

Memorandum

To: ISO Board of Governors

From: Keith Casey, Vice President, Market & Infrastructure Development

Date: July 6, 2011

Re: **Decision on Local Market Power Mitigation Enhancements**

This memorandum requires Board action.

EXECUTIVE SUMMARY

The California Independent System Operator Corporation includes market power mitigation provisions in its market design to ensure that no market participant has the ability to unilaterally influence the price of energy. This memorandum describes proposed changes to the local market power mitigation rules set forth in the ISO tariff and requests ISO Board of Governors approval for a necessary filing with the Federal Energy Regulatory Commission. These changes would:

- Meet the requirement set forth in the September 21, 2006 FERC order to base the market power mitigation on *bid-in demand* rather than the current practice of using *forecast demand*;
- Incorporate design elements to reflect the implementation of convergence (virtual) bidding and new demand response resources;¹
- Improve the accuracy of bid mitigation in both the day-ahead and real-time markets; and
- Incorporate *dynamic competitive/non-competitive path designation* into the LMPM process in place of the current practice of using a more static seasonal designation.

¹ The webpage containing all the documents related to convergence bidding can be found at <http://caiso.com/1807/1807996f7020.html>; demand response at <http://caiso.com/1893/1893e350393b0.html>

Requirement to use bid-in demand

In 2003, as part of its new market design filing with FERC, the ISO filed proposed new local market power mitigation measures. The ISO needed these measures to mitigate the potential exercise of local market power in transmission-constrained areas under the new market design. In the day-ahead market, the mitigation was based on forecast demand rather than the demand that was bid into the market. The mitigation was based on forecast demand at that time to address technology limitations and to determine requirements for *reliability must-run resources*² based on forecast demand. FERC issued an order that approved the proposal, but required the ISO to transition from using forecast demand to bid-in demand as the basis for applying market power mitigation no later than three years after the new market start up. Based on that order, the ISO must implement this change by April 2012. Approval of this enhancement will ensure that the ISO meets the FERC requirement.

Convergence bidding and demand response

Since the inception of the new market in April 2009, the ISO has implemented additional functionality to allow demand response resources to participate in the market and to allow market participants to take financial positions through convergence bidding. Currently, the ISO excludes consideration of convergence (or virtual) bids and demand response bids from the market power mitigation process because, under the current design, these bids could potentially undermine the local market power mitigation process. Management's proposed changes to the methodology for mitigating market power incorporates consideration of convergence bidding and demand response in a manner that does not undermine the effectiveness of the mitigation.

Dynamic competitive path assessment

The Department of Market Monitoring currently uses a seasonal competitive path assessment to determine whether specific transmission paths are competitive or non-competitive. A transmission path is deemed non-competitive if fewer than three resources can relieve congestion on that path. The ISO is proposing to move from a seasonal assessment to a dynamic competitive/non-competitive path assessment each time the mitigation process is executed. The proposed changes include assessing transmission path competitiveness within the market software. Doing so will allow the ISO to run the path assessment and mitigation measures prior to each 15-minute real-time, pre dispatch run to determine the set of mitigated and unmitigated bids for the 5-minute real time market. To accommodate development time for the new functionality and to minimize implementation risks, the dynamic path assessment and associated bid mitigation changes will be implemented in two

² A reliability must-run resource is a generator that the ISO determines to be needed on line to meet reliability requirements. This includes (1) generation needed to meet NERC/WECC reliability requirements (2) generation needed to meet load in constrained areas, and (3) generation needed to provide voltage support. In 2011, there is only one resource designated as reliability must run.

phases. Additional background and discussion of this issue is provided in DMM's board memo.

Mitigation execution time and frequency in real-time

By implementing the proposed enhancements to the local market power mitigation process, the ISO can reduce the overall mitigation process execution time. This will allow the ISO to accommodate the proposed dynamic competitive path assessment, and run the mitigation process in sync with this assessment. The proposed mitigation method is more targeted to those resources that are identified as having local market power and therefore is more accurate. In addition, when real-time mitigation is ultimately implemented, the improvements from using more current market and system information will result in more accurate mitigation.

Management proposes the following motion:

Moved, that the ISO Board of Governors approves the proposed tariff change regarding the enhancements to local market power mitigation, as detailed in the memorandum dated July 6, 2011, and;

Moved, that the ISO Board of Governors authorizes Management to make all necessary and appropriate filings with the Federal Energy Regulatory Commission to implement the proposed tariff change.

