

FINAL

Comments on “Uneconomic Adjustment in the MRTU Market Optimizations”

by

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1. Introduction

This opinion comments on the California Independent System Operator’s (ISO) proposal for making uneconomic adjustments in the MRTU market optimizations. In a previous opinion we expressed our support for the ISO’s use of penalty parameters in these optimizations in order to honor priorities among self-schedules, existing transmission rights (ETCs), transmission ownership rights (TORs), ancillary services requirements, and the relaxation of the physical characteristics of the transmission network in order to obtain feasible day-ahead schedules and real-time operating levels.¹ Since receiving Board approval in July to make a tariff change to allow the use of uneconomic adjustments before exhausting all economic bids to avoid unreasonable scheduling results in the day-ahead and real-time markets under MRTU, the ISO has clarified a number of aspects of its uneconomic adjustment policies which we comment on here.

This opinion is based on the document, “CAISO Draft Final Proposal on Uneconomic Adjustments in the MRTU Market Optimizations,” dated September 19, 2008. We have also participated in a several joint MSC/Stakeholder meetings where these issues were discussed. The most recent meeting on September 25, 2008 dealt the following six issues, which we consider in this opinion:

1. Setting real-time 5-minute interval prices based on the Energy Bid Cap when there is supply shortfall;
2. Using the Energy Bid Cap as the pricing run parameter on transmission constraints that are relaxed in the scheduling run;
3. Adopting an energy price cap and price floor to limit potentially extreme LMPs that can arise due to the interaction of multiple constraints;
4. Enforcing in the reliability procurement mechanism provided by Residual Unit Commitment (RUC) any Energy Limits submitted in the DAM for use-limited resources;
5. Providing financial “firmness” to holders of existing rights if their submitted, valid IFM self-schedules are unbalanced by Uneconomic Adjustment in the IFM; and

¹“Uneconomic Adjustment Policy for Market Redesign and Technology Upgrade (MRTU) for Locational Marginal Pricing Scheduling and Pricing Runs,” June 30, 2008, available at <http://www.caiso.com/1ff1/1ff1e451278c0.pdf>

6. Maintaining the Uneconomic Adjustment parameter values in the BPMs, and the process whereby the parameter values may be revised.

Although we support the ISO's proposal for the majority of these issues, we believe that several of the ISO's proposals could benefit from further stakeholder input. We note these issues below and provide some suggestions for improving the ISO's proposal.

2. Real-Time Five-Minute Interval Prices When There is a Supply Shortfall

We support the ISO's proposal to use the energy offer cap as the pricing parameter on the energy balance equation in the pricing run for the real-time market. This will ensure that the energy component of the real-time locational marginal prices will at least equal the offer cap when there is a supply shortfall in the real-time market. Allowing prices to rise to at least the offer cap rather than setting the market price equal to the last accepted economic offer will provide strong incentives for suppliers to offer to supply energy during periods when a supply shortfall is likely to occur. Under these circumstances suppliers will be eligible to earn prices in excess of the variable costs without submitting offer prices above the variable costs of their generation units.

A similar economic argument could be made for the case of pricing of ancillary services (A/S). However, the ISO is proposing that the penalty parameter (or "shadow price") for violating the AS requirements in the pricing run be set to zero on implementation of MRTU. If setting prices at least equal to the offer cap where there are supply shortfalls is viewed as acceptable for energy, we question why it is not viewed as appropriate for ancillary services. We understand that the degree to which A/S is procured locally and the extent of market power suppliers are able to exercise in the A/S markets are relevant issues that may imply different treatment of the market for A/S from that for energy

We note that this policy for A/S has ramifications for energy market prices because the two sets of products will be procured simultaneously in a co-optimized fashion in the day-ahead integrated forward market (IFM). This means that the scheduling and pricing software will take generation units with A/S offers out of the energy market if those same generation units can provide needed ancillary services at lower cost, and vice-versa. Thus market power exercised in the A/S markets could "spill over" into the energy market if it were indeed more severe in the A/S.

It appears to us that the current ISO proposal, with a zero penalty price for ancillary services procurement, does not solve this market power problem in the A/S markets and creates other potential problems. If there is in fact more market power exercised in the A/S market than in the energy market, this will still impact the energy market through higher bid prices for A/S, regardless of the parameter value. If the exercise of market power in the A/S market is not a serious concern, then the lack of a non-zero penalty parameter will depress A/S prices during periods of true scarcity of A/S when there is adequate energy to meet demand, which is a time when ancillary services prices should signal the need for A/S supply. In contrast, a mechanism that sets the pricing run penalty price for A/S at \$150/MW would result in a \$150/MW price of

the A/S with a supply shortfall. It is also important to note that the ISO's zero penalty price approach could produce A/S prices significantly above the \$150/MW penalty price without A/S scarcity conditions, if a high offer price for A/S is accepted and the generation unit accepted to provide the A/S has a offer price for energy substantially lower than the market-clearing prices of energy which implies a substantial opportunity cost of supplying A/S.

