California
Independent
System Operator

Memo

To: Market Issues/ADR Committee

From: Susan Schneider, Vice President Client Services

Kellan Fluckiger, Vice President Operations

CC: ISO Board, ISO Executives

Date: January 20, 1999

Re: ***COMPROMISE INTERIM SOLUTION TO UNINSTRUCTED DEVIATIONS***

EXECUTIVE SUMMARY

Introduction

The ISO is conducting an intensive stakeholder process to support a comprehensive redesign of the ISO's Ancillary Services markets. The proposed plan for redesigning these markets will be filed with the Federal Energy Regulatory Commission on March 1, 1999. A separate memo to the Market Issues Committee summarizes the major elements proposed for that filing.

One component of the proposed market redesign plan is the ISO's proposal for managing the problem of uninstructed deviations. An earlier version of that proposal was presented to the Board last year (the so-called "Min-Max" proposal), but the Board did not reach a decision at that time.

The ISO has continued to work with Market Participants on the uninstructed deviations problem. The purpose of this memo is to present for the Committee's consideration a proposed compromise solution developed through these discussions.

Proposed Motion

Management requests that the Market Issues Committee recommend to the Board the approval of the following motion:

Moved that the Board approve the change in settlement for uninstructed deviations as follows:

- ***Uninstructed Imbalance Energy obligations (or payments) related to resources with dispatch instructions will be determined based on the "effective price" proposal, contingent on the approval through the market***

redesign process, and classification as critical for implementation before summer, of the proposed use of Replacement Reserve.

The balance of this memo provides background on uninstructed deviations, identifies associated operational problems, explains each element of the proposed compromise, and describes why Management believes each element must be implemented if Min-Max is to be deferred.

BACKGROUND

Uninstructed deviations occur in two distinctly different ways: (1) Scheduling Coordinators that decline, on behalf of the resources they represent, to respond to ISO dispatch instructions; and (2) Scheduling Coordinators that have not bid into the Imbalance Energy market, but deviate from their forward market schedules without notifying the ISO. Both are sources of real-time operational problems that have contributed to the North American Electric Reliability Council's sanctioning the ISO with respect to violating Disturbance Control Standards.

The Market Surveillance Committee's (MSC) report on the ISO's Ancillary Services markets concluded that the way in which uninstructed deviations are settled hinders performance of the ISO markets.[1] The MSC proposed a solution to the settlement of uninstructed deviations, known as the "Min-Max" proposal, which was presented to the ISO Governing Board in August 1998. The Min-Max proposal (briefly described in Appendix 1) would revise the settlement of Uninstructed Imbalance Energy using prices based on 10-minute marginal costs of Imbalance Energy.

In its comments to FERC on the MSC report, the ISO included "correct settlement of uninstructed deviations," in a list of "Short Term Potential Proposals." The ISO has also distributed papers and discussed the Min-Max proposal with Market Participants through several meetings and conference calls.

Several stakeholders expressed concern with the Min-Max proposal, and additional discussions were held to reconsider alternatives. Relying jointly on measures already approved by the Governing Board, a suggested alternative identified by Market

[1] In its "Preliminary Report on the Operation of the Ancillary Services Markets of the California Independent System Operator (ISO)," the ISO Market Surveillance Committee observed that "the demand for ancillary services has been far higher than anticipated," and concluded that these conditions were interfering with the competitive function of the ancillary service markets. In its discussion, the Committee identified as a possible reason for the increased demand for ancillary services the "asymmetry in prices at which different types of deviations from schedules are settled," which "can create incentives for uninstructed over-generation during high-priced 10-minute periods and uninstructed under-generation during low-priced 10-minute periods." The Committee included the "Improper Payment for Uninstructed Deviations" in its list of software-related problems that have been hindering market performance, and recommended that the ISO "revise protocols to help reduce the need for regulation services."

Participants, and a proposal developed through the market redesign process, the ISO has developed a compromise proposal. Management recommends that this compromise to address uninstructed deviations be adopted, and that consideration of previously proposed disincentives such as Min-Max be deferred until it can be determined if additional measures are necessary.