DISCUSSION AND ANALYSIS

Background

The current automated market power mitigation process has one main purpose: to determine the circumstances where a supply resource can exercise local market power, meaning that it could potentially manipulate the price in its local area by controlling supply. In its current design, the ISO runs its local market power mitigation process before the day-ahead market and as part of the hour-ahead scheduling process for the real-time market. Each of these processes results in a bid curve³ that is then considered in the market runs. In the day-ahead timeframe, for example, scheduling coordinators submit bids and self schedules, which are validated by the ISO before beginning the local market power mitigation process. The bids are evaluated for market power in two passes. In the first pass, the *competitive constraints run*, the software uses the competitive transmission paths to clear supply against forecast demand. Transmission paths are deemed competitive if there are three or more suppliers that are able to resolve a constraint on the path. The results are then used in the second pass, the *all constraints run*. In this pass the

³ A bid curve represents MWh output levels and associated prices at which a supplier is willing to supply energy.

software uses a network model that has all transmission constraints enforced (not just those deemed competitive) and clears supply against forecast demand. Any resource that has an increase in its dispatch level between the competitive constraints run and the all constraints run potentially has the ability to exercise local market power and, as a result, its bids will be mitigated. Mitigation means that the software will modify these resources' energy bid curves to the lower of their default energy bids⁴ or their day-ahead market bids. The resulting mitigated bid curves are then used in the applicable market run.

As mentioned above, the current local market power mitigation process uses a forecast of internal demand rather than submitted demand bids. In its 2006 order, FERC recognized that the ISO was unable to implement its current local market power mitigation provisions with bid-in demand at the start of the new market. They directed the ISO to revise its process to use bid-in demand within three years of the new market start up to reduce the likelihood of over-mitigation on suppliers.

In considering how to comply with this requirement, the ISO has examined how virtual bids should be evaluated in the local market power mitigation process. Although the ISO is not proposing to mitigate virtual bids, the implementation of virtual bidding triggers two concerns with the current process. First, bid-in demand will include virtual demand bids in the local market power mitigation process, so there is an increased likelihood that the unmitigated supply bids could determine the locational marginal prices. That is, if a large amount of demand clears due to the addition of virtual demand bids, then unmitigated supply bids may be needed to meet this additional demand. Similarly, since virtual supply bids do not have default energy bids associated with them, a virtual supply bid can potentially "crowd out" a physical supply bid, which has higher bid prices but lower default energy bids than the virtual supply bid. A physical resource can systematically bypass local market power mitigation in this way. To address this issue, the ISO has proposed a market power mitigation enhancement that is able to identify the physical resource for mitigation without mitigating the virtual bid.

There are additional benefits the ISO will be able to incorporate with the proposed changes to the local market power mitigation measures. As mentioned above, the current process has two pre-market passes – the competitive constraints run and the all constraints run. Each of these market runs uses ISO system resources and processing time. The proposed enhancement would streamline the process into one market run, and reduce the overall mitigation process execution time. This would allow the ISO to accommodate a dynamic competitive path assessment. The bid mitigation process will be executed in sync with the dynamic competitive path assessment which will provide more accurate information for the system to make mitigation decisions.

⁴ The ISO maintains default energy bids for all generating units that are calculated using a variety of methods designed to reflect a reasonable competitive bid for each generating unit. These default energy bids are used in the local market power mitigation procedures.

Both the current and proposed mitigation processes require a distinction between competitive and non-competitive transmission paths in order to identify local market power and apply targeted mitigation. When a transmission path becomes congested, there will generally be a change in prices on either side of that path, with prices on the congested side being higher. A transmission path is competitive if there is adequate supply of generation that can provide congestion relief. Currently, the Department of Market Monitoring performs the competitive path assessments four times a year through an off-line study that considers a range of system conditions that may be faced when the resulting path designations are used for mitigation.

Performing the competitive path assessment months prior to using the results in the market execution involves a high degree of unknown circumstances that require employing assumptions to overcome. Moving the competitive path assessment into the market software so that it captures the most up to date information about resource and system conditions reduces the number of assumptions that must be made and improves the accuracy of the resulting competitive assessment.

Local market power mitigation enhancements proposal

Locational marginal price decomposition methodology

Management's proposal uses a new mechanism to determine which bids to mitigate in the local market power mitigation process that is called *locational marginal price decomposition*. The locational marginal price is the cost of serving the next increment of demand at a specific location and is made up of three components: energy, losses and congestion. The locational market price decomposition methodology separates the congestion component into two parts, including the congestion due to constraints on competitive transmission paths and congestion due to constraints on non-competitive transmission paths. This is important because if congestion occurs on non-competitive transmission paths, some resources could have local market power and require mitigation.

The locational market price decomposition methodology considers both physical and virtual bids. When a resource provides a bid into the market, the non-competitive congestion component of the locational market price at that resource's location is evaluated. If a physical resource has potential for local market power due to non-competitive congestion, its bid is mitigated in the market run. However, as with the current methodology, virtual bids will not actually be mitigated under the locational market price decomposition methodology.

Reliability must-run dispatch

Since the local market power mitigation enhancements will require the use of bid-in demand rather than forecast demand, the current mitigation process cannot be relied on to dispatch reliability must-run resources at the level necessary to meet reliability needs and to address non-competitive constraints.

