

UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

Reliability Technical Conference
North American Electric Reliability
Corporation

Docket No. AD13-6-000

North American Electric Reliability
Corporation

Docket No. RC11-6-004

Docket No. RR13-2-000

STATEMENT OF DAVID SOUDER ON BEHALF OF PJM INTERCONNECTION, L.L.C.

On behalf of PJM Interconnection, L.L.C. (“PJM”), I am pleased to report to the Commission on PJM’s view on issues concerning the impact of EPA rules and changes in the resource mix assigned to Panel IV of the Commission’s July 9, 2013 Reliability Technical Conference.

I am David Souder and serve as PJM’s Director of Operations Planning in PJM’s Operations Support Department. In my current role, one of my responsibilities is to ensure the reliable and efficient coordination of transmission and generation outages. I have been with PJM in the operations area since 1991 and have almost 22 years of experience within operations. As a PJM Shift Supervisor and Chief System Operator within the PJM Dispatch Department, which is responsible for real-time operations, I maintained NERC Reliability Coordinator Operator Certification and PJM Transmission and Generation Certifications. I hold a BSEE from Drexel University as well as an MBA from Villanova University. I will respond to each of the Commission’s questions as listed in its June 19 notice with a specific focus on PJM’s actions in response to the various trends and events associated with EPA rules and generator retirements referenced in the questions for Panel IV.

Question a: *What approaches are being taken by the industry, ISOs, and other system planners to address the continued changes in projected resource mix resulting from Environmental Protection Agency rules and, among other things, recent trends in natural gas prices? How are regulators, system planners, and industry participants identifying and responding to potential changes in the generation resource mix or in capacity reserve levels due to retirement of aging or other non-economically viable plants? Which regions are expected to be most affected by retirement of coal plants or other changes in resource mix, and how are those regions responding? How are regions accommodating outages necessitated by generator retrofits?*

Answer a:

In 2011, PJM staff evaluated the impact of various Environmental Protection Agency rules (including the proposed Mercury & Air Toxics Standard (MATS) rule and the Cross-State Air

Pollution Rule) on PJM RTO capacity. Through that early analysis, PJM identified approximately 25,000 MW of capacity that was at risk of retiring.

To put this number in perspective, for the nine years ending with 2011 inclusive, PJM received and processed deactivation requests for 12,100 MW. More recently however, PJM studied an unprecedented 104 deactivation requests totaling 13,868.4 MW between November 1, 2011 and December 31, 2012 alone for deactivation between May 2012 and the end of 2015.

Currently, PJM staff continues to track 11,108 MW (in addition to 5,311 MW that have already retired since announcing the MATS rule proposal) of retirements and an additional 29,451 MW of retrofits with planned outages in the PJM eDART tool. PJM staff continues to work with asset owners of an additional 3,212 MW of generation that has not committed to either retiring or retrofitting, 727 MW Active RMR units, as well as 8,419 MW of generation, which have received an extension under the "Reliability Safety Valve" protocols that PJM and other RTOs negotiated with US EPA and which states have granted pursuant to their authority under the Clean Air Act. Attachment 1 provides a snapshot of projected impacts of Environmental Protection Agency rules on PJM capacity resources.

PJM's Organizational Approach to the EPA Rules - To address the increase in generator retirements, PJM management developed a cross-divisional team composed of PJM Operations, Markets, and Planning staff to begin to quantify and track the on-going impact to PJM RTO Operations. Beginning March 2012, the cross-divisional team held bi-weekly meetings to:

