

Memorandum

To: ISO Board of Governors

From: Laura Manz, Vice President, Market and Infrastructure Development

Date: October 20, 2008

Re: *Decision on MRTU Price Cap and Floor*

This memorandum requires Board action.

EXECUTIVE SUMMARY

Management proposes to adopt a general price cap for the MRTU markets at \$2500 and a price floor at -\$2500. Management is proposing this mechanism as a safety cap to prevent potential severe settlement impacts that could result from extreme prices for energy, ancillary services and residual unit commitment capacity, but to do so in a manner that does not suppress meaningful economic price signals, including price signals for demand response. The price cap would be put in place to guard against unknown issues and unusual circumstances that could arise due to changes in market participant behavior that result in unreasonable market outcomes. The proposed price cap and floor levels were determined by examining the prices resulting from the MRTU market simulations and set to a level that would allow the proper price signals to flow through to the market while protecting against extreme market outcomes.

These potentially high LMPs at particular locations do not set the price for the entire market but apply only in those specific locations where congestion or tight supply conditions exist. Also, in both the day-ahead and real-time markets, the prices paid by most buyers are averages of the LMPs over large areas. In the real-time market, where these conditions are more likely to arise, the prices paid by buyers are hourly averages of 12 successive five-minute interval prices, so high LMPs in specific intervals are muted in the hourly averages. As a result these real-time prices will often have a limited impact on hourly prices and even less impact on overall revenue requirements, which reflect prices over 8,760 hours per year and averaged across large geographic areas. Lastly, the volume of energy transactions in the real-time market is small compared to the day-ahead market. Despite their small impact on overall revenue requirements, however, these prices play a critically important role in sending the right operational price signals and in guiding transmission, generation and demand response investment.

In proposing this market protection mechanism, Management emphasizes that it will not be a substitute for thorough testing of the MRTU software and correction of any identified problems prior to MRTU go-live. If the ISO finds that the performance of the MRTU software and systems during market simulation and pre-production is not acceptable, the ISO will make sure that the identified issues are fully resolved and will not use the proposed price cap and price floor as a band-aid in order to maintain the target go-live date. Nor will the ISO, after go-live, rely on the price cap and floor as a substitute for prompt and thorough investigation of the causes of all extreme prices and the development of appropriate remedies where warranted.

Finally, if the proposed price cap is adopted, Management proposes to re-assess the need for this mechanism in conjunction with a stakeholder process during the first year of MRTU operation, to determine whether the price cap and floor should be modified or eliminated after the first year.

MOTION

Moved, that the ISO Board of Governors approves the proposed rule changes regarding the establishment of a price cap and floor for all energy, residual unit commitment capacity, and ancillary services in the ISO markets under the Market Redesign and Technology Upgrade, as detailed in the memorandum, dated October 20, 2008, and

Moved, that the ISO Board of Governors authorizes Management to make all of the necessary and appropriate filings with the Federal Energy Regulatory Commission to implement the proposed price cap and floor for the ISO markets under the Market Redesign and Technology Upgrade.

ISSUE STATEMENT

Management is proposing a general price cap and price floor for all energy, residual unit commitment capacity and ancillary services in the MRTU markets. MRTU already includes a bid cap (initially set at \$500 per MWh) that limits the values of key inputs to the market – the prices that participants are allowed to submit with their bids. In contrast, a price cap would limit the values of key outputs of the market – the locational market prices (LMPs) and ancillary service marginal prices (ASMPs) used for settlement. The energy bid cap does not set an absolute limit on the actual LMPs that may occur in the markets. LMPs higher than the bid cap (or more negative than the -\$30 bid floor specified in the MRTU Tariff) can occur in the ISO transmission network because the cost of serving one additional MWh of demand at a particular location – which is the definition of a marginal energy price – can be higher than the actual submitted bid prices. This may occur, for example, when there are binding transmission constraints in the area of the load, and the resource whose bid is accepted to relieve that constraint is very distant from and not very effective in relieving the constraint. In such cases it may take many MWh of energy from the resource, perhaps at up to \$500 per MWh, to relieve one MW of overload on the constraint. As a result the price on the constraint would be a multiple of the accepted energy bid price and could drive energy LMPs in the area above the energy bid cap. Early in the MRTU design process stakeholders discussed this possibility on a conceptual basis, and in the course of the current

stakeholder and market simulation processes, the ISO staff has presented and discussed several examples to illustrate this and similar scenarios that may cause high prices. Thus the bid cap, which is an important feature for limiting the ability of market participants to trigger high prices through their bidding behavior, does not in itself affect transmission congestion and supply conditions which play a separate role in setting prices.

