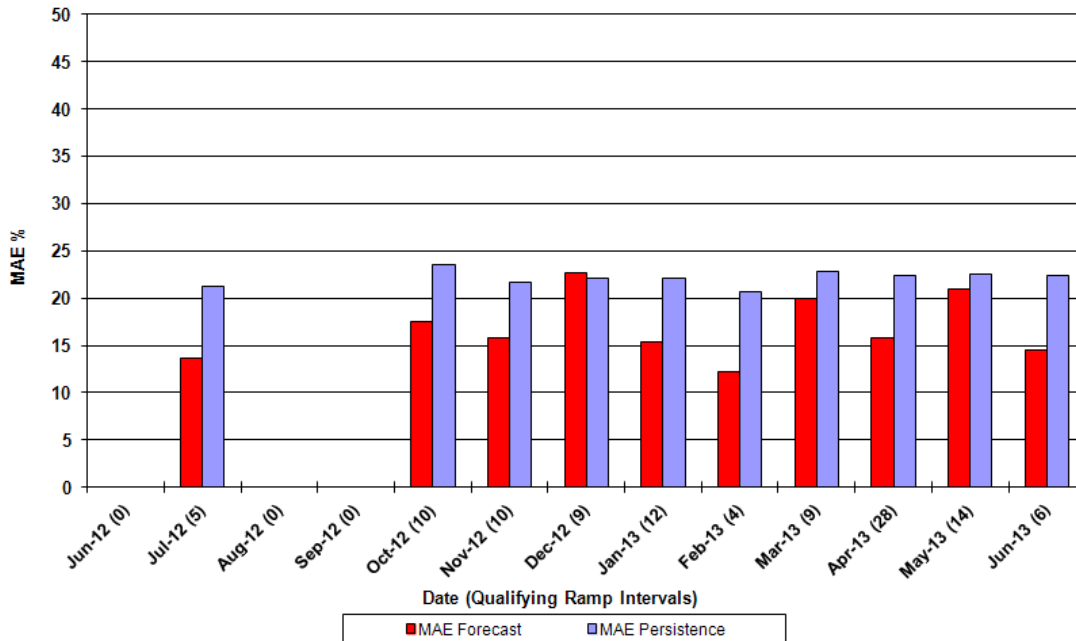
**Hourly Error MW** - Absolute value of the difference between the hourly average actual wind generation and the average hour ahead forecast wind generation.

**Wind Forecast Performance  
Hour Ahead Percent Error  
Wind Capacity 1616MW**



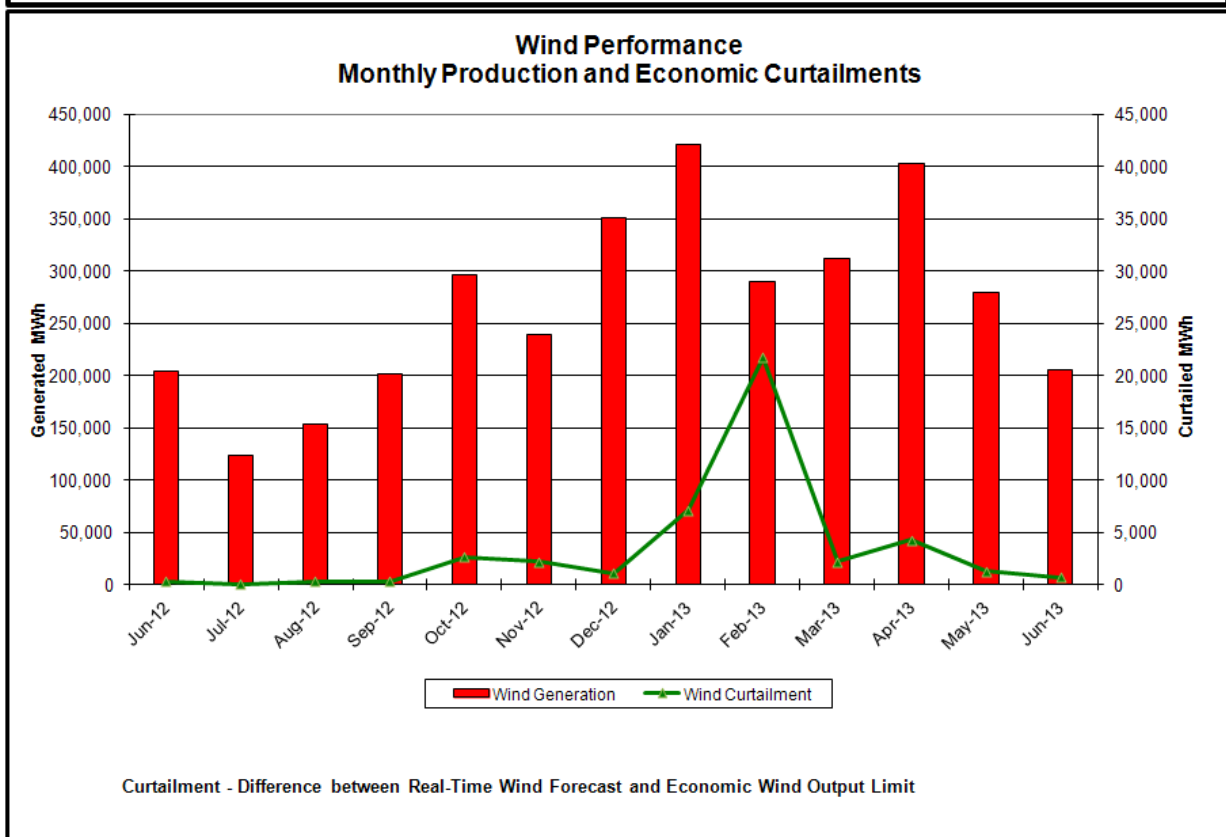
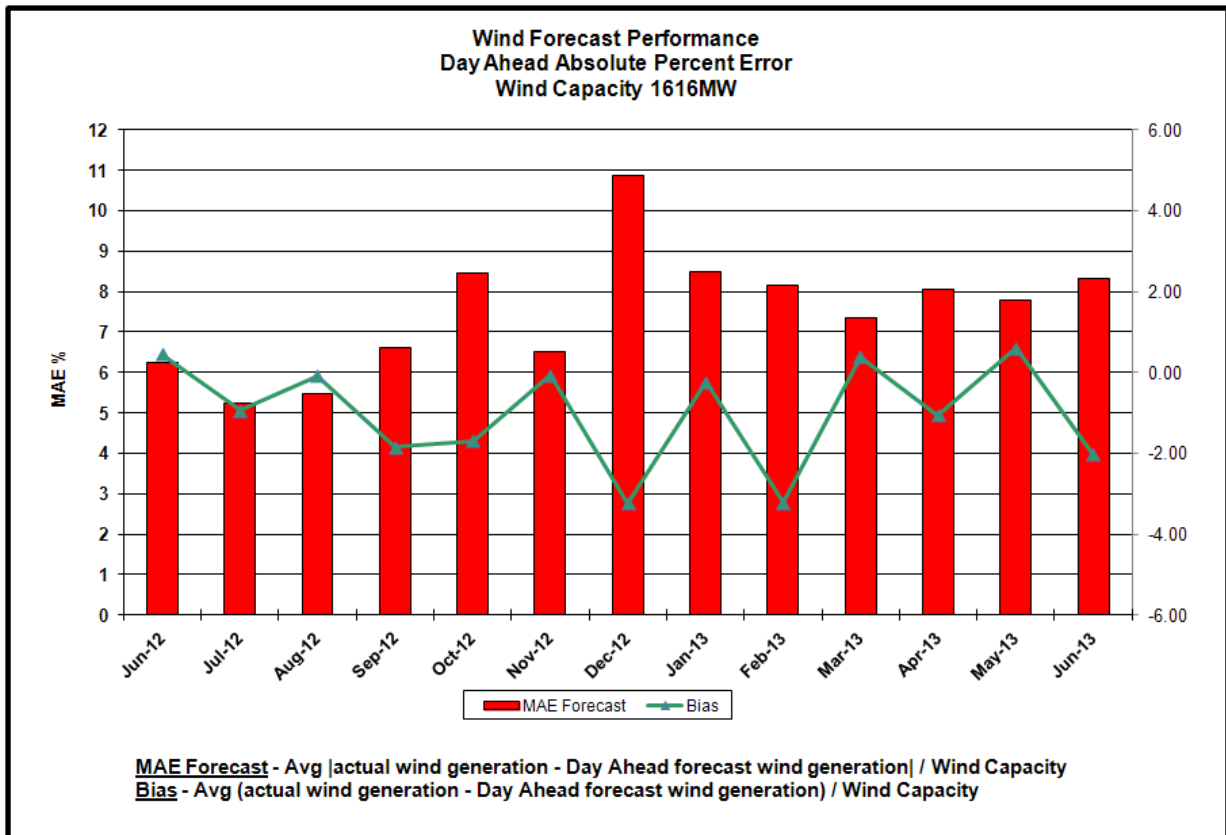
**MAE Forecast** - Avg |actual wind generation - hour ahead forecast wind generation| / Wind Capacity  
**MAE Persistence** - Avg |actual wind generation - hour ahead actual wind generation| / Wind Capacity  
**Bias** - Avg (actual wind generation - hour ahead forecast wind generation) / Wind Capacity

**Wind Forecast Performance  
Hour Ahead Mean Absolute Percent Error  
Ramp Events - Hourly Changes That Exceed 20% (323MW) of Wind Capacity (1616MW)**