- Discuss changes to and the impact of Environmental Protection Agency rules.
- Develop a process to track identified "at risk" generation and expedite the submittal of eDart generation outage tickets (retire, retrofit, and regular maintenance), including:
 - Outreach program to work with Generation Owners to commit to generator retrofit plans.
 - Review status of generator retrofit outages needed for compliance with the regulations.
- Review latest capacity adequacy projections to include generation retirements, planned outages (retrofit and maintenance) as well as expected queue generation.
- Develop a process to have Transmission Owners expedite the submittal of eDART transmission outage tickets associated with RTEP upgrades.
- Discuss detailed analysis of generator deactivations and associated RTEP upgrades.
- Determine if transmission or generation outages need to be rescheduled or if a generator's retirement date or retrofit outages must be extended via a "Reliability Must Run" contract or the "Reliability Safety Valve" option until Regional Transmission Expansion Planning (RTEP) upgrades are in-service, respectively.
- Analyze the impact on ancillary market services such as spinning reserve, regulation and black start.

The cross-divisional team began a successful “out-reach” program. PJM staff is in direct communications with asset owners via one-on-one conversations. In addition, PJM staff has conducted broader communications through various PJM Committee and Subcommittees. PJM staff continues to work with asset owners to provide updated generator retirement and retrofit information within the PJM eDart tool, which is also the tool used to grant generator outages (maintenance, planned and forced) and track reserve margins. The PJM Operational Assessment Process is summarized in the Attachment 2. Finally, PJM has participated in scheduled calls with federal agencies such as US EPA, FERC, and DOE.

Foundational PJM Market and Planning Tools to Address Generator Retirements - PJM approached the challenge by building on various tools and market infrastructure already in place. In short and as described below, PJM utilized two foundational structures to anticipate and plan for this level of generator retirements:

- **Capacity Market Design:** PJM’s forward capacity market which requires generators to commit three years forward to bidding in or notifying PJM of their intent to retire and therefore be excused from participating in PJM’s forward capacity procurement; and
- **Planning and Outage Coordination Tools:** PJM’s ability to direct transmission upgrades to address reliability and our ability to approve transmission and generation outages in order to accommodate retrofits of existing generators with new environmental controls.

PJM also worked with its fellow RTO members and US EPA to add an additional tool to the toolbox in the form of the “Reliability Safety Valve” proposal which would allow for extensions of compliance deadlines under the Mercury and Air Toxics rule to address specific and targeted reliability challenges. EPA incorporated that proposal into its Final Rule and we are grateful for their openness to working with us in that regard.

Additionally, PJM continues to meet with state utility commissions, energy, and environmental agencies to further the understanding of the impacts of environmental rules on the grid and the potential requirements to maintain grid reliability.

Integrating PJM’s Planning Process to Respond to Generator Deactivations - PJM’s 2012 RTEP Process Baseline deactivation analysis identified reliability criteria violations driving the need for transmission upgrade solutions in many transmission zones. These analyses identified the need for more than 130 upgrades comprising a range of solutions: line terminal equipment upgrades, new substations and substation additions to reinforce underlying systems, existing line rebuilds to achieve higher line ratings as well as new transmission lines. In addition, deactivation studies identified the need for many previously identified RTEP baseline projects to be completed earlier. The total increase to the RTEP to include these baseline project changes has amounted to \$2.385 billion to address the 104 deactivation requests.

PJM staff continues to track projected capacity and reserves. PJM periodically communicates projections via the PJM Committee structure, alerting members of potential periods where reserve margins are tight, in an effort to communicate potential windows of opportunities when

there are sufficient reserves to permit generator outages (environmental retrofit and normal maintenance outages). A chart depicting 2015 reserve projections is shown in Attachment 3. PJM typically shares similar projections for the years 2013 through 2016.

Capacity Market Design and Its Impact on Ensuring Capacity Adequacy - PJM's capacity market, the Reliability Pricing Model (RPM), helps to ensure adequate supply of resources to serve forecast peak load plus an installed reserve margin. The PJM Reliability Pricing Model (RPM) has secured sufficient replacement capacity. The RPM 2016/2017 Base Residual Auction (2013 Auction) continued to function as designed, securing the capacity necessary to maintain reliability in the PJM region at competitive prices. The auction procured 169,160 megawatts of capacity resources sufficient to maintain a 21.1% installed reserve margin, 5.5% more than the target installed reserve margin, at prices well below the Net Cost of New Entry (CONE). Attachment 4 illustrates the effectiveness of the RPM Base Residual Auction in procuring over 10,000 MW of replacement capacity over the last two years as well as significant levels of Demand Response and Energy Efficiency resources.

