

Operations Performance Metrics Monthly Report



October 2017 Report

Operations & Reliability Department New York Independent System Operator

Prepared by NYISO Operations Analysis and Services, based on settlements initial process data collected on or before November 2, 2017.

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 Performance and Curtailments*
 - *Lake Erie Circulation and ISO Schedules*

- ◆ **Broader Regional Market Performance Metrics**
 - *PAR Interconnection Congestion Coordination Monthly Value*
 - *PAR 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 2017 Operations Performance Highlights

- Peak load of 22,238 MW occurred on 10/09/2017 HB 19
- 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
- A Major Emergency was declared on 10/08/2017 in HB13 for the loss of Chateaugay-Massena 765kV (#7040) and Marcy-Massena 765kV (#MSU1) lines causing the Central East interface flow to exceed its voltage collapse limit.
- NYISO achieved a wind energy record of 1,622MW on 10/31/2017 HB05 providing 12% of the state's electric demand in HB05.
- The following table identifies the estimated production cost savings associated with the Broader Regional Market initiatives.

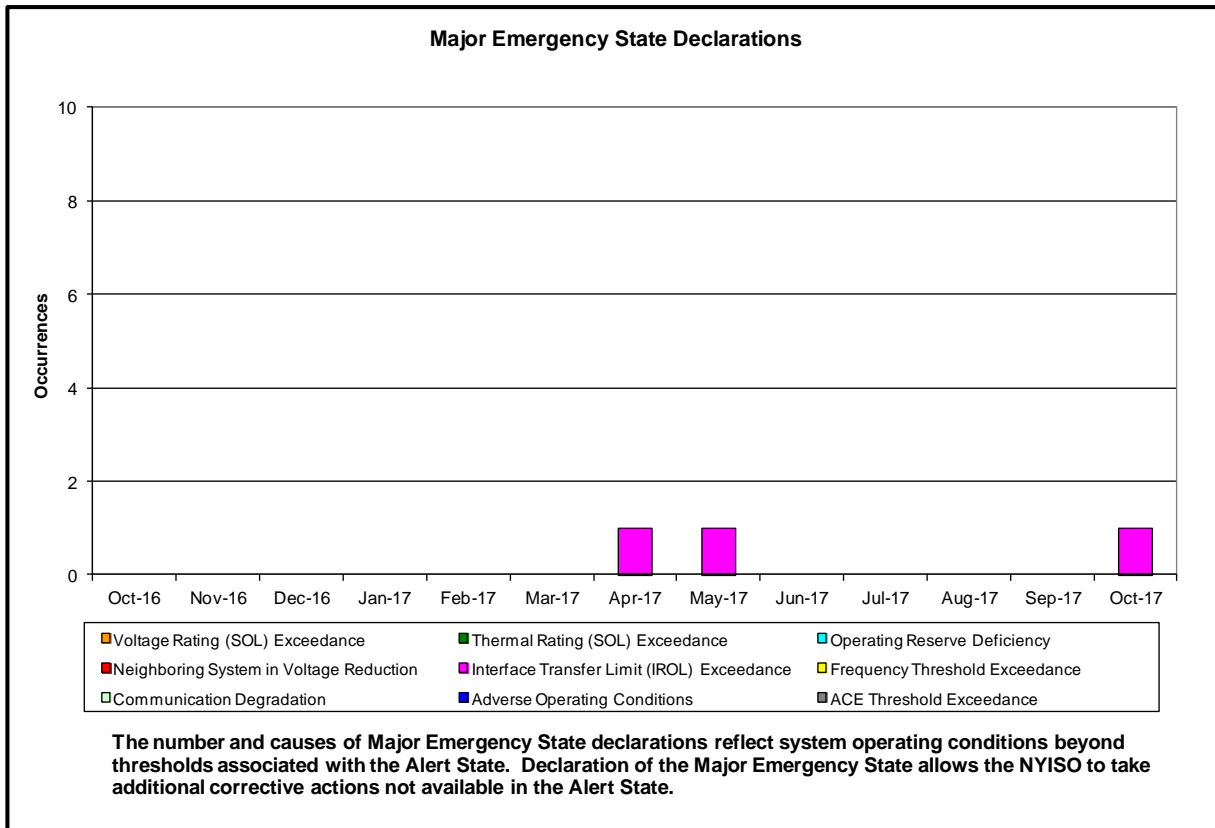
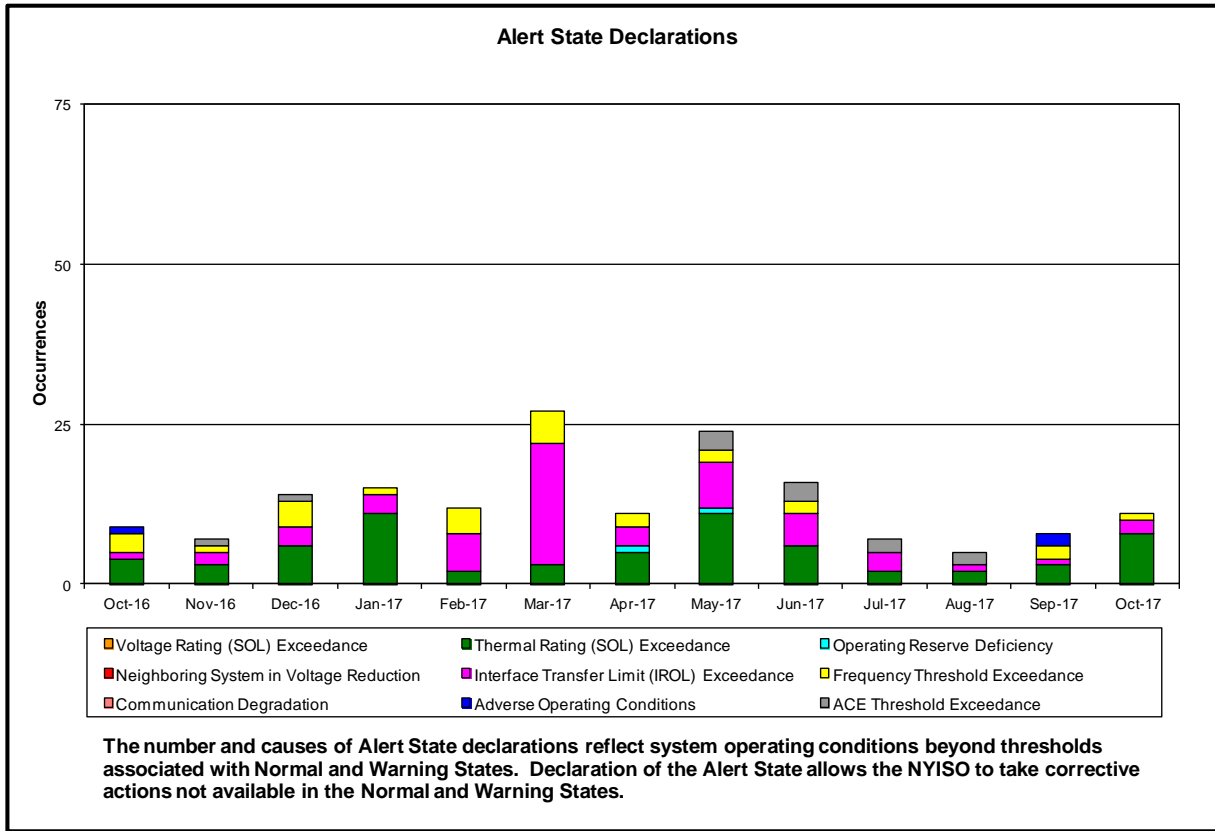
	Current Month Value (\$M)	Year-to-Date Value (\$M)
NY Savings from PJM-NY Congestion Coordination	\$0.28	\$9.41
NY Savings from PJM-NY Coordinated Transaction Scheduling	(\$0.10)	(\$1.11)
NY Savings from NE-NY Coordinated Transaction Scheduling	(\$0.08)	(\$0.96)
Total NY Savings	\$0.10	\$7.34
Regional Savings from PJM-NY Coordinated Transaction Scheduling	\$0.22	\$2.61
Regional Savings from NE-NY Coordinated Transaction Scheduling	\$0.05	\$1.00
Total Regional Savings	\$0.27	\$3.61

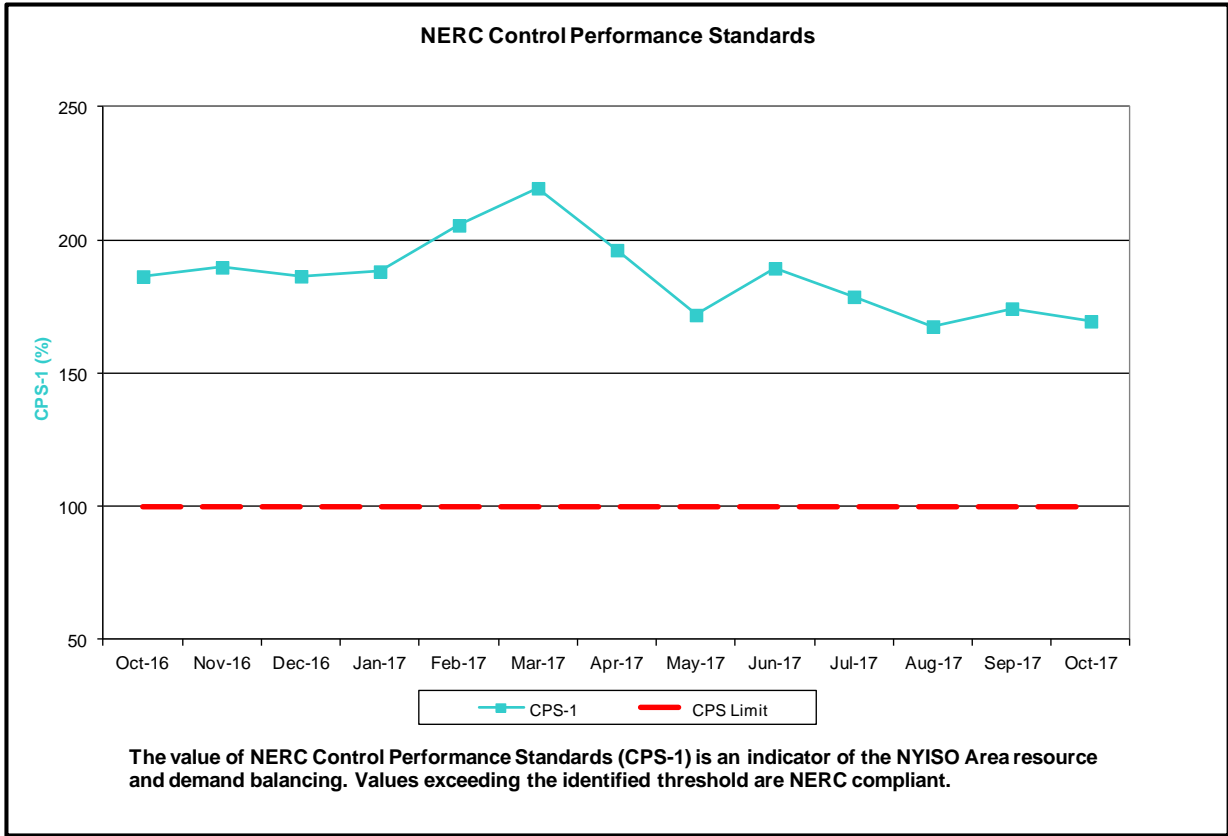
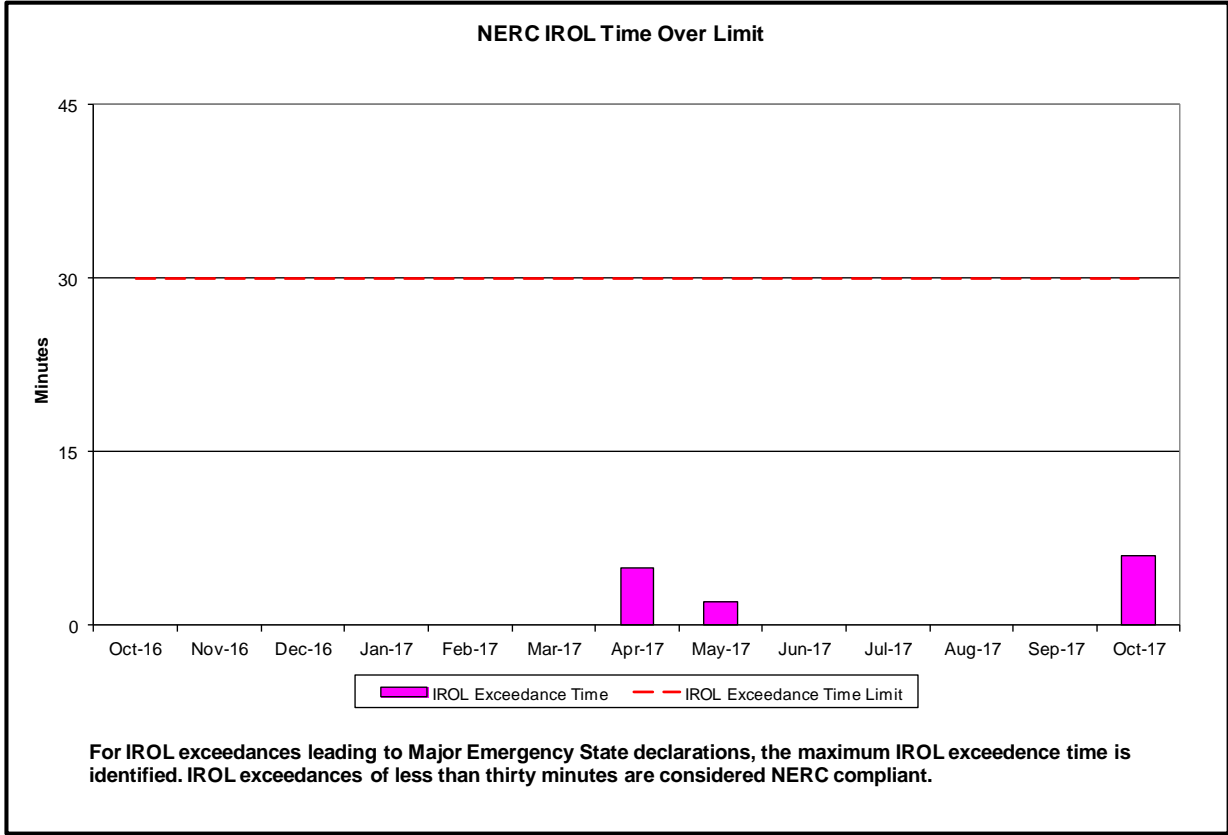
- The following table identifies the Monthly ICAP spot market prices by locality and changes from the end of the prior Winter Capability period.

Spot Auction Price Results	NYCA	Lower Hudson Valley Zones	New York City Zone	Long Island Zone
November 2017 Spot Price	\$0.25	\$3.47	\$3.47	\$0.90
April 2017 Spot Price	\$0.35	\$3.25	\$3.25	\$0.35
Delta	(\$0.10)	\$0.22	\$0.22	\$0.55

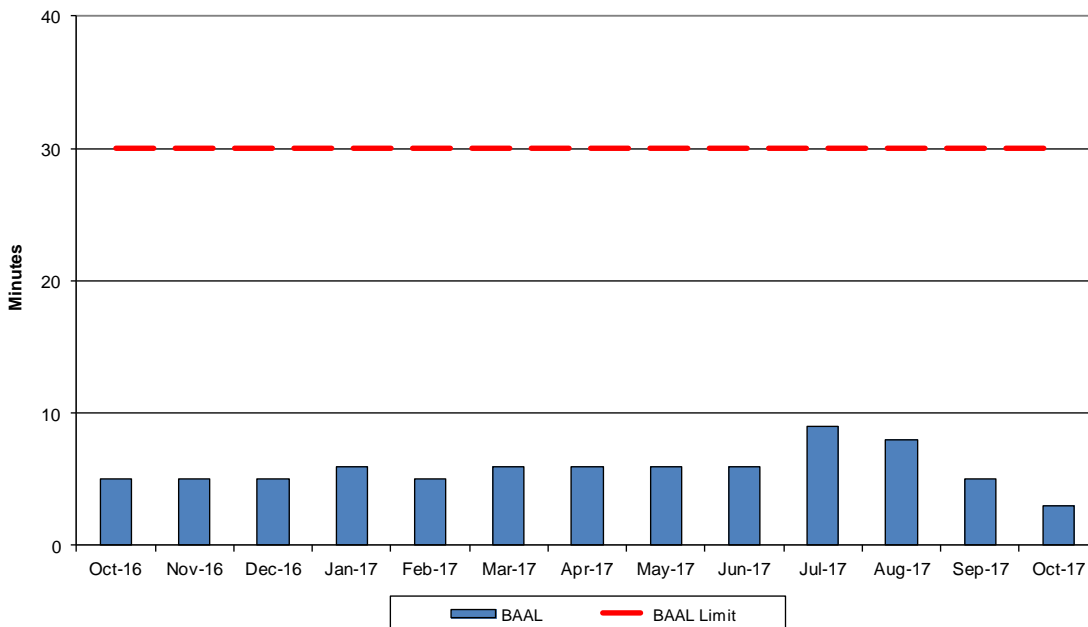
- Price changes from April 2017 to November 2017 are driven by changes in supply as well as Capability Year inputs such as demand curve parameters, Locational Capacity Requirements, the Installed Reserve Margin and the load forecast.