DESCRIPTION OF ISSUE

Since the beginning of ISO operation, uninstructed deviations have occurred in large quantities, particularly during heavy load hours. Several operational issues arise from these deviations, including:

Issue 1) - Excessive Regulation Requirements - Large uninstructed deviations cause significant swings in the real-time balancing need of the ISO, which leads to additional need for Regulation, at substantial costs to Market Participants.

Issue 2) - Failure to Respond to Dispatch Instructions - The ISO experiences significant problems with Scheduling Coordinators' failing to honor Supplemental Energy bids in real time, causing the ISO to continue through the BEEP stack. This unavailability places significant demands on the Supplemental Energy markets.

Issue 3) - Failure to Respond to Operating Orders - Generating Units without bids engaged in uninstructed deviations often disregard operating orders to return to operating levels consistent with their Energy schedules. This causes a need for additional Regulation and places a significant burden on the Imbalance Energy market.

Issue 4) - Inadequate Imbalance Energy - When uninstructed deviations are sufficiently large, the Imbalance Energy market may be inadequate, leading to out-of-market activity.

Issue 5) - Non-Compliance With NERC Disturbance Control Standard - Despite increased procurement of Operating Reserve, the ISO has been cited for two consecutive quarters by NERC for failing to meet the Disturbance Control Standard (which requires return to 60 Hz within 10 minutes after a disturbance).

Issue 6) - Gaming - An opportunity exists to "game" the price differential between the BEEP Interval Price, used to settle for Instructed Imbalance Energy, and the Hourly Ex Post Price, used to settle Uninstructed Imbalance Energy.[2]

Issue 7) - Imbalance Energy Price Volatility - High demands on the Imbalance Energy Market, combined with failures of Scheduling Coordinators to follow Imbalance Energy

[2]An example of this gaming opportunity follows: If a dispatch instruction for incremental Energy is issued by the ISO at a BEEP Interval Price of $25/MWh, but the Hourly Ex Post Price is $20/MWh, then the Scheduling Coordinator who correctly anticipates this price relationship could choose not to respond. The ISO would pay for Instructed Imbalance Energy at $25/MWh, but would only charge $20/MWh for the Uninstructed Imbalance Energy that results from failing to respond, netting a $5/MWh profit to the Scheduling Coordinator for doing nothing. A reciprocal situation exists if the Scheduling Coordinator ignores decremental instructions where they earn a similar profit from failing to respond.

instructions, sometimes causes large variations in BEEP interval prices in the hour. These variations do not reflect true energy needs, but are artificial fluctuations based on market structure and Scheduling Coordinator actions.

COMPROMISE PROPOSAL

Each element of the compromise proposal is essential. Management's recommendation to defer the Min-Max proposal depends on the implementation of several related elements:

1) Billing Ancillary Services based on metered Demand (as approved by the Governing Board in November, 1998);
2) Eliminating payments for Energy and capacity when uninstructed deviations consume capacity obligated to be unloaded and available to provide Operating or Replacement Reserve (as approved by the Governing Board in November, 1998).
3) Use of the "effective price" for settling uninstructed deviations by units that fail to respond to dispatch instructions as discussed below; and
4) Procurement of Replacement Reserve capacity to fill the gap between scheduled and forecast load in a consistent manner that minimizes out-of-market purchases (see discussion below).

Elements 1 and 2 have already been approved by the Governing Board, and element 4 is under consideration in the A/S market redesign process. This memo seeks approval of the third element regarding use of the "effective price."

If implementation of elements 1 through 4 above fail to adequately resolve the operational issues associated with uninstructed deviations, then Management will recommend that further actions to address uninstructed deviations be implemented.

The following explains each element of the compromise proposal.

Billing Ancillary Services Based on Metered Demand

The ISO is working to modify settlements software that will bill A/S capacity costs in proportion to metered demand, rather than to scheduled loads as in the original market design. Amendment No. 13 to the ISO Tariff included changes to implement billing based on metered Demand.

This modification removes a clear incentive to under-schedule. Although billing based on metered Demand provides no explicit disincentive to under-schedule, eliminating the incentive to under-schedule may reduce the demands on the real-time Imbalance Energy market. It thereby may partially address "Issue1 – Excessive Regulation Requirements."

