

Agenda

**MARKET MONITORING UNIT ADVISORY COMMITTEE
LOCATION: CONFERENCE AND TRAINING CENTER,
PJM INTERCONNECTION, L.L.C.**

DATE: FRIDAY, DECEMBER 4, 2020, 12:00 PM – 4:00 PM

1. OVERVIEW (1:00–1:10)

Joe Bowring will provide an overview of the IMM's activities in 2020.

2. MANUAL 15 OVERVIEW (1:10–1:20)

Joel Romero Luna will review Manual 15 (cost development) issues.

3. MBR FILINGS (1:20–1:50)

Catherine Tyler will discuss the IMM's interventions in filings for market based (MBR) rates authorization in PJM.

4. WEATHER NORMALIZED LOAD (1:50–2:10)

Jane Wei will discuss calculations of weather normalized PJM load.

5. IMM ARR/FTR PROPOSAL (2:10-2:35)

Howard will discuss an IMM proposal concerning the ARR/FTR rules.

6. EFFECTIVE LOAD CARRYING CAPABILITY (ELCC): CAPACITY MARKET DESIGN ISSUES (2:35–3:00)

John Hyatt will discuss issues concerning ELCC.

7. ELIGIBILITY FOR COLLECTING REACTIVE CAPABILITY RATES (3:00–3:25)

Jeff Mayes will discuss eligibility for collecting reactive capability rates under Schedule 2 of the PJM OATT, including the requirement that a unit by located on the PJM Transmission System.

8. REQUEST FOR SERVICE (3:25–3:35)

Jeff Mayes will discuss the need for the Market Monitor to receive service of regulatory filings in new matters that implicate PJM market design, market rules and market power, and a formal request to PJM Members that it intends to issue requesting such service.

9. REQUEST FOR STAKEHOLDER FEEDBACK (3:35–4:00)

Joe Bowring will solicit and respond to questions and comments from stakeholders concerning the IMM's implementation of the PJM Market Monitoring Plan.

Manual 15 (Cost Development Guidelines)

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Joel Romero Luna



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Manual 15

- **Manual 15 is supposed to be the document that contains the details of the methods for developing costs-based offers in PJM.**
- **Manual 15 falls short of its goal.**
- **Many sections of the manual are left open to interpretation.**
- **In many cases, the methods used by generators are documented in fuel cost policies.**

Manual 15

- **The current version of Manual 15 should be discontinued and replaced with a straight forward document that details all the methods that a generator can use to calculate cost-based offers.**



Examples of Issues

- **Combined cycle heat input curve.**
- **Combined cycle start cost net gen offset.**
- **Aggregated units modeling.**
- **Incremental offer curve calculation.**
- **No load cost calculation.**
- **Sloped vs. stepped.**
- **Station service / start heat assumptions.**

MMU Cost Offer Technical Guide

- The MMU drafted a cost-based offer technical guide to document the equations that Manual 15 is lacking.
- The purpose of the guide is to:
 - Clarify existing Manual 15 (PJM Cost Development Guideline) language.
 - Provide clear equations for the calculation of accurate cost-based offers.
 - Include detailed, easy to follow examples.
 - Help prevent mistakes in submitting offers for thermal units.
- http://www.monitoringanalytics.com/reports/Technical_References/docs/MM_Cost_Based_Offer_Technical_Guide_20200716.pdf

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IMM MBR Challenges

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Catherine Tyler



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Market-based Rates

- **All PJM market sellers must have FERC approval to sell at market-based rates, instead of cost-based rates. MBR authority is reviewed every three years.**
- **Sellers rely on PJM market power mitigation as the sole justification for market-based rates.**
- **The MBR process allows for challenges to the assumption that PJM's market power mitigation is sufficient to prevent exercises of market power.**
- **The IMM has shown that exercises of market power are possible in PJM.**
- **The IMM has challenged sellers' MBRs.**

IMM MBR Challenges

- **21 Interventions**
 - **15 Triennial Review for Non-Transmission Owners**
 - **6 New Units**
- **10 Responses to Answers**



Order 861 at P21

- **“Public Citizen is mistaken in its view that challengers to a market-based rate filing would have to lodge their objections with the relevant RTO/ISO tariff in a different proceeding.³⁷ Any objections to a Seller’s market-based rate authority can and should occur as a direct response to an initial application, a change in status filing, a triennial update, or in a proceeding instituted under FPA section 206.³⁸”**

Order 861 at P22

- **“For example, PJM IMM notes that its quarterly State of the Market reports contain a comprehensive listing of market power concerns.³⁹ Anyone may use this information in support of a challenge to a Seller’s market-based rate authority.”**