- Reliability Performance Metrics



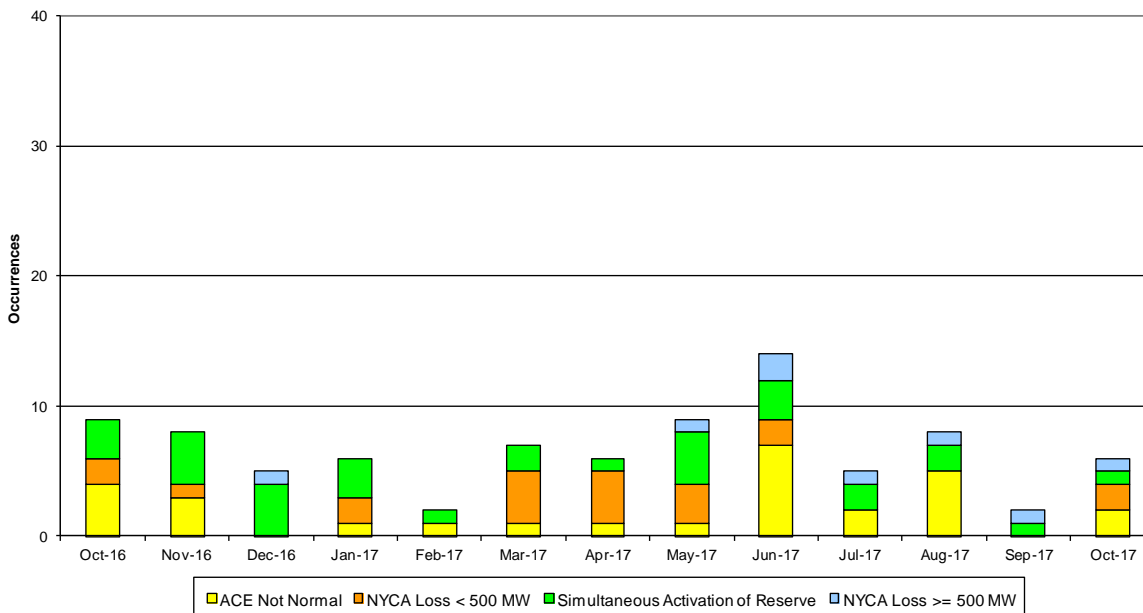


NERC Balancing Authority ACE Limit Standard



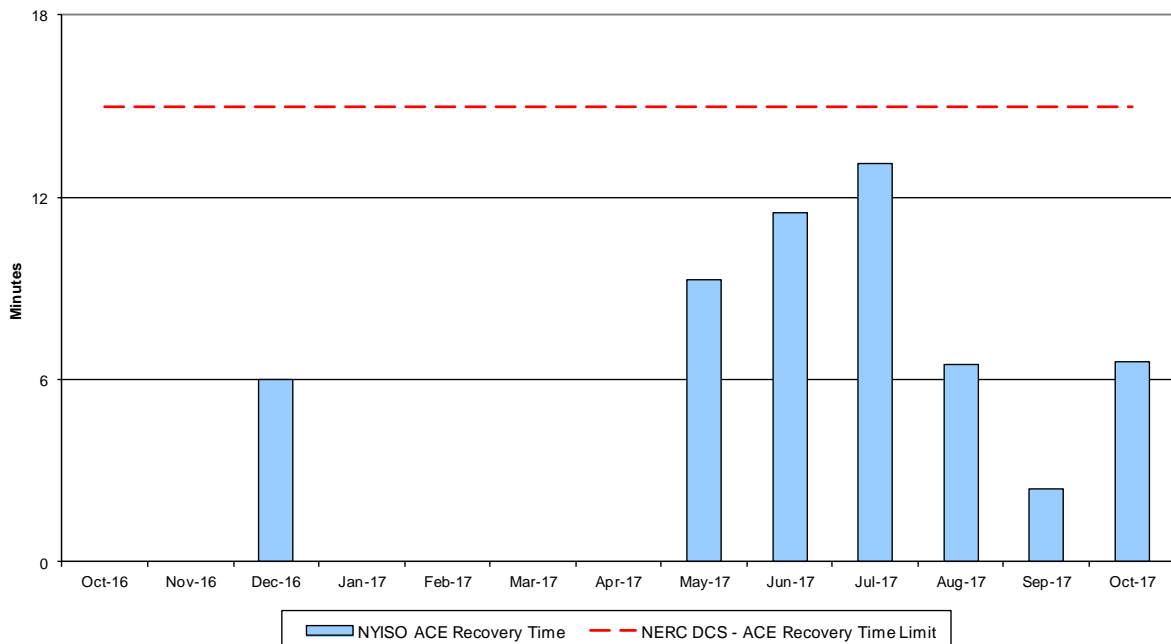
The amount of time the clock-minute average ACE exceeds the clock-minute Balancing Authority ACE Limit (BAAL) is an indicator of the NYISO Area resource and demand balancing. The maximum BAAL exceedance time is identified. BAAL exceedances of less than 30 consecutive clock-minutes are NERC compliant.

Reserve Activations



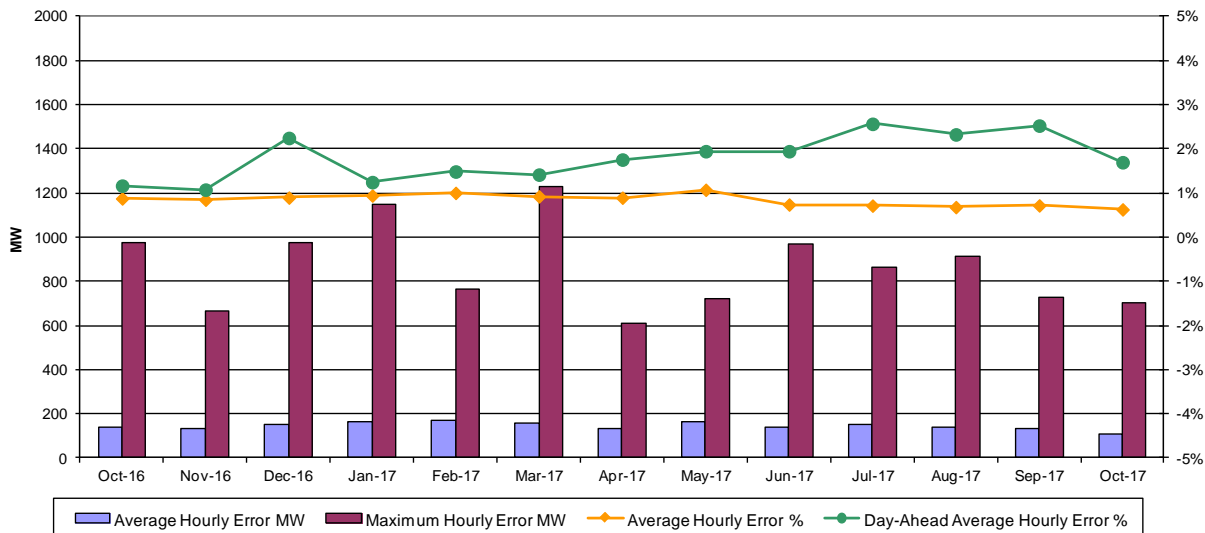
NYISO Reserve Activations are indicators of the need to respond to unexpected operational conditions within the NYISO Area or to assist a neighboring Area (Simultaneous Activation of Reserves) by activating an immediate resource and demand balancing operation.

DCS Event Time to ACE Recovery

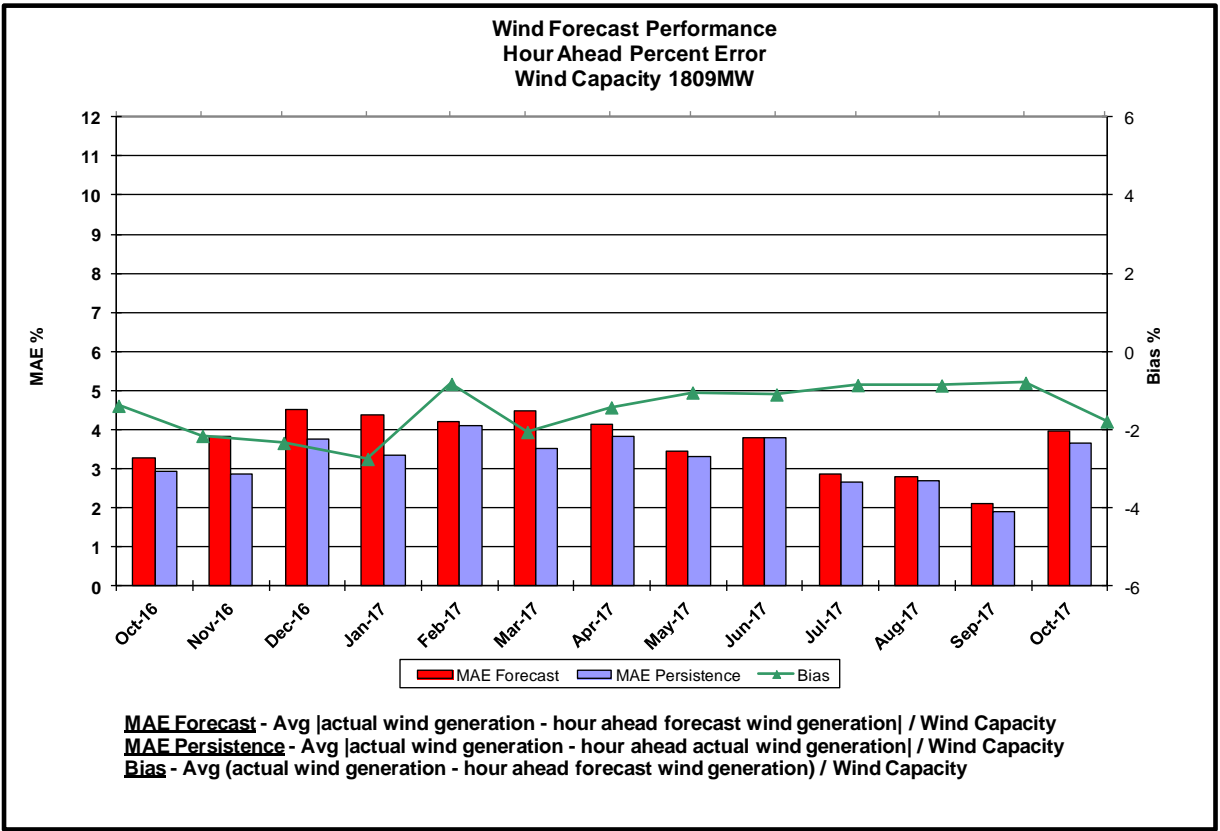
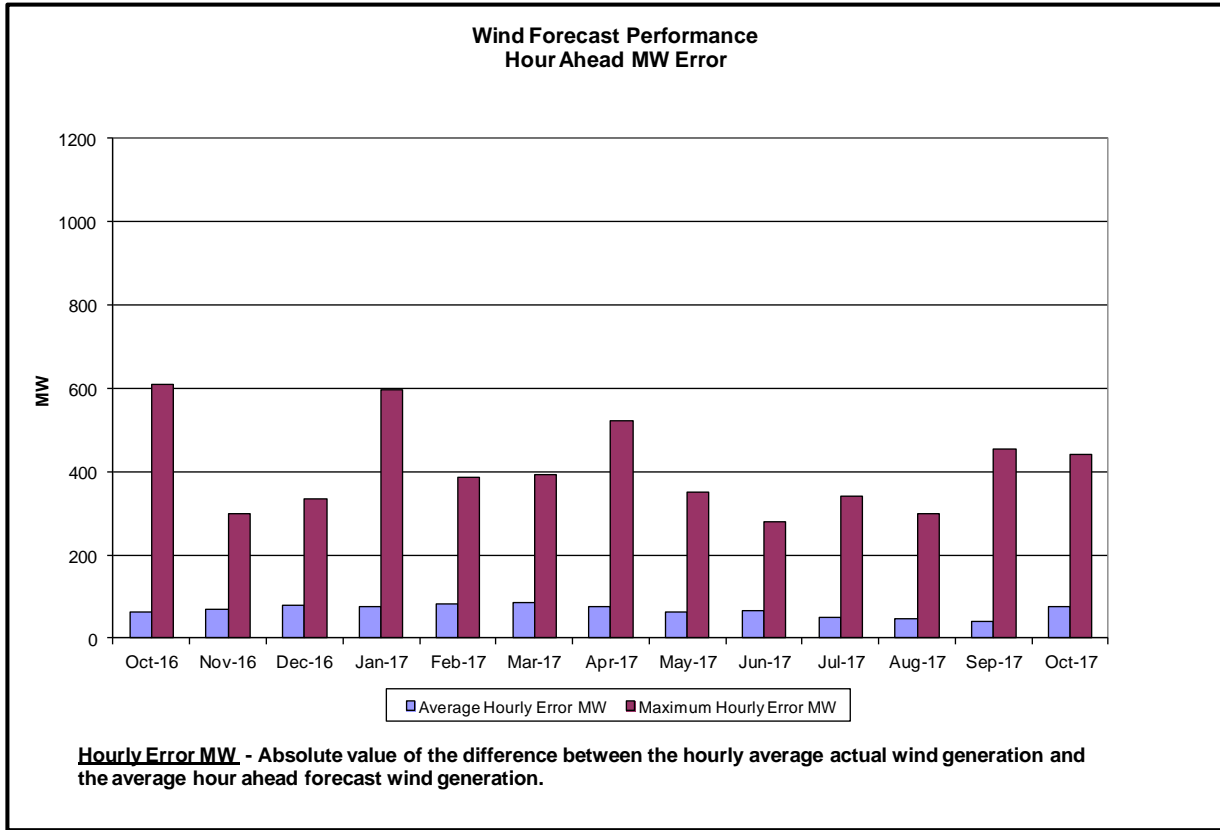