"No-Pay" for capacity and energy associated with uninstructed deviations on Ancillary Services capacity

The ISO is working to modify settlements software to eliminate payments for both A/S capacity and uninstructed Energy when that capacity is unavailable. This proposal was also included in Amendment No. 13 to the ISO Tariff.

This modification will provide disincentives to disobey dispatch instructions to Operating Reserve and Replacement Reserve capacity, or to use that capacity to over-generate without a dispatch instruction. The modification thus directly addresses uninstructed deviations out of Operating Reserve and Replacement Reserve capacity, which is expected to reduce the impact of both "Issue 2 – Failure to Respond to Dispatch Instructions" and "Issue 4 – Inadequate Imbalance Energy."

Use of the "Effective Price" for settlement when dispatch instructions are not met

The Market participants proposed, in response to the Min-Max proposal, that settlement procedures be changed to address "Issue 6 – Gaming." Currently, if a resource fails to follow an incremental dispatch instruction, it is paid the BEEP Interval Prices for the Instructed Energy, and is charged the Hourly Ex-Post Price for the uninstructed decremental deviation when it fails to follow the dispatch instruction.

If the resource fails to follow a decremental dispatch instruction, it pays the BEEP Interval Price for its Energy decrement, and it is paid the Hourly Ex-Post Price for the uninstructed incremental deviation when it fails to follow the dispatch instruction. The gaming opportunity occurs when the resource correctly anticipates that the BEEP Interval Prices will exceed the Hourly Ex Post Price during periods of incremental dispatch instructions, and that the BEEP Interval Prices will be less than the Hourly Ex Post Price during periods of decremental dispatch instructions.

The proposed compromise modification would resolve the gaming issue by treating the resource as if the bid had never been submitted, and the dispatch instruction had never been issued. Under this approach, no payments or charges would arise, thereby eliminating any opportunity to profit from ignoring a dispatch instruction.

To implement this concept, the ISO has developed the "effective price" proposal, which would provide the same result, but which could be more efficiently implemented in the ISO's settlements system. Under the effective price proposal, changes would be made in settlement of uninstructed deviations by resources to which dispatch instructions are given.

The "effective price" for the Instructed Energy is calculated as the weighted average of the BEEP Interval Prices that apply to each dispatch instruction. For example, if the weighted average BEEP Interval Price is $30/MWh for an incremental dispatch instruction, and the Hourly Ex Post Price is $20/MWh, then a shortfall in Energy from that resource would be charged the Hourly Ex Post Price of $20/MWh today, representing a profit opportunity of $10/MWh for doing nothing.

Under the "effective price" proposal, the ISO would charge $30/MWh for the shortfall in Energy from that resource. The use of the "effective price" for settling uninstructed deviations by resources being paid for incremental Instructed Energy (or being charged for decremental Supplemental Energy) eliminates any benefit from the uninstructed deviation, and therefore resolves the gaming problem.

Expanded Replacement Reserve procurement based on unscheduled loads

Management is proposing, through the Ancillary Services market redesign process, to procure Replacement Reserve capacity based on the estimated difference between final Hour Ahead scheduled load (or generation) and the ISO's load forecast, net of any Energy the ISO is confident will be available in real time. To the extent that the inadequacy in the Imbalance Energy market is due to under-scheduled load (or generation), this modification should mitigate "Issue 4 – Inadequate Imbalance Energy."

When the ISO increases Replacement Reserve requirements due to anticipated under-scheduling, the quality of the BEEP stack should be improved, since more resources would be subject to penalty for uninstructed deviations.

WHY ARE THESE PROPOSALS LINKED?

Management has considered the interdependent market impacts of various proposals under consideration in developing the proposed action on the "effective price" proposal. The following explains the rationale for recommending a contingency on that action related to the outcome of the market redesign process.

Uninstructed deviations cause significant operational problems that the "Min-Max" proposal would have broadly addressed. In contrast, the "effective price" proposal narrowly focuses on a gaming opportunity that encourages dispatched resources to ignore instructions. Other significant operational problems, in large part caused by generators without bids that deviate without instruction, ***are not addressed*** by the "effective price" proposal. Since the operational problems resulting from uninstructed deviations have significant reliability implications, deferral of the Min-Max proposal cannot be recommended unless other policies that contribute to the mitigation of these operational problems are concurrently implemented with the "effective price" proposal.

