

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



## ***September 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 October 9, 2017.

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## September 2017 Operations Performance Highlights

- Peak load of 27,442 MW occurred on 09/27/2017 HB 16
- 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 however, on 09/07/2017 and 09/08/2017, the NYISO declared Alert states and reduced power flows to 90% of ratings due to a level K-9 intensity solar storm.
- 0 hours of NERC TLR level 3 curtailment
- On 09/14/2017 the Ramapo PAR 3500 was returned to service. The Ramapo PAR scheduling ratio is now 32% with both PARs in service, as detailed in the *NY-NJ PAR interchange & OBF* web posting.
- On 09/05/2017 the Dolson Ave. station was cut in. It replaces the Coopers Corners-Rock Tavern 345kV (CCRT-42) line with Coopers Corners-Dolson Ave. 345 (CCDA42) line and the Dolson Ave.-Rock Tavern 345kV (DART44) line
- NYISO and PJM have agreed to reduce the initial Operational Base Flow (OBF), which is applied to the ABC and JK Interfaces, from 400 MW to zero MW as of 10/31/2019.
- The following table identifies the estimated production cost savings associated with the Broader Regional Market initiatives.

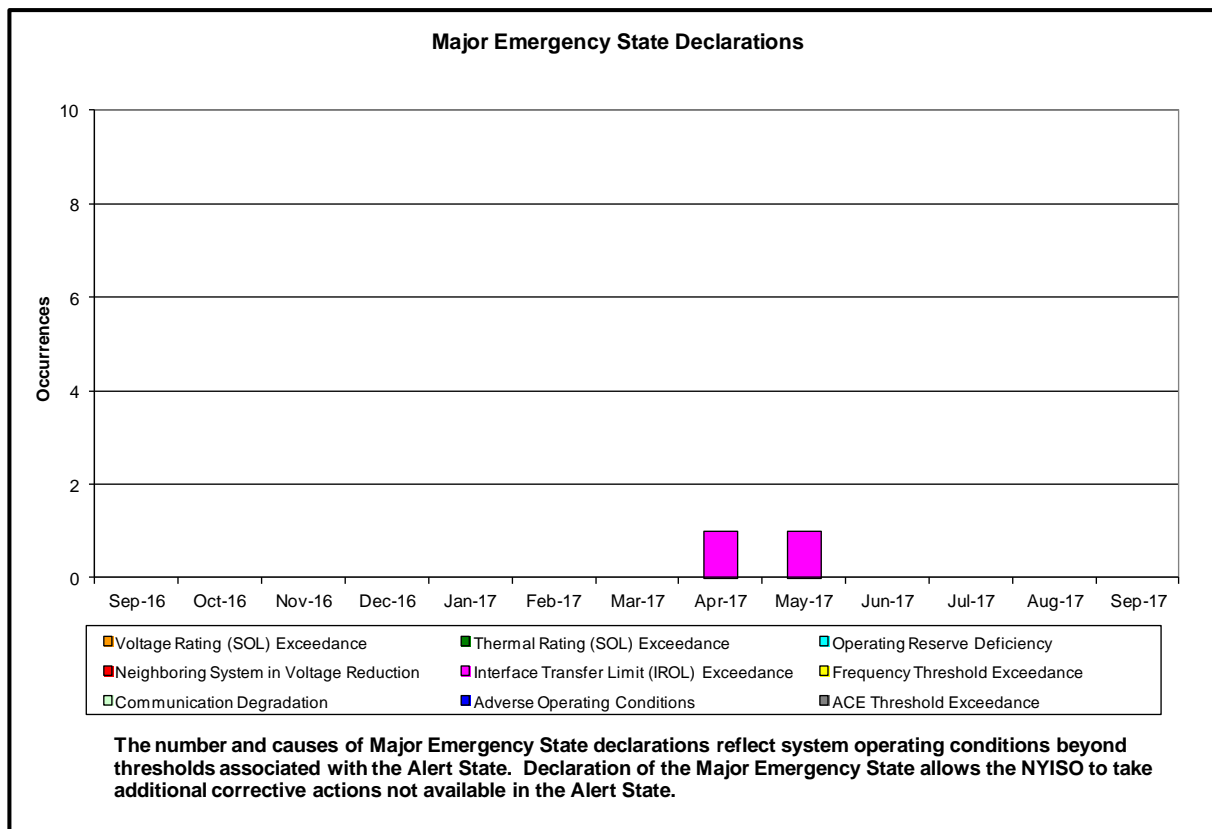
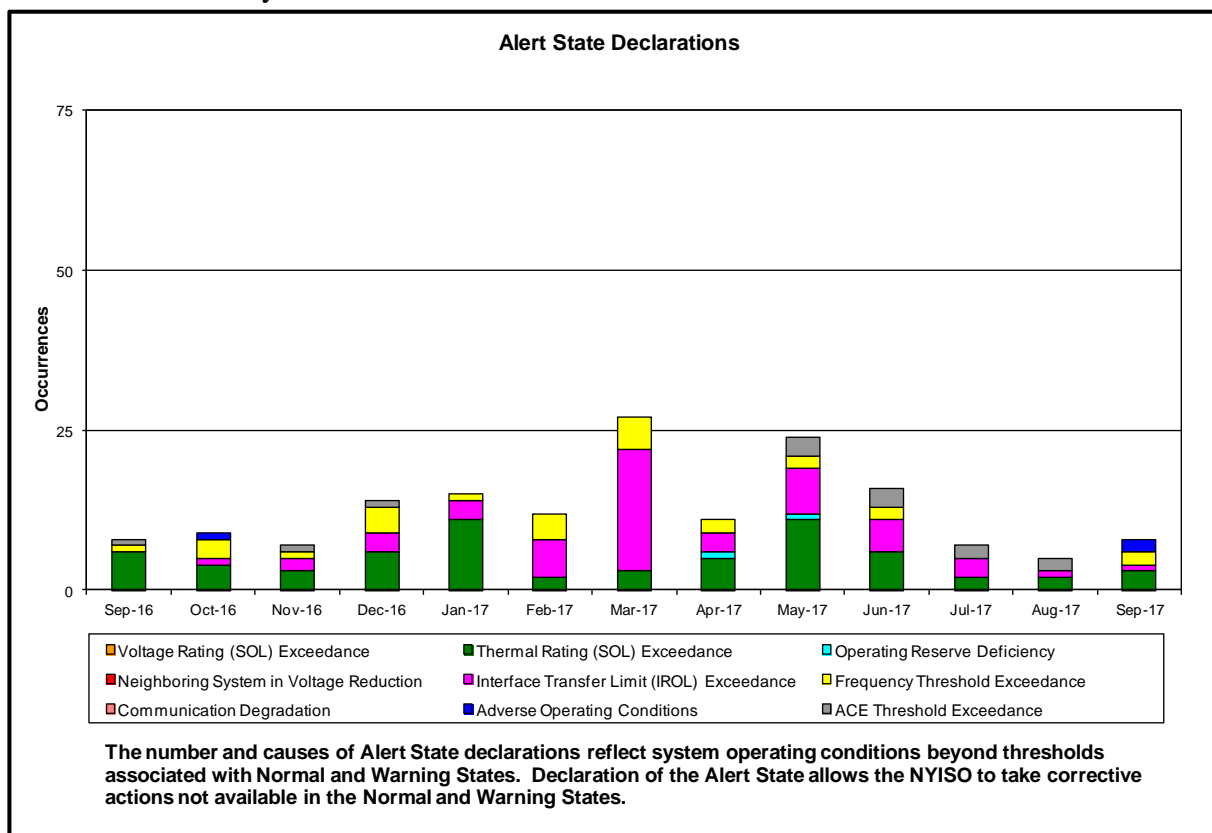
	Current Month Value (\$M)	Year-to-Date Value (\$M)
<b>NY Savings from PJM-NY Congestion Coordination</b>	\$0.35	\$9.12
<b>NY Savings from PJM-NY Coordinated Transaction Scheduling</b>	(\$0.18)	(\$1.01)
<b>NY Savings from NE-NY Coordinated Transaction Scheduling</b>	(\$0.21)	(\$0.87)
<b>Total NY Savings</b>	(\$0.04)	\$7.24
<b>Regional Savings from PJM-NY Coordinated Transaction Scheduling</b>	\$0.23	\$2.39
<b>Regional Savings from NE-NY Coordinated Transaction Scheduling</b>	\$0.19	\$0.95
<b>Total Regional Savings</b>	\$0.42	\$3.34

- Statewide uplift cost monthly average was (\$0.50)/MWh
- The following table identifies the Monthly ICAP spot market prices by locality and price delta.

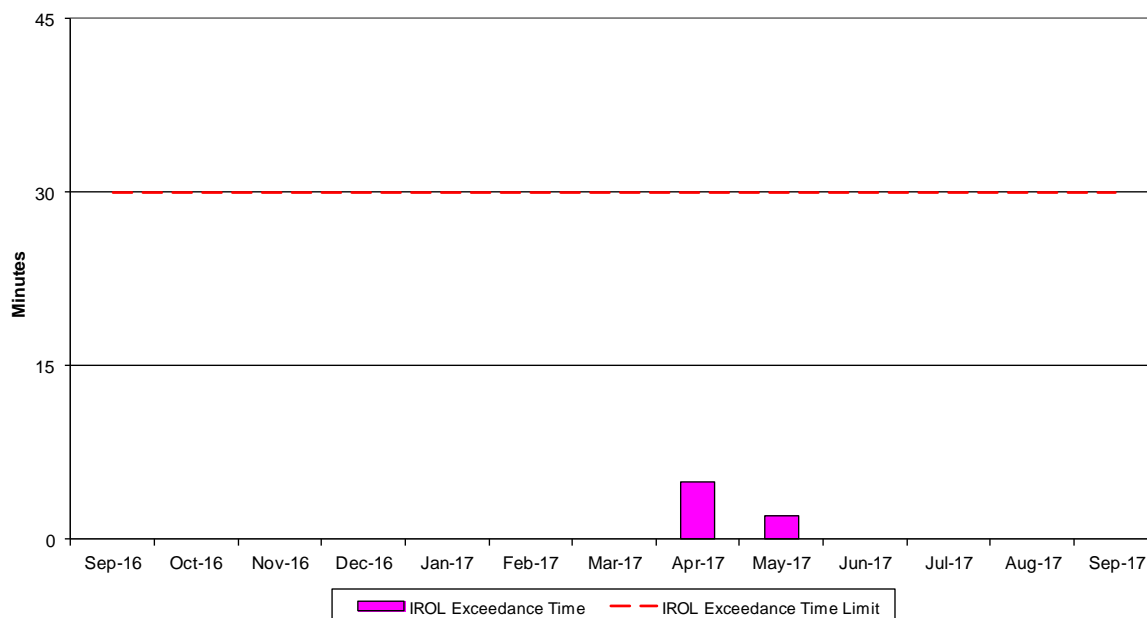
Spot Auction Price Results	NYCA	Lower Hudson Valley Zones	New York City Zone	Long Island Zone
October 2017 Spot Price	\$1.84	\$9.47	\$9.55	\$6.60
September 2017 Spot Price	\$2.18	\$9.90	\$10.19	\$6.59
Delta	(\$0.34)	(\$0.43)	(\$0.64)	\$0.01

- NYC - Price decreases by \$0.64 due to an increase in SCRs and a decrease in unoffered MW
- LHV - Price decreases by \$0.43 due to an increase in SCRs and a decrease in unoffered MW.
- NYCA - Price decreases by \$0.34 due to reduced Imports & Exports, an increase in SCRs and a decrease in unoffered MW.

- Reliability Performance Metrics

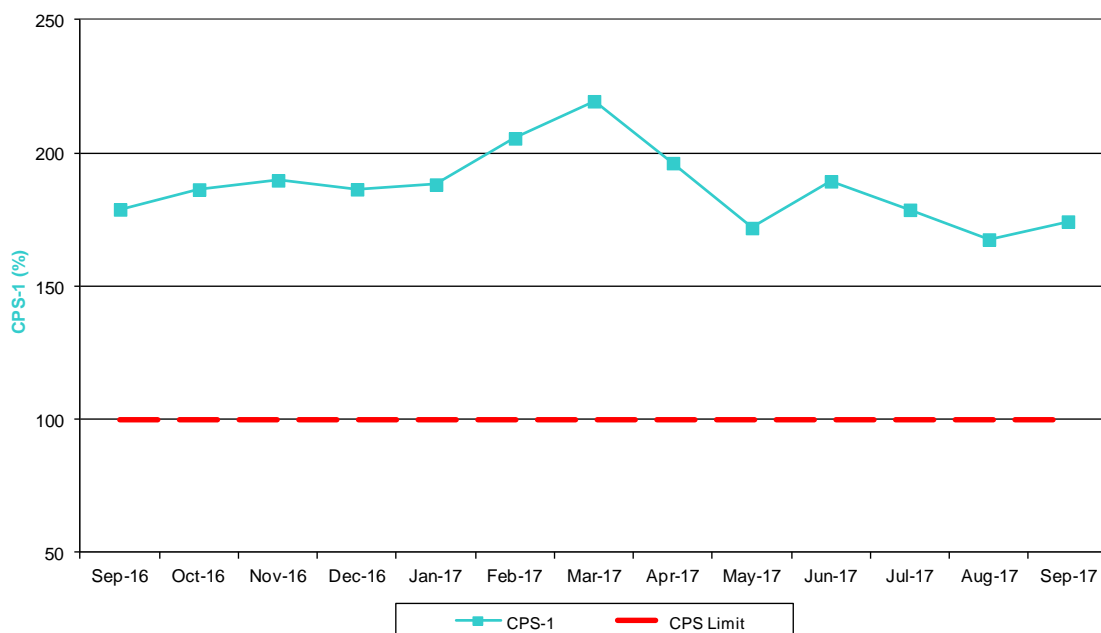


### NERC IROL Time Over Limit



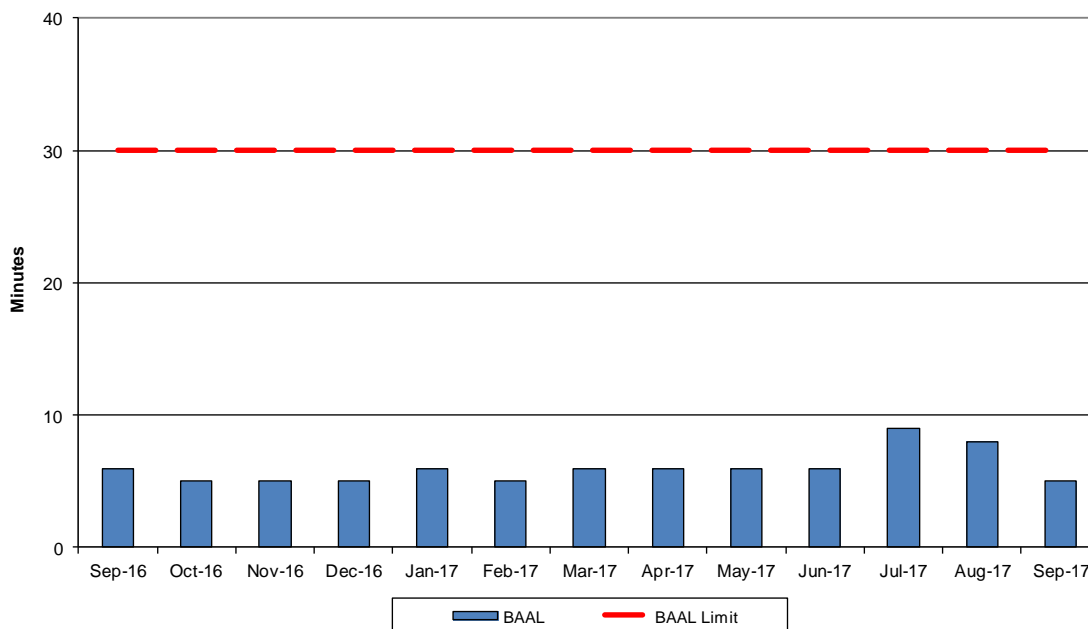
For IROL exceedances leading to Major Emergency State declarations, the maximum IROL exceedance time is identified. IROL exceedances of less than thirty minutes are considered NERC compliant.