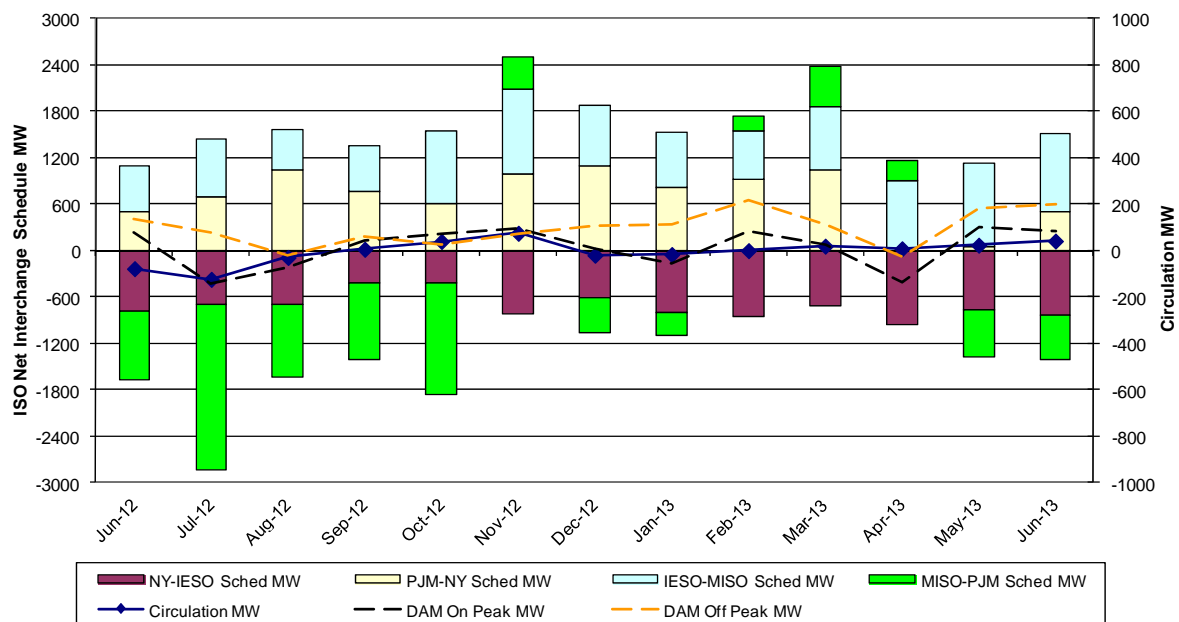


**MAE Forecast** - Avg |actual wind generation - hour ahead forecast wind generation| / Wind Capacity  
**MAE Persistence** - Avg |actual wind generation - hour ahead actual wind generation| / Wind Capacity



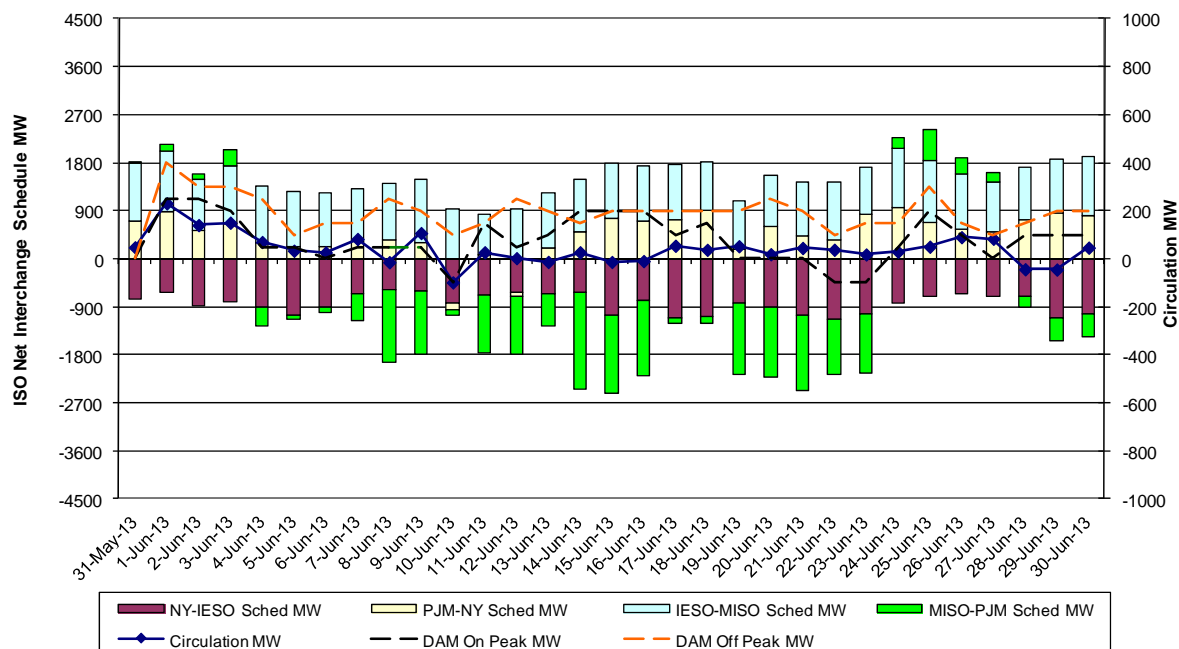


**Lake Erie Circulation and ISO Net Interchange Schedules  
Monthly Averages**



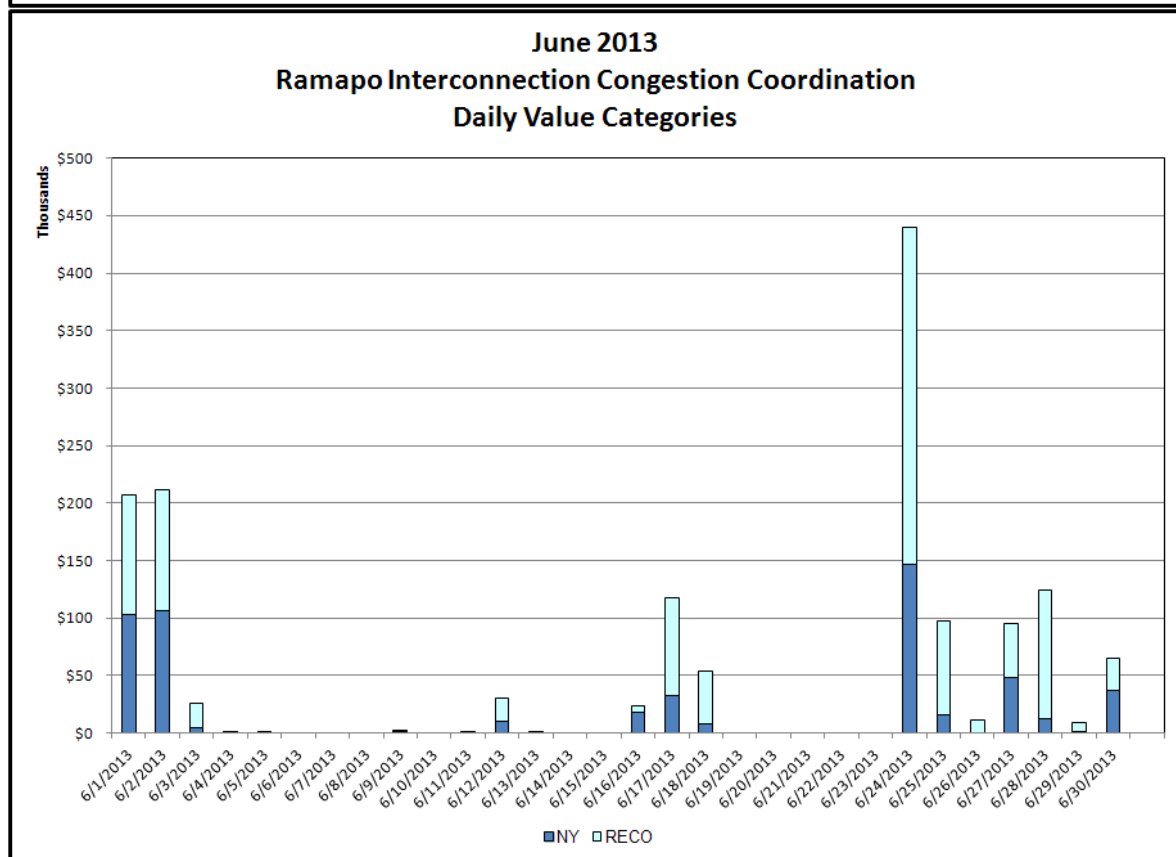
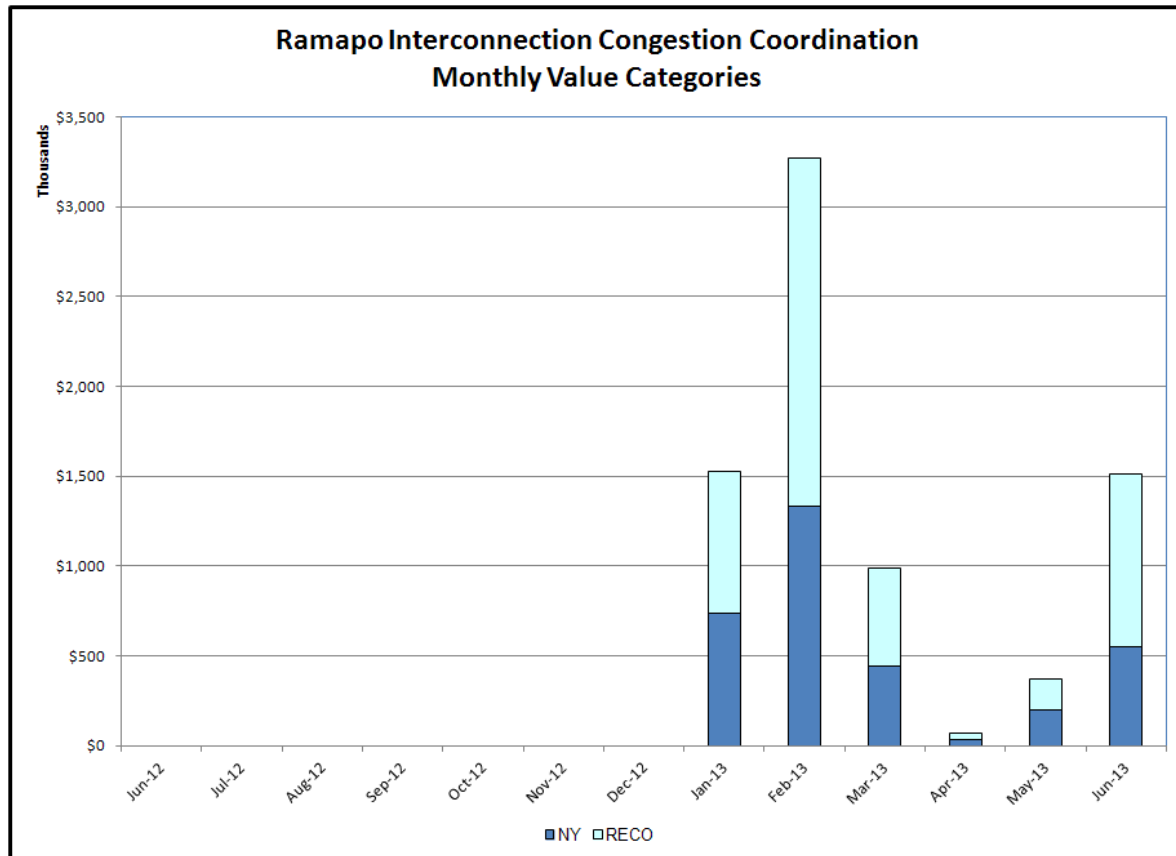
Interchange schedules with positive values aggravate clockwise Lake Erie Circulation.

