

Operations Performance Metrics Monthly Report



July 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 August 8, 2016.

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July 2016 Operations Performance Highlights

- Peak load of 31,187 MW occurred on 07/22/2016 HB 16
- All-time summer capability period peak load of 33,956 MW occurred on 7/19/2013 HB 16
- 21 hours of Thunder Storm Alerts were declared
- 0 hours of NERC TLR level 3 curtailment
- A Major Emergency was declared on 07/27/2016 in HB07 for the loss of the Gilboa-Fraser (GF5-35) 345kV line causing the Central East interface flow to exceed the 105% Voltage Transfer Limit.
- A Major Emergency was declared on 07/30/2016 in HB08 for the loss of the Gilboa-Fraser (GF5-35) 345kV line causing the Central East interface flow to exceed the 105% Voltage Transfer Limit.
- The expanded definition of NERC Bulk Electric System facilities became effective on July 1, 2016. The NY Transmission Owners have registered as NERC Transmission Operators (TOP's) and Transmission Planners (TP's). The NYISO has an expanded role as the registered Reliability Coordinator (RC) and Planning Coordinator (PC). The NYISO and the TOs have entered into a NERC Coordinated Functional Registration (CFR) Agreement which defines compliance responsibilities.
- The following table identifies the estimated production cost savings associated with the Broader Regional Market initiatives.

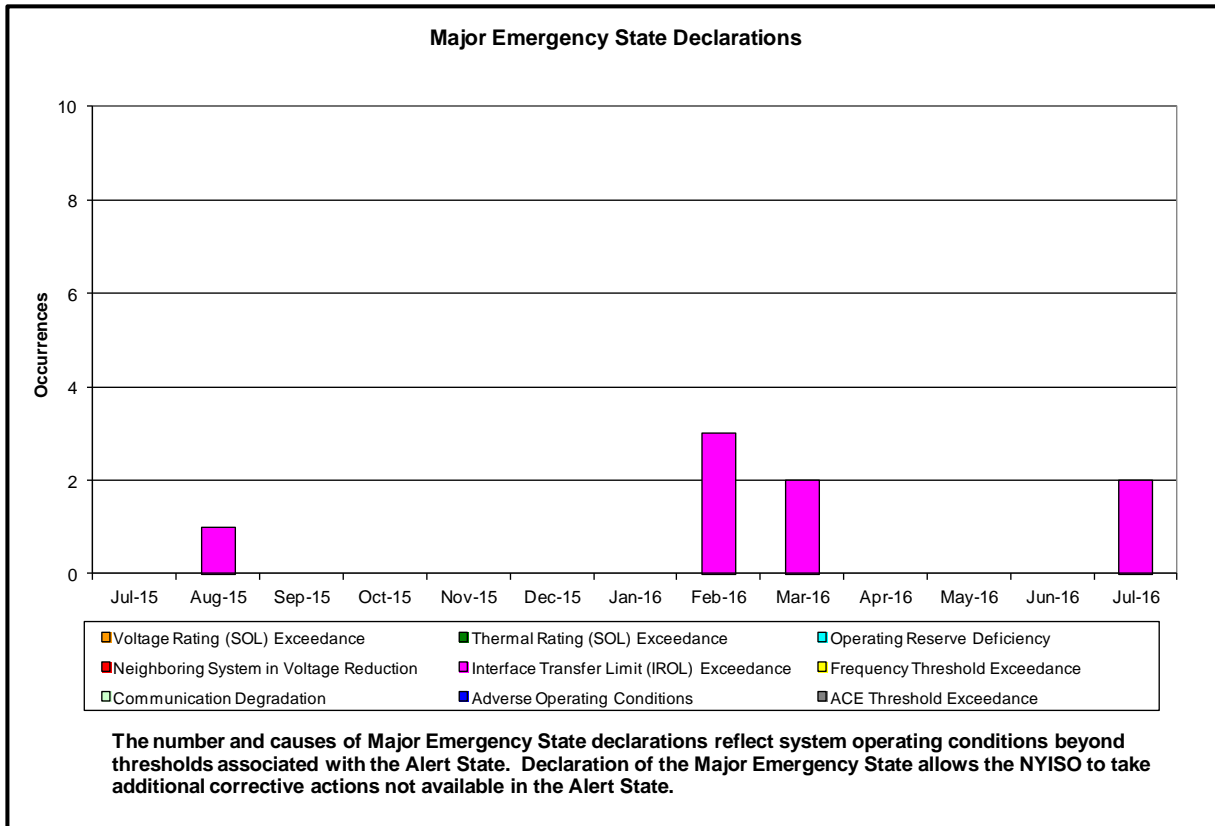
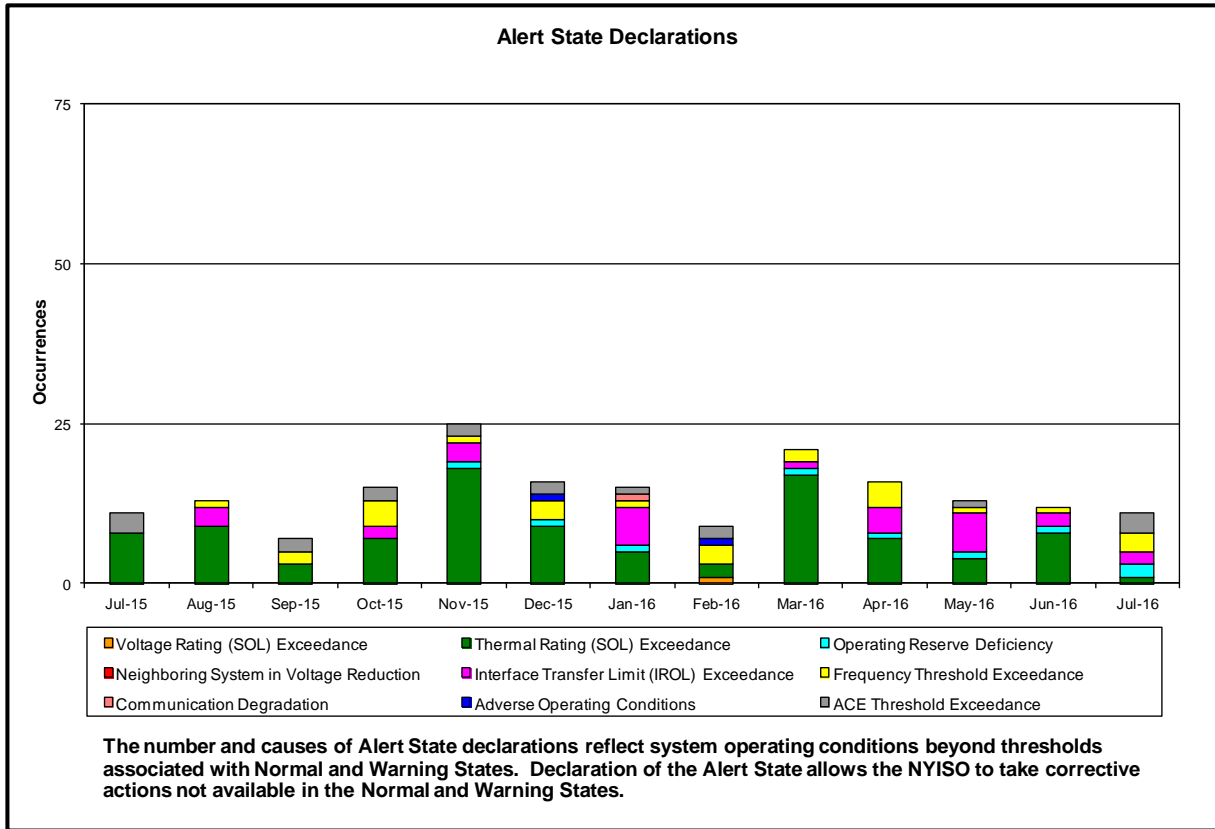
	Current Month Value (\$M)	Year-to-Date Value (\$M)
NY Savings from PJM-NY Congestion Coordination	\$0.65	\$15.07
NY Savings from PJM-NY Coordinated Transaction Scheduling	(\$0.22)	(\$0.11)
NY Savings from NE-NY Coordinated Transaction Scheduling	(\$0.28)	(\$1.28)
Total NY Savings	\$0.15	\$13.68
Regional Savings from PJM-NY Coordinated Transaction Scheduling	\$0.29	\$1.40
Regional Savings from NE-NY Coordinated Transaction Scheduling	\$0.24	\$1.02
Total Regional Savings	\$0.53	\$2.42

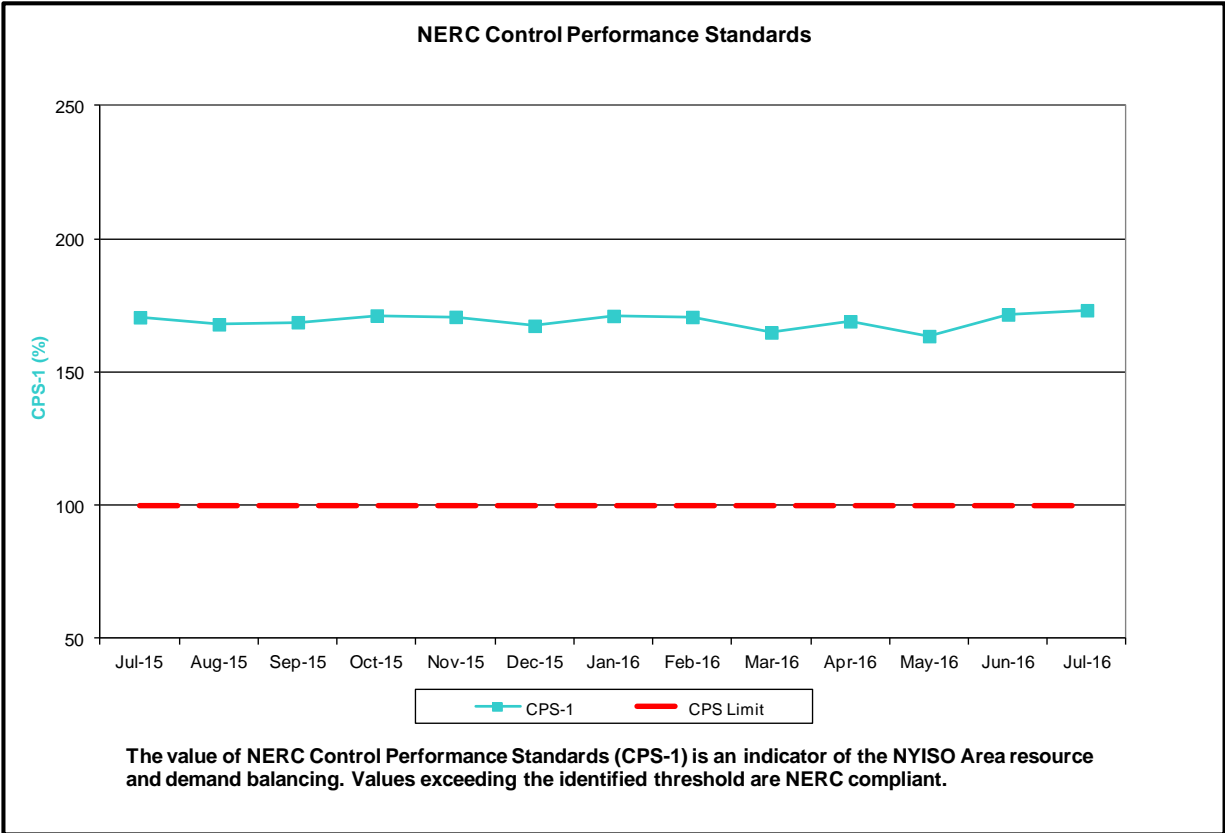
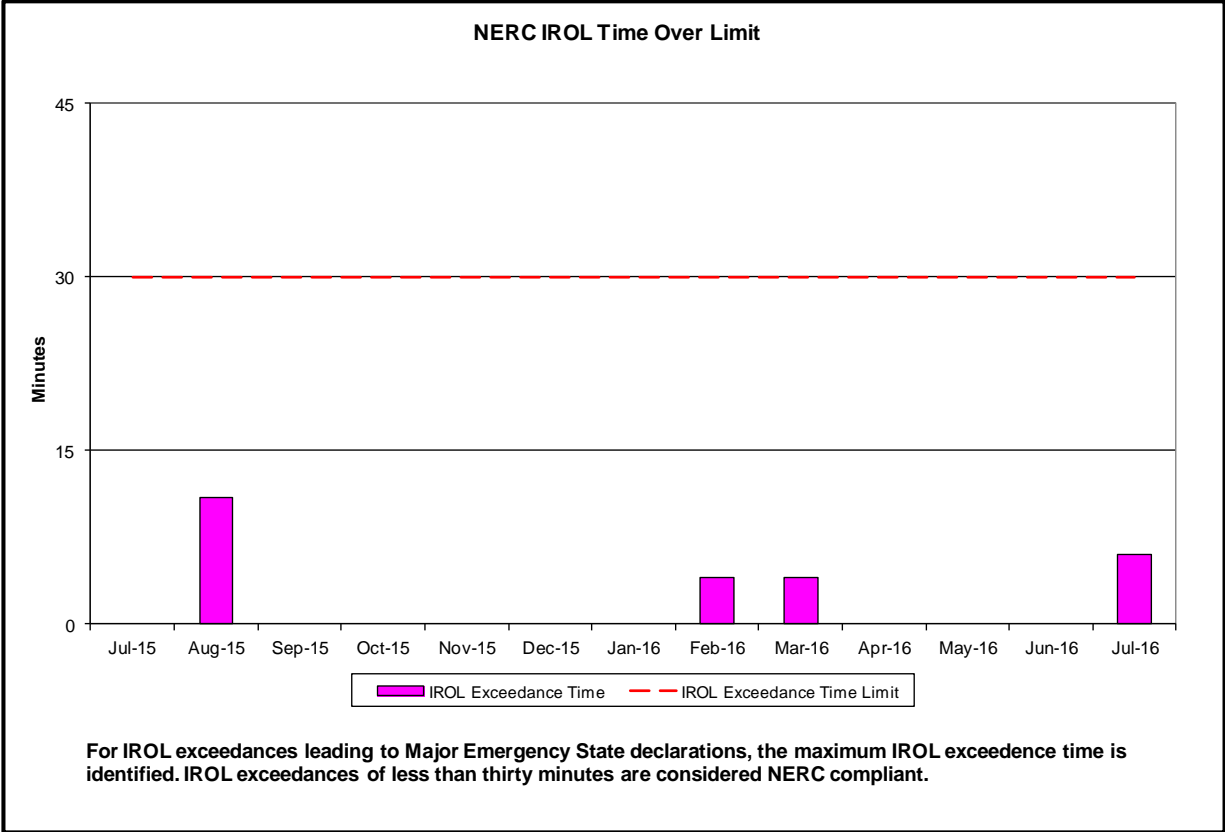
- Statewide uplift cost monthly average was (\$0.49)/MWh
- The following table identifies the Monthly ICAP spot market prices by locality and the price delta.

