

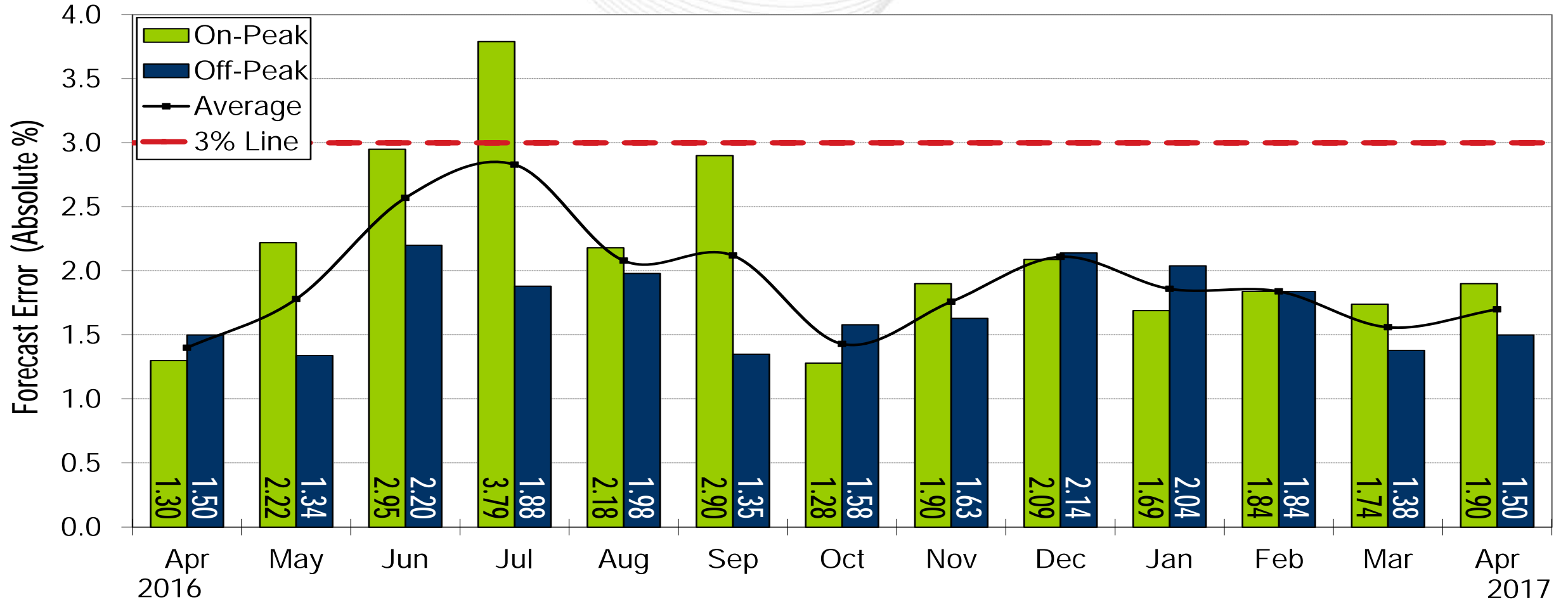


Operations Report

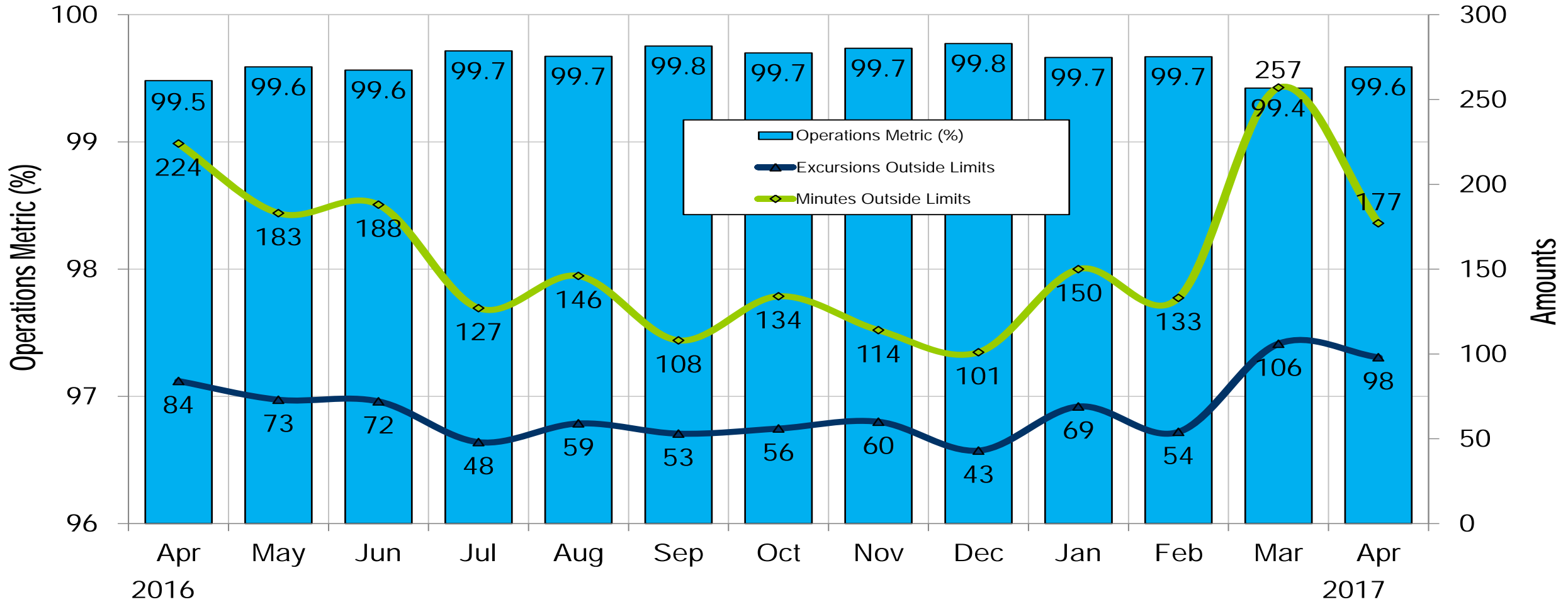


Kenneth Seiler
Executive Director, System Operations
Member Committee
May 17, 2017