In light of these concerns, we believe that a superior approach to this issue would be to address the market power concerns more directly through a lower offer cap for ancillary services of \$150/MW, combined with a penalty parameter for procurement of A/S in the pricing run set at that same offer cap. If there is market power, it will be better mitigated by the lower offer cap and the pricing run penalty price at this offer cap. If there is true scarcity, firms will be able to earn prices above their offer caps without having to submit offers at the level of the offer cap.

3. Pricing Parameter on Transmission Constraints Relaxed During Scheduling Runs

Another element of the ISO's proposal is to set the pricing-run penalty parameter for transmission constraints at the offer-cap in the pricing run. As the ISO notes, however, this proposal is not without potentially adverse consequences to market efficiency. For example, a larger spread between the scheduling run penalty parameter and the pricing run penalty parameter (relative to previous ISO proposal) can lead to lower locational marginal prices (LMPs) during hours when transmission constraints are relaxed in the scheduling run, relative to hours when these constraints were not binding at their original limits or were relieved economically without triggering constraint relaxation.

This type of seemingly perverse outcome stems from the employment of different penalty prices in the scheduling and pricing runs. As we noted in our previous opinion on these issues, the use of a separate scheduling and pricing run distorts the prices coming out of this dual process and masks the true marginal costs of the choice of scheduling run parameters. For this reason, if the ISO does adopt a relatively low pricing parameter on transmission constraints, we strongly urge the ISO to be prepared to raise this penalty price if these kinds of perverse market outcomes become a persistent reality.

4. Adopting an Energy Price Cap and Price Floor

A number of stakeholders have expressed concern about extremely high hour-ahead scheduling process (HASP) prices and real-time market (RTM) five-minute interval prices that have occurred with a non-trivial frequency during Market Simulation. These prices are many multiples above the MRTU offer cap and many multiples below the MRTU offer floor. The two principal explanations offered by the ISO for these extremely high and low prices are low ramp rates set by market participants on their generation units and the use of a multi-period look-ahead in the real-time pricing process, although we cannot rule out these extreme prices occurring because of demand fluctuations when all suppliers submit the maximum ramp rate possible for their generation units.

We recommend that the ISO continue to analyze the cause and overall market impact of future extreme Market Simulation prices, including the extent to which they can be traced to these two aspects of MRTU. Re-running a representative sample of cases from these future price spikes with the ramp rates for all generation units reset to their maximum rate will allow an assessment of the extent to which the use of significantly lower ramp rates is causing these high prices. If feasible, the ISO should also experiment with various ways to simulate the elimination of the multiple interval look-ahead in the real-time market to determine if this is causing extreme prices in the RTM, and if ramping constraints are binding in later intervals and truly imposing high (marginal) costs in the current five-minute pricing interval. The frequency of these extreme prices in the RTM during Market Simulation makes it imperative that the ISO determine if these two factors are the cause of future extreme prices before the start of MRTU.

We also recommend consideration of external restrictions on the range of ramp rates allowed to be offered into the market. We note that the current rules allow for a level of flexibility in setting ramp rates well beyond that seen in other ISO/RTO markets. Although the ISO currently limits ramp rate changes from one operating range to next operating range to be no more than a 10 to 1 ratio, we believe that serious consideration should be given to much tighter restrictions on ramp rate changes across operating ranges and on the set of feasible ramp rate levels, at least for a transition period. Units with significant ramping constraint considerations, such as combined cycle gas turbine (CCGT) units, could be given additional flexibility. However there is little reason to offer the level of flexibility needed by CCGT units to all market participants. A better understanding of the interaction of ramping constraints with the market simulation results would help in determining the importance of imposing additional restrictions.

This experience with Market Simulation points out an important consideration in moving forward with MRTU. Particularly for the HASP and RTM there are many factors which can lead to LMPs that are many multiples of the offer cap. In general, it will take time and effort to determine whether an extreme price was due to an imperfection in the market design, the exercise of significant unilateral market power, or simply the accurate pricing of multiple binding transmission and operating constraints that represent real physical restrictions. For this reason, we support the ISO setting a damage control maximum and minimum price that is linked to the value of the offer cap and floor during the initial year operation of MRTU. The magnitudes of the cap and floor should be adjusted upwards as the offer cap on the ISO's market is increased.

We believe that it is important not to set these caps and floor too low and 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 25 meeting argued against imposing a price cap for precisely these reasons. Although we are sympathetic to this argument we 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 at many times the ISO offer cap and offer floor.

