

Operations Performance Metrics Monthly Report



April 2017 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 May 8, 2017.

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April 2017 Operations Performance Highlights

- Peak load of 19,192 MW occurred on 04/06/2017 HB 11
- All-time winter capability period peak load of 25,738 MW occurred on 1/7/2014 HB 18
- 3 hours of Thunder Storm Alerts were declared
- 0 hours of NERC TLR level 3 curtailment
- A Major Emergency was declared on 04/04/2017 in HB20 for the loss of 1,250MW of generation in ISONE causing the Central East interface flow to exceed its voltage collapse limit.
- High levels of wind curtailment in the North Country this month were coincident with the scheduled outage of the Moses-Adirondack 230kV (#MA1) transmission line.
- The following table identifies the estimated production cost savings associated with the Broader Regional Market initiatives.

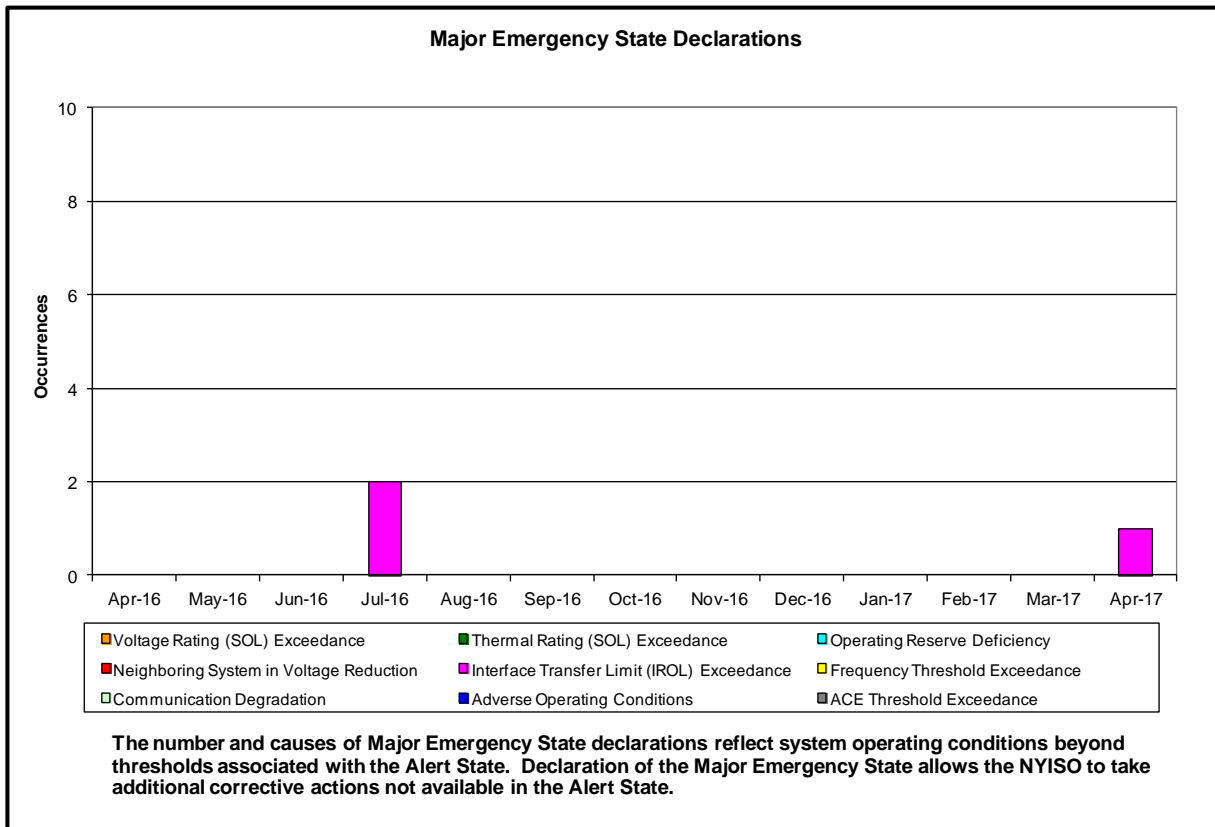
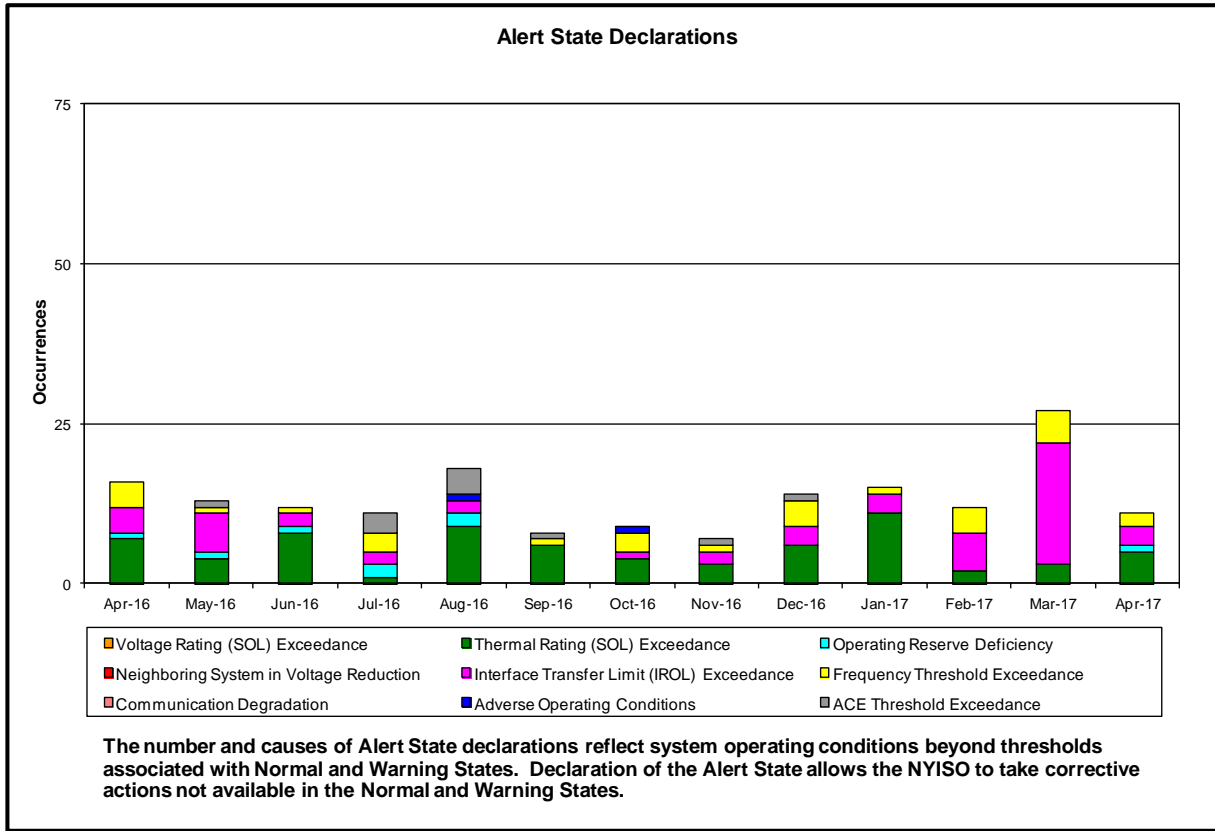
	Current Month Value (\$M)	Year-to-Date Value (\$M)
NY Savings from PJM-NY Congestion Coordination	\$1.29	\$6.76
NY Savings from PJM-NY Coordinated Transaction Scheduling	(\$0.20)	(\$0.27)
NY Savings from NE-NY Coordinated Transaction Scheduling	\$0.33	(\$0.23)
Total NY Savings	\$1.42	\$6.26
Regional Savings from PJM-NY Coordinated Transaction Scheduling	\$0.26	\$0.72
Regional Savings from NE-NY Coordinated Transaction Scheduling	\$0.10	\$0.38
Total Regional Savings	\$0.36	\$1.10

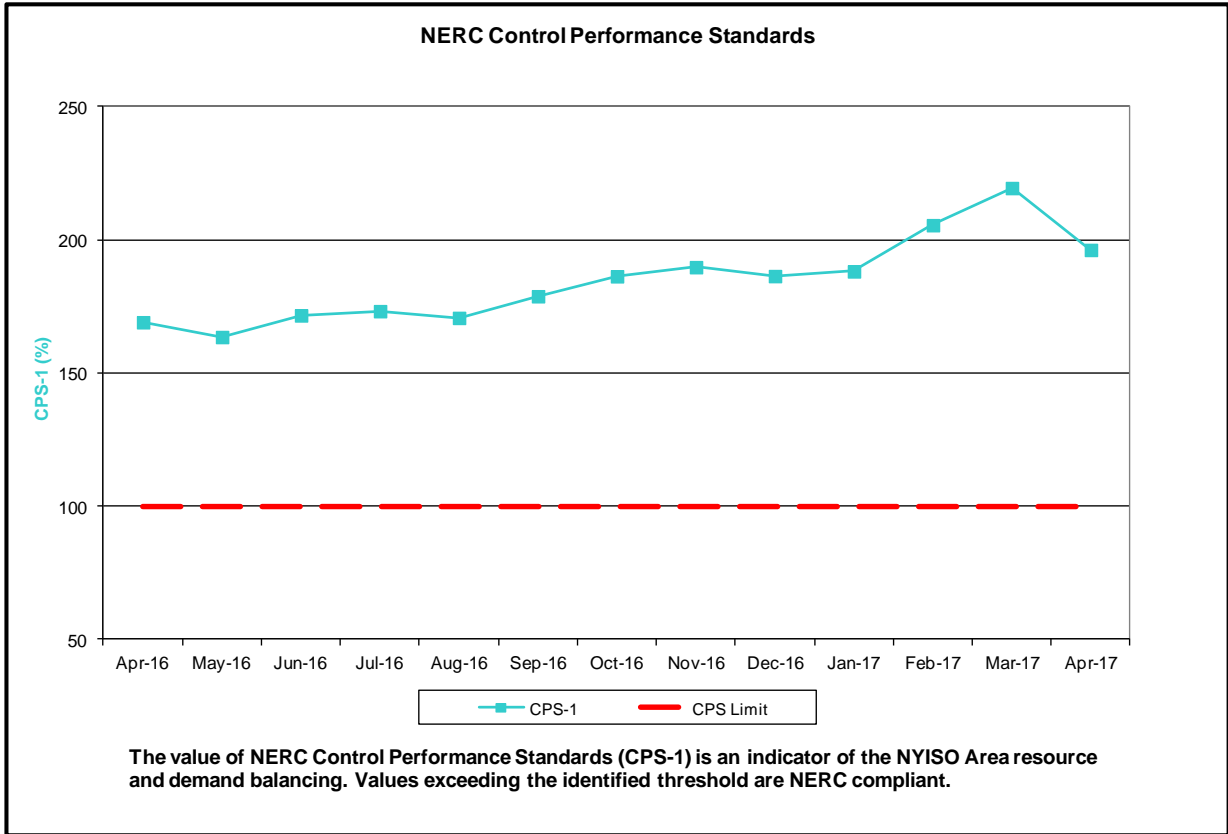
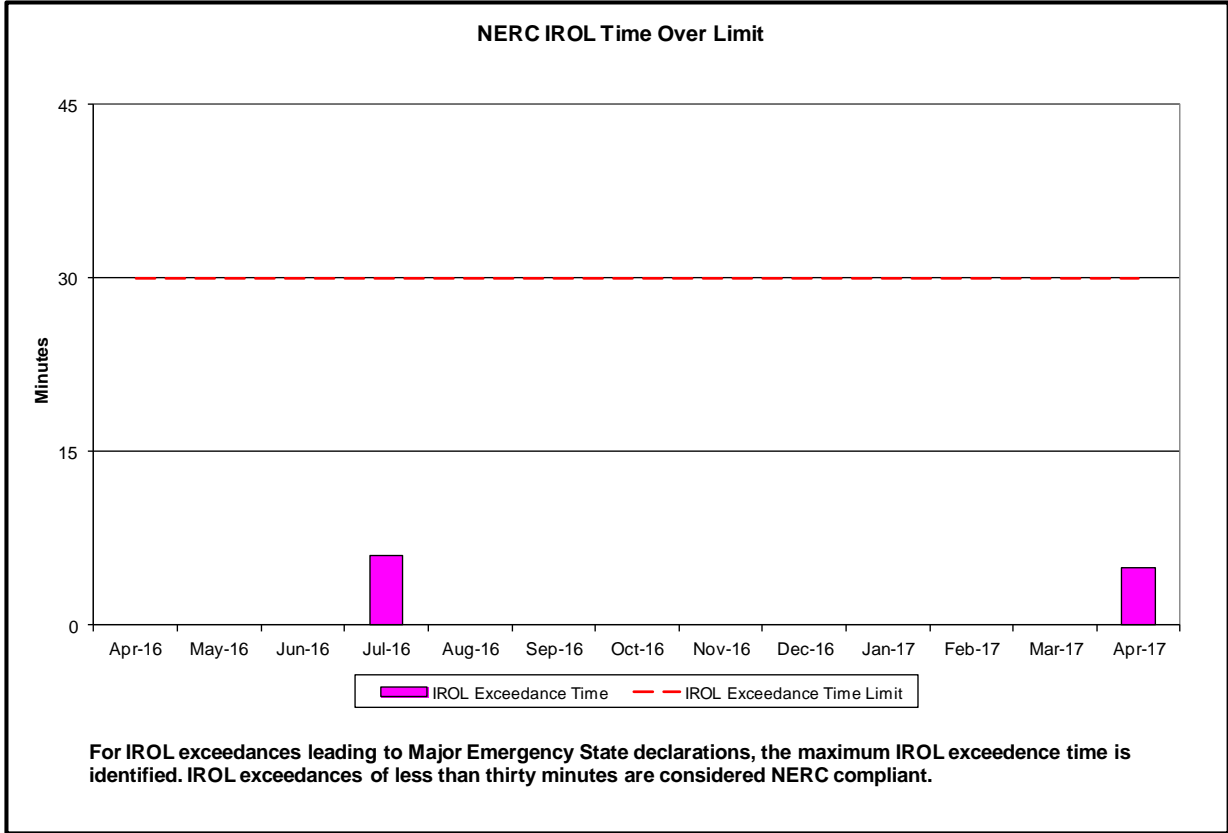
- Statewide uplift cost monthly average was (\$0.08)/MWh
- The following table identifies the Monthly ICAP spot market prices by locality and changes from the end of the prior Summer Capability period.