### NERC Control Performance Standards



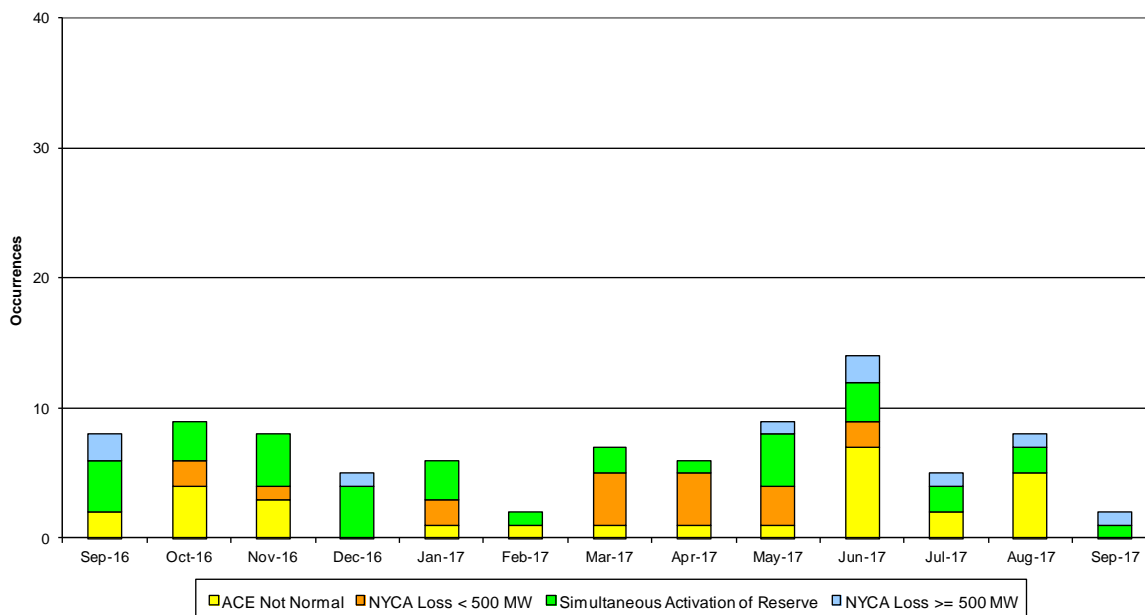
The value of NERC Control Performance Standards (CPS-1) is an indicator of the NYISO Area resource and demand balancing. Values exceeding the identified threshold are NERC compliant.

### NERC Balancing Authority ACE Limit Standard



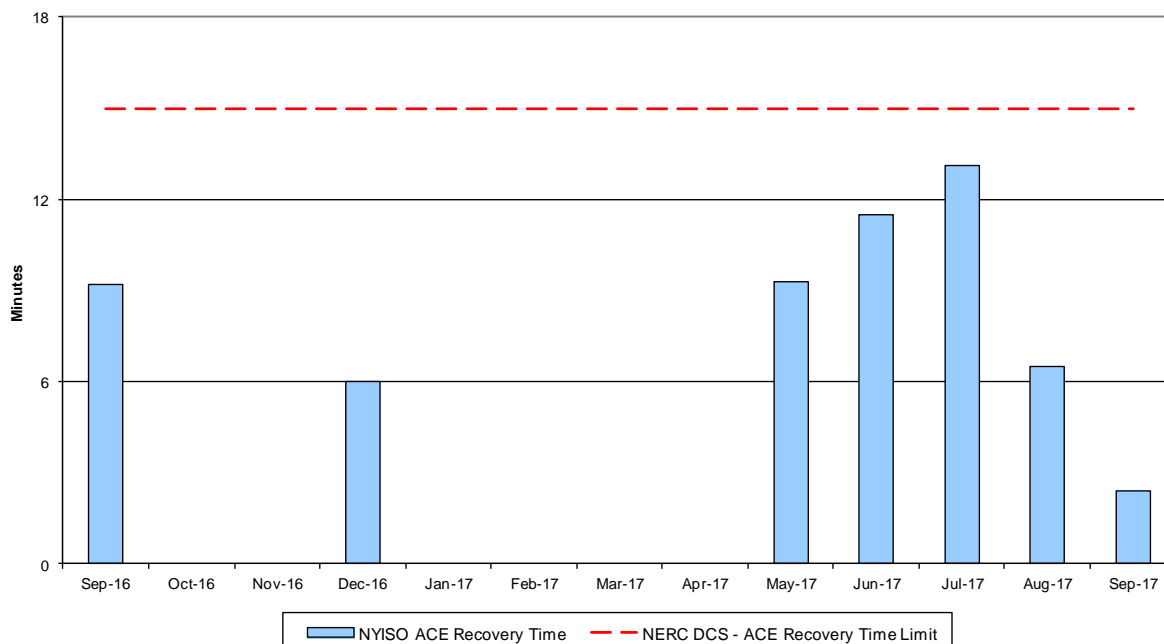
The amount of time the clock-minute average ACE exceeds the clock-minute Balancing Authority ACE Limit (BAAL) is an indicator of the NYISO Area resource and demand balancing. The maximum BAAL exceedance time is identified. BAAL exceedances of less than 30 consecutive clock-minutes are NERC compliant.

### Reserve Activations



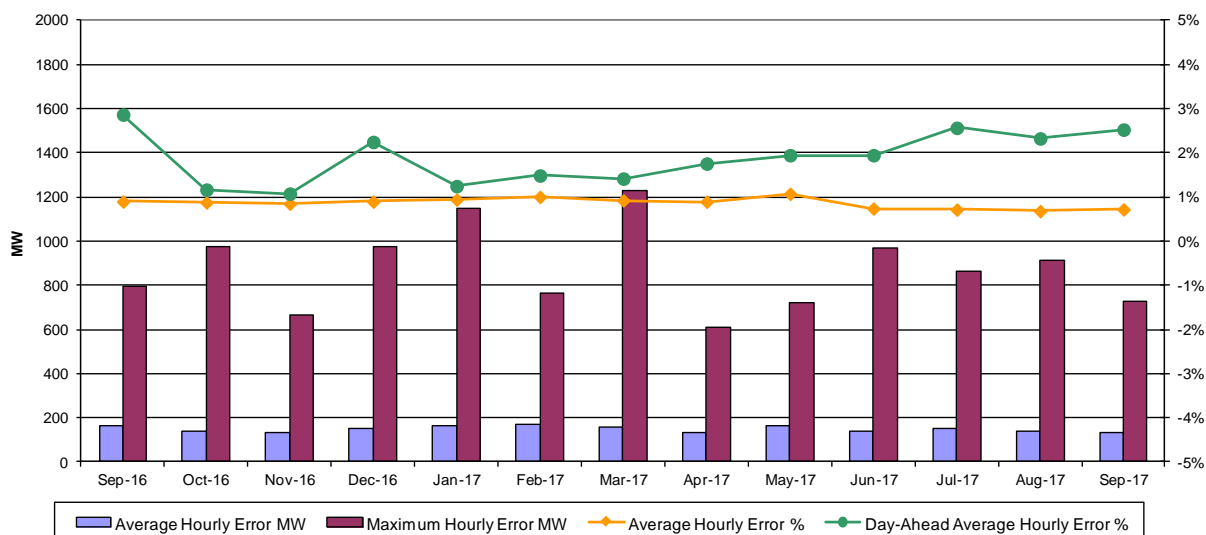
NYISO Reserve Activations are indicators of the need to respond to unexpected operational conditions within the NYISO Area or to assist a neighboring Area (Simultaneous Activation of Reserves) by activating an immediate resource and demand balancing operation.

### 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

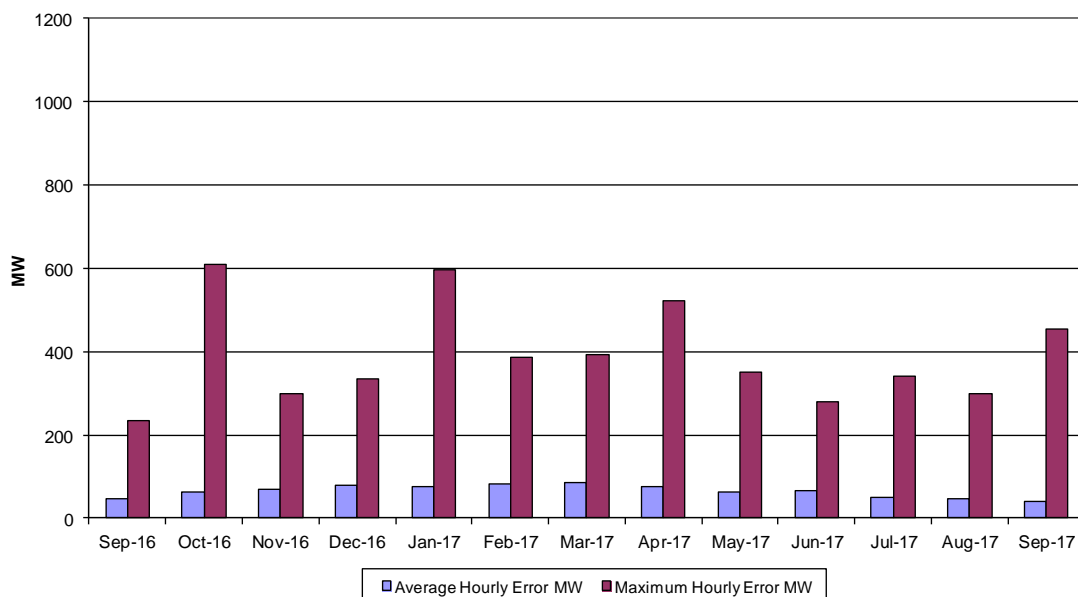


**Hourly Error MW** - Absolute value of the difference between the hourly average actual load demand and the average hour ahead forecast load demand.

**Average Hourly Error %** - Average value of the ratio of hourly average error magnitude to hourly average actual load demand.

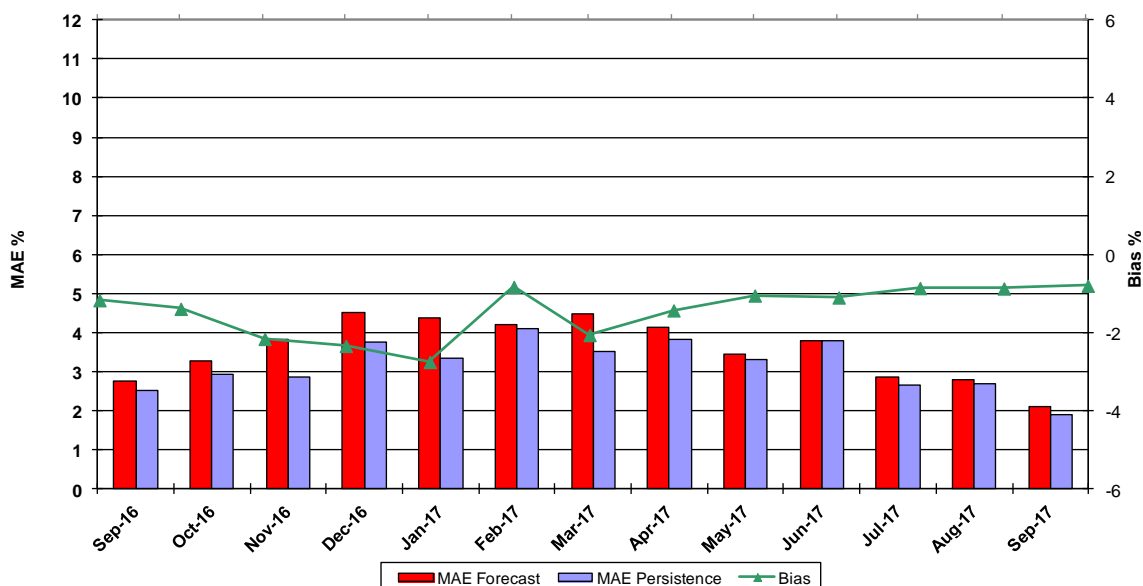
**Day-Ahead Average Hourly Error %** - Average across all hours of the month of the absolute value of the difference between actual load demand and the Day-Ahead forecast load demand, divided by the actual load demand.

### 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 1809MW

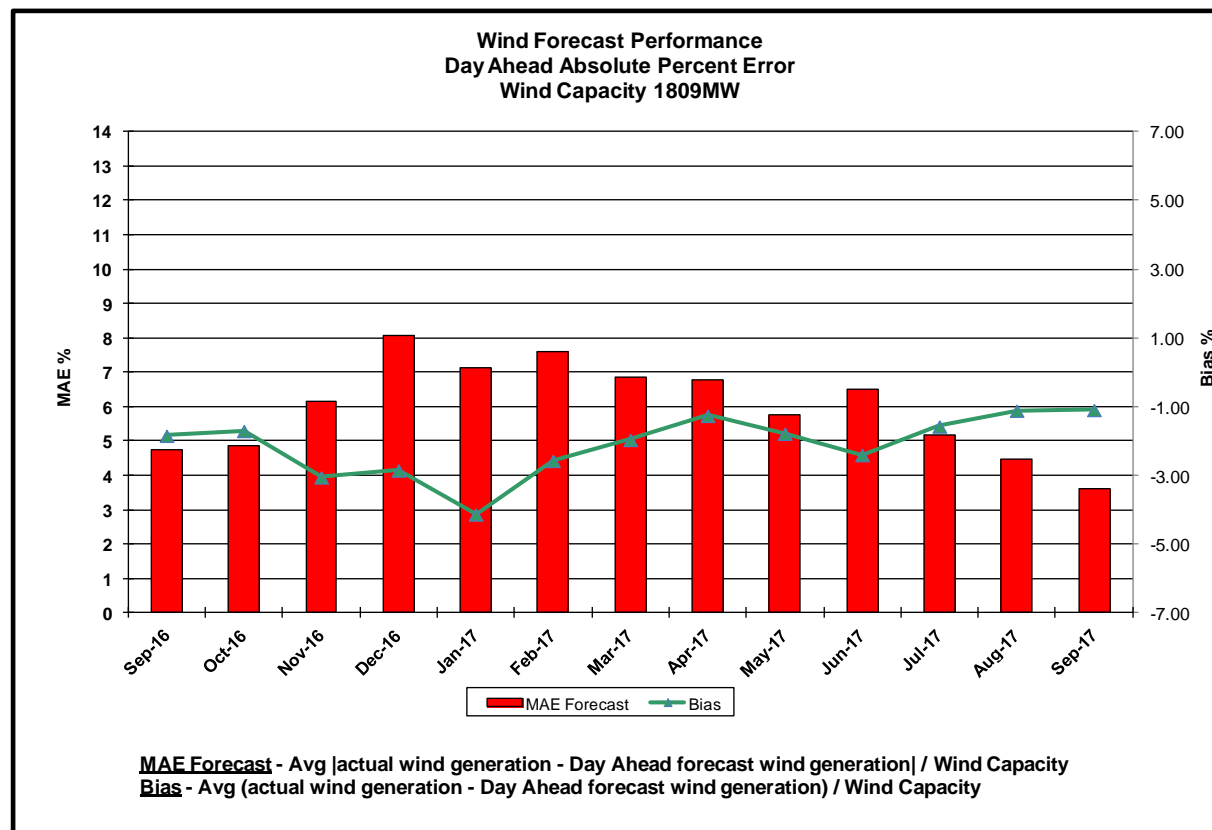
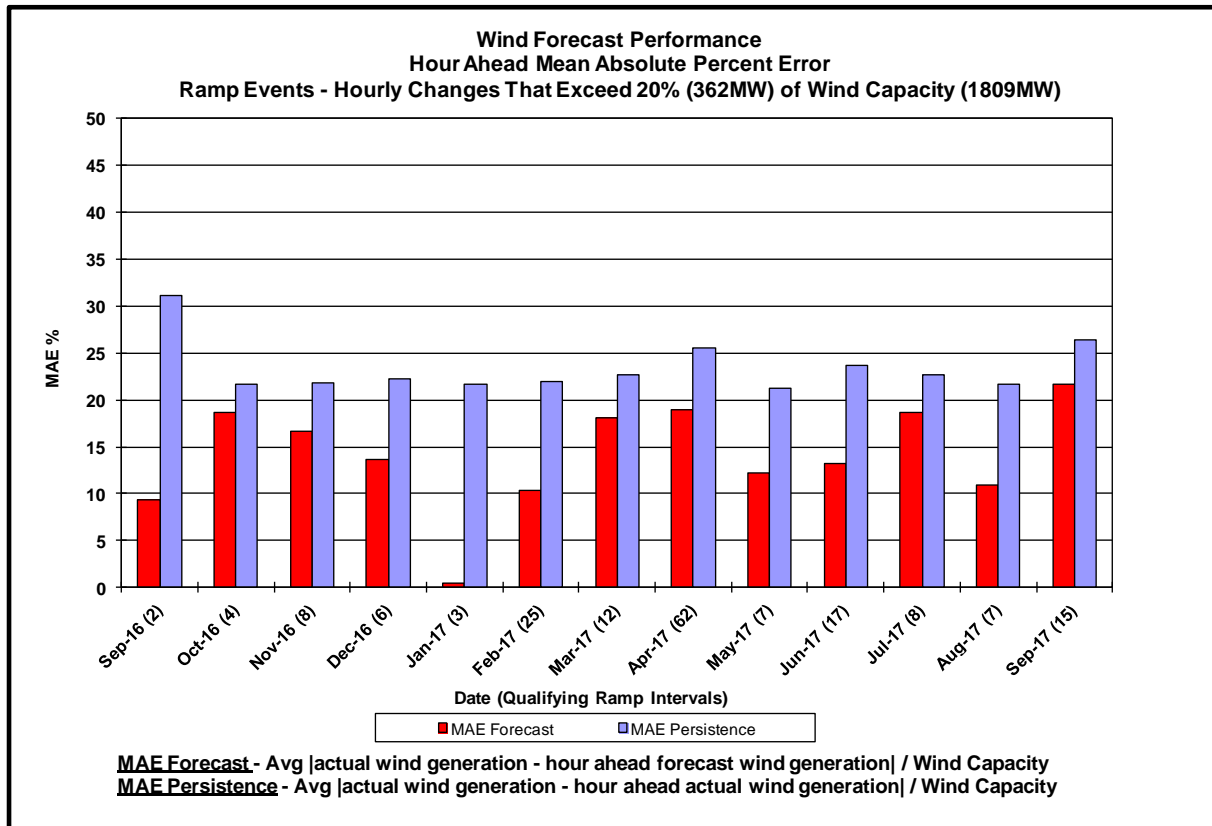


