



PJM Proposal

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- ***Consolidate Tier 1/Tier 2***
 - One product. Uniform compensation, obligation, and penalty.
 - Enhance must offer for reserves
- ***More Flexible Reserve Zone Modeling***
 - Use regional model that exists today
 - Predefine additional regions
- ***Operating Reserve Demand Curve Enhancements (ORDC)***
 - Base reserve value beyond the minimum requirement on statistical representation of uncertainty

- ***EPFSTF***
 - Primary focus to date has been on reserve market design
- ***Variable Operations & Maintenance***
 - Include maintenance in cost-based offers
 - Passed at the 9/27/18 MRC but failed at the MC
- ***Transmission Constraint Penalty Factors***
 - Remove constraint relaxation
 - Passed at the October Members Committee
- ***Fast-start Pricing***
 - Pending at FERC

Goals of PJM's Proposal

1. Reserve and energy prices reflect system conditions and appropriately value scarcity
2. ORDCs reflect the reliability value of reserves
3. Reserve capability is accurately measured
4. Resource will provide reserves when deployed
5. Market power is mitigated
6. Social welfare is maximized



1. Reserve and energy prices reflect system conditions and appropriately value scarcity

- Prices are co-optimized so that energy and reserve prices are consistent with each other given system conditions
 - More dynamic reserve zone model will help to better align reserve prices with actual system constraints
 - Consolidation of Tier1/Tier2 will improve reserve measurement accuracy leading to prices more closely aligned with actual system conditions
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- Current proposal relies on the assumption that an \$850/MWh penalty factor accurately values scarcity
 - PJM does not believe this is the case
 - \$850/MWh penalty factors will cap prices below the cost of actions operators will take to maintain reserves
 - \$850/MWh penalty factors will result in economic shortages and false positives for shortage pricing
 - Discussion of this topic has been deferred to the mid-term

2. ORDCs reflect the reliability value of reserves

- Downward sloping portion of the curve relates system uncertainty with reserve value
 - PJM believes this directly connects the level of reserves with a statistical measure of reliability
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- Current proposal relies on the assumption that \$850/MWh reflects the reliability value of reserves
 - \$850/MWh penalty factors may not reflect the cost of operator actions taken to maintain reserves
 - PJM believes the \$850/MWh needs to be increase

PJM understands the concerns regarding committing reserves at the level the PJM proposal.

1. The exact amount of reserves needed is not known.

- Our goal is to procure enough on-average to ensure we meet the MRR given the uncertainty we've modeled.
- This will result in PJM procuring more reserves than it does today. This is a solution, not a problem.

2. The current approach is not the benchmark.

- We're discussing enhancements to the status quo. Using it to measure the effectiveness of proposals and make decisions can be misleading.

3. Operators will not operate the system at the edge.

- Current markets assume the system can operate without a safety margin. This is not realistic.
- Currently this is managed with manual operator actions rather than a systematic method. These actions may suppress price.

3. Reserve capability is accurately measured

- Remove Tier 1 reserves which create significant uncertainty
- Utilize energy offer parameters to determine reserve capability wherever possible
- More flexible reserve zone modeling will better identify reserves that are behind transmission constraints and cannot be used

4. Resources will provide reserves when deployed

- All resources committed are compensated equally and have an obligation to respond
 - Non-compliance for any resource committed for reserves will be penalized
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- PJM is also working to ensure move its reserve deployment mechanism into generator basepoints
 - Clear communication of expectation
 - Enhance pricing around reserve events

- No changes to impact this
 - Synchronized Reserve market remains cost-based
 - Non-Synchronized Reserve market has \$0/MWh offers
- 2nd Quarter 2018 State of the Market Report indicates the Synchronized Reserve market results were competitive

Short-Term (Q3 2018):

- Synchronized Reserve (SR) Market
 - Consolidation
 - Accuracy
 - Offers

- Dynamic Reserve Zone Modeling (*nodal*)
- E&AS Offset Transition

- Simplified Operating Reserve Demand Curve (ORDC) Enhancements
- Fast-Start Pricing*
- Others??

Mid-Term (Q1 2019):

- 30-Minute Reserve Market
- Complete ORDC Modeling (*top end*)
- Fast-Start Pricing*
- Others??

Long-Term (TRD):

- Broader ELMP implementation
- Day-ahead Reserve Modeling and Shortage Pricing (10 and 30-minute)
- Others??

* Implementation dependent on FERC process and approval/rejection.