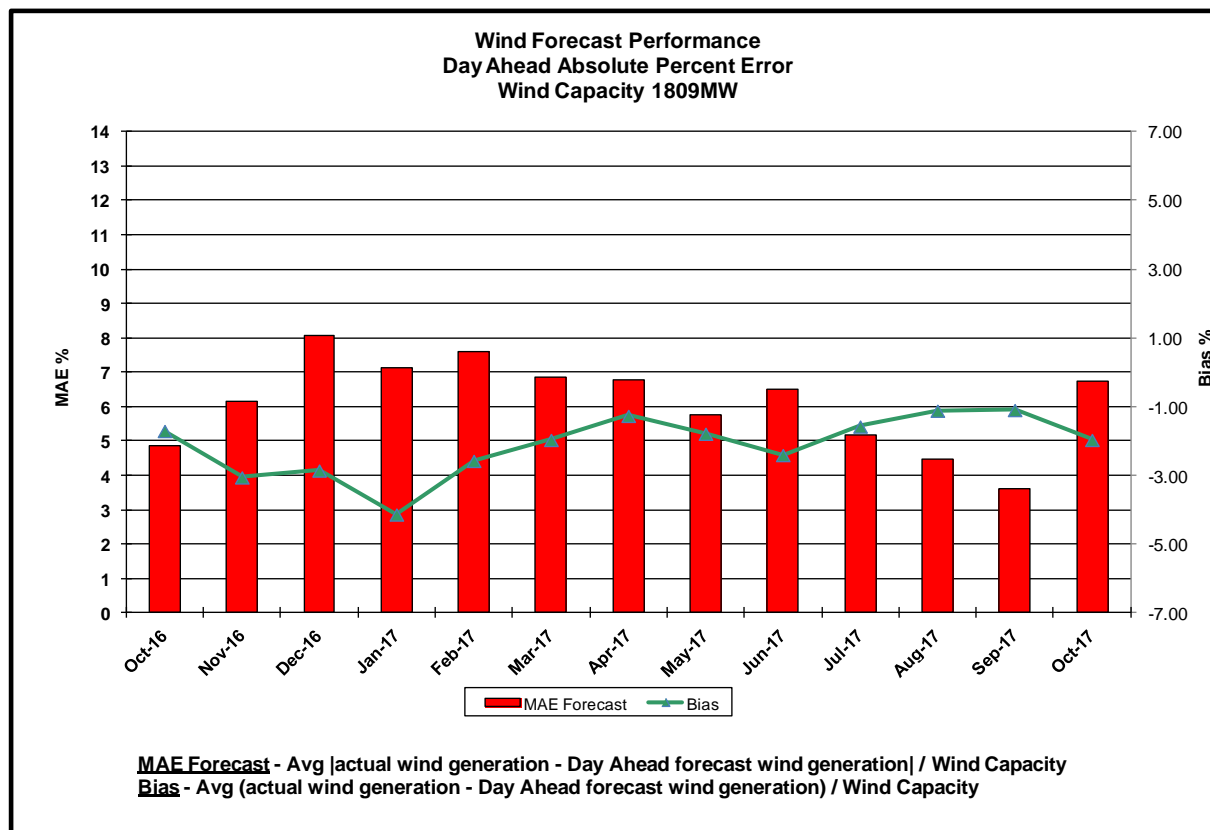
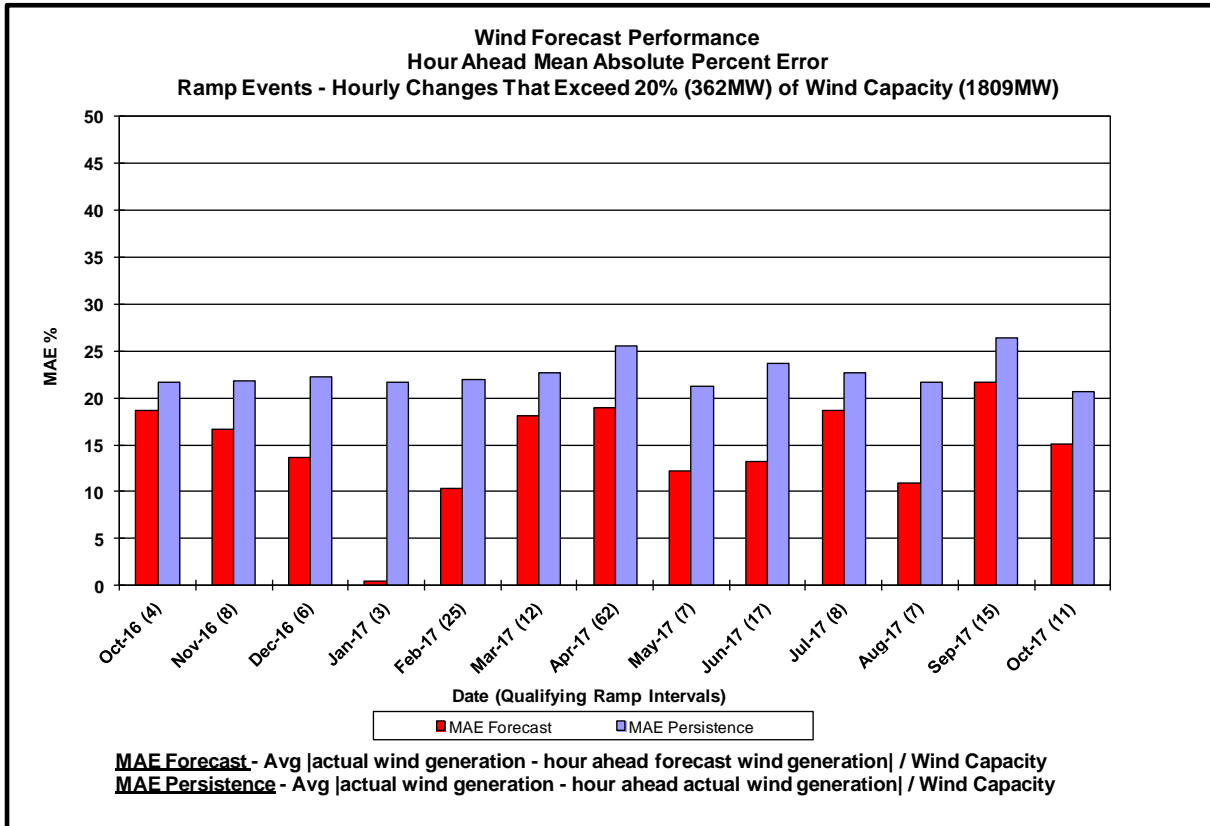
For NYISO initiated Reportable Disturbances, the maximum ACE recovery time is identified. Recovery times of less than 15 minutes are considered NERC compliant.

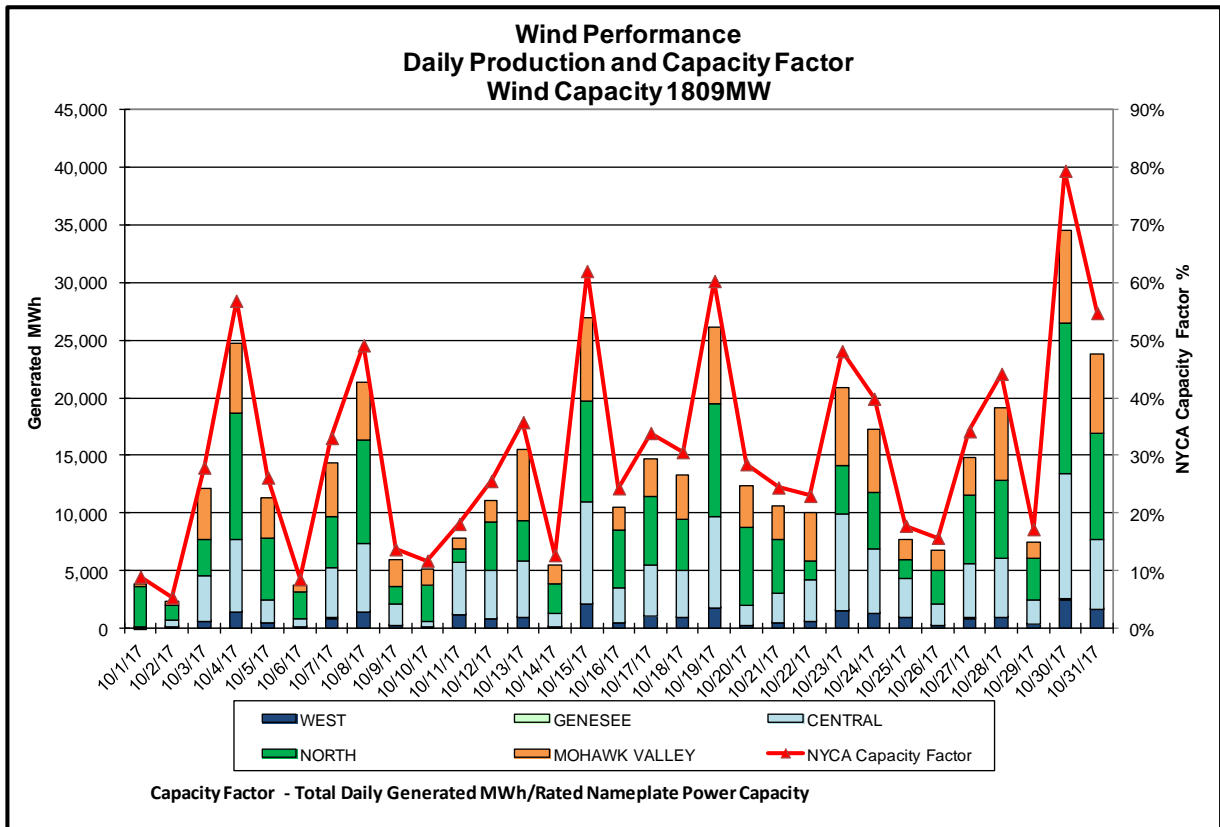
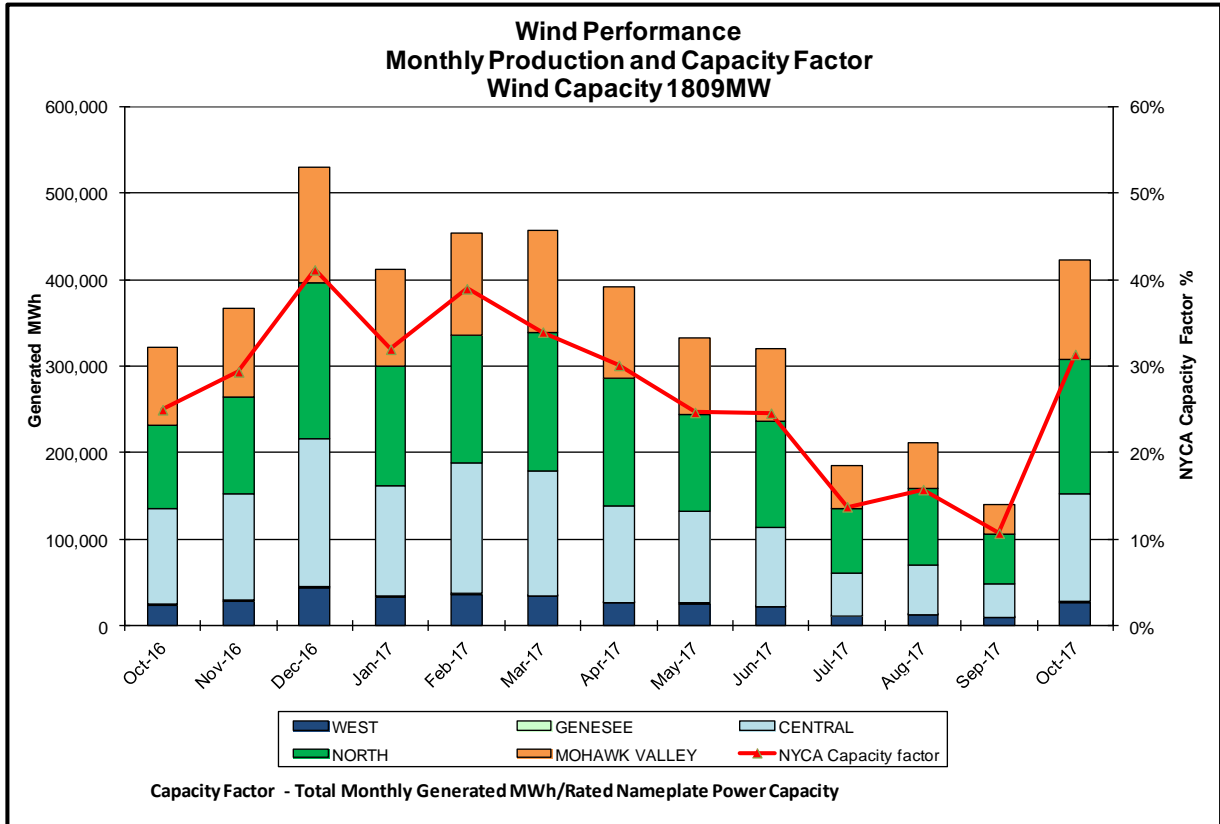
Load Forecast Performance

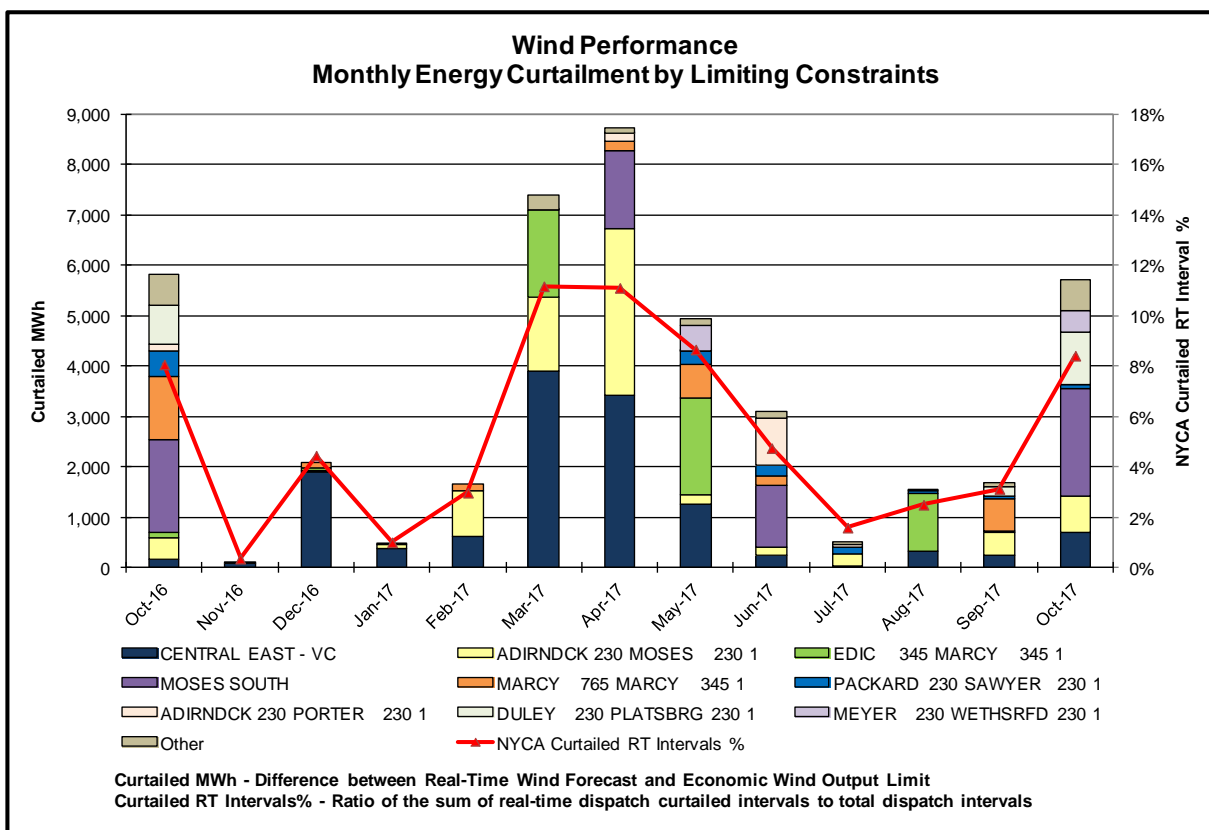
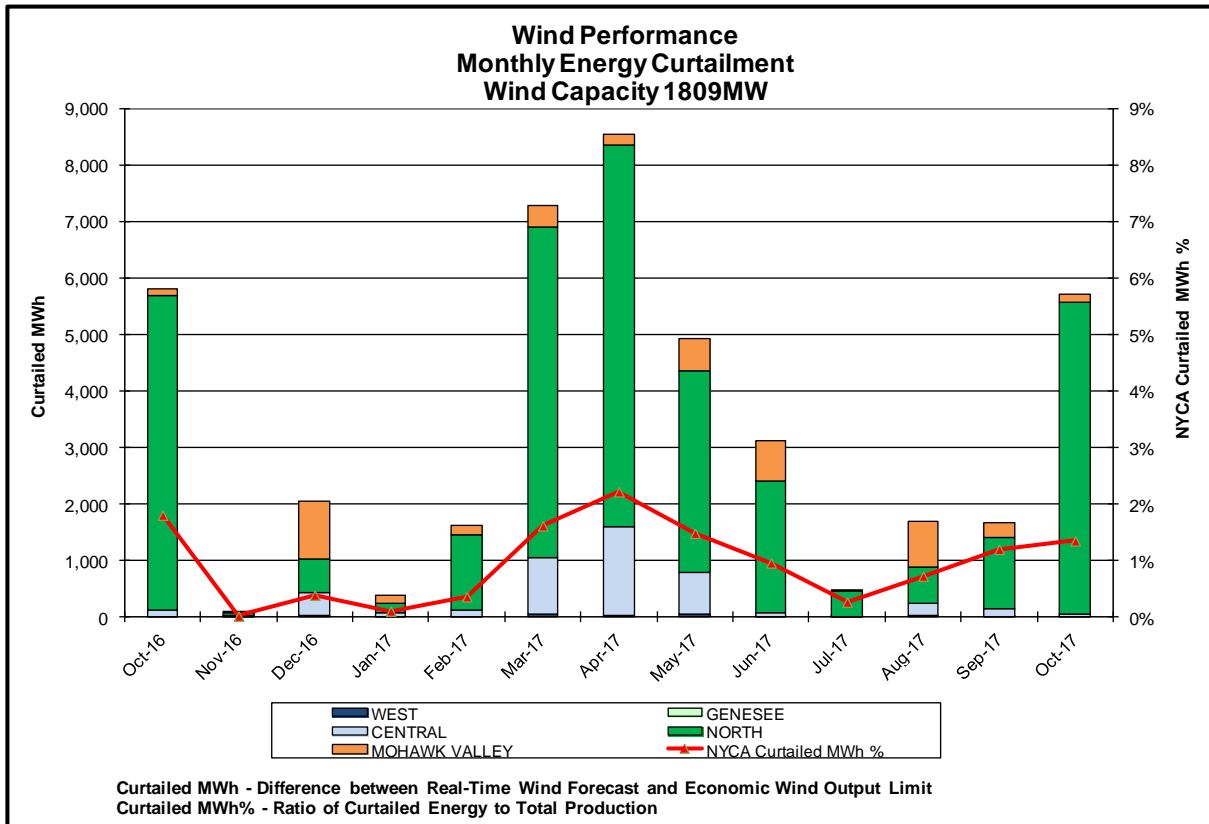


