

Operations Performance Metrics Monthly Report



October 2016 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 November 8, 2016.

Table of Contents

- ◆ **Highlights**
 - *Operations Performance*

- ◆ **Reliability Performance Metrics**
 - *Alert State Declarations*
 - *Major Emergency State Declarations*
 - *IROL Exceedance Times*
 - *Balancing Area Control Performance*
 - *Reserve Activations*
 - *Disturbance Recovery Times*
 - *Load Forecasting Performance*
 - *Wind Forecasting Performance*
 - *Wind Curtailment Performance*
 - *Lake Erie Circulation and ISO Schedules*

- ◆ **Broader Regional Market Performance Metrics**
 - *Ramapo Interconnection Congestion Coordination Monthly Value*
 - *Ramapo Interconnection Congestion Coordination Daily Value*
 - *Regional Generation Congestion Coordination Monthly Value*
 - *Regional Generation Congestion Coordination Daily Value*
 - *Regional RT Scheduling - PJM Monthly Value*
 - *Regional RT Scheduling - PJM Daily Value*

- ◆ **Market Performance Metrics**
 - *Monthly Statewide Uplift Components and Rate*
 - *RTM Congestion Residuals Monthly Trend*
 - *RTM Congestion Residuals Daily Costs*
 - *RTM Congestion Residuals Event Summary*
 - *RTM Congestion Residuals Cost Categories*
 - *DAM Congestion Residuals Monthly Trend*
 - *DAM Congestion Residuals Daily Costs*
 - *DAM Congestion Residuals Cost Categories*
 - *NYCA Unit Uplift Components Monthly Trend*
 - *NYCA Unit Uplift Components Daily Costs*
 - *Local Reliability Costs Monthly Trend & Commitment Hours*
 - *TCC Monthly Clearing Price with DAM Congestion*
 - *ICAP Spot Market Clearing Price*
 - *UCAP Awards*

October 2016 Operations Performance Highlights

- Peak load of 21,143 MW occurred on 10/18/2016 HB 18
- All-time summer capability period peak load of 33,956 MW occurred on 7/19/2013 HB 16
- 0 hours of Thunder Storm Alerts were declared
- 0 hours of NERC TLR level 3 curtailment
- Higher levels of wind curtailment in the North Country this month were coincident with the scheduled outages of the Chateaugay-Massena 765kV (#7040), Massena-Marcy 765kV (#MSU1), and Moses-Massena 230kV (#MMS1/MMS2) transmission lines.
- On 10/21/2016, the Gardenville-Stolle Road 230kV (#66) transmission line ratings were increased by 104MW due to NYSEG efforts to advance part of a 2019 project to upgrade restrictive terminal equipment.
- The following table identifies the estimated production cost savings associated with the Broader Regional Market initiatives.

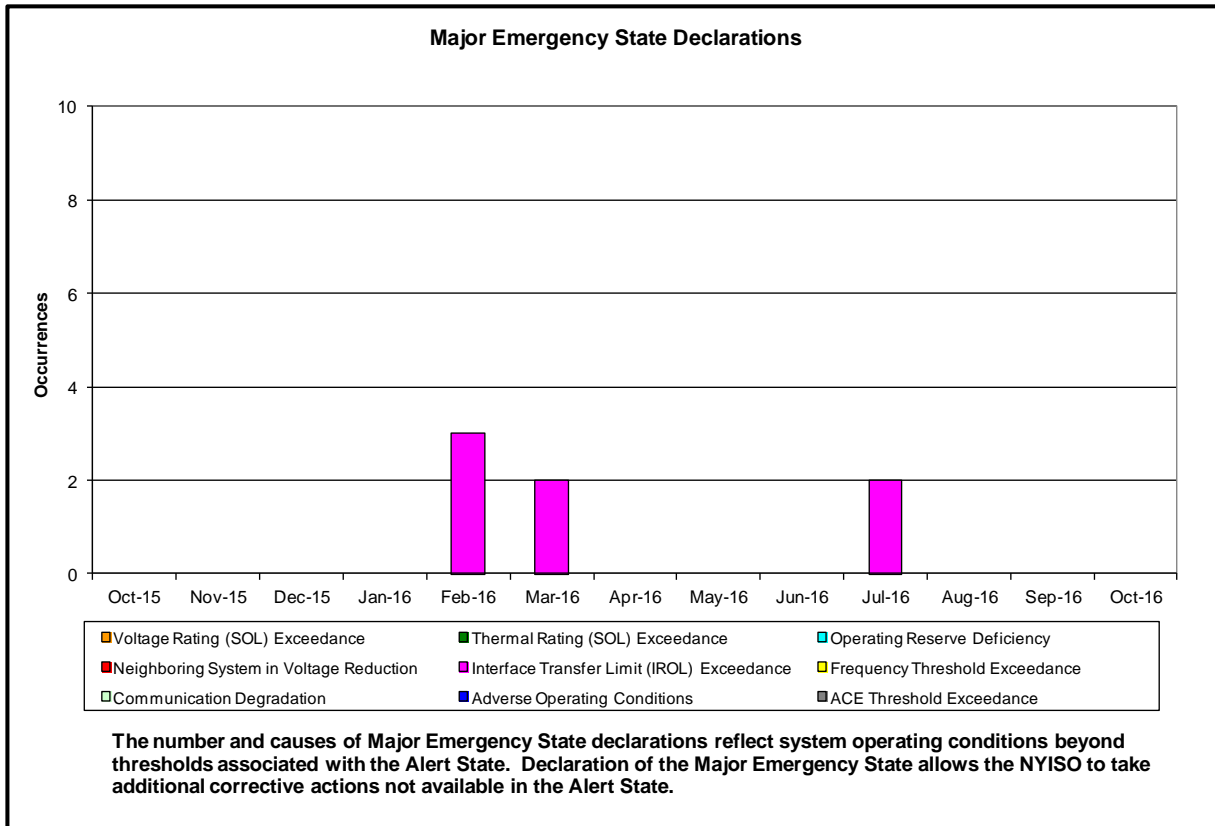
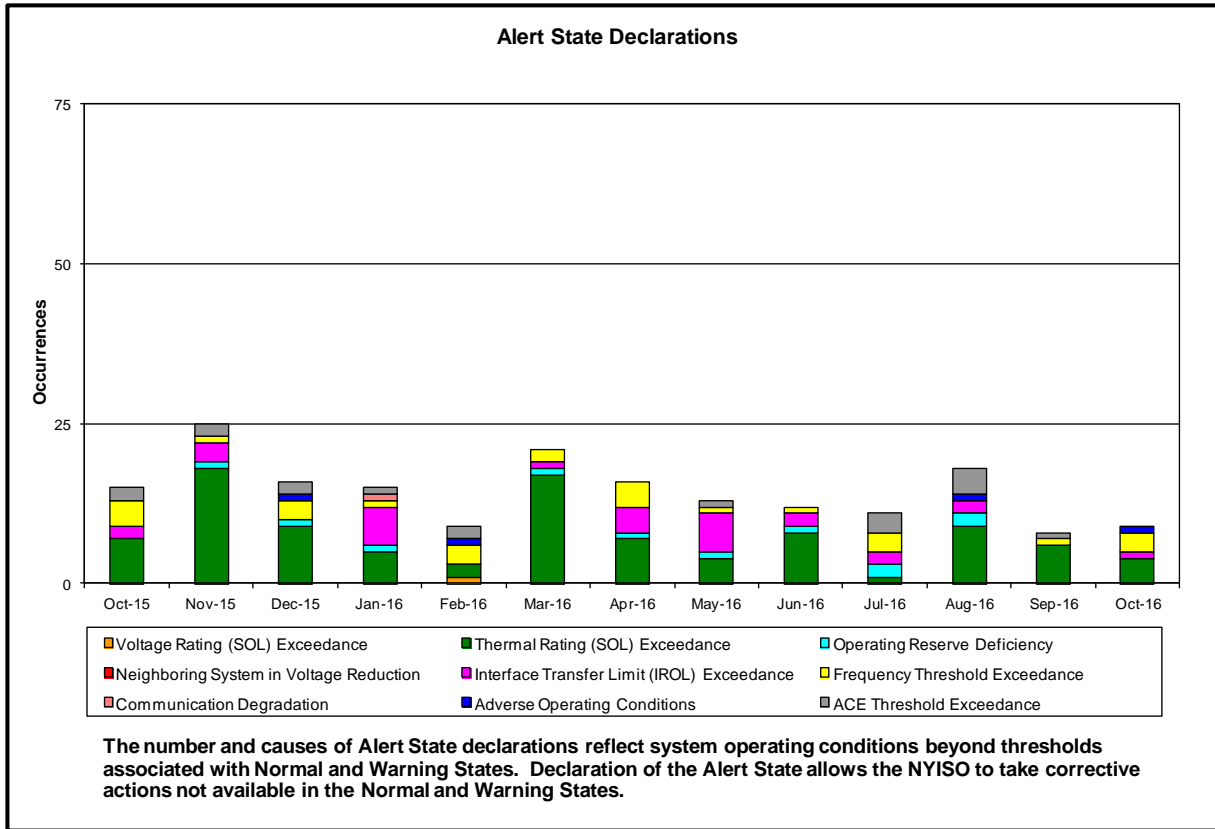
	Current Month Value (\$M)	Year-to-Date Value (\$M)
NY Savings from PJM-NY Congestion Coordination	\$0.11	\$16.70
NY Savings from PJM-NY Coordinated Transaction Scheduling	(\$0.08)	(\$0.55)
NY Savings from NE-NY Coordinated Transaction Scheduling	(\$0.04)	(\$1.52)
Total NY Savings	(\$0.01)	\$14.63
Regional Savings from PJM-NY Coordinated Transaction Scheduling	\$0.13	\$2.14
Regional Savings from NE-NY Coordinated Transaction Scheduling	\$0.07	\$1.51
Total Regional Savings	\$0.20	\$3.65

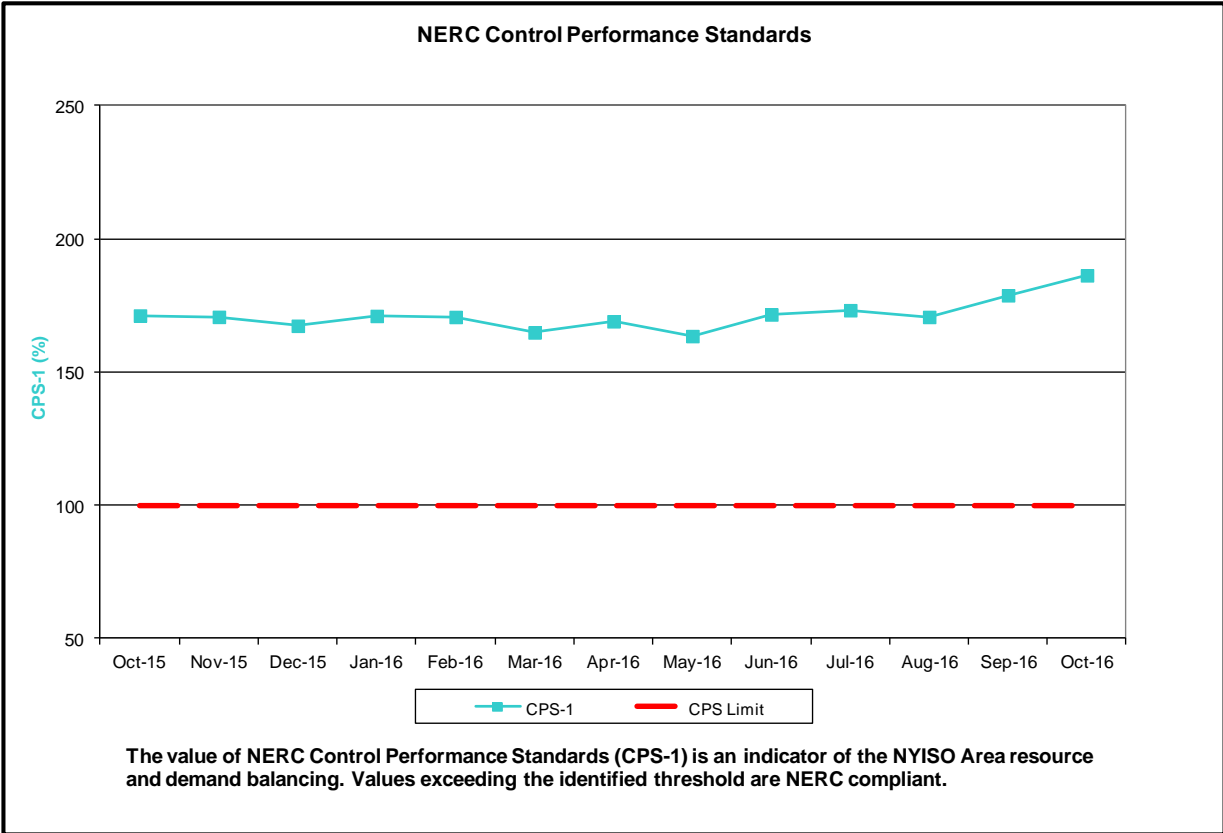
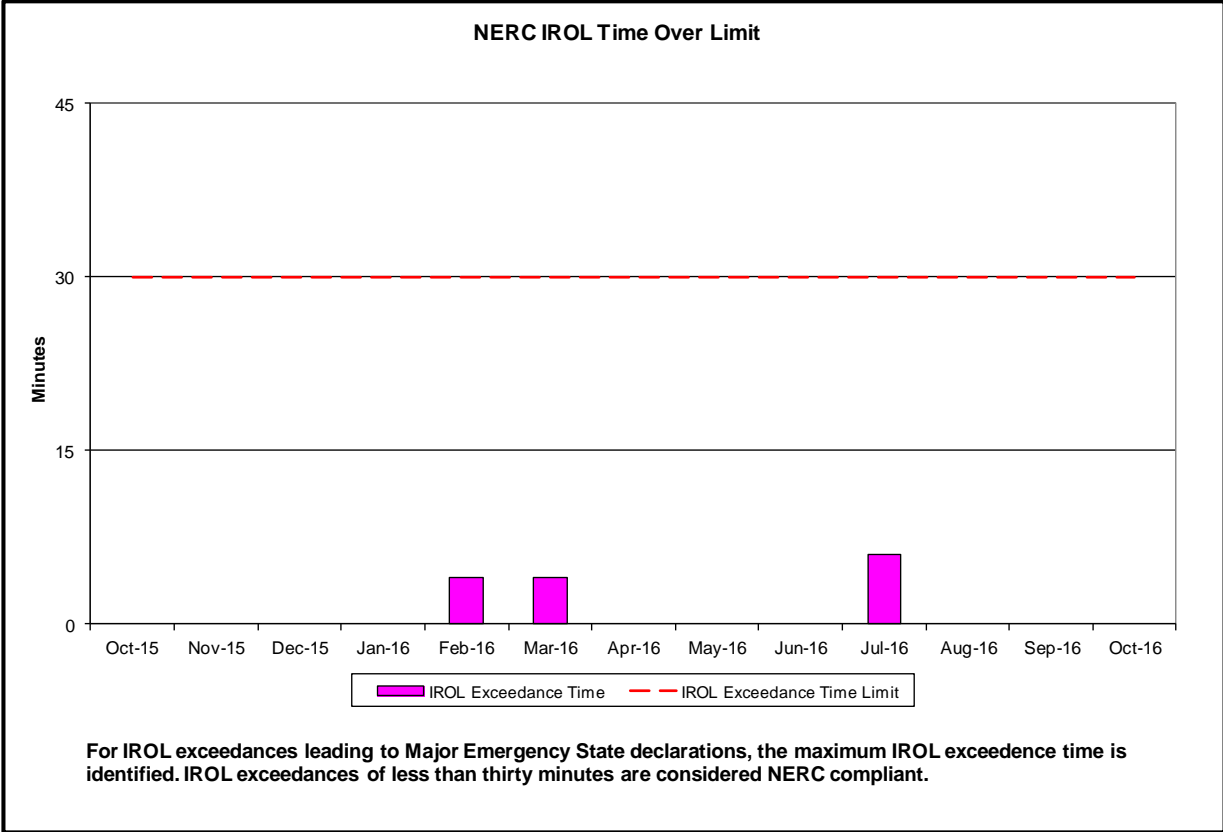
- Statewide uplift cost monthly average was **(\$0.24)/MWh**
- The following table identifies the Monthly ICAP spot market prices by locality and changes from the end of the prior Winter Capability period.