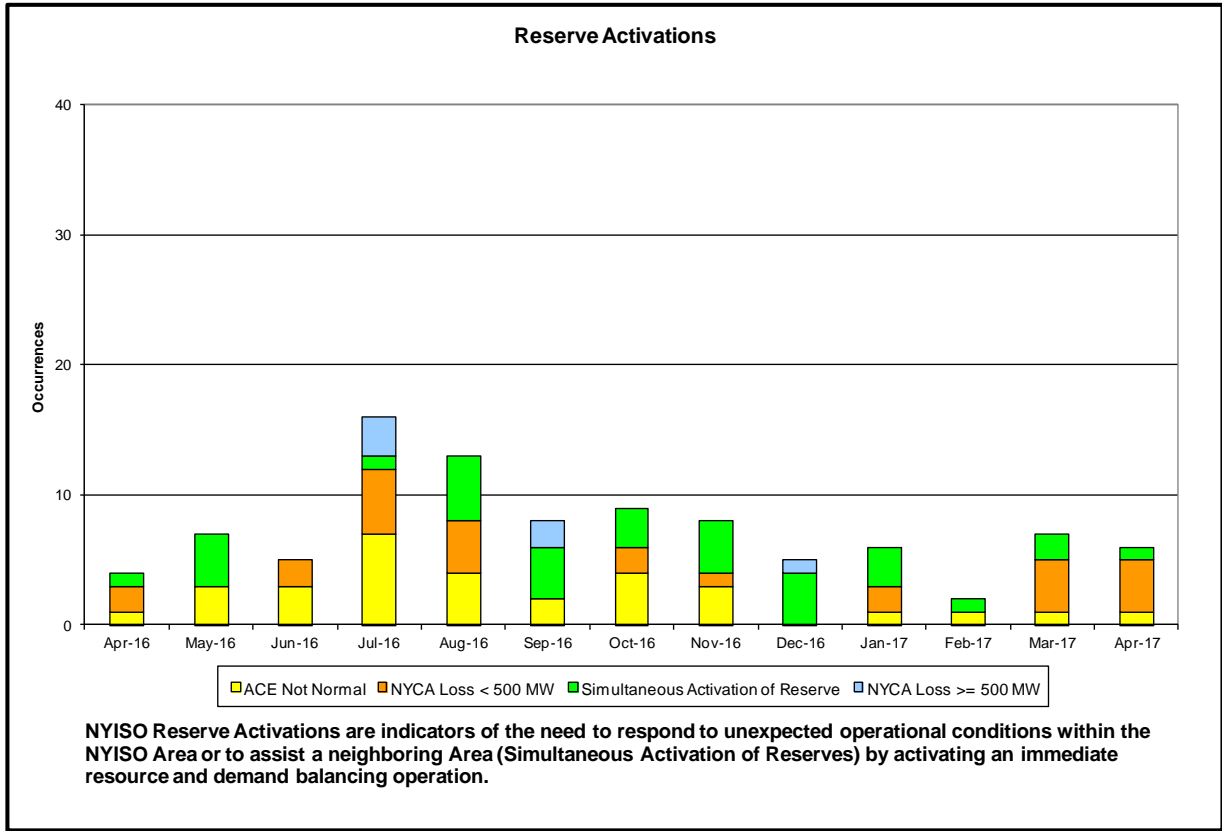
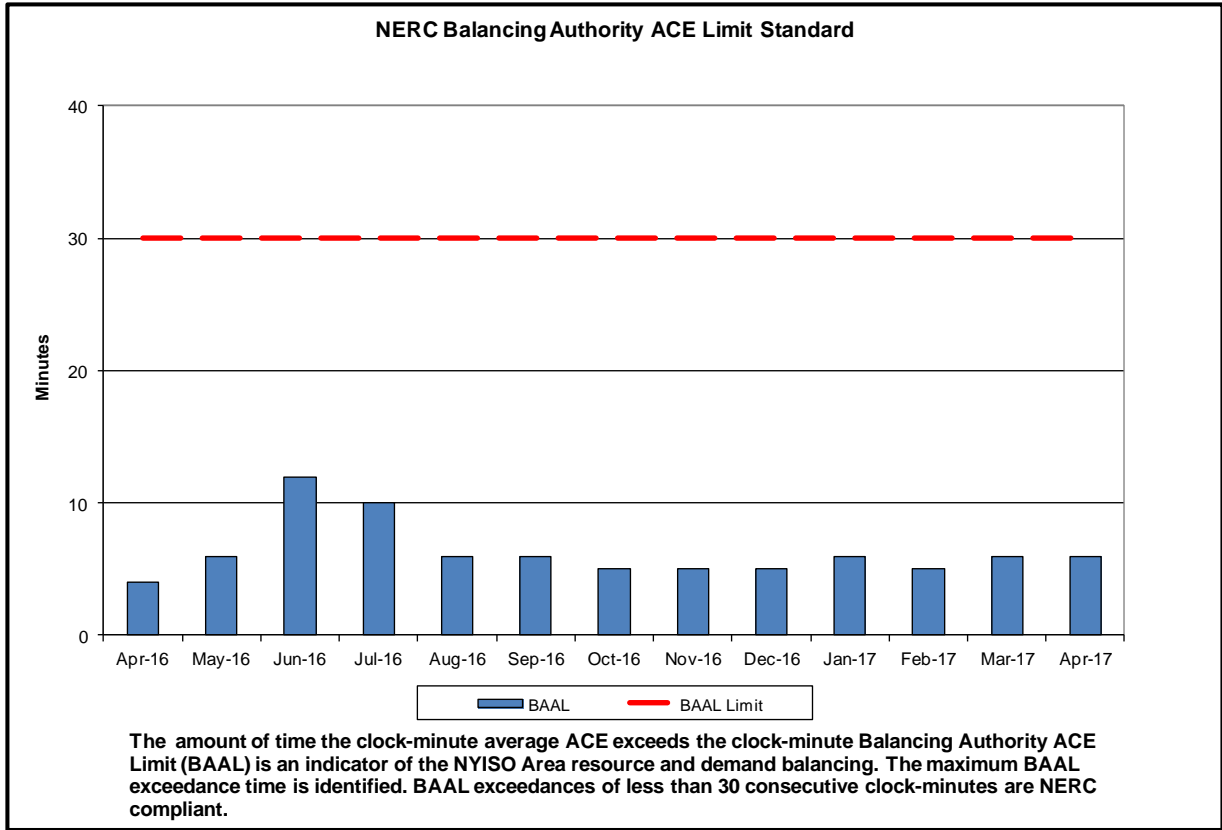
Spot Auction Price Results	NYCA	Lower Hudson Valley Zones	New York City Zone	Long Island Zone
May 2017 Spot Price	\$1.72	\$10.28	\$10.57	\$6.71
October 2016 Spot Price	\$3.12	\$9.16	\$12.14	\$4.34
Delta	(\$1.40)	\$1.12	(\$1.57)	\$2.37

- Price changes from October 2016 to May 2017 are driven by changes in supply as well as Capability Year inputs such as demand curve parameters, Locational Capacity Requirements, the Installed Reserve Margin and the load forecast.