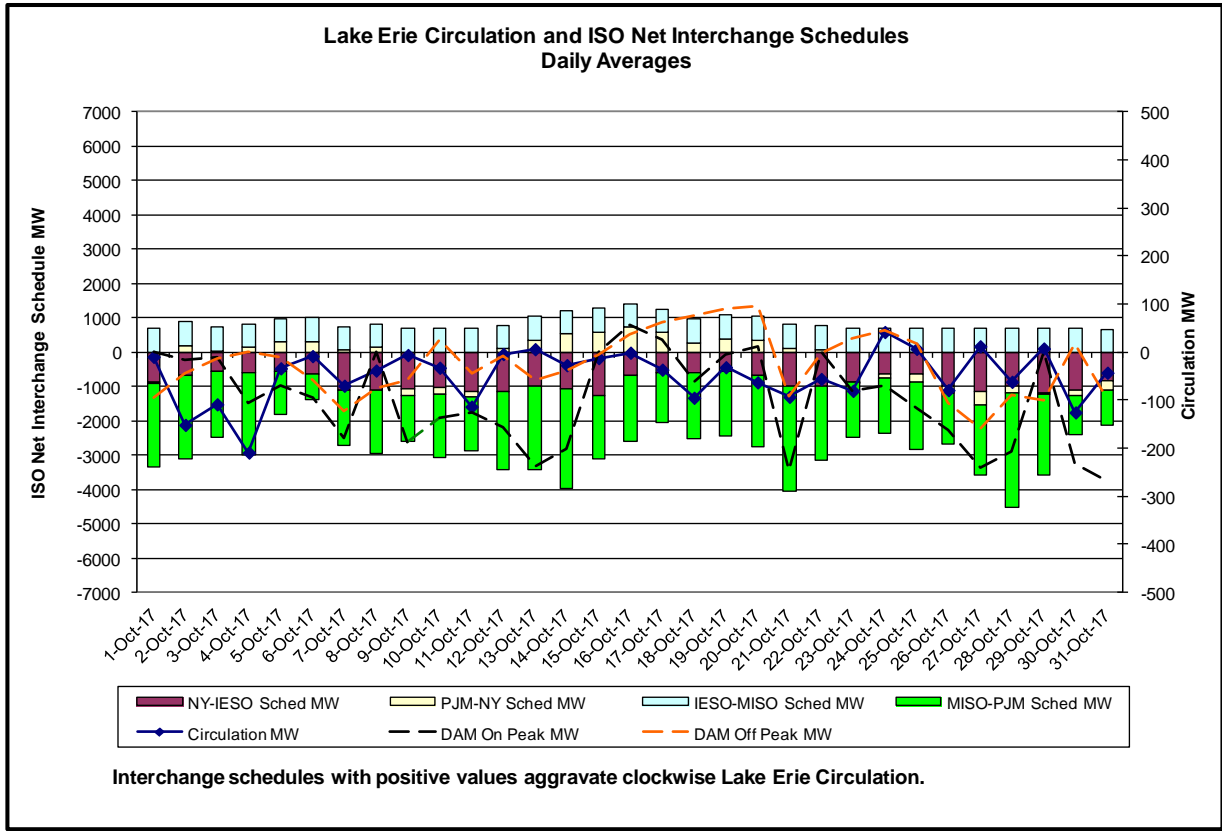
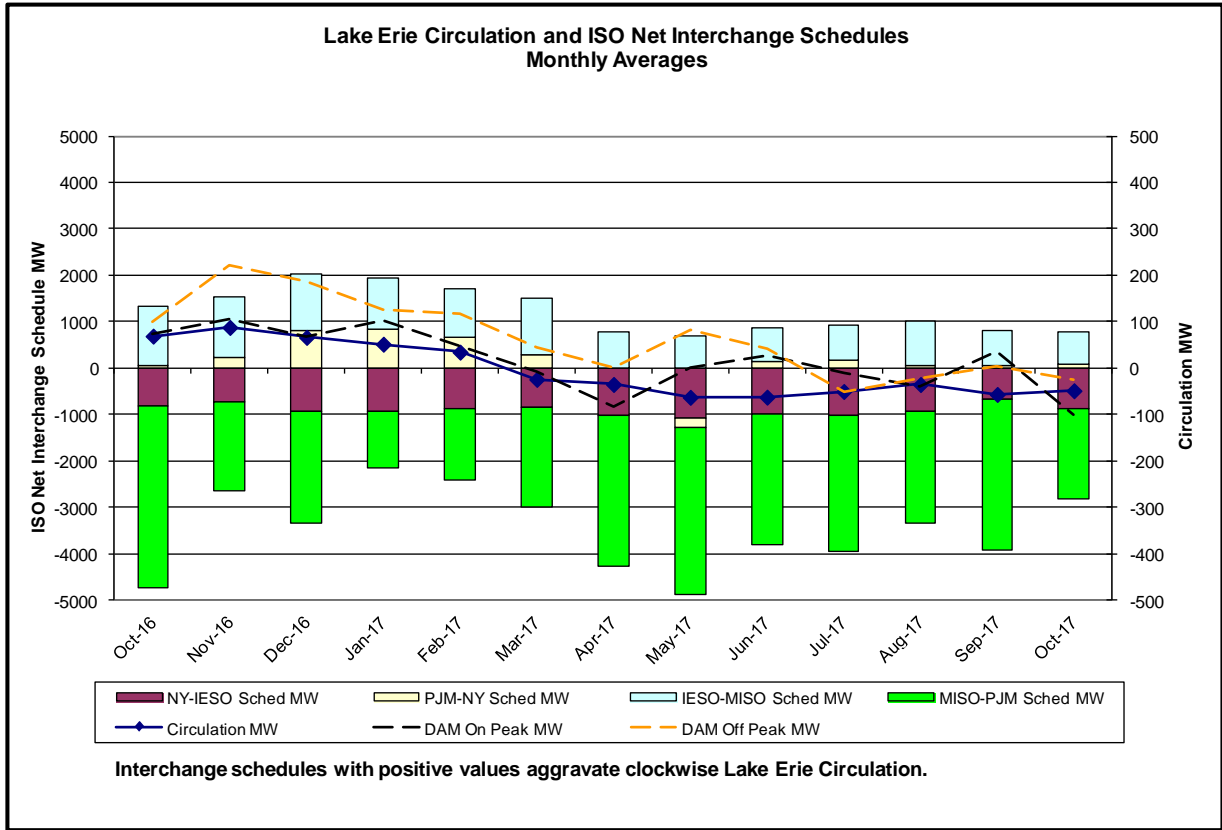
Hourly Error MW - Absolute value of the difference between the hourly average actual load demand and the average hour ahead forecast load demand.
Average Hourly Error % - Average value of the ratio of hourly average error magnitude to hourly average actual load demand.
Day-Ahead Average Hourly Error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



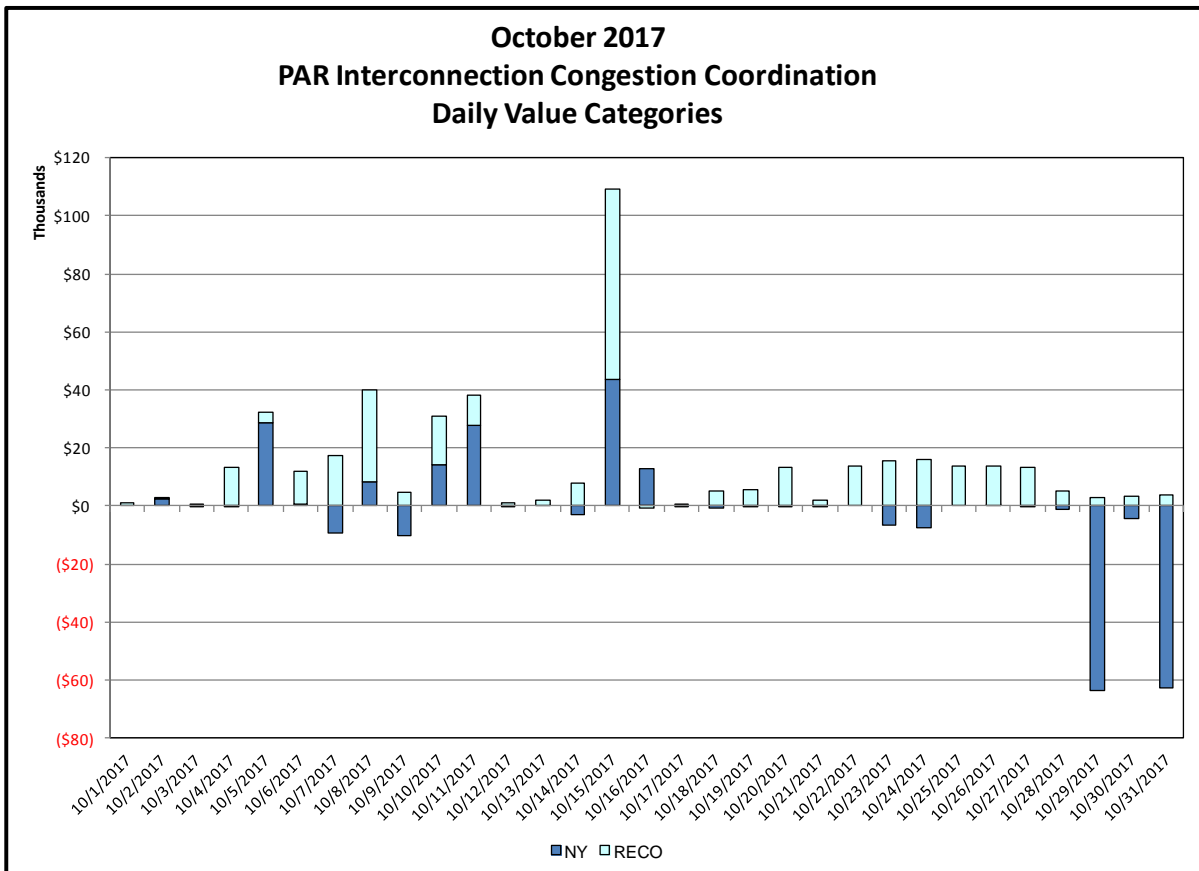
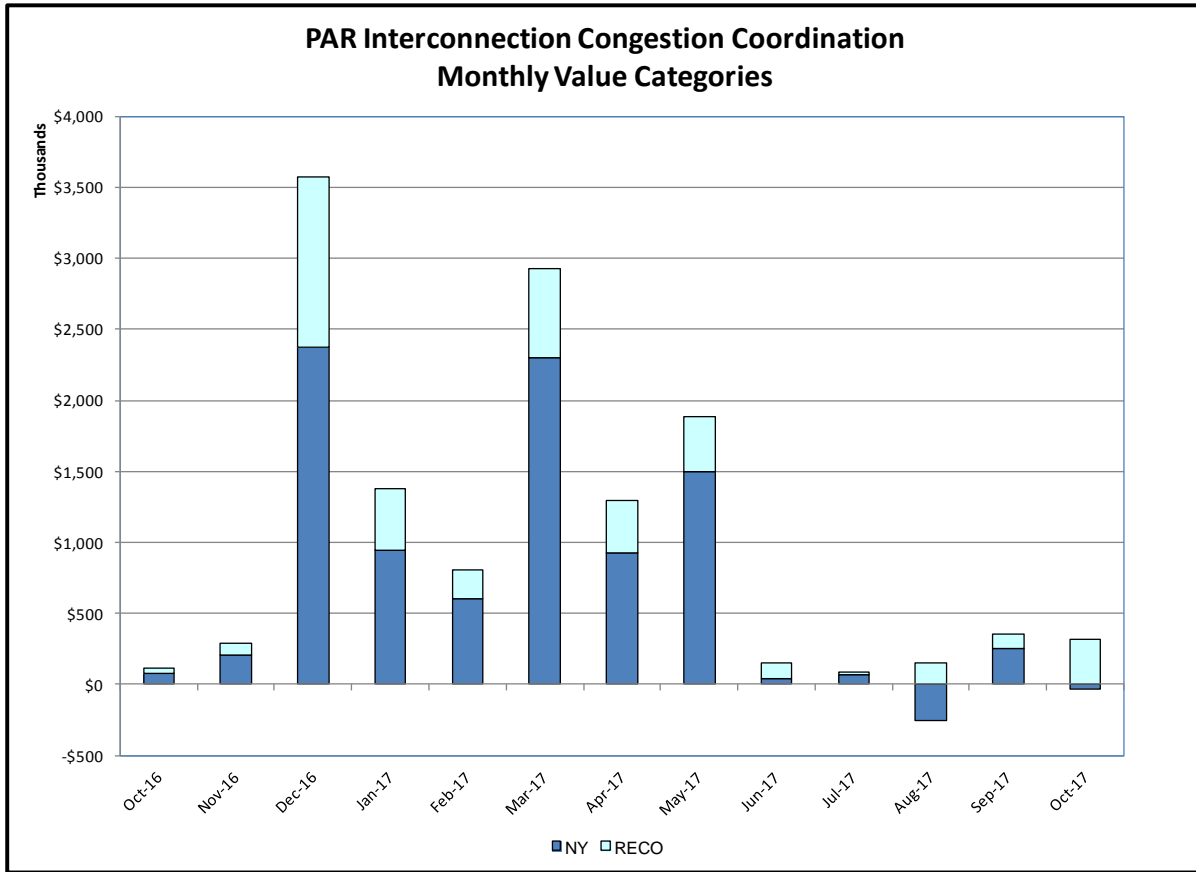