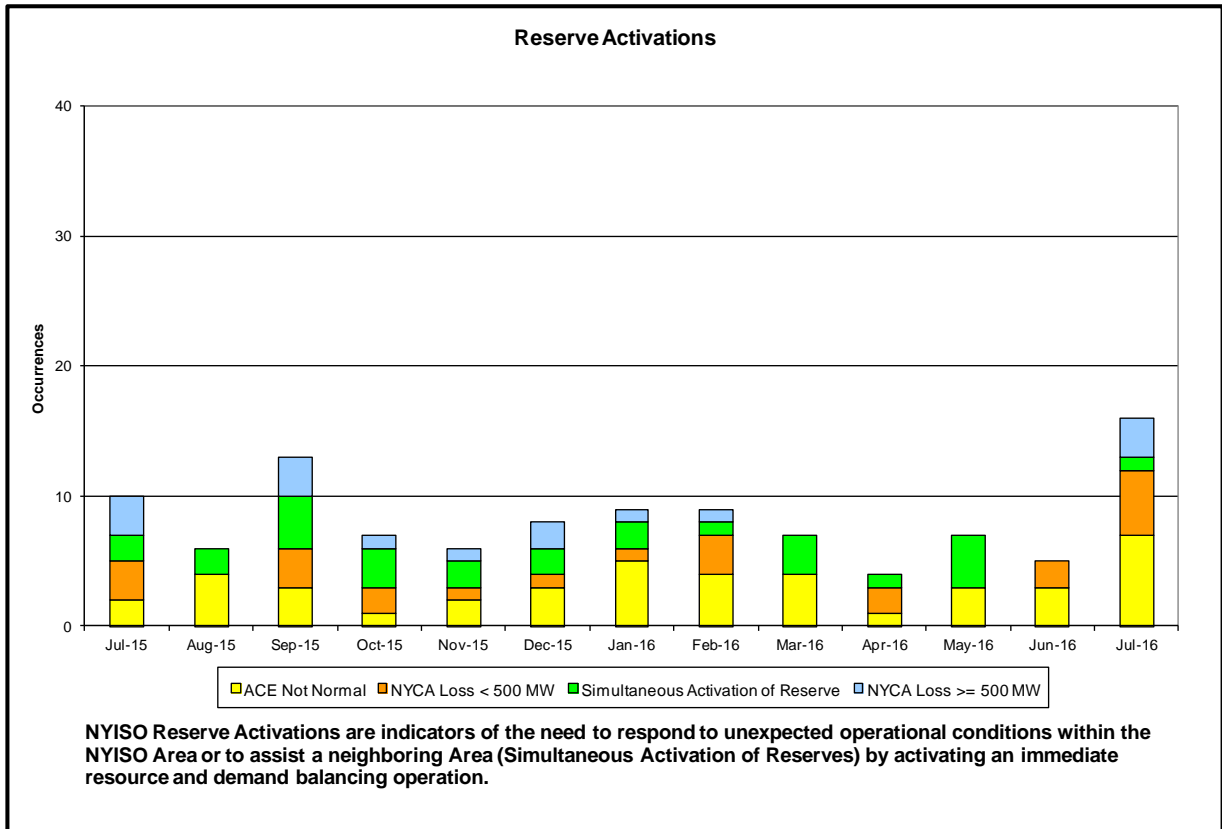
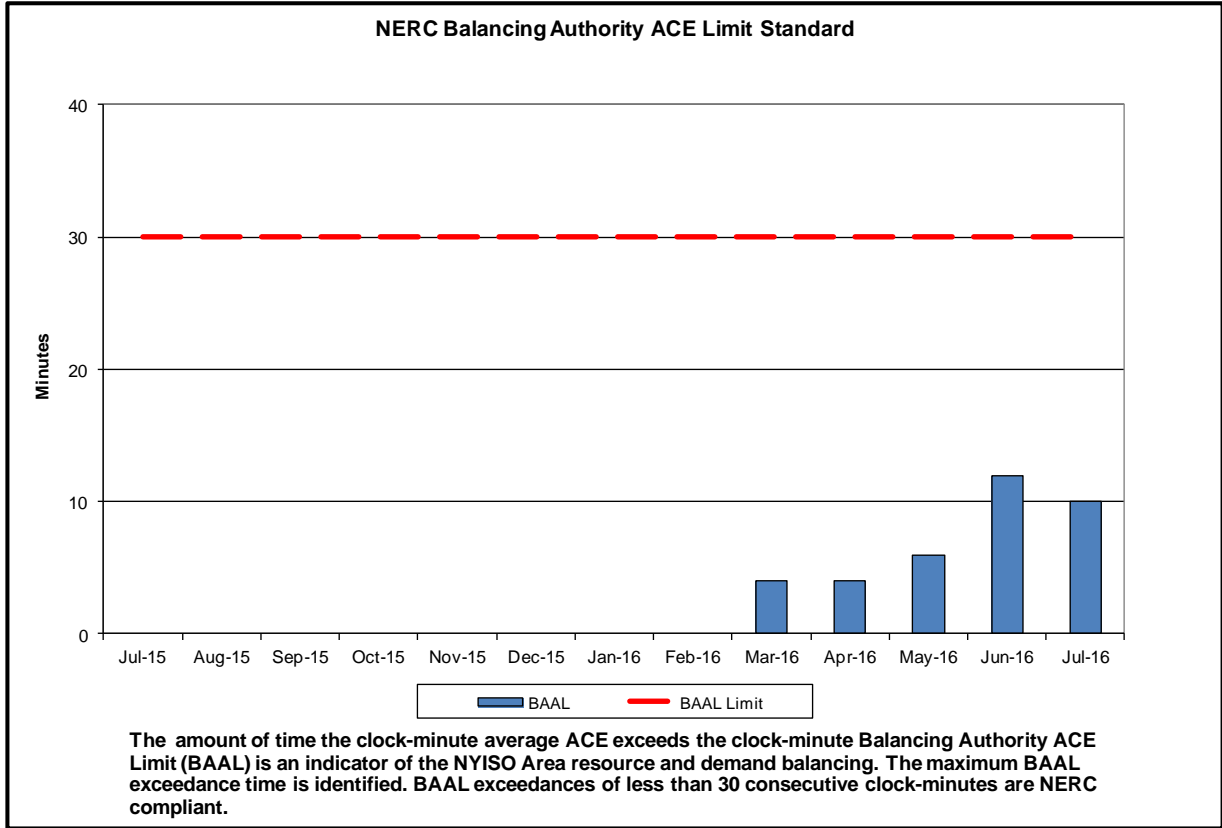
Spot Auction Price Results	NYCA	Lower Hudson Valley Zones	New York City Zone	Long Island Zone
August 2016 Spot Price	\$3.64	\$9.23	\$12.21	\$4.42
July 2016 Spot Price	\$4.27	\$9.25	\$12.22	\$4.37
Delta	(\$0.63)	(\$0.02)	(\$0.01)	\$0.05

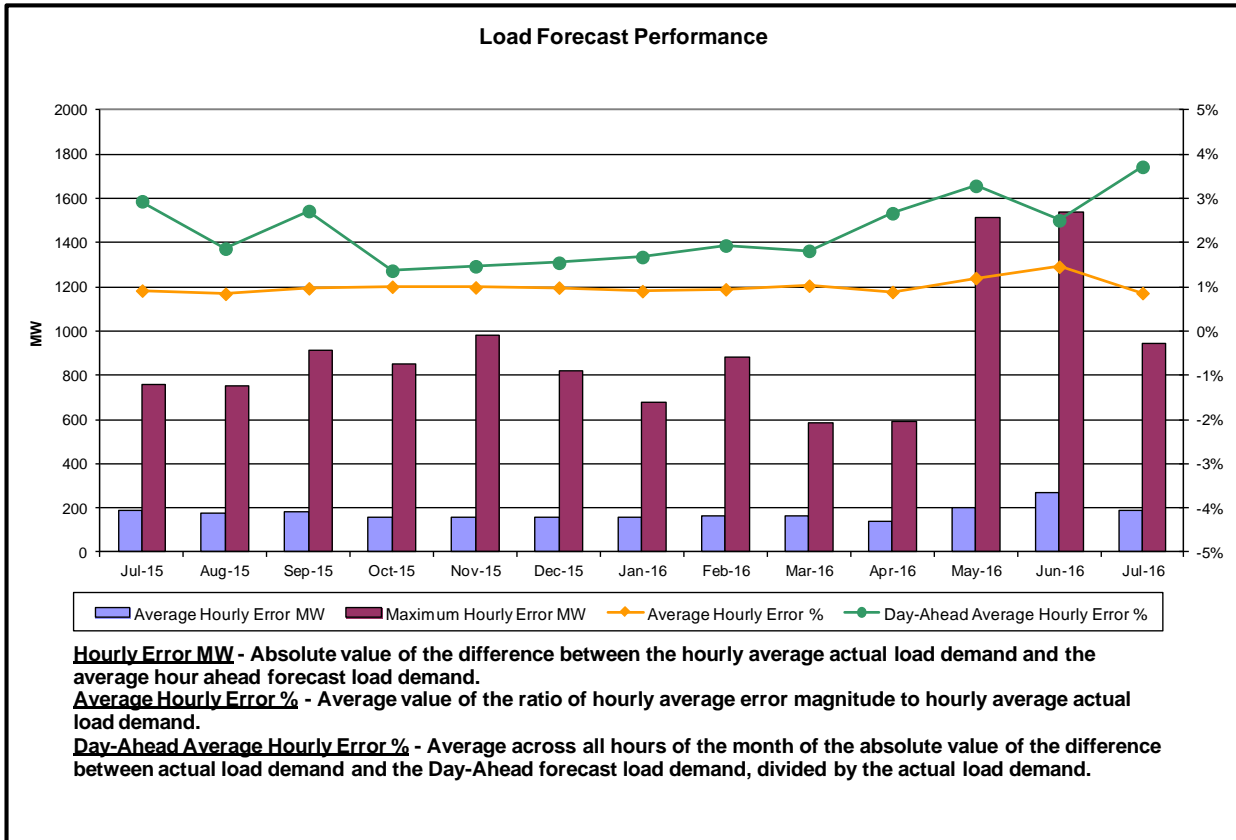
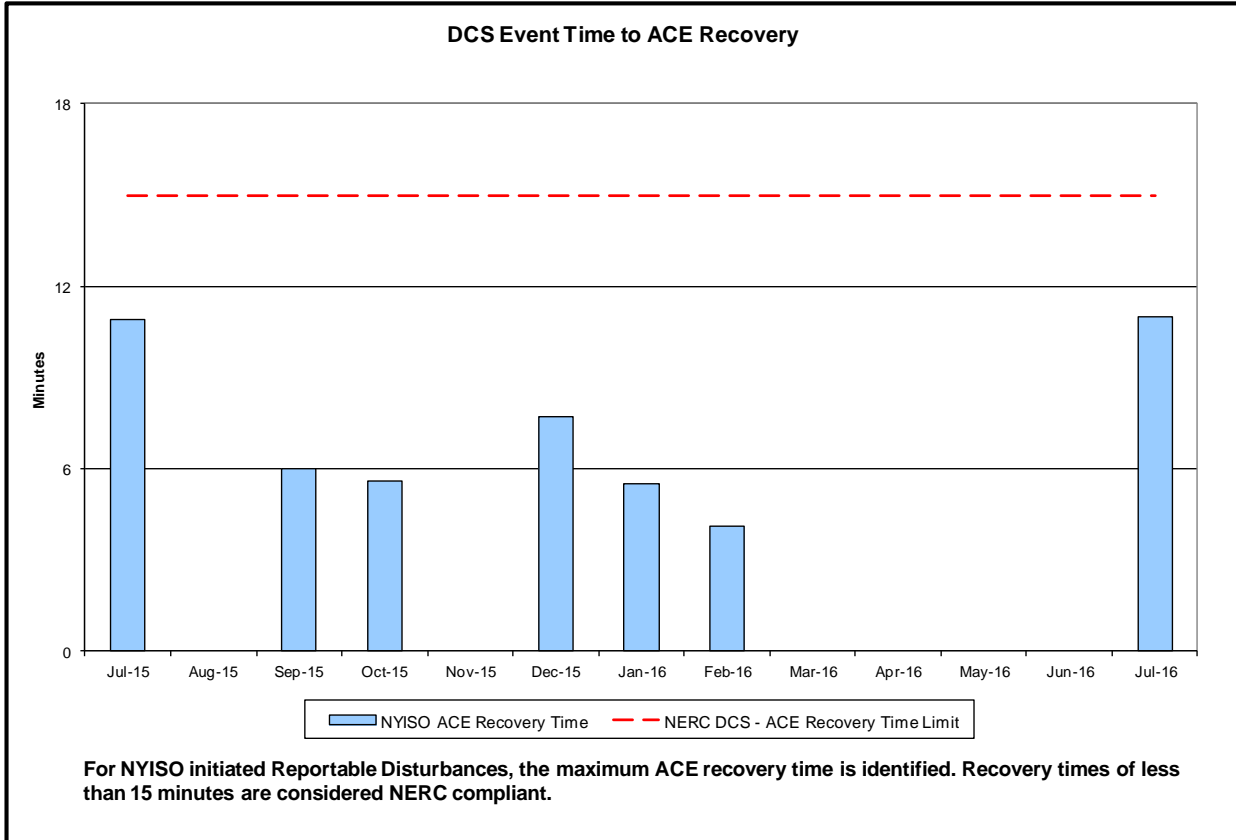
- NYCA - Price decreased by \$0.63 due to an increase in SCR and generation capacity and an increase in external resource imports.

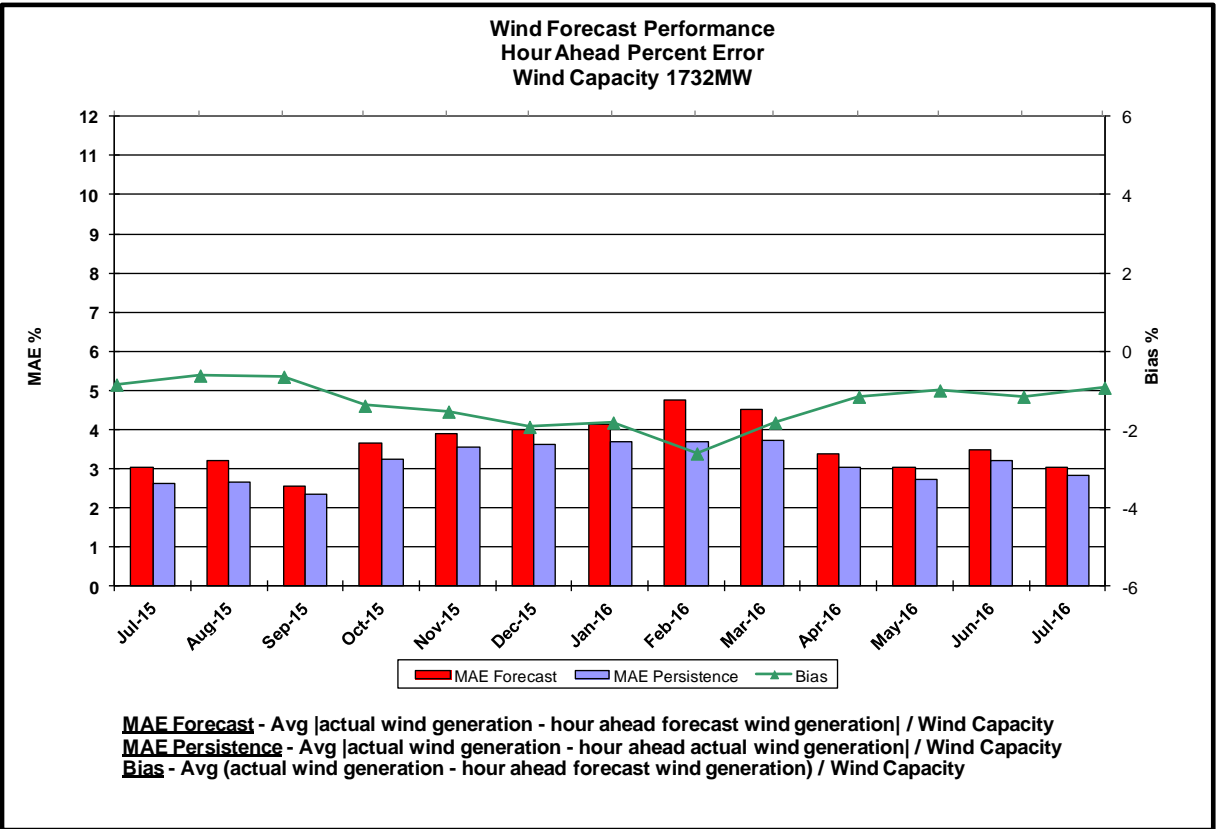
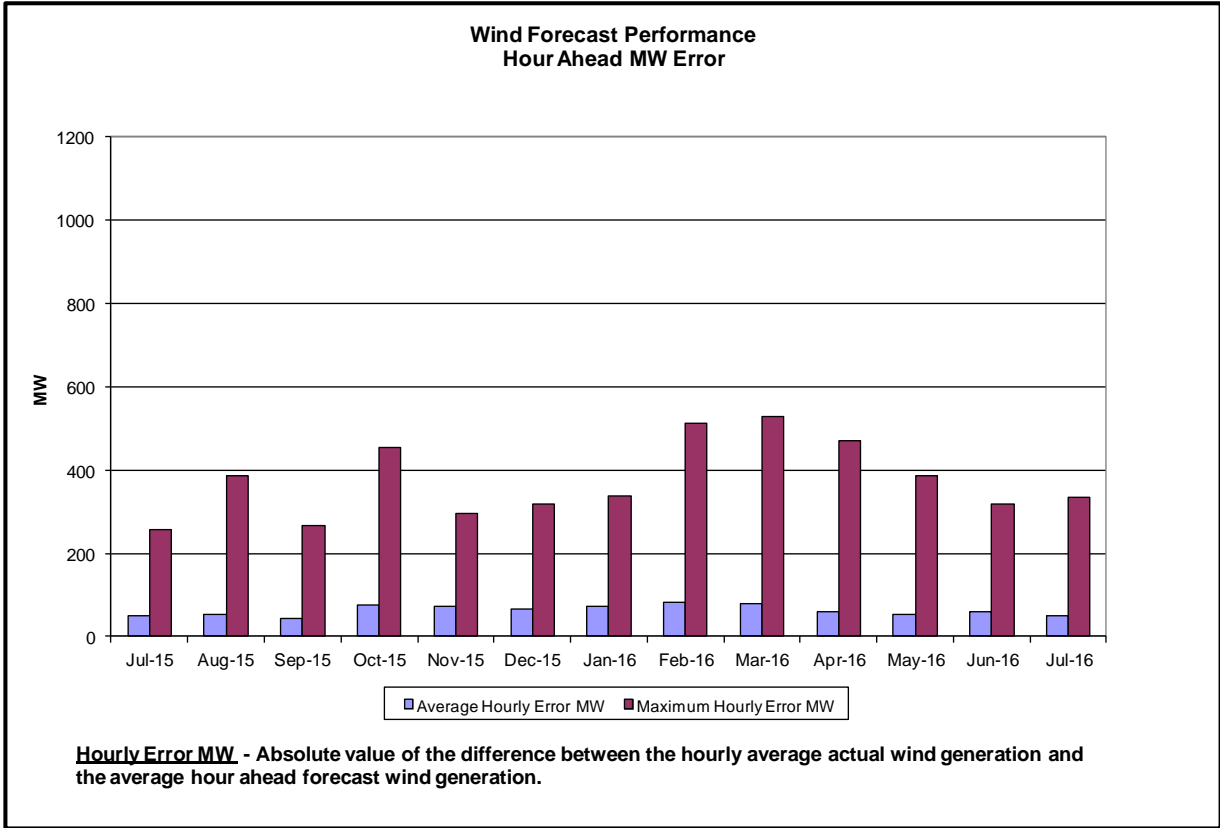
- Reliability Performance Metrics