In the MRTU market simulation, the ISO staff and market participants have examined and discussed similar scenarios where LMPs can rise above the energy bid cap due to the interactions and impacts of inter-temporal constraints, congestion constraints and tight supply conditions. These scenarios reflect conditions that have little probability of actually taking place, particularly in the integrated forward market. The probability that these inter-temporal constraints will arise in the real-time market is greater than in the integrated forward market because in the real-time market dispatches and prices for the upcoming intervals are optimized over a multi-interval time horizon, which can have significant impacts on the first interval prices. Such effects have been most notable in market simulation when there are tight supply conditions interacting with resource ramping constraints.

Management proposes an overall price cap and price floor to serve as a “safety cap,” analogous to “circuit breaker” mechanisms that are used in some financial markets to limit the impact of extreme and unforeseen pricing results. In proposing this mechanism, Management believes that it will rarely be utilized but that it is still prudent simply because it is not possible for market simulation or other testing processes to investigate all possible circumstances that could lead to extreme results. It is important to emphasize that the occurrence of extreme prices does not necessarily indicate that the market software is performing incorrectly. Particularly in the real-time market, the interaction of multiple constraints with the need to instruct supply resources to different operating levels every five minutes to follow changes in load can cause high and volatile prices in particular areas of the grid that may persist for only a few five-minute intervals.

It is also important to recognize that in both the day-ahead and real-time markets, high LMPs at particular locations do not set the price for the entire market but apply only in those locations where congestion or tight supply conditions exist. In both the day-ahead and real-time markets, the prices paid by most buyers in the market are averages of the LMPs over large areas, which mitigate the impact of individual high LMPs. In addition, in the real-time market the prices paid by buyers are hourly averages of 12 successive five-minute interval prices, so any high LMPs in certain intervals are muted in the hourly averages. As a result these prices will often have a limited impact on hourly prices and even less impact on overall revenue requirements, which are spread across 8,760 hours per year and averaged across large geographic areas. In addition, the volume of energy transactions in real-time market, where these conditions may arise more frequently, is small compared to the day-ahead market. At the same time, despite their small impact on overall revenue requirements, these prices play a critically important role in sending the right operational price signals and in guiding transmission and generation investment.

Even though such prices may be the result of correct software performance and accurate modeling of constraints, market participant behavior can be expected to change in unpredictable ways which could produce unpredictable results once the markets transition from a market simulation environment where no financial settlement is at stake to a fully functional market where all transactions are financially binding.

Further tuning of the software may be necessary to adjust for unintended market outcomes produced by the MRTU software. Therefore, to guard against unintended market outcomes having an overly adverse impact on market participants, Management is proposing a price cap and price floor for the initial implementation of the MRTU software.

Specifically, Management proposes the following:

1. A symmetric price cap and price floor of +\$2500 per MWh and -\$2500 per MWh respectively;
2. The price cap and price floor would apply to both the day-ahead integrated forward market and the real-time market;
3. The price cap and price floor would apply to ancillary service marginal prices (ASMPs) and prices for residual unit commitment (RUC) capacity, as well as to LMPs for energy; and
4. Management will open a stakeholder process during the first year of operation of the MRTU markets to assess whether the price cap and floor should be modified or eliminated after the first 12 months.

Management believes that this mechanism will act as a safety cap to prevent severe settlement impacts that could result from extreme prices for energy and ancillary services, but at the same time is high enough to not suppress meaningful economic price signals. The proposed cap and floor levels are appropriate as market simulation results have shown that nearly all day-ahead market prices and the vast majority of real-time prices have been within the price cap range management is proposing.