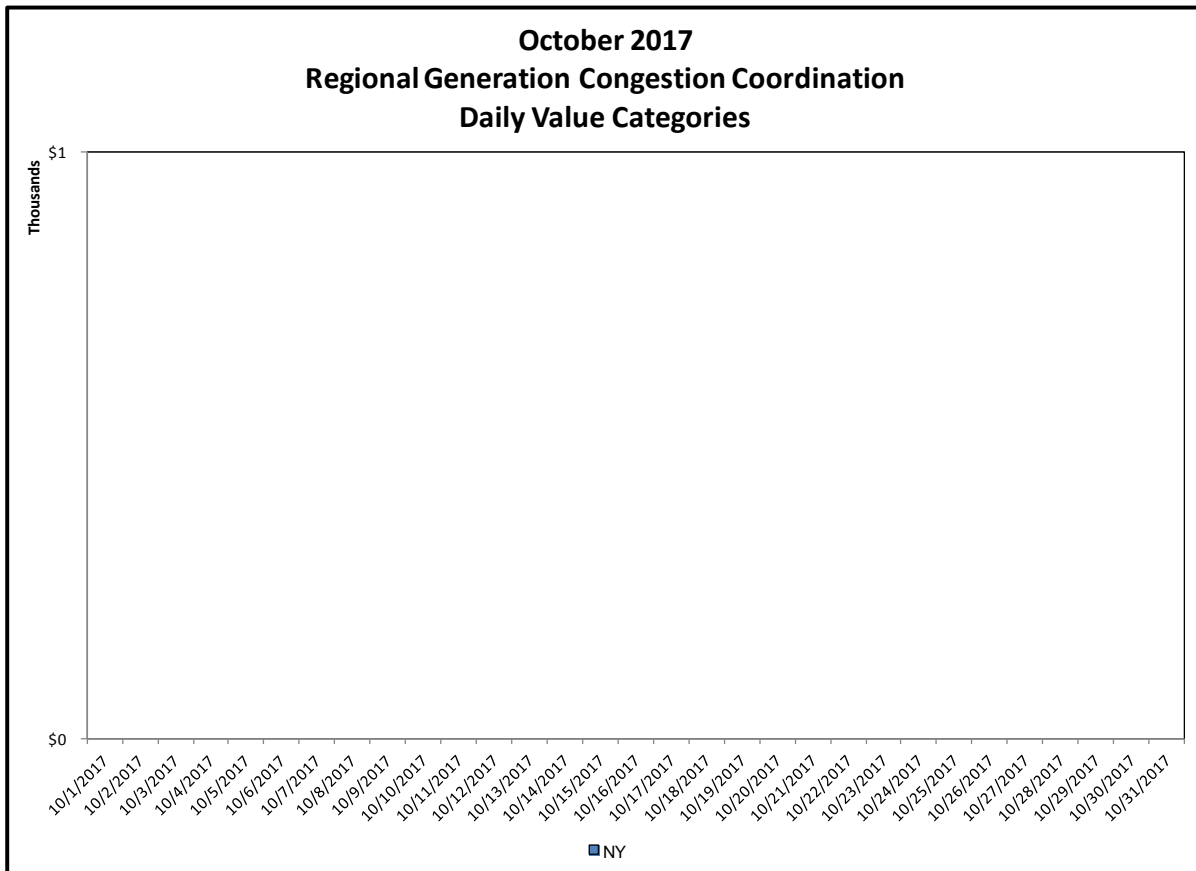
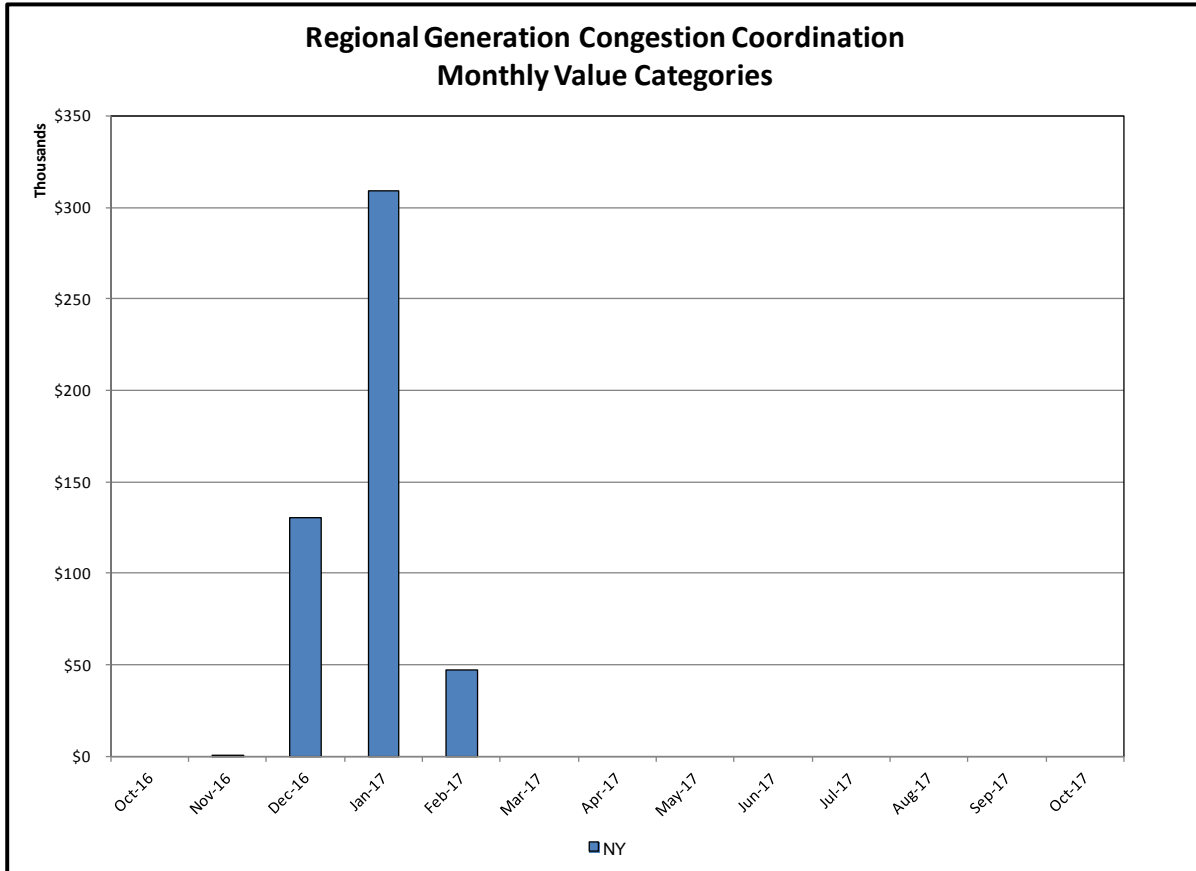


Broader Regional Market Performance Metrics



PAR Interconnection Congestion Coordination

<u>Category</u>	<u>Description</u>
 NY	Represents the value NY realizes from Market-to-Market PAR 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 Interconnection PAR Target levels, excluding RECO on the Ramapo PARs). 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.



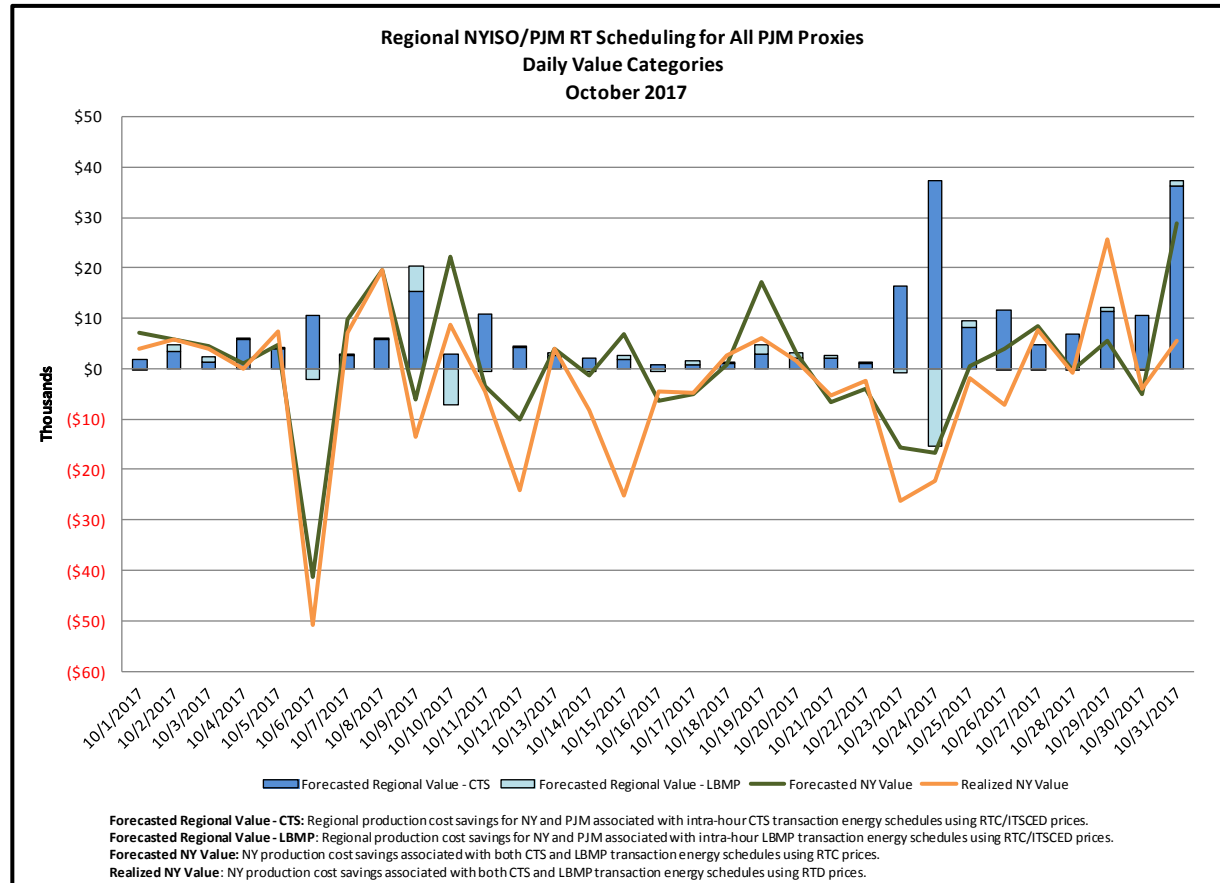
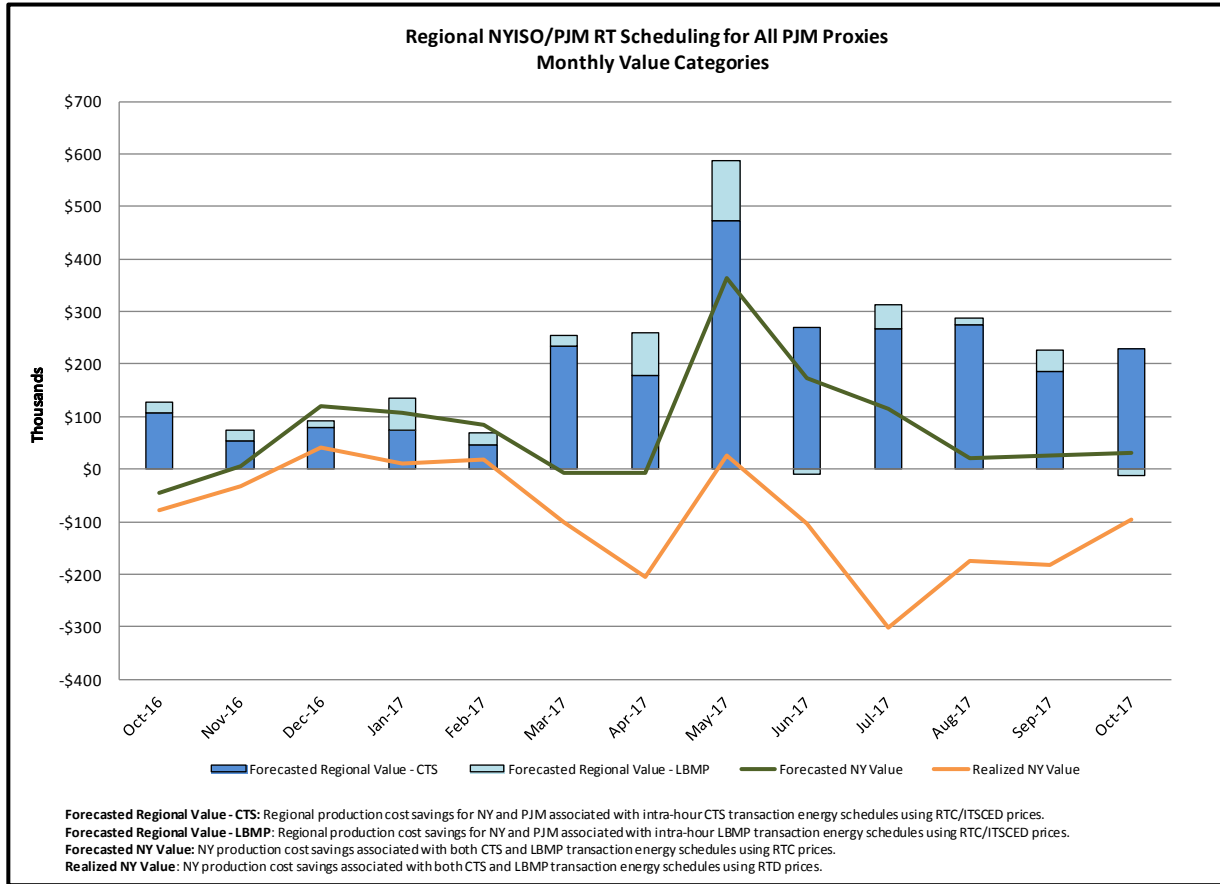
Regional Generation Congestion Coordination