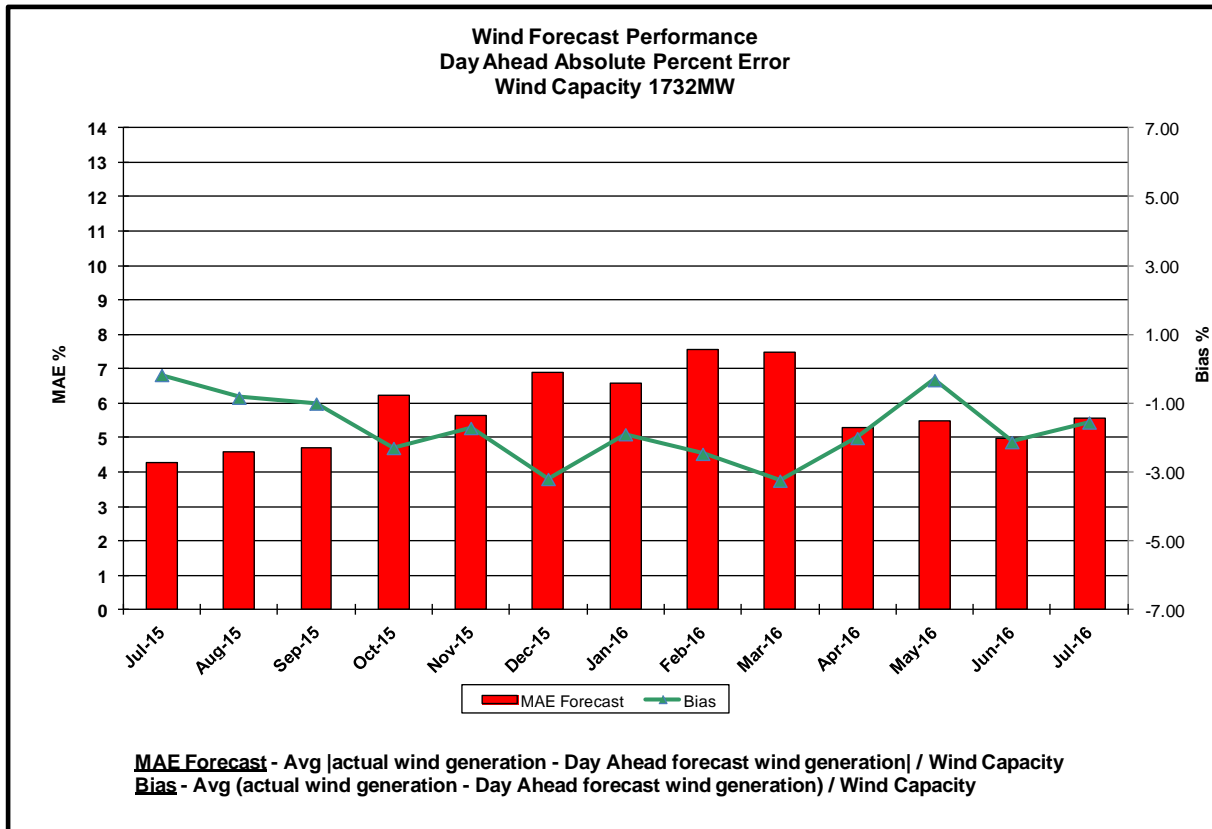
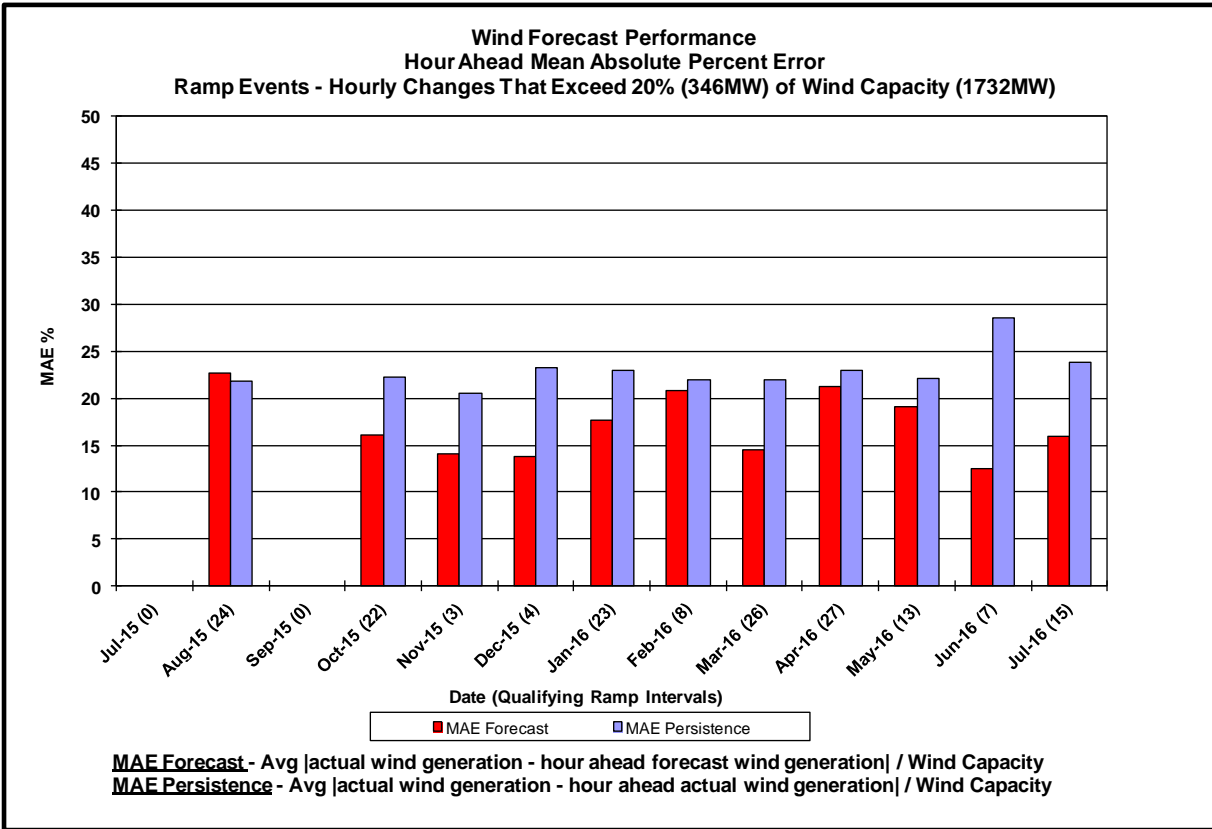


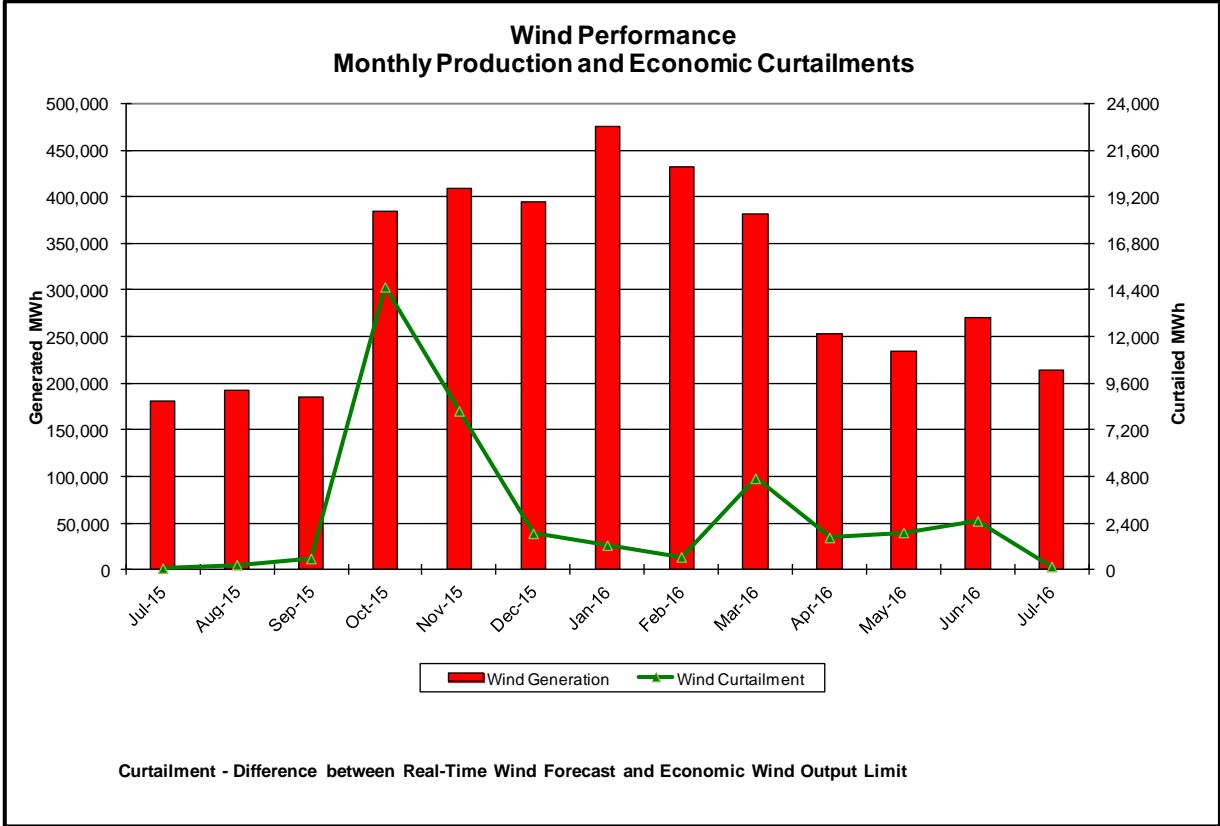


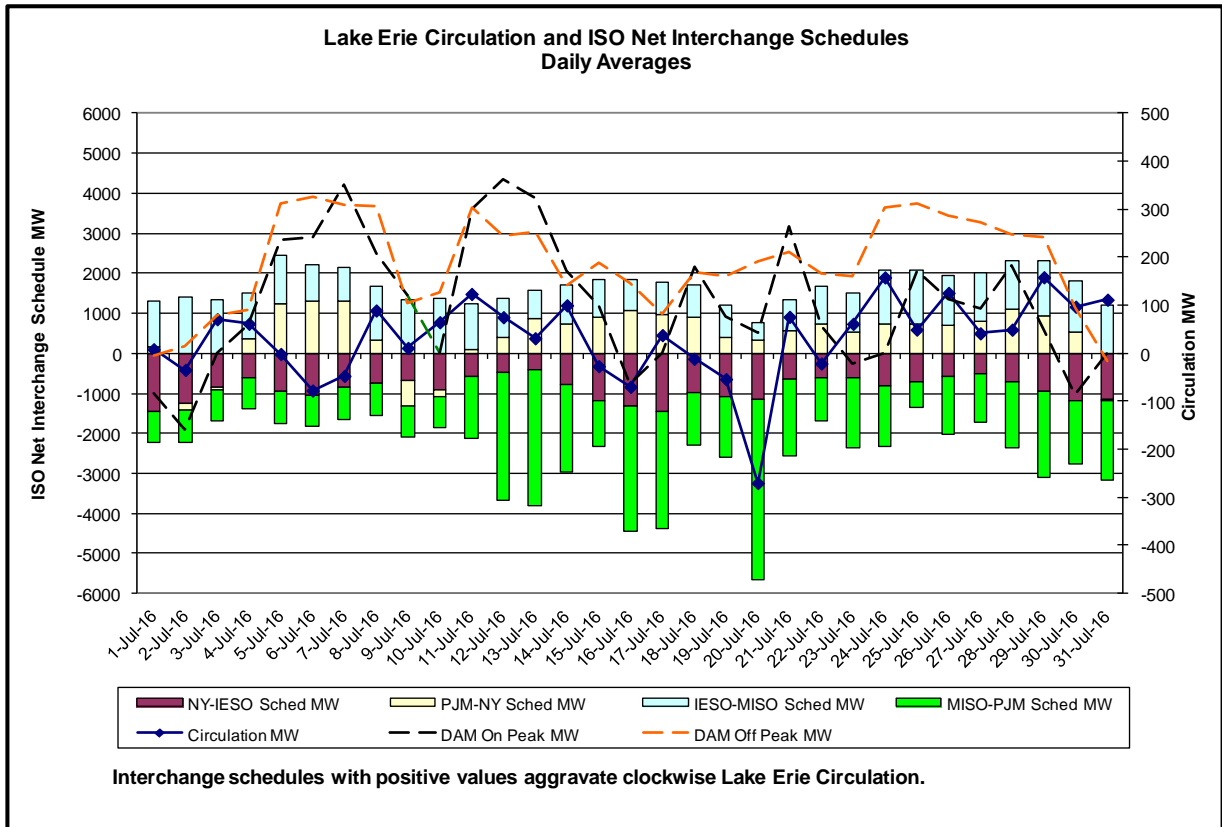
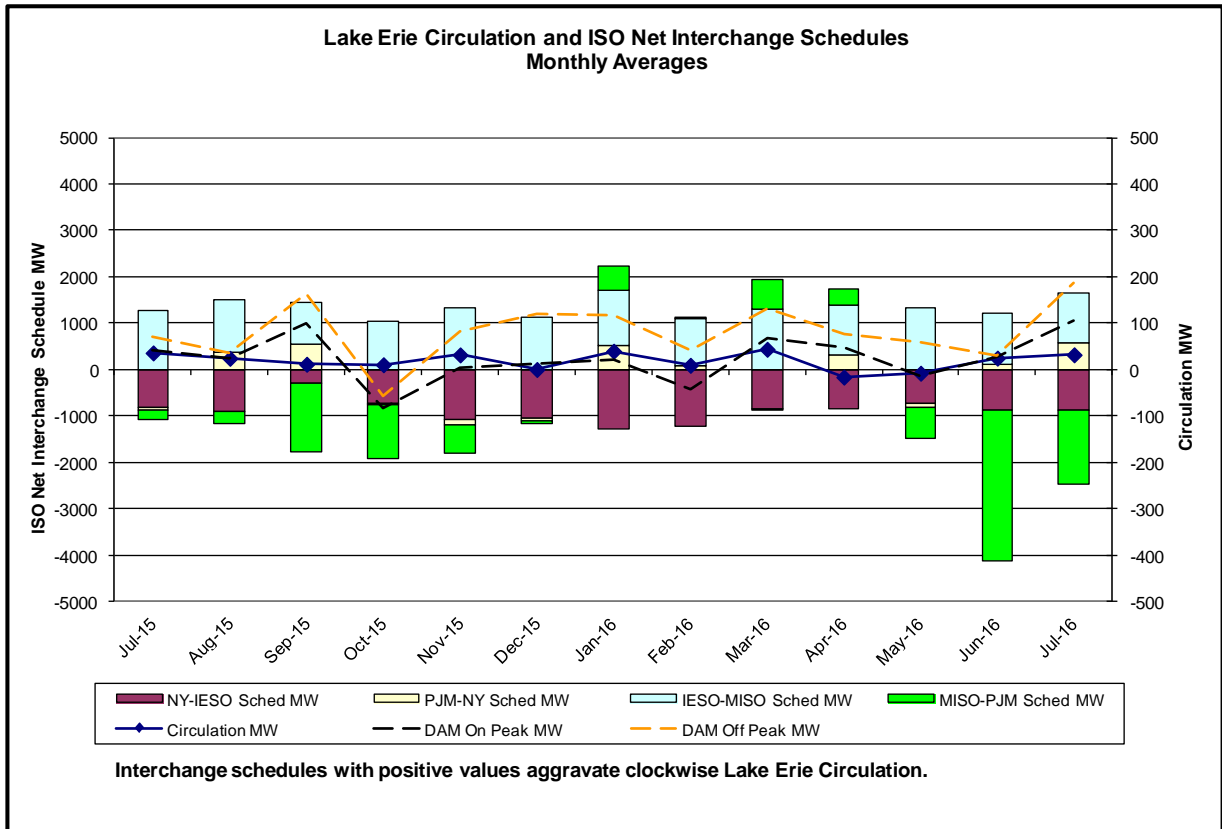