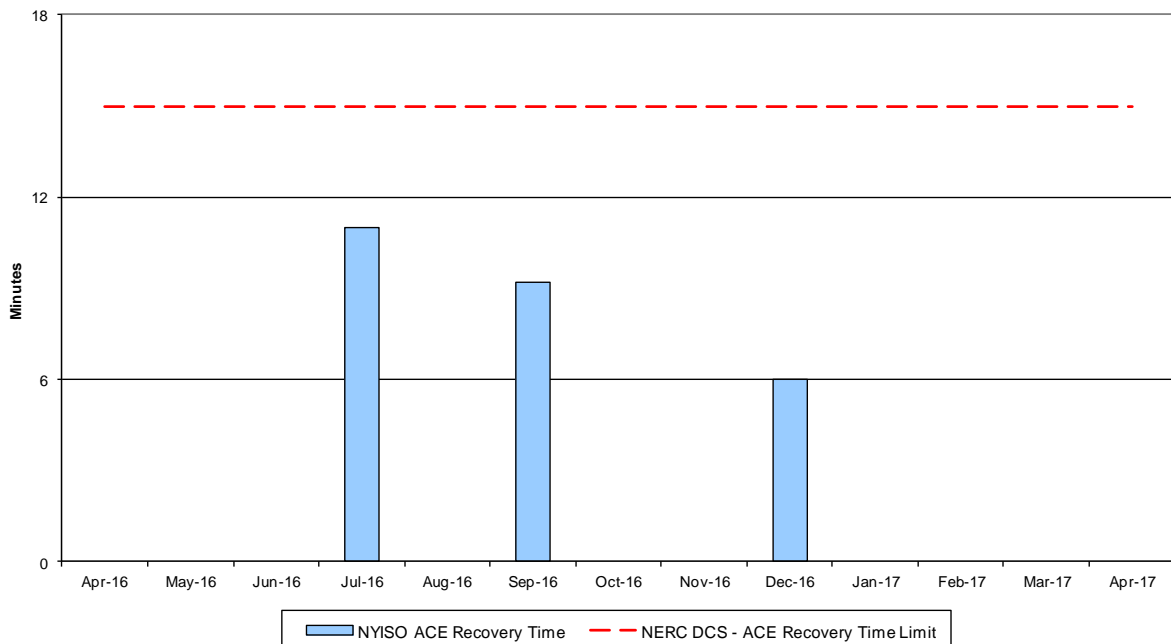
Reliability Performance Metrics





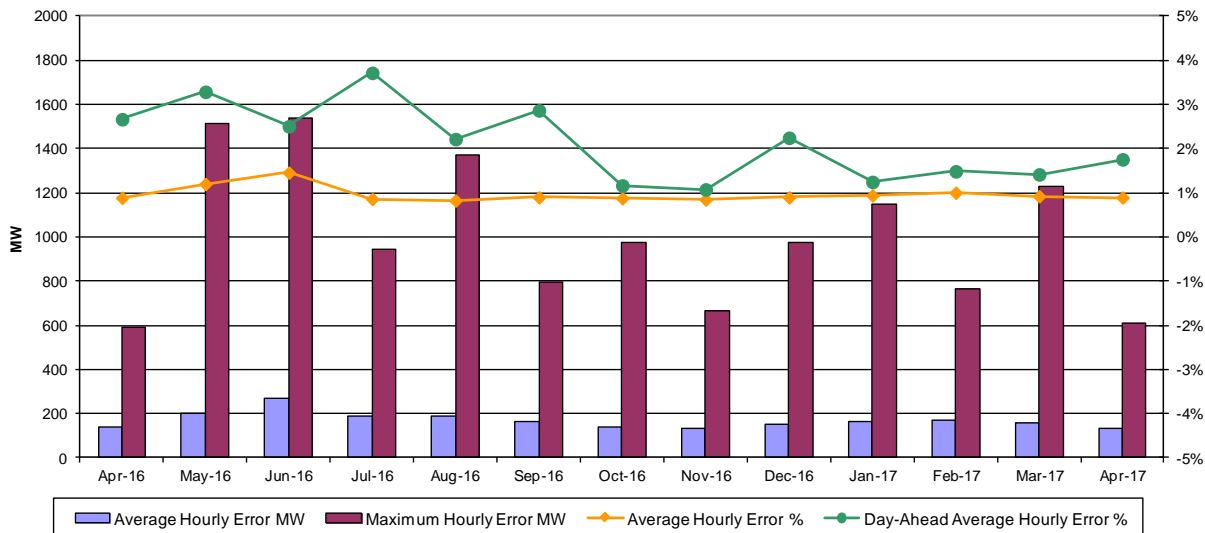


DCS Event Time to ACE Recovery

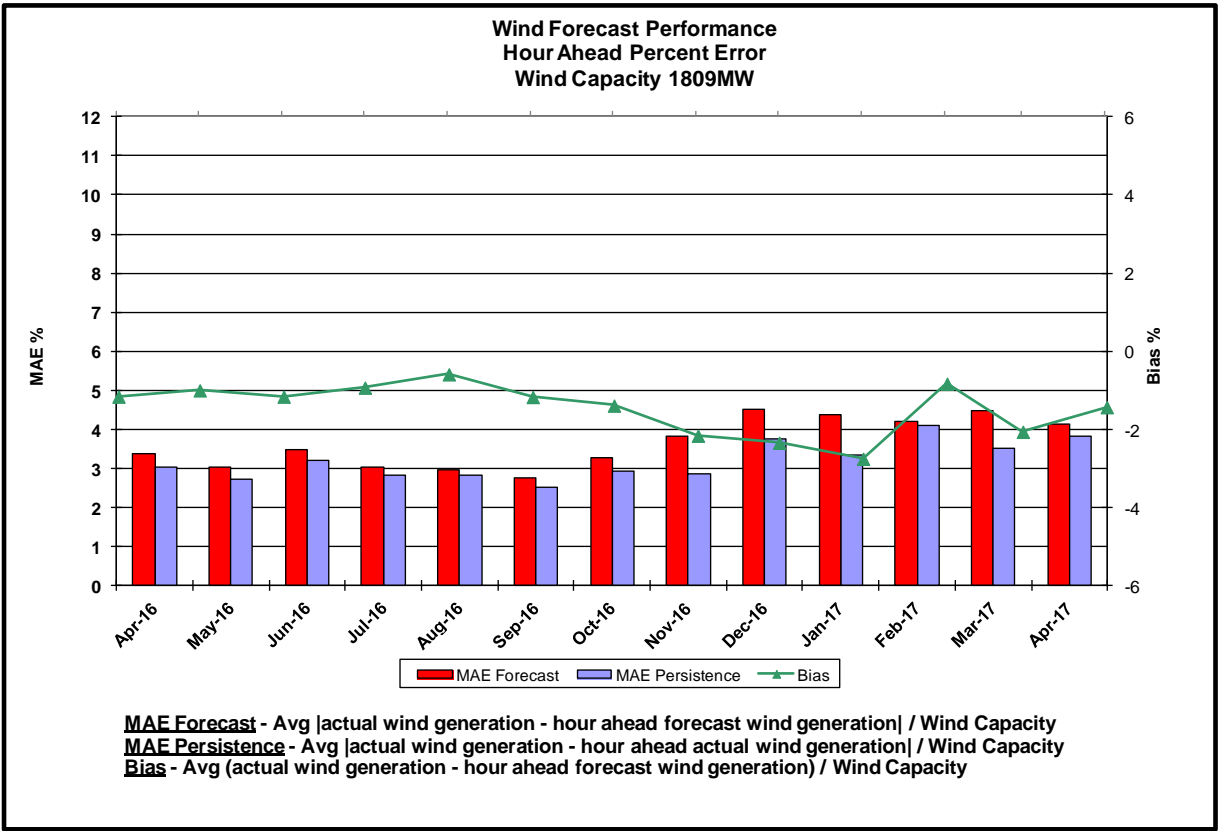
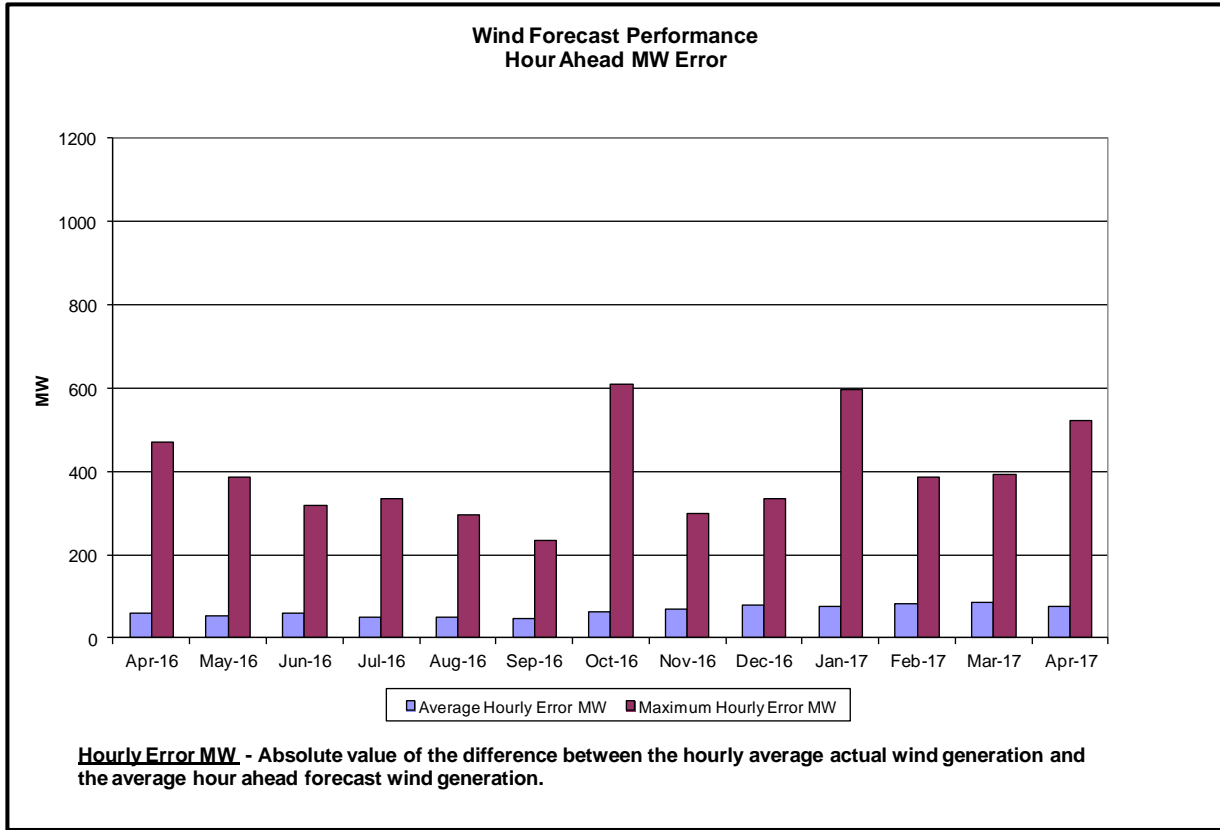


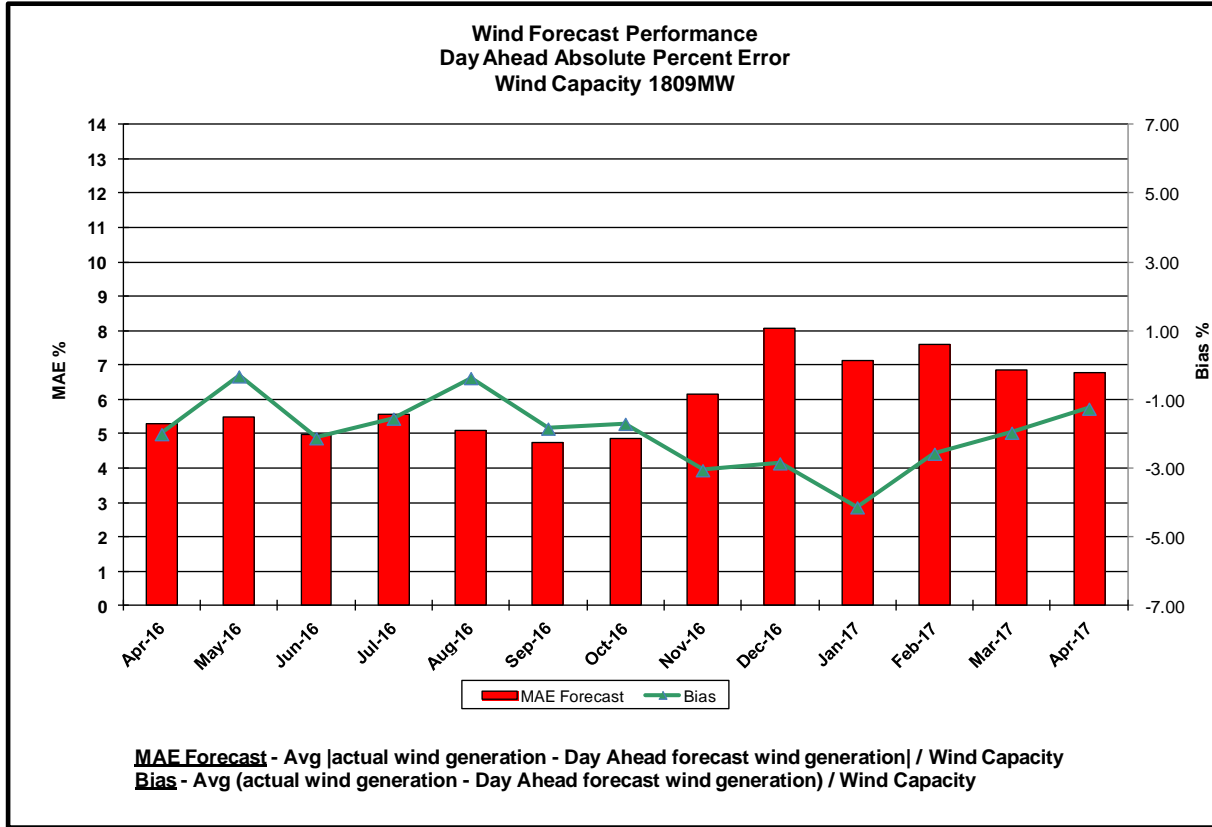
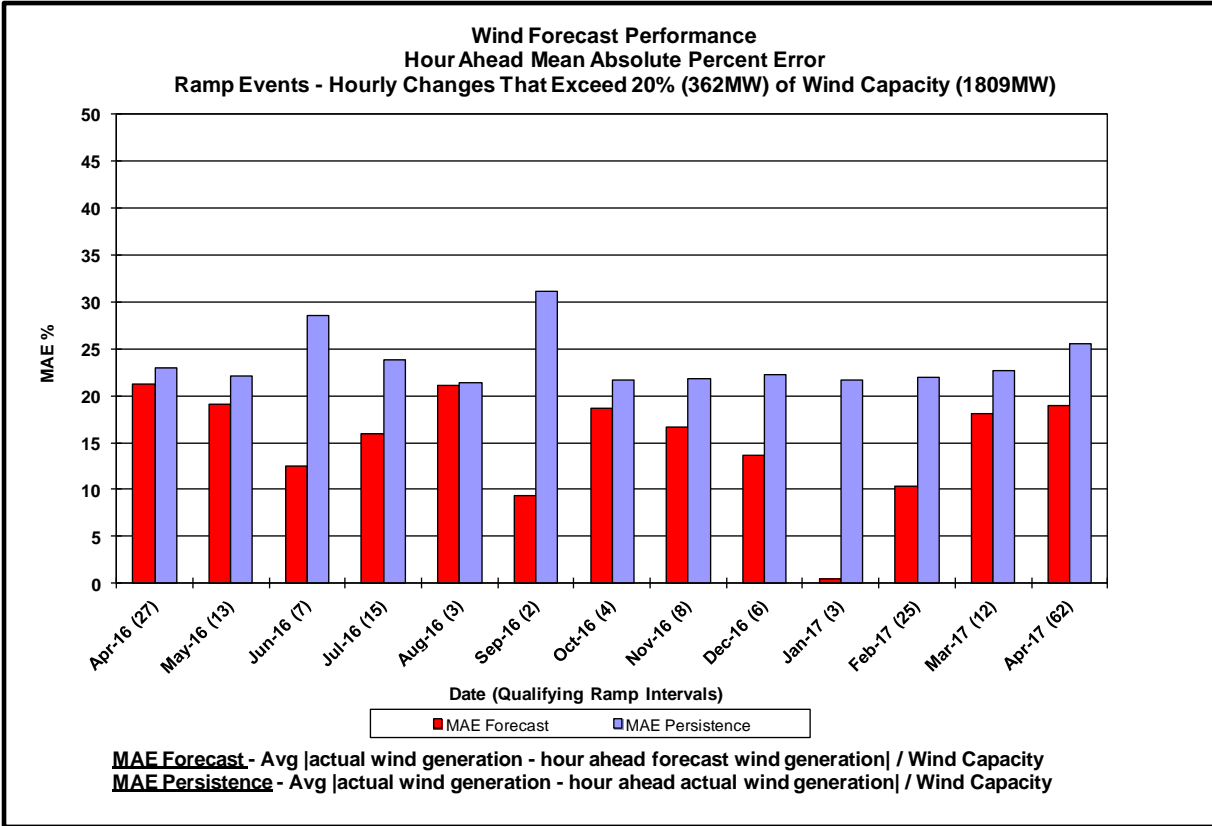
For NYISO initiated Reportable Disturbances, the maximum ACE recovery time is identified. Recovery times of less than 15 minutes are considered NERC compliant.