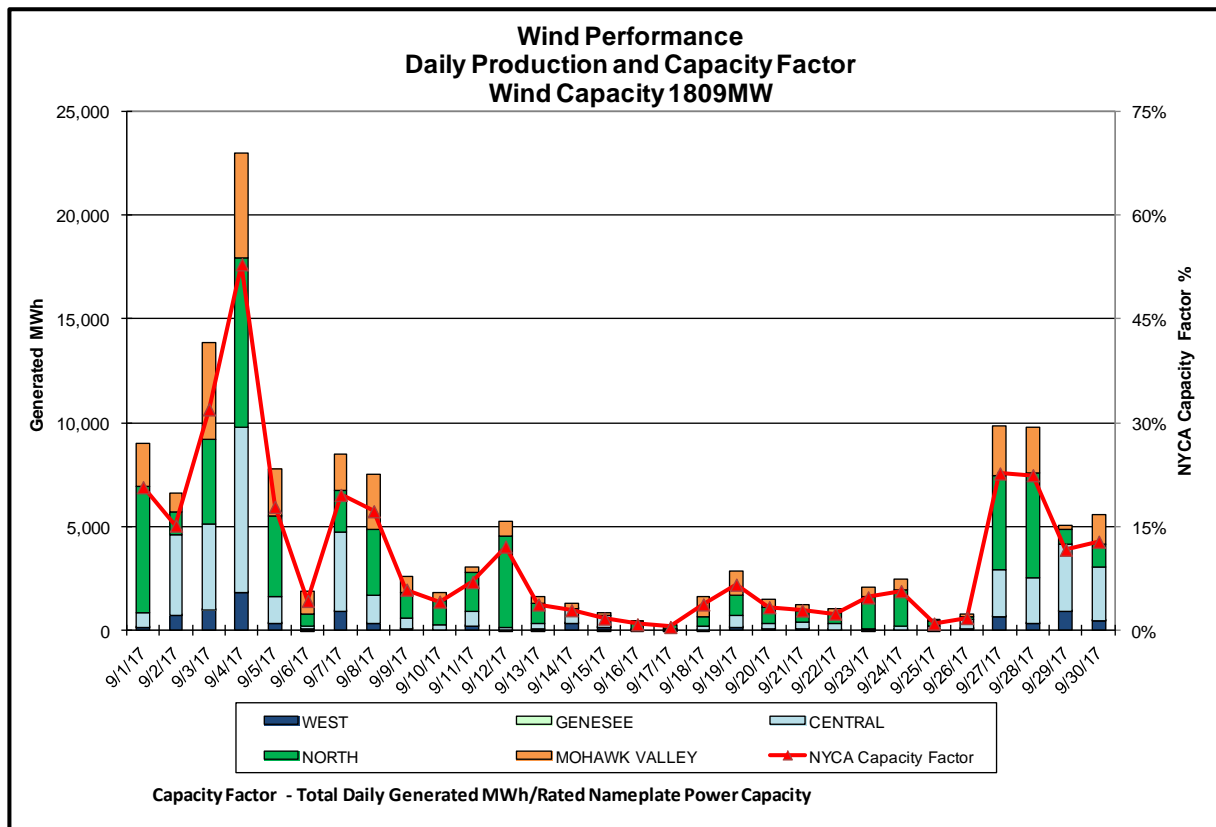
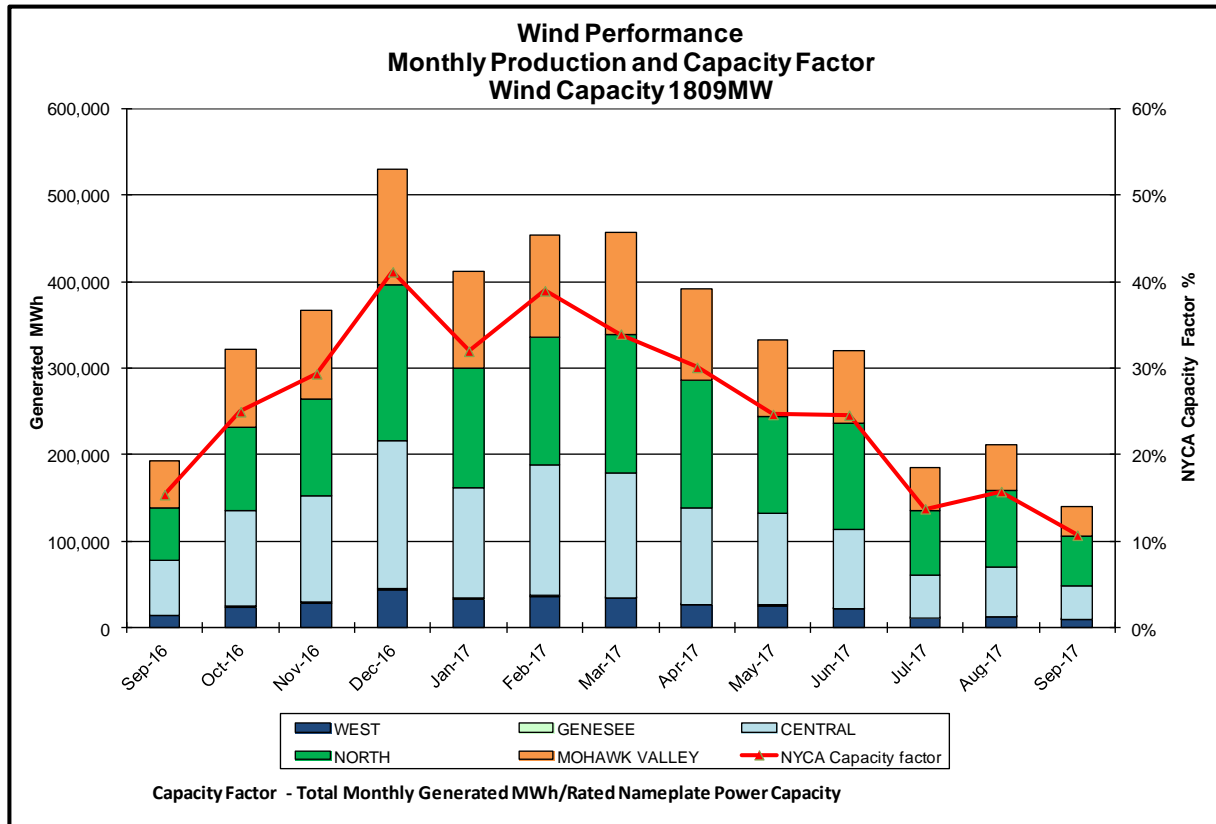
**MAE Forecast** - Avg |actual wind generation - hour ahead forecast wind generation| / Wind Capacity

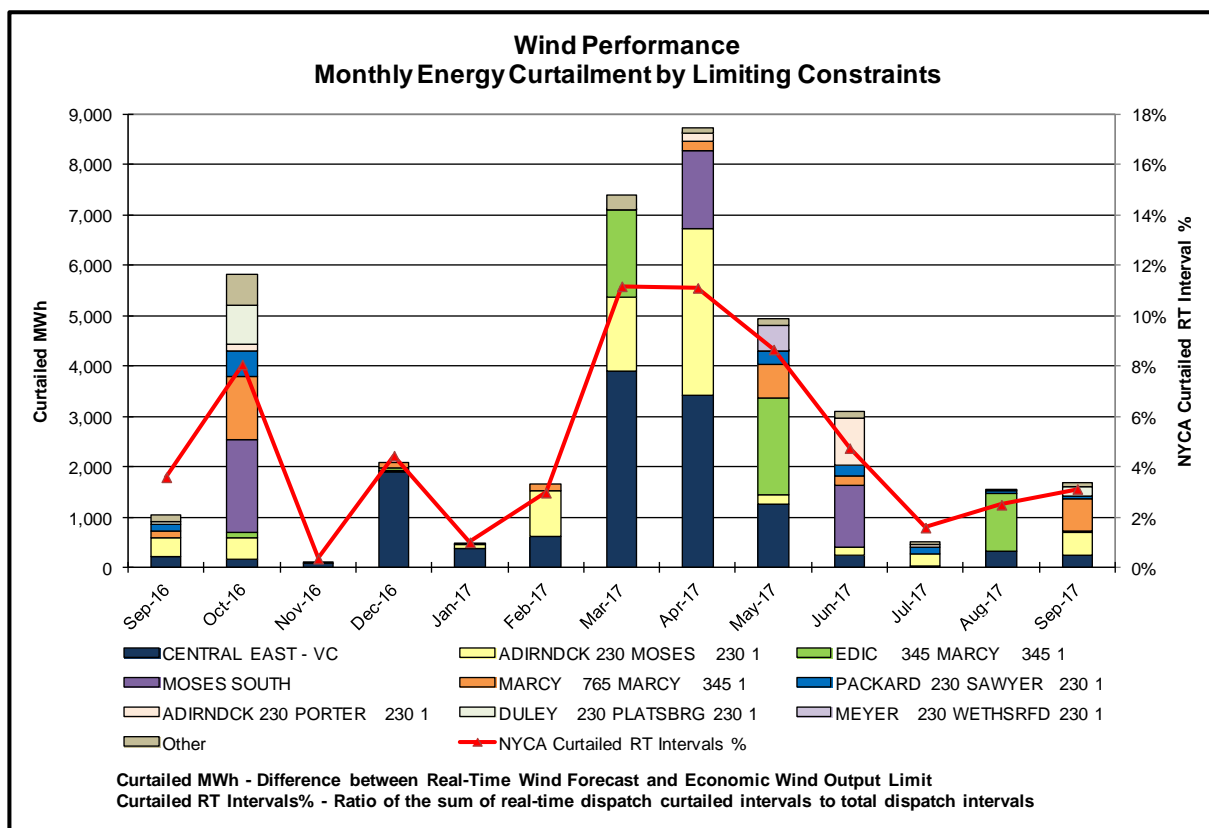
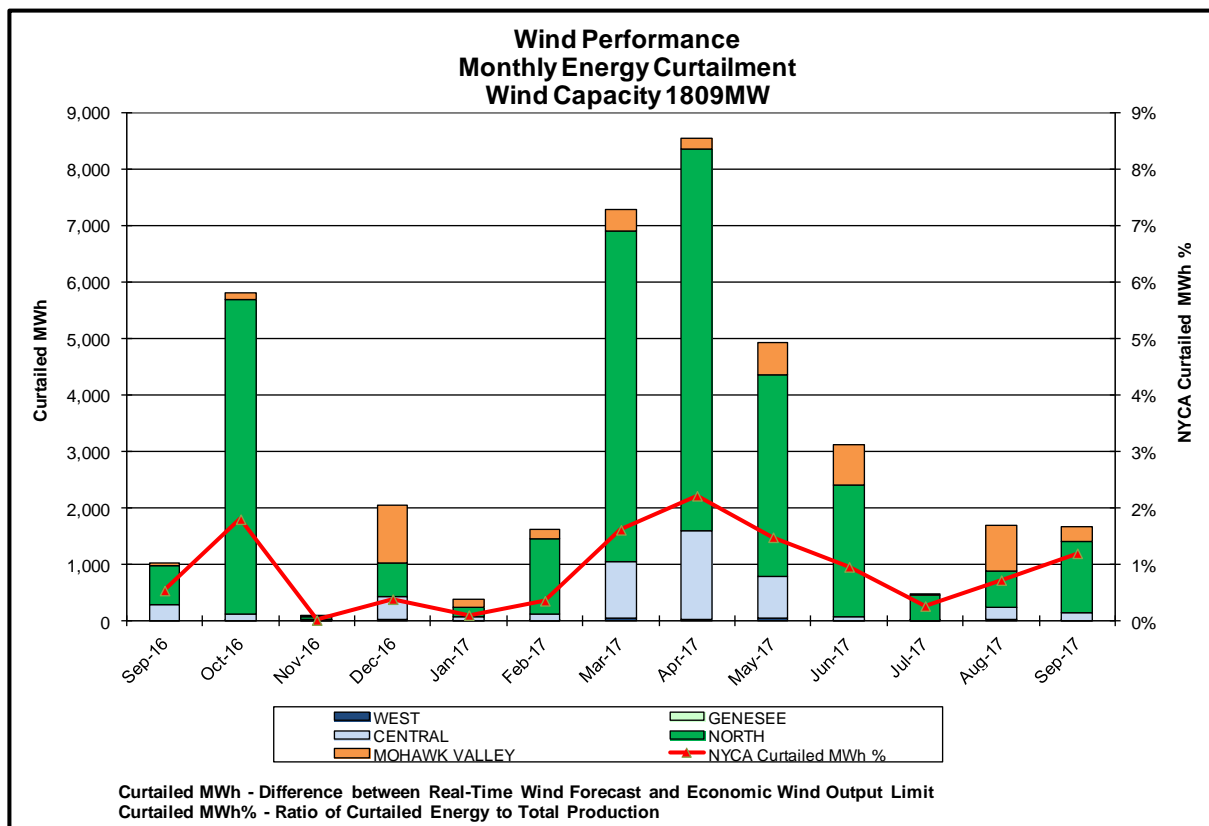
**MAE Persistence** - Avg |actual wind generation - hour ahead actual wind generation| / Wind Capacity