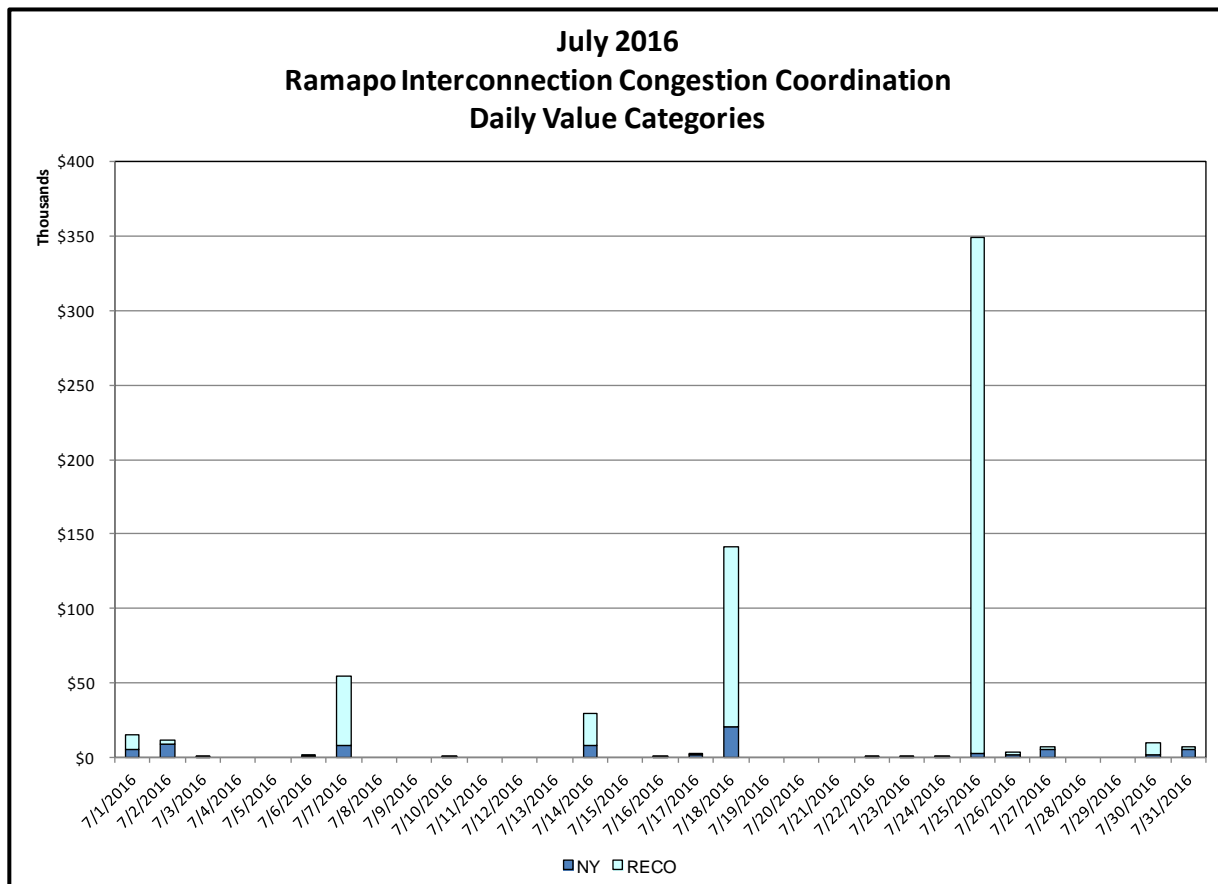
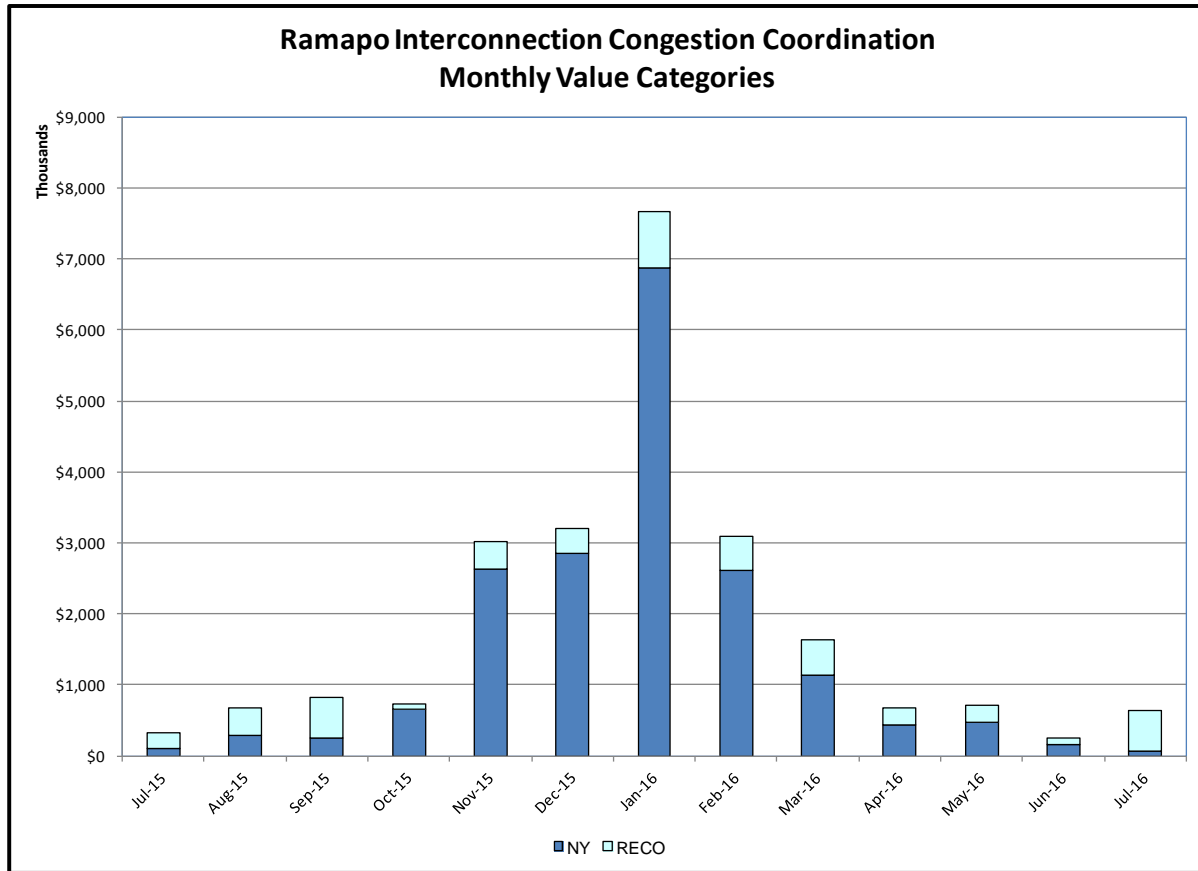






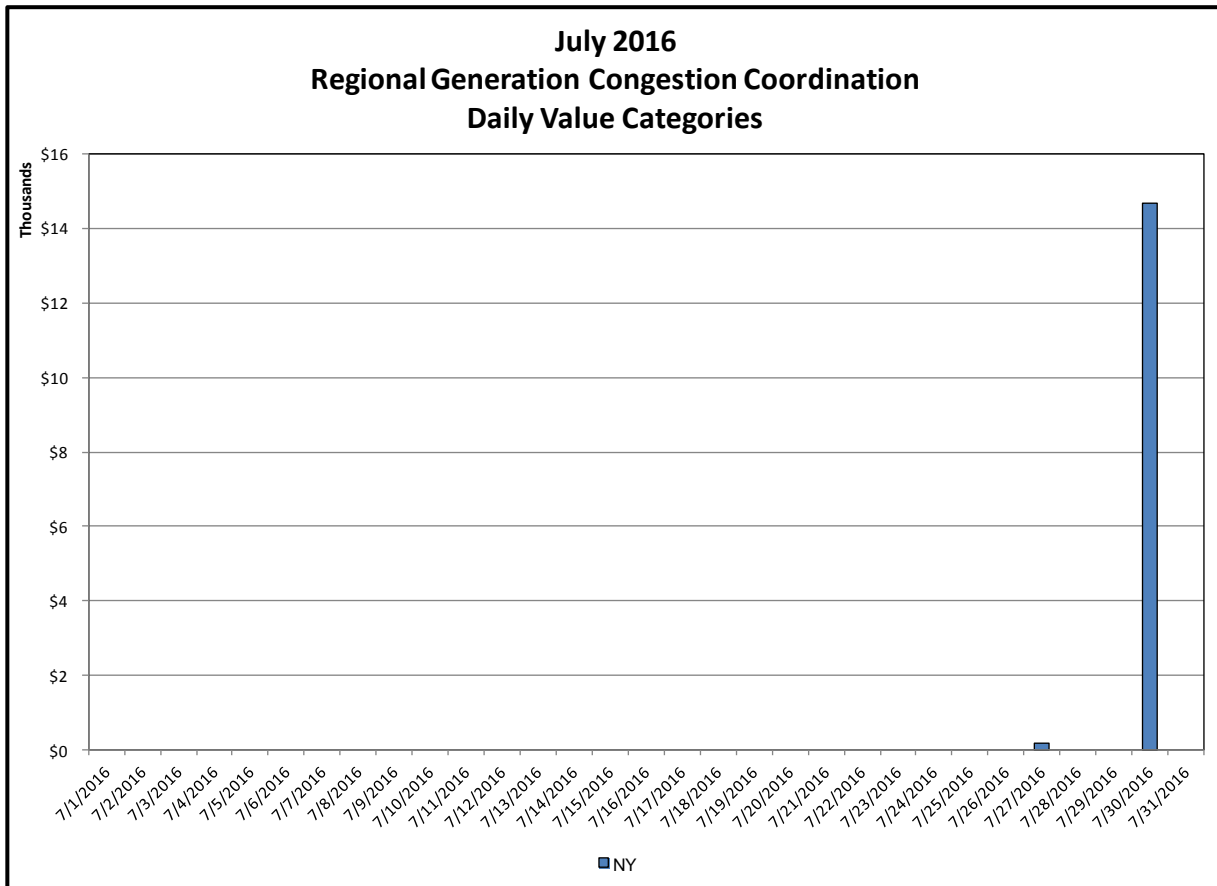
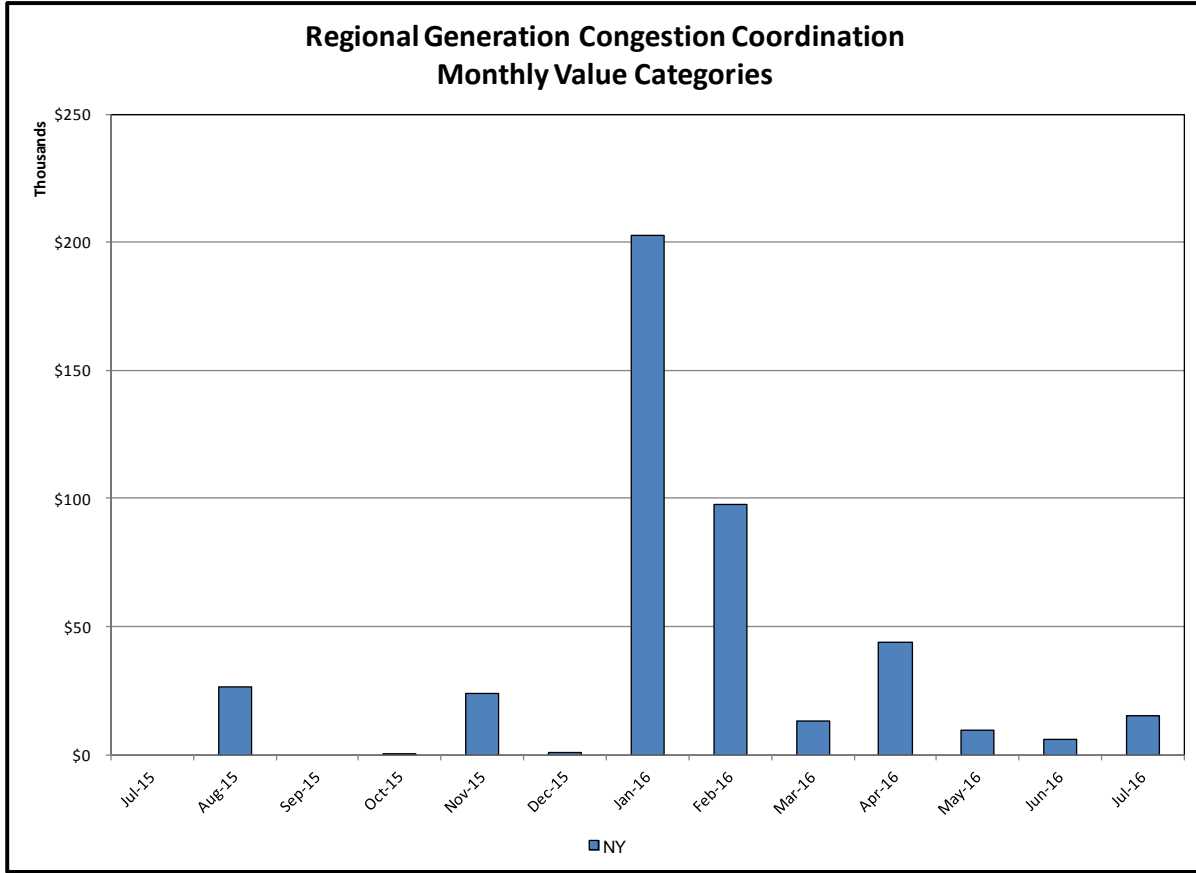