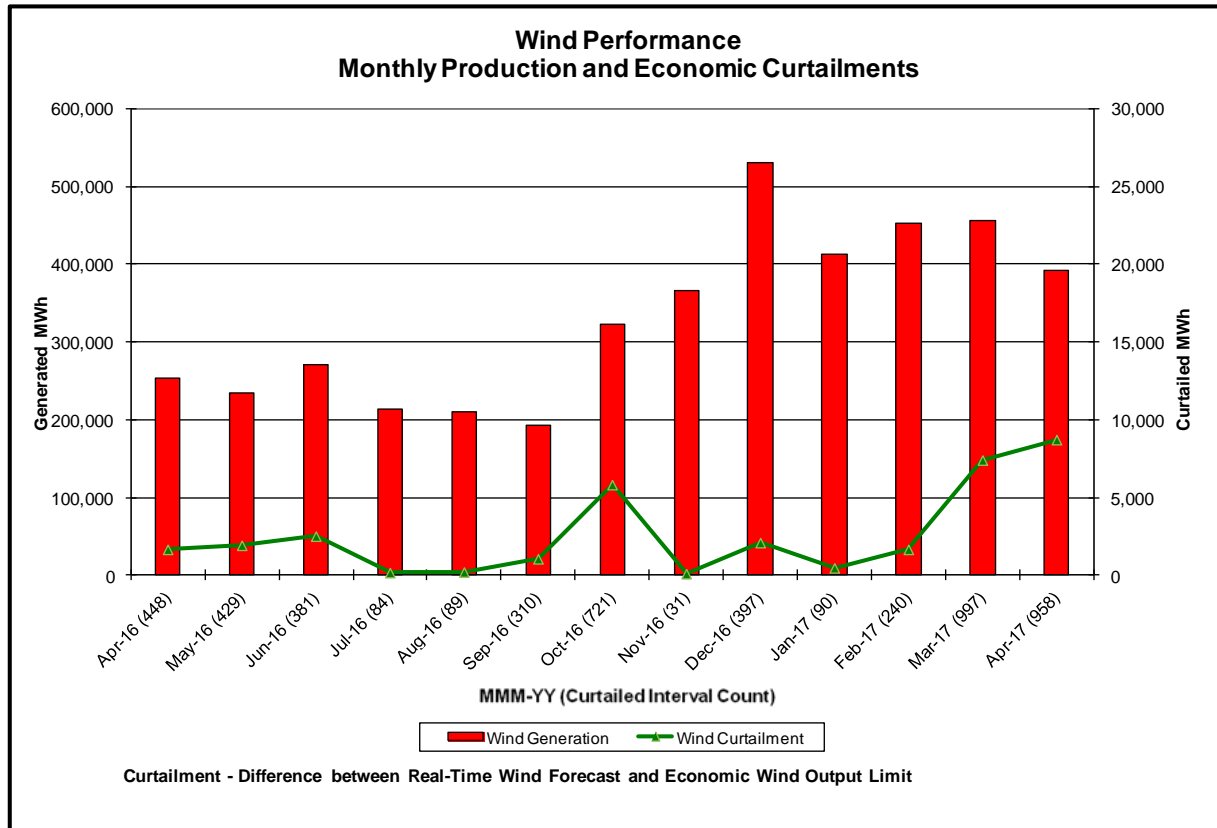
Load Forecast Performance

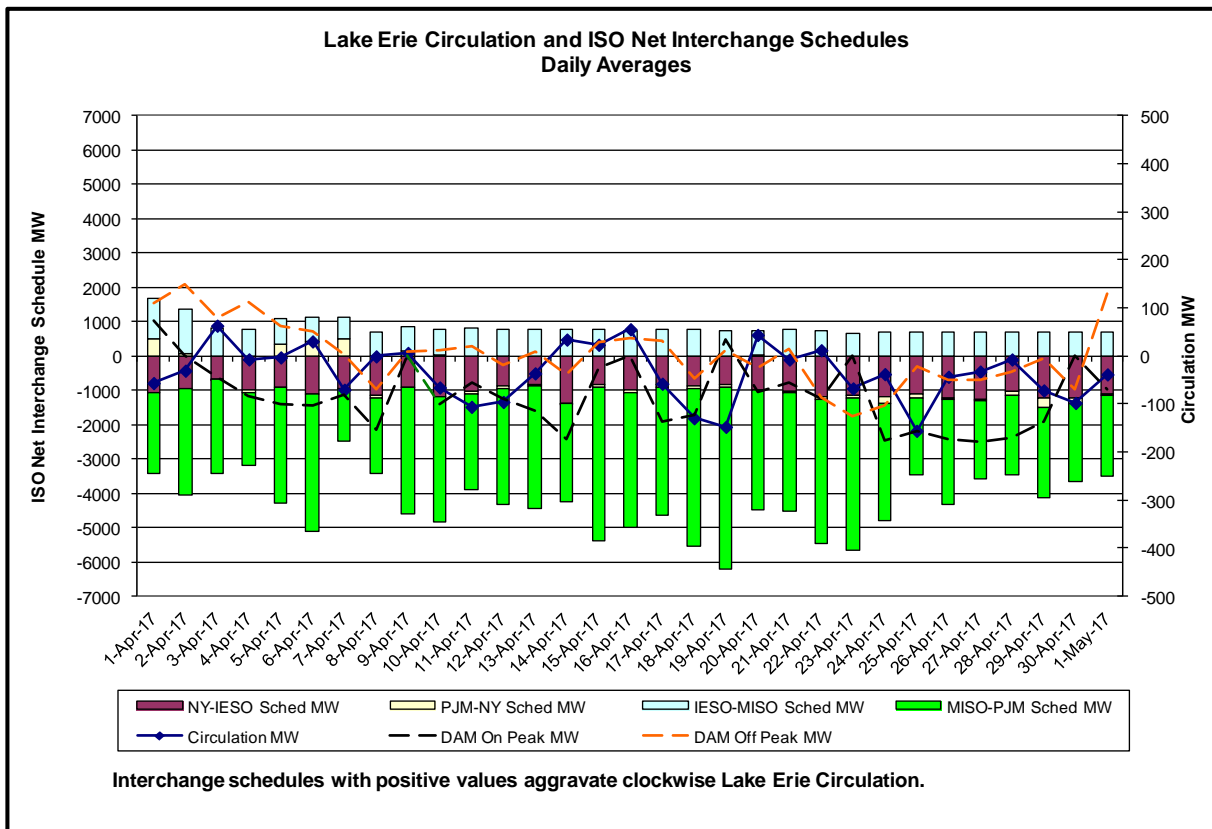
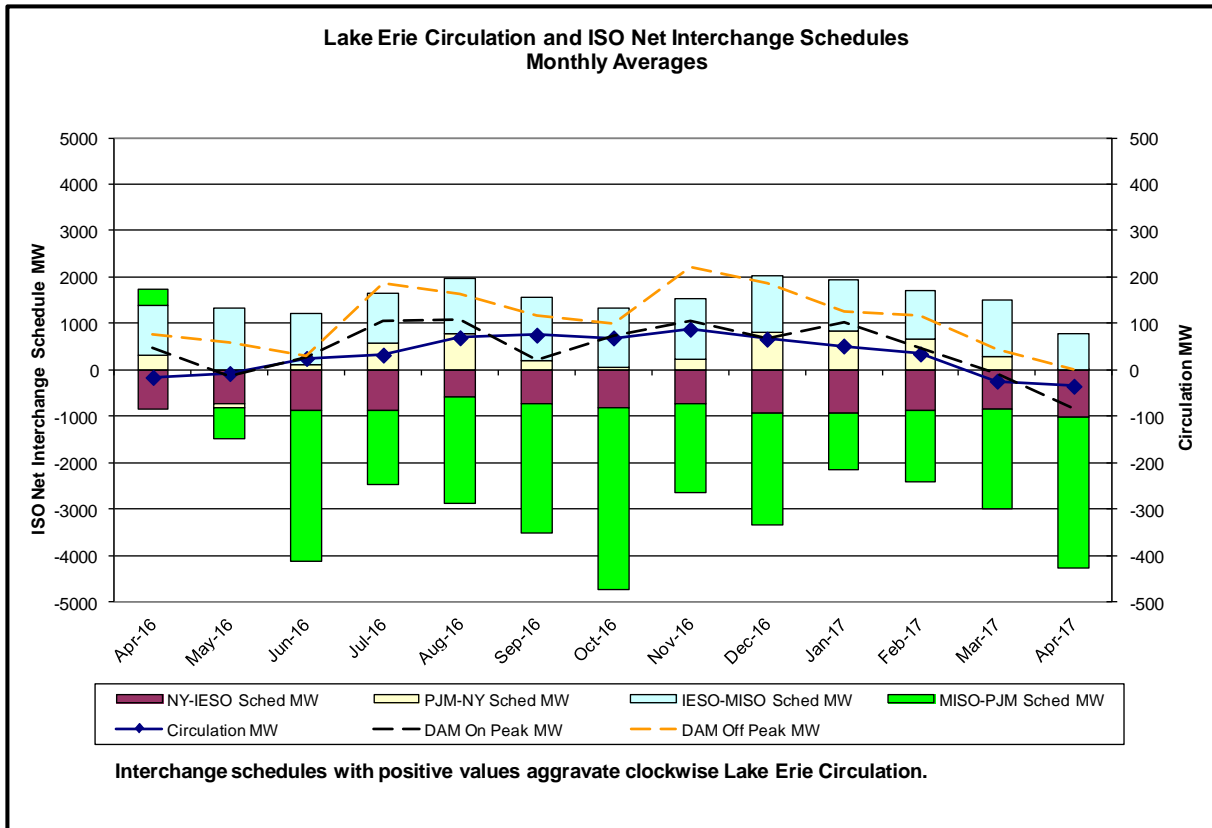