**Bias** - Avg (actual wind generation - hour ahead forecast wind generation) / Wind Capacity

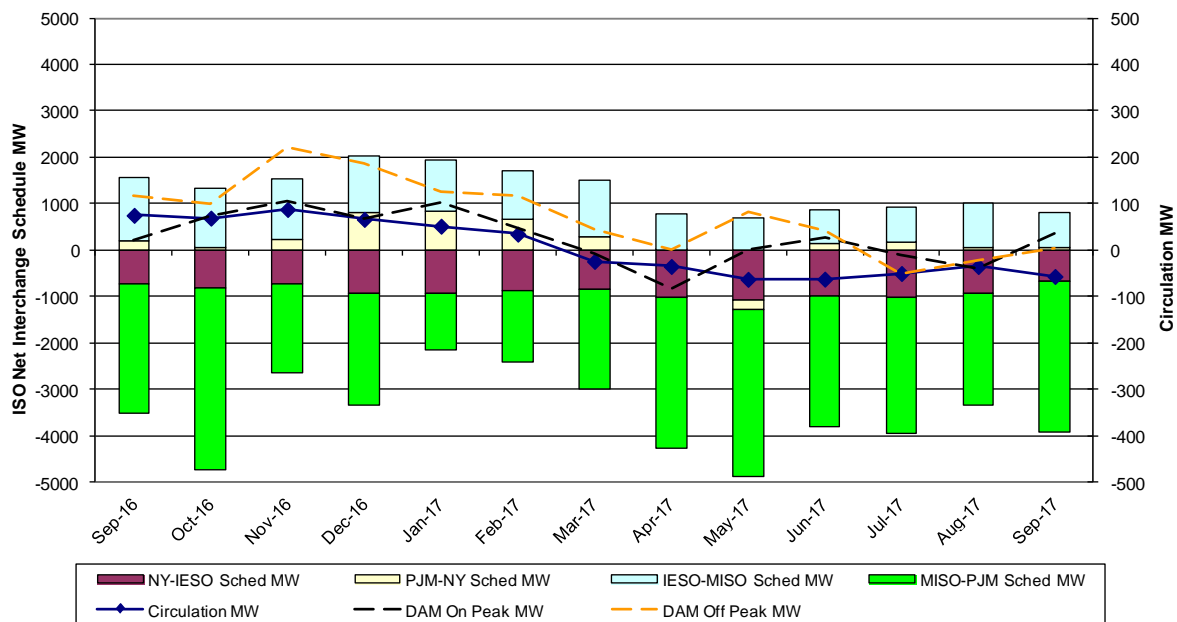






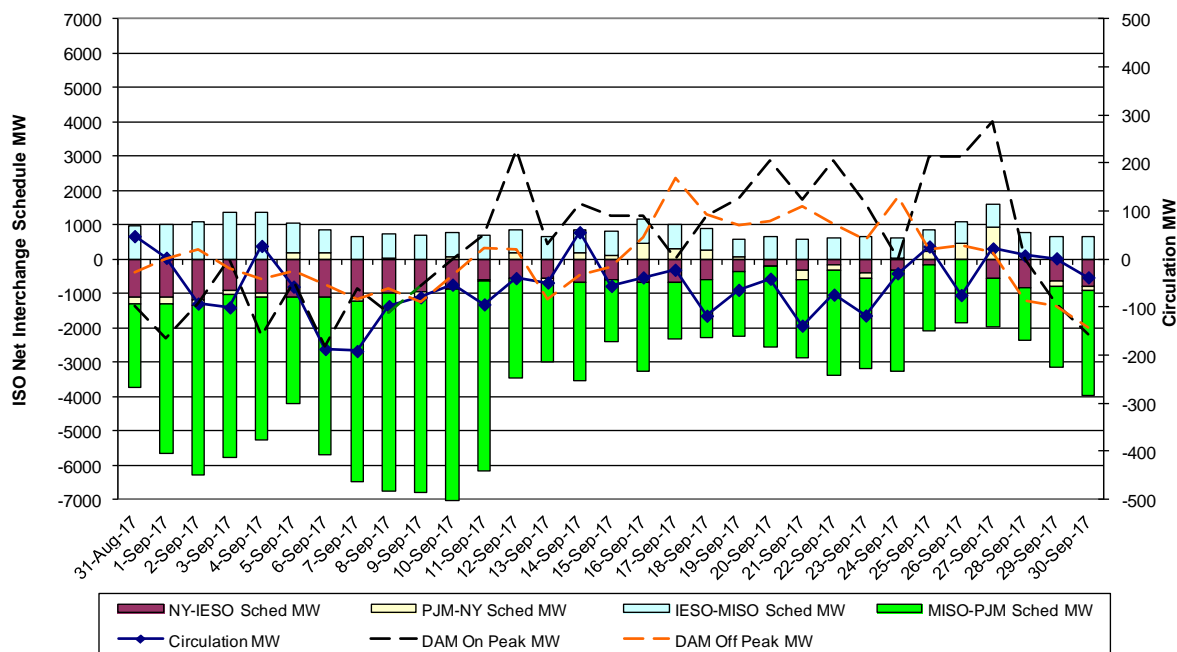


**Lake Erie Circulation and ISO Net Interchange Schedules  
Monthly Averages**



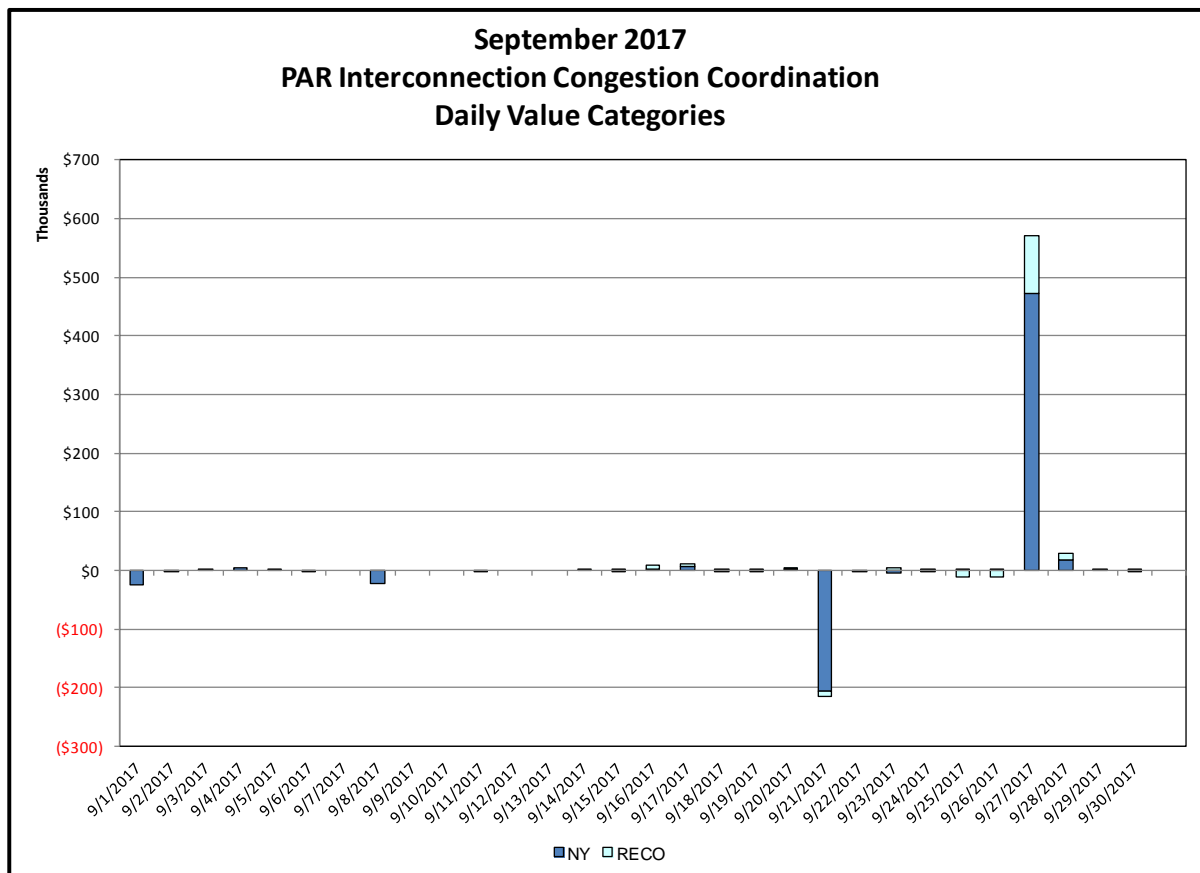
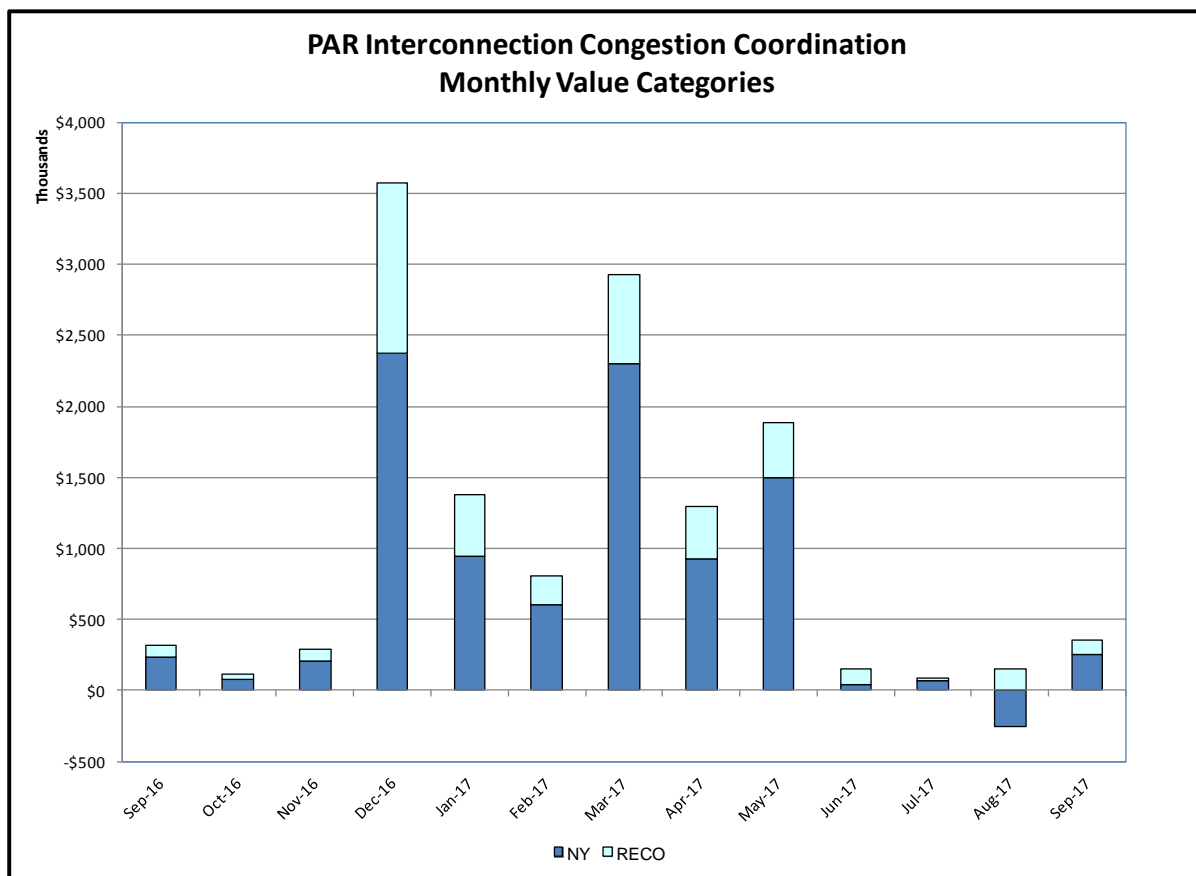
Interchange schedules with positive values aggravate clockwise Lake Erie Circulation.

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



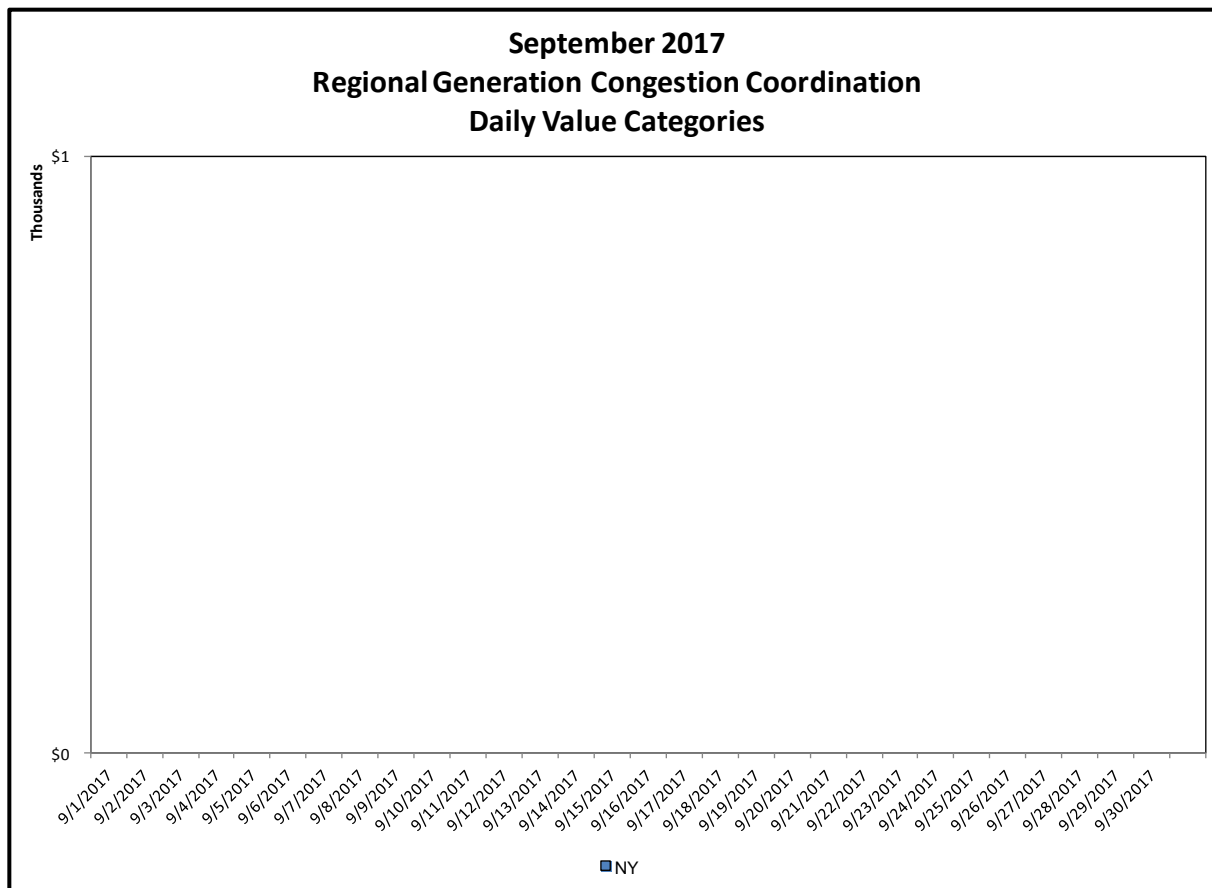
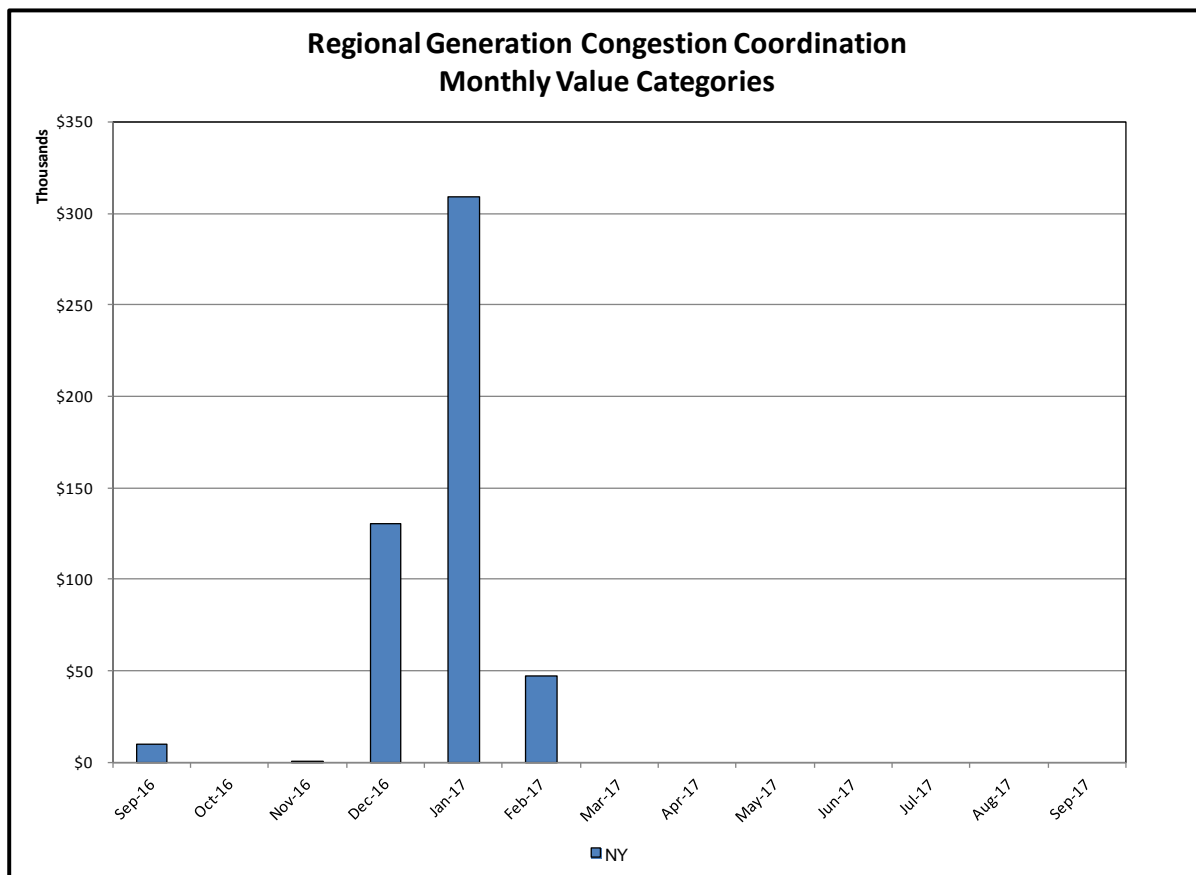
Interchange schedules with positive values aggravate clockwise Lake Erie Circulation.