Broader Regional Market Performance Metrics



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>



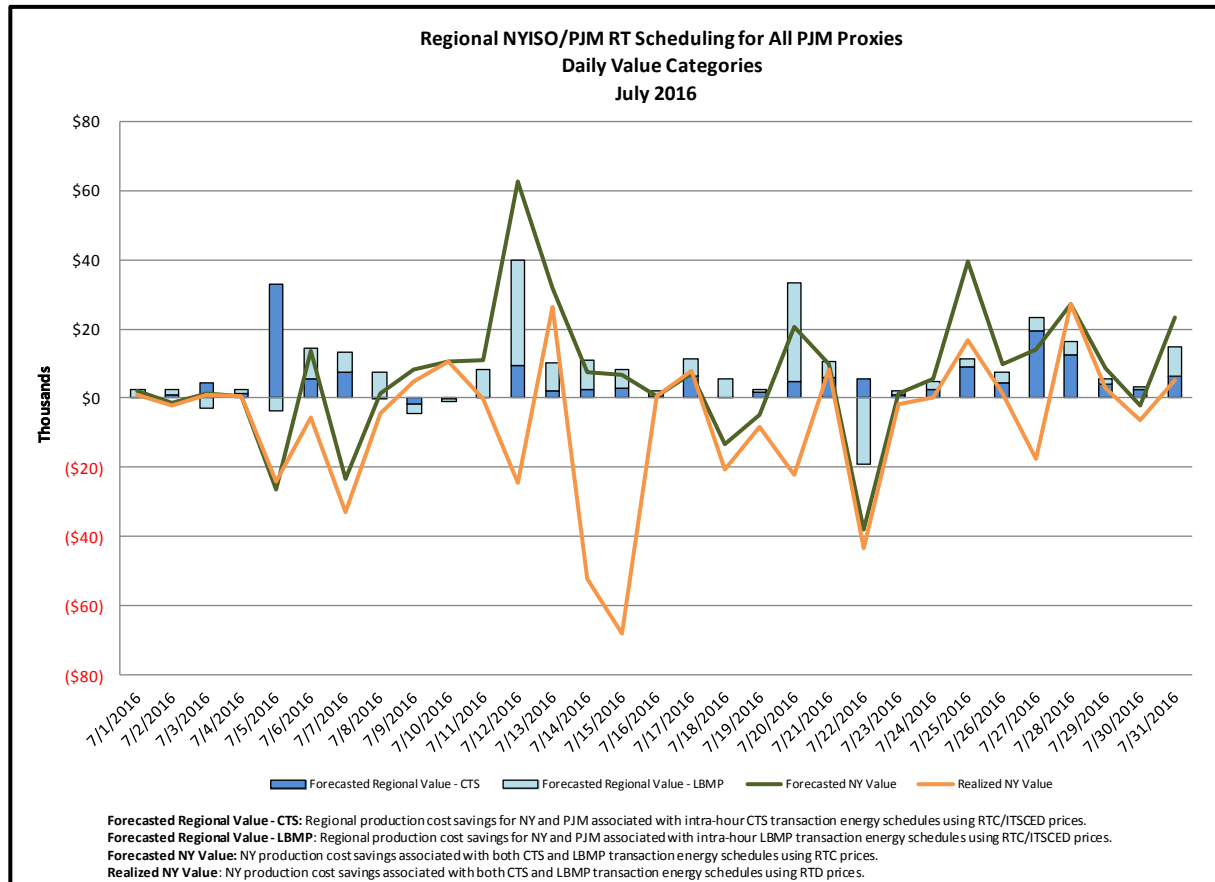
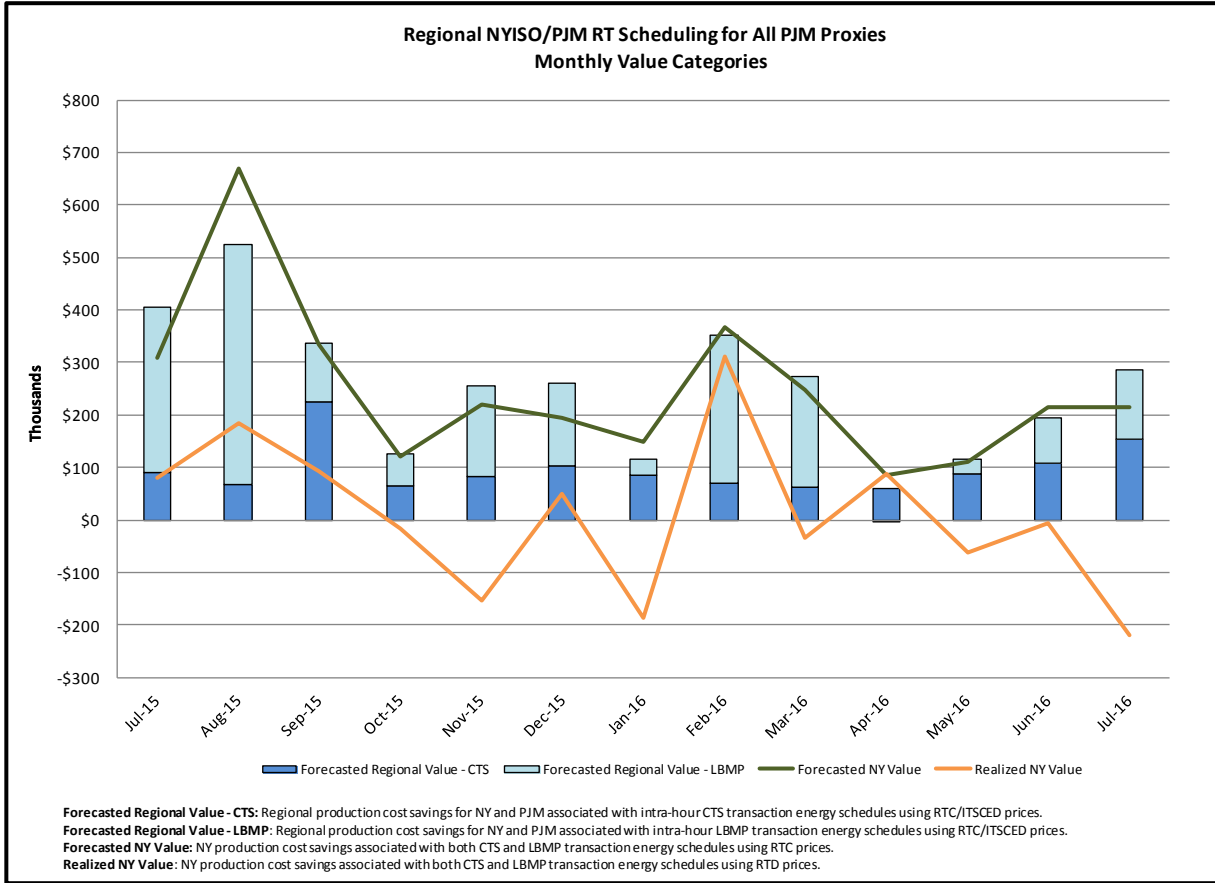
Regional Generation Congestion Coordination

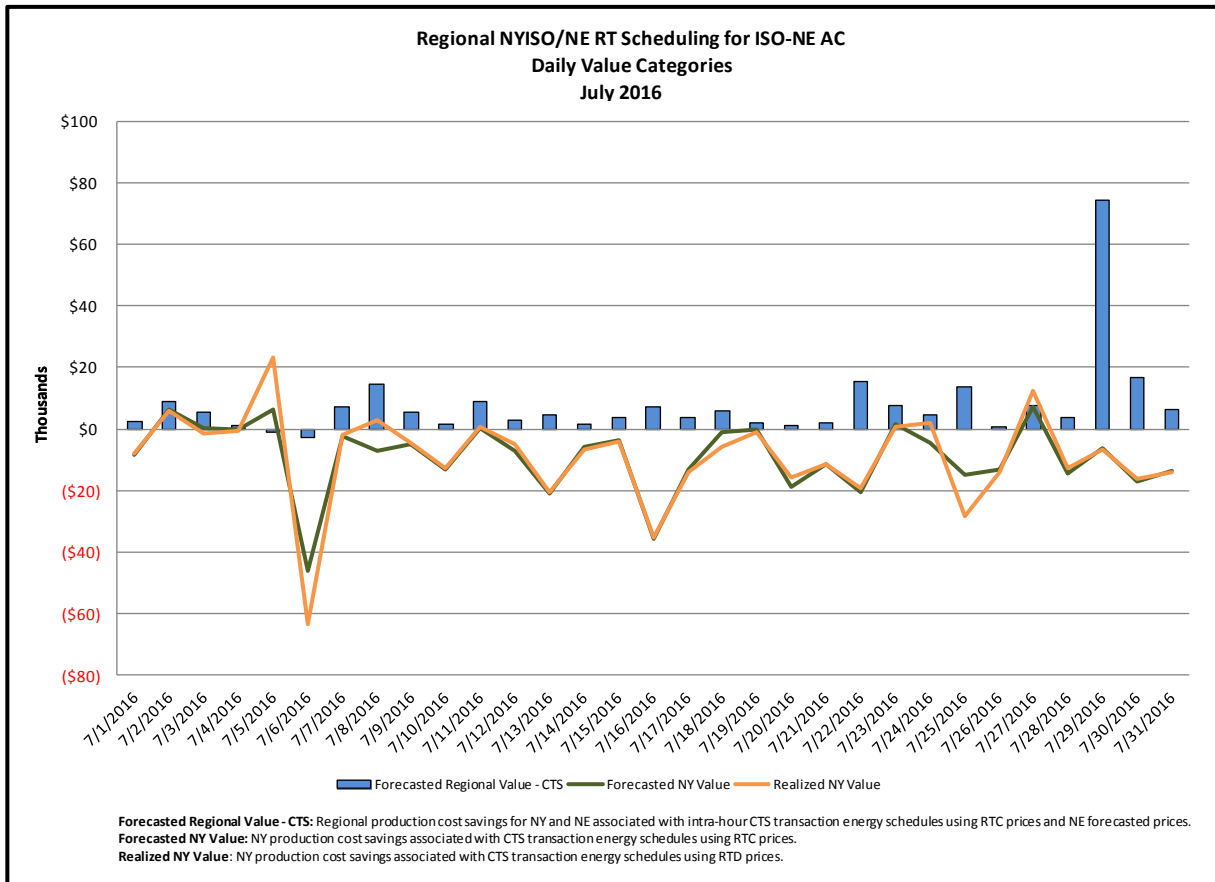
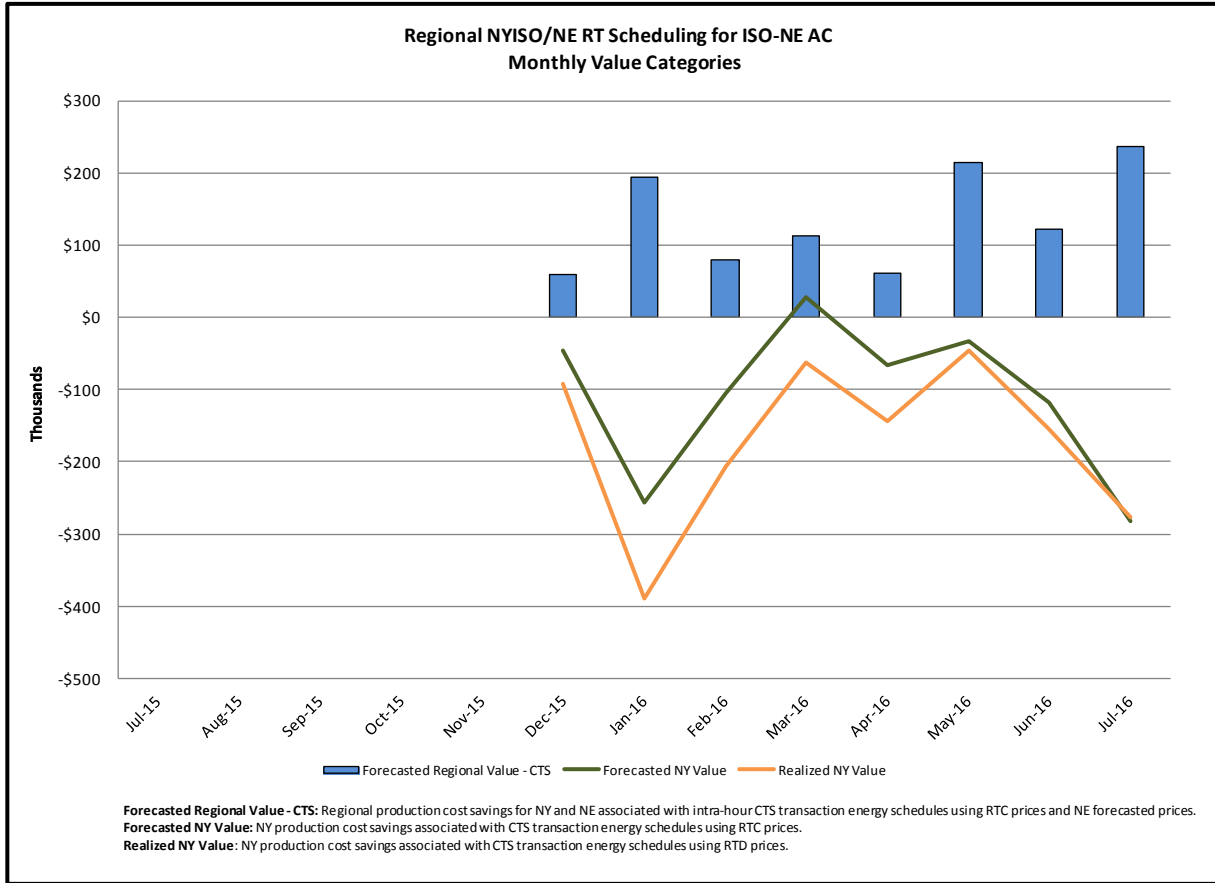
Category