Hourly Error MW - Absolute value of the difference between the hourly average actual load demand and the average hour ahead forecast load demand.
Average Hourly Error % - Average value of the ratio of hourly average error magnitude to hourly average actual load demand.
Day-Ahead Average Hourly Error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

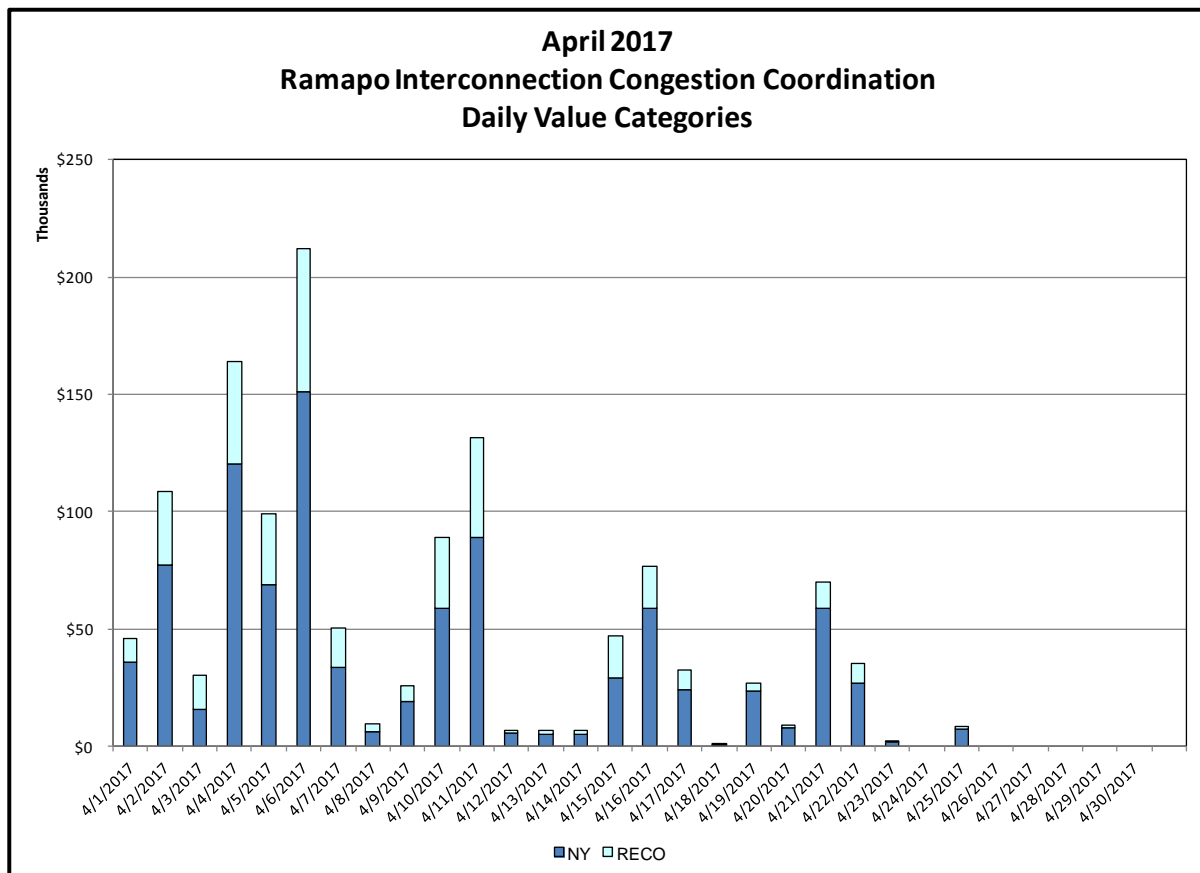
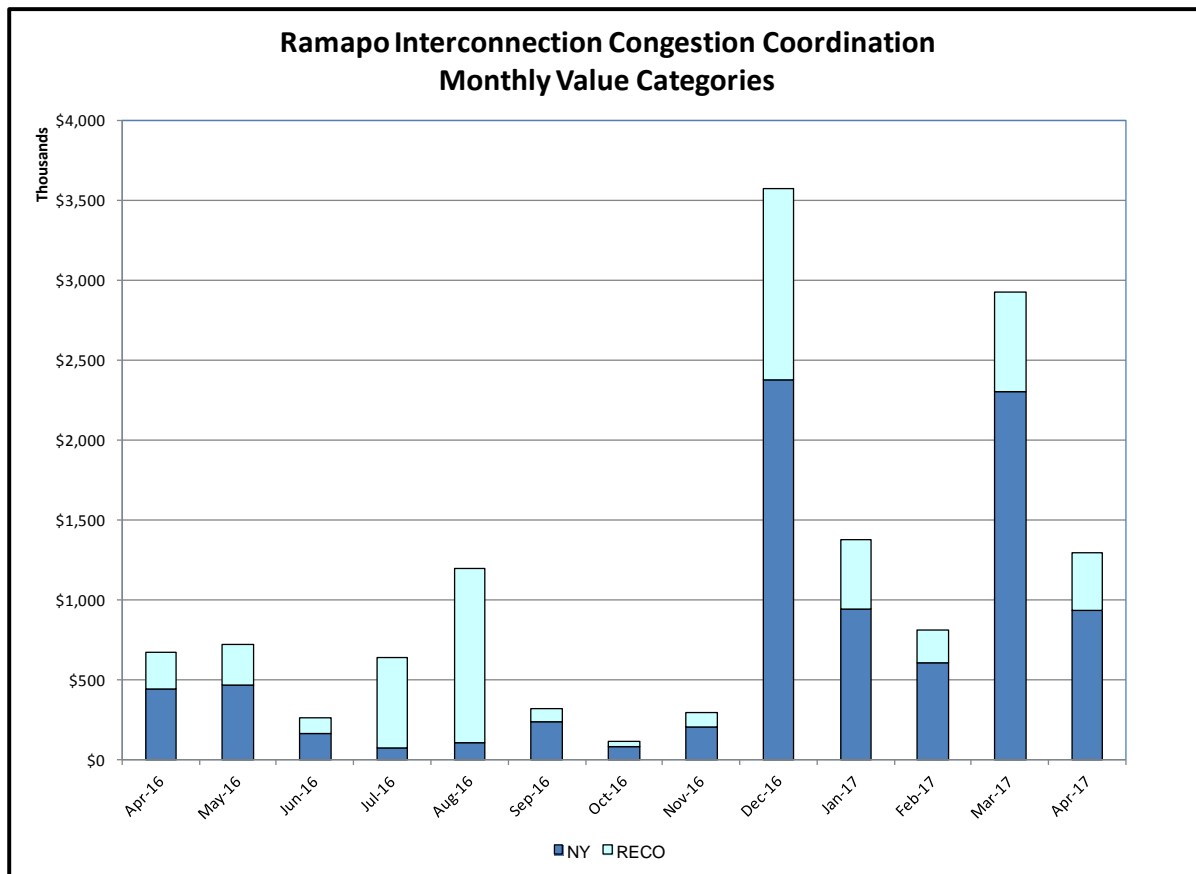






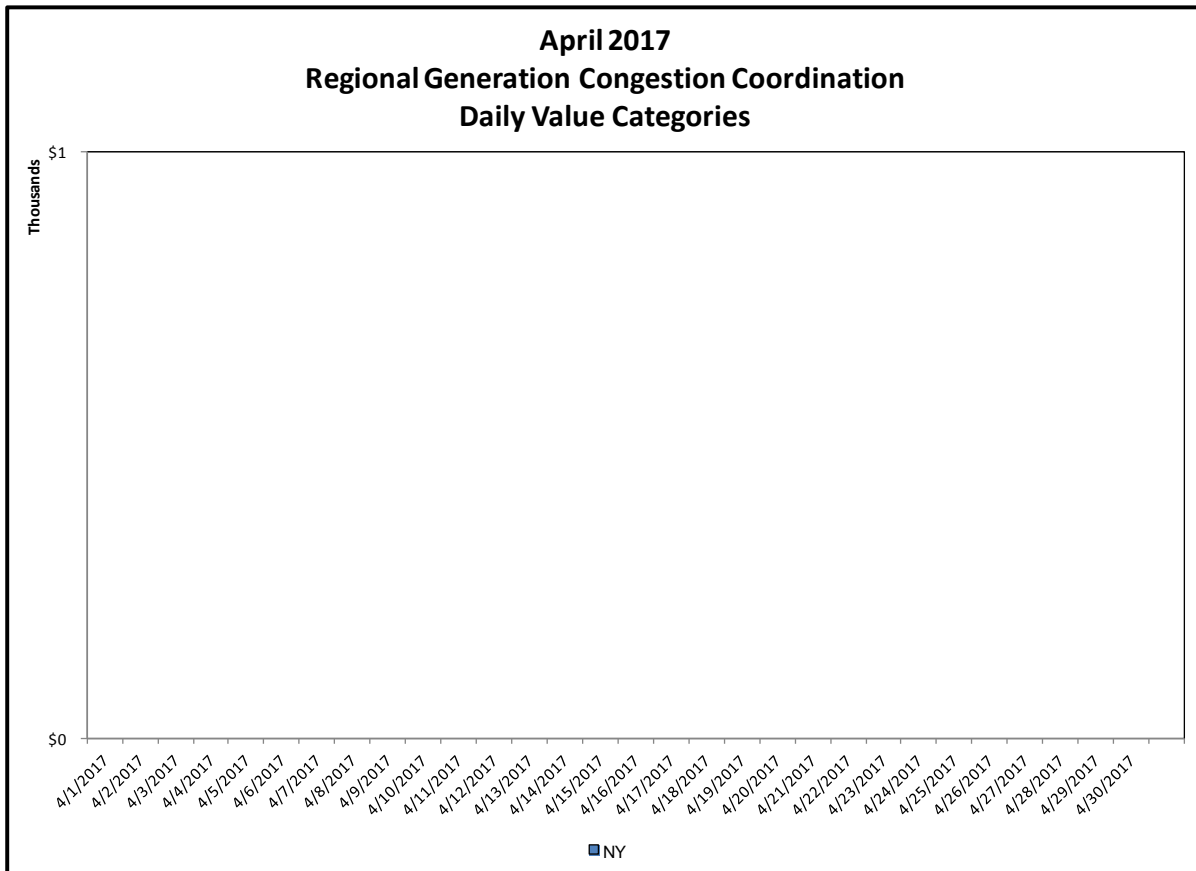
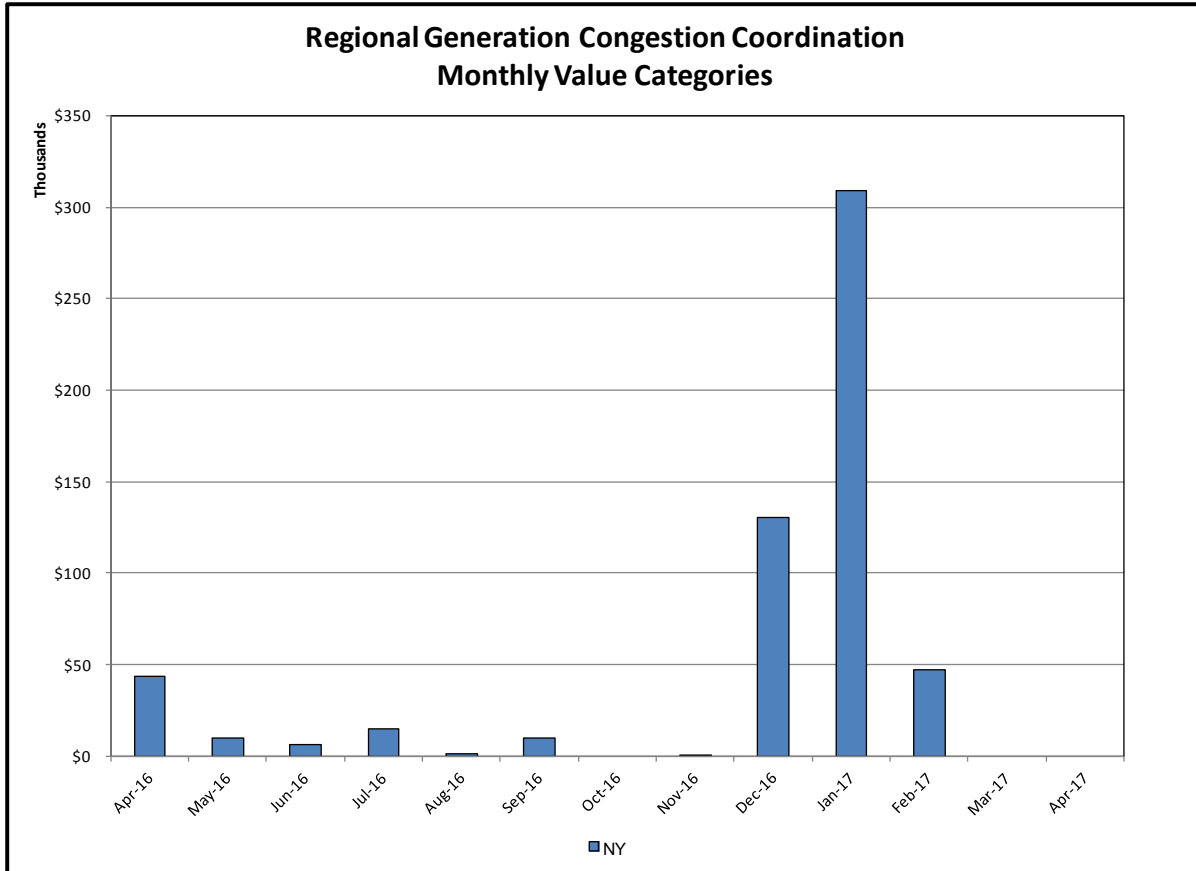


Broader Regional Market Performance Metrics



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.