**Lake Erie Circulation and ISO Net Interchange Schedules  
Daily Averages**



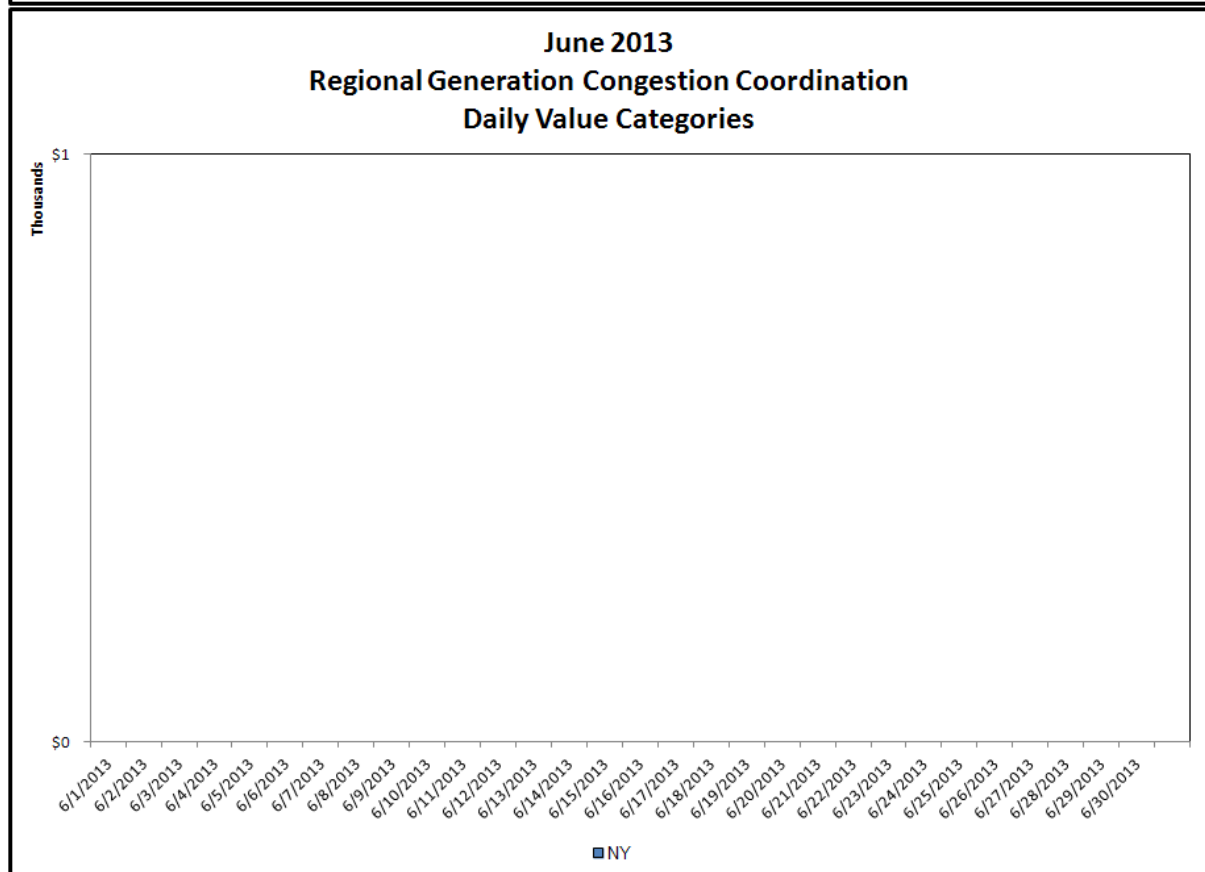
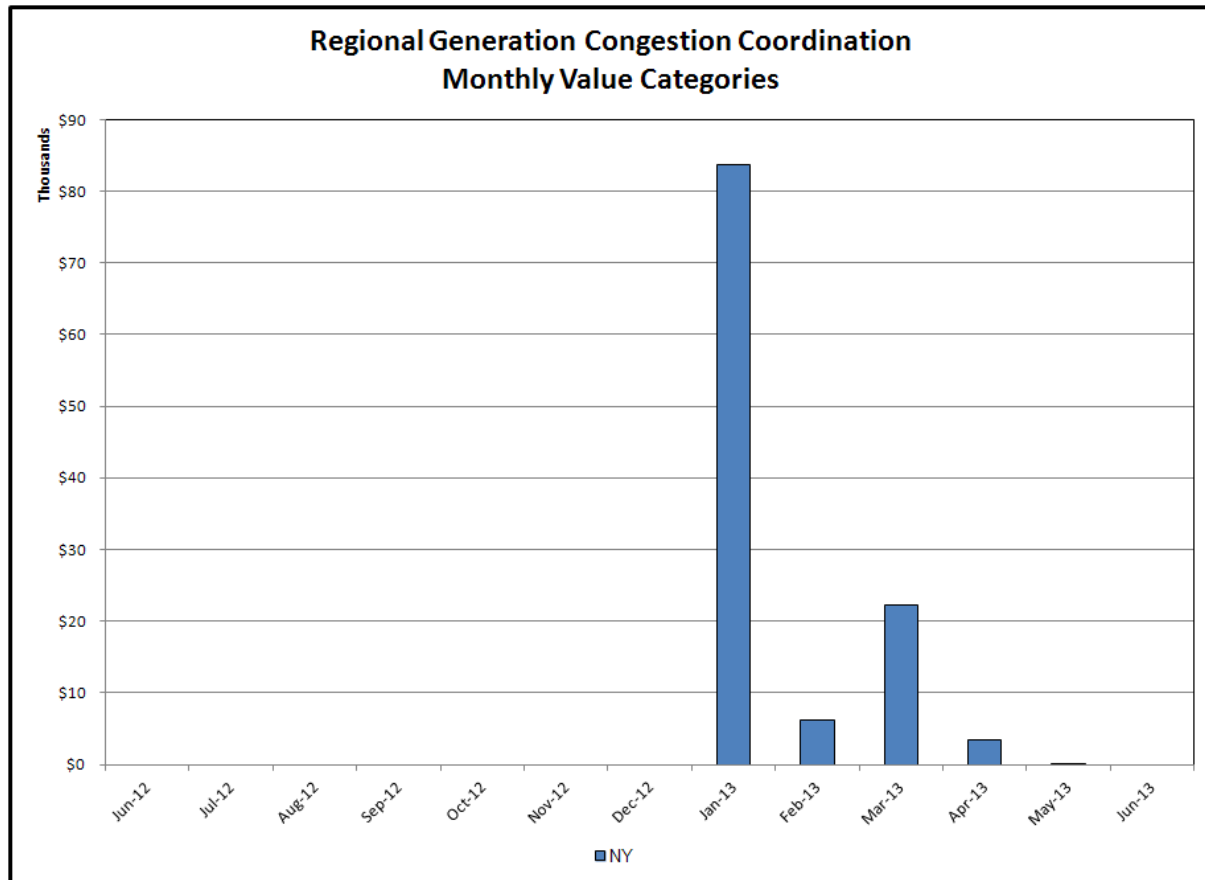
Interchange schedules with positive values aggravate clockwise Lake Erie Circulation.