NY

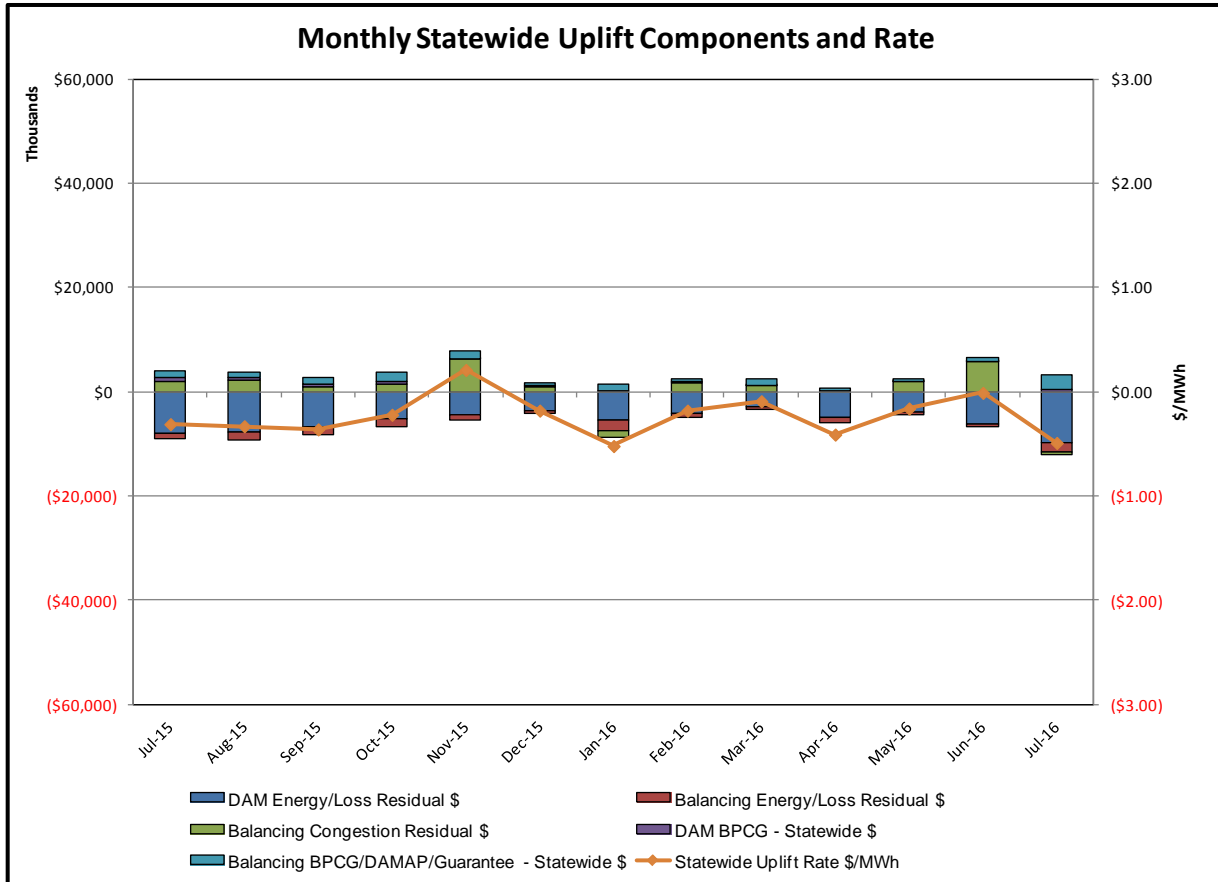
Description

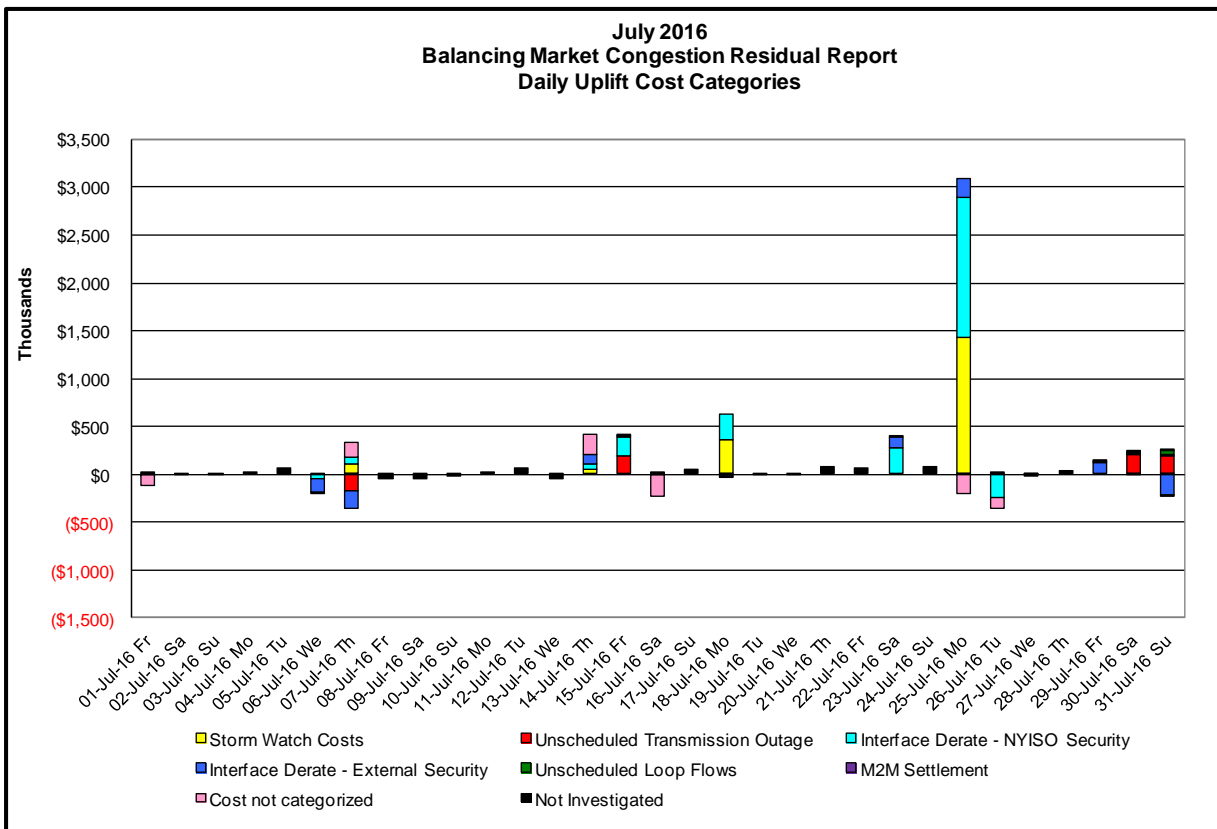
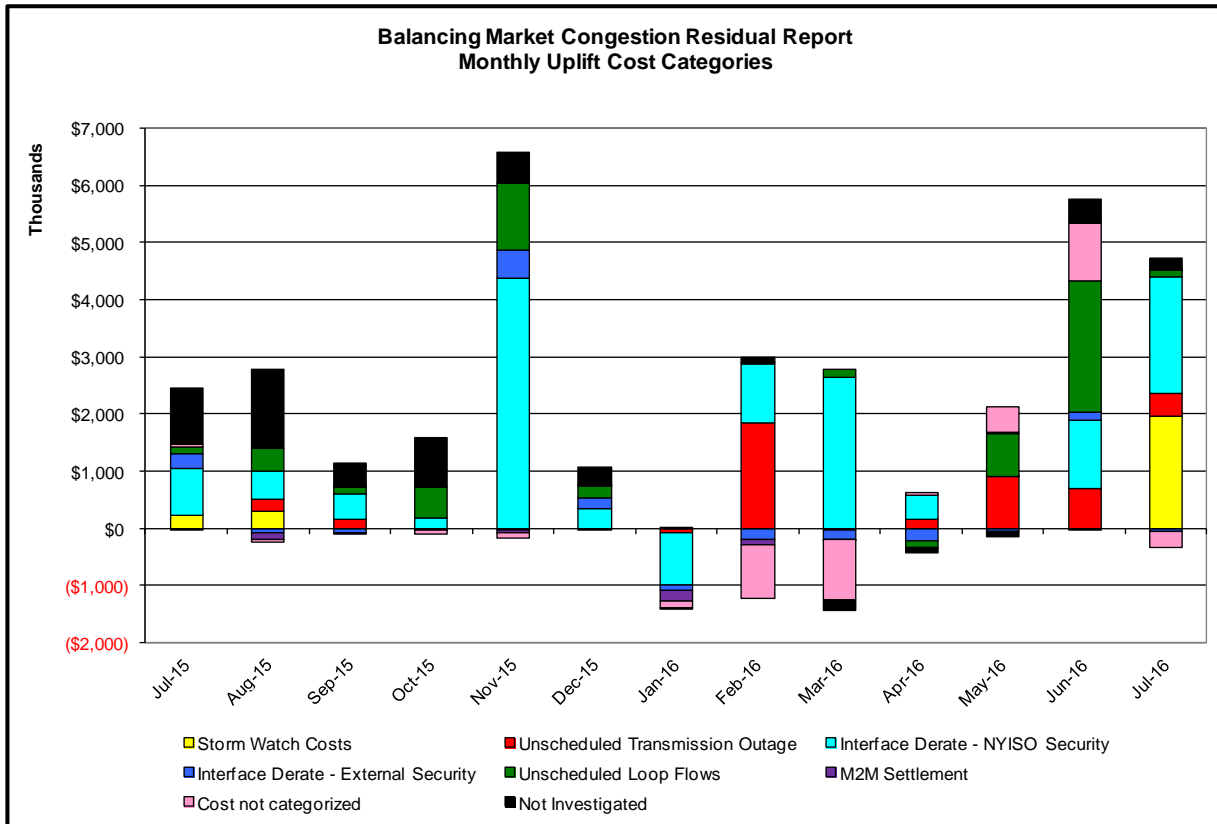
NYISO savings that result from PJM payments to NYISO when PJM's transmission use (PJM's market flow) is greater than PJM's entitlement of the NY transmission system and NYISO is incurring Western or Central NY congestion. Additionally, NYISO savings may result from the more efficient regional utilization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





Market Performance Metrics





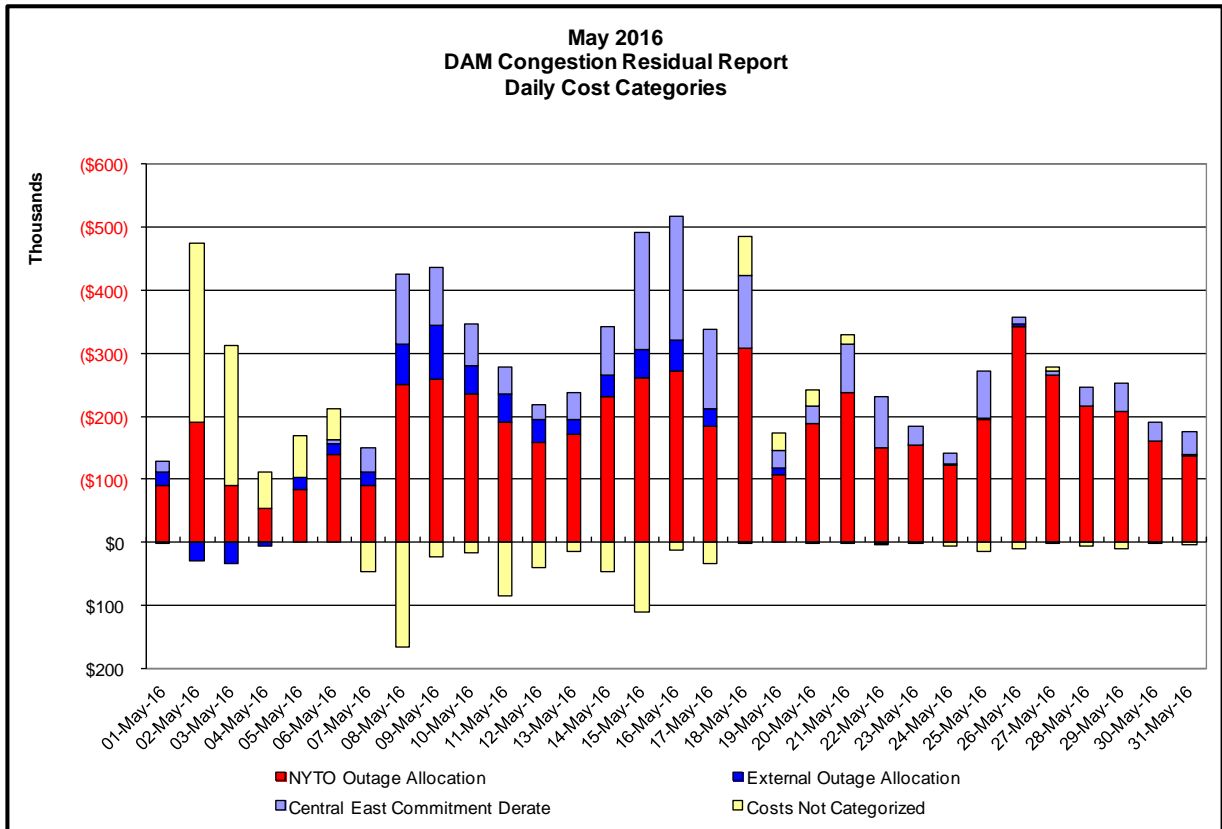
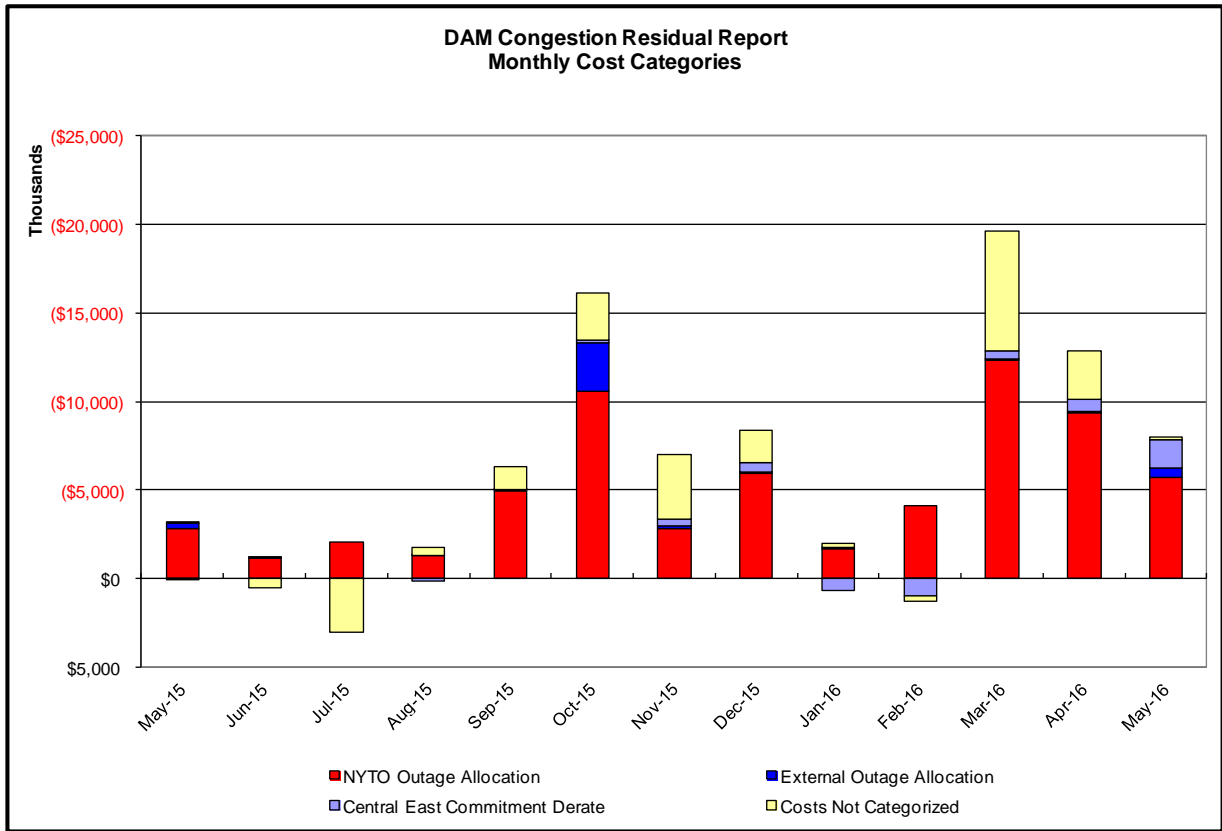
Day's investigated in July: 1, 6, 7, 14, 15, 16, 18, 23, 25, 26, 29, 30, 31		
Event	Date (yyyymmdd)	Description
	7/1/2016	15 Thunder Storm Alert
	7/1/2016	18 NE_AC-NY Scheduling Limit
	7/6/2016	10,19 NYCA DNI Ramp Limit
	7/6/2016	19,20,21 Uprate Freshkills-Willowbrook 138kV (#29211)
	7/6/2016	12,19,20,21 Uprate Gowanus-Goethals 345kV (#25)
	7/6/2016	12,19,20,21 Uprate Gowanus-Goethals 345kV (#26)
	7/6/2016	13,14,15,18 NE_NNC1385-NY Scheduling Limit
	7/6/2016	10,15,18 NE_AC DNI Ramp Limit
	7/6/2016	10,12,13,14,17,18, 19 PJM_AC-NY Scheduling Limit
	7/7/2016	13,14 Thunder Storm Alert
	7/7/2016	10-12 Early Return Sprainbrook-East Garden City 345kV(#Y49)
	7/7/2016	13,14 NYCA DNI Ramp Limit
	7/7/2016	10 Uprate Gowanus-Greenwood 138kV (#42232) for I/o SCB:GOWANUS(2):41&42231&R4
	7/7/2016	22 Uprate Gowanus-Greenwood 138kV (#42231 & 42232) for I/o TWR:GOETHALS 22 & 21
	7/7/2016	10-12 PJM_AC-NY Scheduling Limit
	7/14/2016	16,17 Thunder Storm Alert
	7/14/2016	21 NYCA DNI Ramp Limit
	7/14/2016	23 Uprate East 179th Street-Hell Gate West 138kV (#15055)
	7/14/2016	16 Derate East 179th Street-Hell Gate East 138kV (#15053)
	7/14/2016	16 Derate Northport-Pilgrim 138kV (#677)
	7/14/2016	23 IESO_AC-NY Scheduling Limit
	7/14/2016	16,17 NE_AC DNI Ramp Limit
	7/14/2016	14,16 PJM_AC DNI Ramp Limit
	7/15/2016	12,13 Forced outage Freshkills-Willowbrook 138kV (#29211)
	7/15/2016	10-19 Forced outage Northport-Pilgrim 138kV (#677)
	7/15/2016	15-19 Derate Dunwoodie-Shore Road 345kV (#Y50) for I/o SCB:SPNBK(RNS2):Y49&M29&Y49_ST
	7/15/2016	10-14 Derate Goethals-Gowanus 345kV (#25)
	7/15/2016	18 NYCA DNI Ramp Limit
	7/15/2016	12 Lake Erie Circulation, DAM-RTM exceeds +/-125MW; Gardenville-Stolle Road 230kV (#66)
	7/16/2016	10 Derate Rainey-Vernon 138kV (#36312)
	7/16/2016	10 Derate Greenwood-Vernon 138kV (#31231) for I/o TWR:GOETHALS 22 & 21
	7/16/2016	13 PJM_AC-NY Scheduling Limit
	7/18/2016	15-19 Thunder Storm Alert
	7/18/2016	14,15,16 NYCA DNI Ramp Limit
	7/18/2016	2 Uprate Central East
	7/18/2016	16,17 Derate Dunwoodie-Shore Road 345kV (#Y50) for I/o SCB:SPNBK(RNS2):Y49&M29&Y49_ST
	7/18/2016	15-17 Derate East 179th Street-Hell Gate East 138kV (#15053)
	7/18/2016	16,17 Derate Elwood-Northport 138kV (#681) for I/o Elwood-Northport (#678)
	7/18/2016	17 Derate Elwood-Greenlawn 138kV (#673) for I/o Elwood-Northport (#681)
	7/18/2016	16,17 Derate Northport-Pilgrim 138kV (#677) for I/o BUS:NRTHPRT 679 & G1
	7/18/2016	13,14 Uprate Leeds-Pleasant Valley 345kV (#92) for I/o Athens-Pleasant Valley 345kV (#92)
	7/18/2016	11 PJM_AC-NY Scheduling Limit
	7/23/2016	13-22 Derate Dunwoodie-Shore Road 345kV (#Y50) for I/o SCB:SPNBK(RNS2):Y49&M29&Y49_ST
	7/23/2016	20 Derate Elwood-Greenlawn 138kV (#673) for I/o Elwood-Northport (#681)
	7/23/2016	0,12 Uprate Freshkills-Willowbrook 138kV (#29211)
	7/23/2016	10,13,19,22 Derate Northport-Pilgrim 138kV (#677) for I/o BUS:NPRT 672&1385&601&602&603
	7/23/2016	12 IESO_AC DNI Ramp Limit
	7/23/2016	16 NE_NNC1385-NY Scheduling Limit
	7/23/2016	18 NE_AC DNI Ramp Limit
	7/25/2016	13-17,19,20 Thunder Storm Alert
	7/25/2016	13 Derate Dunwoodie-Shore Road 345kV (#Y50) for I/o SCB:SPNBK(RNS2):Y49&M29&Y49_ST
	7/25/2016	15 Derate East 179th Street-Hell Gate East 138kV (#15053)
	7/25/2016	13 Derate Gowanus-Greenwood 138kV (#42231)
	7/25/2016	13-17 Derate Northport-Pilgrim 138kV (#677) for I/o BUS:NPRT 672&1385&601&602&603
	7/25/2016	11,12,14,16 NYCA DNI Ramp Limit
	7/25/2016	11,12 NE_AC DNI Ramp Limit
	7/25/2016	16,17 PJM_AC DNI Ramp Limit
	7/26/2016	14,18-20,22 Uprate Freshkills-Willowbrook 138kV (#29211)
	7/26/2016	18,19,22 Uprate Freshkills-Willowbrook 138kV (#29212)
	7/26/2016	18-20,22 Uprate Gowanus-Greenwood 138kV (#42231 & 42232)
	7/26/2016	20 Uprate Gowanus-Greenwood 138kV (#42231) for I/o SCB:GOWANUS(14):42&42232&R14
	7/26/2016	18-20 Uprate Gowanus-Greenwood 138kV (#42232) for I/o SCB:GOWANUS(2):41&42231&R4
	7/26/2016	14,20 Uprate Gowanus-Greenwood 138kV (#42231) for I/o TWR:GOETHALS 22 & 21
	7/26/2016	14,18-20,22 Uprate Gowanus-Greenwood 138kV (#42232) for I/o TWR:GOETHALS 22 & 21
	7/26/2016	10 Lake Erie Circulation, DAM-RTM exceeds +/-125MW; Packard-Sawyer 230kV (#77)
	7/26/2016	10 Lake Erie Circulation, DAM-RTM exceeds +/-125MW; Niagara-Packard 230kV (#61)
	7/29/2016	20 NE_AC DNI Ramp Limit
	7/29/2016	12 Lake Erie Circulation, DAM-RTM exceeds +/-125MW; Packard-Sawyer 230kV (#77), Niagara-Packard 230kV (#61)
	7/30/2016	13-20 Forced outage East Garden City-Sprainbrook 345kV (#Y49)
	7/30/2016	0 Uprate East 179th Street-Hell Gate West 138kV (#15055)