Unaddressed Market Power Mitigation Issues

- **Capacity Market Seller Offer Cap**
- **Energy market offer capping**
 - **Crossing curves avoid offer capping**
 - **Markup on cost offer avoids parameter mitigation**
- **Real-time values can be used to avoid parameter mitigation.**
- **Fast-start pricing run has no TPS test.**
- **New: PJM should offer cap resources after commitment with online TPS test to ensure resources with market power are mitigated.**

Overstated RPM Offer Cap

LDA	Product Type	Actual Auction Results		Noncompetitive Offers capped at net ACR	
		Clearing Prices (\$ per MW-day)	Cleared UCAP (MW)	Clearing Prices (\$ per MW-day)	Cleared UCAP (MW)
RTO	Annual	\$140.00	162,911.8	\$124.40	163,416.6
	Summer	\$140.00	715.5	\$124.40	715.5
	Winter	\$140.00	715.5	\$124.40	715.5
RTO Total			163,627.3		164,132.1
ATSI	Annual	\$171.33	8,007.3	\$169.65	8,013.1
	Summer	\$171.33	6.3	\$169.65	6.3
	Winter	\$171.33	0.0	\$169.65	0.0
ATSI Total			8,007.3		8,013.1
EMAAC	Annual	\$165.73	29,287.5	\$155.93	29,363.9
	Summer	\$165.73	88.0	\$155.93	87.9
	Winter	\$165.73	1.0	\$155.93	1.0
EMAAC Total			29,288.5		29,364.9
PSEG	Annual	\$204.29	5,366.6	\$204.29	5,366.6
	Summer	\$204.29	9.3	\$204.29	9.3
	Winter	\$204.29	1.0	\$204.29	1.0
PSEG Total			5,367.6		5,367.6
BGE	Annual	\$200.30	1,937.7	\$124.40	2,492.0
	Summer	\$200.30	85.0	\$124.40	84.6
	Winter	\$200.30	0.0	\$124.40	0.0
BGE Total			1,937.7		2,492.0
ComEd	Annual	\$195.55	22,083.6	\$130.04	22,421.0
	Summer	\$195.55	274.5	\$130.04	274.5
	Winter	\$195.55	274.5	\$130.04	274.5
ComEd Total			22,358.1		22,695.5
DEOK	Annual	\$140.00	2,733.3	\$128.47	2,636.3
	Summer	\$140.00	25.4	\$128.47	25.2
	Winter	\$140.00	0.0	\$128.47	0.0
DEOK Total			2,733.3		2,636.3

Unmitigated Real-Time Markups

Markup Category	Not Failing TPS Test	Failing TPS Test	Percent in Category
Negative Markup	32.7%	6.4%	39.1%
Zero Markup	10.8%	3.7%	14.6%
\$0 to \$5	34.6%	5.3%	39.8%
\$5 to \$10	3.9%	0.4%	4.3%
\$10 to \$15	0.6%	0.1%	0.7%
\$15 to \$20	0.3%	0.0%	0.3%
\$20 to \$25	0.5%	0.0%	0.5%
\$25 to \$50	0.4%	0.0%	0.4%
\$50 to \$75	0.1%	0.0%	0.1%
\$75 to \$100	0.0%	0.0%	0.1%
Above \$100	0.1%	0.1%	0.1%
Total Positive Markup	40.3%	6.0%	46.3%
Total	83.8%	16.2%	100.0%

Parameter Mitigation

	Day-ahead Unit Hours	Percent Day- ahead Unit Hours
Day-ahead commitment during hot and cold weather alerts		
Committed on price schedule less flexible than PLS	31,736	28.5%
Committed on price schedule as flexible as PLS	30,101	27.0%
Total committed on price schedule without parameter limits	61,837	55.4%
Committed on cost (cost capped)	3,228	2.9%
Committed on price PLS	46,485	41.7%
Total committed on PLS schedules (cost or price PLS)	49,713	44.6%

	Day-ahead Unit Hours	Percent Day- ahead Unit Hours
Day-ahead commitment for units that failed TPS test		
Committed on price schedule less flexible than cost	26,020	30.6%
Committed on price schedule as flexible as cost	8,220	9.7%
Total committed on price schedule without parameter limits	34,240	40.2%
Committed on cost (cost capped)	49,841	58.6%
Committed on price PLS	1,013	1.2%
Total committed on PLS schedules (cost or price PLS)	50,854	59.8%

