Recommendations for the PJM Reserve Markets

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PJM Reserve Markets

- Synchronized Reserves
  - Tier 1
  - Tier 2
- Nonsynchronized Reserves
- Day Ahead Scheduling Reserves
Tier 1

• Cost of providing tier 1 is zero.
• Payment based on tier 2 clearing price is a windfall.
• No performance obligation
  • 50.5 percent response rate to events in 2017.
• PJM tier 1 biasing is an administrative operator intervention that affects clearing prices and scarcity determination without adequate transparency.
Tier 1 Recommendations

• Eliminate payment of tier 2 price.
• Define rules for tier 1 biasing.
• No payment if resource deselected by PJM (Adopted)
• Or simply get rid of tier 1.
The tier 2 synchronized reserve market results were competitive.

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<thead>
<tr>
<th>Market Element</th>
<th>Evaluation</th>
<th>Market Design</th>
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<tbody>
<tr>
<td>Market Structure: Regional Markets</td>
<td>Not Competitive</td>
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<td>Participant Behavior</td>
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Tier 2

• Local and aggregate market power exist.
  • Cost based market mitigates market power.
• Must offer requirement
Tier 2 Recommendations

• Enforce must offer requirement.
• Remove $7.50 margin and heat rate degradation from cost-based offer.
• Use five minute LMP and lost opportunity cost to determine price (Adopted).
The day-ahead scheduling reserve market results were competitive.

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Secondary Reserves - DASR

- No performance obligation
- Must offer market
- Cost of providing DASR is zero, unless LOC.
- Aggregate market power
  - DASR market has three or fewer pivotal suppliers in 15.9 percent of hours.
  - Economic withholding, daily average of 39.2 percent of units offer above zero.
Secondary Reserves Recommendations

- Add a real-time performance obligation.
- Apply market power mitigation.
- Document reasons for expanding requirement.
Operating Reserve Demand Curve Recommendations

• Reassess zonal requirements
• Cascading scarcity prices as reserve products go short
• Downward sloping curve based on loss of load probability
• Shifting reserve requirements to capture operator actions