## Broader Regional Market Performance Metrics



### Ramapo Interconnection Congestion Coordination

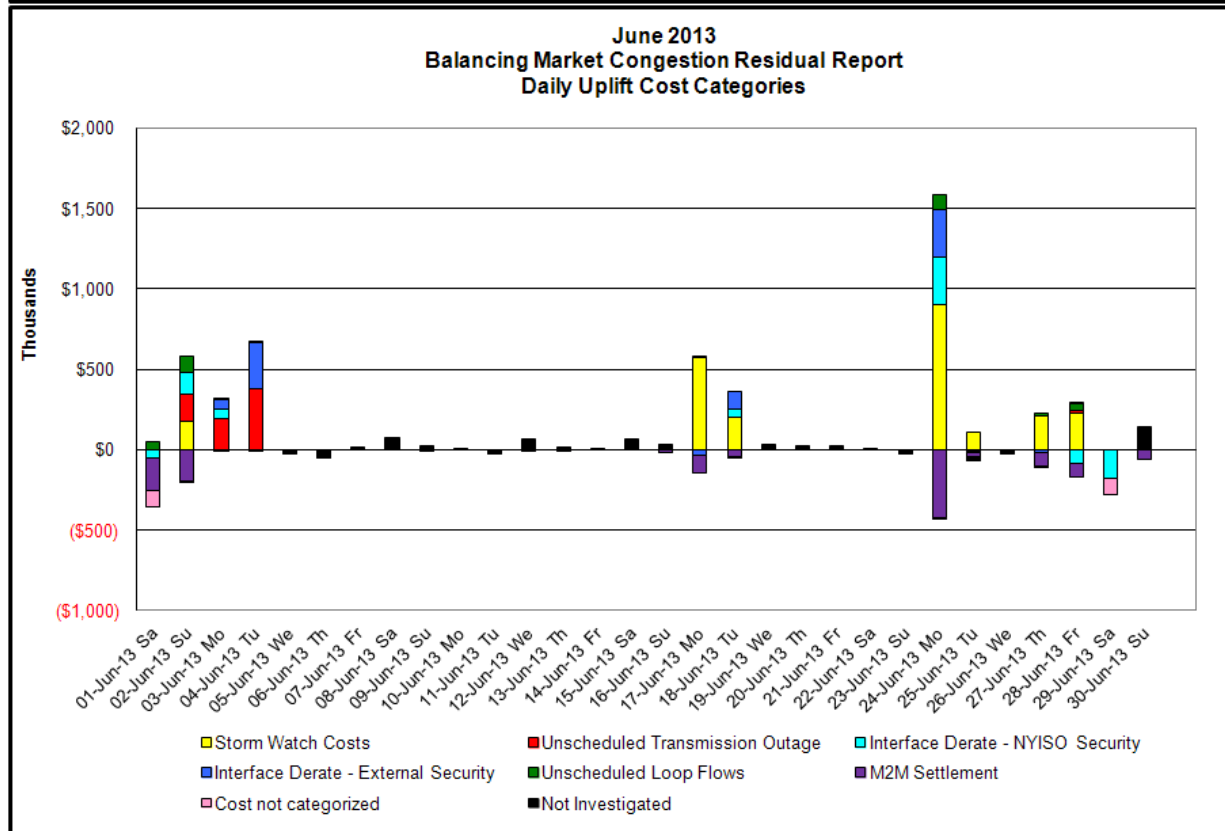
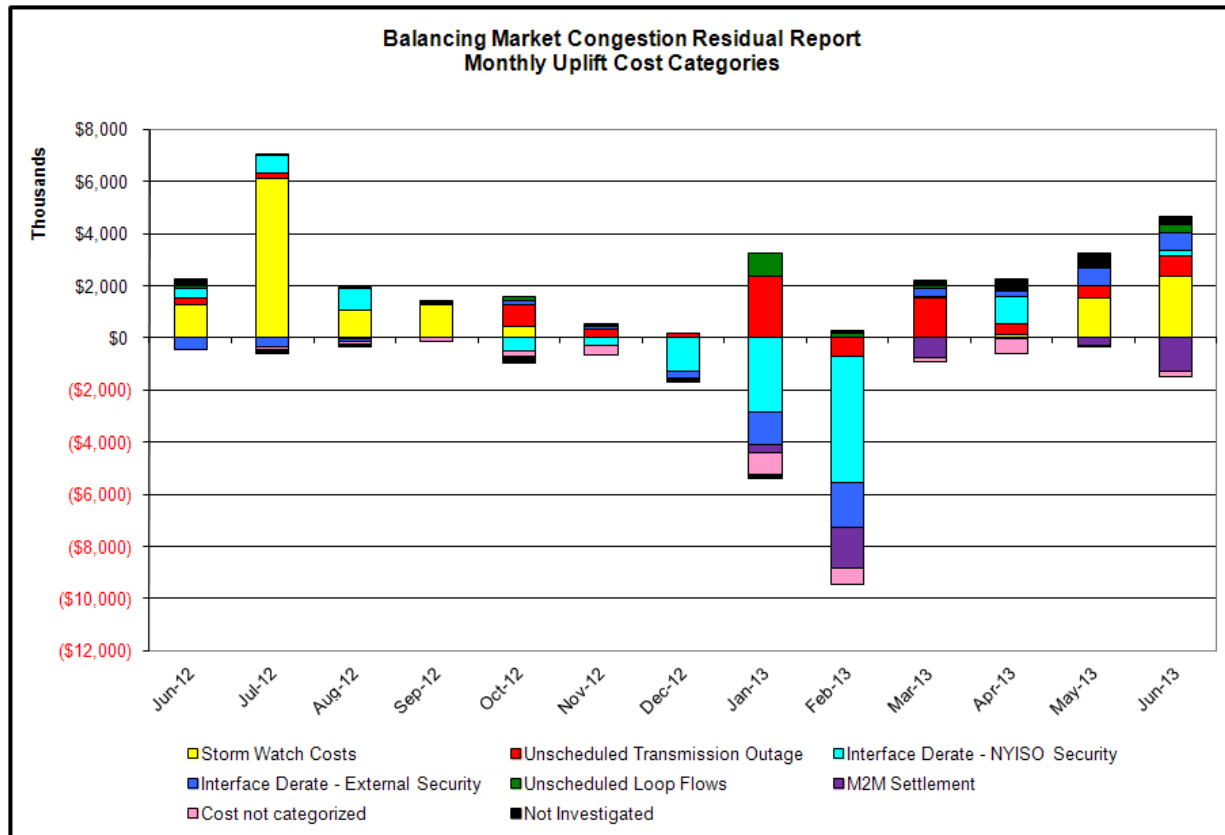
| <u>Category</u> | <u>Description</u>   |
|-----------------|--|
| NY              | Represents the value NY realizes from Market-to-Market Ramapo Coordination. When experiencing congestion, this includes (1) the estimated savings to NY for additional deliveries into NY, plus (2) PJM compensation to NY for additional deliveries into PJM (as compared to the Ramapo Target level, excluding RECO). This is net of any settlements to PJM when they are congested. |
| RECO            | Represents the value of PJM's obligation to deliver 80% of service to RECO load over Ramapo 5018. This includes (1) the estimated reduction in NYCA congestion due to the PJM delivery of RECO over Ramapo 5018, plus (2) PJM compensation to NY for NYCA congestion for the under-delivery or inability to deliver service to RECO load over Ramapo 5018.                             |



## Regional Generation Congestion Coordination

| <u>Category</u> | <u>Description</u>  |
|-----------------|---|
| NY              | <p>NYISO savings that result from PJM payments to NYISO when PJM's transmission use (PJM's market flow) is greater than PJM's entitlement of the NY transmission system and NYISO is incurring Western or Central NY congestion. Additionally, NYISO savings may result from the more efficient regional utilization of PJM's generation resources to directly address Western or Central NY transmission congestion.</p> |

## Market Performance Metrics



Day's investigated in June: 1,2,3,4,17,18,24,25,27,28,29

| Event | Date (yyyymmdd) | Hours          | Description   |
|-------|-----------------|----------------|---|
|       | 6/1/2013        | 13,18-21       | Derate Central East   |
|       | 6/1/2013        | 11,22          | Uprate FreshKills-WillowBrook 138kV (#29211)  |
|       | 6/1/2013        | 1,19,21        | Derate Gowanus-Greenwood 138kV (#42231,#42232) for I/o TWR:GOETHALS                               |
|       | 6/1/2013        | 22             | NYCA DNI Ramp Limit   |
|       | 6/1/2013        | 1,13,18-21     | Lake Erie Clockwise Circulation, DAM-RTM exceeds 125MW; Central East                              |
|       | 6/2/2013        | 14-17,19-23    | Thunder storm Alert   |
|       | 6/2/2013        | 14-17,19-23    | Forced outage Greenwood-Gowanus 138kV (#42231)  |
|       | 6/2/2013        | 10,14-16,21,22 | Derate Central East   |
|       | 6/2/2013        | 7              | Uprate Central East   |
|       | 6/2/2013        | 10,15,16,21,22 | Lake Erie Clockwise Circulation, DAM-RTM exceeds 125MW; Central East                              |
|       | 6/3/2013        | 0-12,14,16-23  | Forced outage Greenwood-Gowanus 138kV (#42231)  |
|       | 6/3/2013        | 20-22          | Derate Central East   |
|       | 6/3/2013        | 14,16          | Derate Leeds-Pleasant Valley 345kV (#92) for I/o Athens- Pleasant Valley 345kV (#91)              |
|       | 6/3/2013        | 20-22          | NE_NNC1385-NY Scheduling Limit  |
|       | 6/3/2013        | 14,16,17,20,23 | Lake Erie Clockwise Circulation, DAM-RTM exceeds 125MW; Central East, Leeds-Pleasant Valley       |
|       | 6/4/2013        | 0,1,6-23       | Forced outage Greenwood-Gowanus 138kV (#42231)  |
|       | 6/4/2013        | 10,14-16,18-21 | NE_NNC1385-NY Scheduling Limit  |
|       | 6/4/2013        | 0              | Lake Erie Clockwise Circulation, DAM-RTM exceeds 125MW; Central East                              |
|       | 6/17/2013       | 16-19          | Thunder storm Alert   |
|       | 6/17/2013       | 12-14,23       | NYCA DNI Ramp Limit   |
|       | 6/17/2013       | 21,23          | Derate Gowanus-Greenwood 138kV (#42231,#42232) for I/o TWR:GOETHALS                               |
|       | 6/17/2013       | 12             | IESO_AC-NY Scheduling Limit   |
|       | 6/17/2013       | 14             | HQ_CHAT DNI Limit   |
|       | 6/18/2013       | 14-18          | Thunder storm Alert   |
|       | 6/18/2013       | 12             | Derate Dunwoodie-Shore Rd 345kV (#Y50) for I/o SCB:SPBK(RNS2):Y49 & M29                           |
|       | 6/18/2013       | 12,14          | Derate Gowanus-Greenwood 138kV (#42231,#42232) for I/o TWR:GOETHALS                               |
|       | 6/18/2013       | 12             | Derate Rainey-Vernon 138kV (#36312)   |
|       | 6/18/2013       | 9,14,15        | HQ_CHAT DNI Limit   |
|       | 6/18/2013       | 15             | PJM_AC DNI Ramp Limit   |
|       | 6/24/2013       | 14-20          | Thunder storm Alert   |
|       | 6/24/2013       | 12,13          | Derate Gowanus-Greenwood 138kV (#42231,#42232) for I/o SCB:GOWANUS                                |
|       | 6/24/2013       | 18-21          | Derate Greenwood/Staten Island  |
|       | 6/24/2013       | 12-14          | Derate Leeds-Pleasant Valley 345kV (#92) for I/o Athens- Pleasant Valley 345kV (#91)              |
|       | 6/24/2013       | 15             | PJM_AC DNI Ramp Limit   |
|       | 6/24/2013       | 12-14          | Lake Erie Clockwise Circulation, DAM-RTM exceeds 125MW; Leeds-Pleasant Valley                     |
|       | 6/25/2013       | 17-19          | Thunder storm Alert   |
|       | 6/25/2013       | 16,17          | Derate East Garden City-Valley Stream 138kV (#262) for I/o BUS:BARRETT 292 & 459 & G2             |
|       | 6/25/2013       | 12-15,21       | Uprate Gowanus-Greenwood 138kV (#42231,#42232)  |
|       | 6/25/2013       | 16,17          | Derate Gowanus-Greenwood 138kV (#42231,#42232) for I/o SCB:GOWANUS                                |
|       | 6/25/2013       | 12,13          | Uprate Gowanus-Greenwood 138kV (#42231,#42232) for I/o SCB:GOWANUS                                |
|       | 6/25/2013       | 18,19          | Derate Greenwood/Staten Island  |
|       | 6/25/2013       | 16             | Derate Huntley-Sawyer 230kV (#78) for I/o Sawyer-SUNY Buffalo 230kV (#80)                         |
|       | 6/25/2013       | 12             | PJM_AC DNI Ramp Limit   |
|       | 6/25/2013       | 0              | NE_NNC1385-NY Scheduling Limit  |
|       | 6/25/2013       | 12,13          | HQ-CHAT-NY Scheduling Limit   |
|       | 6/27/2013       | 18-23          | Thunder storm Alert   |
|       | 6/27/2013       | 21             | Derate East Garden City-Valley Stream 138kV (#262) for I/o BUS:BARRETT 292 & 459 & G2             |
|       | 6/27/2013       | 13             | Uprate Huntley-Sawyer 230kV (#78) for I/o Sawyer-SUNY Buffalo 230kV (#80)                         |
|       | 6/27/2013       | 13             | NYCA DNI Ramp Limit   |
|       | 6/27/2013       | 13,17          | HQ-CHAT-NY Scheduling Limit   |
|       | 6/27/2013       | 18             | Lake Erie Clockwise Circulation, DAM-RTM exceeds 125MW; Leeds-Pleasant Valley                     |
|       | 6/28/2013       | 0,20-22        | Thunder storm Alert   |
|       | 6/28/2013       | 14,16          | Forced outage Freeport-Newbridge 138kV (#461)   |
|       | 6/28/2013       | 12,14          | Derate Dunwoodie-Shore Rd 345kV (#Y50) for I/o SCB:SPBK(RNS2):Y49 & M29                           |
|       | 6/28/2013       | 16             | Derate Dunwoodie-Shore Rd 345kV (#Y50) for I/o SprainBrook-East Garden City 345kV (#Y49)          |
|       | 6/28/2013       | 8,11,13,15     | Uprate FreshKills-WillowBrook 138kV (#29211)  |
|       | 6/28/2013       | 12,14,16       | Derate Leeds-New Scotland 345kV (#93) for I/o Leeds-New Scotland 345kV (#94)                      |
|       | 6/28/2013       | 11,18          | Uprate Leeds-New Scotland 345kV (#93) for I/o Leeds-New Scotland 345kV (#94)                      |
|       | 6/28/2013       | 18,19          | Uprate Leeds-Pleasant Valley 345kV (#92) for I/o Athens- Pleasant Valley 345kV (#91)              |
|       | 6/28/2013       | 14,16,17       | Lake Erie Clockwise Circulation, DAM-RTM exceeds 125MW; Leeds-Pleasant Valley, Leeds New Scotland |
|       | 6/29/2013       | 17             | Uprate Central East   |
|       | 6/29/2013       | 0,12,22,23     | Uprate FreshKills-WillowBrook 138kV (#29211)  |