Spot Auction Price Results	NYCA	Lower Hudson Valley Zones	New York City Zone	Long Island Zone
November 2016 Spot Price	\$0.35	\$3.69	\$3.69	\$0.35
April 2016 Spot Price	\$0.58	\$3.03	\$5.65	\$1.60
Delta	(\$0.23)	\$0.66	(\$1.96)	(\$1.25)

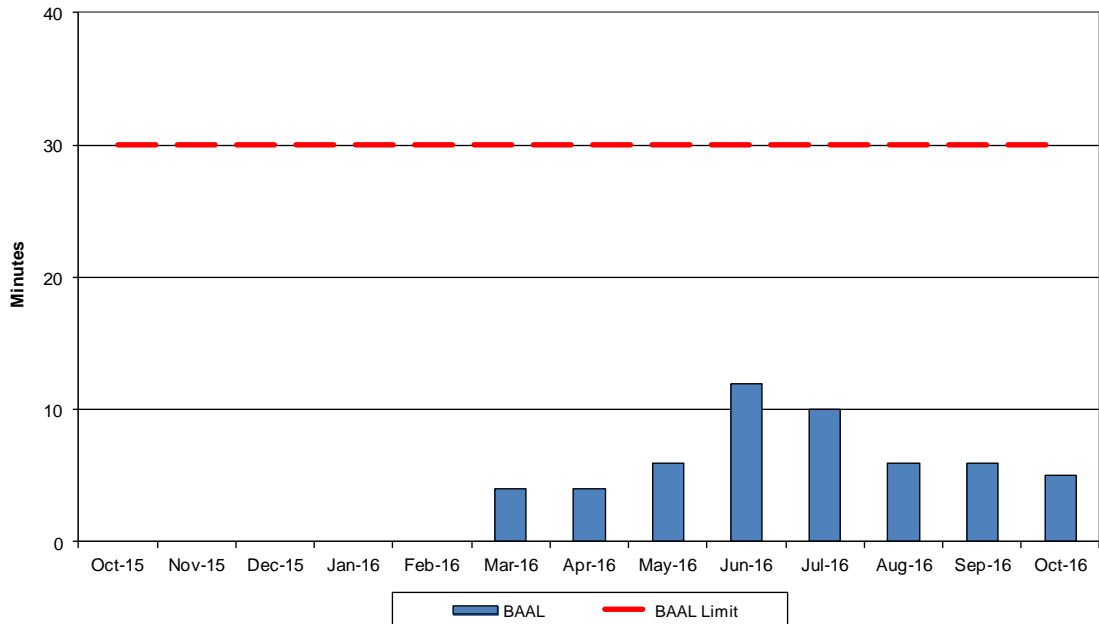
- Price changes from April 2016 to November 2016 are driven mainly by changes in supply as well as Capability Year inputs such as demand curve parameters, Locational Capacity Requirements, the installed Reserve margins and the load forecast.
- NYCA set the LI price and Lower Hudson Valley set the NYC price for this month.

- Reliability Performance Metrics



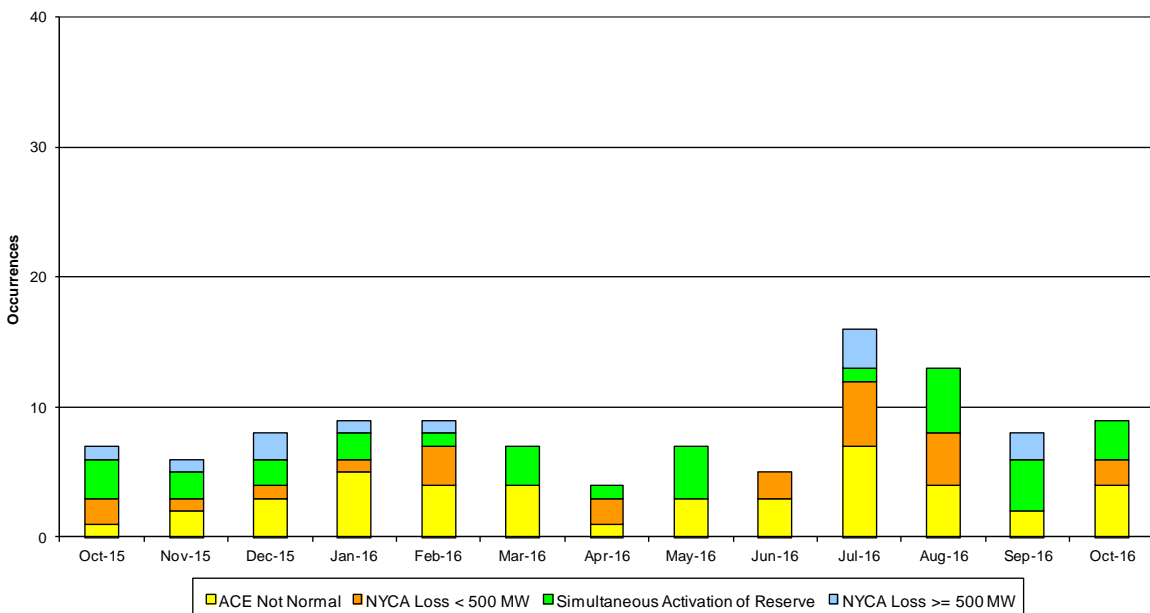


NERC Balancing Authority ACE Limit Standard

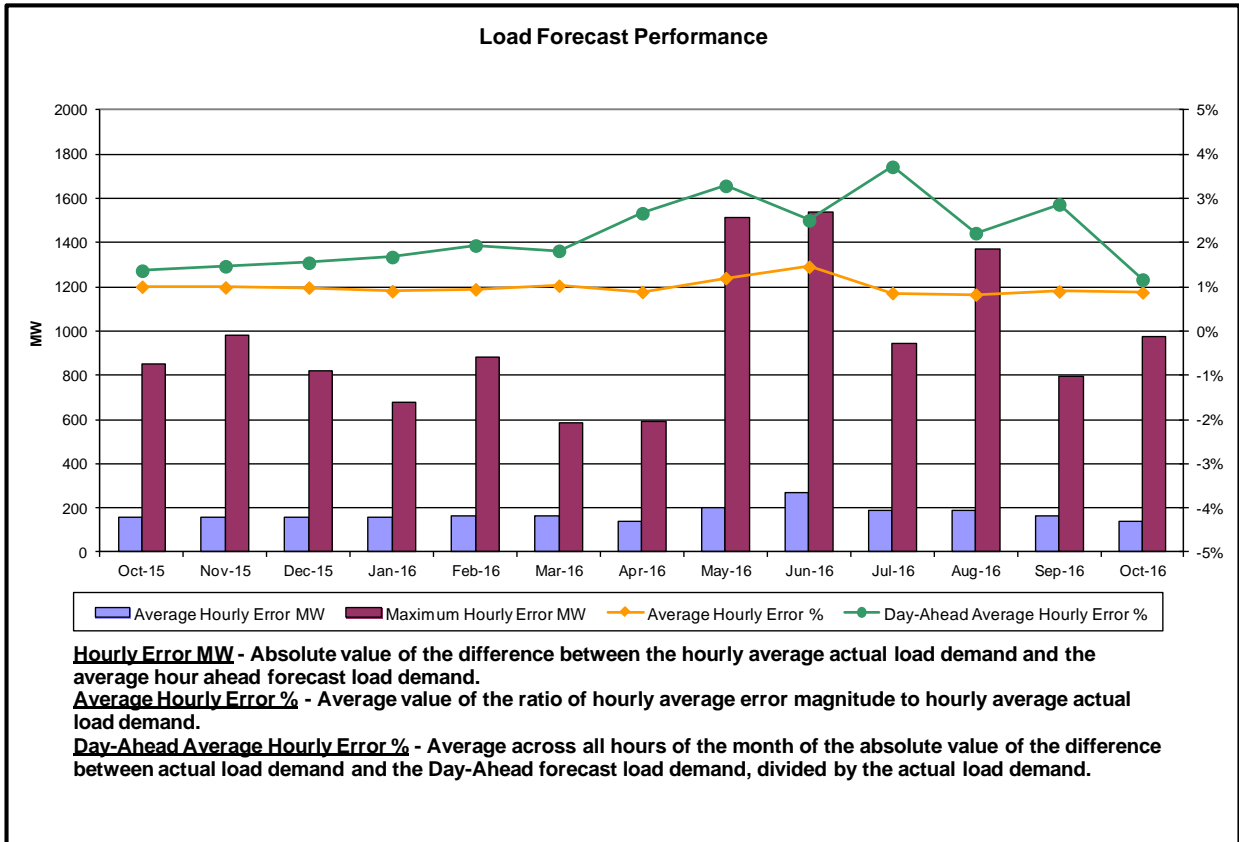
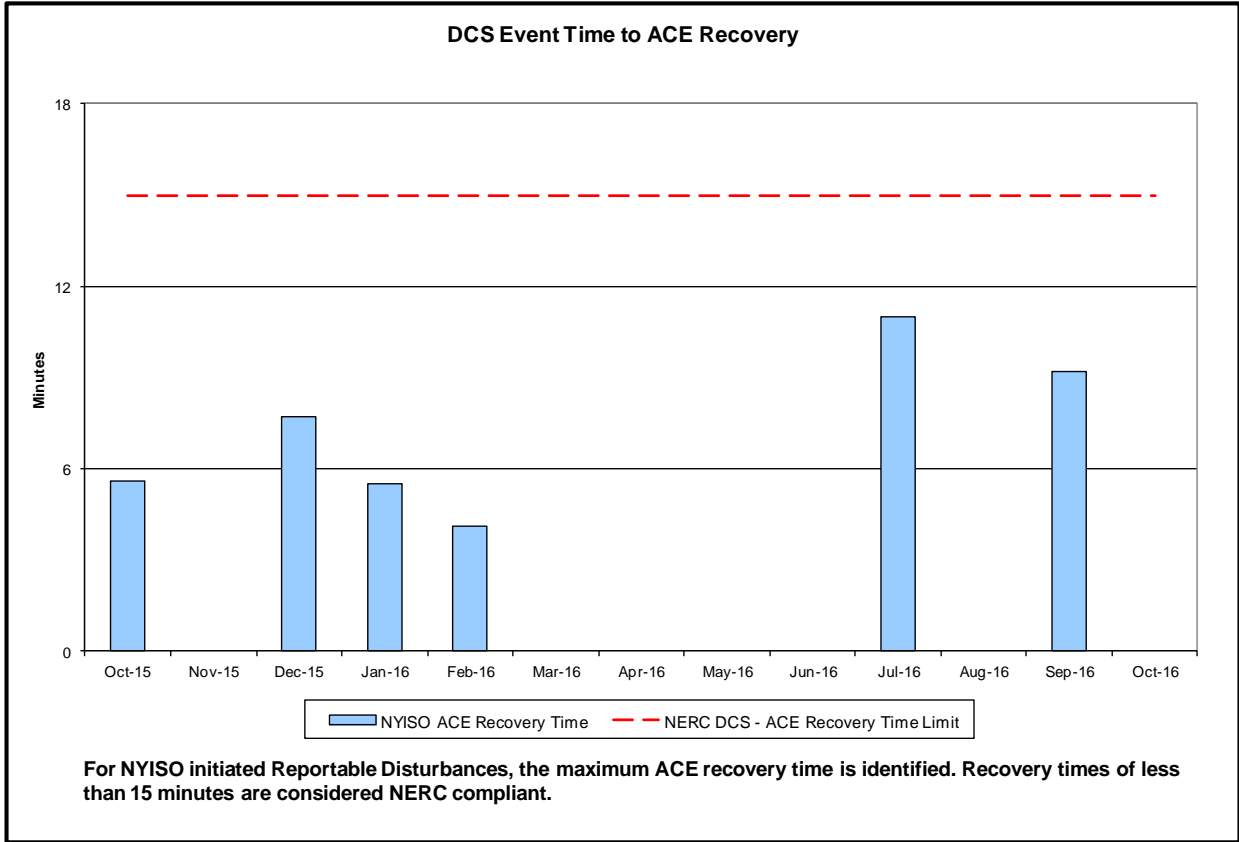