## Broader Regional Market Performance Metrics



### 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

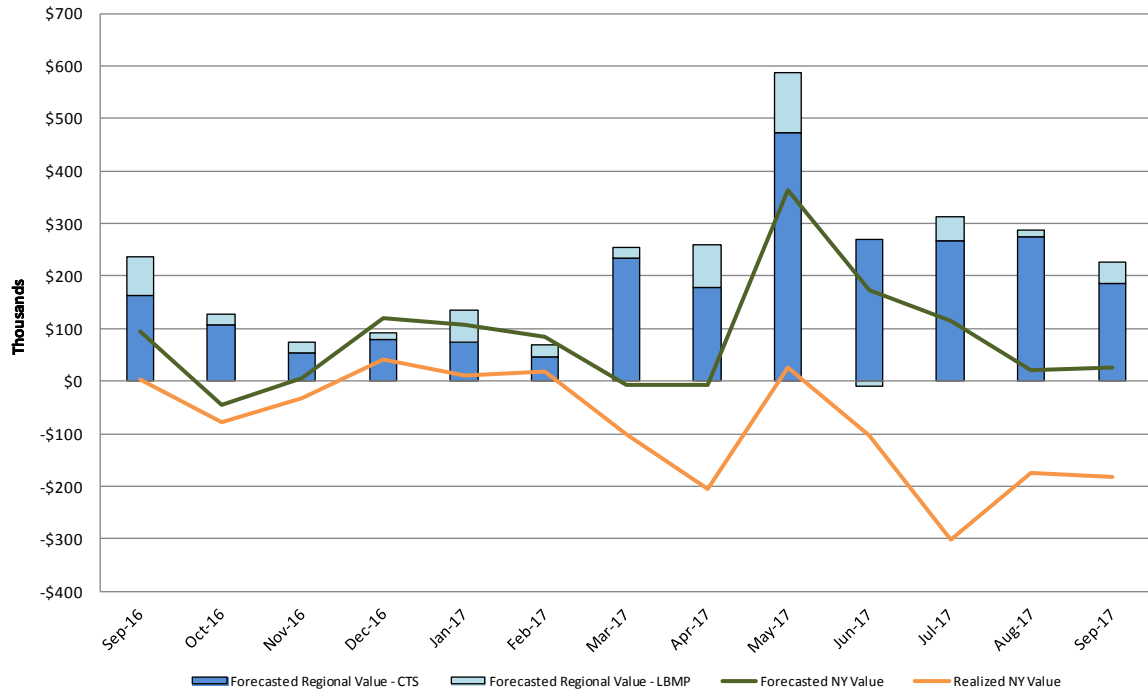
NY

#### 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.

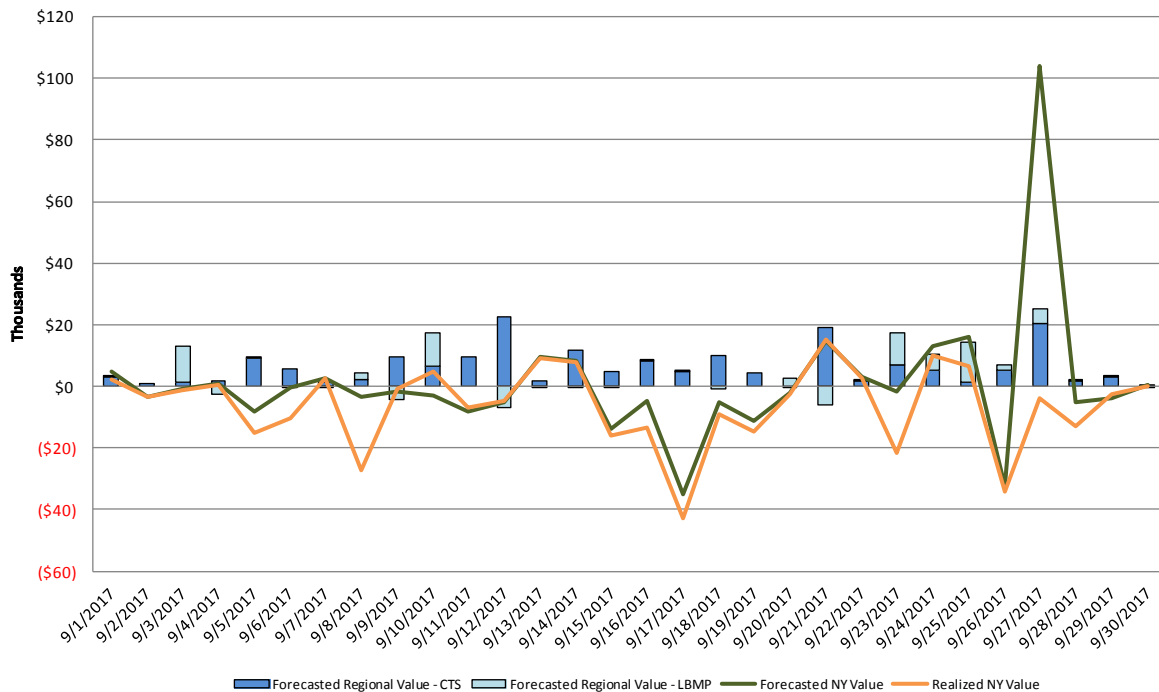


### Regional NYISO/PJM RT Scheduling for All PJM Proxies Monthly Value Categories

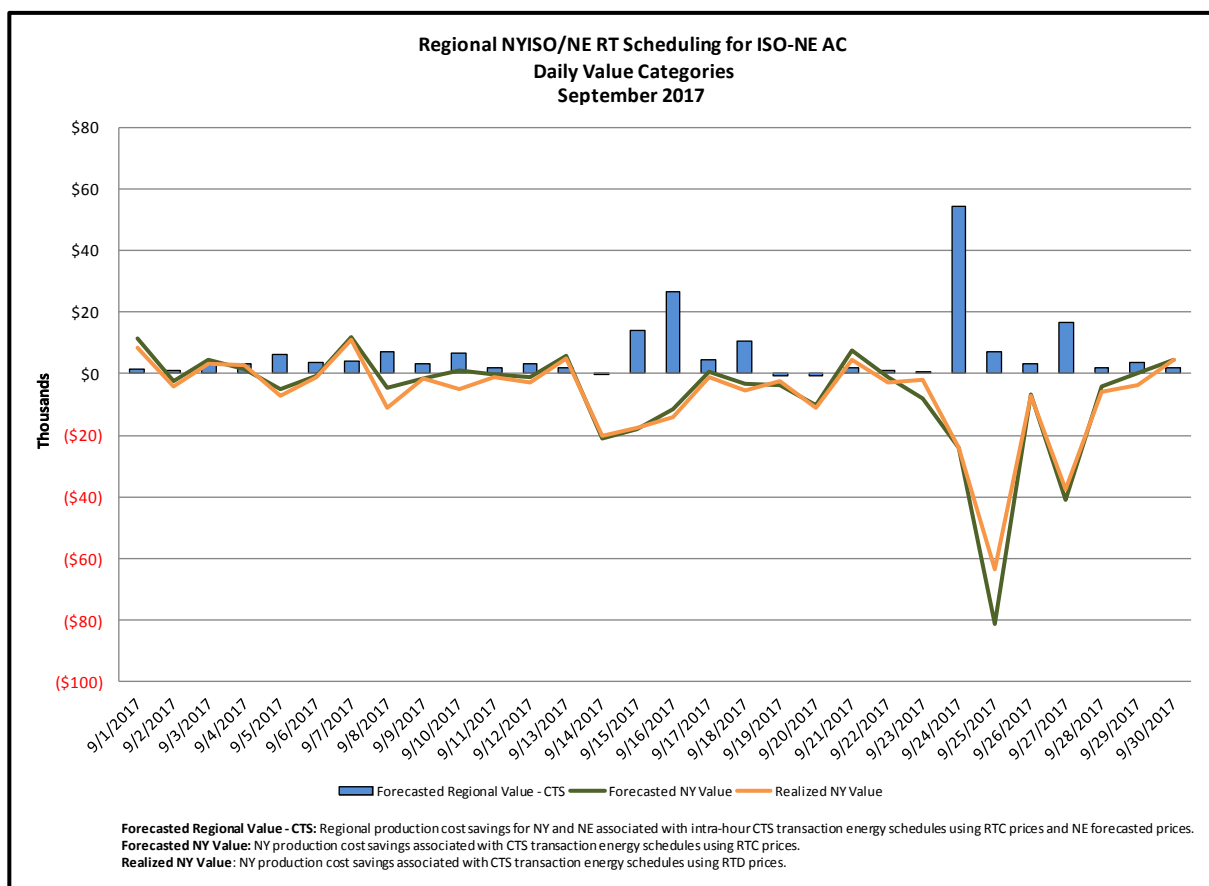
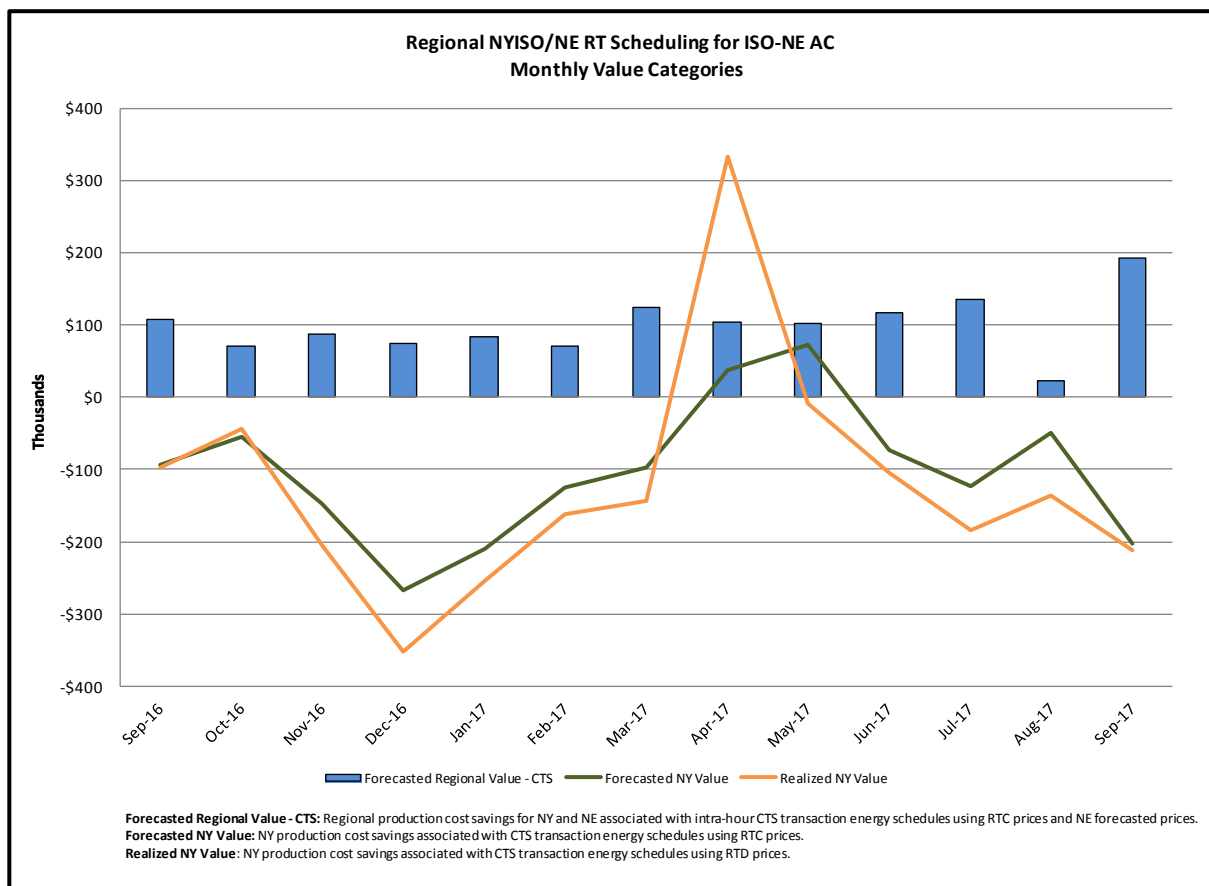


**Forecasted Regional Value - CTS:** Regional production cost savings for NY and PJM associated with intra-hour CTS transaction energy schedules using RTC/ITSCED prices.  
**Forecasted Regional Value - LBMP:** Regional production cost savings for NY and PJM associated with intra-hour LBMP transaction energy schedules using RTC/ITSCED prices.  
**Forecasted NY Value:** NY production cost savings associated with both CTS and LBMP transaction energy schedules using RTC prices.  
**Realized NY Value:** NY production cost savings associated with both CTS and LBMP transaction energy schedules using RTD prices.

