

Commitment Review Process

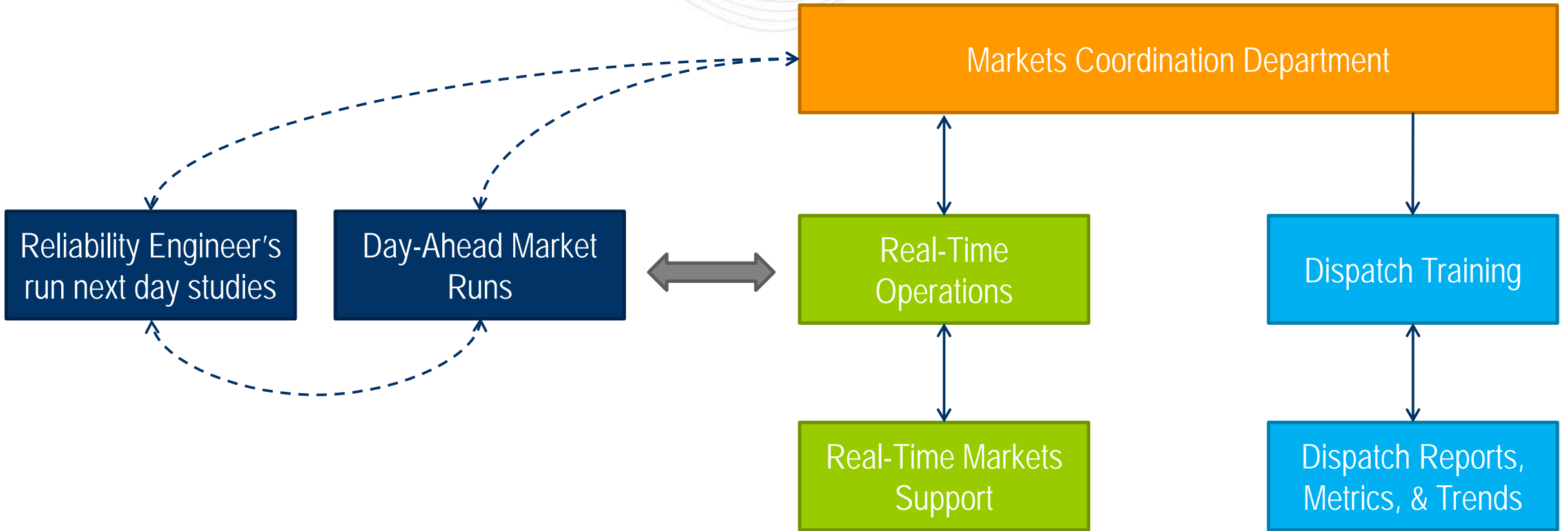


Chris Callaghan

Engineer, Markets Coordination Department

MIC Special Session - Market Operations Price Transparency

April 25, 2017



Reliability Engineers
run next day studies

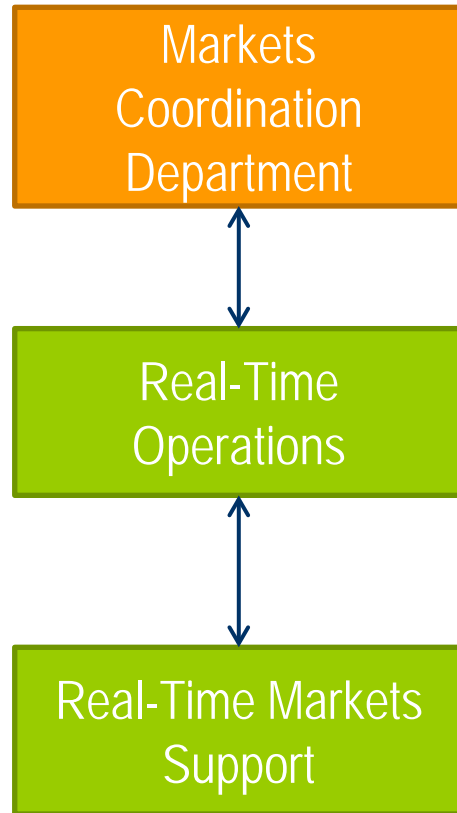
Day-Ahead Market
Solution

- Continual communication helps align Day-Ahead and Real-Time models
- Reliability Engineers send Day-Ahead a list of units needed for reliability, identified in power flow studies
- Day-Ahead Solution
 - Results are sent back to the Reliability Engineers
 - Reliability Engineers run an additional reliability run on the units cleared in Day-Ahead
 - Any additional units needed may be picked up in Reliability Assessment and Commitment (RAC)
- Day-Ahead and Reliability Engineers meet on a weekly basis

