

IMM Revised ORDC Proposal

EPFSTF

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Monitoring Analytics

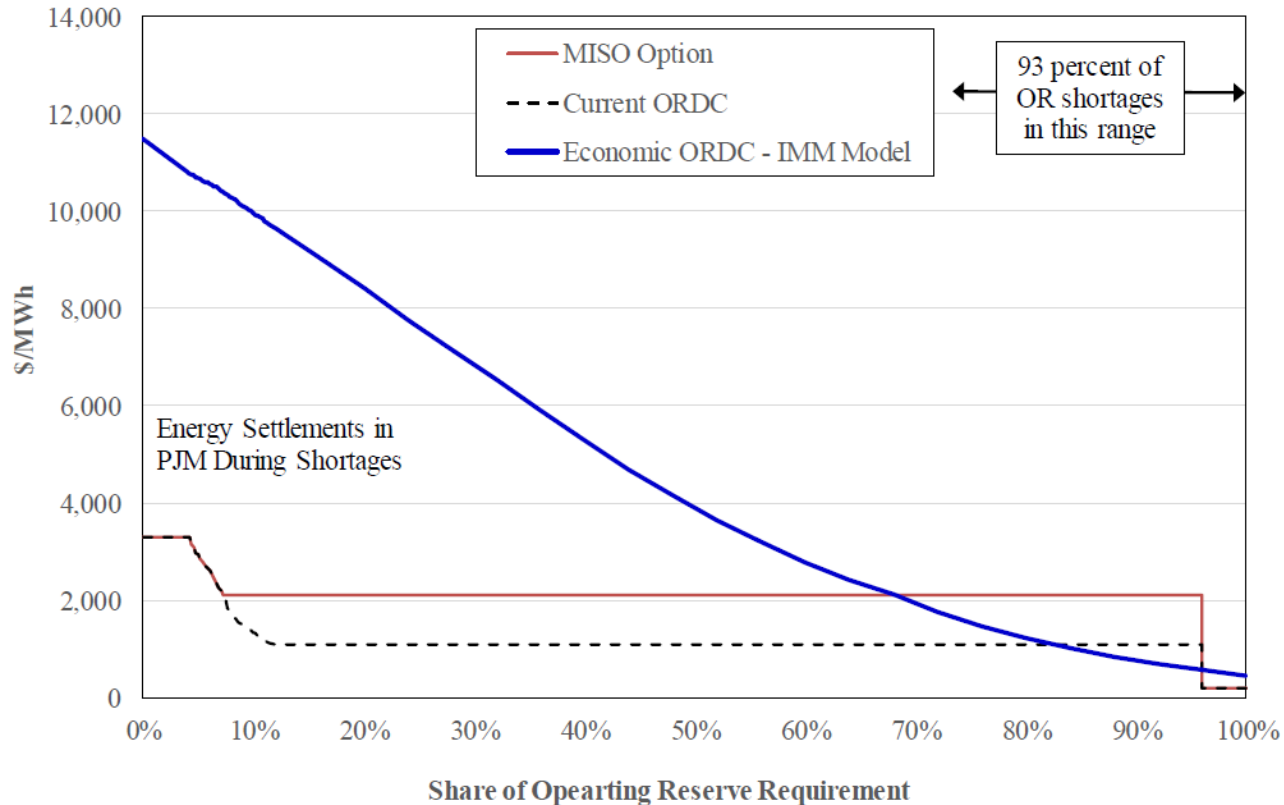
PJM ORDC Proposal

- **PJM's ORDC procures too many reserves and pays the reserves too much.**
- **The PJM approach is not similar to those used by other FERC jurisdictional RTOs**
- **With nesting of products and zones, PJM's ORDC includes higher prices than ERCOT's ORDC that is meant to substitute for a capacity market.**
- **The IMM proposes a more conservative ORDC than PJM's approach.**

