

Market Monitoring in PJM

- Describe the need for Market Monitoring
- Describe the Market Monitoring Plan
- Describe the data and activities analyzed by the Market Monitor
- Describe corrective actions available to the Market Monitor
- Present examples of market power mitigation measures within PJM

Need for Market Monitoring

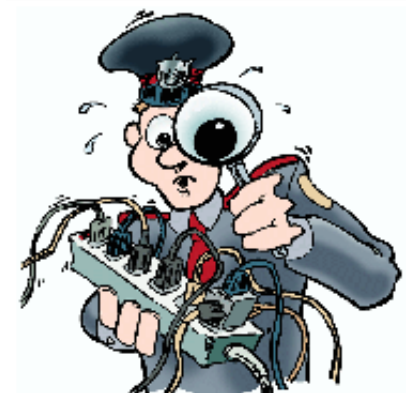
The mission of the Market Monitor is to ensure that PJM's market structure and participant conduct within that structure:

- **Facilitates competition**
- **Limits returns to market power**
- **Provides incentives to competitive behavior**
- **Makes exercise of market power more difficult**
- **Stops exercise of market power** before significant impact



PJM Market Monitoring Goals

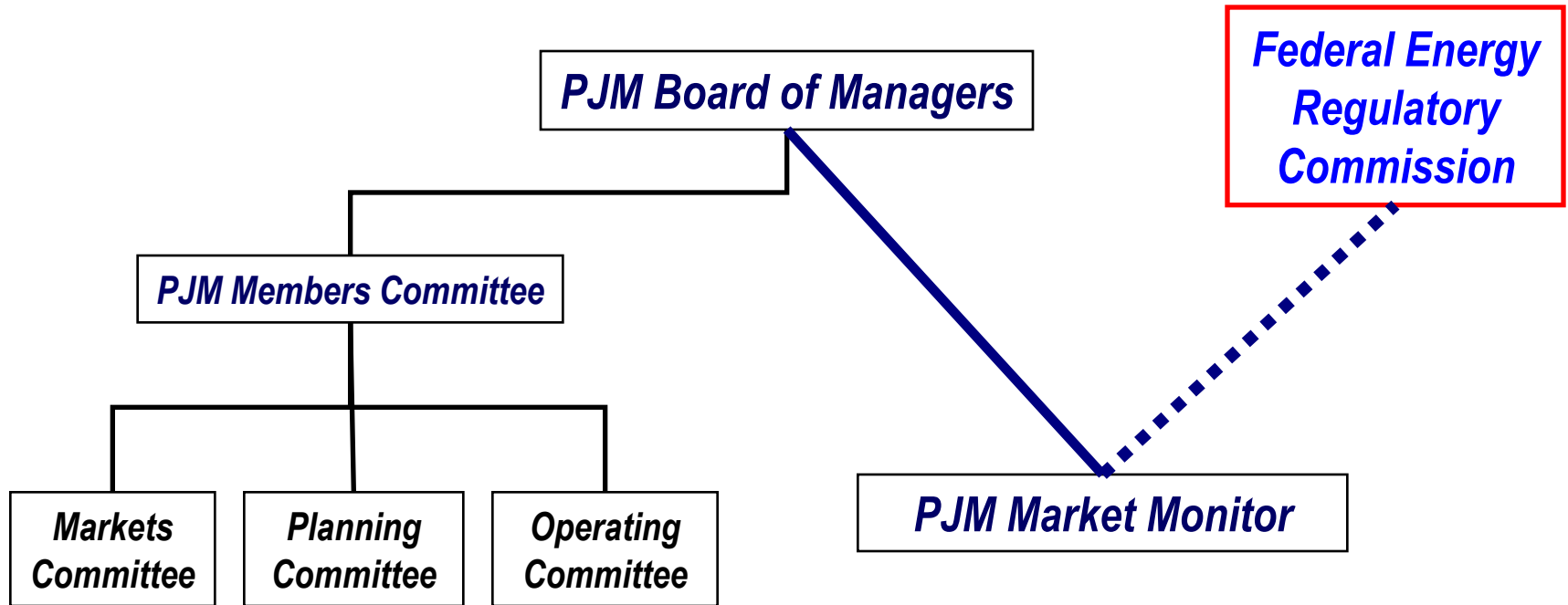
- Promote robust, competitive and non-discriminatory markets.
- Ensure no member or group of members have undue influence over PJM market outcomes
- Ensure that monitoring is conducted in an independent and objective manner.