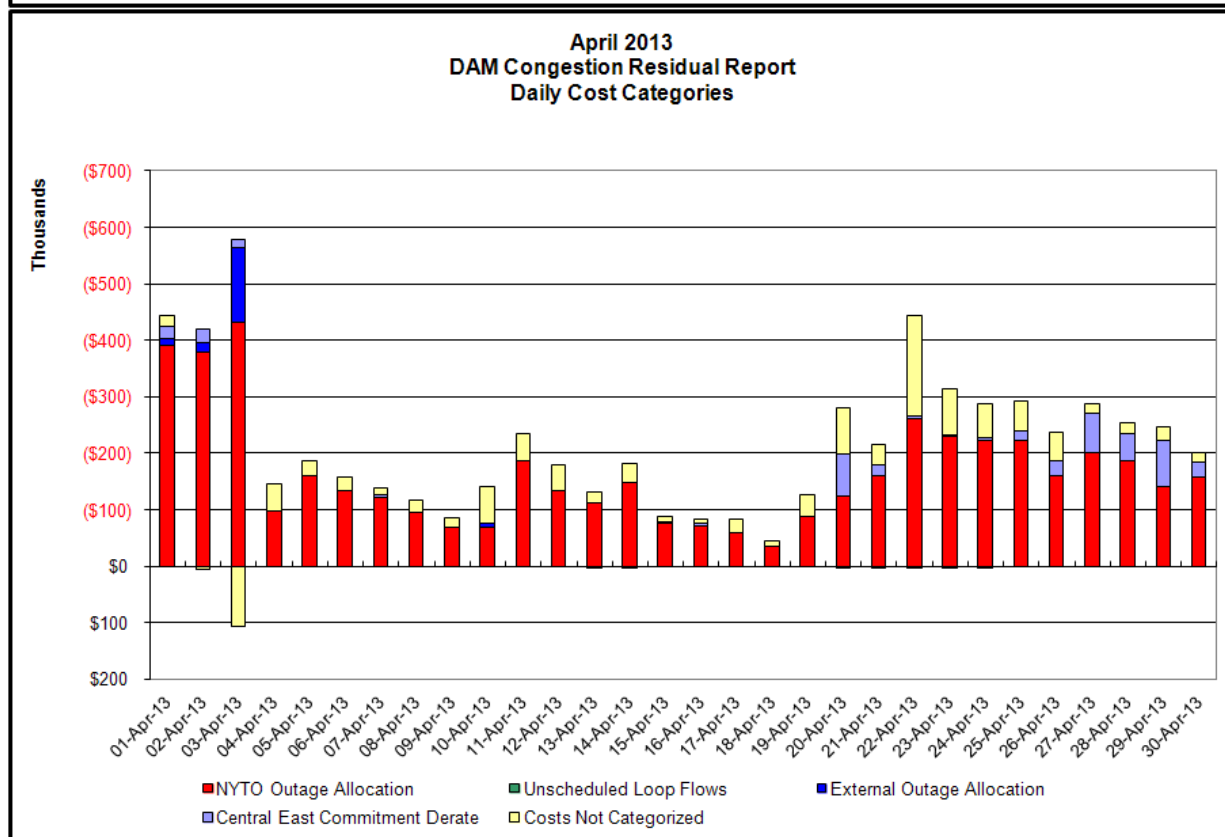
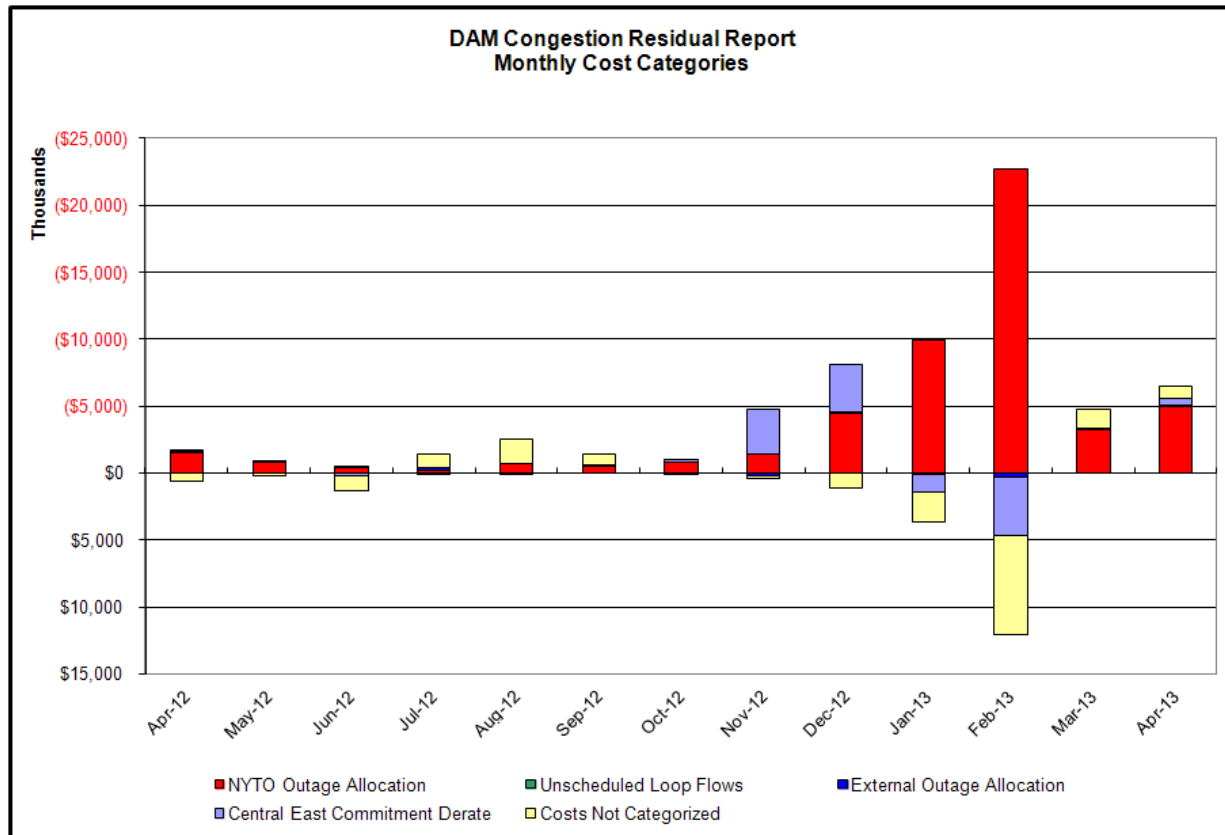


### Real-Time Balancing Market Congestion Residual (Uplift Cost) Categories

| <u>Category</u>                      | <u>Cost Assignment</u> | <u>Events Types</u>   | <u>Event Examples</u>   |
|--------------------------------------|------------------------|---|---|
| Storm Watch                          | Zone J                 | Thunderstorm Alert (TSA)  | TSA Activations   |
| Unscheduled Transmission Outage      | Market-wide            | Reduction in DAM to RTM transfers related to unscheduled transmission outage                    | Forced Line Outage, Unit AVR Outages                          |
| Interface Derate - NYISO Security    | Market-wide            | Reduction in DAM to RTM transfers not related to transmission outage                            | Interface Derates due to RTM voltages                         |
| Interface Derate - External Security | Market-wide            | Reduction in DAM to RTM transfers related to External Control Area Security Events              | TLR Events, External Transaction Curtailments                 |
| Unscheduled Loop Flows               | Market-wide            | Changes in DAM to RTM unscheduled loop flows impacting NYISO Interface transmission constraints | DAM to RTM Clockwise Lake Erie Loop Flows greater than 125 MW |
| M2M Settlement                       | Market-wide            | Settlement result inclusive of coordinated redispatch and Ramapo flowgates                      |   |