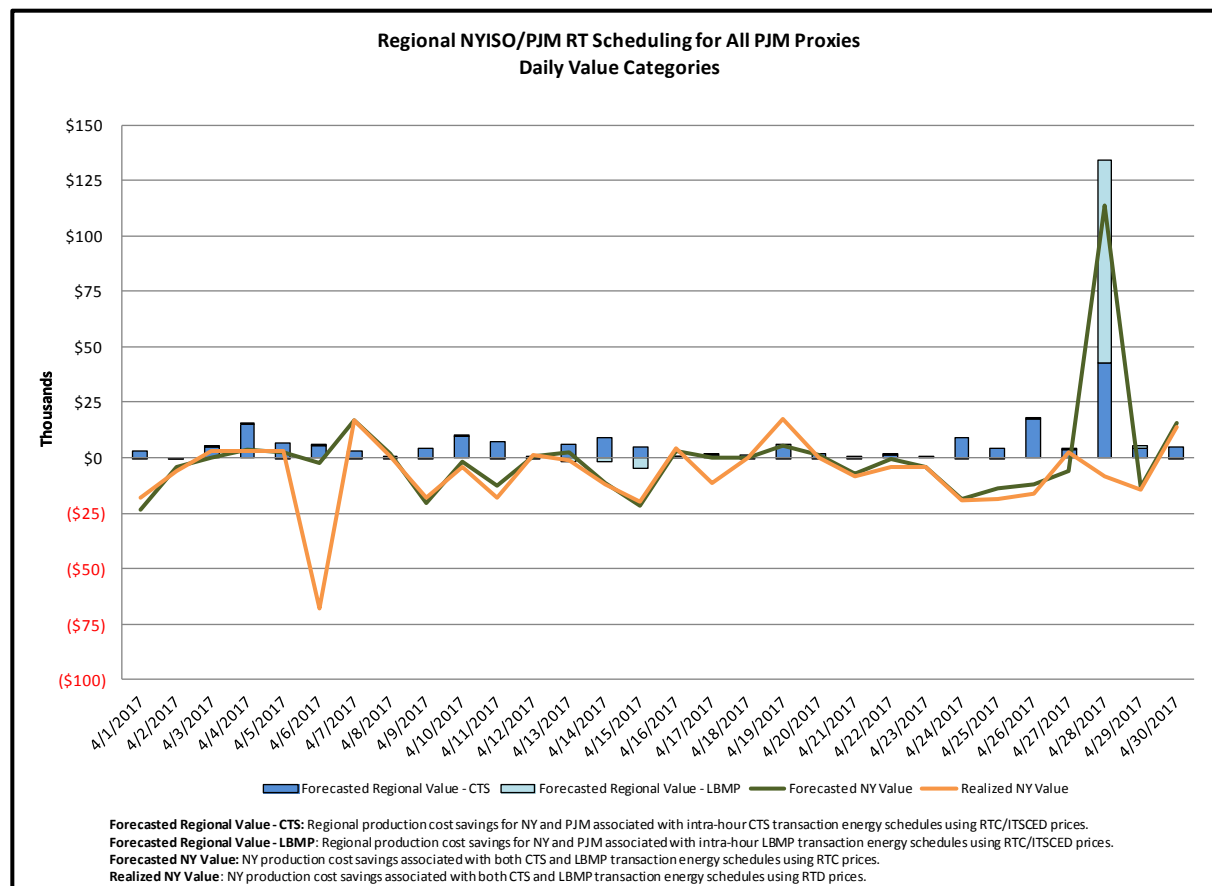
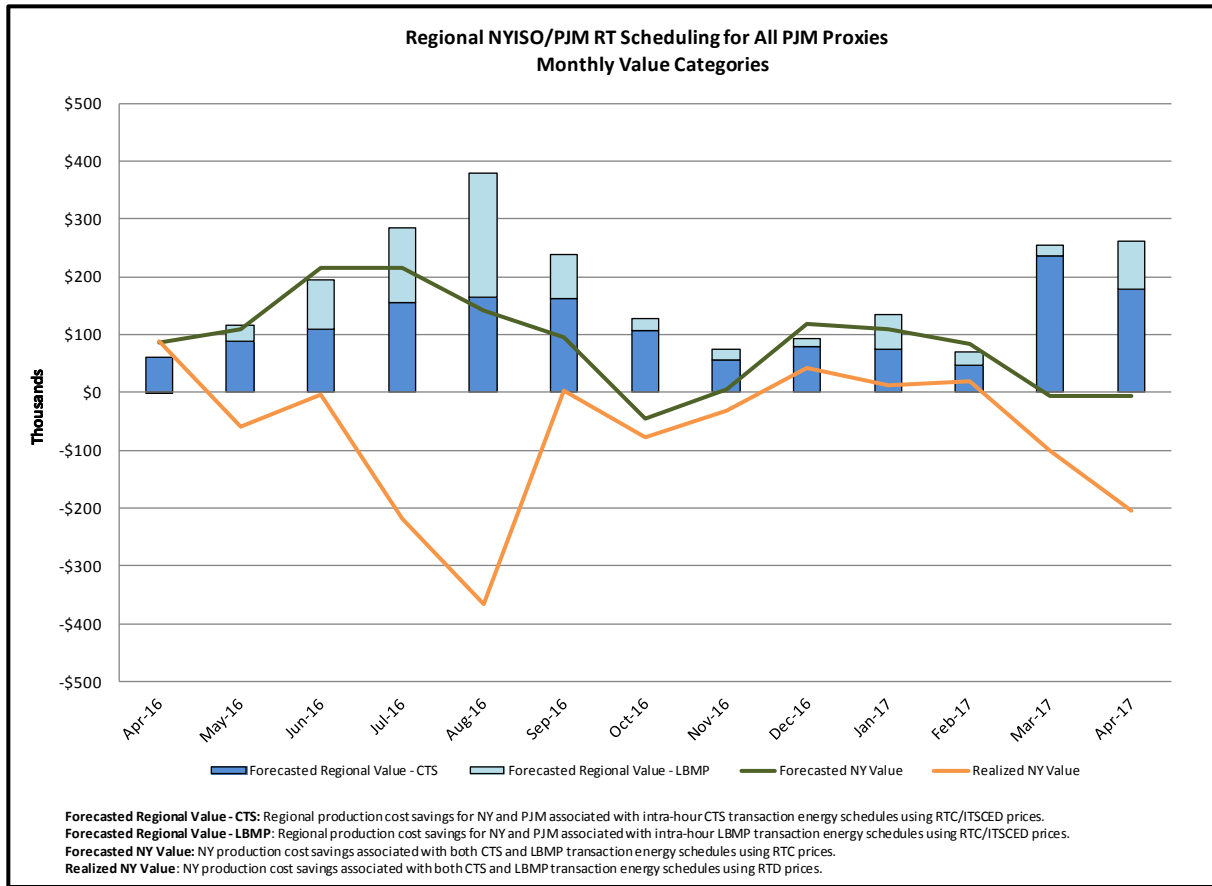
Regional Generation Congestion Coordination

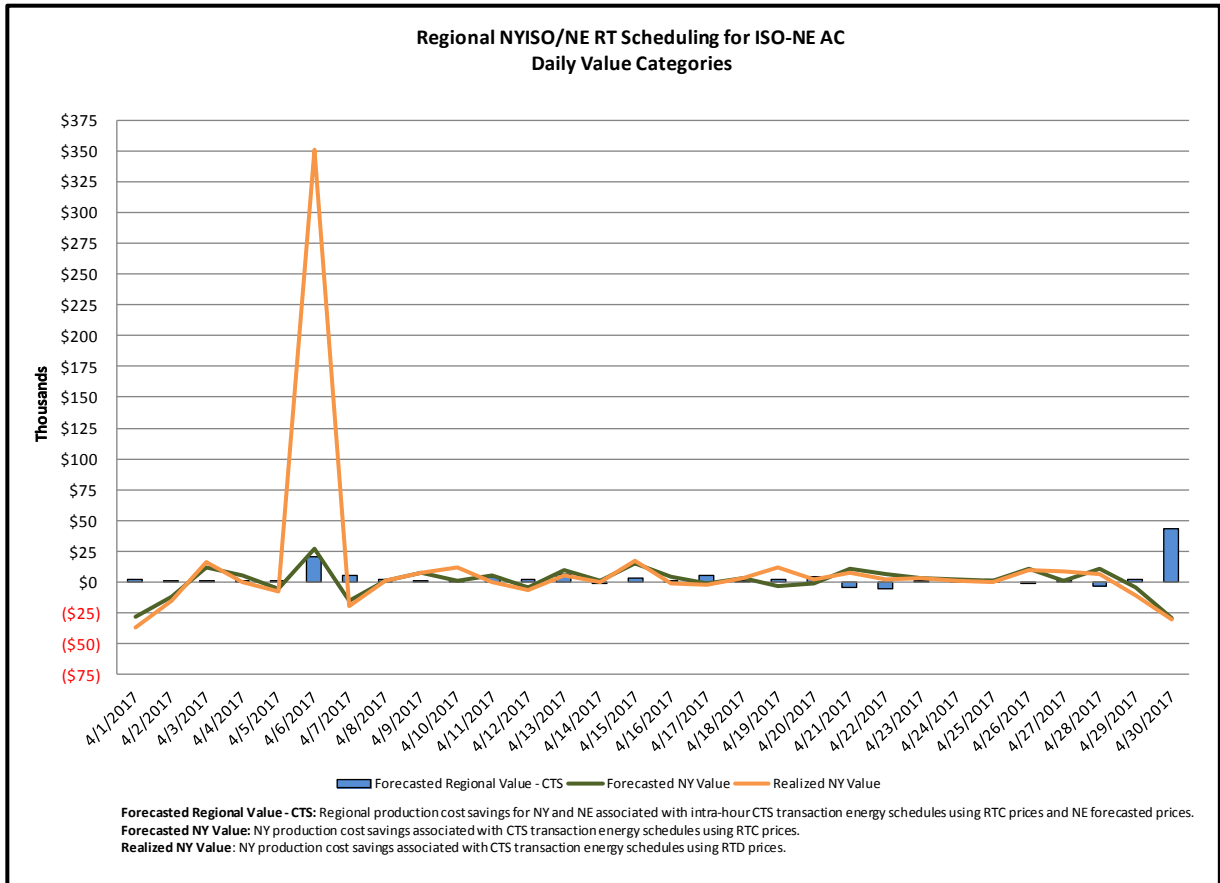
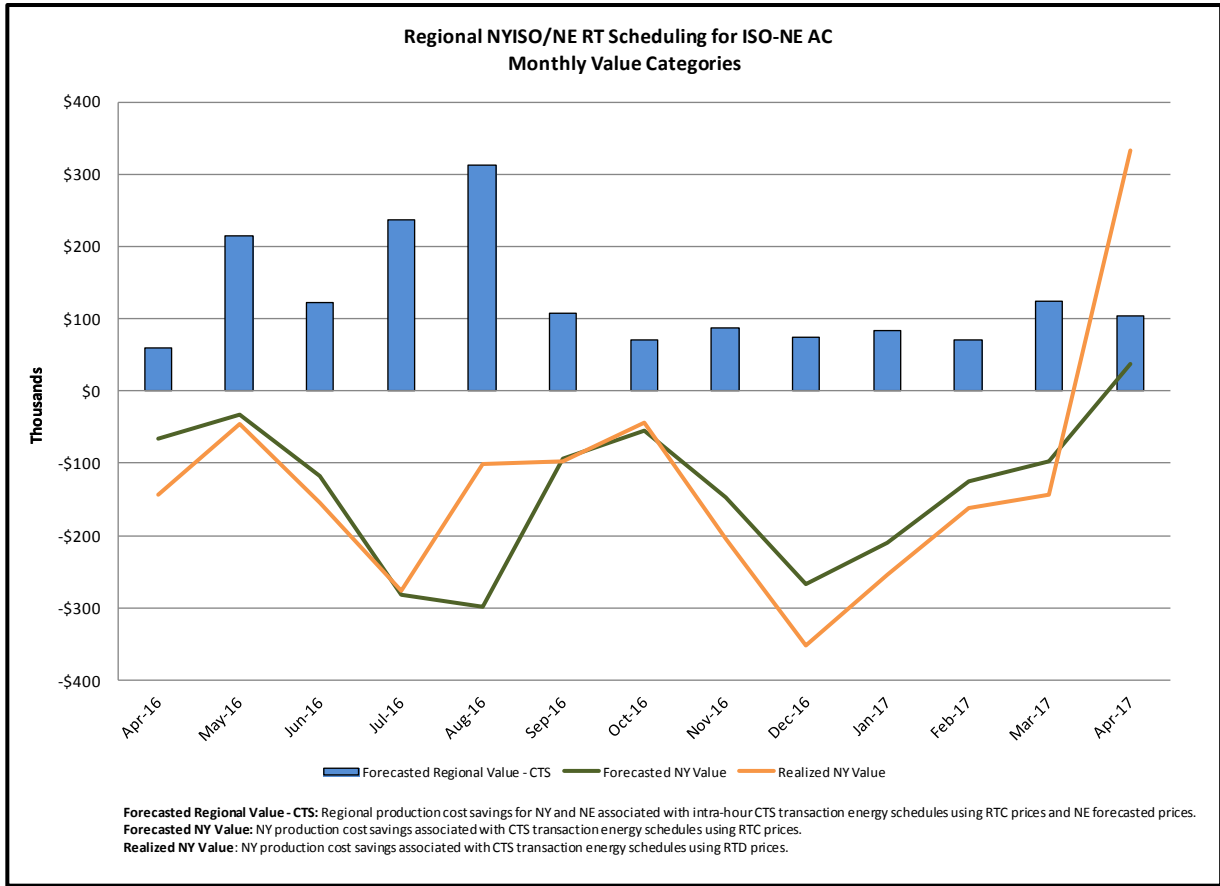
Category