Approximately 10,000 MW of existing coal generation did not clear the RPM 2016/2017 Base Residual Auction due to increasing costs related to environmental retrofits or other needed investments and lower net revenues to cover those increasing costs resulting in higher seller offers. However, the RPM results also demonstrated that new EPA-compliant technologies as well as demand response and energy efficiency resources have come forward as a substitute for that capacity. In that sense, RPM was "stress tested" and passed the test well. Specifically, the PJM region has seen a rapid turnover of a large portion of the generation fleet in an unprecedented short period. RPM has provided the means for PJM to ensure that new resource investments are attracted to the region and has allowed this turnover to occur at very low prices to consumers.

Fuel Diversity - Cleared and committed natural gas resources now exceed coal-fired resources by more than 15,000 MW. Attachment 5 illustrates the level of fuel diversity within the PJM RTO. The EPA rules have reinforced the continuing trend of a shift in generation from coal to natural gas. Despite this shift, to date PJM Operations has not encountered reliability issues resulting from an increase in natural gas capacity. Nevertheless, we are not being complacent about the need to focus on gas-electric coordination issues. As illustrated in Attachment 5, the capacity market, for the first time, beginning in the 2015/16 auction, cleared more gas resources than coal resources. This is a significant change in the make-up of the generation fleet going forward.

Our geographic location, due to the abundance of Marcellus and Utica shale as well as the great number of gas pipelines serving our region help to differentiate our region from those more heavily impacted by limited pipeline options. Nevertheless, as reported to FERC Staff, PJM is actively looking forward through its stakeholder process to enhance its tools for modeling contingencies caused by this increased dependence on natural gas. Moreover, PJM is the lead Principle Investigator working with the Department of Energy to study gas infrastructure in the MISO, PJM,

Ontario, New York, TVA and New England regions as the next phase of the Eastern Interconnection Planning Collaborative project.

Question b: *What is the status of implementation (in the Western Electricity Coordinating Council Region and in the other regions) of the recommendations made or lessons learned in the September 8, 2011 Southwest blackout and from the February 2011 cold weather outages? The purpose of this panel is not to discuss any ongoing investigation but to address what steps are being taken to ensure that the lessons learned are being implemented and are not lost over time. Also, what have been the primary obstacles in implementing the changes recommended in the NERC/FERC blackout reports issued in response to these outages?*

Answer b: September 8, 2011 Southwest Outage

In response to the September 8, 2011 Southwest Outage, PJM established an internal working group that performed an in-depth review of the event report. PJM worked closely with its members to take advantage of recommendations and lessons learned to improve PJM operations.

PJM assembled action plans for each of the 27 recommendations that spanned Operations and Planning functions and established the following timeline:

May 2012 – PJM conducted an internal review

June 2012 – Coordinated with members, neighbors and regional reliability entities to develop recommendation action plans

July 2012 – Review findings and begin to implement recommendations

December 2012 – Completed vast majority of action plans for each of the recommendations

Summary of Actions Taken:

In response to the Southwest Outage and resulting FERC/NERC analyses, PJM and its members conducted reviews and refined where necessary operating manuals and procedures to enhance clarity such as PJM's practice for pre-contingency measures to limit the need for post- contingency action; reviewed external coordination processes and procedures; revised SOL definition from 230 kV to all BES and any reliability and markets facilities; and reviewed and added clarity where necessary to the relay coordination processes.

Answer b: February 2011 cold weather outages

In response to the February 2011 cold weather outages, PJM established an internal working group that performed an in-depth review of the event report and compared the recommendations to the current Cold Weather processes that were developed based on 1994 PJM Cold Weather Event. PJM worked closely with its members to take advantage of recommendations and lessons learned to improve PJM operations.