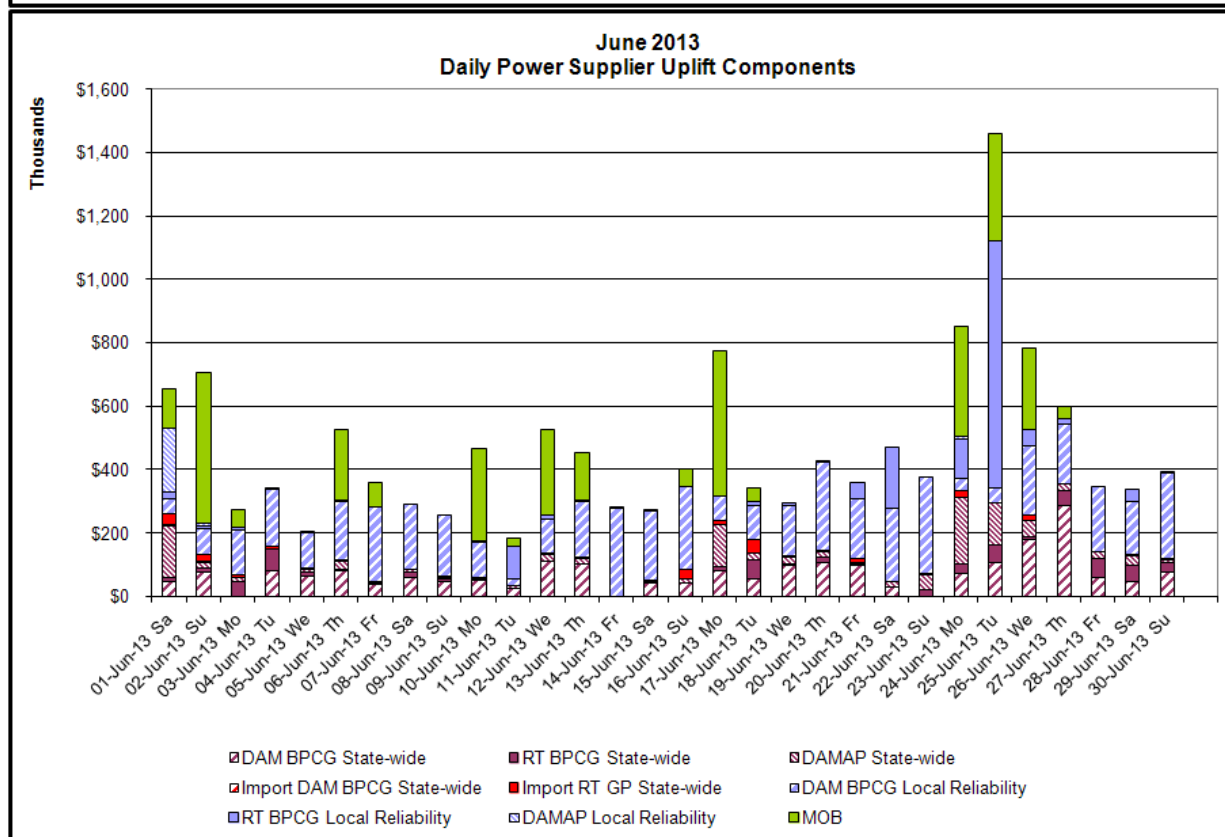
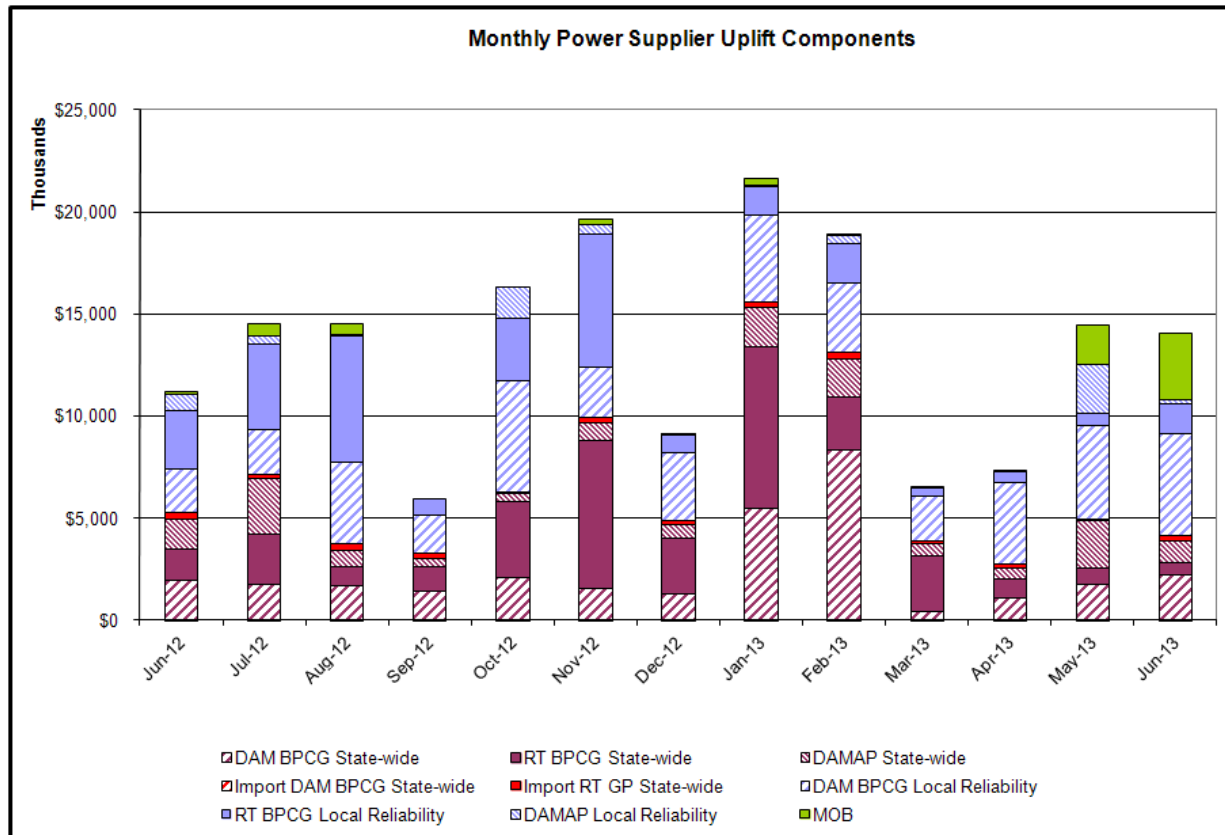
#### Monthly Balancing Market Congestion Report Assumptions/Notes

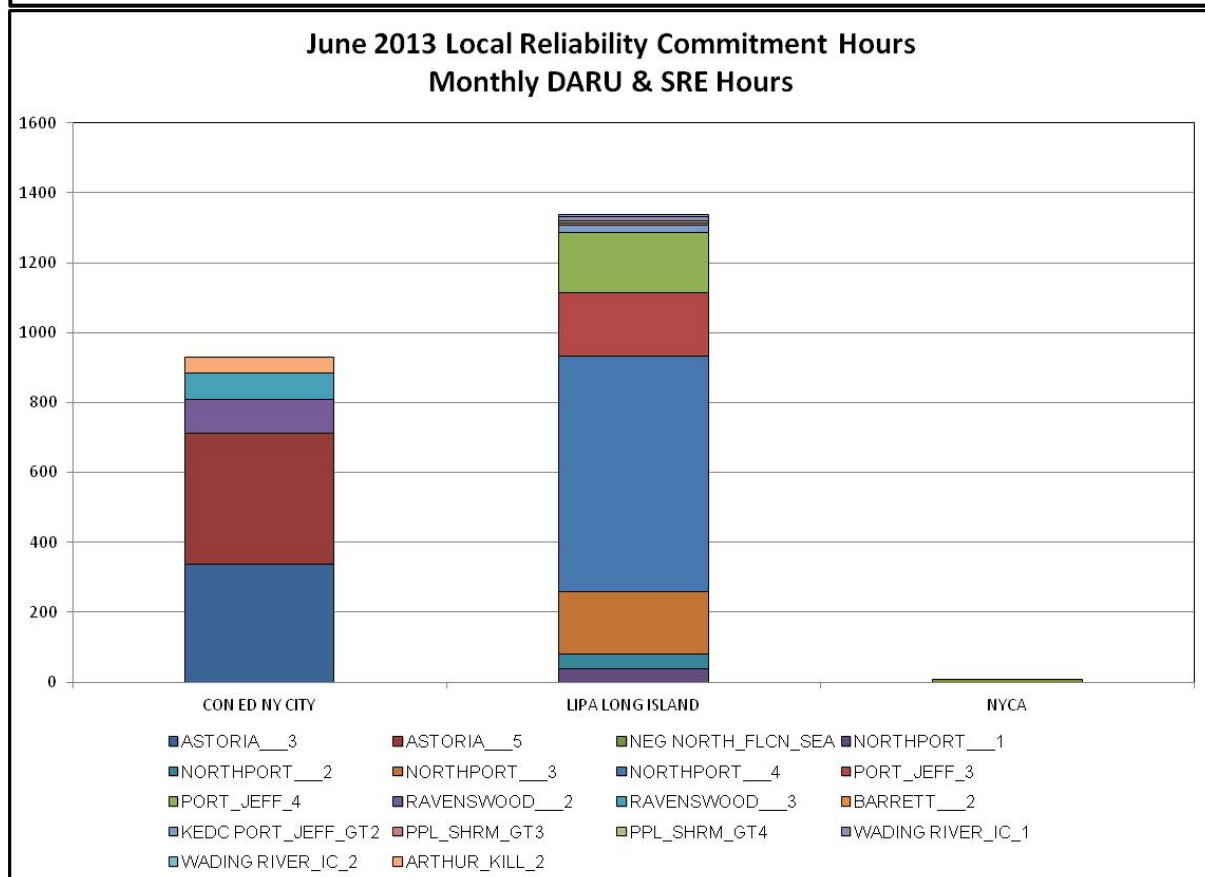
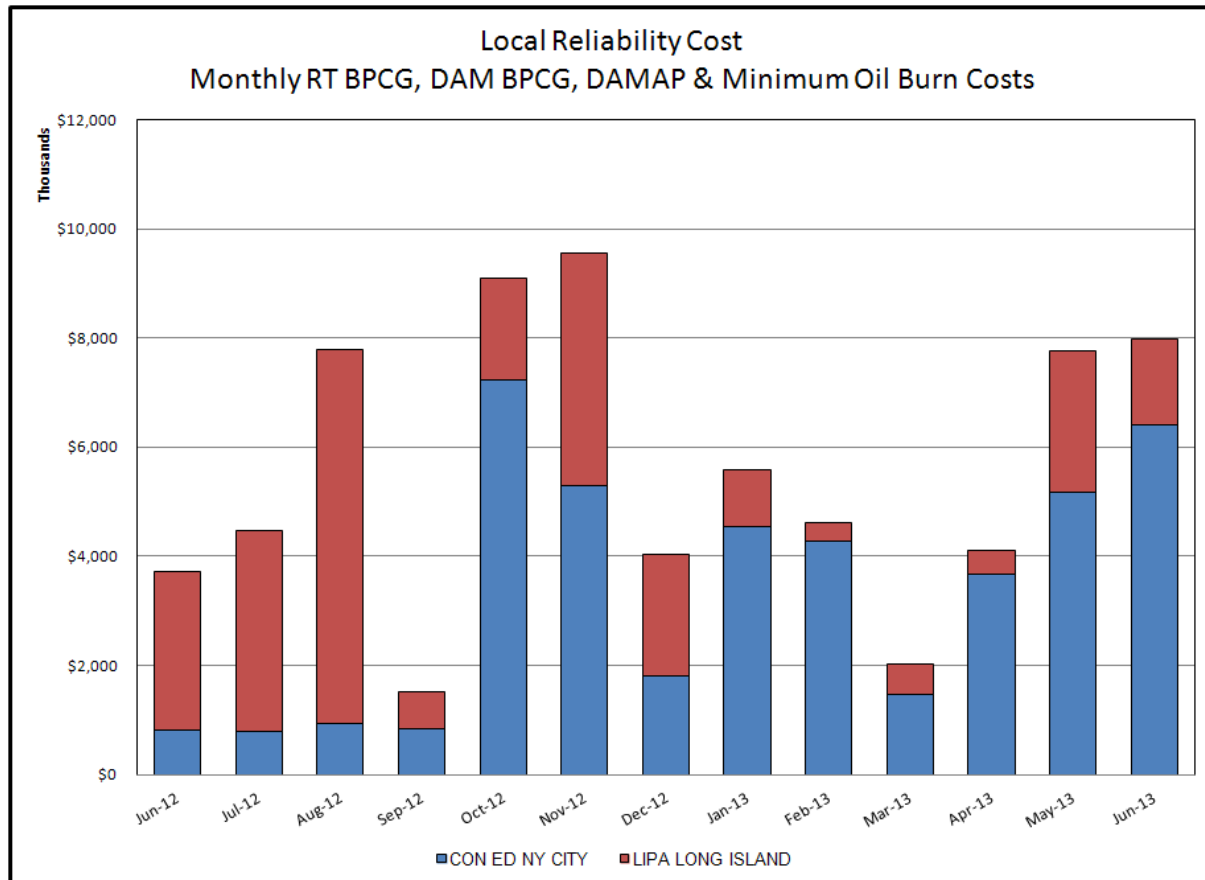
- 1) Storm Watch Costs are identified as daily total uplift costs
- 2) Days with a value of BMCR less M2M Settlement of \$100K/HR, shortfall of \$200K/Day or more, or surplus of \$100K/Day or more are investigated.
- 3) Uplift costs associated with multiple event types are apportioned equally by hour

