

**UNITED STATES OF AMERICA  
BEFORE THE  
FEDERAL ENERGY REGULATORY COMMISSION**

**California Independent System  
Operator Corporation**

**Docket Nos.   ER06-615-\_\_\_\_  
                  ER02-1656-027  
                  ER02-1656-029  
                  ER02-1656-030  
                  ER02-1656-031**

**REPORT OF THE CALIFORNIA INDEPENDENT SYSTEM OPERATOR  
CORPORATION ON POTENTIAL BENEFITS OF MULTI-SEGMENT BIDDING  
FOR ANCILLARY SERVICES**

**I.     Introduction and Background**

The California Independent System Operator Corporation (the ISO) hereby submits this report on the benefits of multi-segment bidding for ancillary services.<sup>1</sup> Multi-segment bidding for ancillary services allows scheduling coordinators to bid different quantities of an ancillary service from a resource with corresponding prices, which vary with differing levels of the resource's output. This feature would allow scheduling coordinators to submit bids that reflect variable costs to provide ancillary services from different operating levels of a resource. This feature could also potentially lead to more efficient awards of ancillary services by allowing the ISO to consider the costs of reserving capacity at different operating levels. In this report, the ISO addresses these potential benefits and clarifies that scheduling coordinators may submit multiple ancillary services bid prices for a resource under the ISO's current market structure. This report also highlights a number of factors that the ISO would need to consider in any examination of whether to design and implement multi-segment bidding for ancillary services.

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<sup>1</sup> The Commission directed the ISO to prepare and file a report on the potential benefits of including multi-segment bidding for certain ancillary services. *California Independent System Operator Corp.* 116 FERC ¶ 61,274 (September 2006) at P 341 and ordering paragraph H.

**II. Scheduling coordinators may receive different market clearing prices for an ancillary service award at different operating levels with a single segment ancillary service bid**

In comments responding to the ISO's proposed tariff changes to implement the new market, Powerex argued that the ISO should revise tariff section 30.5.2.6 to allow market participants to submit ancillary services bids that consist of a multi-segment price/quantity curve, rather than limiting these bids to a single bid segment. ISO tariff section 30.5.2.6 provides that the bid for each ancillary service is a single bid segment. Powerex argued that bid curves or multi-segment bids allow scheduling coordinators to submit bids that reflect the marginal variable production costs at various resource output levels. Powerex asserted implementing multi-segment bidding for ancillary services would provide scheduling coordinators with more flexible opportunities to accurately signal the availability of their resources and offer more capacity for ancillary services, when that capacity cannot be made available except at higher prices. Powerex proposed that this market feature would facilitate more accurate evaluation of the characteristics of the underlying resources and the value of the ancillary service capacity at each MW-level, which will ultimately foster more efficient dispatch of ancillary services.

At the time, the ISO explained that Powerex's proposal created unnecessary complications in connection with the launch of the ISO's new market. Ancillary services are unloaded capacity and the operating cost (\$/MW/h) of providing ancillary services should not depend on how much of the capacity is unloaded or at what level the resource is operating, particularly considering that scheduling coordinators can specify start-up and minimum load costs separately. The ISO further explained that the main cost variation to keep more or less capacity unloaded

is the “opportunity cost” of energy, which is the lost value of the unloaded capacity, if the capacity were scheduled for energy.

The ISO’s market design accounts for this opportunity cost through energy and ancillary services co-optimization. The energy bid curve, which is not restricted to a single segment, is reflected in the opportunity cost of providing ancillary services capacity instead of energy. Ancillary services marginal prices include the opportunity cost of the marginal resource. Accordingly, providing a single segment economic bid for ancillary services suffices to allow scheduling coordinators to receive different market clearing prices for an ancillary service award at different operating levels. Moreover, to the extent market participants seek to use multiple resources outside of the ISO’s balancing authority area to support an ancillary service award, market participants can register multiple intertie resource IDs to support different external resources providing ancillary services.<sup>2</sup> Under each resource ID, scheduling coordinators can submit single segment ancillary service bids independent of each other.

**III. Scheduling coordinators may submit multiple bid prices for ancillary services for a resource in the ISO’s current markets**

While the current ISO market does not allow for multi-segment bidding for ancillary services, market participants and the Commission should recognize that the ISO’s market structure allows a scheduling coordinator to submit multiple ancillary service bids into the ISO markets from the same resource. A scheduling coordinator may self-provide a portion of the capacity from a resource and submit economic bids for another portion of the resource’s capacity. Self-provided ancillary services are modeled as having zero bid prices and the ISO settles these schedules at the market

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<sup>2</sup> Appendix A of the ISO’s tariff defines the term *Resource ID* to mean: “Identification characters assigned by the CAISO to Generating Units, Loads, Participating Loads, Proxy Demand Resources, System Units, System Resources, and Physical Scheduling Plants.”

clearing price. Scheduling coordinators may also submit different bid prices for spinning and non-spinning reserves from the same resource. For example, if the scheduling coordinator believes the resource has different operating costs to provide ancillary service at different operating levels, a scheduling coordinator may submit a higher bid price for spinning reserve for a portion of a resource's capacity and a lower bid price for non-spinning reserve for another portion of the resource's capacity. The ISO notes that on-line resources may also bid non-spinning reserve into the ISO market. Also, a scheduling coordinator may submit a different bid price for the same resource in the real-time market based on the resource's day-ahead market ancillary service award. The bid price may reflect increased operating costs that the scheduling coordinator believes are associated with the providing ancillary services at a different operating level than the scheduling coordinator anticipated would support the resource's day-ahead award.