Due to the dramatic reduction of reliability must-run units in 2011, the ISO has concluded that the most efficient solution to this problem from both process and resource perspectives is to provide for manual reliability must-run dispatch. Under this proposal, if ISO operators believe that a reliability must-run unit needs to be committed they will issue a manual reliability must-run dispatch.

Dynamic competitive path assessment methodology

The dynamic competitive path assessment will test each binding constraint in the associated market run to evaluate competitiveness. This test, known as *the pivotal supplier test*, involves removing the three largest suppliers (defined in terms of amount of congestion relief capabilities) and testing to see whether the remaining supply can relieve congestion on the transmission path in question. If the remaining supply cannot relieve the congestion, the three largest suppliers are considered “pivotal” (i.e., needed for congestion relief on that path) and the path is deemed non-competitive. The residual supply calculations will take into account the most current resource and system conditions, the effectiveness of each resource to relieve congestion on the path, the impact of convergence bids on the ability to exercise market power, and changes in operational and bidding control of physical resources within each portfolio.

Dynamic competitive path assessment implementation schedule

The proposed dynamic competitive path assessment is to be implemented in two phases because of the complexity surrounding the implementation of the real-time changes. The first phase will be implemented in the Spring of 2012 along with the local market power mitigation enhancements and will include a dynamic competitive path assessment in the day-ahead market only. For the day-ahead market, a transmission path will be determined to be non-competitive only if it fails the pivotal supplier test, rather than by default. Because the dynamic competitive path assessment will not be applied in the real-time market in the first phase, the current approach using static path assessments will be applied in the real-time market. Under the static path designation approach, each transmission path is deemed non-competitive by default unless it is tested and passes the current seasonal pivotal supplier test.

The second phase will be implemented before the end of 2012 and will add two dynamic competitive path assessments in the real-time market; one in the hour-ahead scheduling process and a second in the 15-minute pre-dispatch process.

Hour-ahead scheduling process - The static seasonal path designations used in the hour-ahead scheduling process will be replaced with competitive path designations generated by a dynamic assessment performed in the hour-ahead scheduling process. Under the dynamic assessment approach, each path will be considered competitive unless it is tested and fails the pivotal supplier test. Bid mitigation resulting from this run will be applied to all subsequent market runs until the 5-minute real time market dispatch. This includes the financially binding intertie dispatch for energy and ancillary services from the hour-ahead scheduling process, as well as subsequent short term unit commitment and real-time procurement of ancillary services from internal resources.

15-Minute pre-dispatch process - There will be an additional dynamic competitive path assessment applied in each 15-minute real-time pre-dispatch run just prior to the 5-minute real-time market dispatch. It is this additional assessment and mitigation that provides the additional accuracy in the real-time mitigation process since they are evaluated very close to the 5-minute real-time market where market power would be exercised. As with the hour-ahead process, a transmission path will be considered competitive unless it is tested and fails the pivotal supplier test. The proposed local market power mitigation also will be applied after this market run and utilize the more current competitive path designations. All real time bids will be re-evaluated at this stage. Bid mitigation resulting from this run will be applied to the balance of the trade hour starting with the 15-minute period for which the mitigation run applies.

Market Surveillance Committee opinion

The Market Surveillance Committee supports Management's proposal. The opinion of the Market Surveillance Committee is attached.

POSITIONS OF THE PARTIES

Stakeholders generally support the proposal; however, there were requests for additional information and examples describing how the locational marginal price decomposition methodology works in practice. Additional studies were provided to enable stakeholders to evaluate the proposal in more detail.

Some stakeholders urged the ISO to commit to implementing the dynamic competitive path assessment in parallel with the local market power mitigation enhancements. The driver for implementing this proposal is the September 21, 2006 FERC order requiring the use of bid-in demand by April 2012. However, the ISO has committed to implementing the dynamic competitive path assessment simultaneously if possible, or as soon as possible thereafter if it is not possible to implement the changes simultaneously.

Some stakeholders have argued that the current phased approach for implementing the dynamic competitive path assessment will result in a higher number of non-competitive paths and more mitigation. Based on staff analysis, Management believes the current phased implementation plan for a dynamic competitive path assessment, coupled with the enhanced local market power mitigation based on locational market price decomposition, will produce more accurate and less frequent bid mitigation than the current mitigation procedures. Therefore, we recommend this approach over deferring both mitigation changes until they can be implemented simultaneously.

Additional information regarding stakeholder comments is provided in the attached stakeholder matrix.

MANAGEMENT RECOMMENDATION

Management recommends that the Board approve the policy to implement enhancements to local market power mitigation and modify tariff provisions as outlined in this memorandum and authorize Management to make all necessary and appropriate filings with FERC to implement the proposed tariff change.