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California Independent  
System Operator Corporation

**MRTU Market Power Mitigation:  
Proposal on Bid Caps for Start-Up and Minimum Load Costs**

**Department of Market Monitoring**

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### I. Introduction

Market rules incorporated in the CAISO's February 9, 2006, MRTU filing include two options for Generating Units<sup>1</sup> to specify their Start-Up and Minimum Load Costs. On a semi-annual basis, these resources may choose between the following two options:

- **Cost-Based.** This option will apply a formula which calculates start-up and minimum load costs for the resource based on resource operating characteristics (e.g., start-up fuel consumptions) and associated fuel costs;
- **Bid-Based.** A resource that selects this option must submit start-up and minimum load bids that will be in effect for six months. These bids need not be related to actual operating costs.

The CAISO's initial assessment was that extremely high start-up and minimum load bids under this second bid-based option would be deterred by the fact that since these bids would be in effect for a minimum six month period, a generator submitting such bids would run the risk of pricing a unit out of the market during many hours when it would be profitable to operate the unit. However, starting in late 2006, the Department of Market Monitoring (DMM) initiated a process of considering whether bids under the bid-based option should be subject to some type of cap in order to protect against the potential exercise of local market power through submission of very high start-up and minimum load bids.

A range of options for capping start-up and minimum load bids under the bid-based option were presented and analyzed by the Department of Market Monitoring (DMM) in an initial whitepaper issued on February 9, 2007 (February 9 DMM whitepaper) and in a supplemental whitepaper issued on May 15, 2007, (May 15 DMM whitepaper)<sup>2</sup>. Conference calls with stakeholders to discuss these two whitepapers were held in 2007. Written comments received in response to these papers and conference calls are posted on the CAISO website.<sup>3</sup> Input from the CAISO's Market Surveillance Committee (MSC) was also obtained at a February 13, 2007 meeting of the MSC.

This paper provides DMM's proposal for limiting start-up and minimum load bids that may be submitted under the bid-based option provided under the CAISO's MRTU market design. This proposal is designed to limit start-up and minimum load bids submitted on a semi-annual basis

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<sup>1</sup> This proposal applies to all resources eligible to submit start-up and minimum load bids under MRTU, which includes internal generation and non-dynamic and dynamic resource-specific system resources.

<sup>2</sup> *MRTU Market Power Mitigation: Options for Bid Caps for Start-Up and Minimum Load Costs*, Department of Market Monitoring, February 9, 2007 (<http://www.aiso.com/1b87/1b87a5451d380.pdf>)

*MRTU Market Power Mitigation: Options for Bid Caps for Start-Up and Minimum Load Costs*, Supplemental Addendum Department of Market Monitoring, February 9, 2007 (<http://www.aiso.com/1b87/1b87a5451d380.pdf>)

<sup>3</sup> Comments are posted on CAISO website at <http://www.aiso.com/1b98/1b98b6c33d8f0.pdf> (Williams) and <http://www.aiso.com/1b98/1b98b55235570.pdf> (WPTF).

under the bid-based option to approximately 300% of each resource's actual start-up and minimum load costs. The specific details of this proposal are provided in the following section.

## **II. DMM Recommendation**

### ***Proposed Option***

DMM's proposal is based on Option B initially described in the February 9, 2007 DMM whitepaper. As noted in DMM's initial whitepaper, the basic concept underlying this option is that start-up and minimum load bids for each unit would not be allowed to exceed some factor (e.g. 200 to 300 percent) of their actual projected start-up costs. . For gas fired units, the price of gas used to calculate start-up and minimum load bids would be based on forward prices for monthly gas contracts over the six month period for which the start-up and minimum load bid could not be modified by the participant.