Review of Other RTO ORDCs

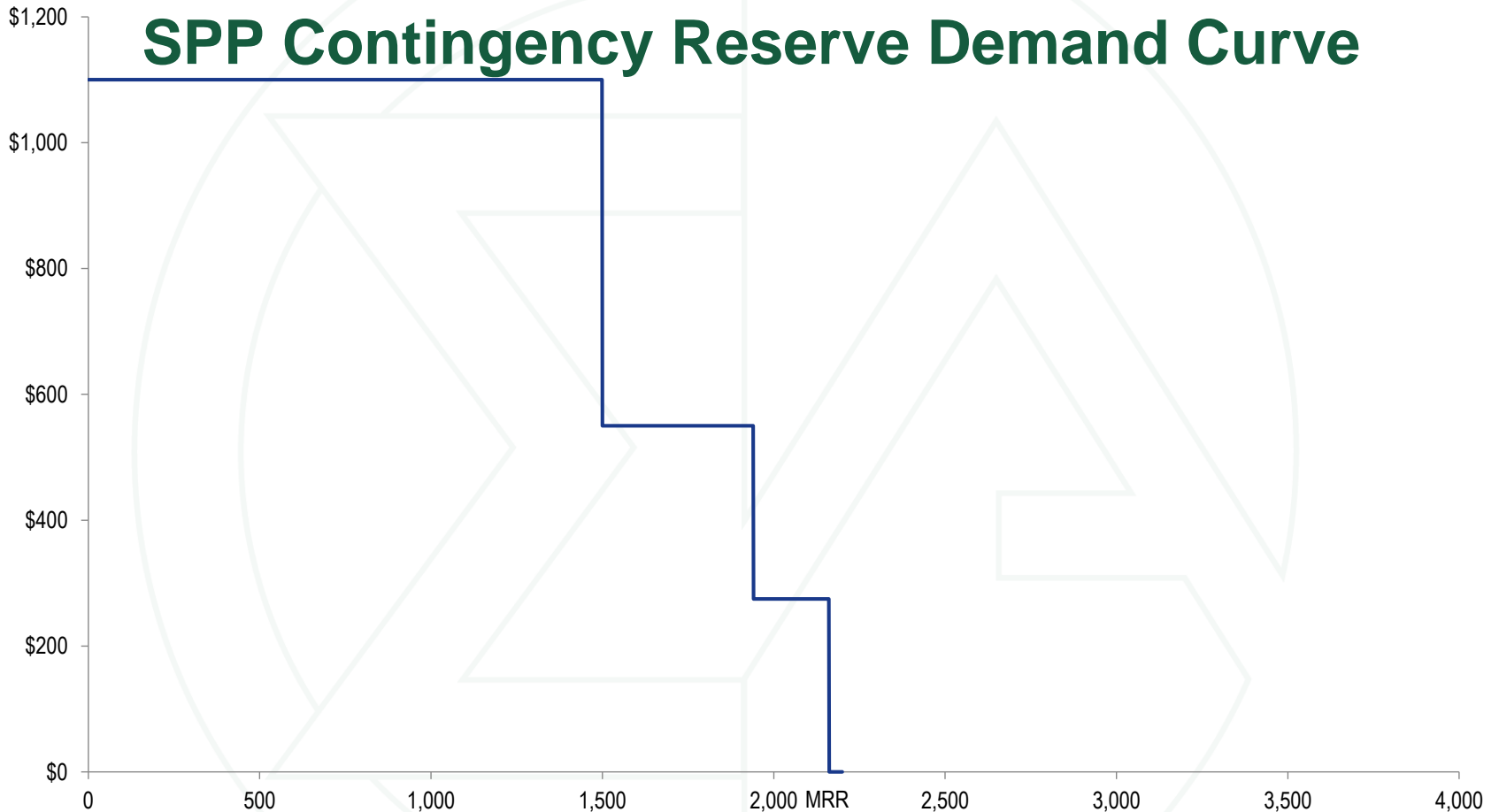
- **ISO New England**
 - **Vertical demand up to penalty factor, no sloped curve**
 - 30 Minute Reserves \$2,000 per MWh
 - 10 Min. Not Synchronized \$3,500 per MWh
 - 10 Min. Synchronized \$3,550 per MWh
 - **Escalating penalty factors for reserve subzones**
- **New York ISO, California ISO, Southwest Power Pool**
 - **Stepped demand curves for shortages only**
- **Midcontinent ISO**
 - **Sloped and stepped curve for shortages only**

MISO and MISO IMM Proposed ORDCs



Source: Potomac Economics, 2016 State of the Market Report for MISO, Analytical Appendix, Section V.F.

SPP Contingency Reserve Demand Curve



Source: SPP Integrated Marketplace Protocols, v.65.a, Section 4.1.5.2 and <https://marketplace.spp.org/groups/scarcity-demand-curve>.



