



**Energy Price Formation Senior Task Force Report**  
**PJM Interconnection**  
**Members Committee Webinar**  
**September 24, 2018**

The Markets and Reliability Committee (MRC) approved the formation of the Energy Price Formation Senior Task Force (EPFSTF) at its December 21, 2017 meeting to evaluate proposals to enhance energy market and reserve market pricing.

The EPFSTF held its 1st meeting on January 18, 2018. The EPFSTF reviewed the problem statement and issue charge, reviewed the draft EPFSTF charter and workplan, and reviewed PJM's planned response to FERC regarding their Order Instituting Section 206 Proceeding and Commencing Paper Hearing Procedures and Establishing Refund Procedures issued on December 21, 2017 regarding fast-start resources.

The second EPFSTF meeting was held on January 29, 2018. The EPFSTF continued consideration of the charter and workplan, and performed interest identification. The EPFSTF began consideration of Key Work Activity 2 regarding design criteria. The EPFSTF considered plans for education sessions, and received an educational discussion regarding Locational Marginal Pricing calculation and uplift, and received an update on PJM's planned response to FERC's Order Instituting Section 206 Proceeding and Commencing Paper Hearing Procedures and Establishing Refund Procedures issued on December 21, 2017 regarding fast-start resources.

The third EPFSTF meeting was held on February 15, 2018. The EPFSTF continued consideration of the charter and workplan and completed interest identification. The EPFSTF continued consideration of Key Work Activity 2 regarding design criteria and Key Work Activity 3 regarding gaps between design criteria and the current market design.

The fourth EPFSTF meeting was held on March 5, 2018. The EPFSTF completed consideration of the charter. Dr. Scott Harvey, FTI Consulting, provided a presentation reviewing the History of LMP, discussing the goals of implementing LMP pricing in the 1990s, constraints with the LMP design and implementation and the evolution of LMP. The EPFSTF continued consideration of Key Work Activity 2 regarding design criteria and Key Work Activity 3 regarding gaps between design criteria and the current market design. Finally, the EPFSTF briefly reviewed the matrix entries for design components, status quo and options regarding PJM's response to FERC in the fast start resources compliance filing.

The fifth EPFSTF meeting was held on March 29, 2018. The task force completed Key Work Activity 2 – identification of design criteria, and continued work on Key Work Activity 3 – identification of gaps between the design criteria and the current market design, focusing on reserves and shortage pricing. Representatives from ERCOT provided education on ERCOT's Operating Reserves and Reliability Deployment Price Adders. The EPSTF also captured design components to build the options matrix focusing on Shortage pricing and Reserves pricing.



On April 12, 2018 PJM posted a letter from PJM President & CEO Andy Ott which discussed activities of the EPFSTF, addressing suggested focus areas and timelines.

The sixth EPFSTF meeting was held on April 18, 2018. The task force discussed the change in timelines and focus areas suggested in the Board's letter. There were no objections to adopting the proposed timelines and focus areas. The task force continued consideration of Key Work Activity 3 - identification of gaps with current market design. The task force received a presentation on potential design components to consider for Reserve Zone modeling and Synchronized Reserves Market to build the options matrix on Shortage pricing and Reserve pricing.

The seventh EPFSTF meeting was held on May 4, 2018. The task force approved the updated work plan to implement the Board's recommended focus and timelines, and completed Key Work Activity 3 - identification of gaps with current market design. The task force received presentations on highlighting the operations and reliability needs for reserves and the limitations of the current reserve market design, differences between capacity reserves and operational reserves, the fundamentals of market clearing with co-optimization and the concept of lost opportunity cost, and the current cost structure and Manual 15 requirements for Synchronized Reserve offers, as well as an update to the short-term Synchronized Reserve Market goals. The task force reviewed design components and options to build the matrix for EPFSTF focusing on the reserve market.

The eighth EPFSTF meeting was held on May 23, 2018. The task force received presentations on analysis of the concepts and framework for enhancements to the ORDC, as part of the short term goals, the Synchronized Reserves offer margin, and reserve zone modeling (from IMM's perspective). PJM provided an overview of the latest proposal for synchronized reserves, and the task force reviewed the matrix, including design components and options focusing on the reserve market.

The ninth EPFSTF meeting was held on June 8, 2018. The task force received a presentation on current methodology behind Minimum Reserve Requirement (MRR) determination and actions taken during emergency procedures, an Operating Reserves Demand Curve (ORDC) framework that was presented at May 23, 2018 EPFSTF meeting with more examples and continue discussion regarding any adjustments to the uncertainties that are used, a presentation on the consideration of using ORDC for Day Ahead Scheduling Reserve Market, an IMM presentation on analysis of PJM ORDC framework and historical Reserves, and a presentation on Locational Reserve Zone Modeling.

The tenth EPFSTF meeting was held on June 13, 2018. The task force received a presentation on the IMM's proposal for Synchronized Reserves, and captured design components and options to the EPFSTF matrix focusing on the reserve market. Stakeholders received a summary of the presentation on Locational Reserve Zone Modeling that was given at the June 8, 2018 EPFSTF meeting.

The eleventh meeting was held on June 25, 2018. The task force continued discussion of Locational Reserve Zone Modeling, received presentations from the IMM regarding the Offer Margin Adder and conceptual thoughts on ORDC reforms, and received a presentation from PJM expanding on the ORDC framework focusing on how the Synchronized Reserve and Primary Reserve products could be co-optimized.



The twelfth meeting of the task force was held on July 17, 2018. PJM completed the presentation begun at the last meeting regarding the ORDC framework focusing on how the Synchronized Reserve and Primary Reserve products could be co-optimized. PJM also presented on potential adjustments to the ORDC to account for Operator actions. PJM also discussed updates to the proposal on Locational Reserve Zone Modeling for short term goals. The task force received a report from the Operating Committee related to their evaluation of the operational basis for adding a Real-time 30 Minute Reserve product. All proposal options were reviewed in the matrix, and the task force reviewed the workplan and basis for action.

The thirteenth meeting of the task force was held on August 6, 2018. PJM provided an update on potential adjustments to the ORDC for Operator Actions, and the IMM gave a presentation on ORDC from their perspective. PJM staff reviewed the executive summaries of PJM proposals on Synchronize Reserves, ORDC and Reserve Zone modeling.

The fourteenth meeting of the task force was held on August 22, 2018. PJM presented on the frequency of out of market adjustments to the ORDC, the value of additional reserves procured beyond the MRR, and the methodology that will be used for simulation results of the PJM proposal for EPFSTF. The IMM provided a presentation on SR Must Offer Requirements.

Next meeting: September 26, 2018

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