Load Forecasting Error (Achieved 80% of the Time)



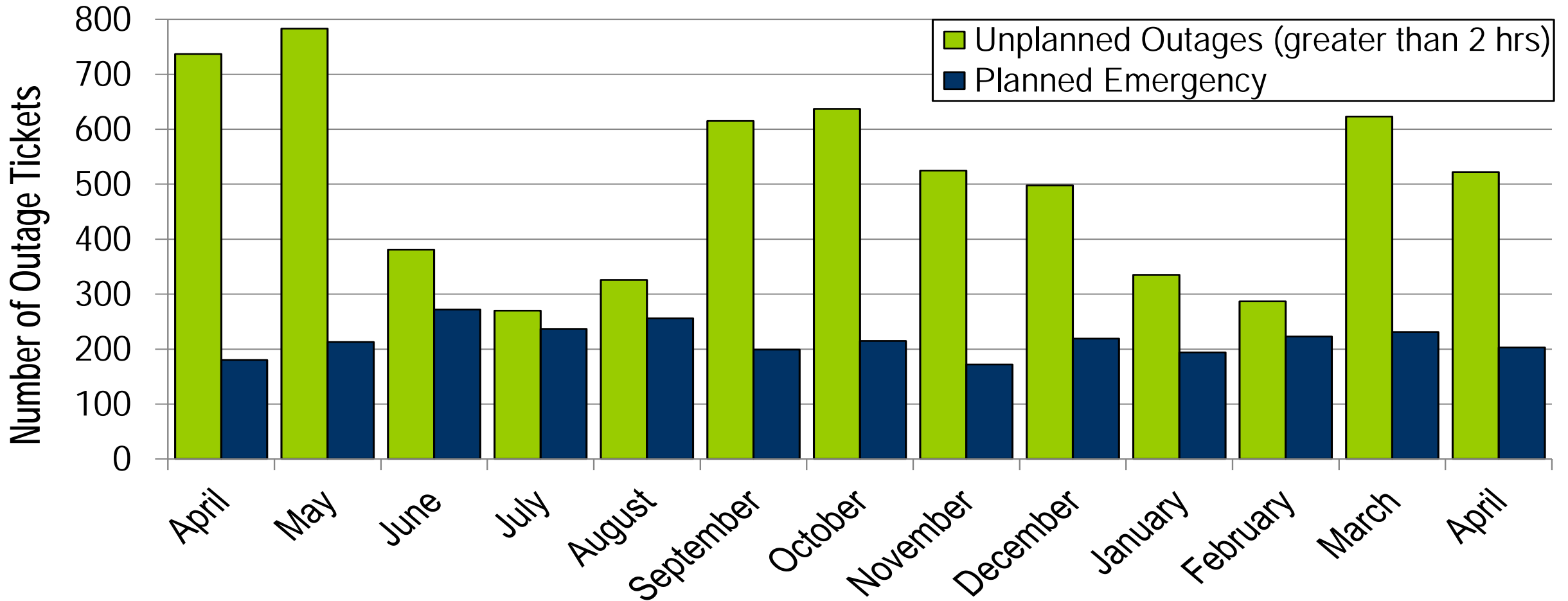
Average RTO load forecast error performance for April was 1.70%, within the goal of 3%.