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	

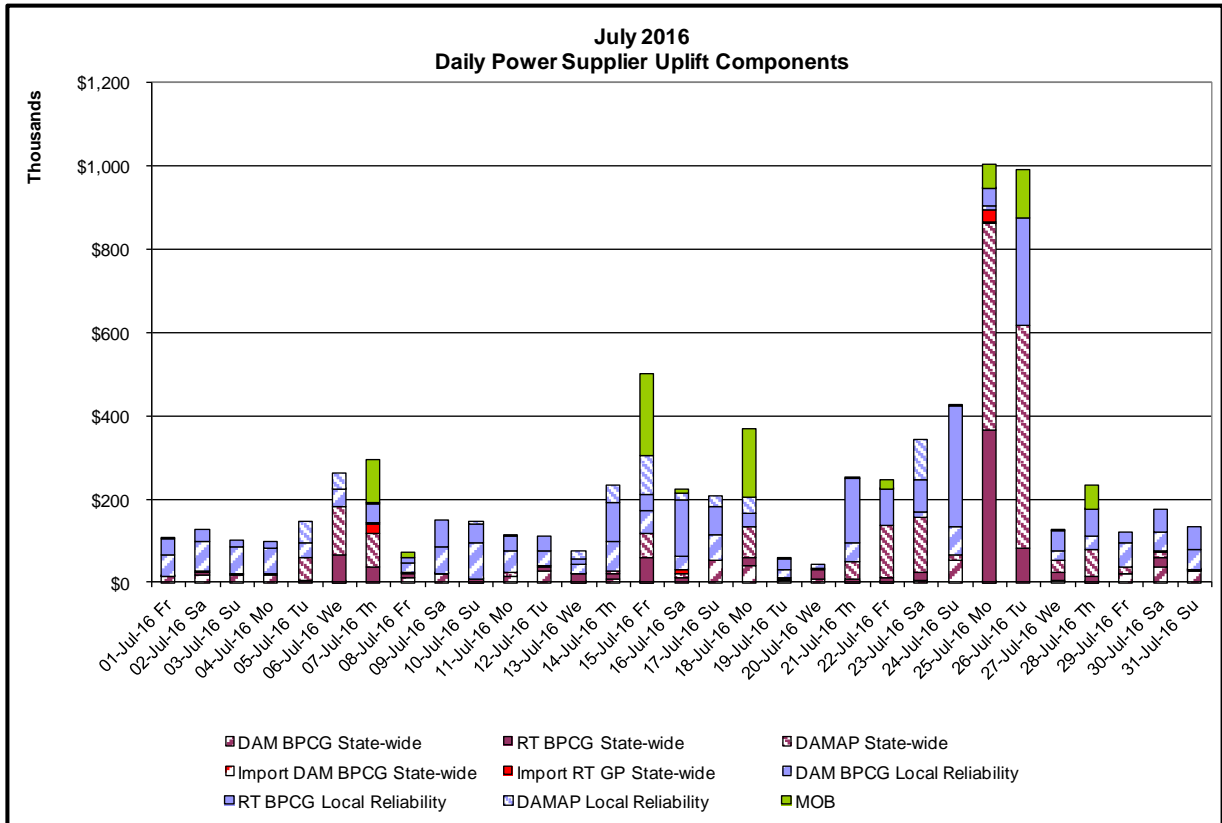
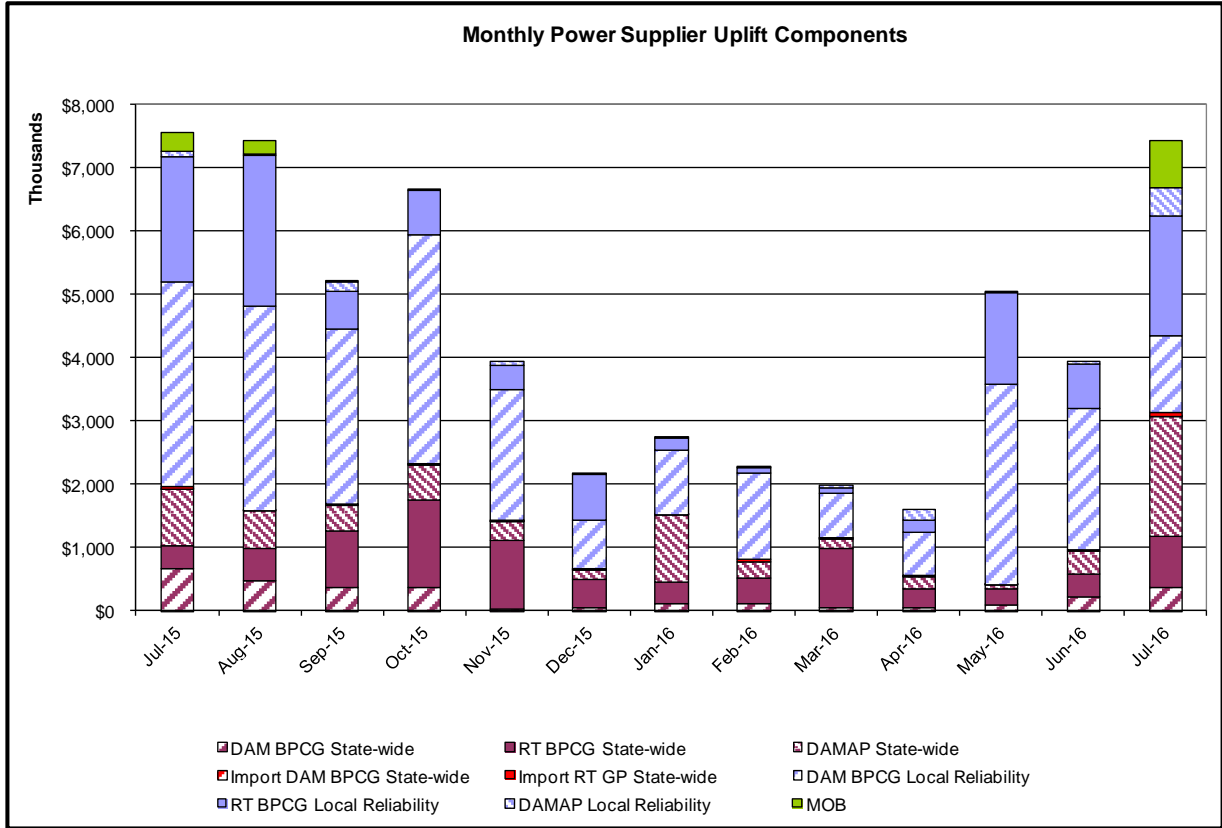
Monthly Balancing Market Congestion Report Assumptions/Notes

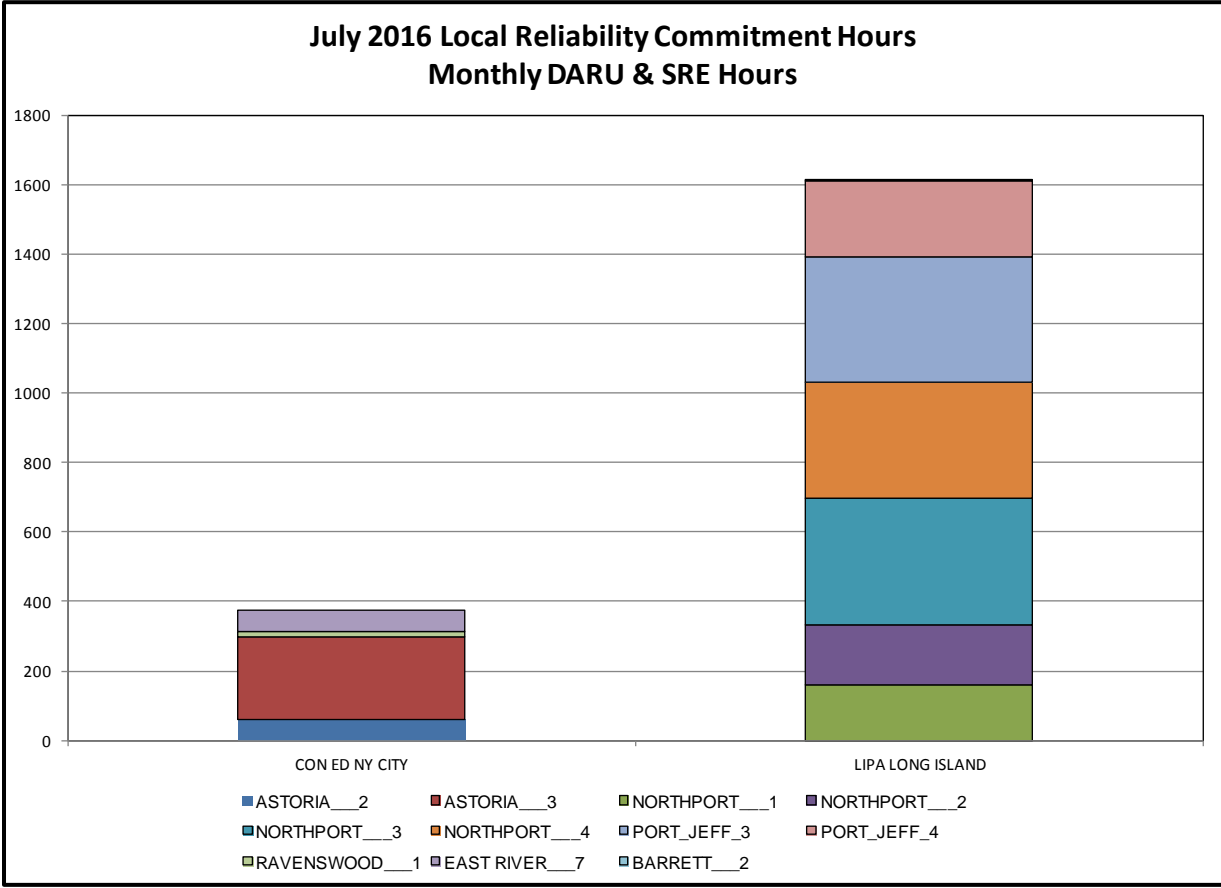
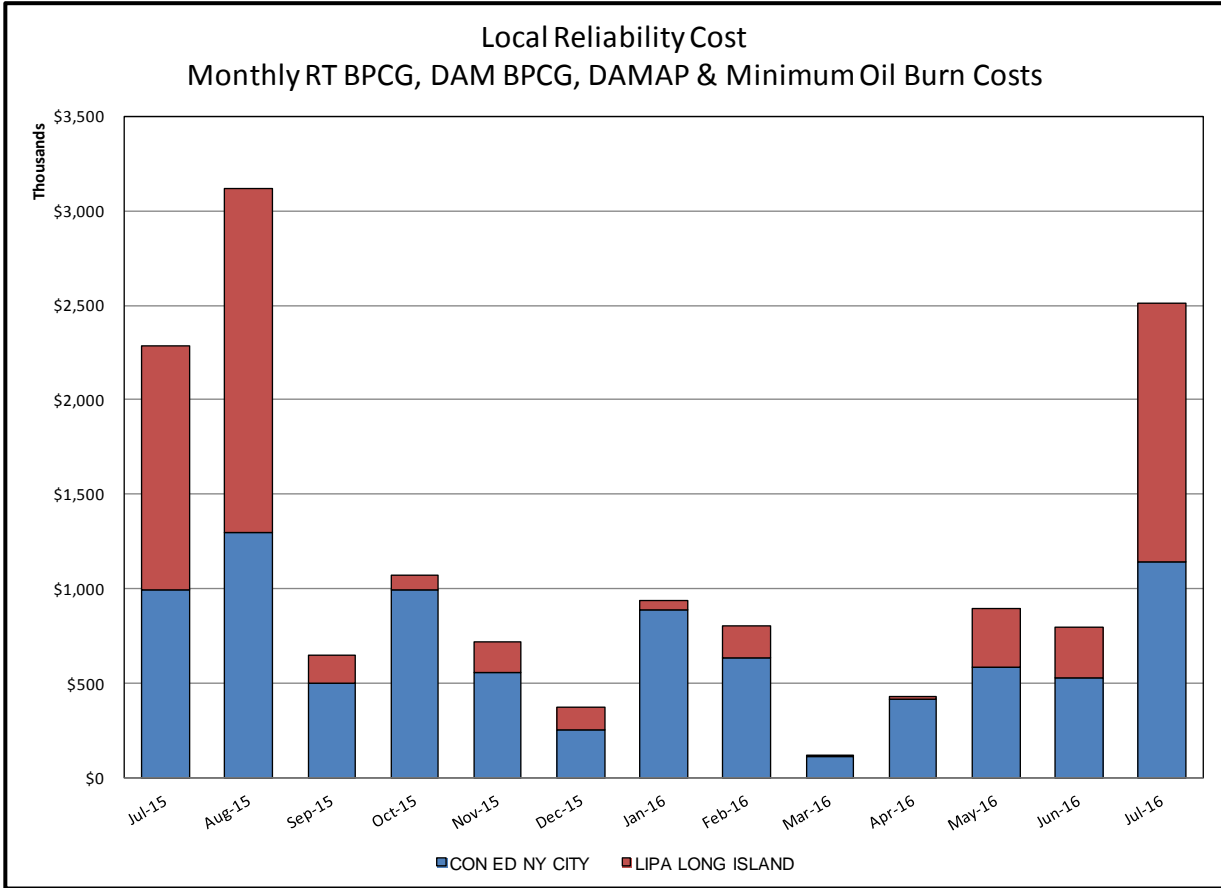
- 1) Storm Watch Costs are identified as daily total uplift costs
- 2) Days with a value of BMCR less M2M Settlement of \$100K/HR, shortfall of \$200K/Day or more, or surplus of \$100K/Day or more are investigated.
- 3) Uplift costs associated with multiple event types are apportioned equally by hour

