

# Least Cost Schedule Analysis

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IMM



Monitoring Analytics

# Status Quo vs. Proposals

- **The offer schedule chosen for units that fail the TPS test under the status quo is determined in the day ahead market, which evaluates each schedule like a separate resource, finding the lowest production cost outcome for the market.**
- **Each of the proposals would eliminate the current process.**



# Status Quo vs. Proposals

- **PJM's proposal would use an offline least cost schedule formula.**
- **The IMM proposal would choose the lowest of each offer point and parameter from both cost and price schedules.**
- **The GT Power Group proposal would choose the cost schedule for all units failing the TPS test.**

# PJM Proposal Dispatch Cost Formula

- **Day ahead market dispatch cost =**
  - **Sum of hourly dispatch cost**
  - **For the highest cost hours of the day for the number of hours of the min run time**
  - **Plus the highest hour start up cost for the day**
- **Hourly dispatch cost =**
  - **Cost at eco min + no load**

# IMM Proposal

- **Under the IMM approach, there is no selection of the cost or price schedule.**
- **The lowest cost points and most flexible parameters would be selected from each schedule.**
- **The benefit of this approach is that the application of market power mitigation would not change based on combinations of prices and parameters. For example,**
  - **Crossing offer curves**
  - **High offer curves paired with low start up or no load cost**
  - **Inflexible parameters paired with low offer curves**



# GT Power Group Proposal

- **The results of the GT Power Group approach would also not be affected by combinations of prices and parameters.**
- **The weakness of this approach is that it would choose the cost schedule even when it is unambiguously more expensive than the price schedule.**

# Least Cost Schedule Analysis

- **The IMM gathered offer data from example days in 2022 and 2023 to evaluate the performance of the least cost schedule selection under the current and proposed rules.**
- **Unlike the PJM proposal, the IMM and GT Power proposals are not sensitive to the combination of parameters and prices submitted in an offer schedule.**
- **The PJM proposal would change the selected schedule in many circumstances. The analysis focuses on how the schedule selection would differ from the status quo under PJM's proposal.**

## Observations: Min Run Time

- Under the PJM proposal, more units would be committed on the cost schedule due to min run time.
- Under the status quo, if a unit commitment is economic for longer than the min run time, the min run time does not affect the least cost schedule determination.
- The IMM and GT Power Group proposals would use the shorter min run time for all resources that fail the TPS test.
- The PJM proposal would frequently also use the cost schedule where the price schedule is used under the status quo due to the shorter cost min run time.



## Observations: Hourly Differentiated Offers

- Many resources submit hourly differentiated offers, especially for different gas days.
- The PJM proposal takes the highest cost hours of the day for the number of hours of the min run time.
- This means that costs from the higher cost gas day would determine the least cost schedule even if the TPS failure and the commitment were in the other gas day.
- The IMM proposal would choose the lower offer prices hour by hour.
- The GT Power Group proposal would choose based on TPS test failures.

# Dispatch Point Evaluation

- **Under the current process for selecting the least cost schedule when a unit fails the TPS test, the entire offer curve is not considered.**
  - **The day ahead commitment process evaluates up to the dispatch point.**
  - **The real time commitment process evaluates up to the economic minimum.**
- **Under the PJM proposed process, the issue is exacerbated.**
  - **The day ahead commitment process would only evaluate up to the economic minimum.**
  - **The real time process would remain the same.**

# Crossing Offer Curves

- In the scenarios where offer curves cross, with high markup in the higher price range, PJM's proposal does not address the issue. PJM's proposal does not evaluate offer curves above the eco min.
- In the scenarios where the start up or no load offer has a negative markup while the offer curve has a positive markup, the schedule selected resulting from PJM's proposal would vary based on the magnitude of the differences and the min run time.
- Market sellers could calculate the dispatch cost in advance and alter offers to ensure selection on the price schedule.

# Implications

- **Based on unit by unit analysis, the IMM confirms that the PJM proposal does not solve current issues with the least cost schedule evaluation. The PJM proposal creates new issues that are easily exploitable.**
- **The IMM package and the GT Power Group package do not have these issues.**
- **The GT Power Group package could result in a higher cost offer being chosen for units with market power.**
- **Only the IMM package ensures that market power is mitigated and the most flexible parameters and least cost offers are selected.**

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