PJM's BAAL performance has exceeded the goal of 99% for each month in 2017.

- One spinning event in the month of April
- One reserve sharing event with NPCC
- The following Emergency Procedures occurred in April:
 - 30 Post-Contingency Local Load Relief Warnings (PCLLRW)
 - 8 High System Voltage
 - 1 Minimum Generation Alert

2017 Planned Emergency & Unplanned Transmission Outage Summary



Note: "Unplanned Outages" include tripped facilities. One tripping event may involve multiple facilities.

Event	Date	Start Time	End Time	Duration	Region	Tier 1 Estimate (MW)	Tier 1 Response (MW)
1	04/08/2017	11:53	12:03	00:10	RTO	1222.6	827.2

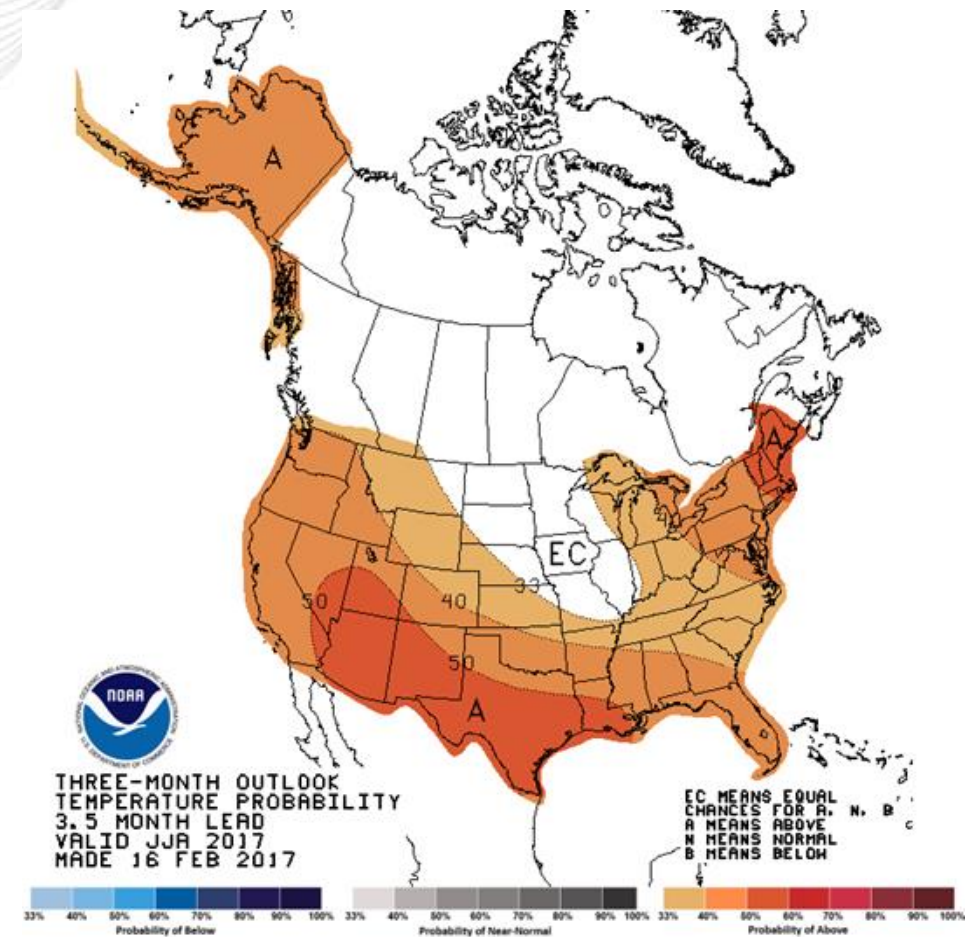
Event	Date	Start Time	End Time	Duration	Region	Tier 2 Assigned (MW)	Tier 2 Response (MW)	Tier 2 Penalty (MW)
1	04/08/2017	11:53	12:03	00:10	RTO	879.3	828.7	50.6