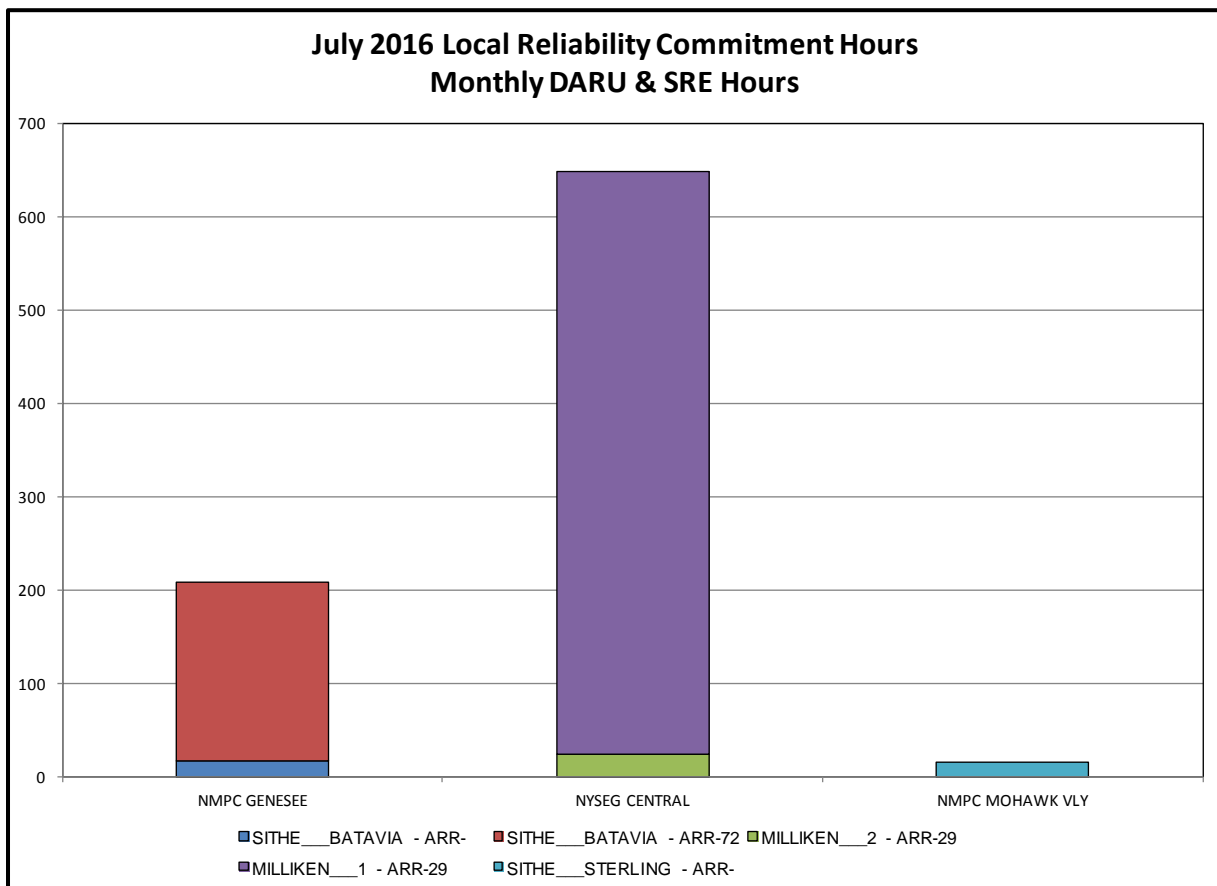
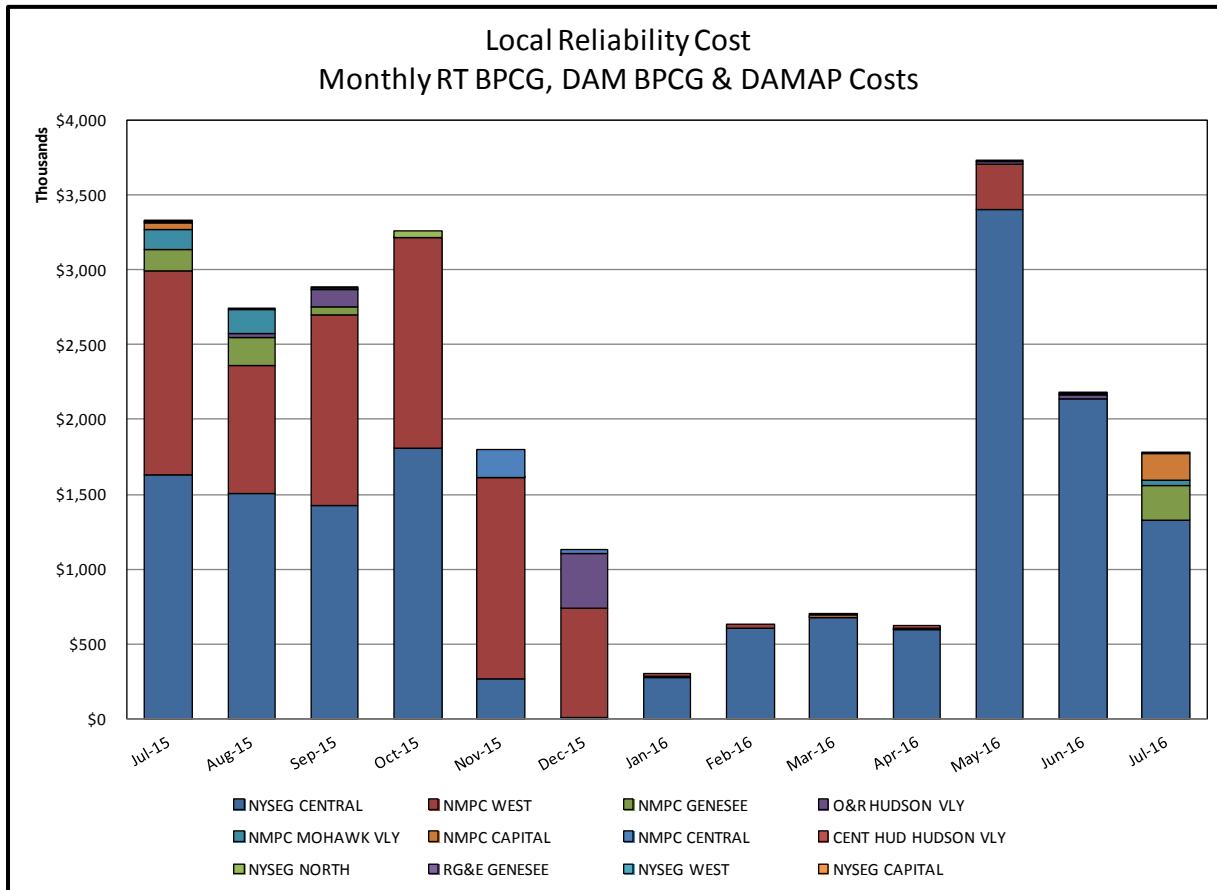


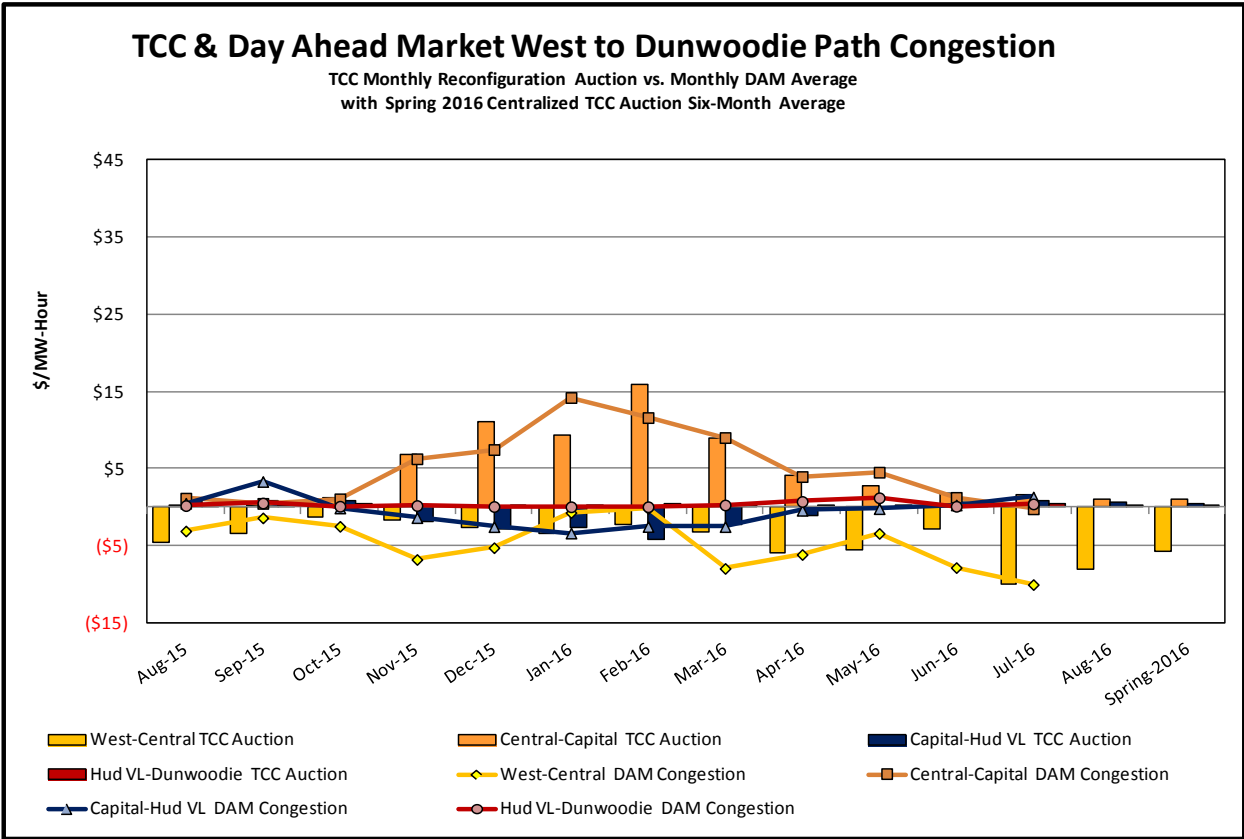
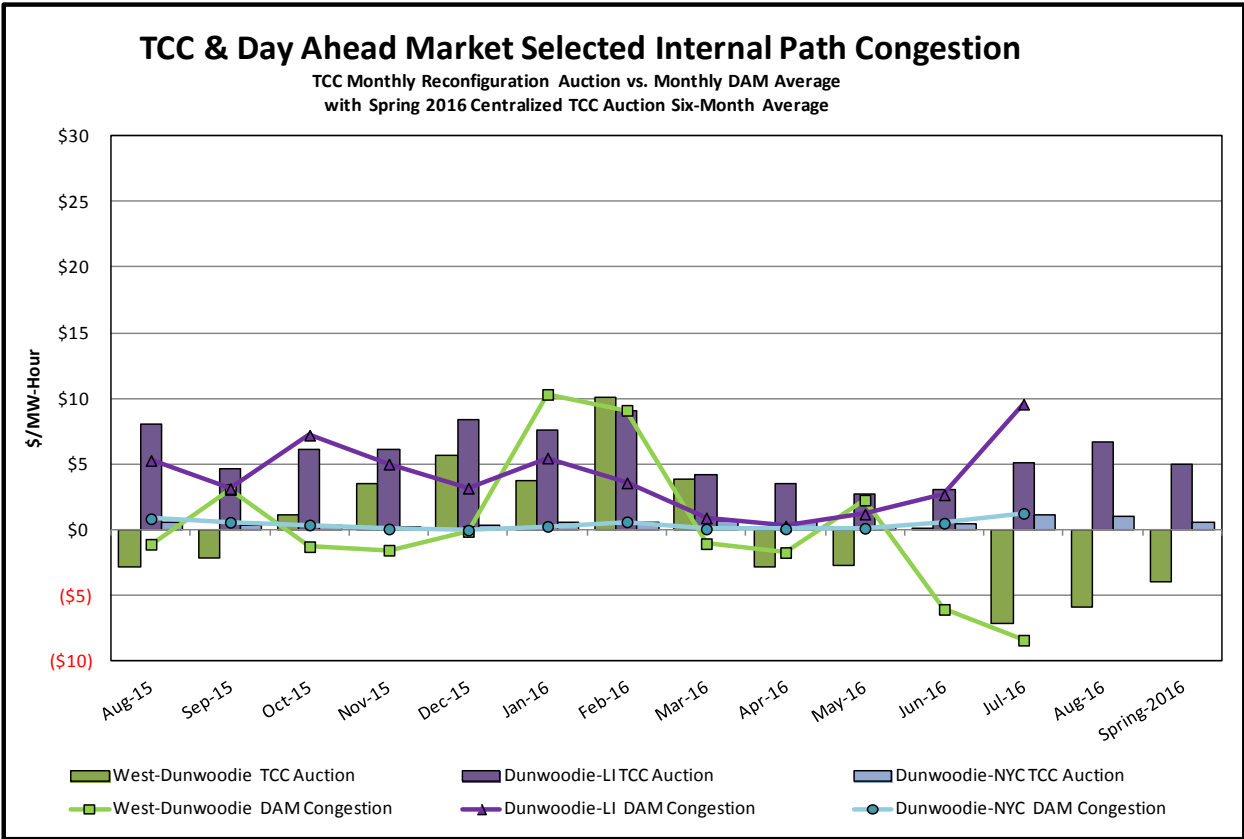
Day-Ahead Market Congestion Residual Categories

<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 2016 Centralized TCC Auction Six-Month Average

