California Independent
System Operator Corporation

Potential Changes in Market Design Rule

Limiting the Pool of Resources Considered in Integrated Forward Market

Department of Market Monitoring

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Introduction

California Independent System Operator (ISO) is considering modifying a current market rule which limits the pool of bids considered in the Integrated Forward Market (IFM) to resources that are dispatched in the Local Market Power Mitigation (LMPM) procedures run prior to the IFM (ISO Tariff Section 31.2). This whitepaper reviews the initial rationale for this current market rule, along with the reasons for the potential change under consideration by the ISO. The paper is designed to provide a framework for input on this potential market rule change from stakeholders and the ISO Market Surveillance Committee (MSC). Further discussion of this issue and some quantitative analysis of the potential impact of this rule change based on test cases performed on the ISO IFM software will be provided at the MSC meeting on June 17, 2009.

Background

The ISO's new market design includes a mechanism for mitigating local market power in the Integrated Forward Market (IFM) through a series of pre-IFM Local Market Power Mitigation (LMPM) procedures. Under these pre-IFM LMPM procedures, the ISO's IFM market model is first run with only Competitive Constraints (CC) enforced. A second run of the IFM market model is then performed with All Constraints (AC) enforced (including both competitive and non-competitive constraints). Units that are dispatched to a higher level in this second AC run are then subject to bid mitigation. These pre-IFM runs are made using forecasted demand. A more detailed description of these pre-IFM LMPM procedures is provided in the ISO's February 9, 2006 MRTU Filing.[1]

Under the ISO's current market design, the pool of bids considered in the Integrated Forward Market (IFM) is limited to units that are "dispatched" in the pre-IFM Market MPM runs (ISO Tariff Section 31.2). Specifically, the pool of resources committed in the AC run of the MPM process form the pool of resources that is available for commitment in the IFM (ISO Tariff Section 31.2).

The rationale for limiting the pool of resources considered in the IFM in this manner is to avoid the potential for relatively high priced unmitigated bids to be dispatched and set prices in the IFM. In theory, this may occur due to fact that the IFM market optimization minimizes total *bid costs*, rather than *total cost paid* (i.e.,. market clearing quantities × market clearing prices). This creates the potential for a scenario in which *bid cost minimization* when applied to clearing bid-in demand in the IFM (as opposed to forecasted load, which the mitigation was based on) would result in a relatively small

[1] See *Prepared Direct Testimony of Keith Casey*, included as Attachment K (Exhibit No. ISO-6) of the ISO's February 9, 2006 MRTU Filing, *http://www.caiso.com/1798/1798f7656580.pdf*.

quantity of high priced unmitigated bids being dispatched and setting LMPs in the IFM – thereby raising overall costs.

In other cases, however, limiting the pool of units considered in the IFM to resources dispatched in the AC run could raise overall costs in the IFM by preventing lower priced unmitigated bids from being dispatched. For instance, this could occur if bid-in demand in the IFM was significantly higher than the ISO forecast of demand that was used in the pre-IFM MPM procedures.[2] Under this scenario, limiting the pool of units considered in the IFM to units being dispatched in MPM runs could result in high prices if a relatively extreme re-dispatch of resources was necessary to meet the higher level of demand bid into the IFM. However, if the pool of resources available in the IFM was not limited to those resources dispatched in the AC run, lower-priced resources may be available to meet bid-in demand in the IFM.

The potential advantages and disadvantages of limiting the pool of units available in the IFM was discussed and considered as part of the MRTU design process. It was decided that, on balance, it would be appropriate to include this limitation in the initial market design, but that the ISO would monitor the impacts of this rule and be prepared to eliminate the limitation if it was determined that this would improve overall market performance. Given this approach, the MRTU software was designed with a feature that can be set to remove this limitation on bids considered in the IFM without the need to develop any additional software enhancements.

Analysis of Impact of Market Performance

Now that the ISO's new market design has been in effect for over two months, the Department of Market Monitoring (DMM) has been able to perform some empirical analysis to better assess the potential risks and benefits of removing the restriction on resources considered in the IFM.[3] Preliminary results of this analysis suggest that removing this restriction may generally result in a slight reduction in overall prices and costs in the IFM, with minimal risk of higher prices under some scenarios. At the same

[2] Forecasted load (rather than bid-in demand) is used in the pre-IFM MPM runs for two reasons: (1) to accurately determine the appropriate level of dispatches for Reliability Must run (RMR) units needed for local reliability, and (2) determine local market power mitigation for non-RMR units. See *Prepared Direct Testimony of Keith Casey*, included as Attachment K (Exhibit No. ISO-6) of the ISO's February 9, 2006 MRTU Filing, (pp. 32) *http://www.caiso.com/1798/1798f7656580.pdf*.

[3] Concerns about the potential effects of the market rule limiting the pool of units considered in the IFM were raised to DMM with regard to IFM results for April 30. On this day, the load clearing the IFM within the SDGE LAP was significantly higher than the ISO's day ahead load forecast used in the pre-IFM MPM runs. During the peak hours of April 30, the ISO's load forecast for the SDGE LAP was about 3.5% (or 95 MW) less than the amount of energy clearing the IFM and actual loads. On this specific day, IFM prices for the SDGE LAP initially posted by the ISO reached $200/MWh for multiple hours. However, analysis by the ISO has subsequently determined a different cause for these high prices, namely a software error in treatment of forbidden regions in the IFM.[3] Analysis by DMM also explicitly eliminated limitation placed on bids considered in the IFM as a cause of the high prices.[3]

time, however, initial analysis suggests that removing this restriction may in some cases cause a significant increase in the execution time of the IFM software and create some increase in the potential for the software to fail to meet the required level of optimality within the solution time allotted for execution.

In order to empirically assess the potential impacts of either maintaining or eliminating the rule, DMM re-simulated the IFM for numerous days *with* and *without* this limitation in effect. Market performance under these alternative market scenarios is being compared in terms of a variety of measures or criteria, including:

- Average LMPs by LAP
- Total IFM market costs (including Ancillary Services and any Bid Cost Recovery payments for units committed through the IFM).
- Changes in the number of resources committed in the IFM that would result if the pool of units considered in the IFM was not restricted to resources dispatched in the MPM runs.[4]

In addition, results will be used to assess operational difficulties that might be caused due to increasing the execution time of the IFM software, and the impact this may have on failing to meet the required level of optimality within the solution time allotted for execution of the IFM software.

Result of this analysis will be presented at the MSC meeting on June 17, 2009.

Next Steps

The next steps for advancing this potential market design change are as follows:

- This issue will be discussed at the June 17 MSC meeting.
- Stakeholders may submit any initial written comments on this issue by June 24, 2009.
- Based on results of further analysis of the market and operational impacts of this rule change, along with input from stakeholders and the MSC, the ISO will seek to issue draft recommendation on this issue by July 2, 2009.
- The ISO is tentatively planning on holding a stakeholder conference call to discuss any draft recommendation on July 7, 2009.
- Approval to file a tariff modification to remove the limit on bids considered in the IFM to resources clearing the AC run may be sought at the ISO Board of Governors Meeting on July 20-21, 2009.

[4] Specifically, results were compared to identify units that were *not* committed in MPM that would be committed in the IFM if these units had been in the pool of units considered in the IFM, and units that were committed in the MPM and IFM with the restriction in place that would *not* have be committed if the pool of units considered in the IFM had *not* been restricted.

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