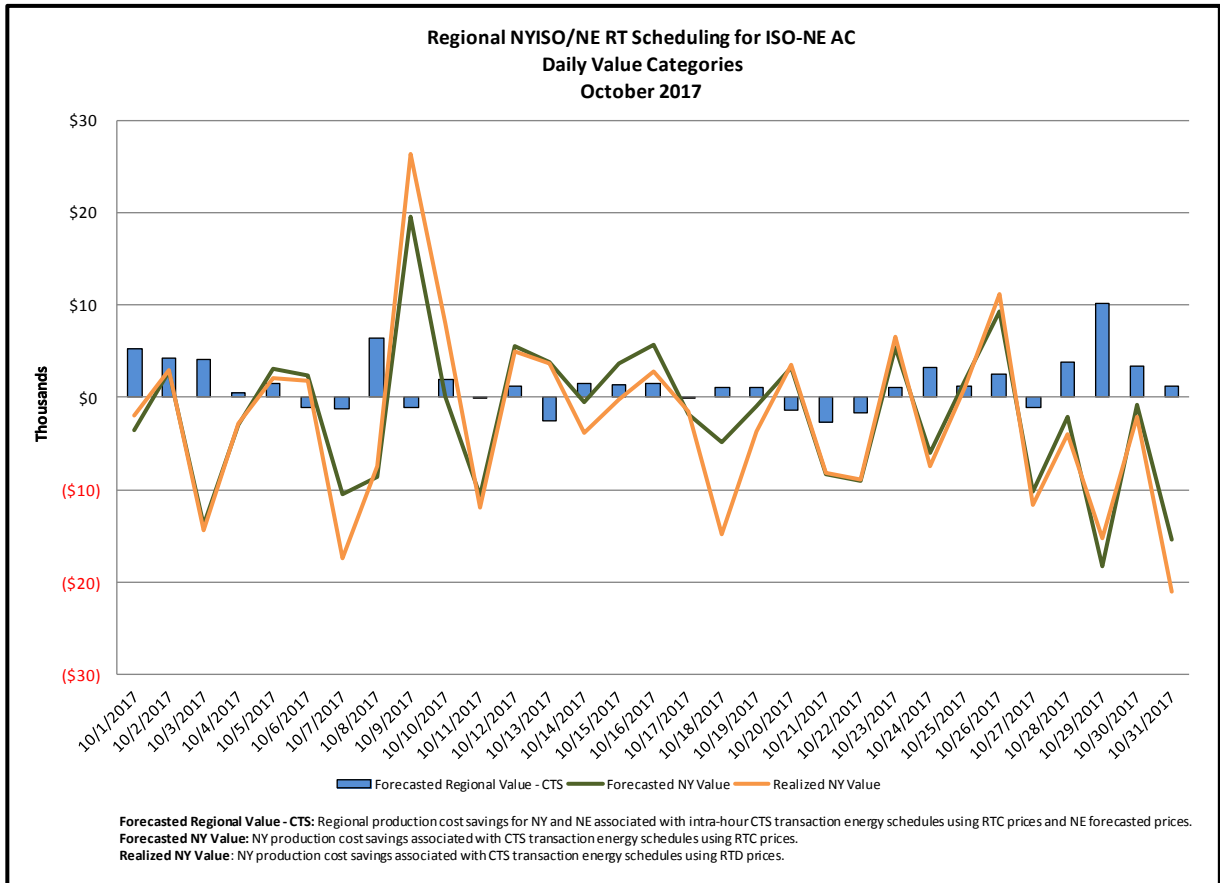
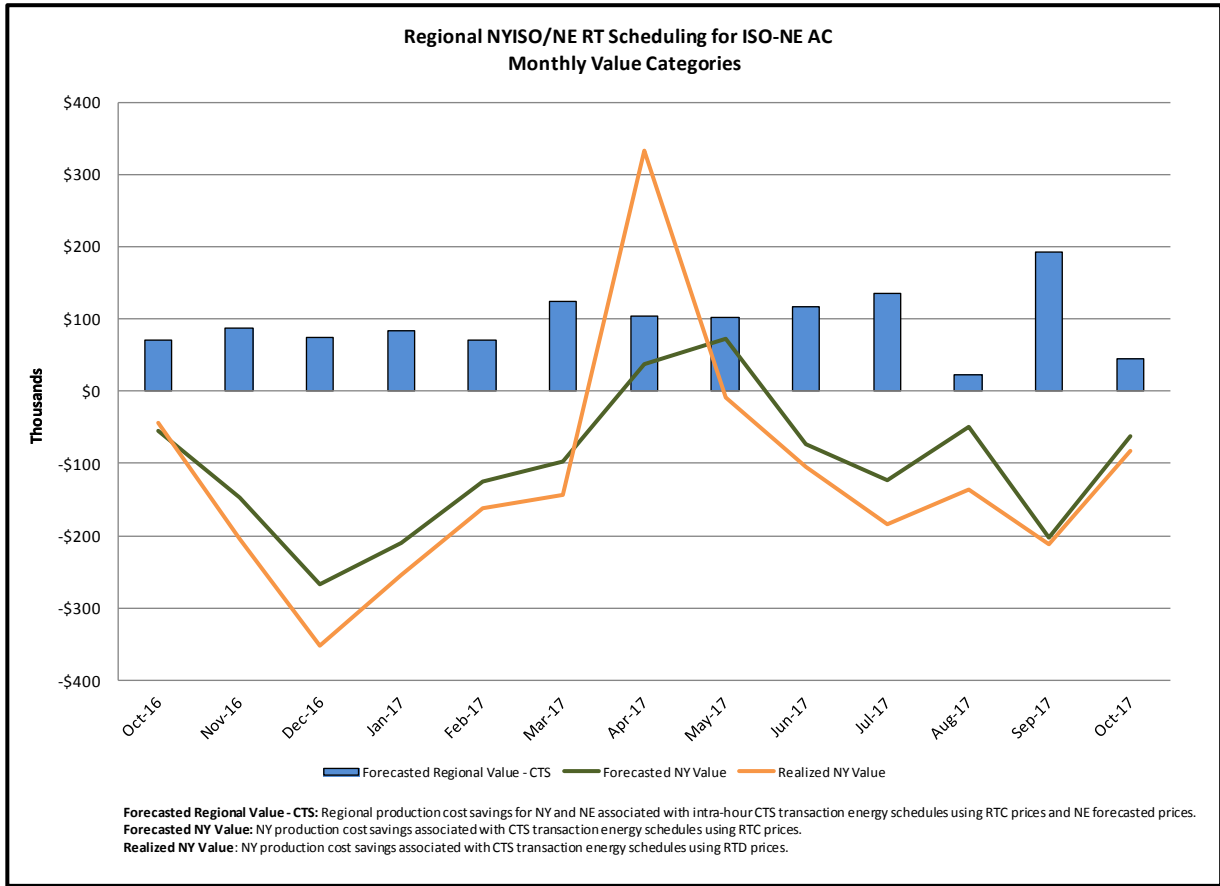
Category

NY

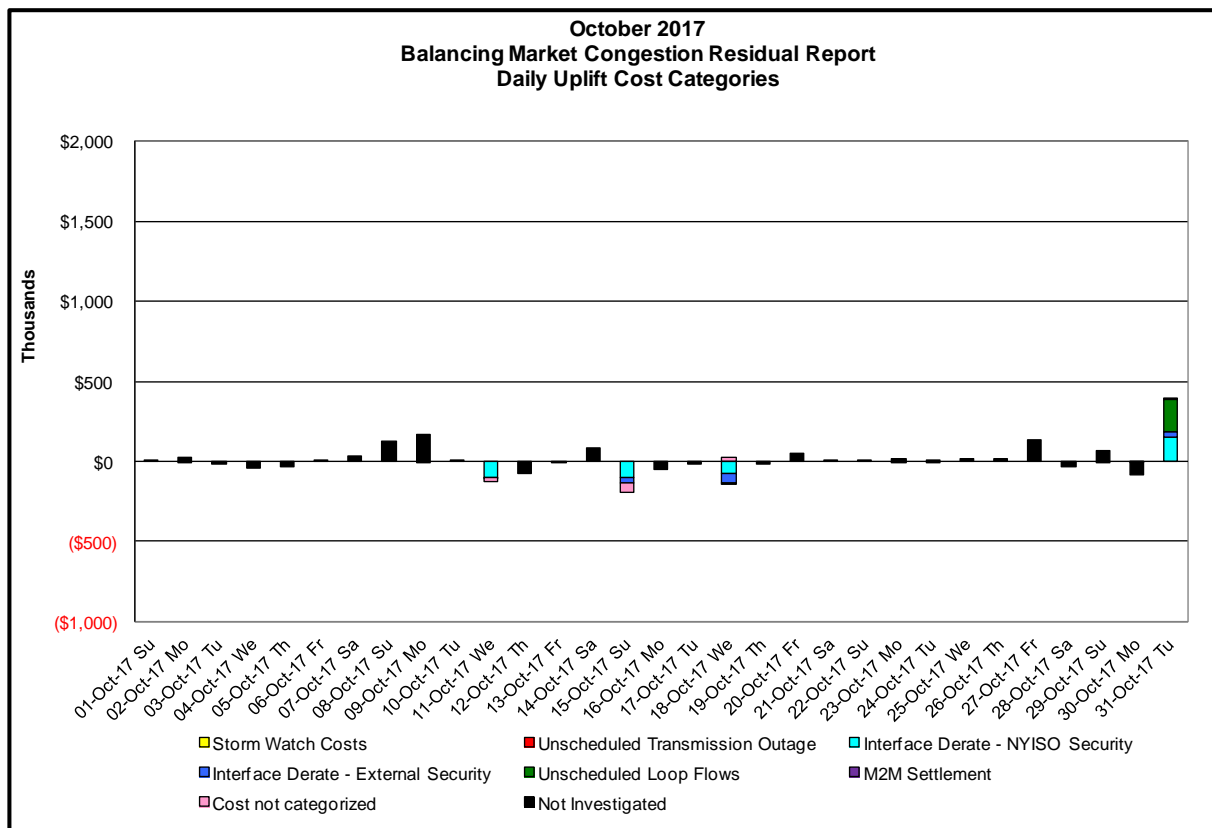
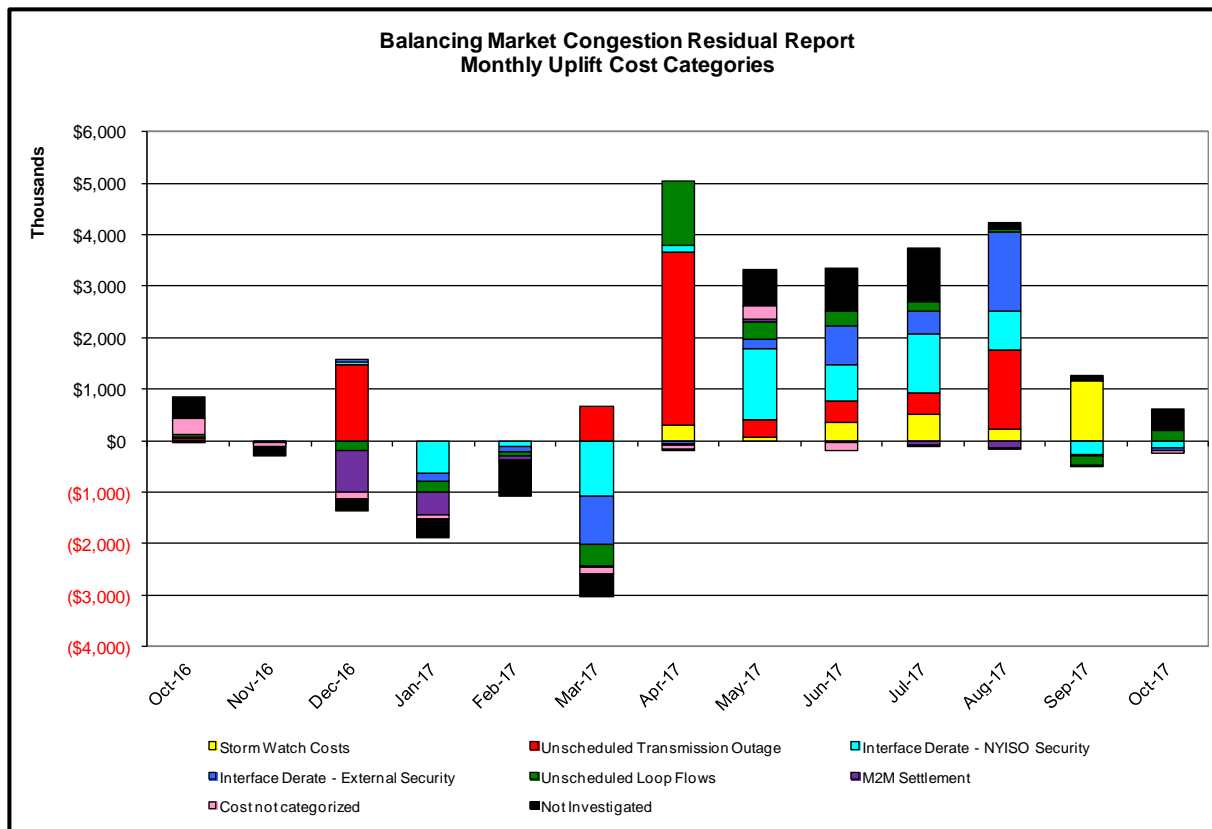
Description

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: 11, 15, 18, 31

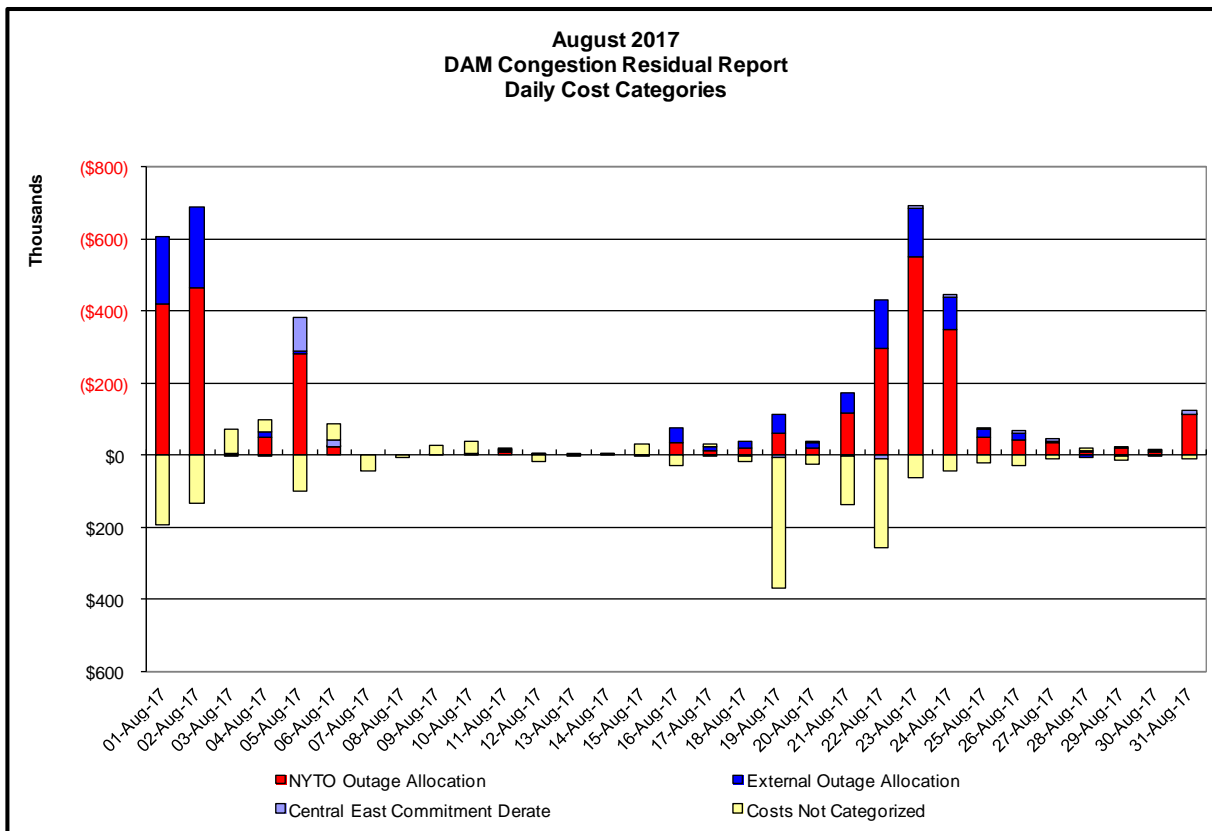
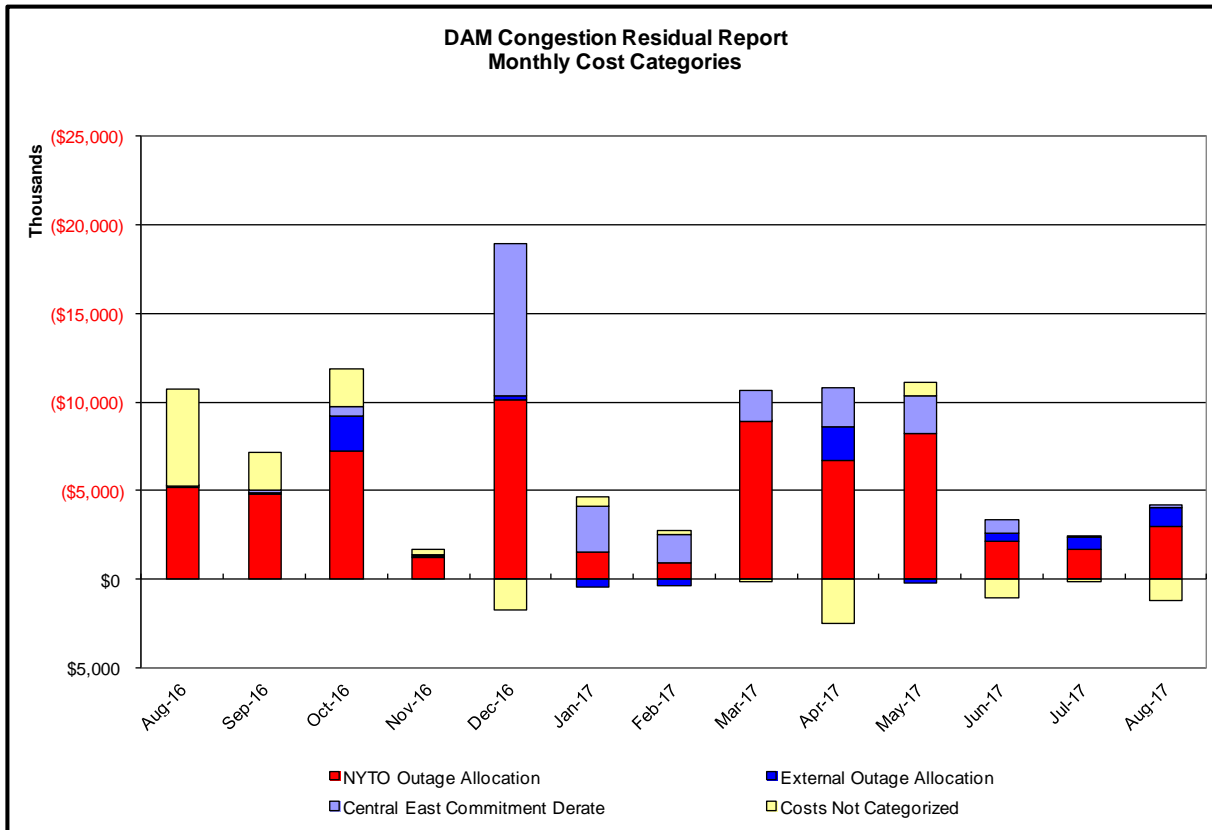
Event	Date (yyyymmdd)	Hours	Description
	10/11/2017	8	NYCA DNI Ramp Limit
	10/11/2017	14	Uprate Dunwoodie-Shore Rd 345kV (#Y50)
	10/11/2017	10, 14, 19	Uprate Dunwoodie-Shore Rd 345kV (#Y50) for I/o SCB:SPBK(RNS2):Y49&M29&Y49_ST
	10/11/2017	8-12, 14, 19	Uprate East 179th Street-Hellgate East 138kV (#15055)
	10/11/2017	8-12, 14	Uprate Freshkills-Willowbrook 138kV (#29211)
	10/11/2017	8-12, 14	Uprate Gowanus-Greenwood 138kV (#42231)
	10/11/2017	8, 9	Uprate Gowanus-Greenwood 138kV (#42232) for I/o SCB:GOWANUS(2):41&42231&R4
	10/11/2017	11, 12, 14, 19	Uprate Gowanus-Greenwood 138kV (#42231) for I/o TWR:GOETHALS 22 & 21
	10/11/2017	8-12, 14	Uprate Gowanus-Greenwood 138kV (#42232) for I/o TWR:GOETHALS 22 & 21
	10/11/2017	8, 9	Uprate Motthaven-Dunwoodie (#72)
	10/11/2017	14	Uprate Leeds-Pleasant Valley 345kV (#92) for I/o Athens-Pleasant Valley 345kV (#91)
	10/11/2017	8-9	Uprate Scriba-Volney (#20) I/o Scriba-Volney (#21)
	10/11/2017	19	NE_AC-NY Scheduling Limit
	10/15/2017	6	Derate Central East
	10/15/2017	9, 10, 13, 15, 21	Uprate Foxhills-Greenwood 138kV (#29231)
	10/15/2017	8-10, 13, 15, 21	Uprate Goethals-Gowanus 345kV (#25)
	10/15/2017	8-10, 13, 21	Uprate Goethals-Gowanus 345kV (#26)
	10/15/2017	21-23	NE_AC-NY Scheduling Limit
	10/15/2017	6	NE_AC DNI Ramp Limit
	10/18/2017	18-20, 22, 23	Uprate Dunwoodie-Shore Rd (#Y50)
	10/18/2017	17, 18	Uprate East 179th Street-Hellgate East 138kV (#15055)
	10/18/2017	17	Uprate Goethals-Gowanus 345kV (#25)
	10/18/2017	17	Uprate Goethals-Gowanus 345kV (#26)
	10/18/2017	17, 18	Uprate Rainey-Vernon 139kV (#36312)
	10/18/2017	7, 18, 19	Uprate Scriba-Volney (#20) I/o Scriba-Volney (#21)
	10/18/2017	7, 18-20, 22, 23	NE_AC-NY Scheduling Limit
	10/18/2017	20, 22	NE_AC DNI Ramp Limit
	10/18/2017	23	Lake Erie Circulation, DAM-RTM exceeds +/-125MW: Central East
	10/31/2017	12, 17, 18	Derate Moses-Adirondack 230kV (#MA1) for I/o SIN:MSU1&7040& HQ GN&LD PROXY
	10/31/2017	12	Derate Central East
	10/31/2017	20	Uprate Malone-Willis 115kV (#1-910) for I/o Moses Willis 230kV (#MW1)
	10/31/2017	8, 12, 17, 18	Derate Niagara-Packard 230kV (#61) for I/o TWR:PACKARD 62 & BP76
	10/31/2017	18, 21	NYCA DNI Ramp Limit
	10/31/2017	18	NE_AC DNI Ramp Limit
	10/31/2017	19, 21	IESO_AC DNI Ramp Limit
	10/31/2017	6-8, 12	Lake Erie Circulation, DAM-RTM exceeds +/-125MW: Central East
	10/31/2017	6-8, 12, 17, 18	Lake Erie Circulation, DAM-RTM exceeds +/-125MW: Niagara-Packard