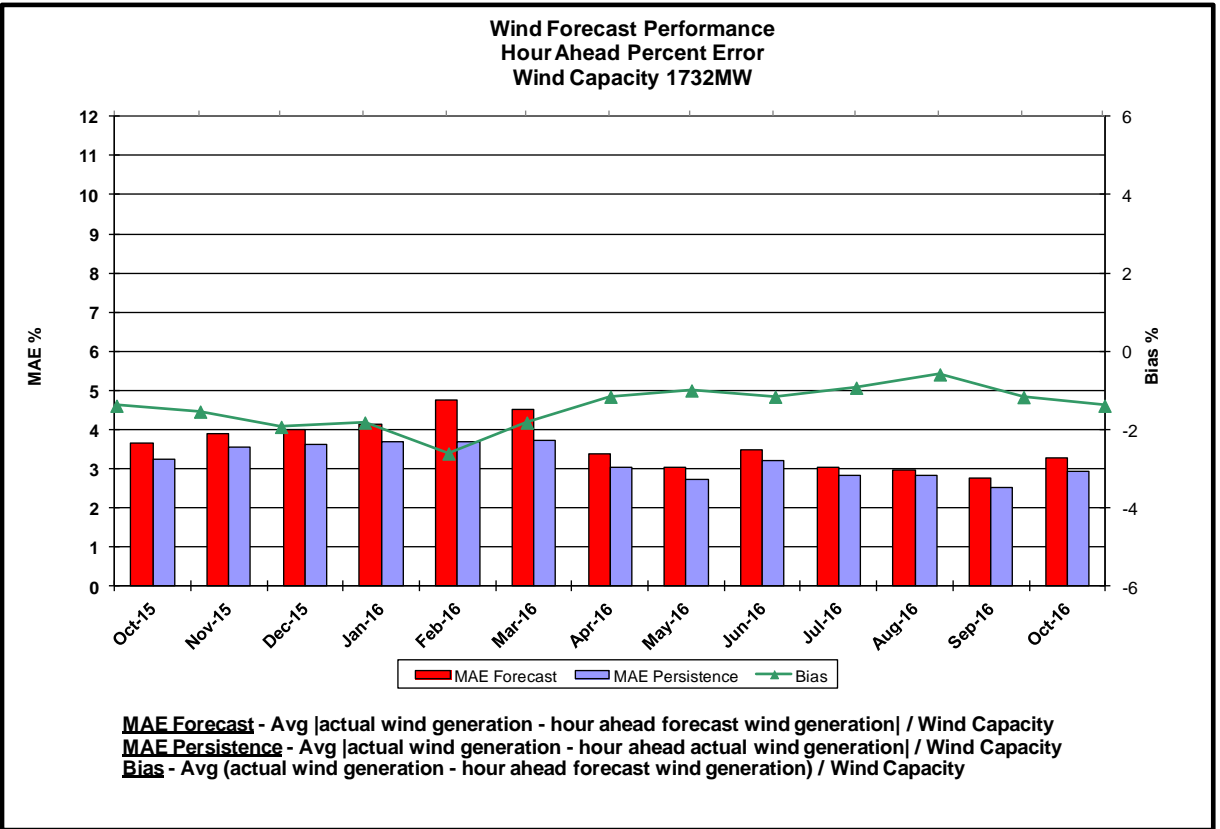
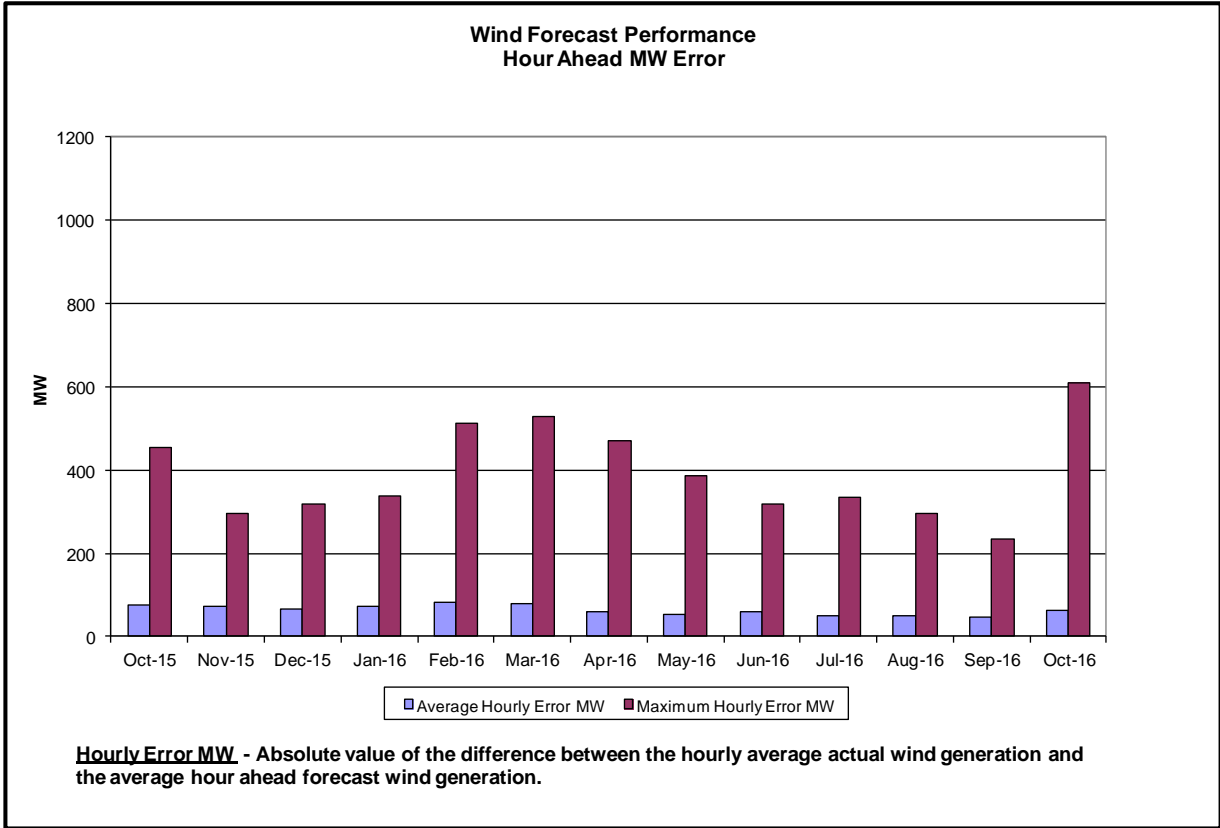
The amount of time the clock-minute average ACE exceeds the clock-minute Balancing Authority ACE Limit (BAAL) is an indicator of the NYISO Area resource and demand balancing. The maximum BAAL exceedance time is identified. BAAL exceedances of less than 30 consecutive clock-minutes are NERC compliant.

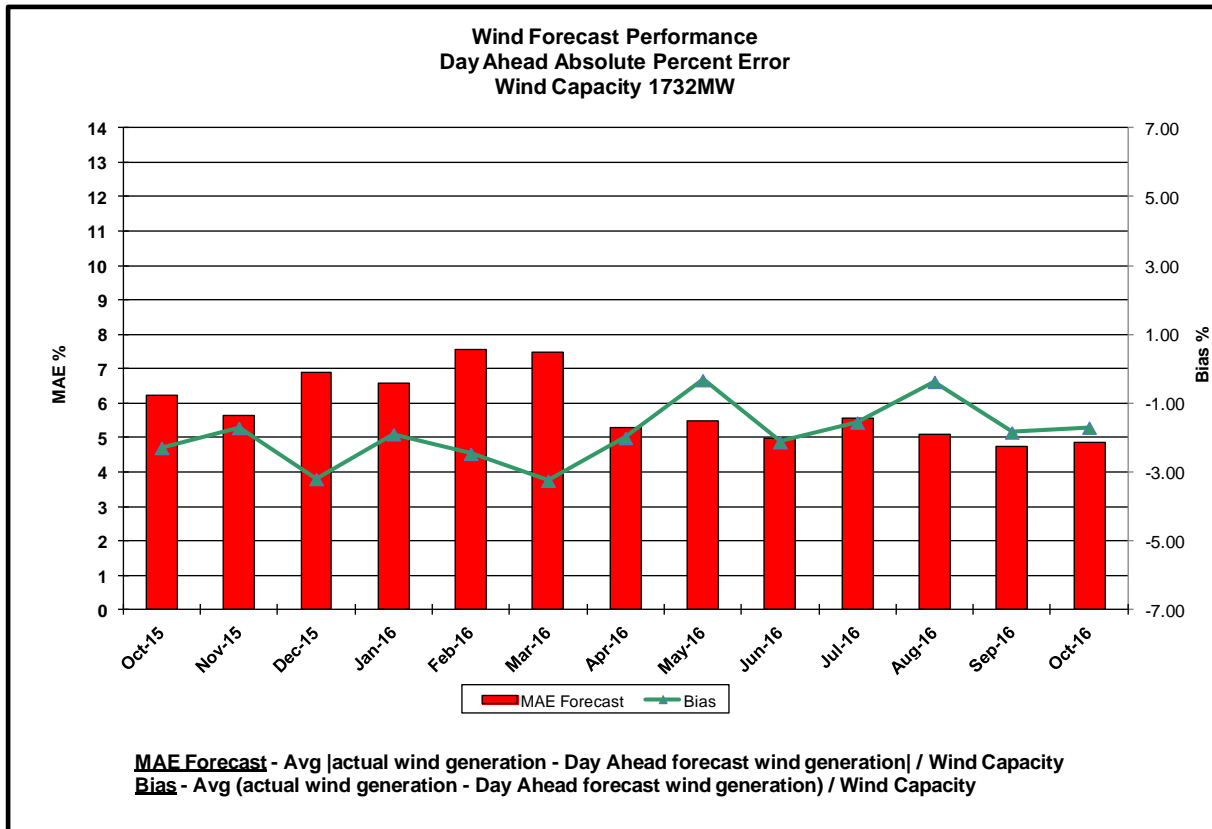
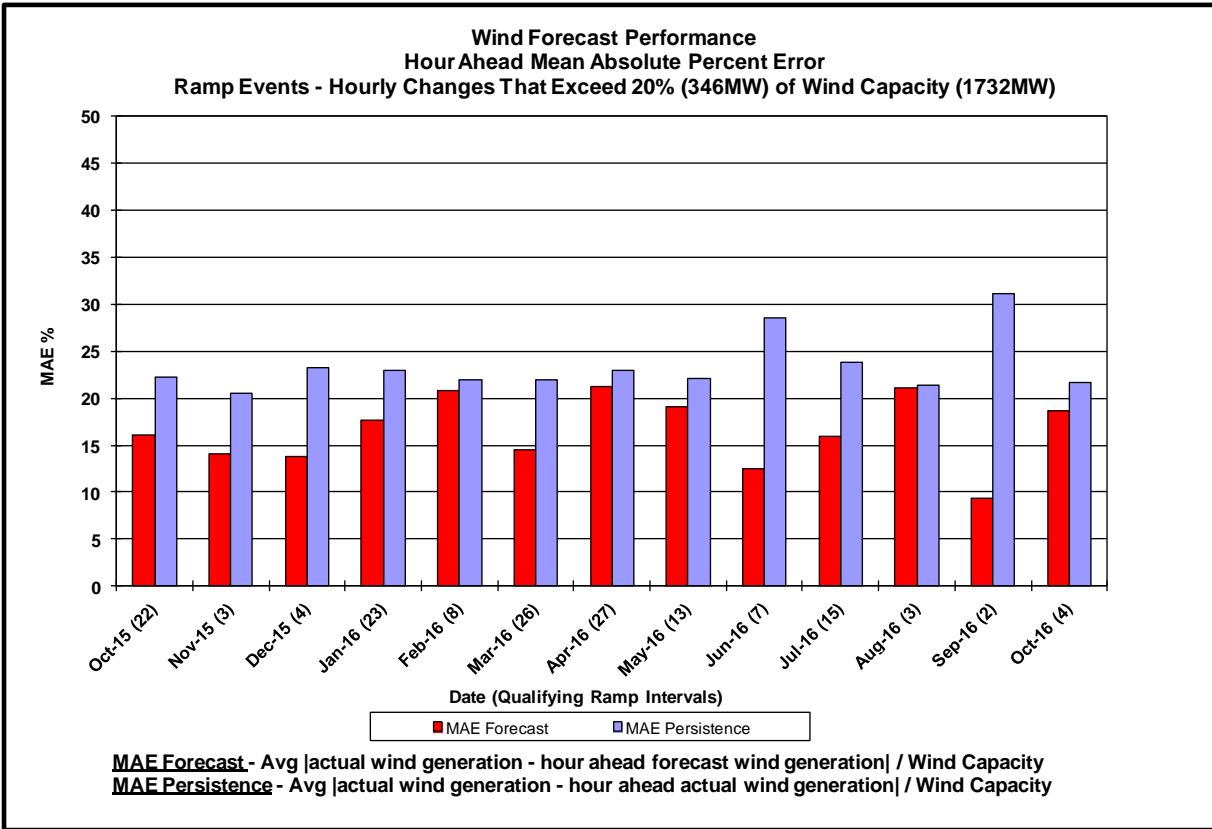
Reserve Activations