- Under the PJM tariff, the Market Monitor is an independent, external entity under a FERC approved contract with the PJM board.
- The 6-year market monitoring contract with Monitoring Analytics LLC, an external firm headed by former PJM Market Monitor Dr. Joseph Bowring, began Q208.
- The contract can only be terminated with FERC approval.



Market Monitoring Reporting Structure



- The Market Monitor does not report through the PJM Members Committee but rather directly to the PJM Board and to FERC.
 - Market Monitoring Plan is not subject to modification by PJM members.
 - PJM Market Monitoring Plan: Attachment M of the PJM Tariff

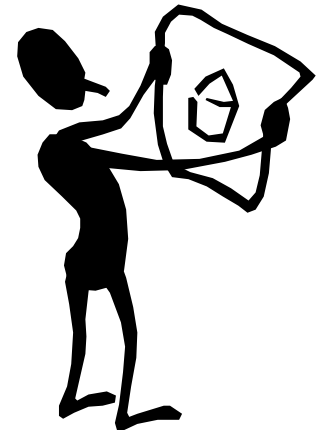
Market Monitoring Plan

- MMU annual budget reviewed by the PJM Finance Committee, the PJM board and representatives of State Commissions. Disputes resolved by the FERC.
- State commissions are able to receive confidential information from PJM or the MMU, subject to certification to the FERC that they have adequate procedures to preserve confidentiality.



Market Monitoring Plan

- Monitor **compliance with rules**, standards, procedures and practices of PJM.
- Identify **actual or potential design flaws** in rules, standards, procedures and practices of PJM.
- Identify **structural problems** in the PJM market that may inhibit a robust and competitive market.
- Evaluate the potential of Market Participants to **exercise undue market power**.
- Access to all **data** collected by PJM.



What is market power?

High prices?
Price greater than cost?
Low prices?



Subtle and complex ways to exercise market power

- Market power is generally not aggregate market issue
- Constrained sub-markets
- Offer parameters
- Retirements/mothballing
- Transmission / ramp hoarding
- FTR – virtual bid interaction



Conditions for Market Power

- Conditions for the exercise of market power:
 - Ownership concentration
 - Inelastic demand
 - Discontinuity in supply curve
 - Constrained sub-markets
 - Transmission / generation outages
 - Exploitable market rules
 - Lack of market transparency
 - Ineffective monitoring



- Approach to market analysis
 - **Structure**
 - Concentration
 - Pivotal suppliers
 - **Conduct/Behavior**
 - Withholding
 - Offer Characteristics
 - **Performance**
 - System markup
 - Net revenue
 - **Definition of the market**
 - Relevant competitors



Market Monitoring Composition

- Diverse staff expertise
 - Economics
 - Engineering
 - Utility
 - Financial Markets
 - Database/IT
 - Legal



Communication is Key

- Interaction with market participants is critical to understanding market participation
- Interaction with State Commissions is critical to understanding retail/wholesale interaction issues
- Interaction with RTO staff is critical to understanding market operation
- Coordination with FERC is essential to efficient monitoring and mitigation



Corrective Actions of the Market Monitor

- **Discussion of issues** with relevant Market Participants; informal resolution of issues.
- **Recommend modifications to rules**, standards, procedures and practices of PJM.
 - **Make recommendations** to PJM Committees or to PJM Board.
 - **Make regulatory filings** to address market issues and seek remedial measures.
- **Evaluate additional enforcement mechanisms.**



Authority of Market Monitor

- No authority to modify prices ex post
- No authority to make ad hoc adjustments in day-to-day market activities
- No authority to require changes in market participant behavior



- Referrals to FERC
- Enforcement
 - FERC has enforcement authority
 - FERC approved tariffs include market rules
 - Violation of RTO market rules
 - Violation of FERC behavioral rules



