

Memorandum

To: ISO Board of Governors
From: Eric Hildebrandt, Director, Market Monitoring
Date: May 8, 2013
Re: **FERC Order No. 764 Market Design Changes**

This memorandum does not require Board action.

EXECUTIVE SUMMARY

The Department of Market Monitoring (DMM) strongly supports Management's proposed market design changes stemming from FERC Order No. 764. As described in Management's memo on this topic, these market design changes are designed to more effectively and efficiently integrate larger amounts of renewable variable energy resources into the ISO system.

A key feature of these changes is the establishment of financially binding 15-minute energy schedules and prices for all resources, including those within the ISO systems as well as imports and exports on interties with other balancing areas. DMM expects this to increase market efficiency by creating price signals that more closely reflect the value of intertie schedules that can be changed over the operating hour and provides an incentive for more resources to transition to providing 15-minute scheduling flexibility. Settling internal and intertie schedules (including virtual bids) at 15-minute market prices will also help to significantly reduce real-time energy imbalance offset charges.

DMM worked closely with the ISO and stakeholders in developing these market design changes. Management's final proposal includes several key modifications made to address concerns identified by DMM. While Management's proposed changes will greatly enhance market performance, DMM cautions that large real-time revenue imbalances could still accrue when real-time congestion occurs and transmission limits are adjusted downward after the day-ahead market to account for unscheduled flows. Thus, it will remain important for the ISO to continue efforts to improve modeling of power flows, so that the need to reduce flows in real-time by adjusting constraint limits downward is reduced.

BACKGROUND

In June 2012, FERC approved Order No. 764, which is designed to remove barriers to the integration of variable energy resources by requiring every transmission provider to allow adjustment of energy schedules between balancing areas every 15 minutes, rather than allowing only hourly scheduling on interties. The ISO views Order No. 764 as an opportunity to implement real-time market changes that were not possible before this order. These changes include establishment of a 15-minute market for scheduling and settlement of all resources, including those within the ISO, as well as imports and exports on interties with other balancing areas. Establishing this type of 15-minute market allows the ISO to address some of the fundamental market inefficiencies that led to high real-time energy imbalance offset costs and the suspension of virtual bidding on interties in December 2011.

Management's final proposal includes several key modifications made to address concerns identified by DMM. We strongly support Management's proposed changes and expect them to more effectively and efficiently integrate larger amounts of renewable variable energy resources into the ISO system, while enhancing overall real-time market performance and efficiency. The remaining sections of this memo provide DMM's comments on the main benefits and components of Management's proposed changes.

HOURLY INTERTIE SCHEDULES

We strongly support the portion of the ISO proposal regarding settlement of hourly intertie schedules that are not dispatchable on a 15-minute basis. Under the ISO proposal, imports and exports have the option of continuing to be bid and scheduled on a fixed hourly basis as part of an hour-ahead scheduling process. These bids are also referred to as *hourly block* resources, since if these bids are accepted they must be scheduled at the same fixed quantity for the entire operating hour. Fixed hourly schedules resulting from this process will be settled based on prices that are determined through the dispatch process that is performed every 15 minutes throughout the operating hour. Bid cost recovery will not be paid if these 15-minute prices fail to cover the bid price of fixed hourly transactions.

DMM strongly supports this approach since it creates appropriate price signals that more closely reflect the different value of fixed hourly-block schedules relative to flexible interties schedules that can be adjusted on a 15-minute basis. This also provides an incentive for more suppliers to transition to providing 15-minute scheduling flexibility. We believe this is important to help achieve the long-term goal of these market design changes of more effectively and efficiently integrating larger amounts of renewable variable energy resources into the ISO system.

Under the ISO's proposal, hourly block schedules can incorporate the risk of 15-minute market prices exceeding their costs into their hourly bid prices. Bids for hourly block imports will be exposed to the risk of 15-minute market prices settling below the hourly block advisory price. These incremental imports can raise their bid price in order to hedge themselves against this risk.

As noted in the MSC's opinion, while the introduction of 15-minute scheduling without price guarantees for fixed hourly schedules represents a significant operational and market change, experience at other ISOs and RTOs indicates that these changes can be effectively managed by market participants and the ISO. These same market features have been in place at the PJM and the Midwest ISO for around 8 years. Therefore, DMM also believes that these market features can be successfully implemented in California. However, DMM concurs with the MSC that the impacts of these changes will need to be analyzed by the ISO following implementation.