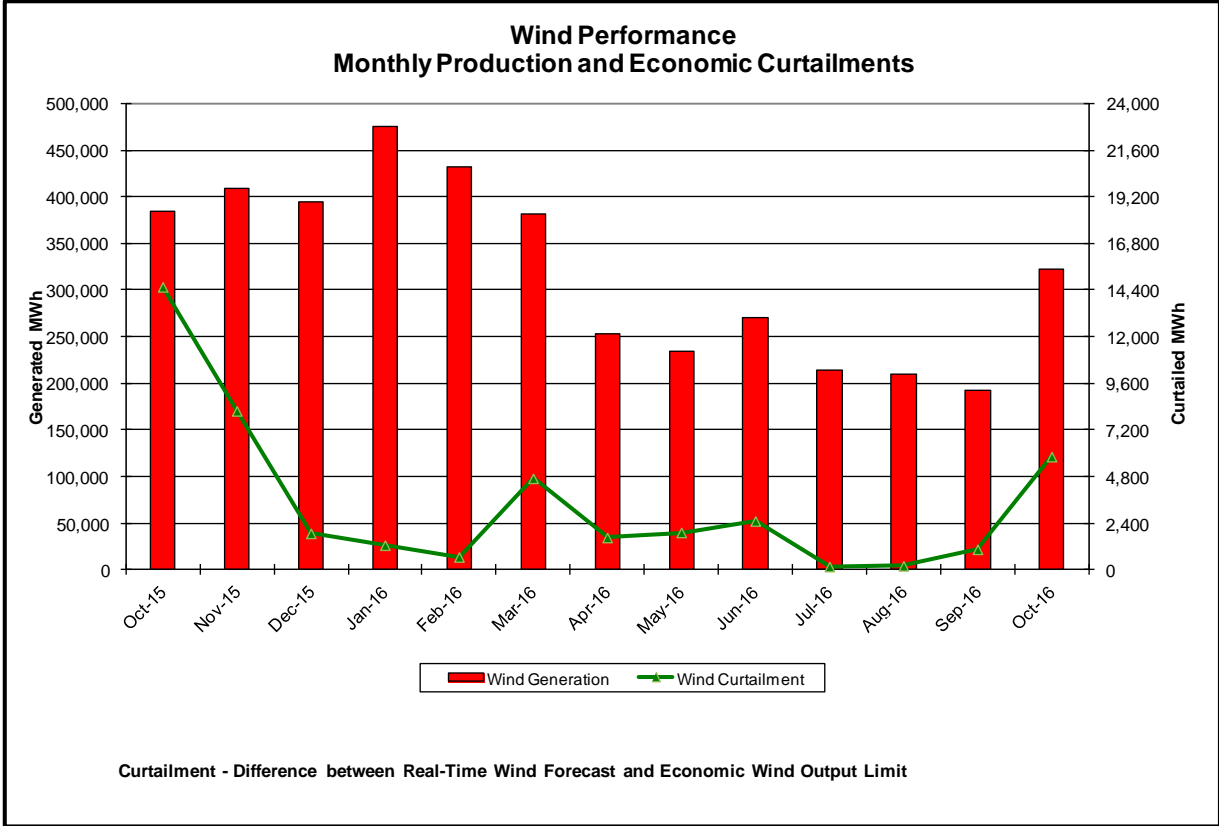


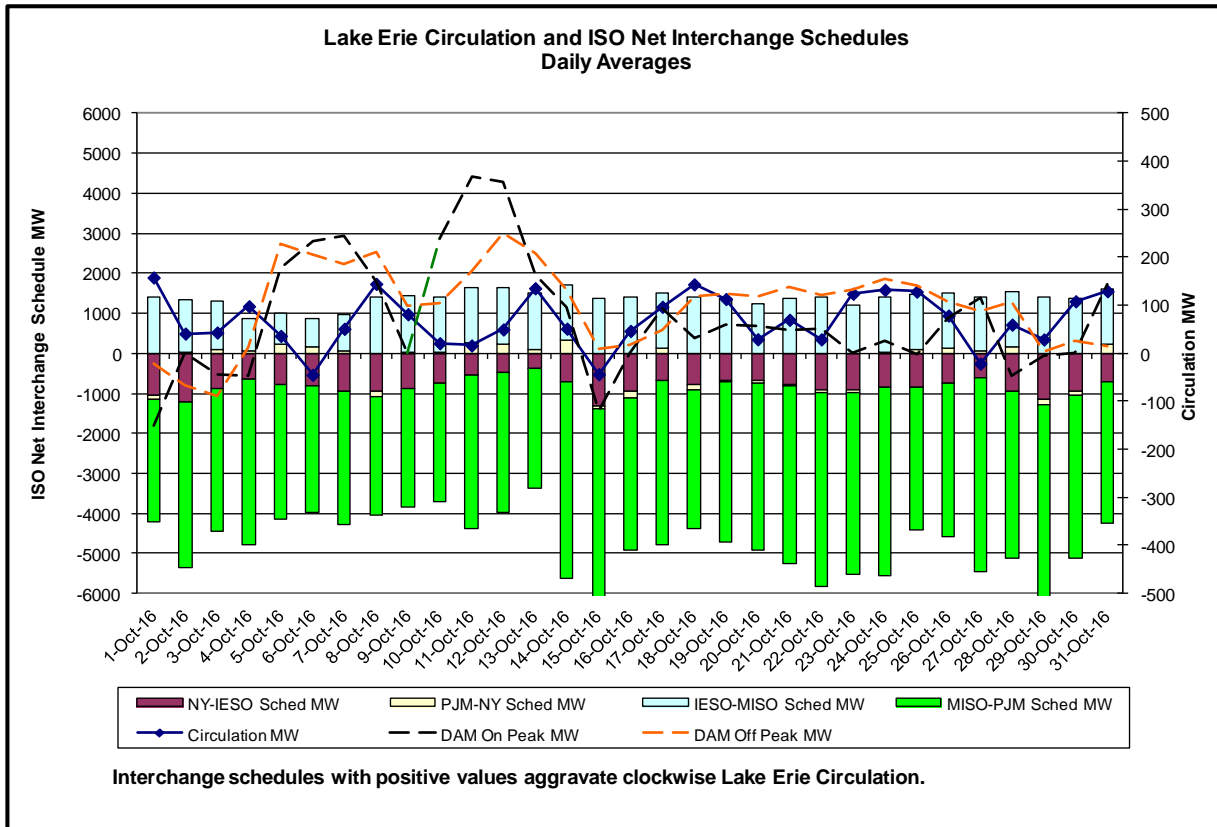
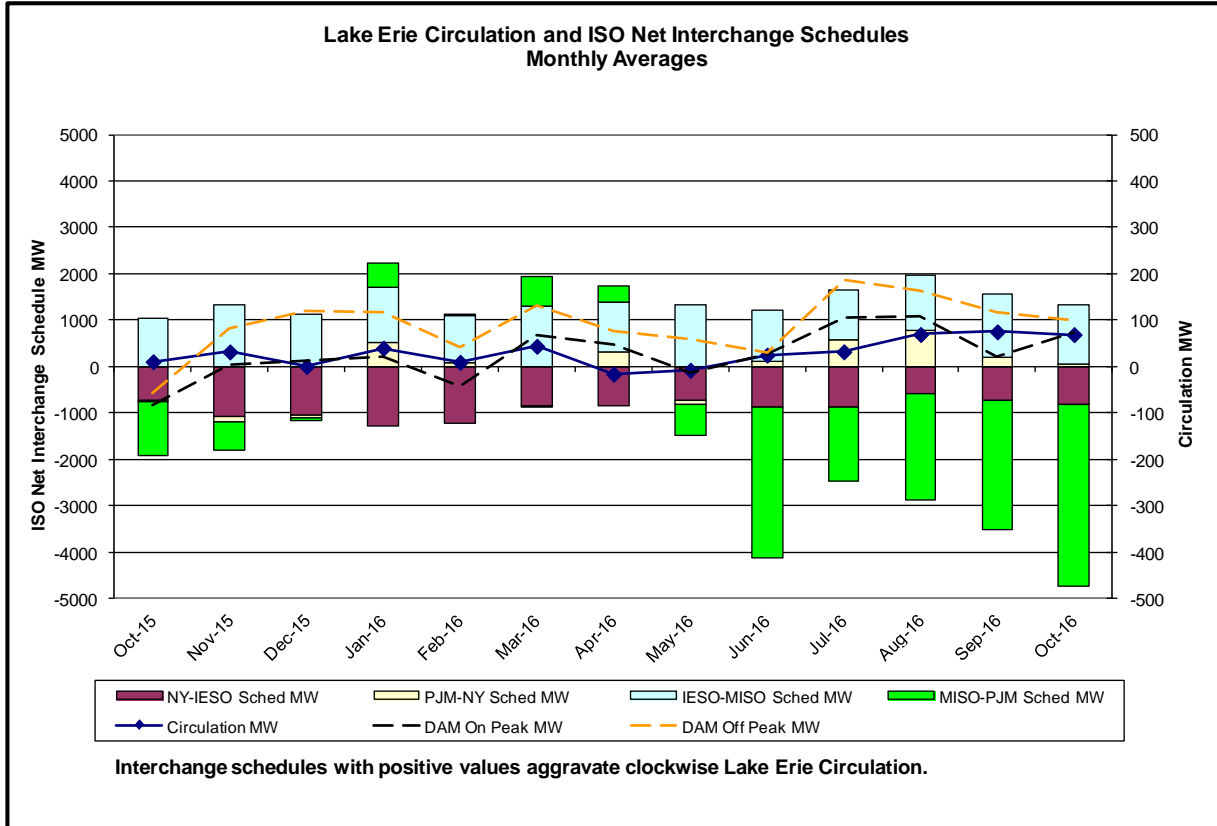
NYISO Reserve Activations are indicators of the need to respond to unexpected operational conditions within the NYISO Area or to assist a neighboring Area (Simultaneous Activation of Reserves) by activating an immediate resource and demand balancing operation.



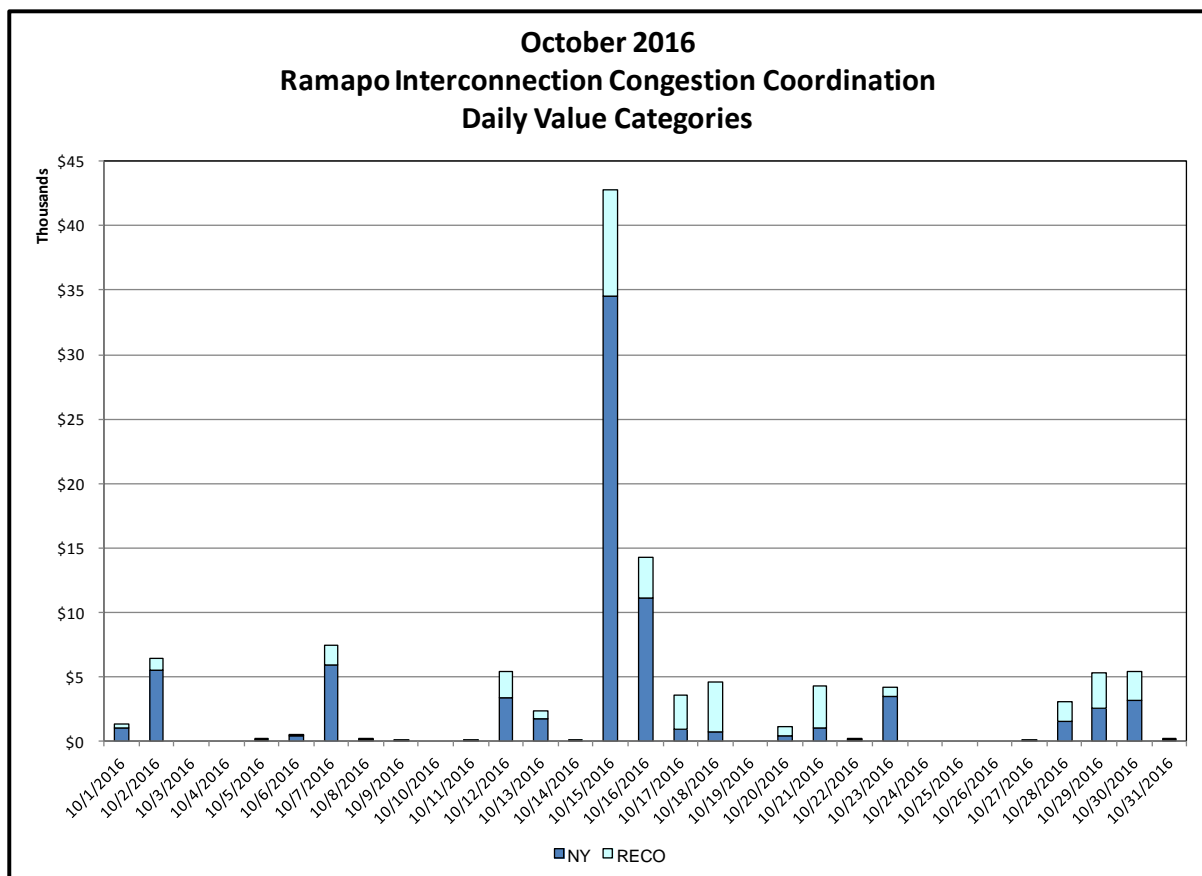
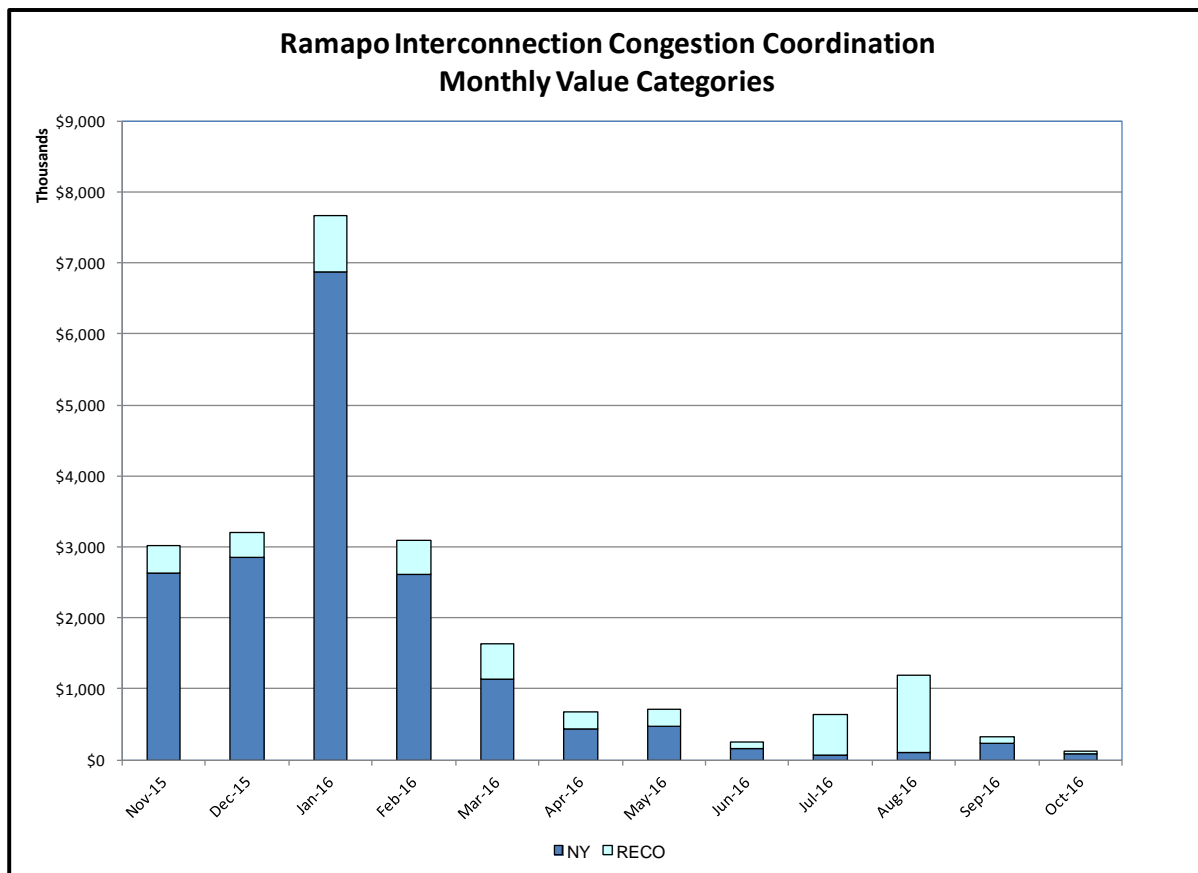






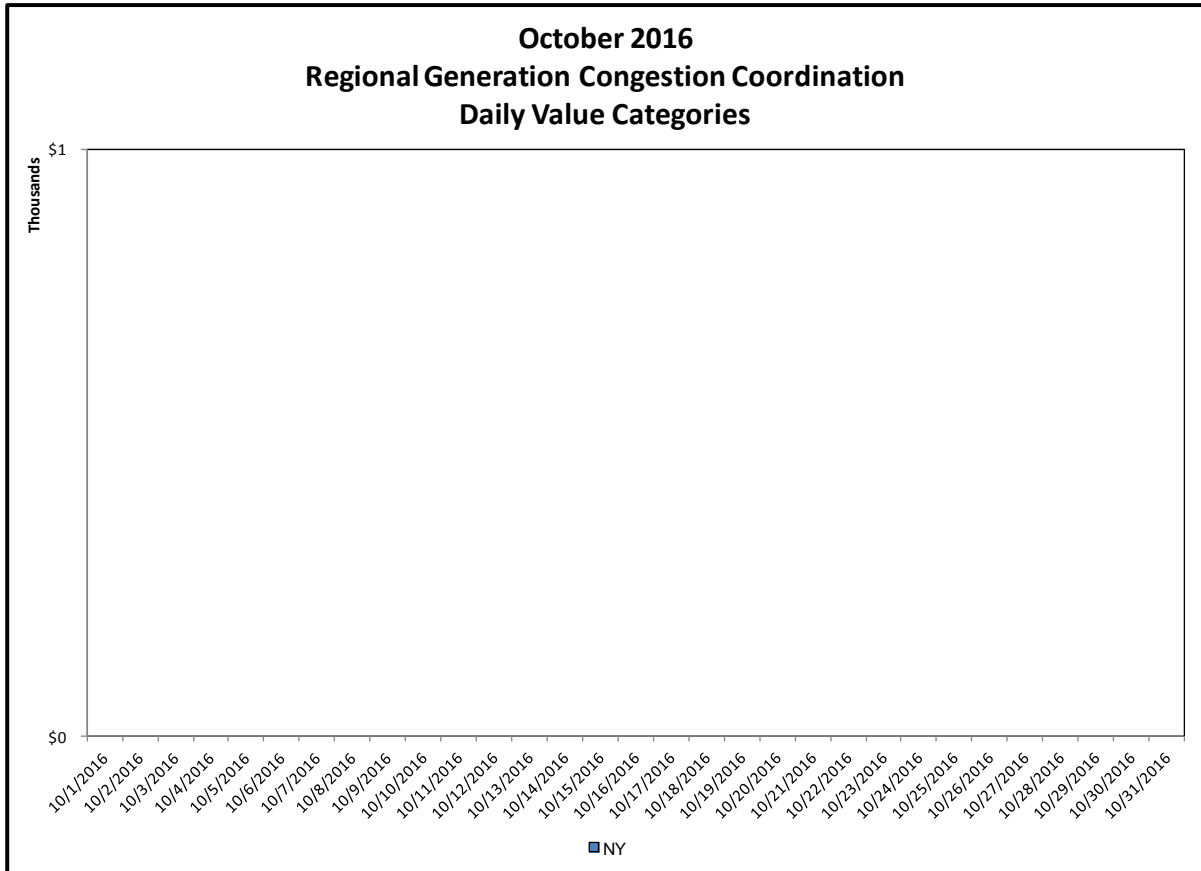
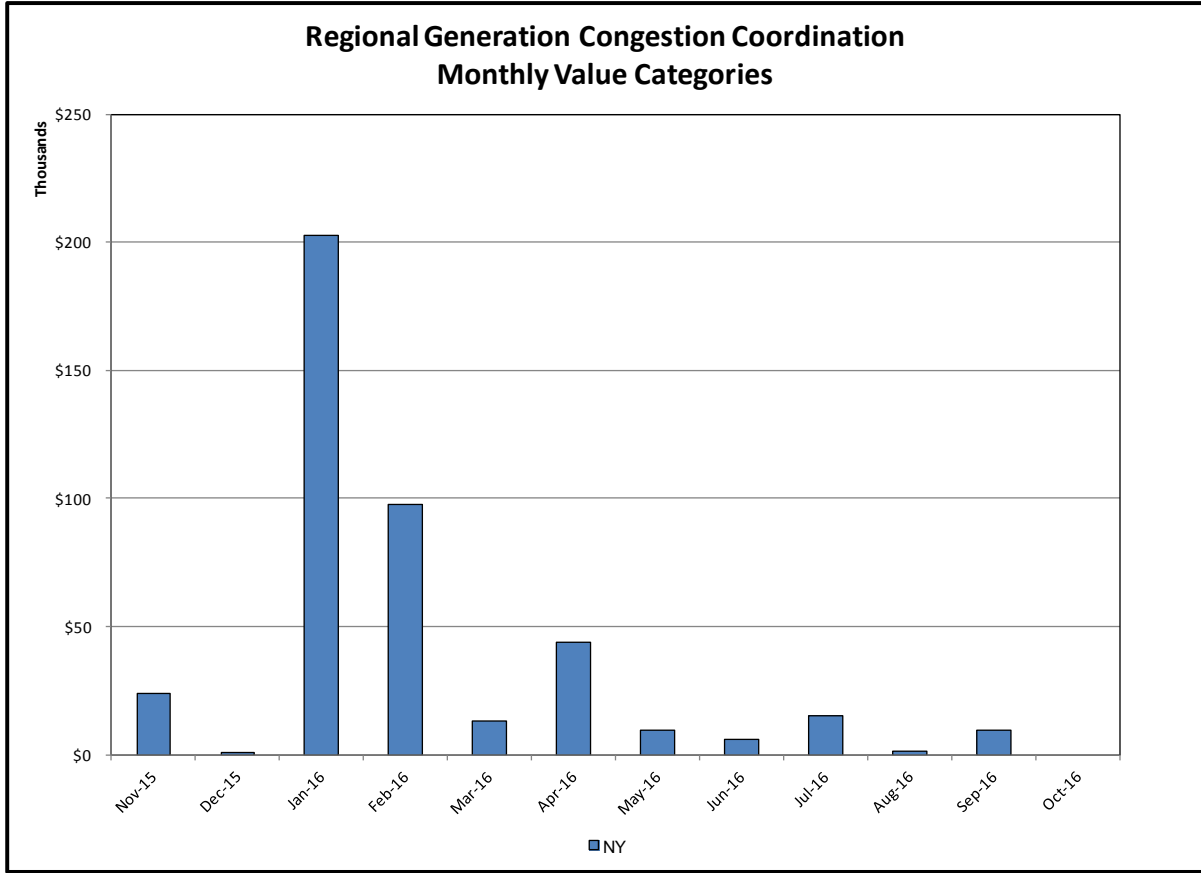