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Weather Normalized Load

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Jane Wei

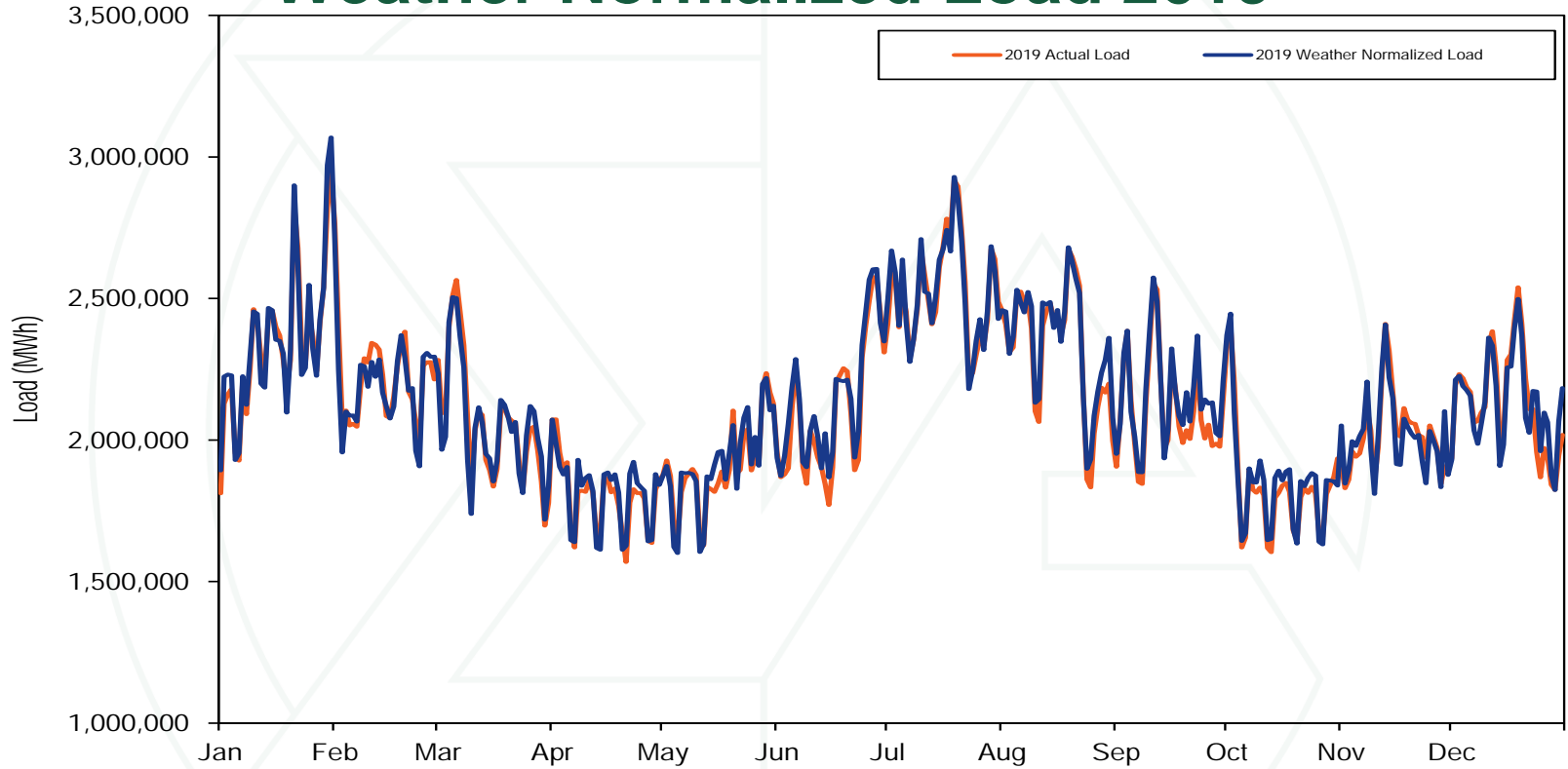


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Weather Normalized Load

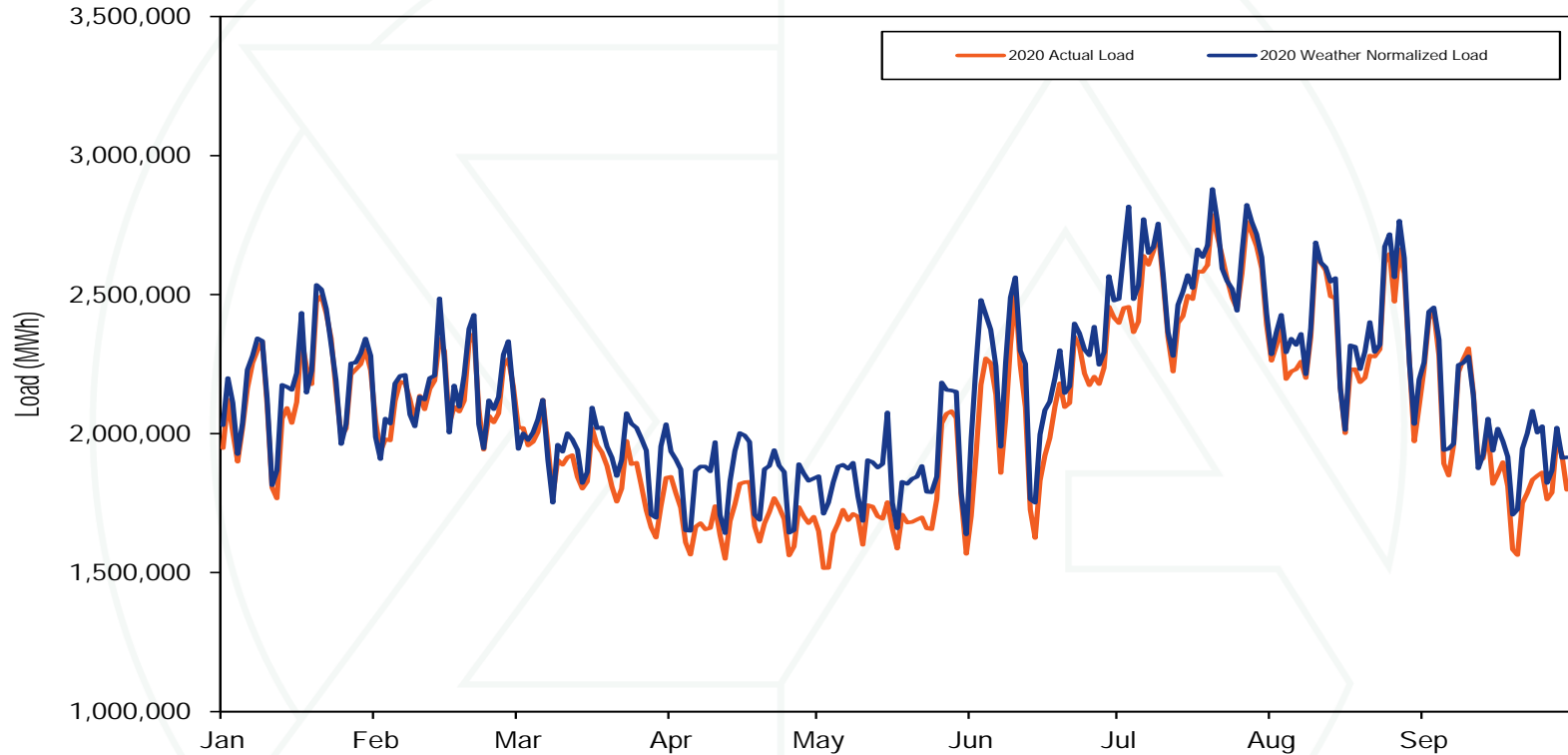
- **PJM real-time load was lower in the first nine months of 2020 than in the first nine months of 2019. This was a result of both weather conditions and COVID-19.**
- **The IMM developed a measure of weather normalized load to help identify the separate impact of COVID-19.**
- **The weather normalized model is based on the historic relationship between PJM daily load, and HDD, CDD, and time of year, for 2015 through 2018. (Heating/cooling degree days.)**

Weather Normalized Load 2019



Actual load was very close to weather normalized load.

Weather Normalized Load 2020



Actual load was significantly lower than weather normalized load from March through May, and in late September.

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Issues with the ARR/FTR Rules

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Howard Haas



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The Current Path Based ARR/FTR is Flawed

- **The current path based ARR/FTR rules are flawed because load cannot recover all of the congestion paid by load either in aggregate or on an individual LSE level.**
- **Congestion is paid by load. Congestion is the difference between load charges and generation credits after all virtual activity is settled.**
- **Congestion results from LMP differences caused by binding transmission constraints.**
- **Congestion is paid on a network, not path basis.**