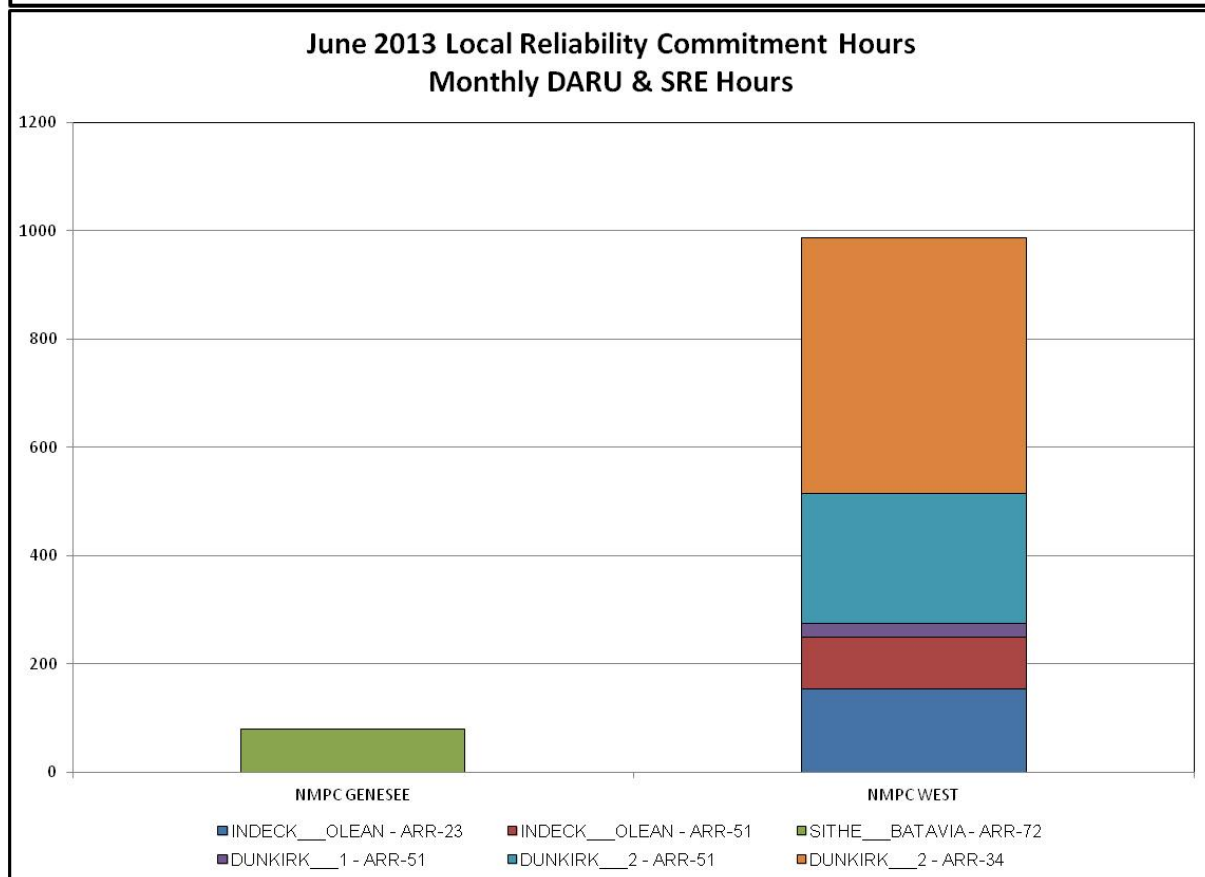
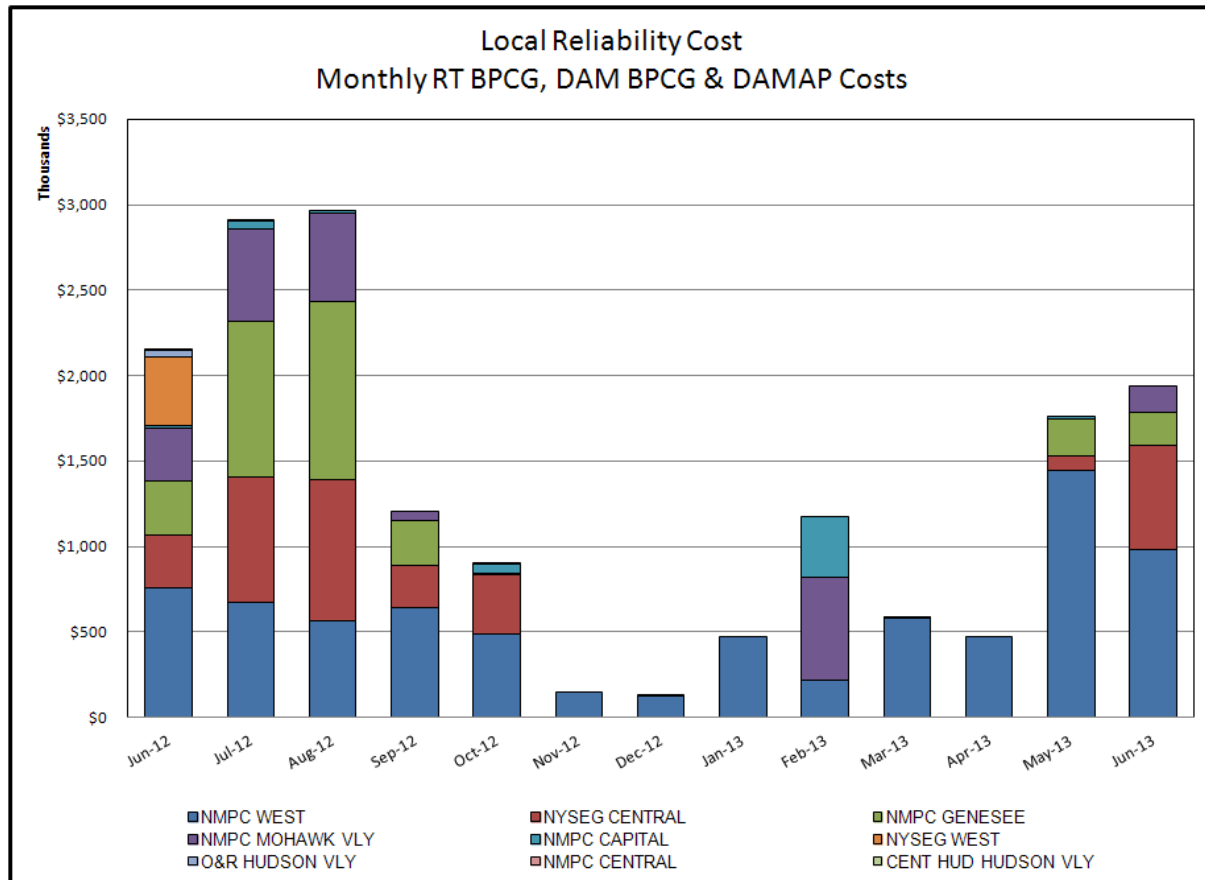


### Day-Ahead Market Congestion Residual Categories

| <u>Category</u>                | <u>Cost Assignment</u>              | <u>Events Types</u>  | <u>Event Examples</u>  |
|--------------------------------|-------------------------------------|--|--|
| NYTO Outage Allocation         | Responsible TO                      | Direct allocation to NYTO's responsible for transmission equipment status change.  | DAM scheduled outage for equipment modeled in-service for the TCC Auction. |
| Unscheduled Loop Flows         | All TO by Monthly Allocation Factor | Residual impact of Lake Erie circulation, MW difference between the DAM and TCC Auction.   | Lake Erie Loop Flow Assumptions  |
| External Outage Allocation     | All TO by Monthly Allocation Factor | Direct allocation to transmission equipment status change caused by change in status of external equipment.                                | Tie line required out-of-service by TO of neighboring control area.        |
| Central East Commitment Derate | All TO by Monthly Allocation Factor | Reductions in the DAM Central East_VC limit as compared to the TCC Auction limit, which are not associated with transmission line outages. |  |