Broader Regional Market Performance Metrics



Ramapo Interconnection Congestion Coordination

<u>Category</u>	<u>Description</u>
NY	<p>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.</p>
RECO	<p>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.</p>



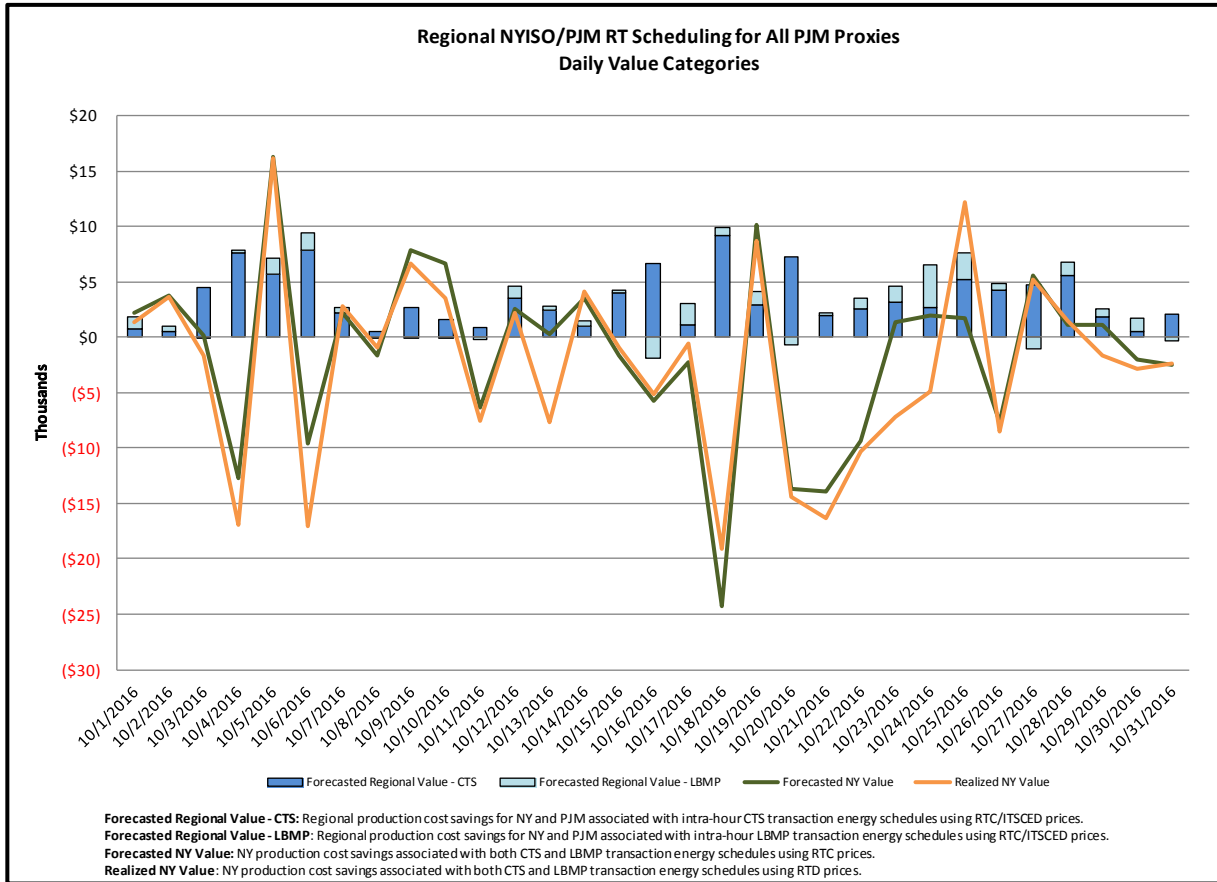
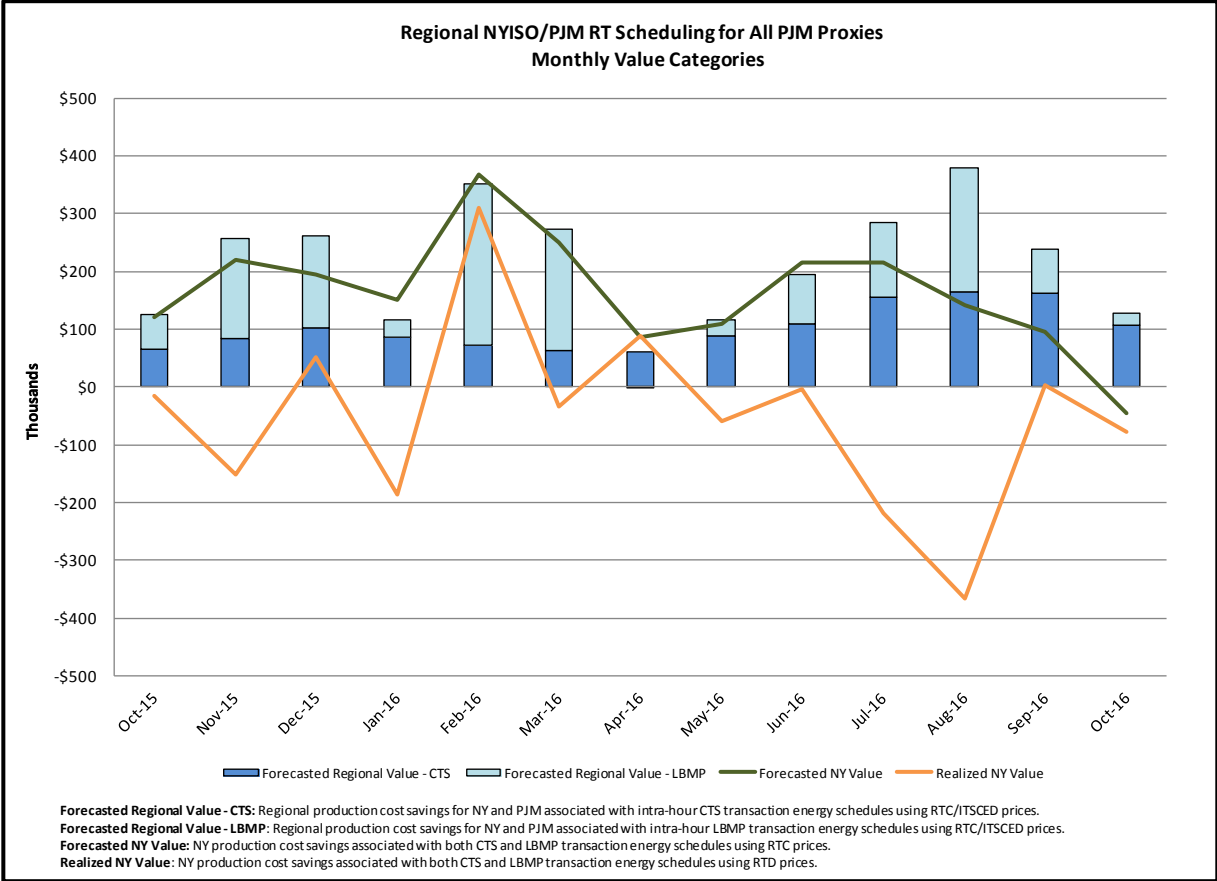
Regional Generation Congestion Coordination

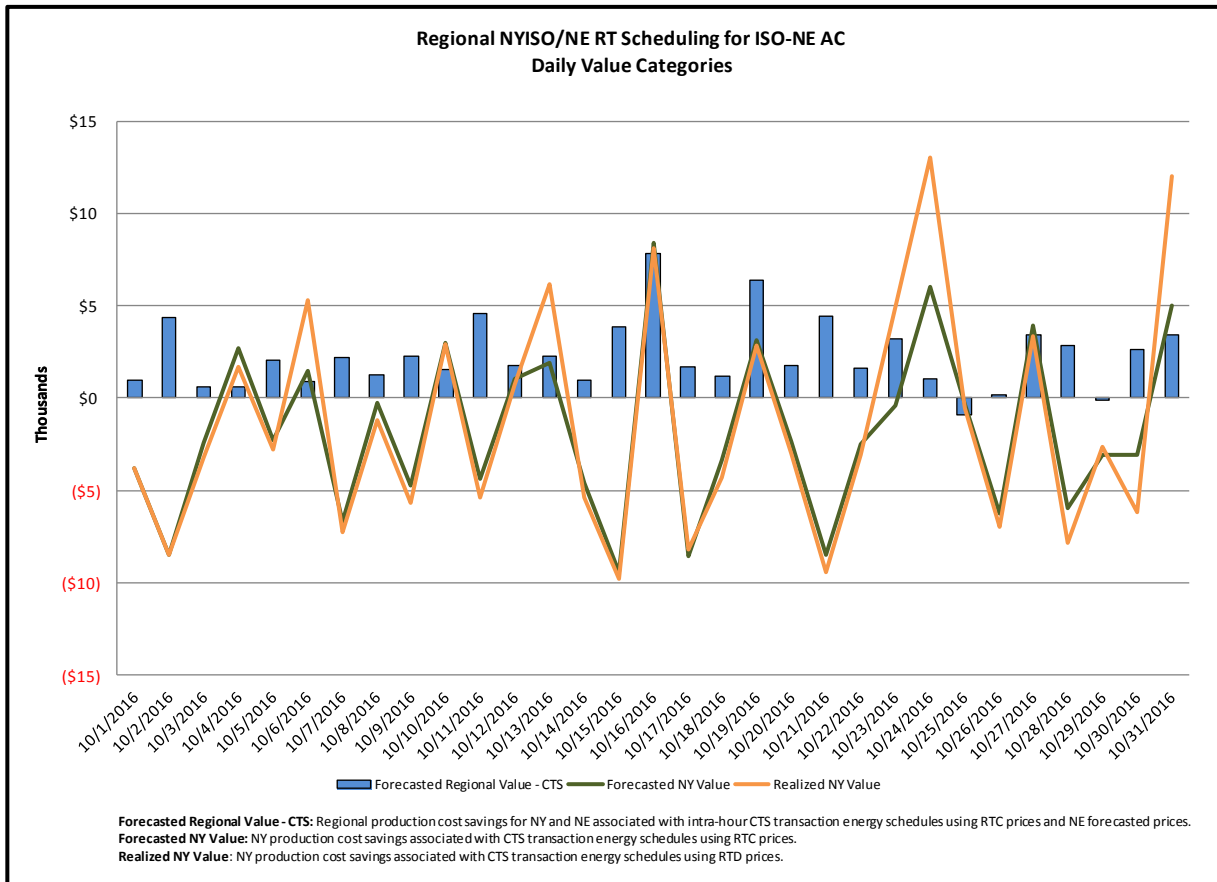
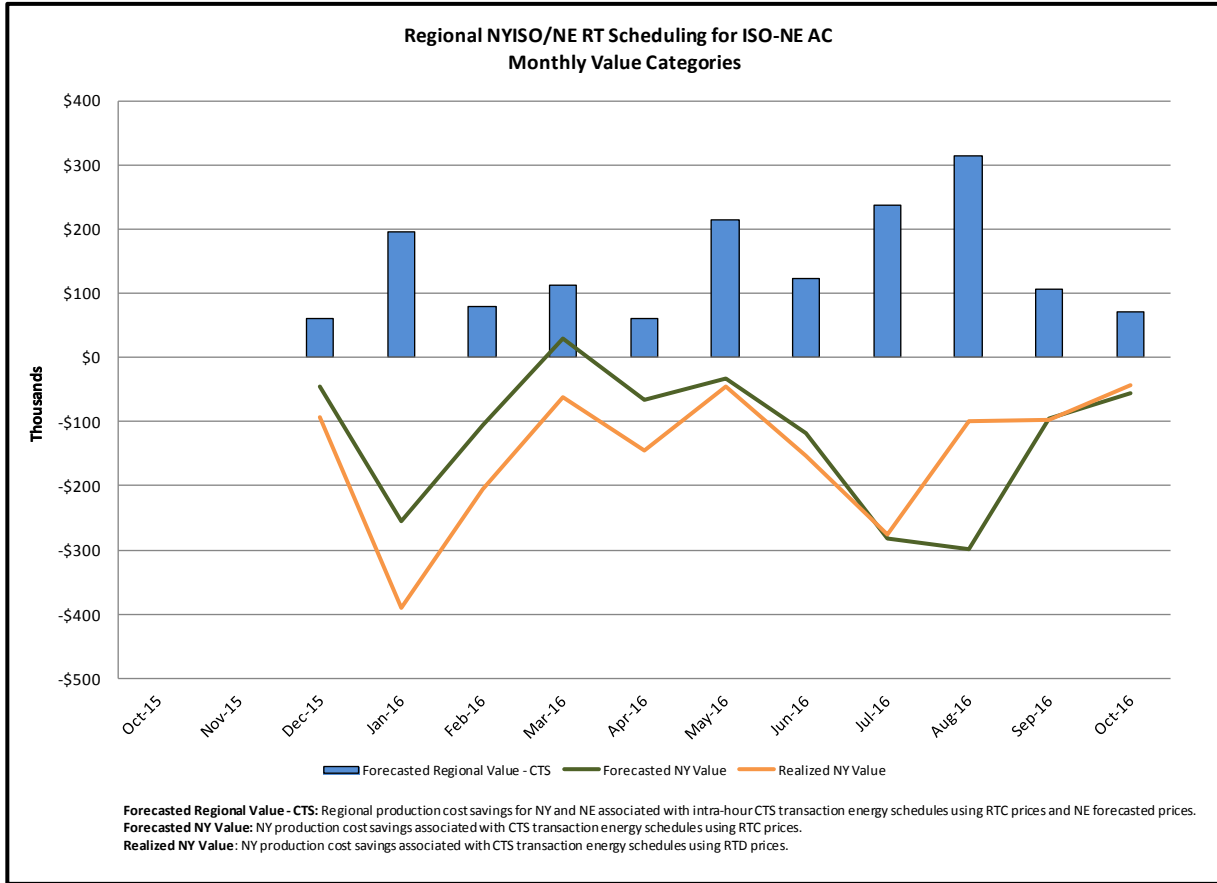
Category

