Commitment Review Process

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Reliability Engineer & Day-Ahead Operator Communication

- 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
Reliability Engineer Studies 3-7 days

• Power flow studies (which include a full contingency list) are performed 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
Reliability Engineer Studies 3-7 days out

- 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 Engineer Studies 3-7 days

- 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
RT Operations

- 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
Training and Feedback

- 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
Perfect Dispatch Reporting

- 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