Finally, DMM has noted that providing bid cost recovery for imports and exports would essentially re-instate the same "bid or better" settlement rules for hourly intertie schedules that led to over \$33 million in uplift cost from the time these rules were implemented on October 1, 2004 until the time they were changed on March 25, 2005 through the filing of Amendment 66 to the ISO tariff.¹ As explained in the ISO's Amendment 66 filing, these uplifts inevitably result when real-time prices are either higher or lower than the projected or advisory prices used to clear the hour-ahead market. A very large portion of this uplift was paid for off-setting import and export bids (by the same or different participants) that provided no net energy to the ISO system.

REAL-TIME IMBALANCE OFFSET COSTS

The real-time imbalance offset charge is the difference between the total money paid out by the ISO and the total money collected by the ISO for energy settled at hour-ahead and 5-minute market prices. In the past, high real-time energy imbalance offset charges have resulted when large volumes of energy on interties have been bought back in the hour-ahead market at relatively low prices, and then replaced by purchases of additional energy from resources within the ISO system in the 5-minute real-time market at higher prices. These revenue imbalances are allocated to load-serving entities based on measured demand.

Under the proposed changes, most real-time transactions on interties and resources within the ISO will be scheduled and settled based on the same 15-minute market process. This should significantly reduce revenue imbalances allocated through real-time energy imbalance offset charges by essentially eliminating the difference in prices

¹ See Amendment 66 tariff filing, March 23, 2005, available on ISO website at: http://www.caiso.com/Documents/Req_ExpeditedConsideration_ShortenedCommPeriod.pdf

used to settle intertie transactions and 5-minute prices currently used to settle energy from resources within the ISO.

However, high real-time imbalance offset charges can also result from differences in congestion prices and flows on interties between the day-ahead and real-time markets. Thus, despite the proposed market improvements, large real-time revenue imbalances could still occur if transmission limits are adjusted downward after the day-ahead market to account for unscheduled flows when congestion occurs. This creates offset costs by reducing the volume of energy flows in the real-time market over congested constraints. It will remain therefore important for the ISO to continue efforts to improve modeling of flows in these two markets, so that the need to reduce flows in real-time by adjusting constraint limits downward is reduced.

VIRTUAL BIDDING

The ISO is proposing to re-implement virtual bidding on interties 12 months after these market design changes are implemented. DMM believes this is a prudent approach given the significant nature of the market design changes being proposed and the past experience with virtual bidding in the ISO market.

Under Management's proposal, when virtual bidding on interties resumes, all virtual bids on interties and internal locations within the ISO will all be settled at the 15-minute prices. This eliminates the problem that led to high real-time energy revenue imbalance costs and the suspension of virtual bidding on inter-ties in late 2011.²

However, DMM cautions that virtual bidding on interties could still inflate uplift cost from real-time revenue imbalances that stem from differences in congestion and flows on interties between the day-ahead and real-time markets. As discussed in DMM's 2012 annual report, this occurs when constraint limits need to be adjusted downward in the real-time market to account for unscheduled flows not incorporated in the day-ahead market model. Thus, DMM has recommended the ISO carefully consider this issue and that if virtual bidding on interties is re-implemented this be done in a very limited and gradual manner that is contingent on the observed performance of this new market design.

SCHEDULING OF VARIABLE ENERGY RESOURCES

The proposed changes allow variable energy resources to reserve hourly intertie transmission capacity to accommodate fluctuations in these resources' 15-minute

² As described in DMM's 2011 annual report, this problem was created by the fact that virtual bids at inter-ties were settled on hour-ahead prices, while virtual bids at internal locations were settled at 5-minute prices. For further detail see the *2011 Annual Report on Market Issues and Performance*, Department of Market Monitoring, April 2012, pp. 77-79: <http://www.caiso.com/Documents/2011AnnualReport-MarketIssues-Performance.pdf>.

schedules. This represents a key provision of the proposal aimed at removing barriers to the integration of variable energy resources.

Hourly transmission capacity reserved for variable energy resources will either become financially binding or released for other resources in the 15-minute market. However, this has the potential to allow transmission reservations for variable energy resources to displace intertie resources with fixed hourly schedules. Consequently, DMM has recommended that the ISO retain the authority to utilize its own forecast of the output of a variable energy resource if schedules submitted by these resources appear to be systematically inaccurate and create detrimental market impacts.

CONCLUSION

DMM strongly supports Management's proposed market design changes stemming from FERC Order No. 764. These market design changes should help to more effectively and efficiently integrate larger amounts of renewable variable energy resources into the ISO system. DMM worked closely with the ISO and stakeholders in developing these market design changes. Management's final proposal includes several key modifications made to address concerns identified by DMM. As with any major market design change, it remains important to continually monitor and reassess the effectiveness of these market design changes as they are implemented and adjust rules as needed in response to actual market performance.