Local Market Power Mitigation
Under Convergence Bidding

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Overview

- Review of LMPM options discussed in Oct. 2 DMM whitepaper.
- Illustrative example of new Option B provided in Oct. 6 supplemental paper.
- DMM conclusions
LMPM Options Given Further Consideration

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- Since Sept. 18 MSC/Stakeholder meeting, further review of these options has been performed with ISO staff and MSC.
- Results of this review are summarized in October 2 DMM whitepaper.
Review of Current Approach
(Load Forecast + Physical Supply)

- Guarantees that sufficient physical supply to meet forecasted load is subject to mitigation. This should:
  - Significantly limit degree to which virtual supply will “displace” physical supply in uncompetitive constrained areas (in pre-IFM mitigation process and in actual IFM clearing).
  - Avoid need for excessive reliance on RUC and additional market power mitigation of RUC in local areas.
  - To the extent that virtual demand bids increase demand in local areas in IFM, a relatively small amount of competitively priced virtual supply bids may be necessary “at the margin” to avoid price spikes in IFM due to this additional demand.
  - Since a relatively predictable amount of physical supply will be subject to mitigation, this should help stability of prices and outcomes, and increase ability of participants to manage virtual bidding.
Review of SCE Suggestion (exclude Virtual Supply) and New Option A

- **SCE Approach:** Under relatively high load conditions, clearing total bid-in demand (physical plus virtual) against unmitigated market bids for physical supply only in CC run would be likely to undermine LMPM in several ways:
  - Demand clearing CC run could be very high relative to physical supply (120-130%?)
  - Highest (unmitigated) bids dispatched in CC run used as “floor” for final mitigated bids would be driven up above competitive levels.
  - The CC run schedule for many units in local areas would be relatively high (any bid mitigation starts at this point on unit’s bid curve).
  - Many units needed in local areas may be dispatched at full output in CC run, and therefore not be dispatched up in AC run (so that not mitigation would be triggered)

- **New Option A**
  - Would address the problem above by clearing physical supply only against forecasted load in CC run.
  - However, if bid-in demand (physical plus virtual) clearing AC run exceeded load forecast, some additional mitigation may be triggered outside of non-competitive local areas due to this additional system-wide demand.
Review of New Option B:
Use Mitigated Bids in AC Run & Protect CC Schedules

- Allows virtual supply and demand bids to be included in LMPM, while eliminating concerns about how VB may undermine LMPM.

- Likely to increase market efficiency by ensuring that physical supply needed to meet local uncompetitive constraints is considered in “merit order” of DEB (rather than bid price).

- Allows competitively priced virtual supply to “compete” with physical supply based on:
  - Unmitigated bid prices of physical units on system wide basis (CC run)
  - Mitigated bid prices of physical units to meet minimum generation requirements within uncompetitive areas.

- Ensures that units subject to mitigation only at minimum level needed to resolve congestion on uncompetitive constraints in AC run.
  - May change mix of units mitigated, but would not substantially increase overall capacity actually subject to mitigation.
This base case example illustrated how virtual supply bids can undermine LMPM if included in current LMPM procedures.

- In CC run, market bids are used to establish competitive baseline with only competitive constraints enforced.
- Highest bid accepted in CC run set “floor” for each unit’s mitigated bid in AC and IFM.
Illustrative Example of New Option B: Use Mitigated Bids in AC Run & Protect CC Schedules

- **Base Case Example**
  - Illustrate problem if virtual supply included in LMPM under current framework for AC run.

- **Illustrative Example of Alternative Approach for AC Run**
  - Example uses same data in Base Case
  - Illustrates impact of making two changes in AC Run:
    - Protect CC schedules of each unit in AC run with negatively priced bid
    - Apply mitigation to bids using DEBs for physical supply prior to AC run
      - Bids for units not dispatched in CC run are minimum of (a) DEB or (b) market bid.
      - For units dispatched in CC run, highest unmitigated bid accepted in CC run is used as “floor” for mitigated bid for remaining capacity.
In AC run, non-competitive constraints are also enforced.

Market is cleared using unmitigated bids.

In this example, the relatively high priced virtual supply bid in local constrained area is dispatched in AC run to mitigate congestion on uncompetitive paths.

Other physical units with high market bids (but relatively low DEBs) are not dispatched in AC run and therefore not subject to bid mitigation.
In IFM, the relatively high priced (unmitigated) virtual supply bid sets LPM in local constrained area.
Potential DEB-based LMPM – CC Run

CC run same as current LMPM approach:
- Units dispatched in merit order based on unmitigated bid price.
- Highest bid accepted in CC run set “floor” for each unit’s mitigated bid in AC and IFM.

However, unlike current LMPM, dispatch levels in CC are “protected” in AC run with negative priced bids (see next slide)
Potential DEB-based LMPM – AC Run

Mitigated bids used in AC run with uncompetitive constraints enforced:

- Negatively priced CC schedules minimize mitigation:
  - Units in constrained area are dispatched up over only as needed to relieve congestion on non-competitive constraint.
  - Outside of constrained area, units with lower DEBs not dispatched up in AC run.
Only Unit C has mitigated bids used in IFM.

Higher priced virtual supply does not set LMP in local constrained area.

Lower priced virtual supply still free to “compete” with physical supply in CC run, AC run and IFM.
Conclusions/Recommendations

- Two viable approaches for LMPM under convergence bidding:
  - Continuation of current approach (forecast load and physical supply)
  - New Approach B (Use mitigated bids and protect CC run schedules in AC run)

- DMM recommends further consideration of new approach, especially as way of complying with FERC directive to base LMPM on bid-in demand within 3 years of MRTU start-up.