The year-to-date Perfect Dispatch performance score through April 2017 is 74.72%.

The estimated cumulative production cost savings through April 2017 is over \$1.3 billion with over \$46 million in savings in 2017.

- Current forecasts show a higher probability of above average temperatures for the entire RTO this summer.

For the period June – August 2017. Temperature probabilities followed by precipitation.





PJM Load and Capacity Comparison: 2017 vs. 2016

2017

Forecast Load (MW) Total	Demand Response (MW)	Forecast Load Less Demand Response (MW)	Installed Generation Capacity (MW)	Reserve Margin (MW)	Reserve Margin	Required Reserve Margin
152,999 ↑	9,120 ↑	143,879 ↑	* 185,804 ↑	41,925 ↑	29.1% ↑	16.6% ↑

Summer installed capacity estimate as of 3/21/17 since the final installed capacity depends on the commissioning of new generation prior to the summer.*

2016

Forecast Load (MW) Total	Demand Response (MW)	Forecast Load Less Demand Response (MW)	Installed Generation Capacity (MW)	Reserve Margin (MW)	Reserve Margin	Required Reserve Margin
152,131	8,777	143,354	183,912	40,558	28.3%	16.4%

Summer Seasonal Study Base Case

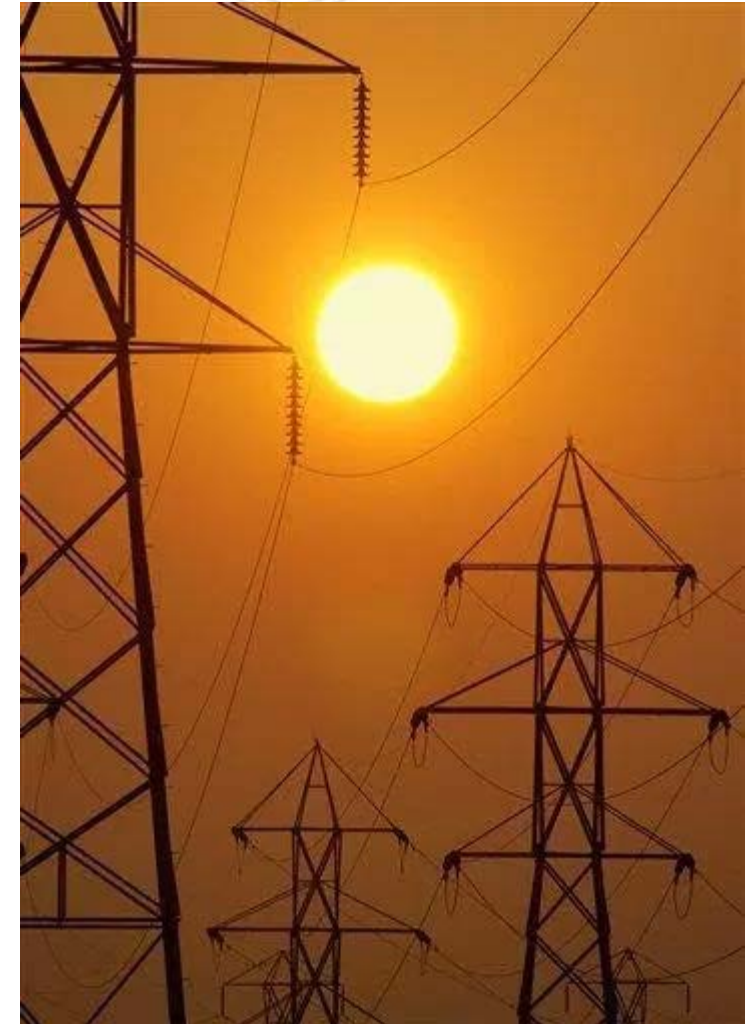
LAS Load Forecast	158,818 MW
RTO Net Interchange	5,407 MW* (Importing)
PJM RTO Installed Capacity	185,804**
Discrete Generator Outages	14,113 MW

* 5407 MW of net interchange is included in the total RTO installed capacity as pseudo-ties/dynamic schedules.

** Summer installed capacity estimate as of 3/21/17

- No reliability issues identified
- Off-cost generation re-dispatch and switching required to control local thermal or voltage violations in some areas
- All networked transmission voltage violations were controlled by capacitors. All other voltage violations were caused by radial load.

- Perform a Summer Seasonal Assessment
- Run emergency drills to ensure readiness
- System Operator Training
- Assess the weather outlook daily
- Review projected load and capacity daily
- Coordinate with neighboring grid operators to discuss the season



Appendix

Goal Measurement: Balancing Authority ACE Limit (BAAL)