NY

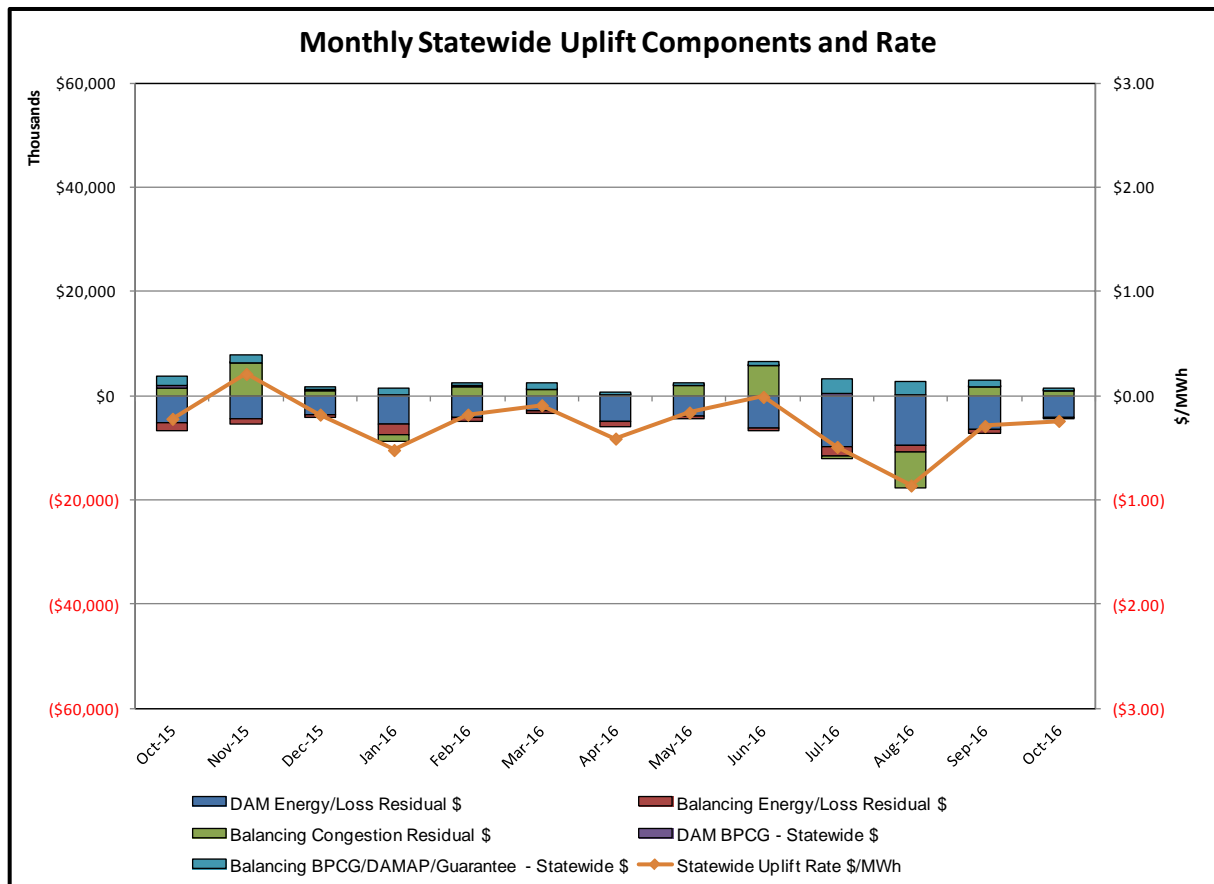
Description

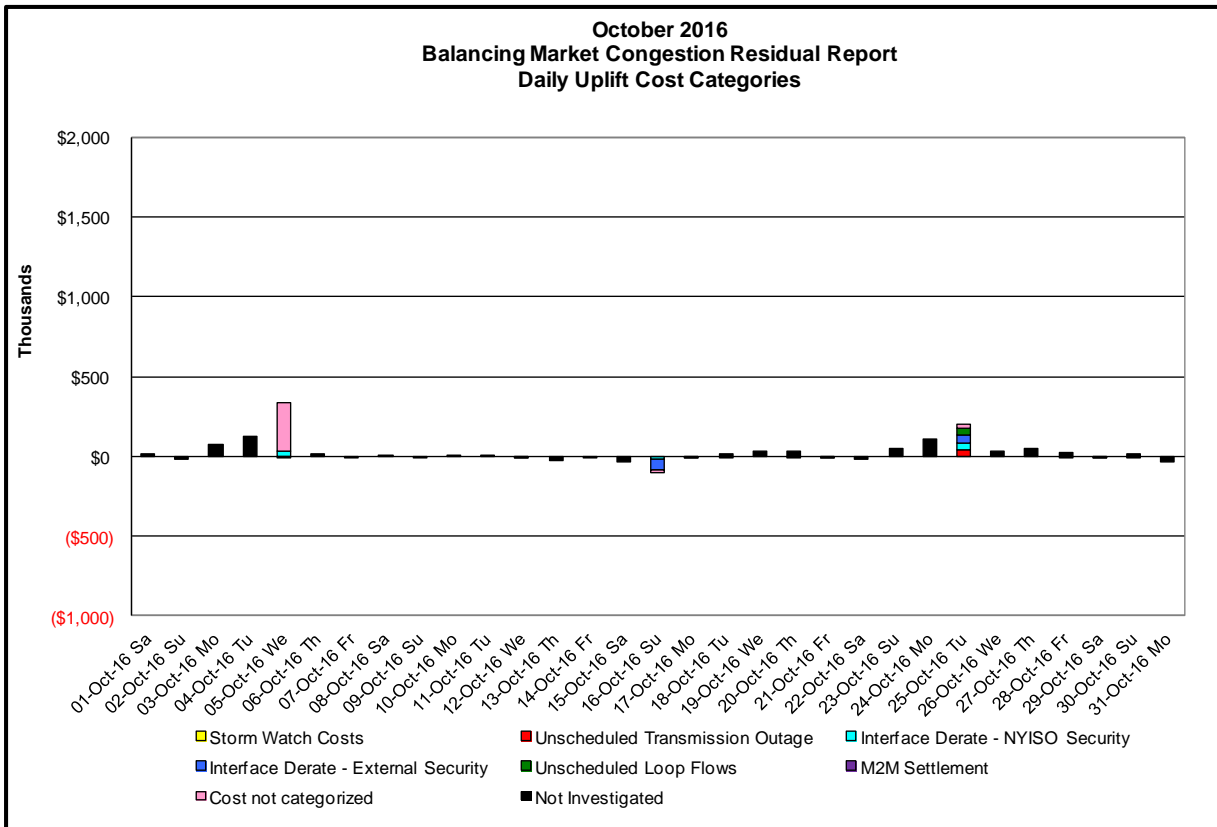
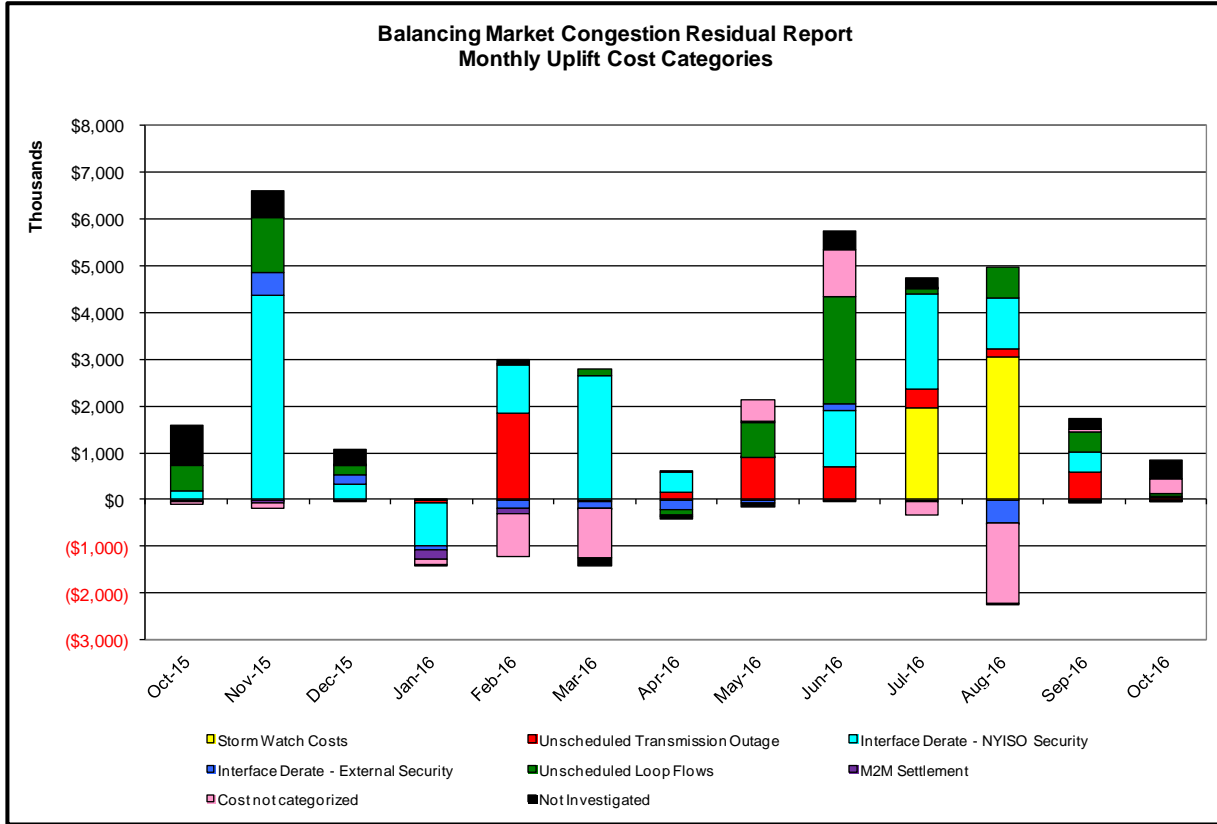
NYISO savings that result from PJM payments to NYISO when PJM's transmission use (PJM's market flow) is greater than PJM's entitlement of the NY transmission system and NYISO is incurring Western or Central NY congestion. Additionally, NYISO savings may result from the more efficient regional utilization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





Market Performance Metrics





Day's investigated in October: 5, 16, 25

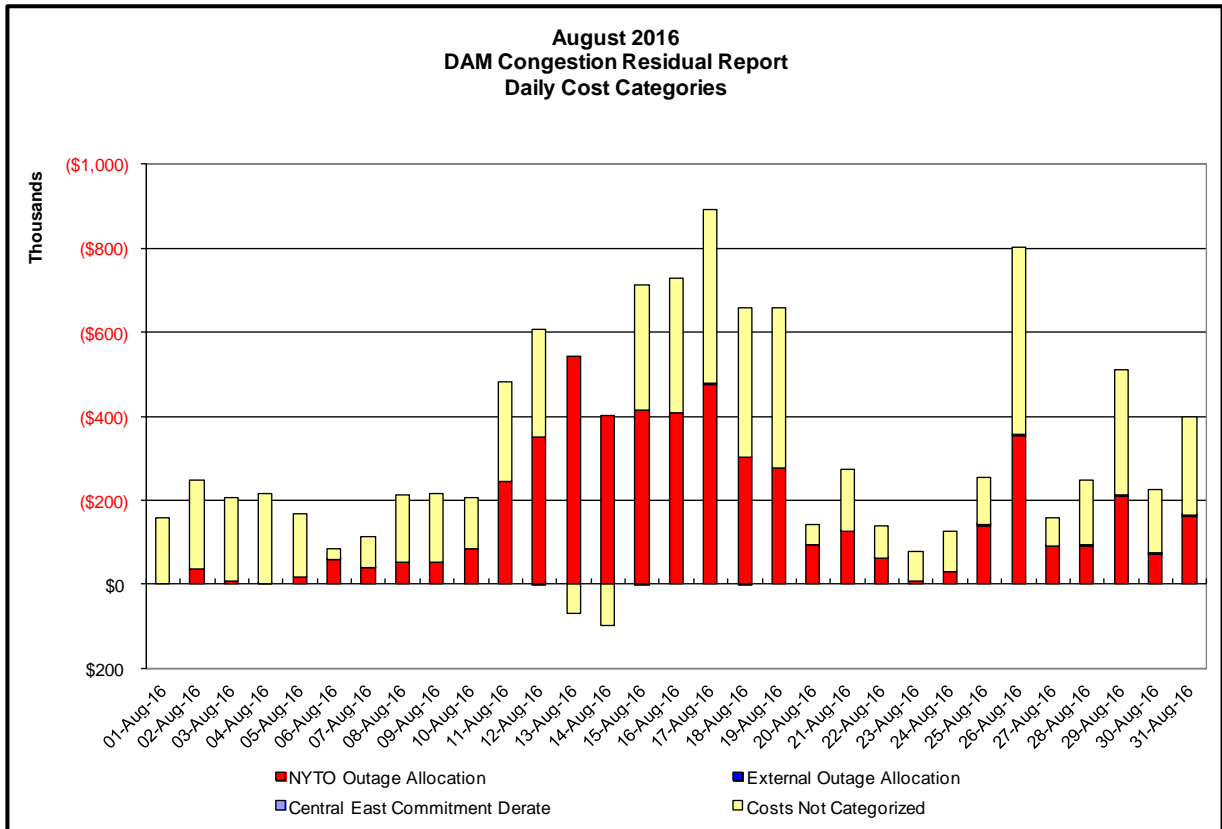
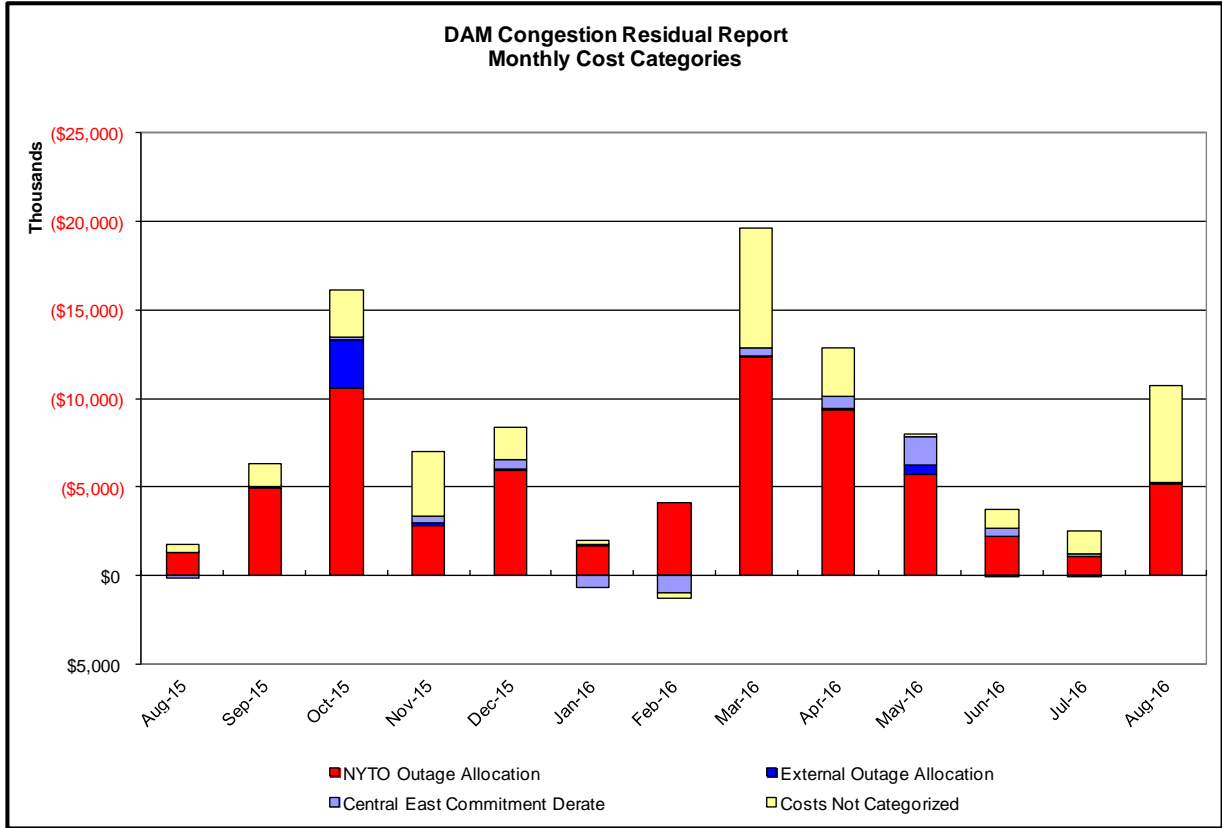
Event	Date (yyyymmdd)	Hours	Description
	10/5/2016	15	NYCA DNI Ramp Limit
	10/5/2016	19	NE_AC-NY Scheduling Limit
	10/16/2016	19,21,22	NYCA DNI Ramp Limit
	10/16/2016	16,18-22	IESO_AC DNI Ramp Limit
	10/25/2016	7-10	Forced outage Adirondack-Porter 230kV (#12)
	10/25/2016	11	NYCA DNI Ramp Limit
	10/25/2016	10	Derate Marcy 765/345kV (#AT1) for I/o Chases Lake-Porter 230kV (#11)
	10/25/2016	9,10	Derate Packard-Sawyer 230kV (#77) for I/o BUS:PACKARD BK3 & 61 & 78
	10/25/2016	10	Derate Packard-Sawyer 230kV (#78) for I/o Packard-Sawyer 230kV (#77)
	10/25/2016	21,23	HQ_Chat-NY Scheduling Limit
	10/25/2016	7-10	HQ_Cedars-NY Scheduling Limit
	10/25/2016	7-11,21,23	NE_AC-NY Scheduling Limit
	10/25/2016	10,11,18	Lake Erie Circulation, DAM-RTM exceeds +/-125MW; Packard-Sawyer 230kV (#77)