#### **IV. The procurement of ancillary service in the ISO market does not benefit from multi-segment bidding for ancillary services**

Typically, multi-segment bidding helps form a more granular supply curve (with a smaller MW volume at each segment of the supply curve compared to a single-segment bid price). This feature provides demand with information regarding the cost of supply in greater detail. If demand is price sensitive, demand will respond to the more granular information about the cost of supply by adjusting its demand curve accordingly. All else being equal, more granular information about the cost of supply will result in a better match between supply and demand and provide greater incentives for demand to respond to a price signal. Multi-segment bidding for ancillary services, therefore, can in theory benefit both supply and demand. On the other hand, if demand does not respond to price, demand cannot derive a benefit from multi-segment bids.

The ISO's ancillary service requirements are set based on applicable reliability standards. Currently, total contingency operating reserve (spinning and non-spinning) requirements equal the sum of 5 percent of hydro generation and 7 percent of thermal generation; 50 percent of this total is for spinning reserve and the other half is for non-spinning reserve.<sup>3</sup> The ISO determines its hourly regulation service requirements based on system conditions, including changes in the ISO's demand forecast, generation self-schedule changes, and hourly inertia fluctuation.<sup>4</sup> The price of supply for these ancillary services, however, is not a factor in determining these requirements. A more granular supply curve with a multi-segment bid price will not change the ISO's ancillary services procurement requirements. Instead, the supply curve bid segment on the margin, no matter what the MW size of the bid, will determine the ancillary service market clearing price.

**V. Any discussion of designing and implementing multi-segment ancillary services bidding in the ISO's market requires consideration of a number of factors.**

Any effort to design and implement multi-segment ancillary services bidding in the ISO's market will require consideration of a number of factors, including whether and how other organized electricity markets use multi-segment bidding for ancillary services as well as the actual costs and benefits for ISO market participants that would result from this effort.

Based on the ISO's research, it does not appear that other organized markets in the United States permit multi-segment bidding for ancillary services. The ISO

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<sup>3</sup> WECC Standard Bal-002-WECC-10 Operating Reserves requirement (a) (ii) <http://www.wecc.biz/library/Documentation%20Categorization%20Files/Regional%20Standards/BAL-STD-002-0.pdf>

<sup>4</sup> See ISO technical bulletin 2009-12-02 dated December 30, 2009 <http://www.caiso.com/Documents/TechnicalBulletin-ASProcurement-Regulation.pdf>

has contacted representatives of other organized electricity markets and has not received any indication that they intend to deploy multi-segment bidding for ancillary services.

As discussed above, the ISO market will not benefit from the implementation of multi-segment bidding for ancillary services. The introduction of multi-segment bidding will, however, create additional costs to ISO market participants. In order to allow for multi-segment bid prices for ancillary services, the ISO would need to modify existing software and provide training to market participants. Besides these immediate costs, multi-segment bidding for ancillary services may complicate the design of other products and thereby increase their implementation costs.

In addition, designing and implementing multi-segment bidding for ancillary services would displace available resources to work on other enhancements to the ISO's market. The ISO believes that its market participants need to assess these potential costs of pursuing a market enhancement, especially in a case in which ISO market will not benefit from the enhancement. In connection with the ISO's most recent market design initiative process, only one stakeholder supported development of multi-segment bidding for ancillary services.<sup>5</sup> The ISO will maintain this issue in its market design catalog and ask for additional stakeholder input in subsequent initiatives examining the catalog.

## **VI. Conclusion**

While some theoretical benefits exist for multi-segment bidding in a market, the ISO's market will not realize these benefits because the ISO does not establish

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<sup>5</sup> Final 2011 Market Design Initiatives Catalog at 25-26.  
<http://www.caiso.com/Documents/Final2011MarketDesignInitiativeCatalog.pdf>

ancillary service procurement requirements based on bid-in cost. Moreover, the ISO's current market design allows for multiple bid prices for ancillary services from a resource. The ISO market also generates market clearing prices with an embedded opportunity cost that reflect the operating cost of providing ancillary services at different operating levels. As such, the ISO market already contains features that scheduling coordinators seek through the introduction of multi-segment bidding for ancillary services. The ISO, however, will continue to examine the issue of whether to develop multi-segment bidding for ancillary services and accept stakeholder input through its market design initiative process.

Respectfully submitted,

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## CERTIFICATE OF SERVICE

I hereby certify that I have served the foregoing document upon the parties listed on the official service list in the captioned proceedings, in accordance with the requirements of Rule 2010 of the Commission's Rules of Practice and Procedure (18 C.F.R. § 385.2010).

Dated at Folsom, California this 16<sup>th</sup> day of March 2012.

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