PJM and its members performed a detailed review based on the following timeline:

August/September 2011 – PJM conducted an internal review.

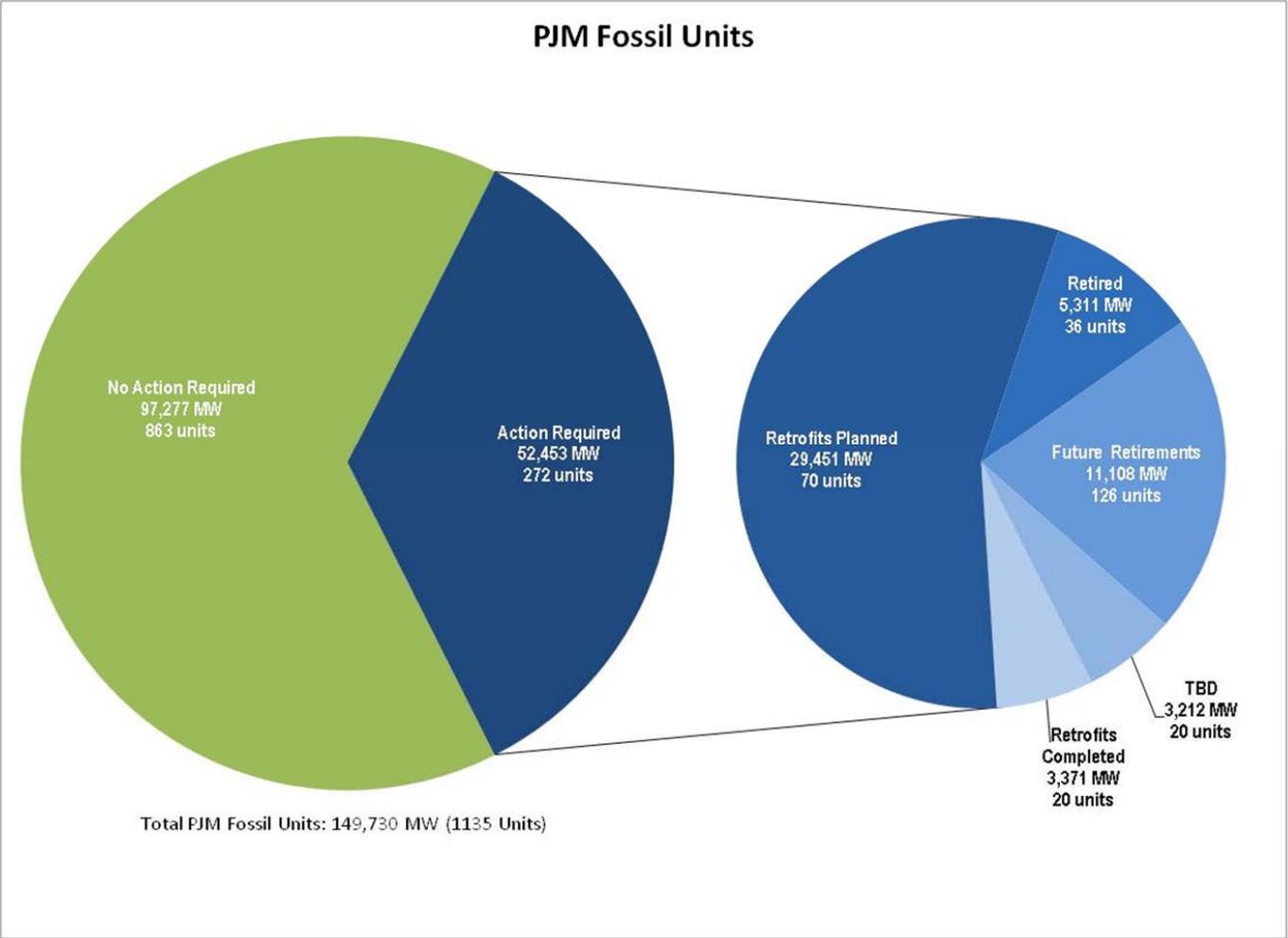
September through November 2011 – PJM coordinated with members to review recommendations and develop appropriate action plans.