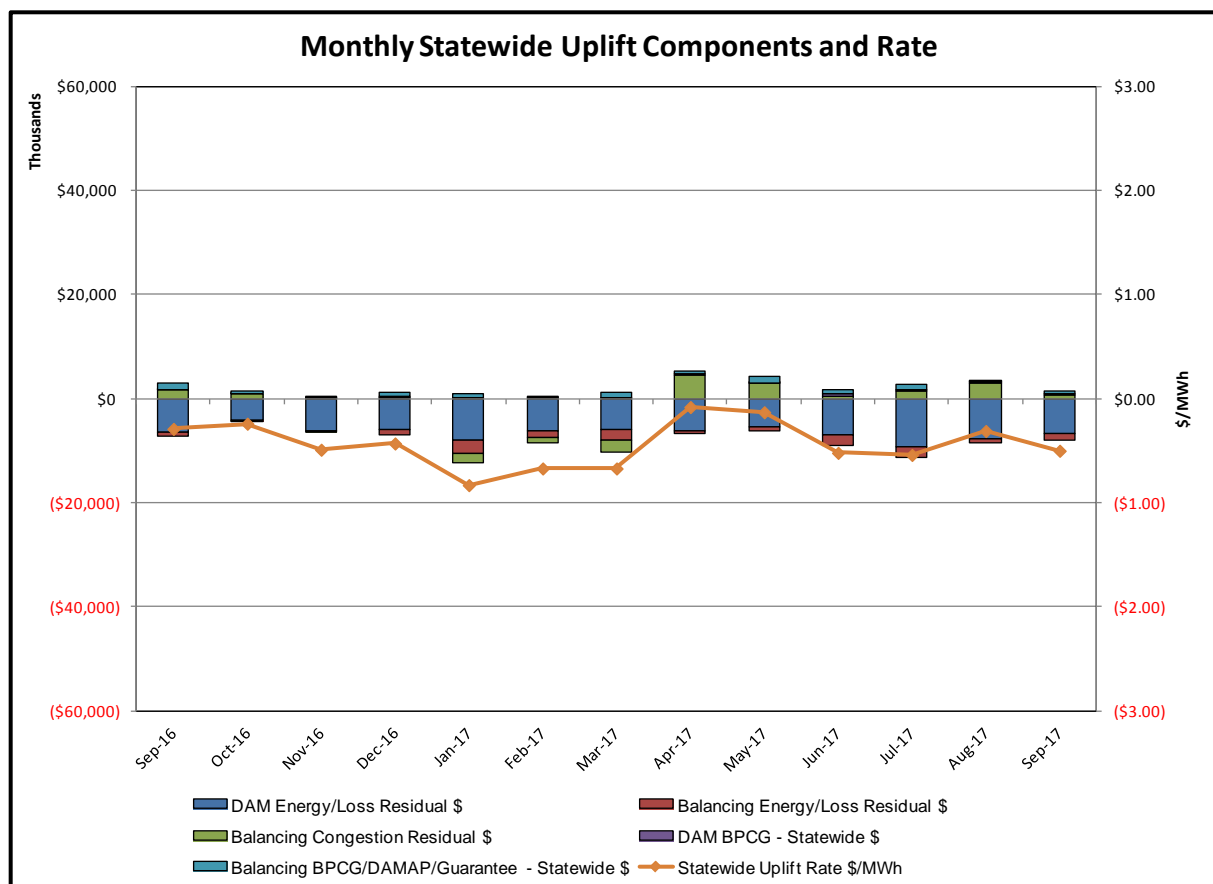
### Regional NYISO/PJM RT Scheduling for All PJM Proxies Daily Value Categories September 2017

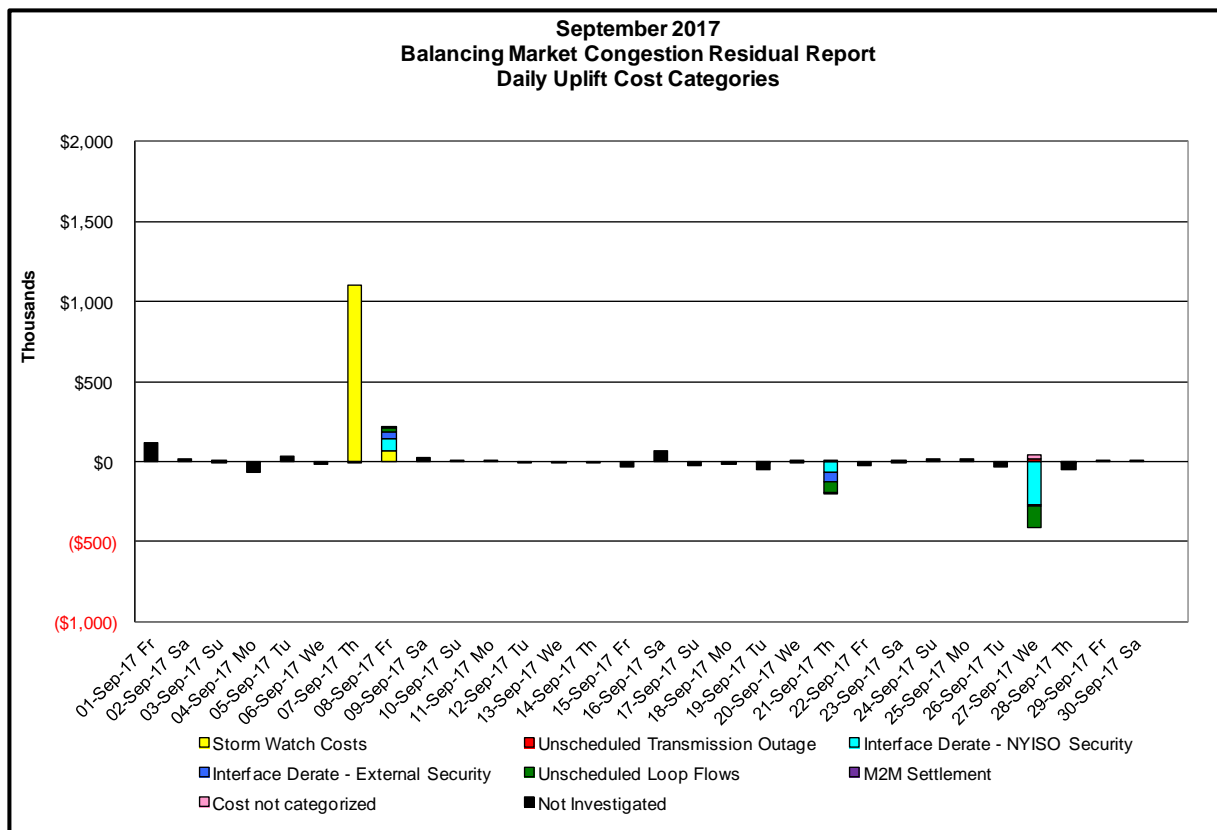
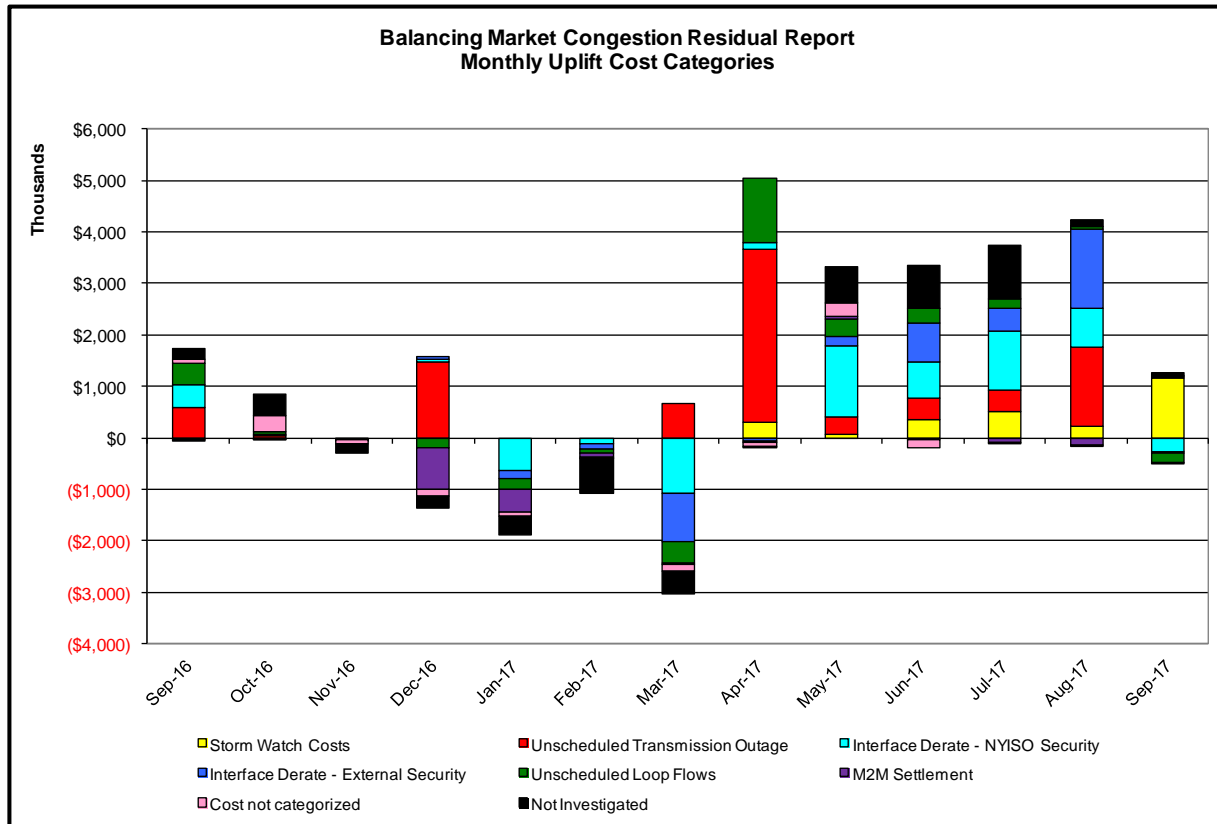


**Forecasted Regional Value - CTS:** Regional production cost savings for NY and PJM associated with intra-hour CTS transaction energy schedules using RTC/ITSCED prices.  
**Forecasted Regional Value - LBMP:** Regional production cost savings for NY and PJM associated with intra-hour LBMP transaction energy schedules using RTC/ITSCED prices.  
**Forecasted NY Value:** NY production cost savings associated with both CTS and LBMP transaction energy schedules using RTC prices.  
**Realized NY Value:** NY production cost savings associated with both CTS and LBMP transaction energy schedules using RTD prices.



## Market Performance Metrics





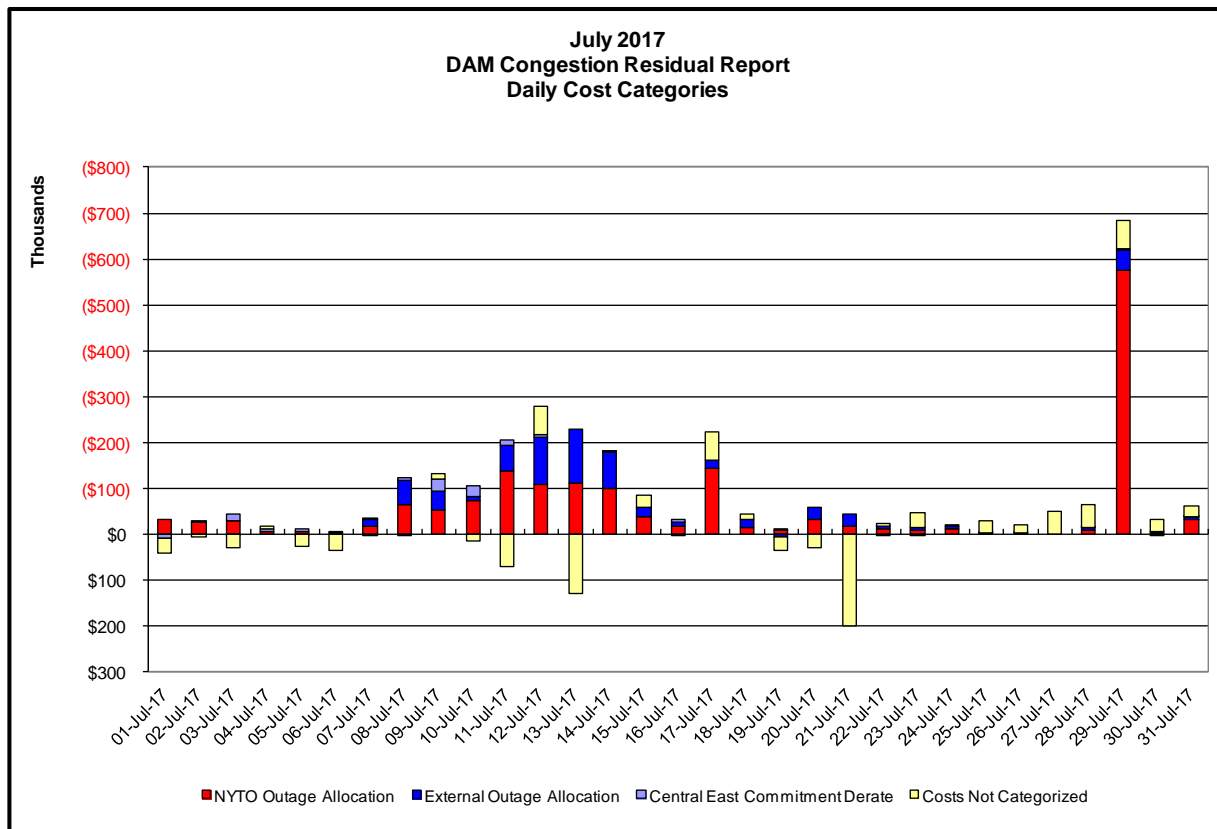
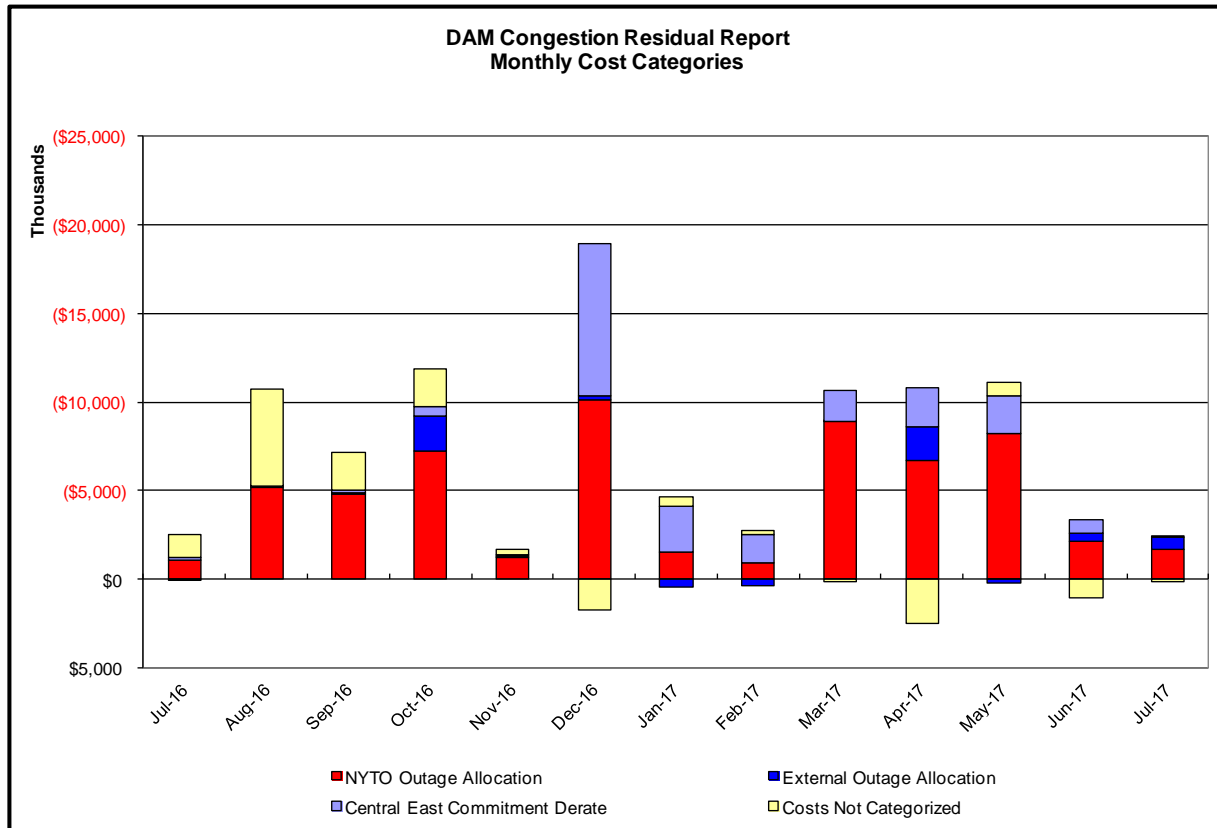
Day's investigated in September: 7,8,21,27			
Event	Date (yyyymmdd)	Hours	Description
	9/7/2017	21-23	Thunderstorm Alert
	9/8/2017	2,3,10	Thunderstorm Alert
	9/8/2017	8,12,15-17	Derate Marcy 765/345kV (#AT1) for I/o TWR:MOSES MA1 & MA2
	9/8/2017	8,12	NYCA DNI RAMP Limit
	9/8/2017	3,12	NE_AC DNI Ramp Limit
	9/8/2017	15	PJM AC-NY Scheduling Limit
	9/8/2017	16,17	Lake Erie Circulation, DAM-RTM exceeds +/-125MW; Niagara-Packard
	9/21/2017	17	Derate Motthaven-Dunwoodie 345kV (#71)
	9/21/2017	15	Uprate Scriba-Volney 345kV (#20) for I/o Scriba-Volney 345kV (#21)
	9/21/2017	21	Uprate E179th Street-Helgate 138kV (#15055)
	9/21/2017	14,16	NYCA DNI RAMP Limit
	9/21/2017	16,17,20	HQ_CHAT Scheduling Limit
	9/21/2017	13-16	NE-NY Scheduling Limit
	9/21/2017	14	NE_AC DNI Ramp Limit
	9/21/2017	13-15	PJM AC-NY Scheduling Limit
	9/21/2017	14,15	Lake Erie Circulation, DAM-RTM exceeds +/-125MW: West Central
	9/27/2017	11,14	Forced outage of Marcy South Series Compensation
	9/27/2017	14	Forced outage East Garden City-Newbridge 138kV (#467)
	9/27/2017	20	NYCA DNI RAMP Limit
	9/27/2017	19,21	Uprate Central East
	9/27/2017	19	Uprate Freshkills 345kV/138kV Bank (#TA1)
	9/27/2017	22,23	Uprate Malone-Willis 115kV (1-910) for I/o TWR:MOSES MW2 & MAL4
	9/27/2017	17,19,22,23	Uprate Scriba-Volney 345kV (#20) for I/o Scriba-Volney 345kV (#21)
	9/27/2017	11	Derate Dunwoodie-Sprainbrook 345kV (#W75) for I/o TWR:PVLLE F38&F39&Y86&Y87&BK1
	9/27/2017	22-23	Uprate Leeds-Pleasant Valley 345kV (#92) for I/o Athens-Pleasant Valley 345kV (#91)
	9/27/2017	12,17,19,22,23	Uprate Scriba-Volney 345kV (#20) for I/o Scriba-Volney 345kV (#21)
	9/27/2017	15	NE_AC DNI Ramp Limit
	9/27/2017	12,19	Lake Erie Circulation, DAM-RTM exceeds +/-125MW: Packard-Sawyer
	9/27/2017	19,21	Lake Erie Circulation, DAM-RTM exceeds +/-125MW: Central-East