DMM's May 15, 2007 whitepaper included a preliminary recommendation that the basic approach described above represented the best approach of the various options identified in DMM's initial whitepaper. However, three variations of this basic option were presented:

- ***200% of Projected Cost.*** Under this approach, start-up and minimum load costs for gas-fire units would be projected using the same unit specific operating characteristics submitted by generators used to calculate start-up and minimum load costs under the cost-based option (i.e. start-up gas consumption, minimum load heat rates, etc.). However, the gas price used in calculating start-up and minimum load costs would be based on the forward price of monthly gas contracts for the six month period for which the cap would be in effect, as described in more detail in Section III of this paper. Finally, the resulting calculation of start-up and minimum load costs would be multiplied by 200% to determine the maximum level of the start-up or minimum load bid (in \$) that could be submitted under the six-month bid-based option.<sup>4</sup>
- ***200% of Projected Cost based on Maximum Gas Futures Prices with Additional Cost Recovery Mechanism.*** Under this approach, if a unit owner submitted a start-up or minimum load bid that was capped at this 200% level, and – over the subsequent six month period in which this bid would remain in effect – spot market gas prices then increased to the point where the unit's actual start-up or minimum load cost exceeded this cap, then the owner could receive an additional payment covering the difference between the capped bid and the actual start-up or minimum load cost.
- ***300% of Projected Cost based on Maximum Gas Futures Prices.*** Under this approach, the limit on each unit's bid-based start-up and minimum load bid would be calculated in the same manner as under the first option, except that the unit's projected start-up and minimum load costs would be multiplied by 300% rather than 200%. As noted in the May 15 DMM whitepaper, the 300% level corresponds to the maximum impact threshold in effect in another ISO (MISO), as well as the maximum spike in gas prices that has occurred over the last five years (relative to the NYMEX futures prices in the preceding six months).

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<sup>4</sup> For non-gas fired units, an analogous limit would be established under which a generator would first submit cost-based start-up and minimum load calculations, and would then be subject to a limit of 200% of these costs under the bid-based option.

Based on additional analysis of these three options in DMM's May 15, 2007 whitepaper and input from stakeholders, DMM's final recommendation is to adopt the third of these options, under which start-up and minimum load bids would be limited to 300% of the unit's projected start-up and minimum load costs. Rationale for DMM's final recommendation is provided in Section II of this paper.

### ***Forward Gas Price Index***

Under the recommended approach, a specific formula would be established to determine the potential future price of gas over the period for which the unit's start-up or minimum load bid would be in effect. DMM recommends adopting the specific methodology described in DMM's May 15 whitepaper. Under this approach, gas prices used in calculating caps for gas-fired units would be based on the highest price for monthly gas contracts at Henry Hub for over the six month period for which the cap would be in effect.<sup>5</sup> In practice, the gas price to be used in this calculation would be re-calculated once a month – based on gas futures prices over a forward-looking six month period – and resource-specific or market-wide start-up and minimum load bid caps would be recalculated each month using the updated gas price. Any Scheduling Coordinator submitting a bid-based start-up or minimum load bid at any point in time would be subject to the most recent cap calculated by the CAISO.

In order to avoid significant impacts due to very short term (day-to-day) fluctuations in gas futures prices, this calculation could be performed based on the average of gas futures prices over a period of days (e.g. over the first three weeks of the month prior to the start of each six month period). Thus, under this approach, caps for SCs electing the bid-based option starting in each month ( $m$ ) would be based on the following equation:

$$\text{NYMEX}_m = \text{Max} (\text{AVG\_NYMEX}_m, \dots, \text{AVG\_NYMEX}_{m+6})$$

Where

$\text{AVG\_NYMEX}_m$  = the average closing price of the NYMEX gas futures contract at Henry Hub for month  $m$  during first 21 days of the month prior ( $m-1$ ) to the first month ( $m$ ) of the six month period for which the maximum monthly contract price is being calculated ( $m, m+1 \dots, m+6$ ).

For example, in order to calculate bid caps applicable for units starting under the bid-based option in February 2008, the average price of the six monthly NYMEX gas contracts at Henry Hub for the months February through June 2008 would be calculated using the daily closing

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<sup>5</sup> It may be noted that prices for gas contracts at Henry Hub may be somewhat lower on average than gas contracts for gas delivered to the California from other supply regions. However, DMM proposes to use prices for NYMEX contracts at Henry Hub since this is a more liquid and transparent market, but still has a high degree of price correlation with gas prices in California. In addition, as shown in the analysis presented in DMM's May 15 whitepaper, to the extent that price at Henry Hub may be lower than delivered gas prices in California, this difference is well below the 300% multiplier that would be used in calculating start-up and minimum load bid limits.

prices for these six contracts during the first 21 day of January 2008. The maximum of these six averages would be used as the gas price in setting start-up and minimum bid caps applicable for any unit starting under the bid-based option in February 2008. This calculation would be updated each month, with the resulting bid caps being applicable to any unit starting under the bid-based option in subsequent months.