For example, when the ISO experienced significant under-scheduling during peak load periods last summer, operational problems were exacerbated by significant increases in uninstructed generation. This behavior would be mitigated by the market redesign proposal to increase Replacement Reserve requirements to meet the differences between scheduled and actual load. Such Replacement Reserve would then be obligated to be available and to respond to instructions, subject to the "no-pay" provision for Ancillary Services approved earlier by the Board, and would therefore be less likely to engage in uninstructed deviations.

In summary, the "effective price" proposal eliminates the gaming opportunity, while procuring additional Replacement Reserve should reduce the amount of uninstructed

deviations. Together, these measures should improve the ISO's ability to more efficiently manage real time imbalances, and should provide sufficient mitigation of the impacts of uninstructed deviations to allow Management to recommend deferral of Min-Max.

To be clear, Management does not recommend implementing only the "effective price" proposal. The "effective price" proposal alone does not increase incentives to bid and, in fact, may cause a decrease.[3]

Even with both of these measures, uninstructed deviations by resources that do not submit bids, or which fail to honor their Supplemental Energy bids, are not deterred. Consequently, there is no guarantee that both measures will be sufficient to avoid the ultimate need to implement the Min-Max proposal, or some equally effective alternative. The ISO will continue to evaluate the performance of the real time market after these measures are implemented, and will determine whether uninstructed deviations remain a significant problem. Based on that review, Management will assess whether additional action is necessary.

[3] The "gaming" opportunity with which Management is concerned often allows a resource to benefit from incompletely meeting a dispatch instruction. The benefit of ignoring instructions creates an incentive to submit bids. By removing that incentive, some decrease in bids may result, although Management does not believe the effect would be significant, since only non-performing bids should respond to such an incentive.

APPENDIX 1
DESCRIPTION OF
THE "MIN-MAX" PROPOSAL

The principal objective of the Min-Max proposal is to provide incentives for bids to be submitted, dispatch instructions to be honored, and for Scheduling Coordinators undertaking uninstructed deviations to see a correct marginal price signal for their decisions. This objective would be accomplished by paying more for Energy delivered to the ISO in response to an incremental dispatch instruction, than for a Scheduling Coordinator's Energy surplus due to uninstructed over-generation or under-consumption. Similarly, the charge for Energy supplied by the ISO following a decremental dispatch instruction would be less than the charge for a Scheduling Coordinator's Energy deficit due to uninstructed over-consumption or under-generation. These results could be accomplished by paying the lowest BEEP Interval Price or 10-minute price in an hour for uninstructed deviations where Energy is supplied to the ISO, and charging the highest BEEP Interval Price or 10-minute price for uninstructed deviations where the ISO supplies Energy.

The Min-Max proposal would be applied on a zonal portfolio basis, which would allow Scheduling Coordinators to balance deviations within each zone, or if there is no congestion, within the ISO Control Area. Since the ISO would charge more to meet Energy deficits than is paid for Energy surpluses, the ISO would over-collect. These over-collections would be redistributed to Scheduling Coordinators in proportion to metered Demand. The net effect would be to redistribute revenues from Scheduling Coordinators that do not submit bids, respond to dispatch instructions, and balance uninstructed deviations; to those Scheduling Coordinators that do so. [4]

Although the Min-Max proposal addresses a number of important problems, and has been strongly supported by several Market Participants and ISO Management as a useful element of the ISO's Ancillary Services market redesign, it has been resisted by several other Market Participants for a variety of reasons. Furthermore, some Market Participants have argued that many of the problems addressed by the Min-Max proposal might be mitigated by actions either already taken, or proposed as part of the A/S market redesign project, and that the ISO should not implement the Min-Max proposal until it is demonstrated that the problems that it would address remain serious.

[4] Energy from the following transactions would continue to be settled at the Hourly Ex Post Price: Generating Units providing Regulation, deviations associated with RMR calls, and out-of-market calls.