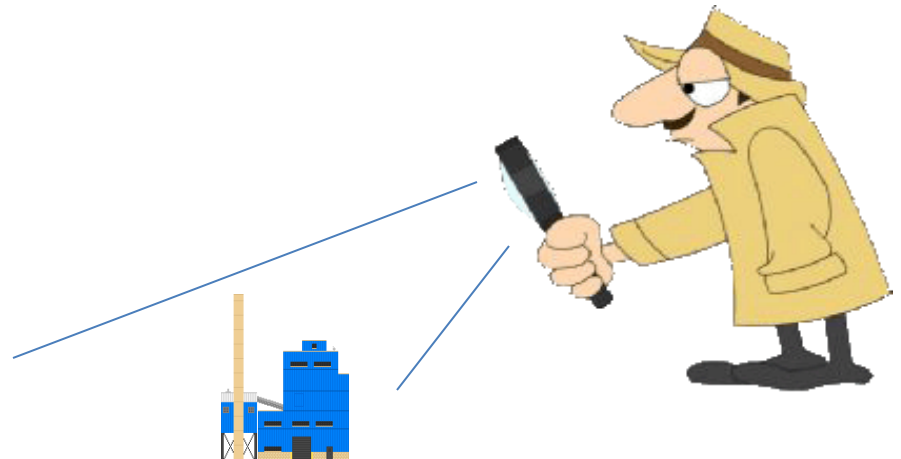
Examples of Market Power Mitigation Measures

- Energy market offer cap = +/- \$1,000/MWh
 - Energy market offer cap includes operating reserve payments
- Start up and no load costs can be modified only biannually
- Only one market-based offer curve per day
 - Hourly price offer changes not permitted
- Structural Market Testing and Mitigation
 - Three-Pivotal Supplier Test
 - Regulation Market
 - RPM



Examples of Market Power Mitigation Measures

- Required submission of cost data by unit
- If maximum economic output specified in day ahead offer is less than in real time, forced outage ticket
- If unit classified as Max Emergency in day ahead and not in real time, forced outage ticket
- Economic considerations in RTEP process

