Item 5: Multi-Interval Real-Time Market Overview

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Multi-Interval Real-Time Market (MIRTM) Development History

- **Fall 2011**: ‘MMS Look-Ahead SCED White Paper’ discussed at WMS Special Look Ahead Workshop

- **February 2012 – January 2013**: Market Enhancement Task Force (METF) reported to TAC
  - METF officially disbanded at the January 3, 2013 TAC meeting

- **September 2014**: Updated Multi-Interval Real Time Market paper provided to TAC

- **Fall 2014 to Current**: Multi-Interval Real Time Market concepts discussed at Supply Adequacy Working Group (SAWG)
## MIRTM at the other ISOs

<table>
<thead>
<tr>
<th>ISO/RTO</th>
<th>MIRTM?</th>
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<tbody>
<tr>
<td>PJM</td>
<td>Yes</td>
</tr>
<tr>
<td>MISO</td>
<td>Partial (Look-ahead commitment in place; look-ahead dispatch under design discussions)</td>
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<tr>
<td>ISO-NE</td>
<td>Yes</td>
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<tr>
<td>NYISO</td>
<td>Yes</td>
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<tr>
<td>SPP</td>
<td>No</td>
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<tr>
<td>CAISO</td>
<td>Yes</td>
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<tr>
<td>ERCOT</td>
<td>No</td>
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How it would work

• MIRTM would extend the Real-Time Market’s time horizon from the current 5-minute interval to X minutes in the future
  – Currently, ERCOT contemplates a 30-minute look-ahead
  – This horizon would be divided into 5-minute intervals
• MIRTM could commit and dispatch Resources during any of these intervals based on forecasted prices
• The longer horizon enables more efficient dispatch of current fleet of Resources
• Additionally, MIRTM can be expected to enhance competition by attracting more Resources to the market, including:
  – ‘Blocky’ resources such as DR that is either on or off
  – Resources with temporal constraints including:
    • Ramp period >5 minutes
    • Minimum run time
    • Maximum run time
    • Return-to-service time
How it would work

- **MIRTM with six 5-minute intervals (total of 30 minutes)**

  - **Interval where the LMPs, MW awards (energy, AS) and Commitment Instructions are **ALL binding** commitment instructions**

  - **Intervals where **ONLY** Commitment Instructions are **binding** and the LMPs and MW awards (energy, AS) are **indicative****

  - Sequence of Multi-Interval RT Markets

  - Analysis window of rolling 30 minutes
Make-whole payments / net benefits

- If SCED commits a Resource based on a forecasted price, and the price does not materialize in real time, the Resource would be entitled to a make-whole payment
- The net benefits question is:
  - Would the savings to Load over time from committing lower-priced Resources that otherwise could not participate in the RTM exceed the cost of the occasional make-whole payment?
- ERCOT is developing a MIRTM ‘simulator’ to inform the decision-making process
  - Inputs include Load Resource bids and temporal constraints as provided by Demand Side Working Group participants
Benefits of MIRTM

• IMM recommendation, 2014 State of the Market Report:
  – ‘We continue to believe there is opportunity to improve the commitment and dispatch of both load and generation resources that require longer than 5 minutes to come on line, but are available within 30 minutes. Therefore, we recommend that ERCOT evaluate improvements to this process that would allow it to facilitate better real-time generator and load commitments.’

• MIRTM could mitigate several shortcomings inherent in the current single interval (5-minute) RT Market
  – Could enable broader RTM participation by demand response and more efficient use of quick-start generators
  – Could allow ERCOT Operations to rely on market forces to address anticipated conditions, rather than out-of-market instructions
  – Could reduce number of instances of transient price spikes due to ramp rate limitations
Additional considerations

• MIRTM effectiveness will require a more accurate Short-Term Load Forecast
  – ERCOT has identified and is working on significant improvements to the STLF

• Market Management System (MMS) software vendor, ABB, has built MIRTM in numerous other markets, so development would not be ‘from scratch’

• Cost of implementation could be reduced if implemented concurrently with Real-Time Co-optimization of Energy and Ancillary Services
Questions?