### 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	

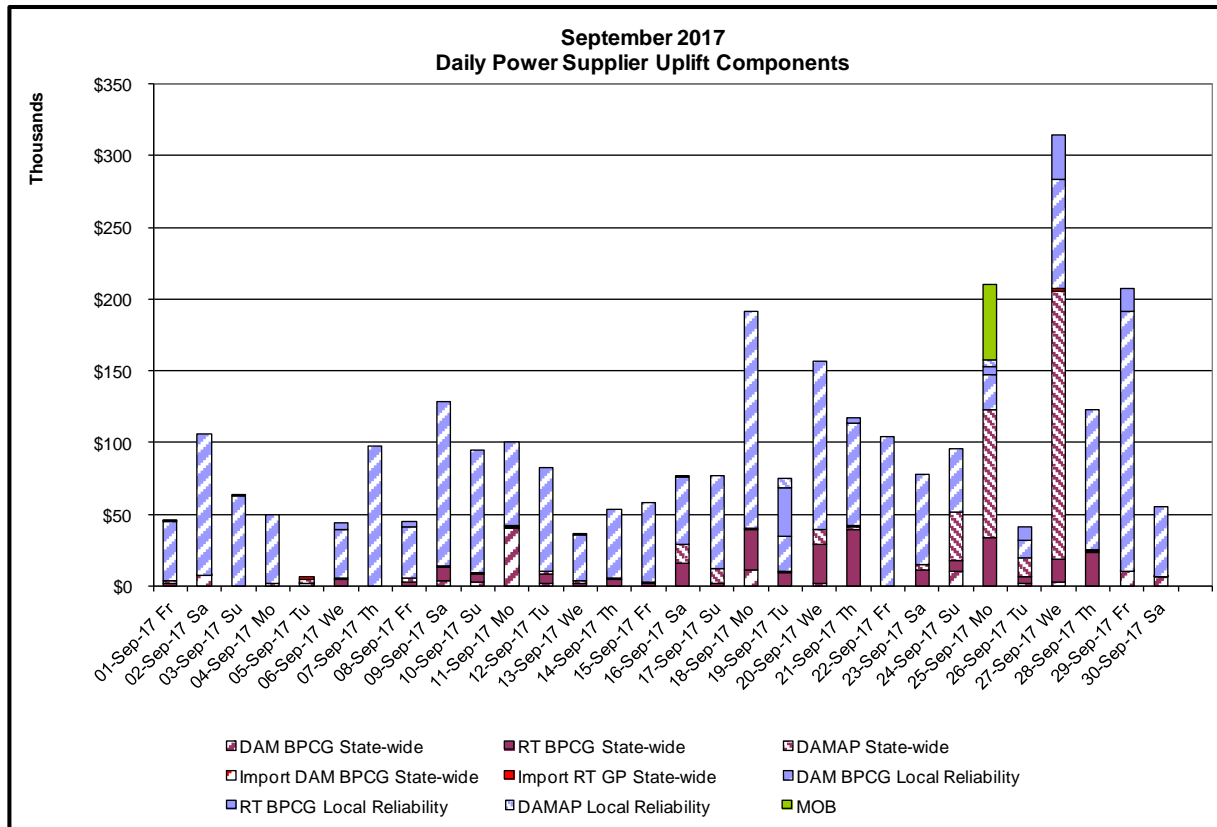
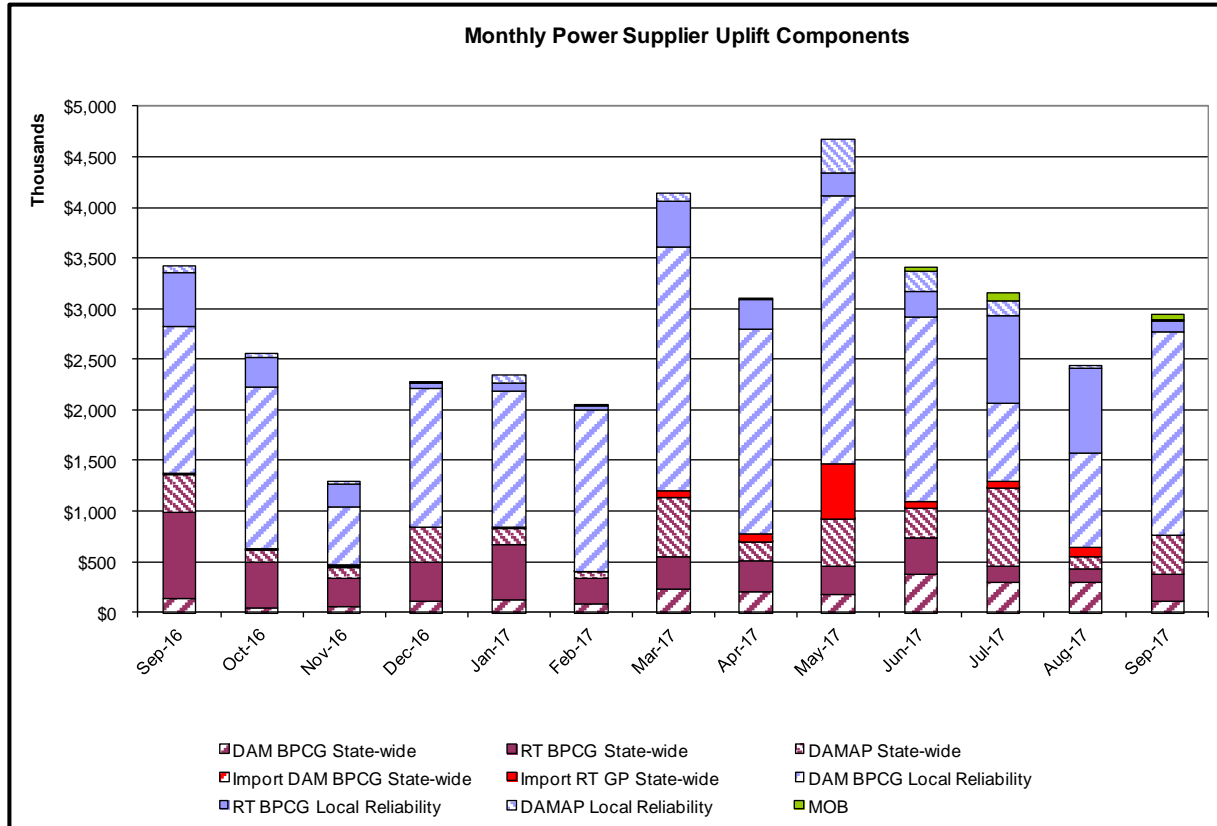
#### Monthly Balancing Market Congestion Report Assumptions/Notes

- 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

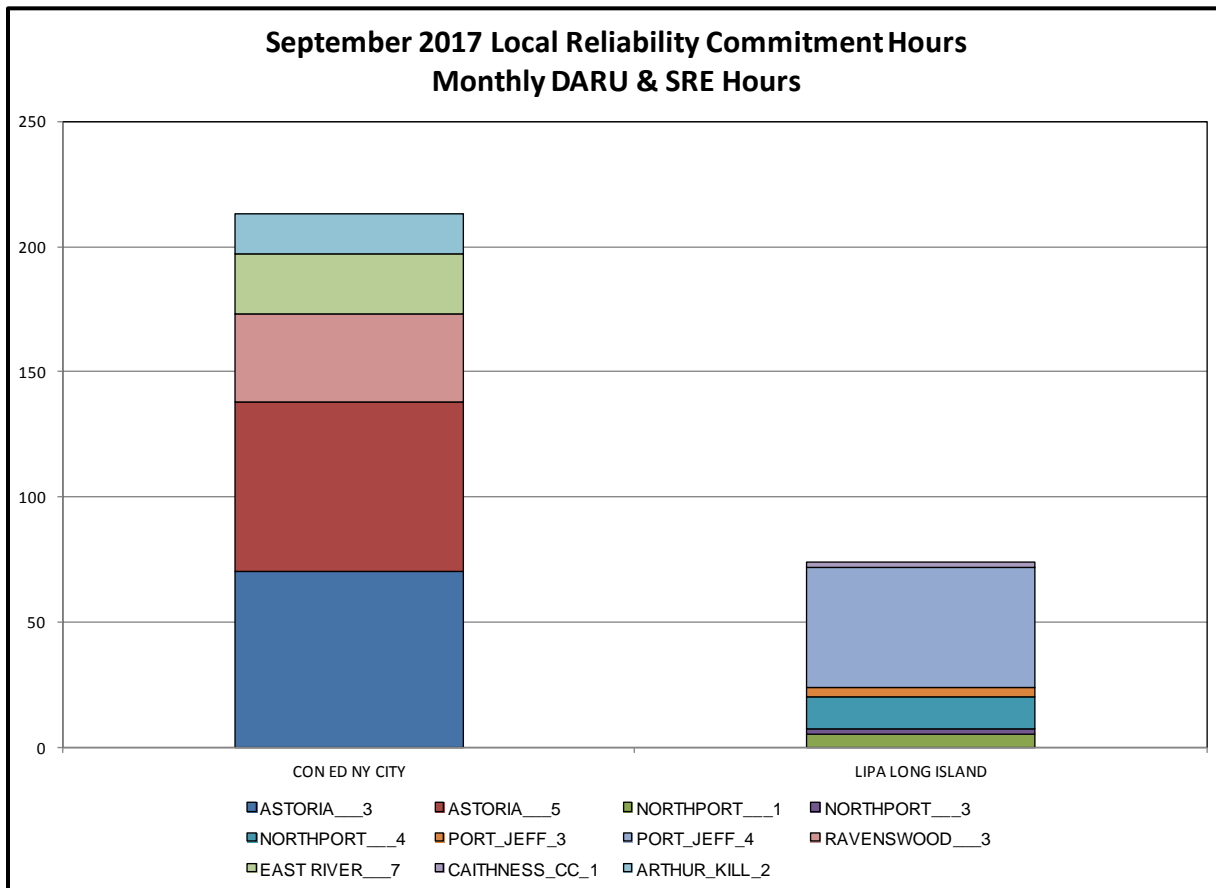
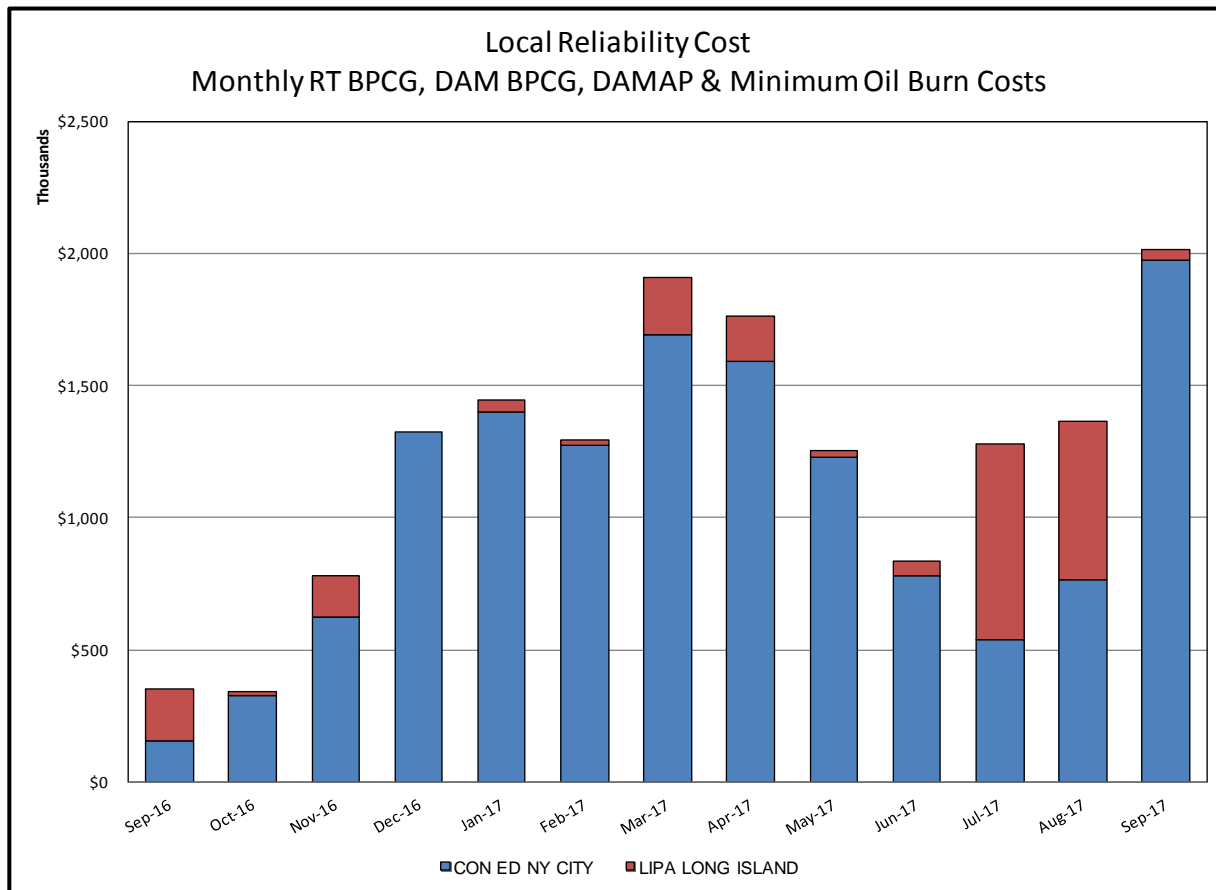