IMM Revised ORDC Proposal

- **Simple ORDC: vertical demand with penalty factor**
 - Consistent with precedent of other RTOs
 - Used for both synchronized and primary reserve
- **No sloped curve, no extension beyond MRR**
- **Identical curves in day ahead market**
- **Max price equal to energy offer cap**
 - \$1,000 per MWh, unless PJM has approved a higher cost-based offer, per FERC rules
 - Increases at \$250 per MWh increments with higher approved cost-based offers, up to \$2,000 per MWh
- **Note: Further development needed for consideration of IMM's previous proposal, Intertemporal ORDC based on operator actions.**



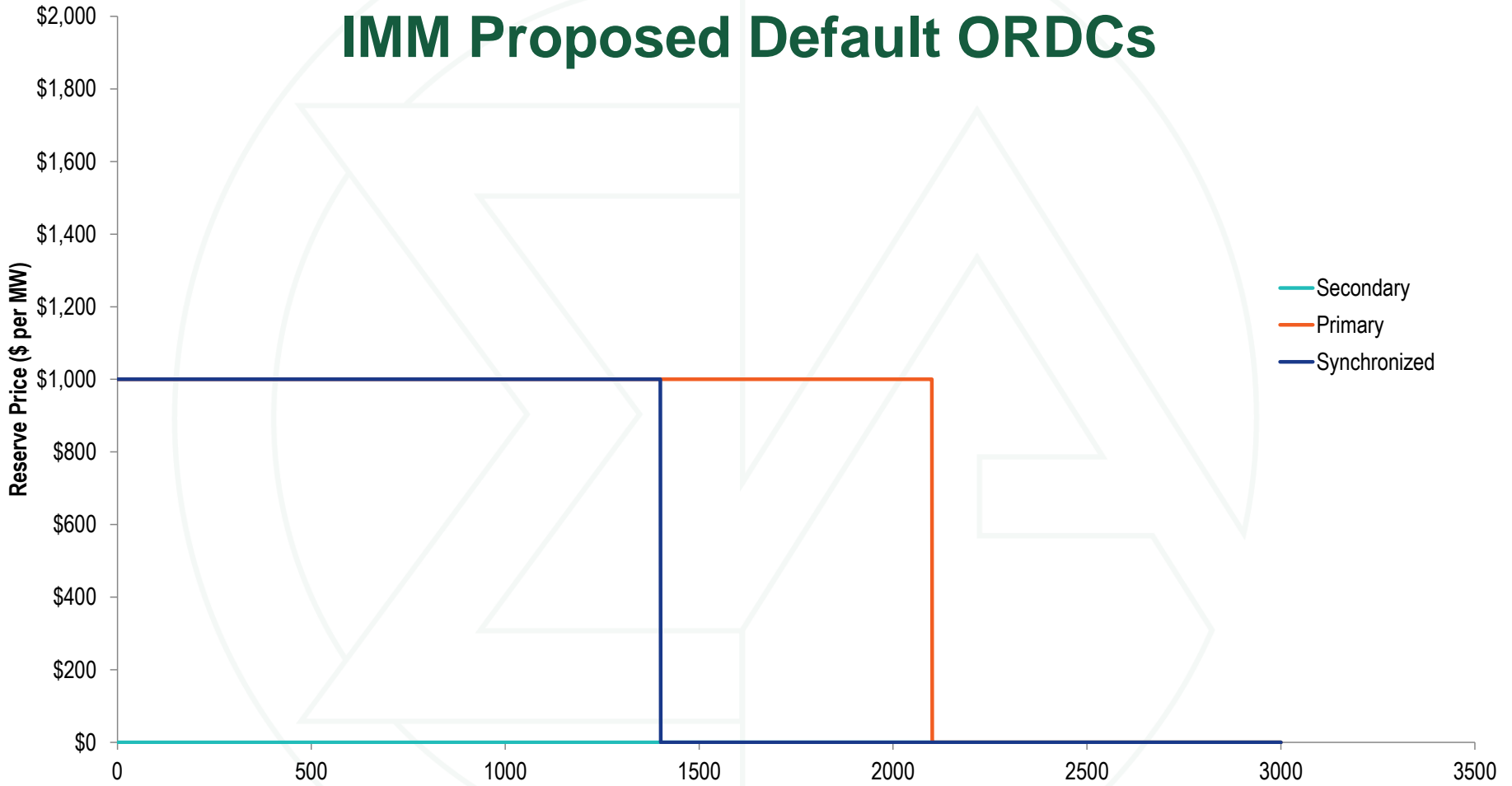
Operator Actions

- **Operators may increase the minimum reserve requirements under predefined conditions.**
 - **Change in the largest contingency (Synch., Primary)**
 - **Extreme weather (Synchronized, Primary)**
 - **Gas contingencies (Secondary)**
- **The increased requirements will have defined start and end times.**
- **PJM will post on its website:**
 - **The active minimum reserve requirements**
 - **The reason for any increased reserve requirements**
 - **The beginning and end times for the increased reserve requirements**