December 2011 through March 2012 – PJM and members complete action plans.

Summary of Actions Taken:

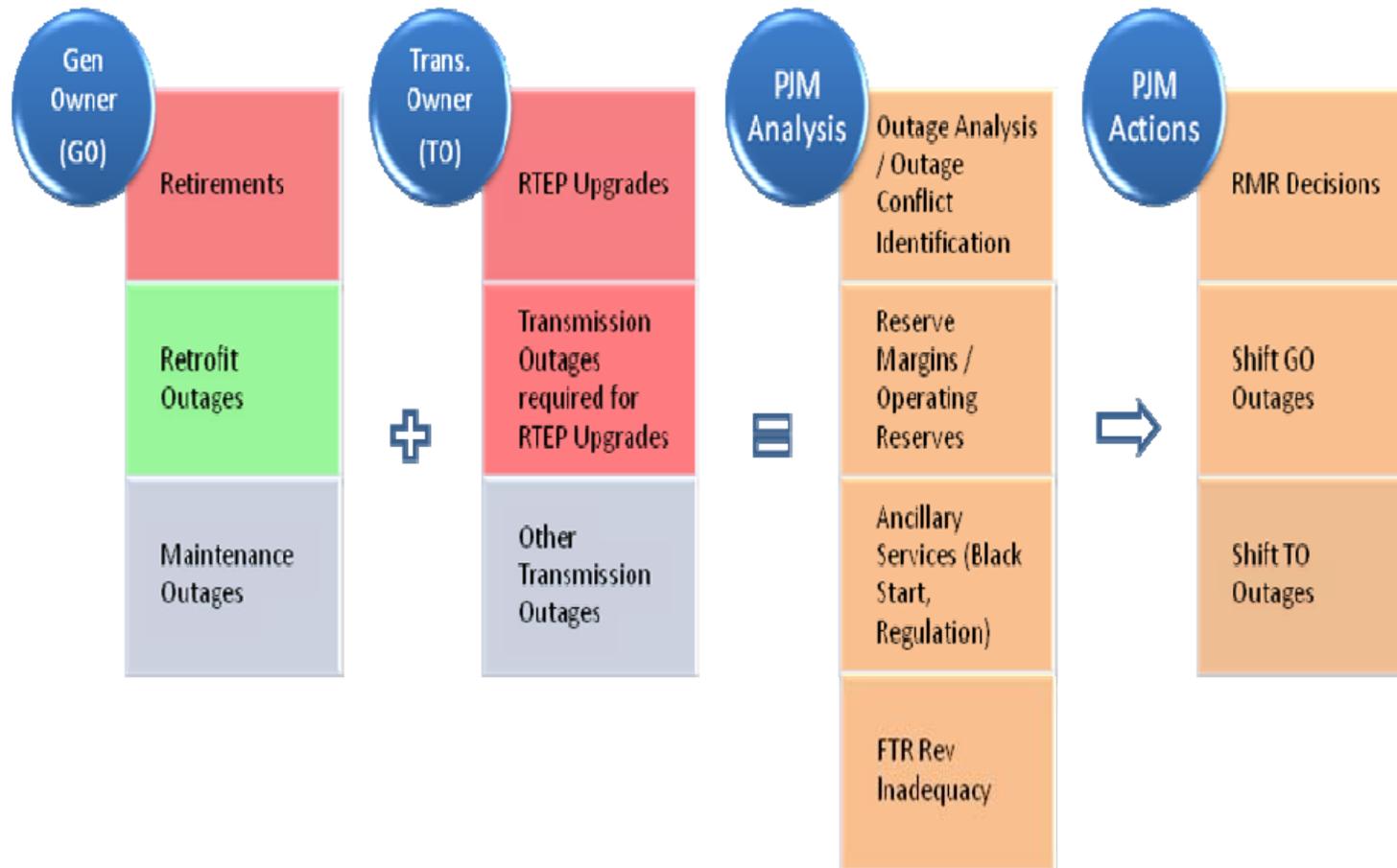
In response to the Cold Weather Outage and resulting FERC/NERC analyses, PJM and its members conducted reviews and refined where necessary operating manuals and procedures focused on recommendations related to communications, load management, critical load on under-frequency or manual load shed feeders, generator performance in cold weather, and generator fuel switch capability.