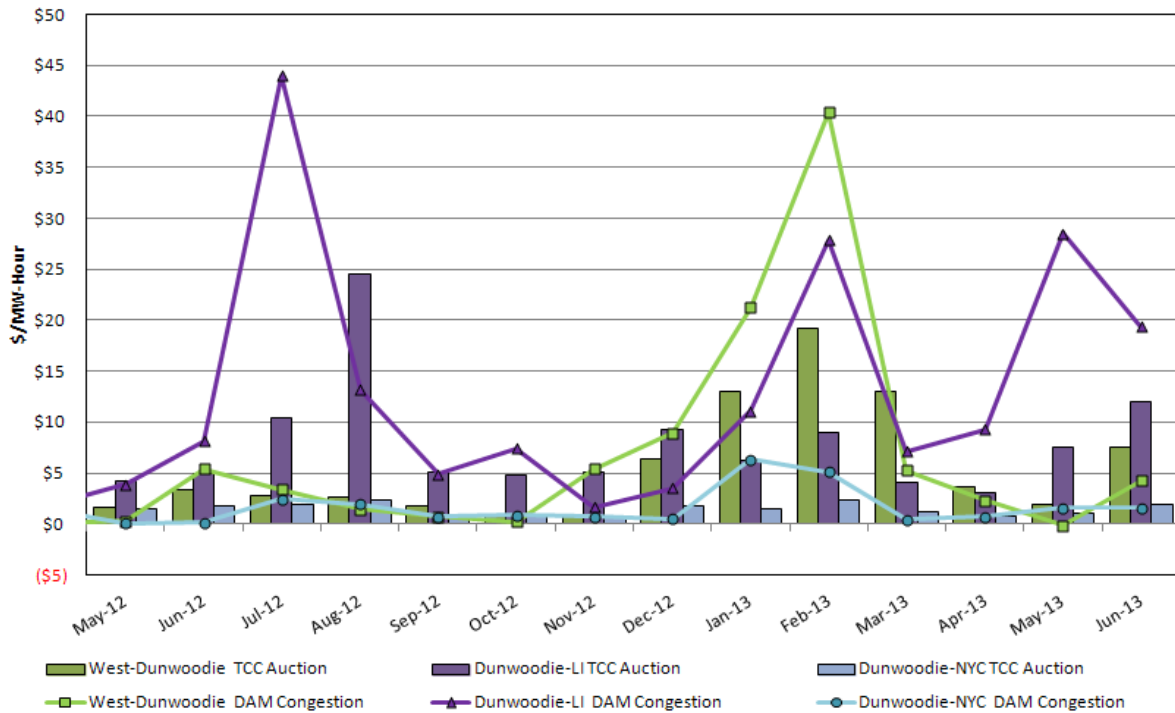






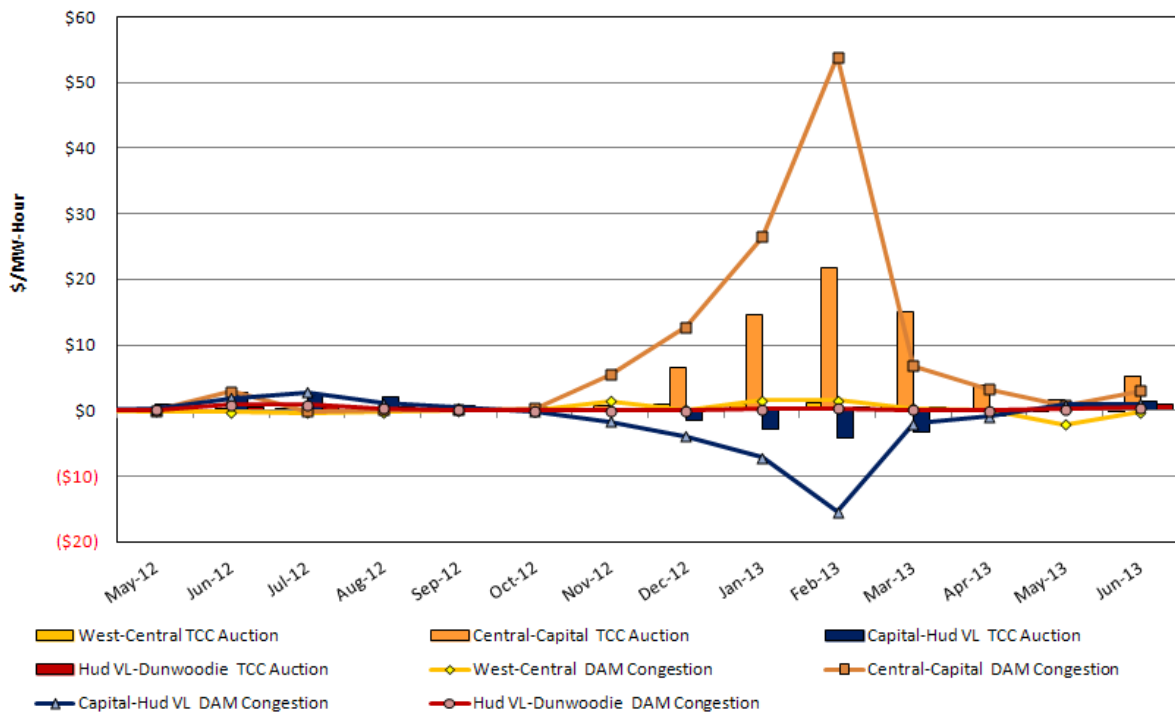
## TCC & Day Ahead Market Selected Internal Path Congestion

TCC Monthly Reconfiguration Auction vs. Monthly DAM Average



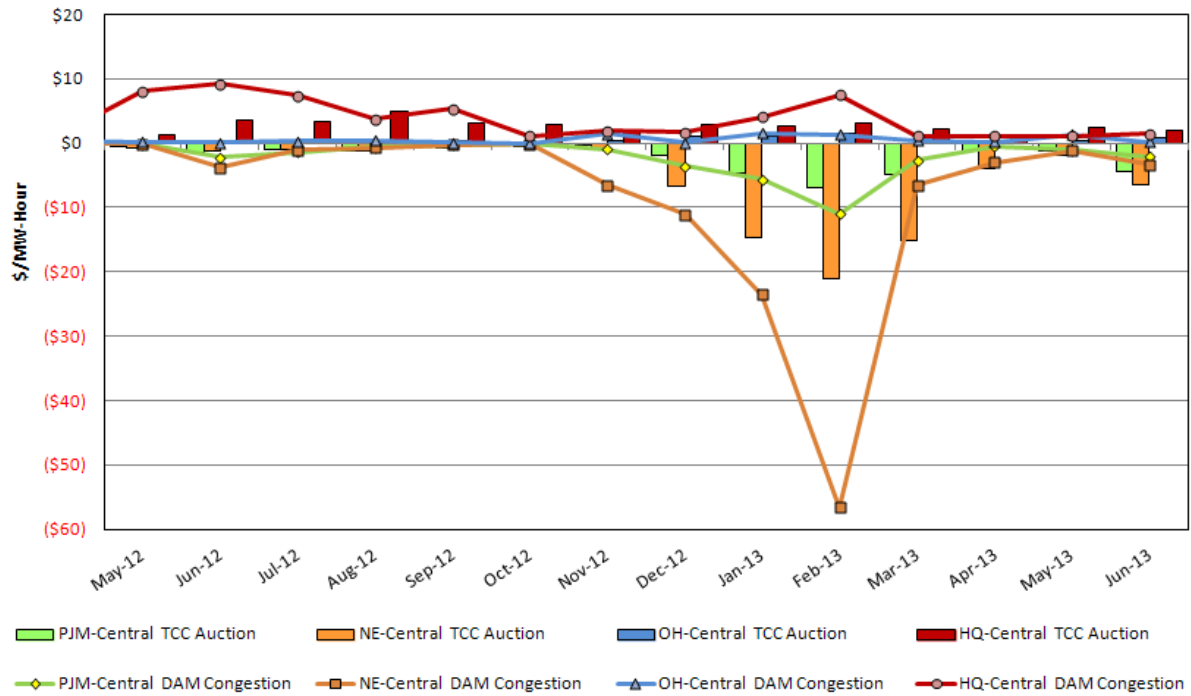
## TCC & Day Ahead Market West to Dunwoodie Path Congestion

TCC Monthly Reconfiguration Auction vs. Monthly DAM Average



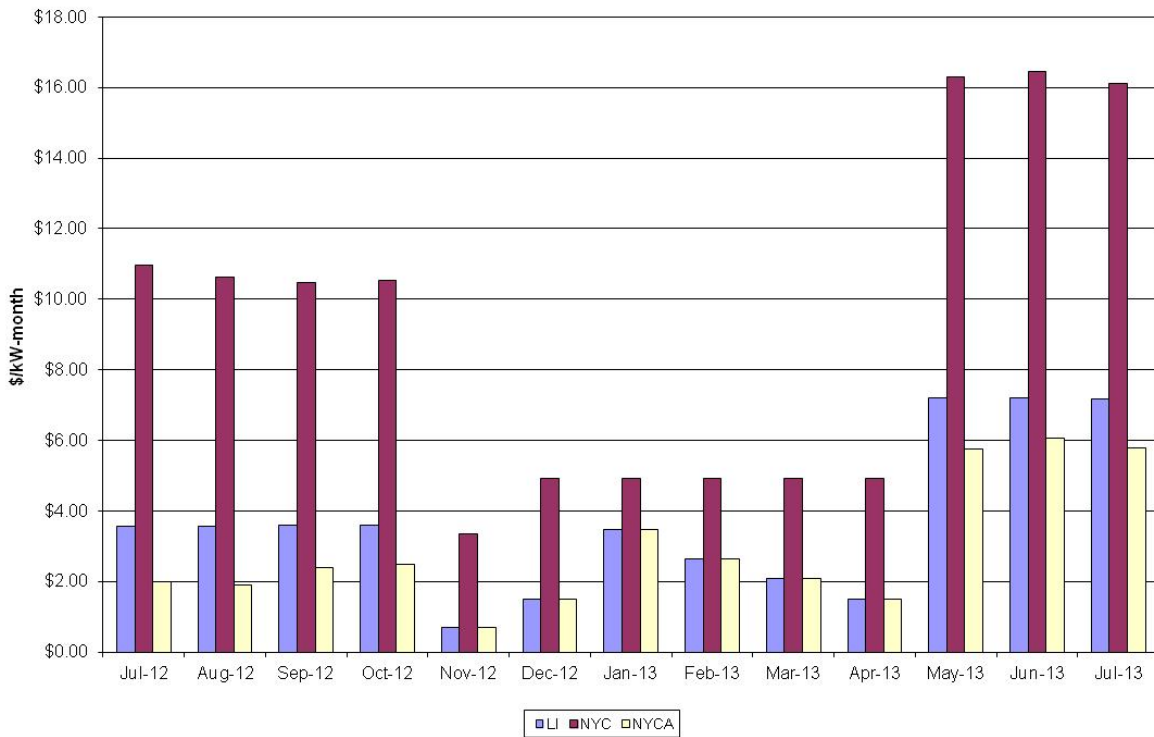
## TCC & Day Ahead Market Selected External Path Congestion

TCC Monthly Reconfiguration Auction vs. Monthly DAM Average





ICAP Spot Market Clearing Price



UCAP Sales