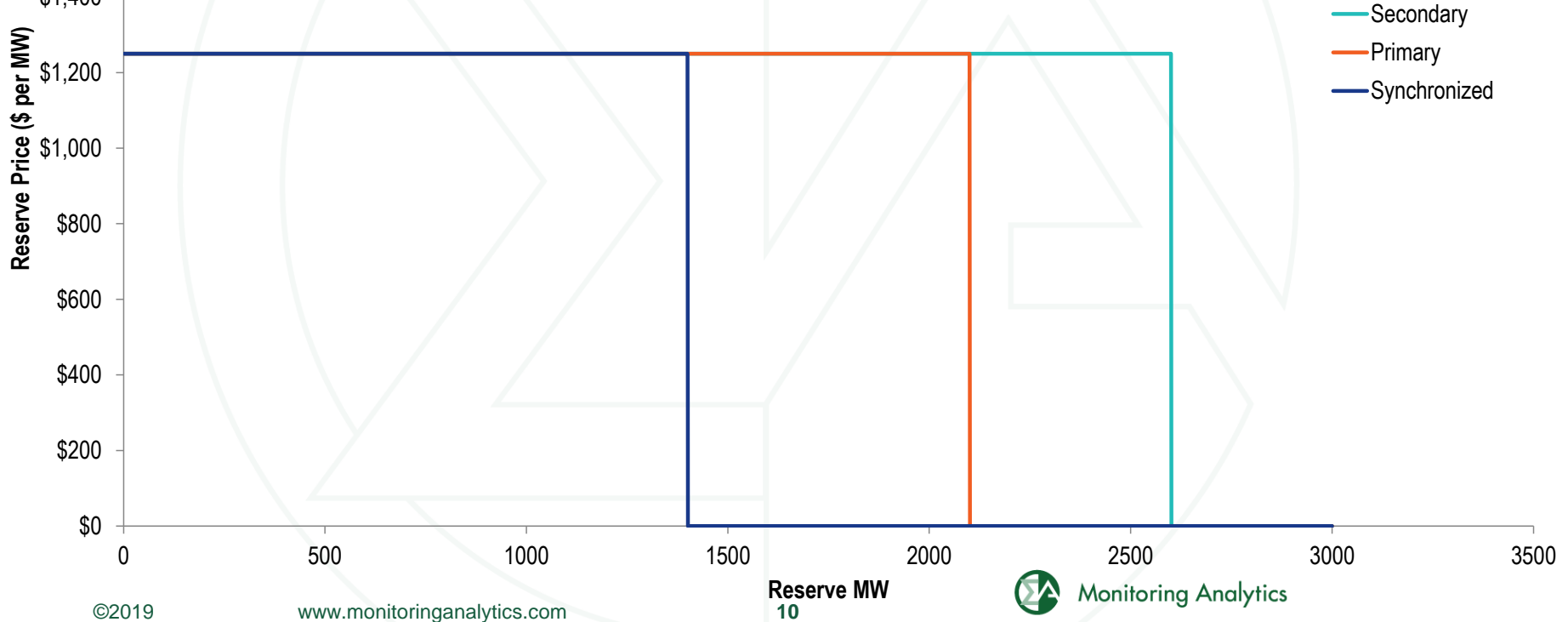
Secondary (30 Minute) Reserves

- **Eliminate Day Ahead Schedule Reserves**
- **Default requirement is zero**
 - **Consistent with no NERC requirement**
- **Secondary reserves may be created with an ORDC based on a PJM defined contingency**
 - **such as a gas contingency**
 - **defined under the operator actions provisions for increasing a minimum reserve requirement**
- **Penalty factor is \$1,000 to \$2,000 per MWh, as with synchronized and primary reserves.**
- **Demand Response should participate under the same rules as generators.**

IMM Proposed Default ORDCs



IMM Proposed ORDCs with Approved Cost Offer of \$1,100 per MWh and Defined Gas Pipeline Contingency



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