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	

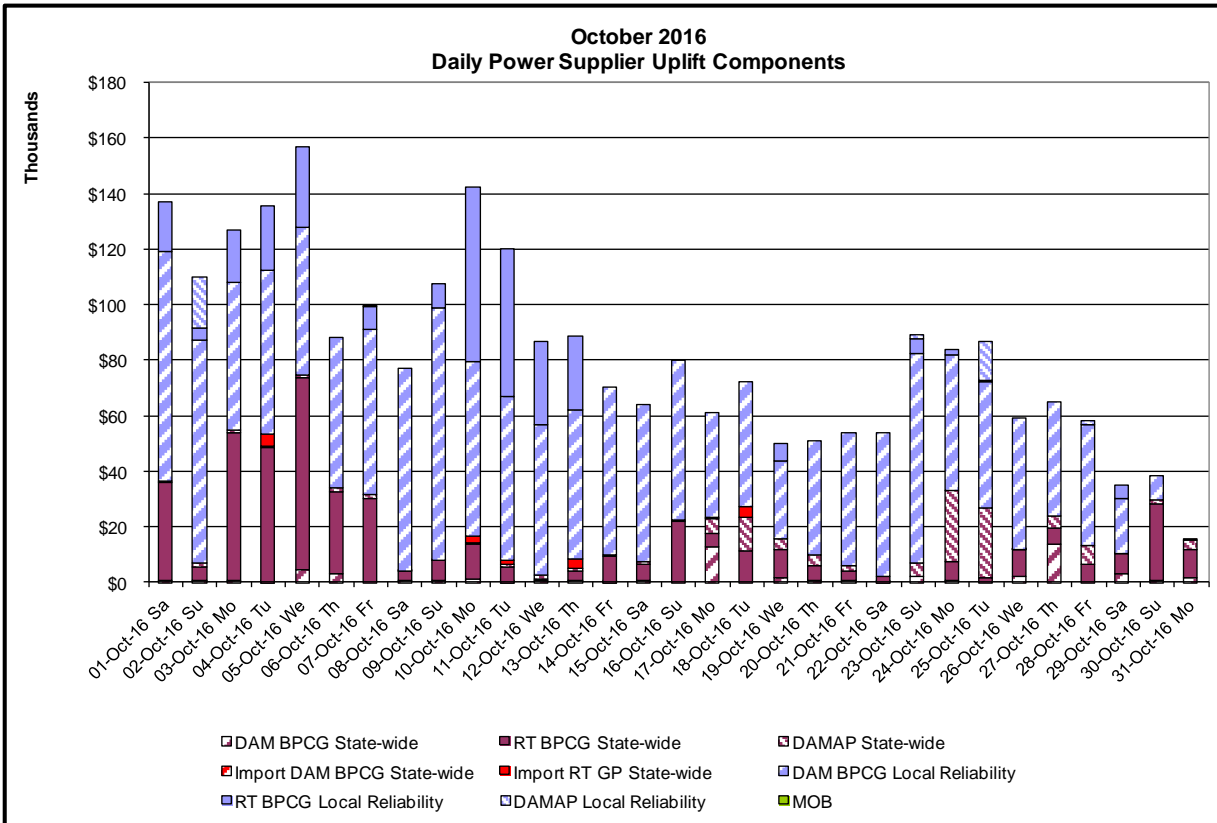
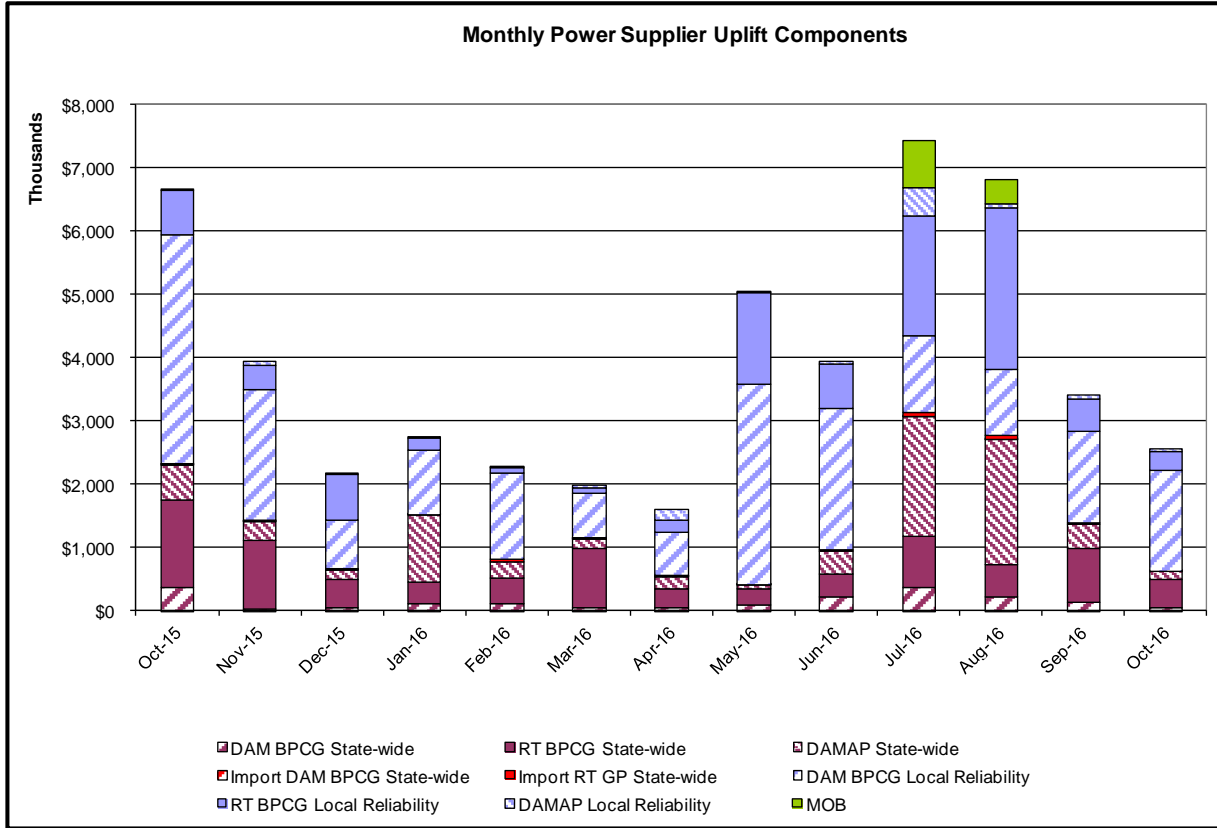
Monthly Balancing Market Congestion Report Assumptions/Notes

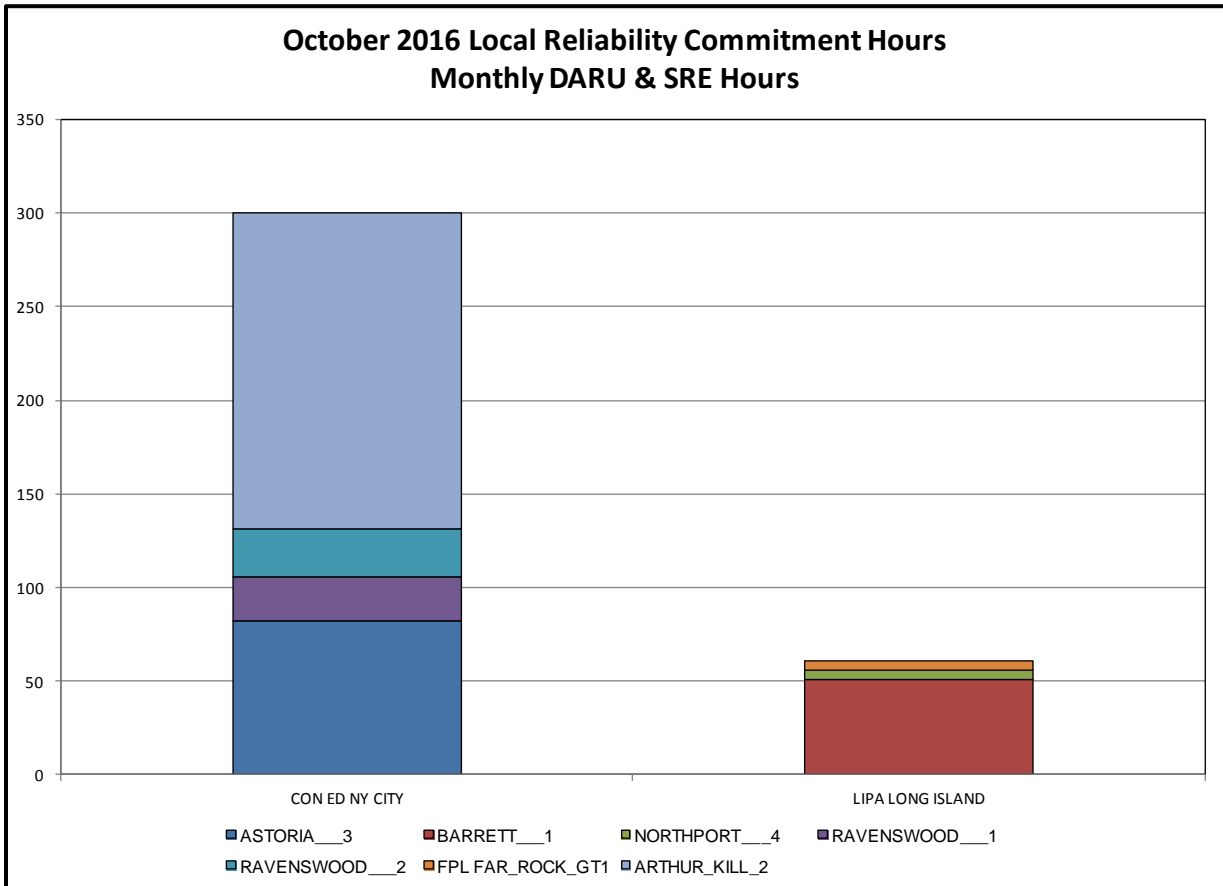
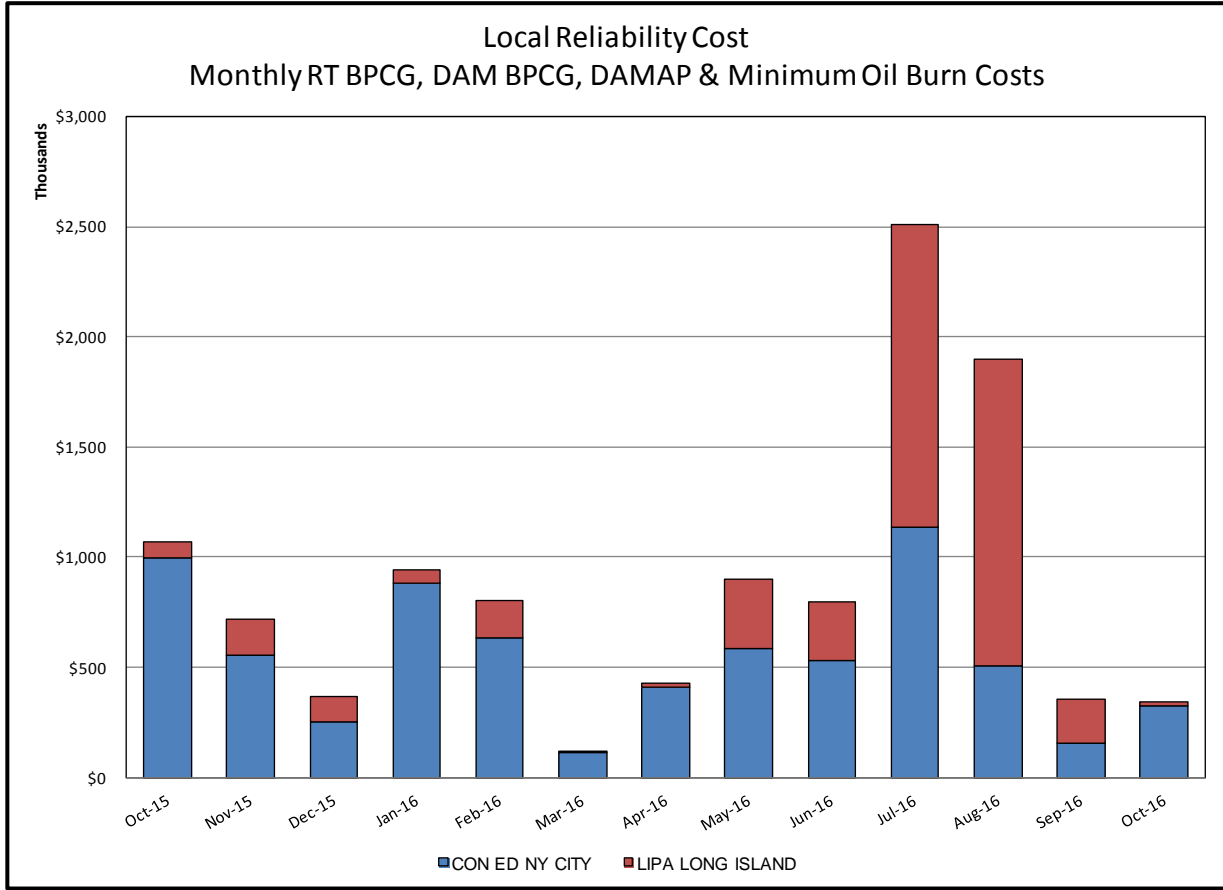
- 1) Storm Watch Costs are identified as daily total uplift costs
- 2) Days with a value of BMCR less M2M Settlement of \$100K/HR, shortfall of \$200K/Day or more, or surplus of \$100K/Day or more are investigated.
- 3) Uplift costs associated with multiple event types are apportioned equally by hour