Fossil Resources affected by Environmental Regulations



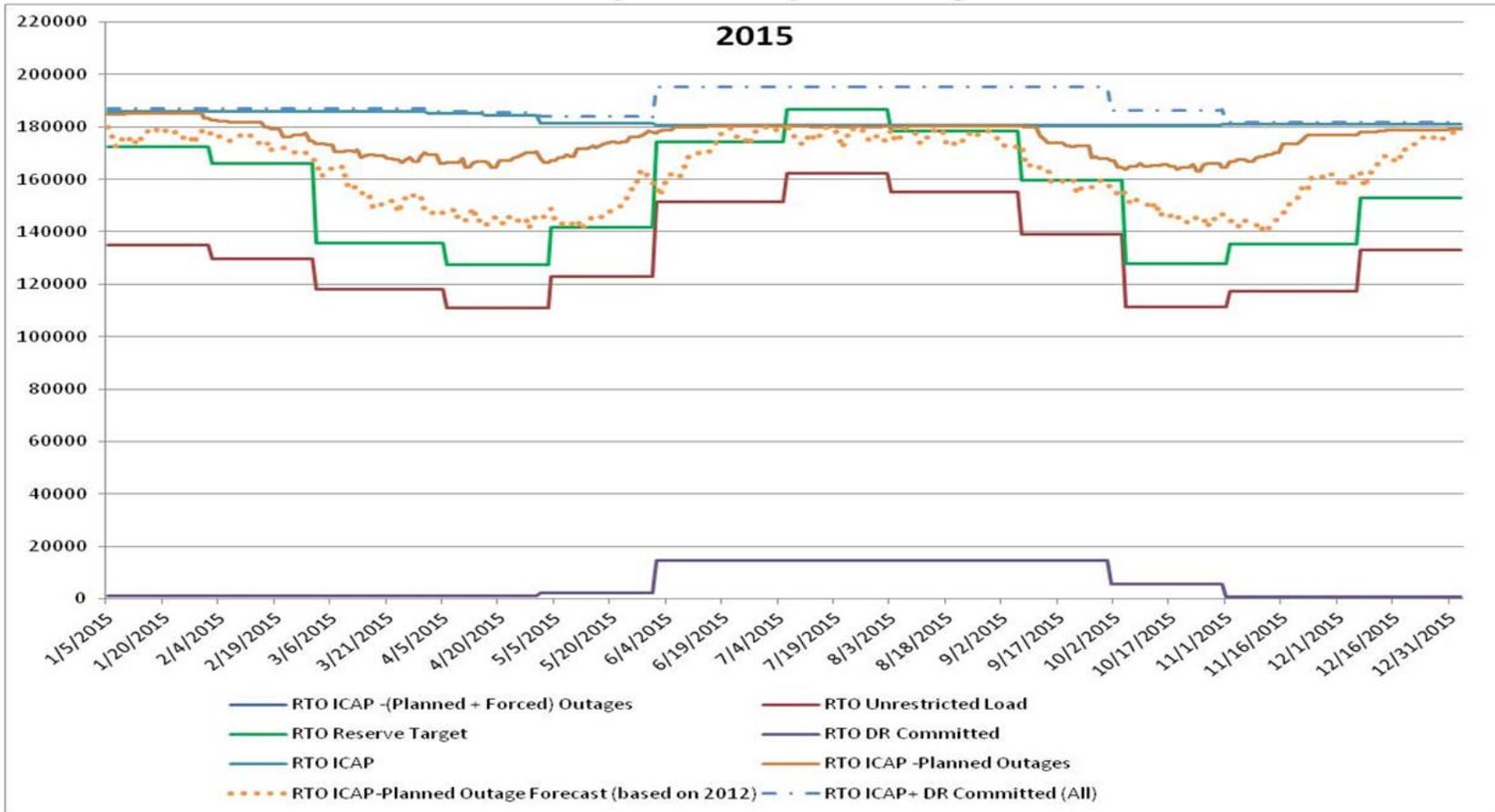
Attachment 1

PJM Operational Assessments Process



Attachment 2

Generation Capacity Projection - RTO



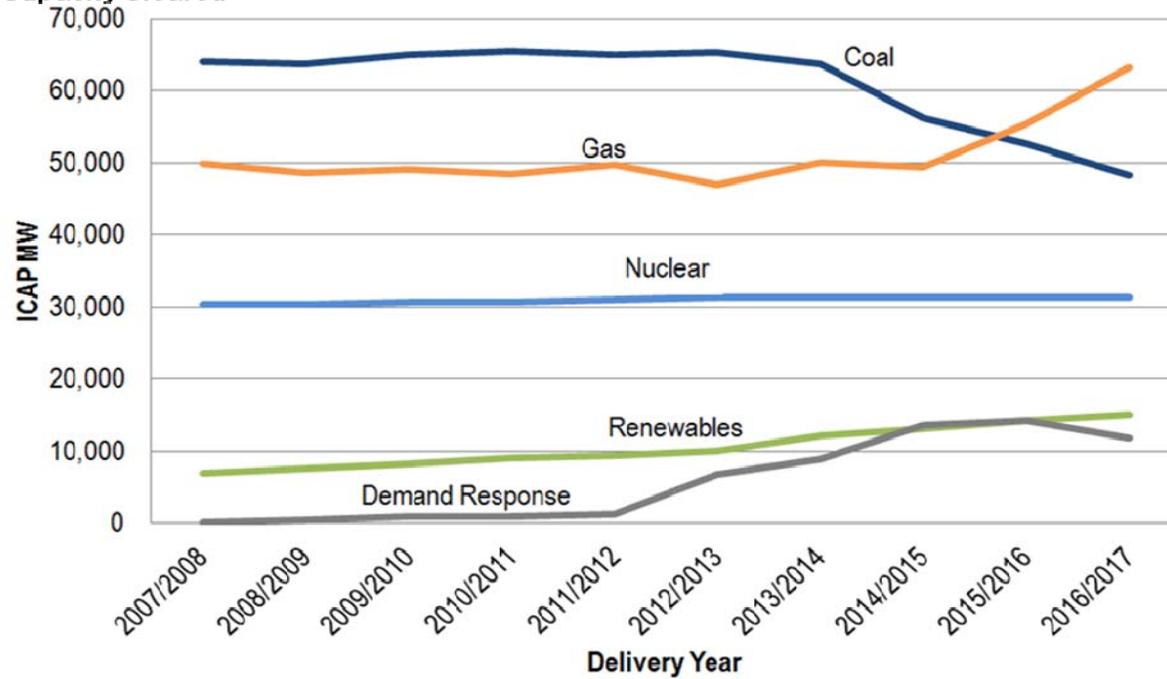
Attachment 3

Megawatts of New Capacity Procured by Type

	New Generation	Generation Upgrades	Demand Response	Energy Efficiency
2013 Auction	4,281.6	1,181.3	12,408.1	1,117.3
2012 Auction	4,914.3	120.5	14,832.8	922.5

Attachment 4

PJM Installed Capacity Cleared



Attachment 5