- The purpose of the new BAAL standard is to maintain interconnection frequency within a predefined frequency profile under all conditions (normal and abnormal), to prevent frequency-related instability, unplanned tripping of load or generation, or uncontrolled separation or cascading outages that adversely impact the reliability of the interconnection. NERC requires each balancing authority demonstrate real-time monitoring of ACE and interconnection frequency against associated limits and shall balance its resources and demands in real time so that its ACE does not exceed the BAAL (BAALLOW or BAALHIGH) for a continuous time period greater than 30 minutes for each event.
- PJM directly measures the total number of BAAL excursions in minutes compared to the total number of minutes within a month. PJM has set a target value for this performance goal at 99% on a daily and monthly basis. In addition, current NERC rules limit the recovery period to no more than 30 minutes for a single event.

Perfect Dispatch refers to the hypothetical least production cost commitment and Dispatch, achievable only if all system conditions (load forecast, unit availability / performance, interchange, transmission outages, etc.) were known and controllable in advance. While being hypothetical and not achievable in reality, this is useful as a baseline for performance measurement.

The Perfect Dispatch performance goal is designed to measure how well PJM commits combustion turbines (CTs) in real time operations compared to a calculated optimal CT commitment profile.

The Perfect Dispatch performance measure is calculated as $100\% \times (\text{The accumulative year-to-date optimal CT production cost in Perfect Dispatch} / \text{The accumulative year-to-date actual real-time CT production cost})$.

The Perfect Dispatch performance goal was removed as a goal beginning in 2015. Currently Perfect Dispatch does not have a performance goal, but the metric will continue to be tracked.

The cumulative Estimated Production Cost Savings helps to demonstrate the savings that result from PJM's process changes since the inception of the Perfect Dispatch analysis in 2008. This estimate is determined by comparing the Perfect Dispatch performance for all resources to benchmarks set at the beginning of the Perfect Dispatch analysis. A benchmark of 98.18% is used for comparison of the 2017 metric which is 99.42% through the end of April.