This market protection mechanism is not in any way designed to be a substitute for thorough testing of the MRTU software and correction of any identified problems prior to or after MRTU *go-live*. If the ISO finds that the performance of the MRTU software and systems during market simulation and pre-production is not acceptable, the ISO will not *go-live* with MRTU until the identified issues are fully resolved. Furthermore, the ISO will not use the proposed price cap and price floor as a band-aid in order to maintain the target *go-live* date. Nor will the ISO, after *go-live*, rely on the price cap and floor as a substitute for prompt and thorough investigation of the causes of all extreme prices and the development of appropriate remedies where warranted. Management does not intend this market protection mechanism to reduce the importance of promptly and diligently investigating the causes of all extreme prices to determine whether they are legitimately due to the interaction of actual market conditions, or are the result of flaws or loopholes in the market rules or the software, or manipulative behavior by market participants. The ISO has established internal processes to conduct such investigations and identify corrective actions where needed.

POSITIONS OF THE PARTIES

The ISO posted a white paper on September 19, 2008 that described the company's proposal for imposing a \$2500 price cap and -\$2500 price floor on the MRTU markets. On September 25th the ISO held a joint Market Surveillance Committee (MSC)/Stakeholder meeting where the ISO presented the price cap issue and discussed its merits with the MSC and stakeholders.

A number of stakeholders have expressed concern about extreme prices, particularly in the real-time market, that have occurred during market simulation. Often time these prices have been significantly above the MRTU bid cap and below the MRTU bid floor. The MSC recommended in their opinion adopted on October 6th that the ISO continue to analyze the cause and overall market impact of future extreme Market Simulation prices. The MSC stressed that it is important not to set the price cap and floor too low which would suppress valid economic signals of the value of energy, especially from flexible generation units, and limit the incentive to determine the underlying cause of these high prices. Several stakeholders at the September 25th meeting agreed with this sentiment in arguing against imposing a price cap. The MSC expressed that although they are sympathetic to this argument, they believe that it would be imprudent at the start of MRTU for the ISO not to have a damage control price cap and price floor set significantly above the ISO bid cap and bid floor.

Western and Pacific Gas and Electric (PG&E) provided written comments supporting the proposed price cap and floor as a prudent protection for market participants from both known and unknown software uses and market flaws. PG&E further expressed that the price cap allows the market to send strong price signals while at the same time provides a sanity check on prices by not relying blindly on the market software optimization.

Southern California Edison (SCE) commented that this is a major policy issue which should not be addressed in the uneconomic adjustments forum because it has major policy implications that need additional discussions with stakeholders. SCE believes that the caps may mask serious market defects and encourages the ISO to focus its efforts on ensuring that the model produces reasonable prices before implementing price caps.

Western Power Trading Forum (WPTF) expressed concern about the implementation of a price cap and floor. There concern is based on: (1) 2006 MSC and FERC deliberations which recognized that while bids were capped, nodal prices were not capped and would reflect the price of serving demand in constrained areas while being based on capped/mitigated bids. WPTF argues that the ISO's price cap proposal reverses this approach. (2) The rationale for the ISO's approach is based on limited information and is not well documented. It raises concerns about the reliability, stability and configuration of the MRTU software. (3) There is no evidence of market power or no other indication that constraining prices is appropriate. Dynegy also argued that changes to the bid cap structure are unsupported and premature. Finally, Citigroup & EPIC both expressed concerns about the appropriate bid floor.

While the ISO understands these concerns, Management believes that the proposed price cap and floor are at levels that will not alter the original bid cap design structure except under extreme circumstances. The price cap will contain severe settlements impacts during times of unintended extreme prices due to potential structural problems with the market software or underlying design.

MANAGEMENT RECOMMENDATION

Management recommends that the Board approve the motion to adopt a \$2500 price cap and -\$2500 price floor for the MRTU markets as a just and reasonable measure to protect against potential extreme prices.