Bid caps for non-gas fired generation, would be set at 300% of the unit's submitted cost-based bid. Thus, an important new requirement for this proposal is that a generating unit must have a cost-based start-up and minimum load bid submitted to the CAISO to be eligible for a bid-based value.

### **III. Rationale for Final Recommendation**

DMM believes the approach incorporated in its final recommendation represents the best approach for limiting start-up and minimum load bids under the bid-based option for the following reasons:

- **Local Market Power Mitigation.** DMM believes the proposed approach strikes a reasonable balance between the need to limit the potential for the exercise of local market power mitigation through extremely high start-up and minimum load bids, and FERC's stated preference for providing suppliers with a bid-based option for start-up and minimum load bids. In practice, DMM believes that the only units which might be expected to submit start-up and minimum load bids above the proposed level (300% of costs) in the absence of any cap are units that could expect to be needed for local reliability. However, as described in the May 15 DMM whitepaper, the 300% multiplier is significantly higher than the threshold that is typically allowed in other ISO's when units are dispatched for local reliability. Meanwhile, the 300% multiplier above costs corresponds to the maximum impact threshold in effect in any other ISO for mitigation of start-up and minimum load bids for non-congested areas (MISO).<sup>6</sup>
- **Gas Price Risk.** As described in the May 15 DMM whitepaper, the 300% multiplier above cost would have provided sufficient "headroom" to cover the maximum spike in gas prices that has occurred over the last five years (relative to the NYMEX futures prices in the preceding six months) with a high level of confidence. In addition, DMM notes that even without any such cap, generators would need to deal with the issue of gas price risk over the subsequent six month period in when determining any start-up and minimum load bids submitted under the bid-based option. Again, since start-up and minimum load bids under the bid-based option remain in effect for six months, DMM believes that the only units which might be expected to submit start-up and minimum load bids above the proposed level (300% of costs) in the absence of any cap are units that could expect to be needed for local reliability.
- **Feasibility and Ease of Implementation.** A key advantage of this approach is that the necessary start-up and other operating data for all gas-fired units should already be collected under MRTU and entered into the CAISO's Master File. In effect, this approach utilizes the

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<sup>6</sup> While a more dynamic approach – under which start-up and minimum load bids are mitigated only when units are constrained on due to uncompetitive constraints or market conditions – might avoid any concerns of "over-mitigation" under the proposed approach, such an approach cannot be developed and implemented as part of the initial MRTU software.

same data used under the cost-based option, but substitutes a different gas price (derived from a simple formula that be easily calculated by the CAISO and all participants). Unlike some of the other approaches, this option does not require further definition of unit types, categories, prototypical units, or other values to be used in the calculation. DMM has also verified that this approach may be relatively easy to implement by the CAISO through controls on the values that may be entered by participants in the Master File, which allow the CAISO to verify and approve data before it is accepted in the Master File. The CAISO believes this is approach could be implemented relatively easily by calculating – on a monthly basis – the maximum start-up or minimum load bid that may be entered by any unit by combining the monthly gas index described in this report with the start-up and minimum load operating characteristics of each unit in the Master File. An internal CAISO process would then be put in place to check any start-up or minimum load bid submitted by a participant against this value prior to acceptance of the value in the Master File. In practice, since start-up and minimum load bids under the bid-based option may only be modified once every six months, the CAISO expects that the volume of bids submitted each month will be very limited.

- **Transparency for Market Participants.** The proposed approach would provide a high degree of transparency for market participants relative to other options that were identified and considered. Although the final gas price used in calculating the start-up and minimum load bid cap for each generators each month would not be known with complete certainty until the third week of the month prior to the start of the six month period for which the bid would remain in effect, generators could easily calculate the approximate level of the proposed gas price index with a high level of accuracy well in advance of the time when start-up and minimum load bids would need to be submitted to the CAISO. Meanwhile, all other inputs used in calculating the applicable start-up and minimum load cap for each unit would be based on data submitted to the generators themselves.