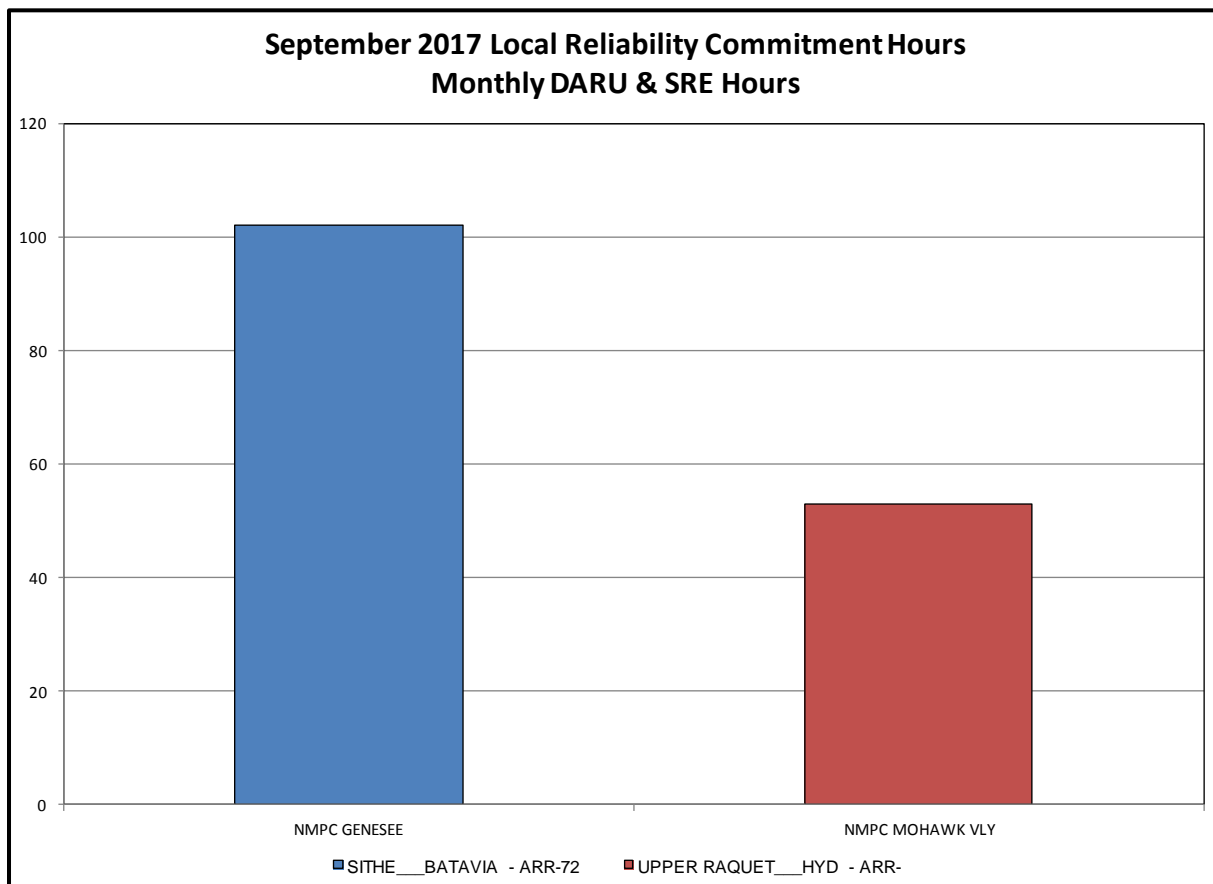
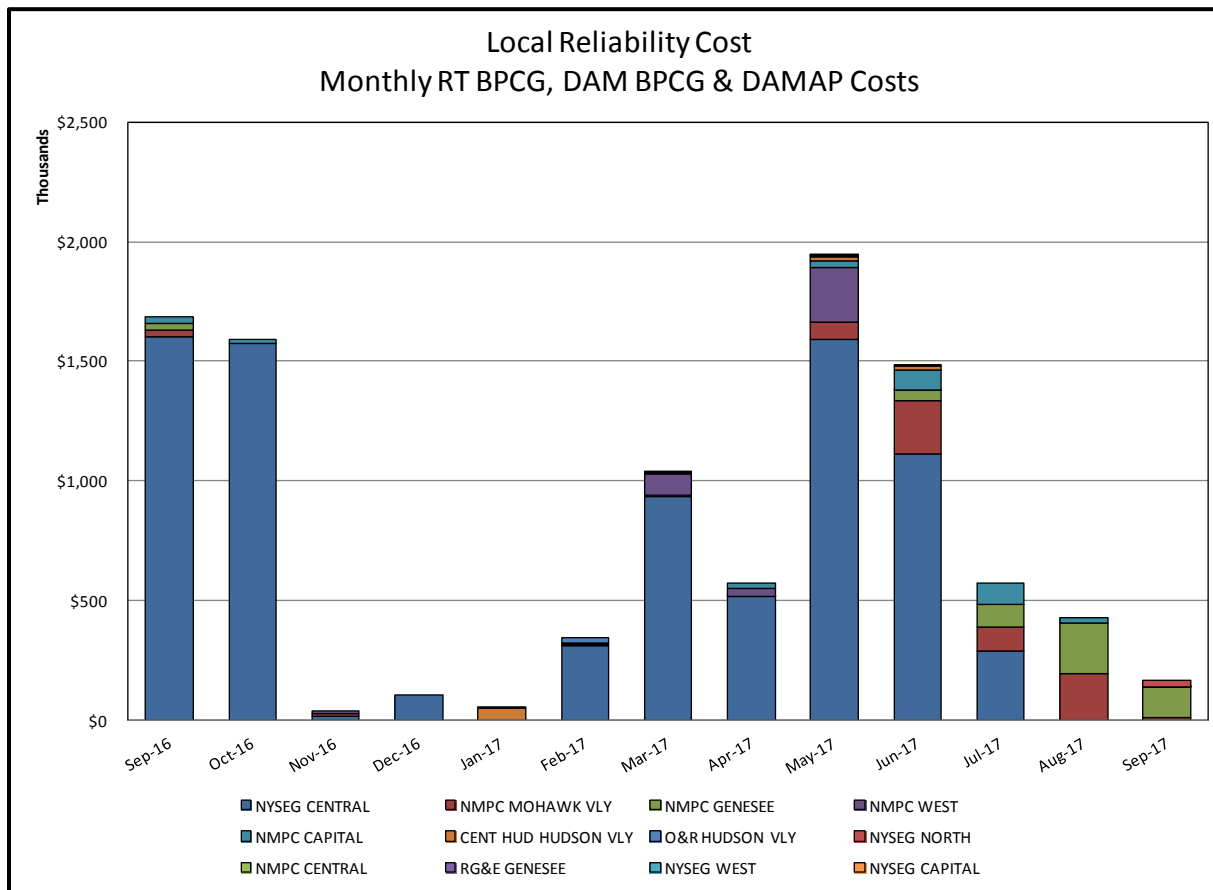
### Day-Ahead Market Congestion Residual Categories

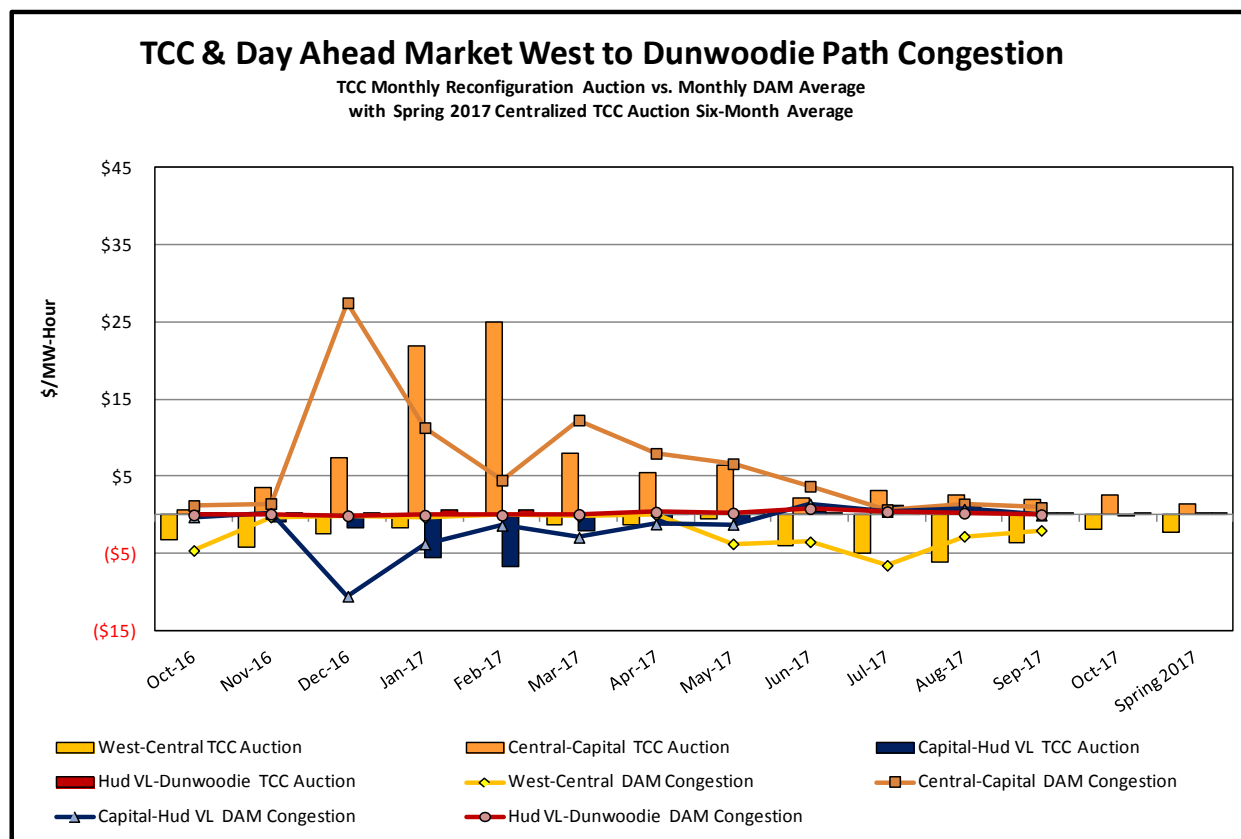
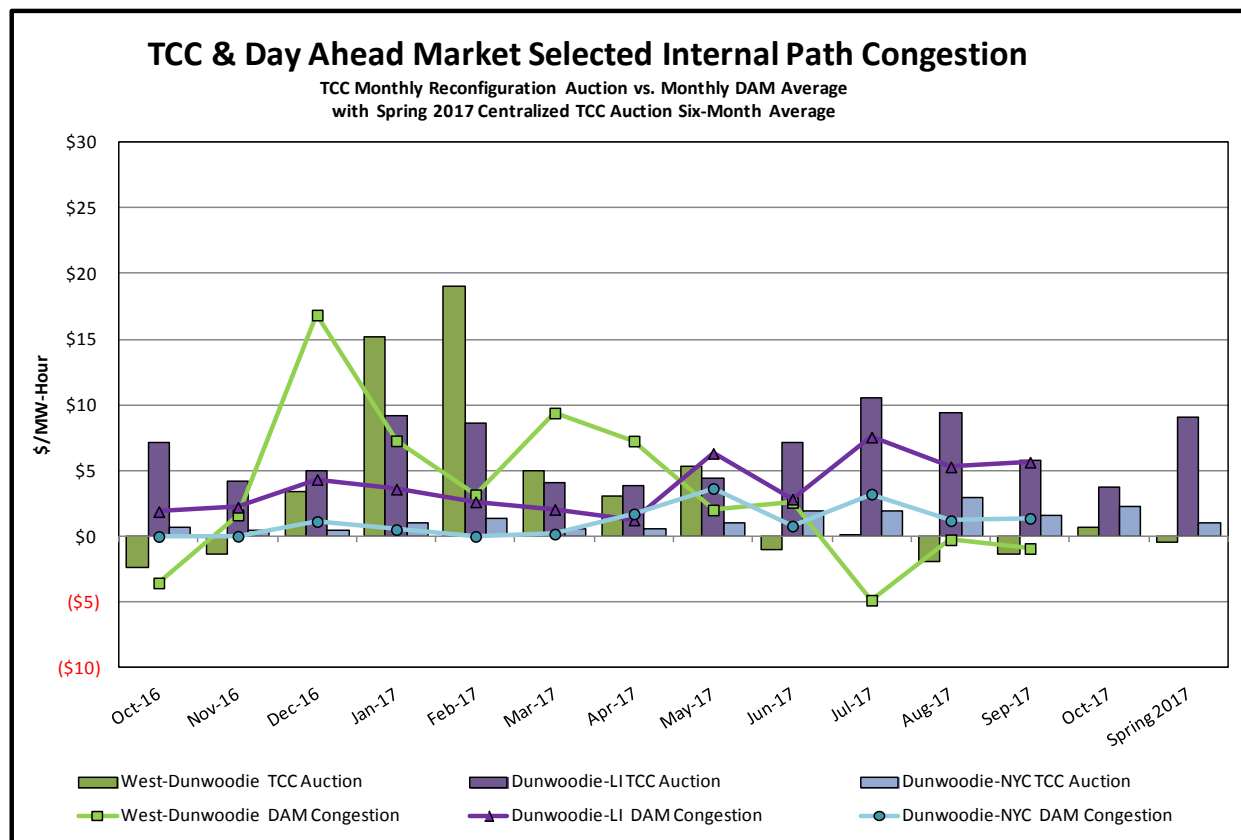
<u>Category</u>	<u>Cost Assignment</u>	<u>Events Types</u>	<u>Event Examples</u>
NYTO Outage Allocation	Responsible TO	Direct allocation to NYTO's responsible for transmission equipment status change.	DAM scheduled outage for equipment modeled in-service for the TCC Auction.
External Outage Allocation	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 Spring 2017 Centralized TCC Auction Six-Month Average