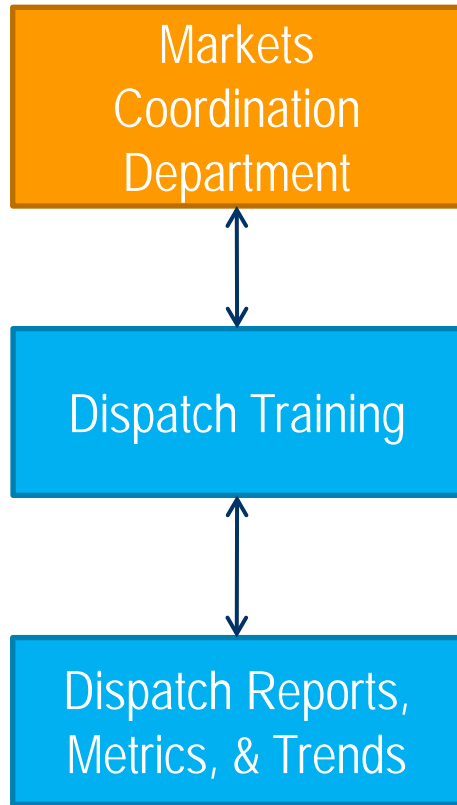
- Power flow studies (which include a full contingency list) are preformed for scheduled transmission outages:
 - Thermal constraints
 - Reactive constraints (real-time or post contingency voltage)
 - Extreme weather: Hot, Cold, Hurricane, etc.
- For low voltage issues, a thermal surrogate is created in close proximity to the impacted bus

- Using the results of the Reliability Engineer's study
 - Units are identified for thermal constraints are based on distribution factors (DFAX)
 - If required, Long Lead units are committed or "run through"
 - Units with greater than 32 hours total time to start cannot be committed in the Day-Ahead Market
 - Before the Day-Ahead Market executes, next day commitments are given to the Day-Ahead operators

- Reliability Engineers will study
 - Non-cost options e.g. switching options
 - Utilize Combustion Turbines (CT) commitment options
 - More flexible
 - Lower uplift cost
 - Allows dispatch to evaluate the need in Real-Time
 - If CTs are insufficient to control, Steam generation will be committed



- Markets Coordination provides Real-Time Markets Support
- Actively monitors:
 - Units off-cost for constraints
 - Trending BOR units
 - Manually dispatched units
- Real-Time Operations reports forecasted outages & system conditions that carry into the following day(s) to the Reliability Engineer's and Day-Ahead Market



- Markets Coordination & Real-Time Markets coordinate with Dispatch Training and review:
 - Real-Time operations the previous week
 - Market Uplift results
 - Weekly
 - Long-term trending
 - Perfect Dispatch results/recommendations
 - Forecasted operations
- Lessons Learned and Trends discussed with:
 - Day-Ahead
 - Dispatch
 - Reliability Engineer's
 - Real-Time Markets

- PJM reviews Energy Market Uplift results on a daily basis
- Reports identify the units and causes of any high uplift
- Trending metrics are reviewed monthly to identify any trends or reoccurring issues
- Feedback is sent to Dispatch, Day-Ahead, the Reliability Engineers, and Dispatch training to establish proactive steps to mitigate future uplift

- Quarterly posting of Reactive Service Charges causes
- PJM [Energy Market Page](#)

Operational Data
Data Directory
Interregional Data Map
PJM Tools
Energy Market
Fuel Cost Policies
LMP Model Information
Market-to-Market Coordination
Capacity Market (RPM)
Financial Transmission Rights
Ancillary Services
Demand Response
Billing, Settlements & Credit
System Operations
Advanced Technology Pilot Program

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Energy Market

The PJM Energy Market procures electricity to meet consumers' demands both in real time and in the near term. It includes the sale or purchase of energy in PJM's Real-Time Energy Market (five minutes) and Day-Ahead Market (one day forward). Learn more about the [energy market](#) at the Learning Center.

Real-Time Energy Market

7-Day Load Forecast
Hourly LMP Files: [Daily](#) | [Monthly](#)
Marginal Fuel Type Data
Hourly Load: [Preliminary](#) | [Estimated](#) | [Metered](#)
Export Credit Screening: [Nodal Reference Prices](#) [CSV](#)
Learn more [PDF](#) about export credit screening.

Causes of Recent Reactive Service Charge [XLS](#) 2.24.2017
[External Interface Price Definitions](#) [XLS](#) 5.5.2009
Forecasted Interface Prices
NYIS & IMO Interface Definition Impact Analysis [XLS](#) 3.9.2017

Contact PJM

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New to Energy Market?

Maps: [Locational Marginal Pricing](#) | [Interregional Data](#)

- PJM runs and reviews Perfect Dispatch results daily and provides feedback and recommendations on:
 - All Combustion Turbine units called in Real-Time
 - Any Steam units called outside of Day-Ahead
 - Bid Production Cost (BPC) impact caused by Load and Interchange forecasts
- Results and feedback are sent out to Dispatch, Day-Ahead, the Reliability Engineers, and Dispatch training to establish proactive steps
- Results are also reviewed on a monthly basis to identify any trends or reoccurring issues and presented to PJM's Operating Committee