NY

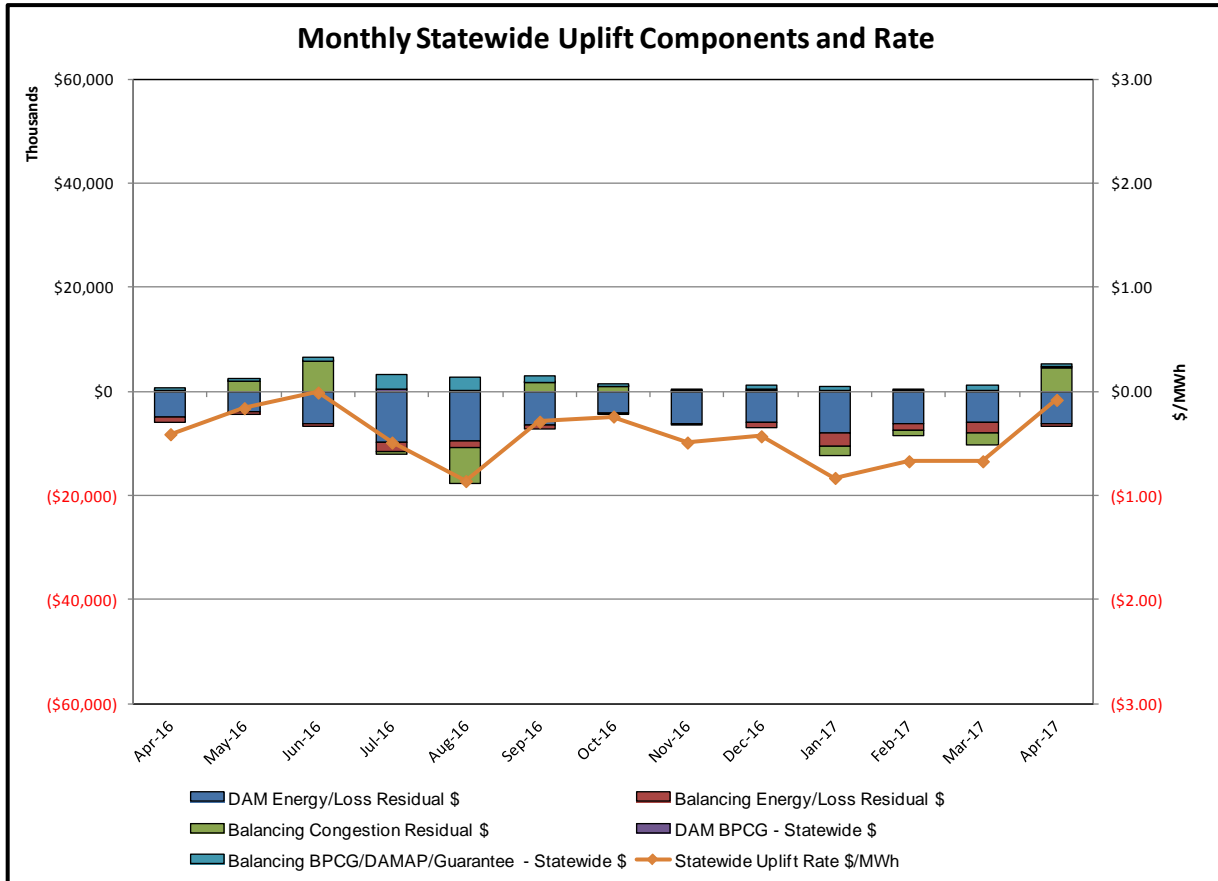
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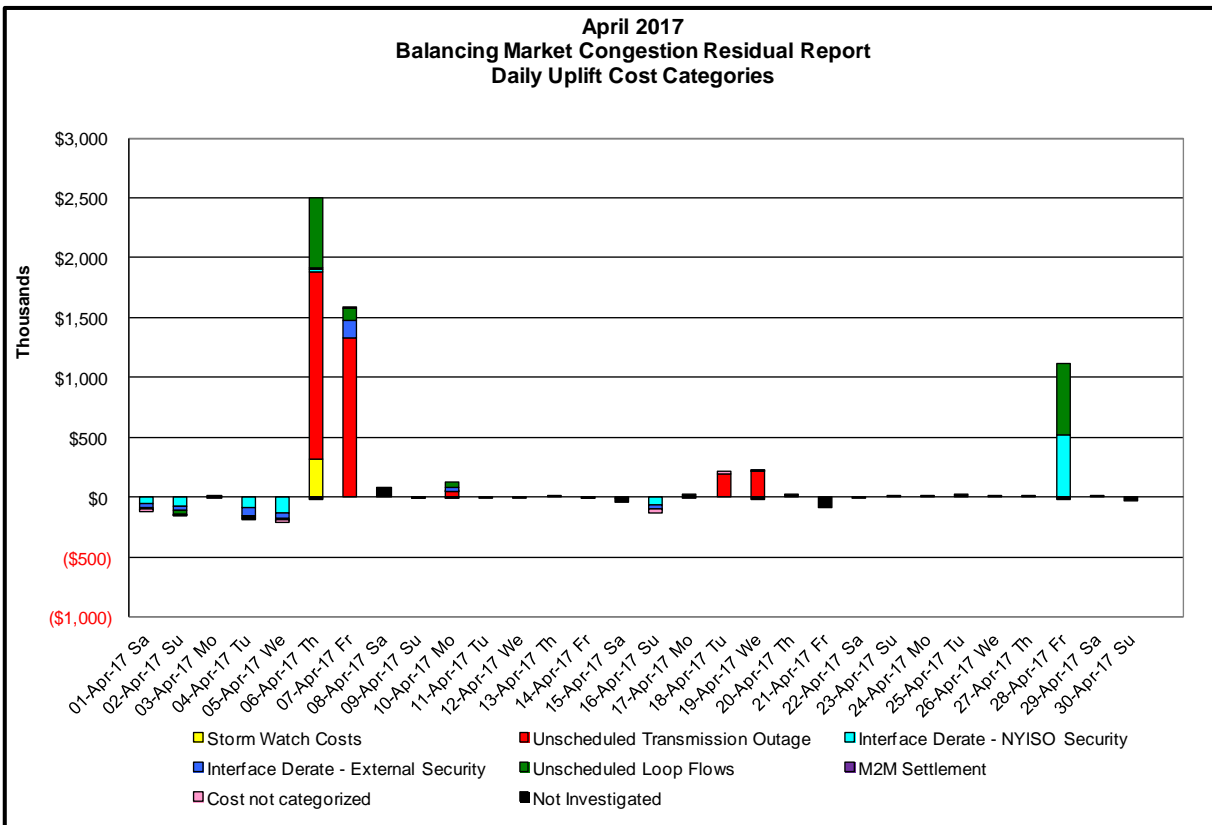
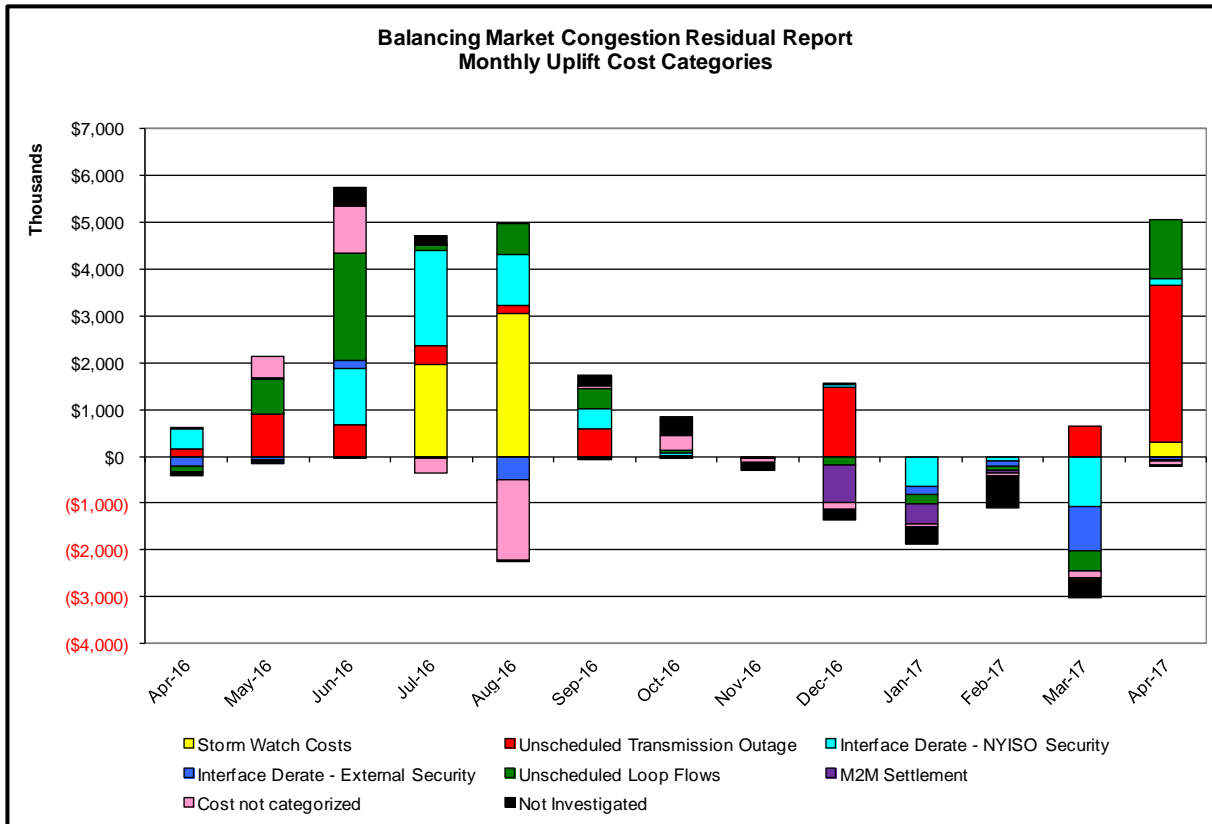
NYISO savings that result from PJM payments to NYISO when PJM's transmission use (PJM's market flow) is greater than PJM's entitlement of the NY transmission system and NYISO is incurring Western or Central NY congestion. Additionally, NYISO savings may result from the more efficient regional utilization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