Load Cannot Claim All Congestion Paid

- **ARR paths from allowable sources to sink do not align with actual network use and/or where congestion is collected.**
- **Even if all available path based ARR rights are self scheduled by load, load cannot claim all congestion.**
- **FTR paths are available that do not align with ARR paths and/or are not sources of congestion collected.**
- **The goal of FTR revenue guarantees under path based system requires PJM to undersell expected system.**
 - **End of year surplus comes from unallocated rights.**
 - **Binary outage modeling contributes to misalignment of available ARR rights relative to actual network use.**

The Current Path Based ARR/FTR is Inefficient

- **Load cannot effectively participate as supply.**
- **No reserve price can be set (not a real market):**
 - No active participant on the supply side
 - FTRs on paths that do not align with ARR rights and/or the actual collection of congestion
- **Surplus auction revenue should never be paid to FTRs.**
- **Available paths do not align with physical network use.**
- **FTR insurance at the expense of ARR holders**
 - Reduced capability available to support FTRs
 - Balancing congestion assigned to load to support FTRs.

Congestion Is a Network Issue

- **Load should have the rights to all congestion load pays, no more no less.**
 - Requires that congestion rights are based on actual network use, not the PJM bill.
 - Constraint specific day ahead and balancing congestion costs paid by each LSE.
- **Load should have the ability to sell its congestion rights.**
 - Load should determine what is sold and the reserve price for the sale.
 - The revenues from the sale should go 100 percent to load.

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ELCC – Capacity Market Design

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John Hyatt



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PJM 205 Filing (ER21-278-000)

- **PJM filed (October 30, 2020) new rules that rely on the Effective Load Carrying Capability (ELCC) method for determining the capacity value for intermittent generators, storage resources and combination resources.**
- **Market Monitor filed comments on November 20, 2020**
 - **PJM's ELCC approach is flawed**
 - **Process was rushed without adequate review**
 - **PJM should include current rules in the RAA**
 - **Additional evaluation is necessary to determine if ELCC would be an improvement over current rules**

ELCC Issues

- **Three basic issues with PJM ELCC approach**
 - **PJM's ELCC approach must assume an ex ante resource mix that is not a function of capacity market clearing.**
 - **PJM's ELCC approach is not adequately grounded on actual data and does not capture the interdependence of different resource types.**
 - **PJM rules include floors for each class of ELCC resource. Floors will be in place for 13 years and floor calculations will rely on 10 year forecasts of the capacity resource mix.**

An Efficient ELCC Approach

- **An efficient ELCC approach requires that capacity values are determined simultaneously with the clearing of the RPM auction.**
- **This approach requires the construction of a multivariable ELCC function or ELCC surface that is used as an input into the capacity market**
 - **ELCC surface will give the ELCC corresponding to different resource capacity mixes**
- **The capacity market clearing will reflect a marginal ELCC approach**

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Eligibility for Collecting Reactive Capability Rates

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Jeffrey Mayes



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OATT Schedule 2

- **PJM procures reactive capability under Schedule 2 to the OATT**
- **PJM procures capability for the Transmission System in its role as the Transmission Provider**
- **PJM is not responsible to procure reactive capability for facilities that it does not manage**
- **In some cases, generators are not required to provide reactive output under their interconnection service agreements**

Reactive Capability Is Local

- **Reactive power is a local service**
- **PJM plans to ensure sufficient reactive capability throughout the system**
- **The contribution from generators is deemed sufficient if all units have a .9 lagging to .95 leading power factor**
- **Separate provisions compensate resources dispatched for reactive output (MVAR)**
- **Pseudo tied units are explicitly excluded from eligibility for compensation under Schedule 2**
- **The issue is pending in Ingenco (ER20-1863) and Whitetail 3 (ER20-1851)**

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Request for Service

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Jeffrey Mayes



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IMM Formal Request for Service

- The IMM intervenes and participates in FERC proceedings about matters including market design, participant behavior, market power, manipulation and compliance.
- PJM receives service from PJM.
- PJM stakeholders may initiate proceedings at FERC that implicates matters within the Market Monitor's purview.
- FERC service rules predate the creation of RTOs/ISOs/MMUs.
- **The IMM formally requests that PJM stakeholders and PJM members provide contemporaneous service for all matters initiated at the FERC or at PJM state PUCs that implicate PJM market design, structure or rules.**

Examples

- Petitions under FPA § 203 for mergers and acquisitions
- Petitions for waiver of PJM rules
- Petitions for a declaratory order
- Complaints under FPA § 206 related to PJM markets or rules
- Requests to resolve issues concerning offers or market participation
- Rates schedules filed under PJM tariff provisions:
 - Reactive capability
 - Black Start Service
 - RMR Service
 - Market based rates schedules

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