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	

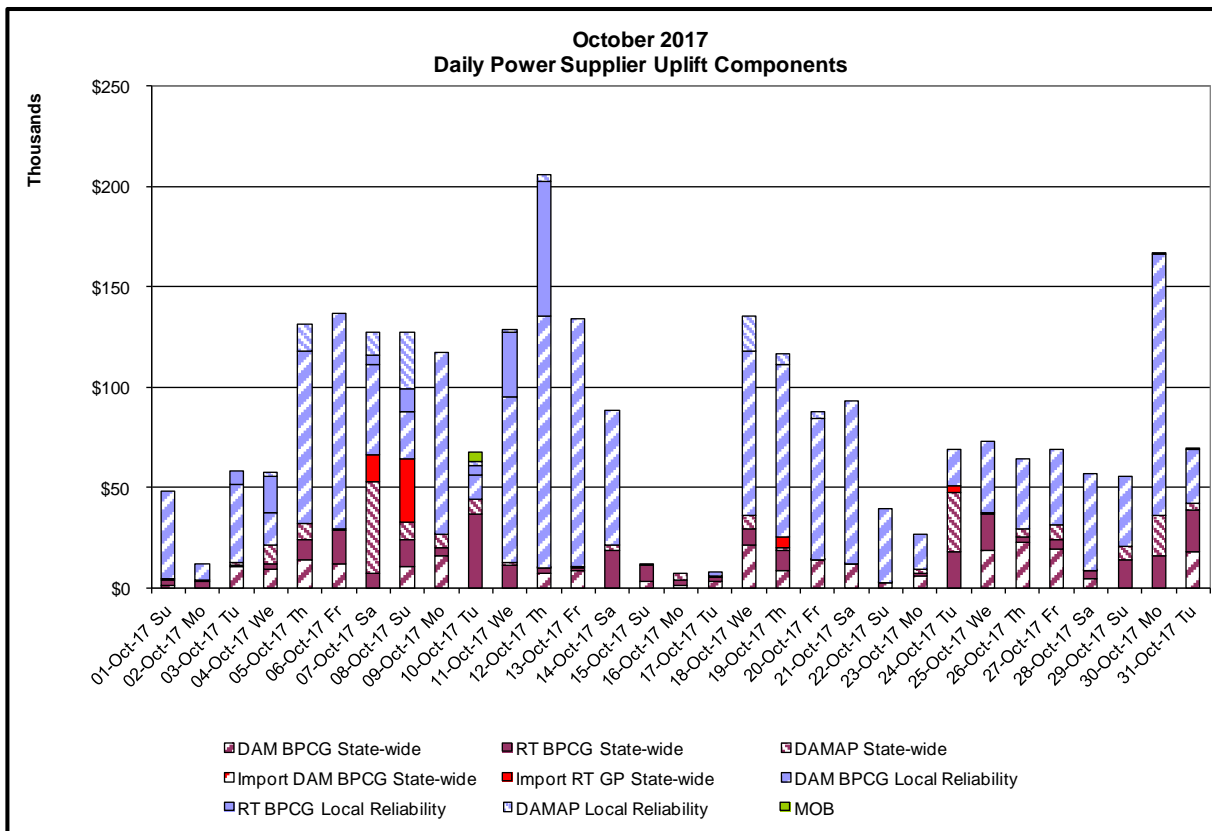
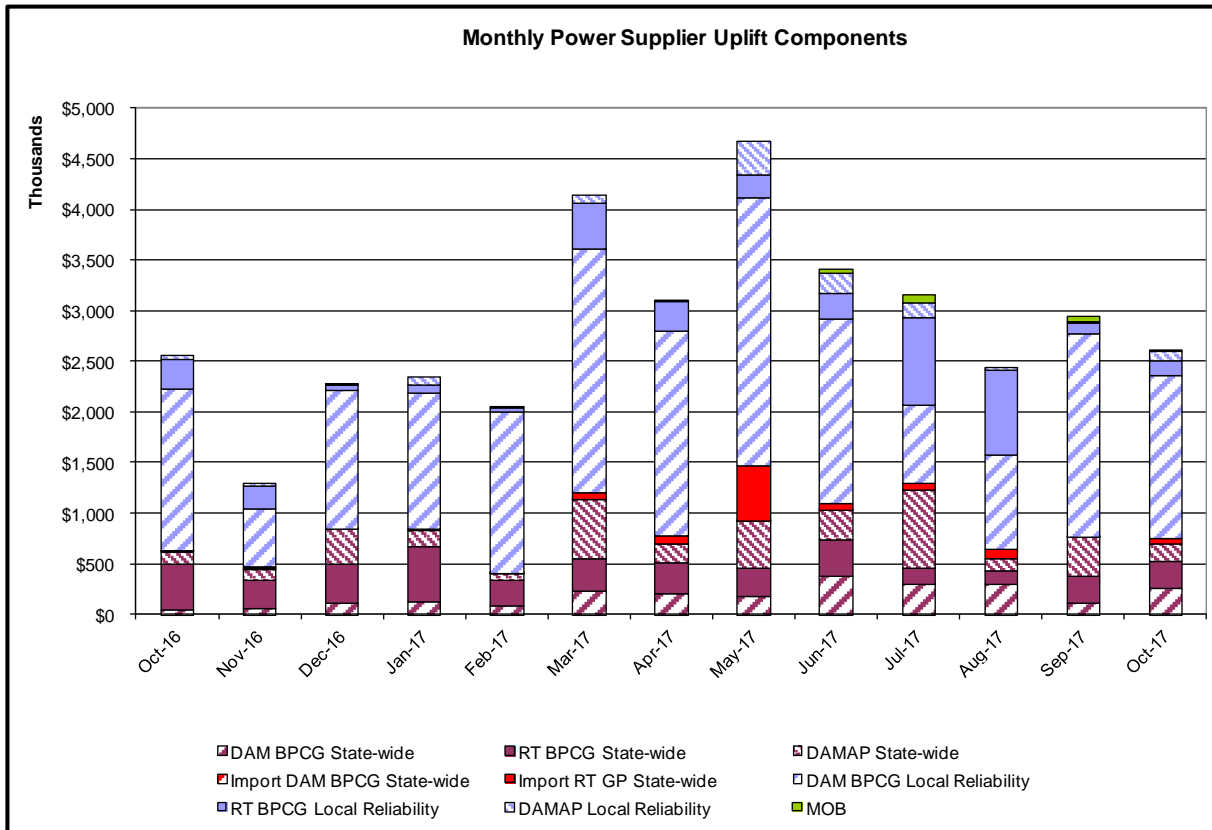
Monthly Balancing Market Congestion Report Assumptions/Notes

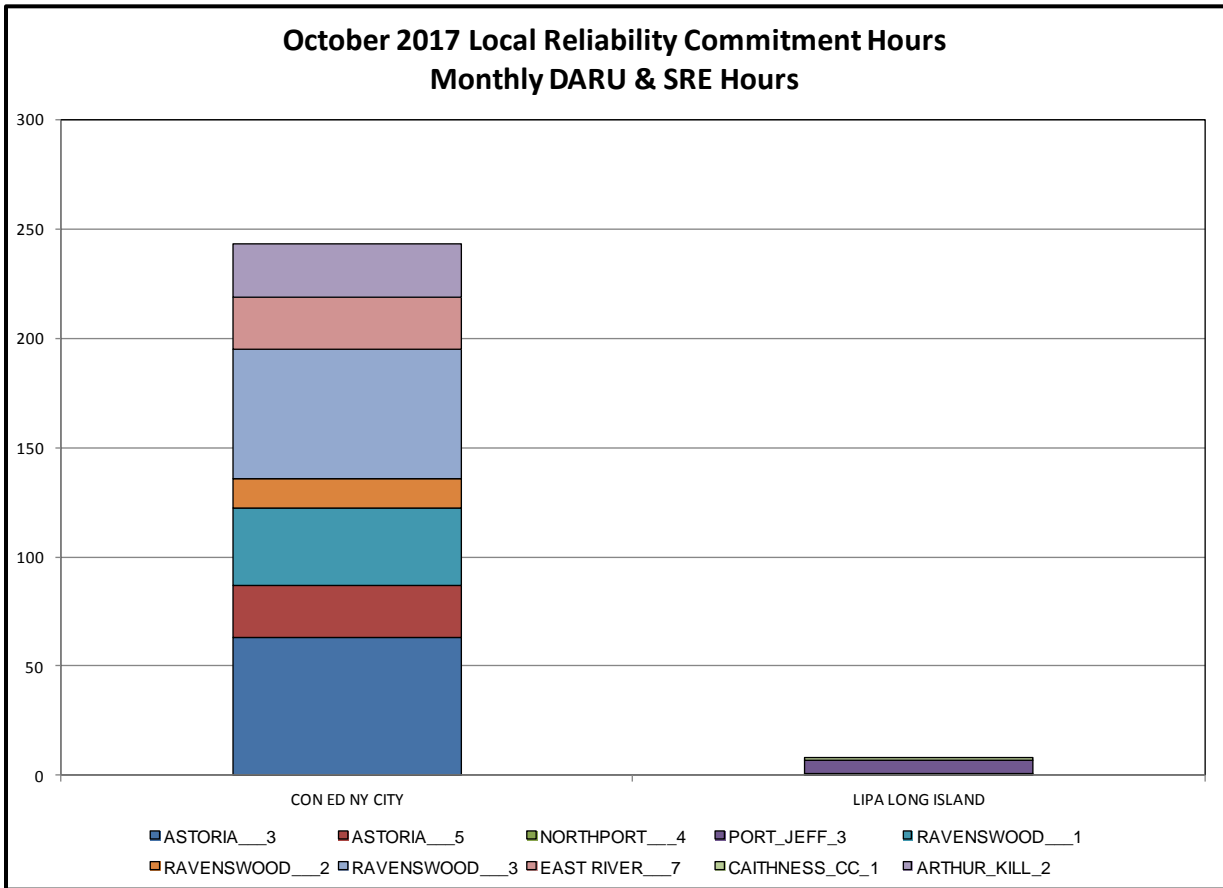
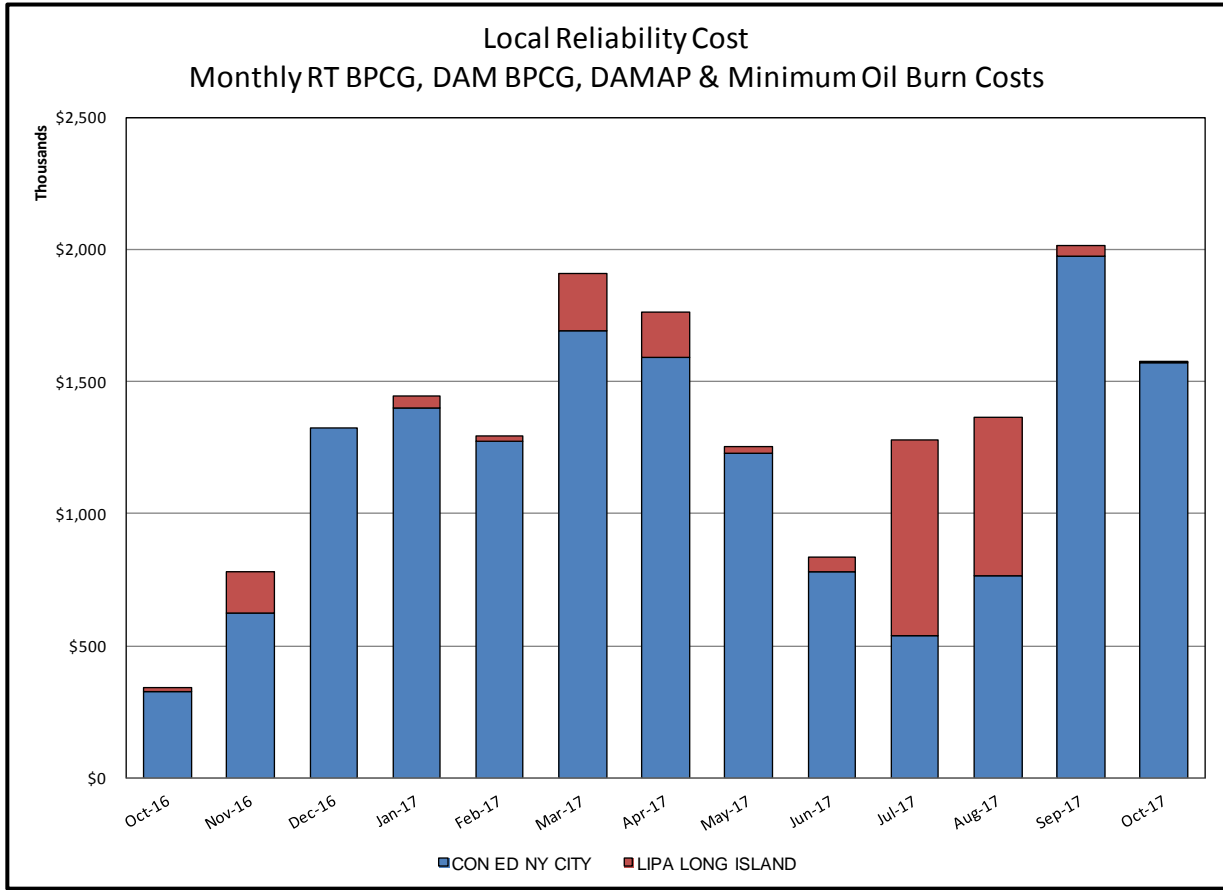
- 1) Storm Watch Costs are identified as daily total uplift costs
- 2) Days with a value of BMCR less M2M Settlement of \$100K/HR, shortfall of \$200K/Day or more, or surplus of \$100K/Day or more are investigated.
- 3) Uplift costs associated with multiple event types are apportioned equally by hour