However, it is important that this mechanism not be viewed as a substitute for thorough testing and understanding of the prices resulting from the market simulation process. If there are

flaws in market software, market design, or new serious potential for the exercise of unilateral market power, a \$2500 cap would not prevent serious cost consequences to rate-payers.

5. Energy Limitations in Residual Unit Commitment Market

We support the ISO's clarification to enforce energy limitations on generation units taken in the residual unit commitment (RUC) process. This proposal is consistent with the two major goals of implementing a LMP market: (1) obtaining feasible generation schedules, and (2) pricing all relevant operating constraints. If generation units are scheduled in the RUC process to operate longer than they are physically capable of operating, this would violate the first goal of implementing an LMP market. Ignoring these constraints in the pricing process violates the second rationale for an LMP-based market.

6. Providing Financial Firmness to Holders of Existing Transmission Rights

A major concern of holders of TORs and ETCs is whether the ISO's uneconomic adjustment policies would fully honor the scheduling priorities implied by these rights. The specific issue raised by ETC holders is that if ETC/TOR Custom Load Aggregation Point (CLAP) load is not scheduled using the same granularity as non-ETC loads, ETC/TOR scheduling priority could not be ensured for the load side of their self-schedules. This outcome occurs because the majority of load is scheduled at the Default Load Aggregation Points (DLAPs), which cover much larger geographic areas than the CLAPs and therefore would be much less effective in relieving a binding transmission constraint in the area of a CLAP load. This can result in larger day-ahead adjustments for CLAP load that use ETCs or TORs. In order for the ISO to honor the scheduling priorities of ETCs and TORs within the current MRTU design, one side of a day-ahead ETC or TOR schedule must sometimes be adjusted in the day-ahead integrated forward market (IFM) despite the fact that this imbalance is subsequently remedied in the HASP or RTM. The downside of this process is that it can subject the ETC or TOR holder to real-time congestion costs, under-scheduling penalties, and other charges for participating in the HASP or RTM.

The ISO proposes to mitigate the financial risks to ETC/TOR holders due to unbalanced IFM adjustments of submitted valid self-schedules. Specifically, the ISO's IFM can adjust one side of a balanced day-ahead self-schedule that uses an ETC or TOR. As noted above, in order to honor the scheduling priority of that ETC or TOR, the ISO will attempt to make room for the side of the transaction curtailed in the day-ahead market in the HASP or RTM. The ISO proposes to provide what it calls the "perfect hedge" treatment for both the day-ahead and subsequent HASP or RTM market participation by refunding any congestion charges in these markets that are borne by the ETC or TOR holder. The current ISO proposal does not contemplate refunding any under-scheduling penalties or other charges caused by the day-ahead curtailment and subsequent HASP or RTM market participation.

During the September 25 meeting representatives of ETC/TOR holders in the San Francisco Bay area presented a proposal to honor their scheduling priority. This proposal calls for scheduling and settling ETC/TOR CLAP loads using the DLAP load distribution factors

(LDFs) rather than using the CLAP LDFs. This would make it more straightforward to use penalty parameters to enforce ETC/TOR scheduling priorities using consistent pricing run penalty parameters for ETC/TOR and DLAP load. Although there are many details of this proposal that must be worked out, we believe that it is worthy of further consideration and discussion between stakeholders and the ISO because it appears to limit the need for the more complicated multiple market scheduling and pricing process implicit in the ISO proposal.

We also encourage the ISO to assess the risk of significant under-scheduling penalties to ETC or TOR holders as well as other costs unrelated to congestion that would arise if ETC/TOR schedules are cut in the IFM. If potentially significant, then mitigation of those risks through waiver of such penalties or similar measures should be considered. We understand the ISO is currently considering other solutions to deal with these problems. We support these efforts because ETC and TOR holders are exposed to other risks besides the real-time price under the current ISO proposal.

7. Maintaining Uneconomic Adjustment Parameters in Business Practices Manual

As stated in our previous opinion on the uneconomic adjustment process, we support giving the ISO considerable discretion to alter the values of the penalty parameters without resorting to a tariff change, particularly due the first year of MRTU. For the reasons cited in our previous opinion, we support the ISO proposal for putting the values of the penalty parameters in the business practices manuals and allow them to be changed quickly in response to the needs of the ISO system operators.

8. Concluding Comments

As discussed above, we generally support the ISO's proposals for addressing the issues in its uneconomic adjustment proposals. However, we believe there are three major areas worthy of further consideration. The first is the rationale for and level of the price cap on the ISO's real-time energy market. The second is our proposed imposition of a \$150/MW value for the A/S offer cap as well as the pricing run penalty price for A/S balance equation. Third is the process the ISO will use to ensure full compliance with the terms of their ETC and TOR contracts.