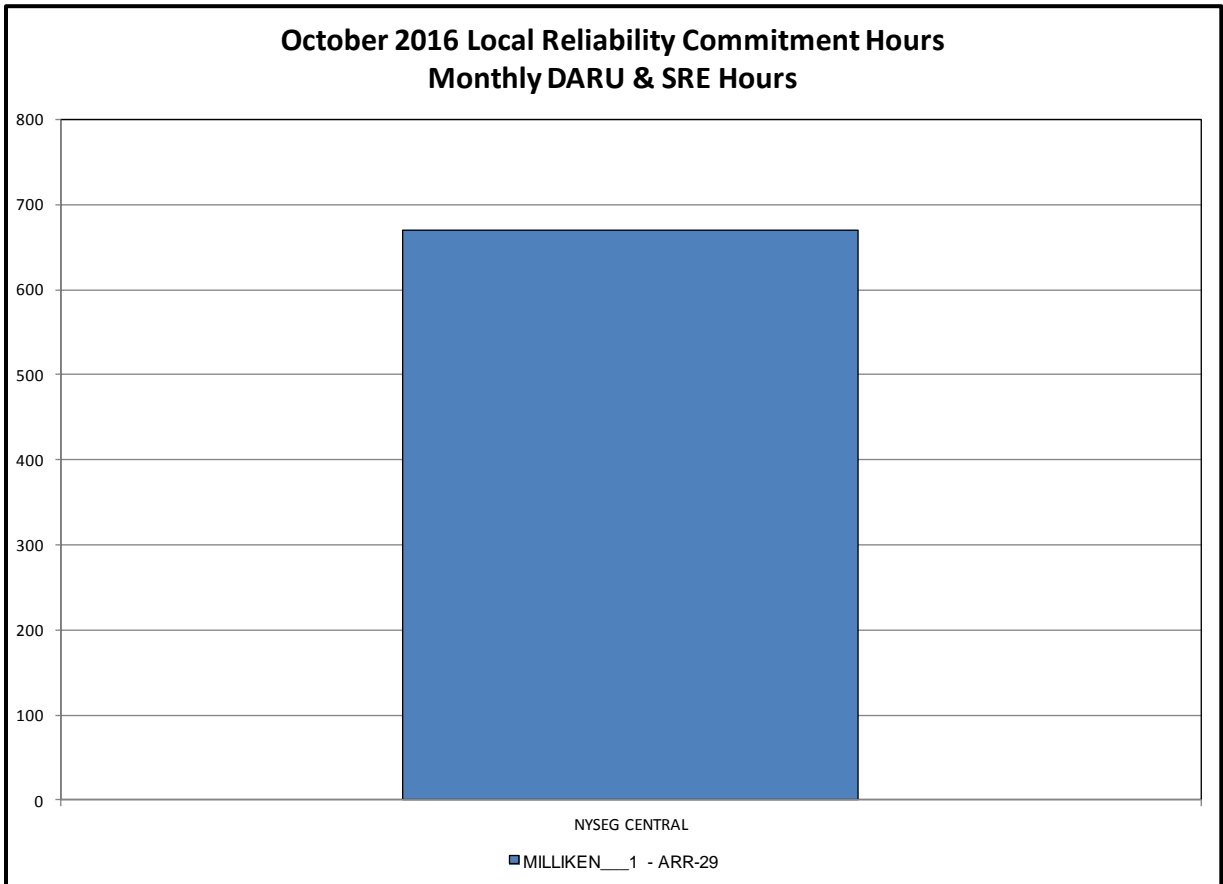
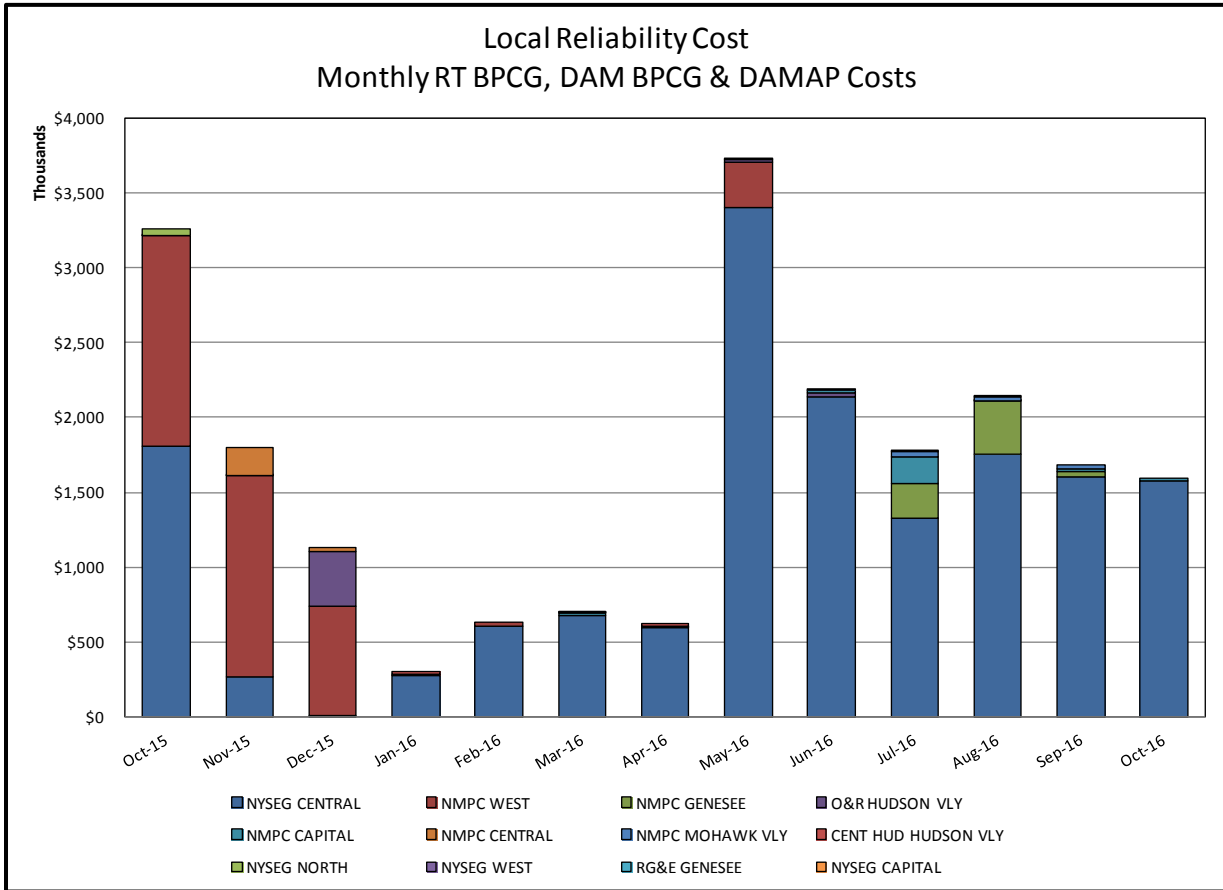


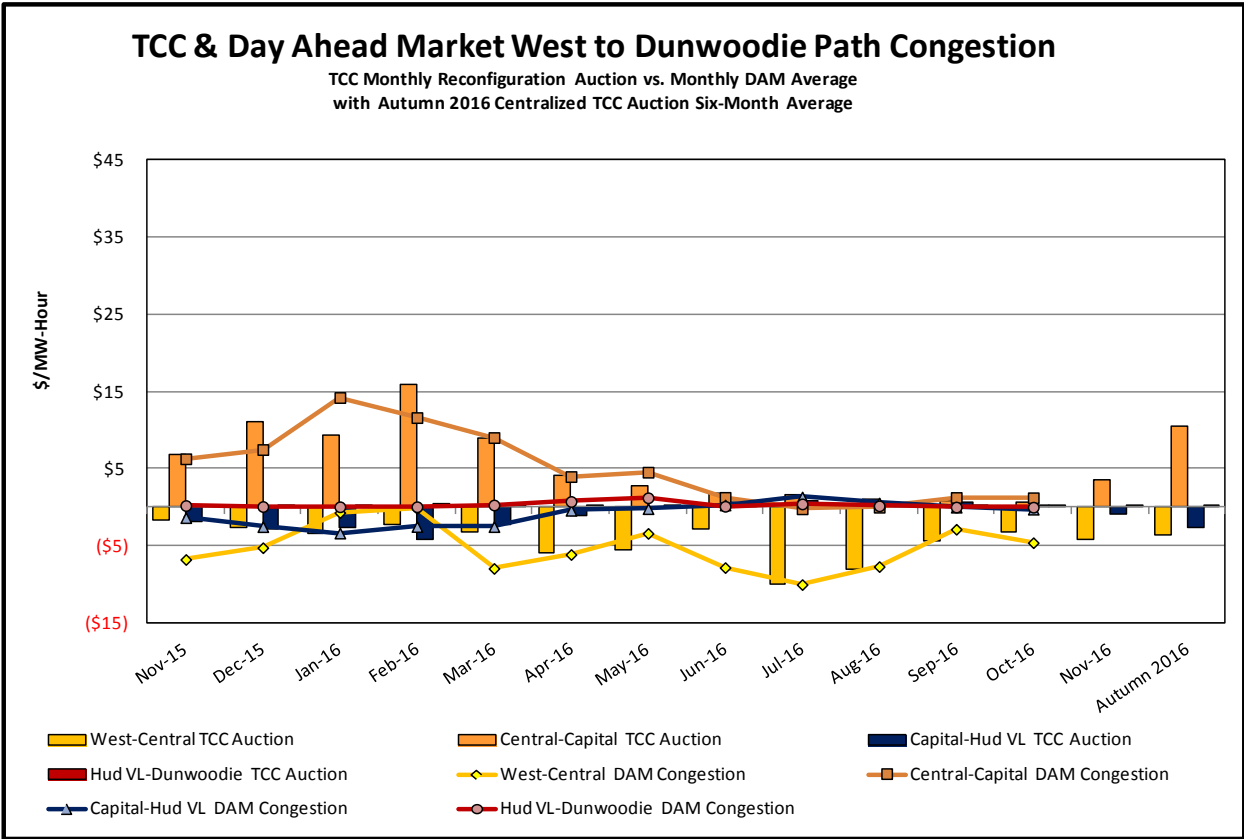
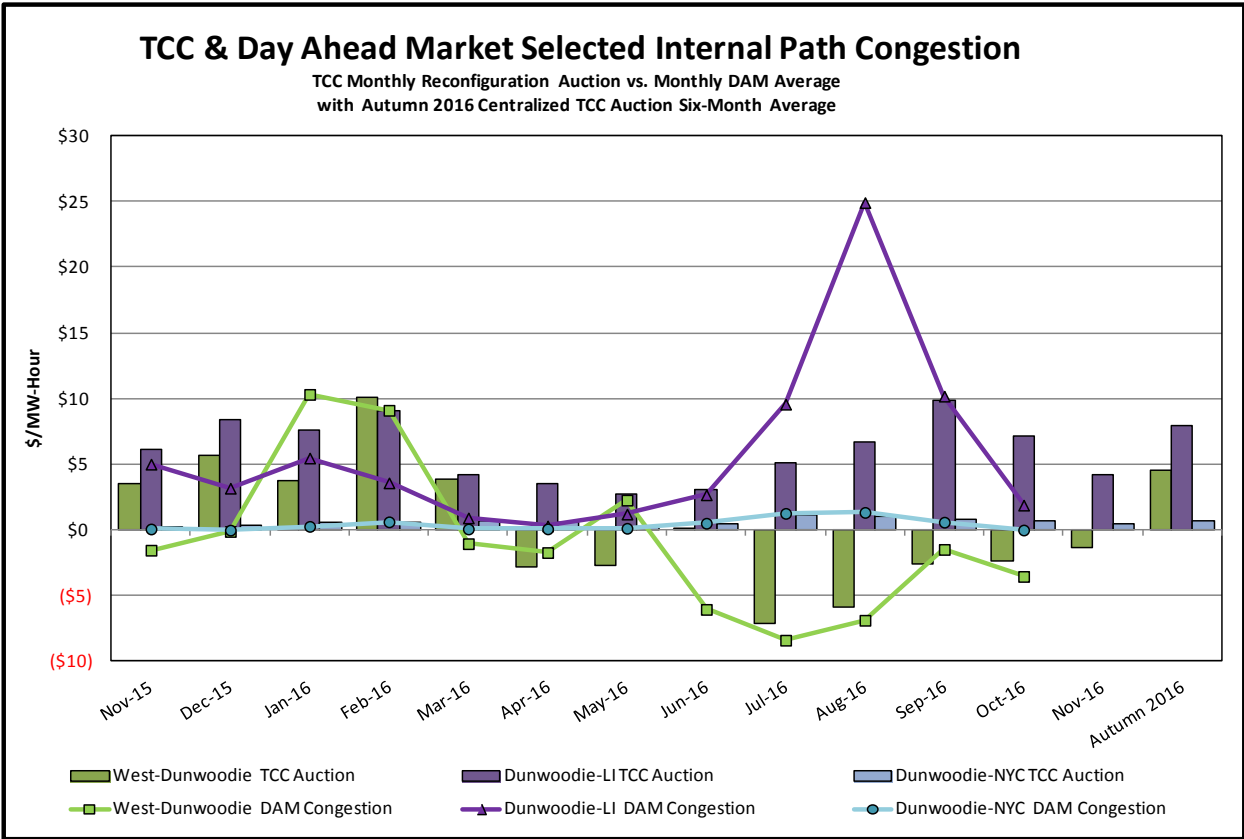
Day-Ahead Market Congestion Residual Categories

<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.	









TCC & Day Ahead Market Selected External Path Congestion

TCC Monthly Reconfiguration Auction vs. Monthly DAM Average
with Autumn 2016 Centralized TCC Auction Six-Month Average