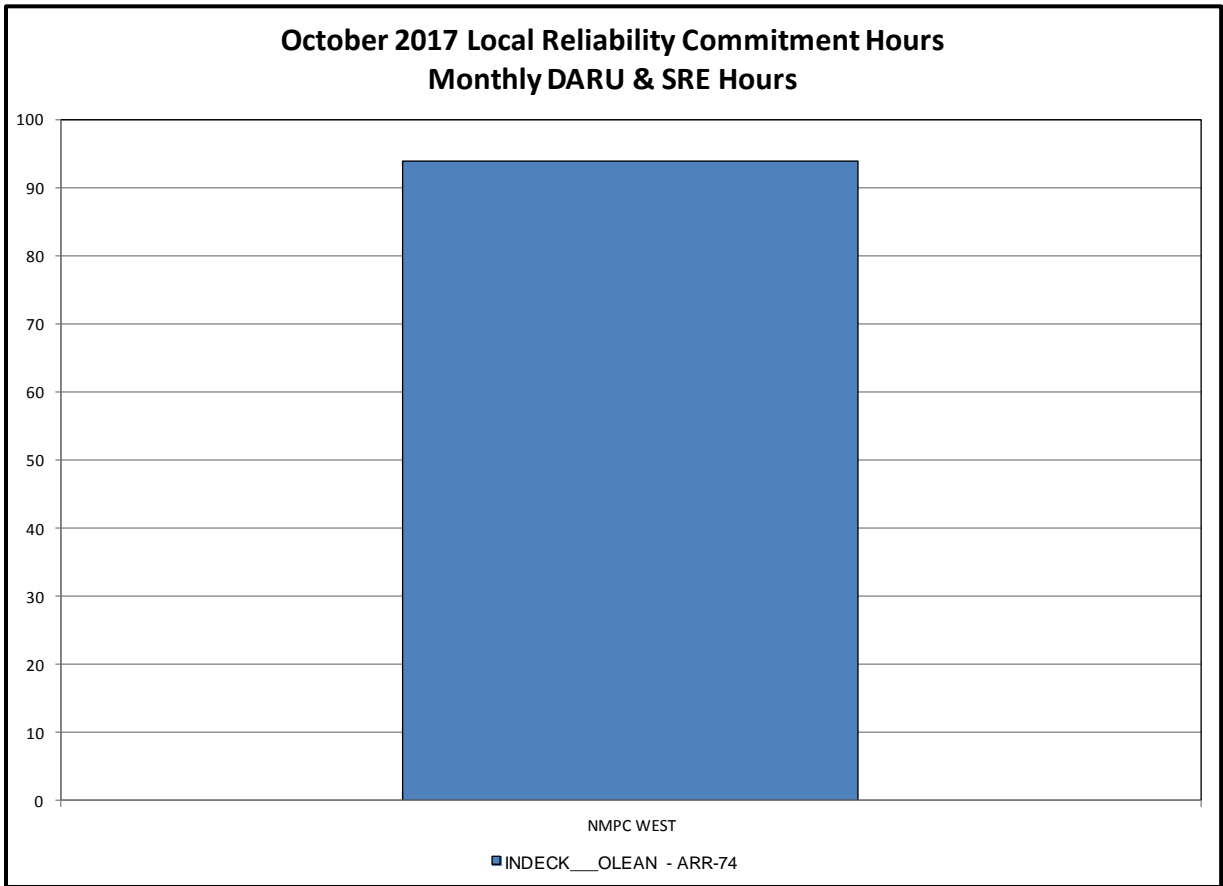
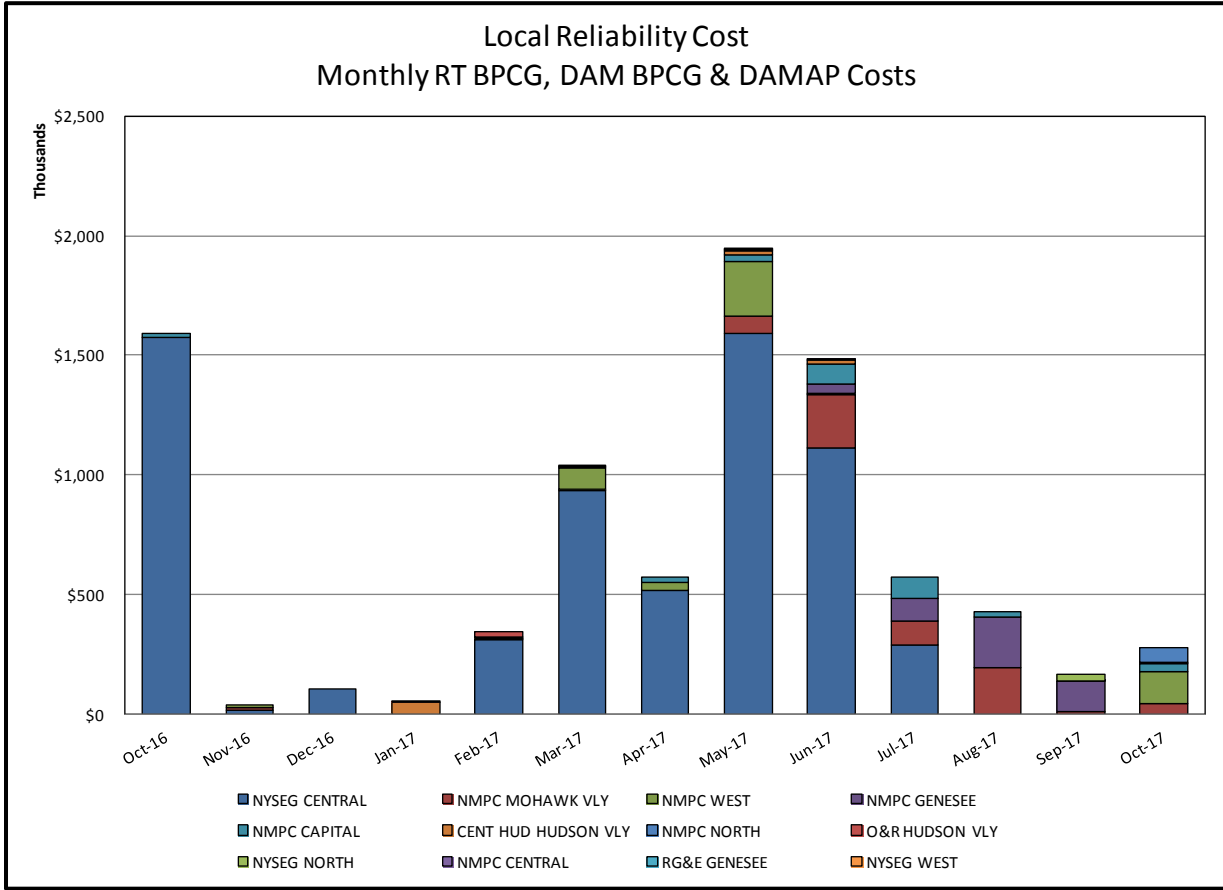


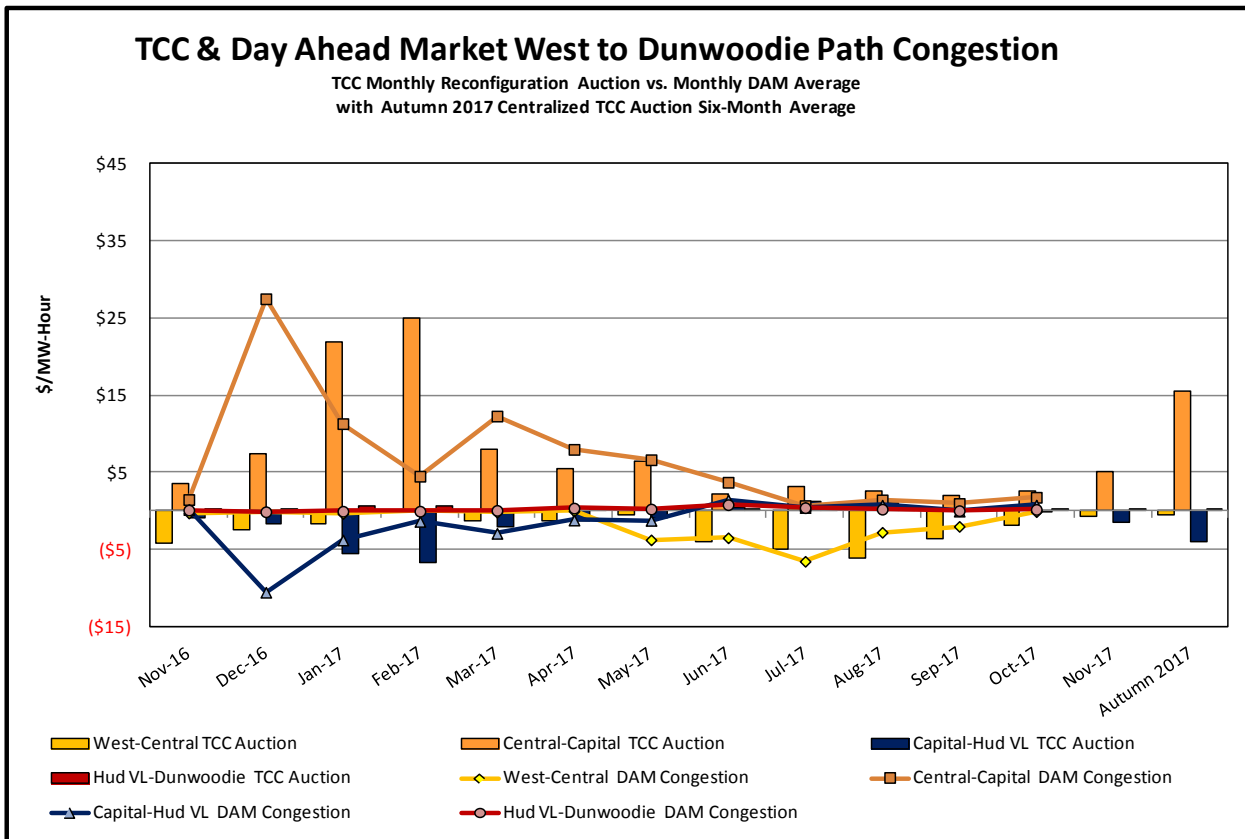
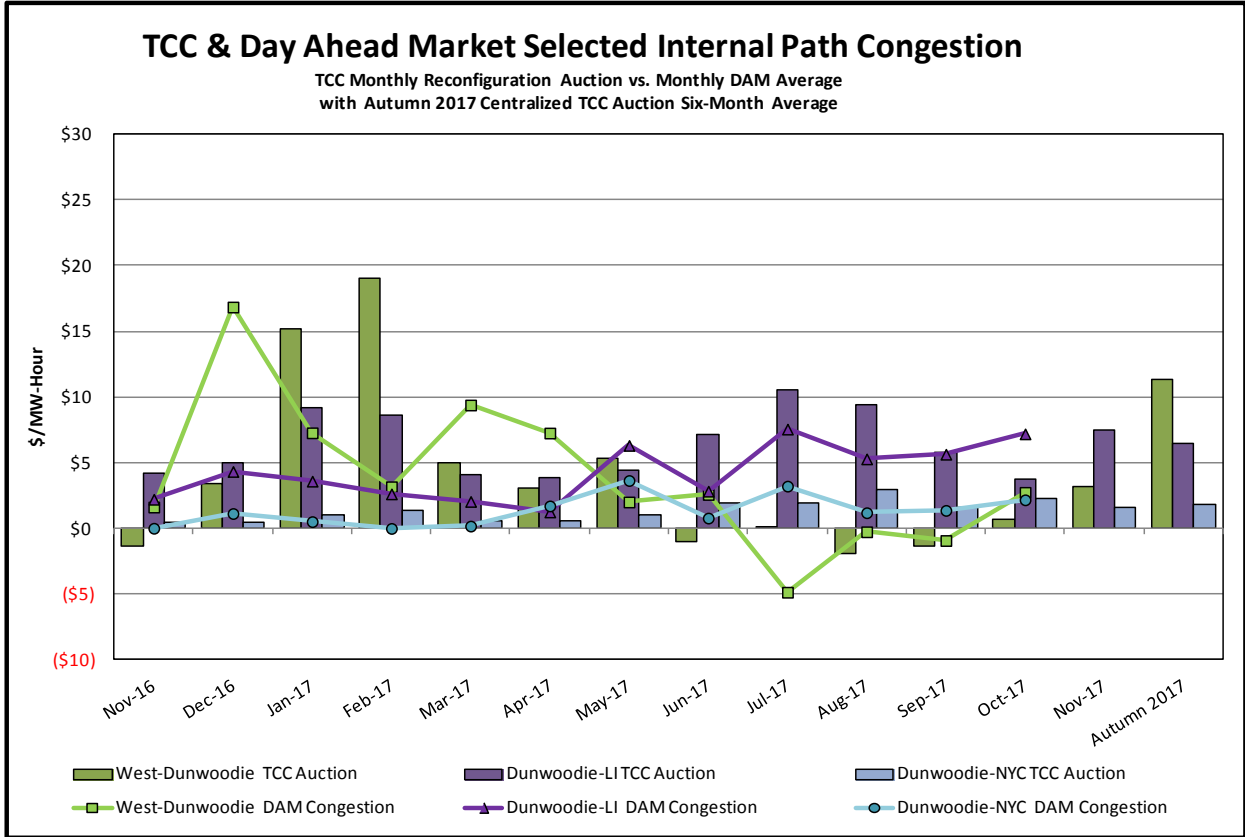
Day-Ahead Market Congestion Residual Categories

<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 2017 Centralized TCC Auction Six-Month Average