Market Performance Metrics





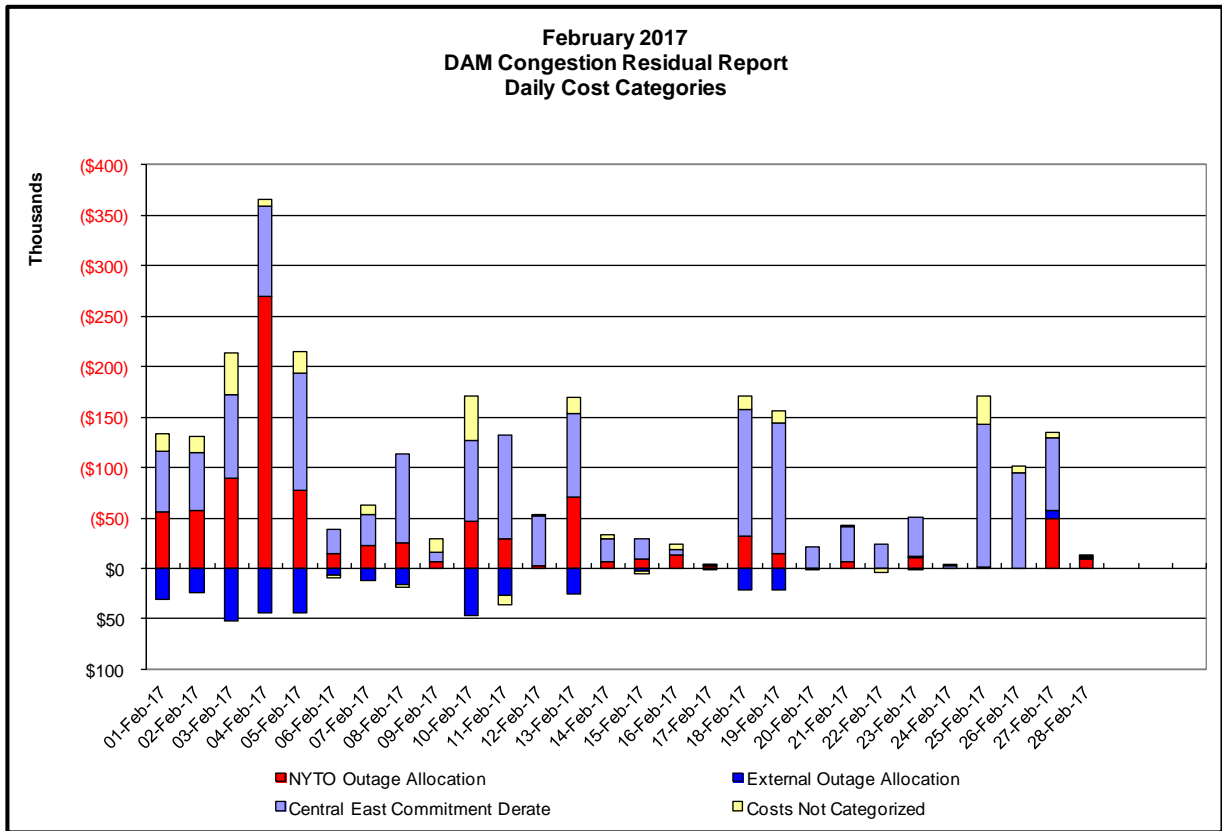
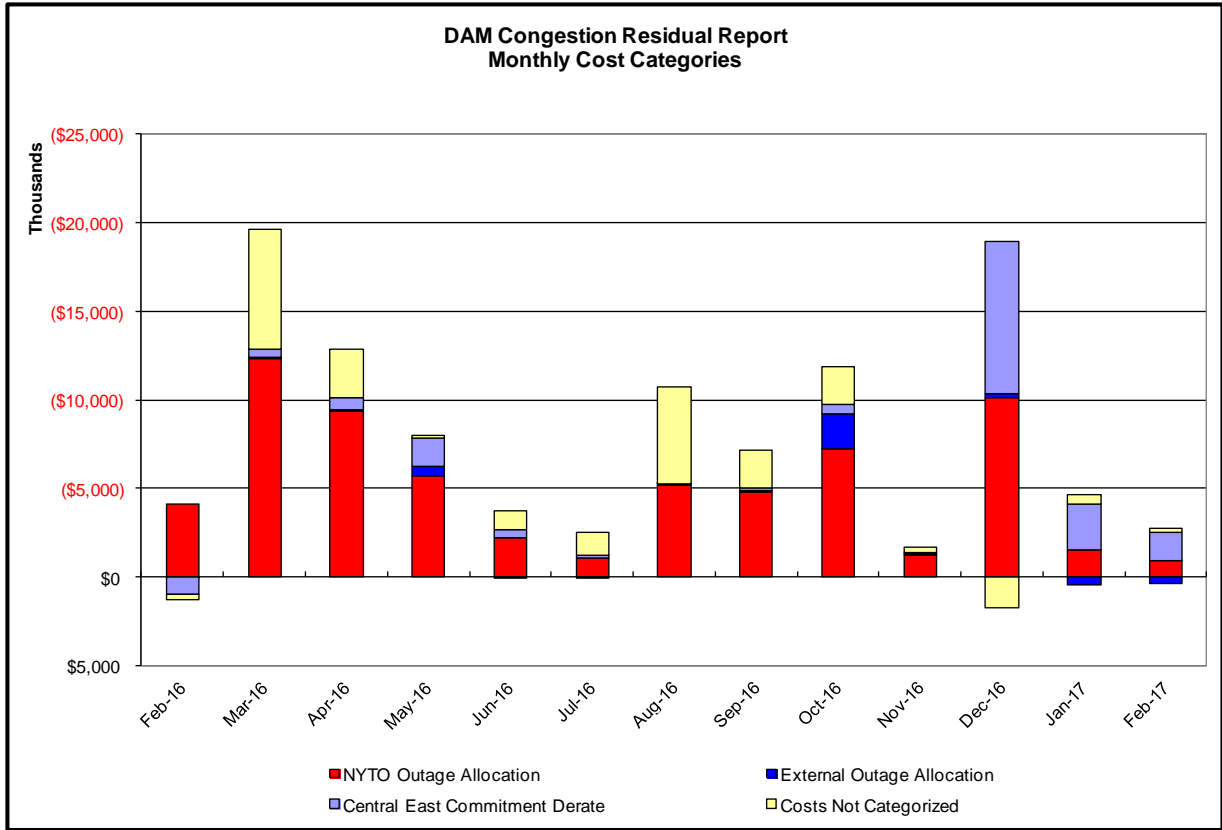
Day's investigated in April: 1,2,4,5,6,7,10,16,18,19,28			
Event	Date (yyyymmdd)	Hours	Description
	4/1/2017	10-12,20	NYCA DNI Ramp Limit
	4/1/2017	12-14,17,18,22,23	Uprate Central East
	4/1/2017	20	HQ_CHAT-NY Scheduling Limit
	4/1/2017	10-14,17,22,23	NE_AC-NY Scheduling Limit
	4/1/2017	22,23	NE_AC DNI Ramp Limit
	4/1/2017	13	NE_NNC1385-NY Scheduling Limit
	4/1/2017	20	PJM_AC DNI Ramp Limit
	4/1/2017	12,13	Lake Erie Circulation, DAM-RTM exceeds +/-125MW; Central East
	4/2/2017	0-5,7,12-17,22,23	Uprate Central East
	4/2/2017	0,22	NE_AC DNI Ramp Limit
	4/2/2017	7,12-15,17	PJM_AC-NY Scheduling Limit
	4/2/2017	1-3,5,7,12-15	Lake Erie Circulation, DAM-RTM exceeds +/-125MW; Central East
	4/4/2017	5,6,9,11-17,22,23	Uprate Central East
	4/4/2017	6,11	HQ_CHAT-NY Scheduling Limit
	4/4/2017	11-14,16,17,22,23	NE_AC-NY Scheduling Limit
	4/4/2017	23	NE_AC DNI Ramp Limit
	4/4/2017	5,6,9	Lake Erie Circulation, DAM-RTM exceeds +/-125MW; Central East
	4/5/2017	0-7,16,17	Uprate Central East
	4/5/2017	9	NYCA DNI Ramp Limit
	4/5/2017	0-2,16,17	NE_AC-NY Scheduling Limit
	4/5/2017	1,2	NE_AC DNI Ramp Limit
	4/5/2017	9	PJM_AC DNI Ramp Limit
	4/5/2017	16,17	Lake Erie Circulation, DAM-RTM exceeds +/-125MW; Central East
	4/6/2017	14-18	Thunder Storm Alert
	4/6/2017	13-23	Forced outage Chateaugay-Massena 765kV (#7040)/Massena-Marcy 765kV (#MSU1)
	4/6/2017	3,4,9	Uprate Central East
	4/6/2017	10,11	Derate Leeds-New Scotland 345kV (#94) for I/o BUS:N.SCTLD #99&18&1&94&BK1&C2
	4/6/2017	1	NE_AC DNI Ramp Limit
	4/6/2017	13-15	Lake Erie Circulation, DAM-RTM exceeds +/-125MW; Central East
	4/7/2017	0-4,7-14	Forced outage Chateaugay-Massena 765kV (#7040)/Massena-Marcy 765kV (#MSU1)
	4/7/2017	1,2,4	NE_AC DNI Ramp Limit
	4/7/2017	8	Lake Erie Circulation, DAM-RTM exceeds +/-125MW; Central East
	4/10/2017	15,16	Extended outage Leeds-New Scotland 345kV (#93)
	4/10/2017	16	Derate Central East
	4/10/2017	15	NE_AC DNI Ramp Limit
	4/10/2017	15	Lake Erie Circulation, DAM-RTM exceeds +/-125MW; Leeds-New Scotland
	4/16/2017	0-2,11-19	Uprate Central East
	4/16/2017	15	NYCA ACTIVE DNI
	4/16/2017	0-2,11,12,17,18,19	NE_AC DNI Ramp Limit
	4/16/2017	1,11,12,19	PJM_AC-NY Scheduling Limit
	4/18/2017	8-17	Forced outage Dunwoodie-Mott Haven 345kV (#71)
	4/19/2017	8-17,19,21,23	Forced outage Dunwoodie-Mott Haven 345kV (#71)
	4/19/2017	21,23	NYCA DNI Ramp Limit
	4/19/2017	4	Uprate Central East
	4/19/2017	21	NE_AC DNI Ramp Limit
	4/19/2017	4	Lake Erie Circulation, DAM-RTM exceeds +/-125MW; Central East
	4/28/2017	17	Extended outage Niagara-Rochester 345kV (#NR2)
	4/28/2017	2,5	Uprate Central East
	4/28/2017	15	Uprate Dysinger East
	4/28/2017	9,15	Uprate East 179th Street-HellGate West 138kV (#15055)
	4/28/2017	10,11	Derate MottHaven-Dunwoodie 345kV (#72)
	4/28/2017	2,4	NE_AC-NY Scheduling Limit
	4/28/2017	10,11	Lake Erie Circulation, DAM-RTM exceeds +/-125MW; Niagara-Packard, Niagara Robinson Road

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 Lake Erie Loop Flows exceeding +/- 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.
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.	