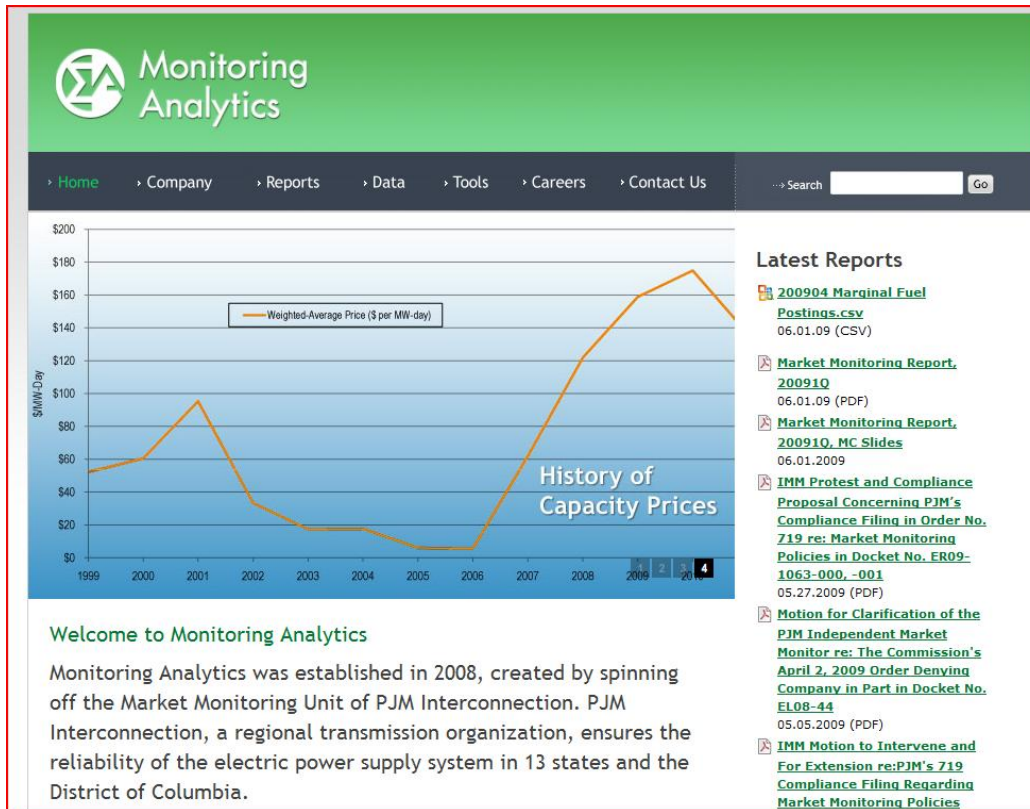


Examples of Market Power Mitigation Measures

- Transmission outage notification requirements and FTR auction
- Required approval of transmission line rating and voltage limit changes
- Required coordination of transmission outages
- Required coordination of generator outages
- FTR forfeiture rules
- Demand elasticity initiatives
 - Demand Side Response Working Group



State of the Market Report

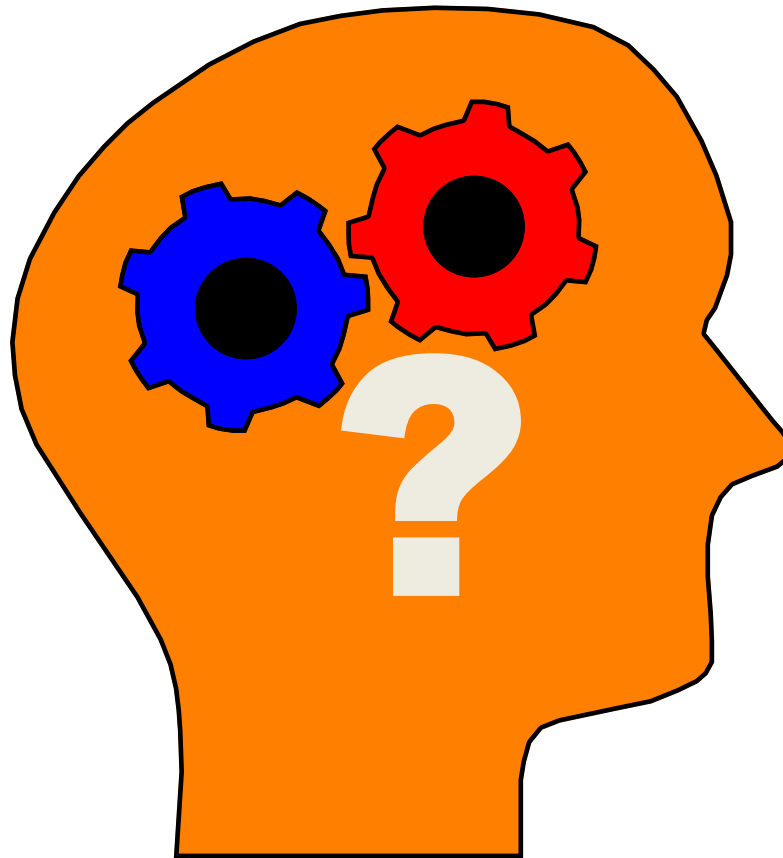


<http://www.monitoringanalytics.com/home/index.shtml>

- **Market Monitor's annual assessment of the competitiveness of the PJM markets**
- **Analyzes market structure, participant behavior, market performance**
- **Provides details, charts, and graphs of various market activities and prices**

- Market Monitor Role
 - Monitor and report on issues relating to operation of PJM markets
 - Evaluate the operation of markets to detect design flaws or structural problems
 - Recommend enforcement actions to regulators
 - Ensure that the monitoring program will be conducted in an independent and objective manner





Disclaimer:

PJM has made all efforts possible to accurately document all information in this presentation. The information seen here does not supersede the PJM Operating Agreement or the PJM Tariff both of which can be found by accessing:

<http://www.pjm.com/documents/agreements/pjm-agreements.aspx>

For additional detailed information on any of the topics discussed, please refer to the appropriate PJM manual which can be found by accessing:

<http://www.pjm.com/documents/manuals.aspx>