



Memo

To: Market Issues/ADR Committee
From: Susan Schneider, Vice President, Client Services
Kellan Fluckiger, Vice President, Operations
CC: ISO Board of Governors, ISO Officers
Date: February 19, 1999
Re: ***Ancillary Service Market Redesign and FERC Filing***

EXECUTIVE SUMMARY

Introduction

This memo summarizes the Ancillary Service (AS) Market Redesign that will be filed with FERC on March 1, 1999. It is based on comprehensive design process over the last 4 months at the ISO, with extensive participation by stakeholders. The proposed plan follows the Governing Board approval, at the January 28, 1999 meeting, of the key redesign elements that will be implemented for the summer of 1999.

The objective of the redesign plan is to establish workably competitive markets and reduce the opportunities and incentives to exercise market power. The filing at FERC will include the following elements:

- ***draft tariff language*** for the five redesign elements planned for summer 1999 implementation;
- ***requirements for lifting the current price caps*** (i.e., the cap in the AS capacity market and the cap in the real time energy market ("BEEP Cap"), which must be addressed in the March 1 filing even though the Board does not need to decide on raising price caps this month;
- ***the "safety net" concept***, which the Board should consider in preparation for raising the price caps; and
- ***a discussion of additional redesign elements*** that will be considered after the ISO gains operating experience with the new redesign elements during the summer of 1999.

Summary of Requested Committee and Board Action

Management requests that the Market Issues Committee recommend to the Board approval of the AS Redesign Plan, as outlined in this memo, for filing at FERC on March 1, 1999, including the filing of language substantially similar to the attached tariff changes. Management recommends the following motion:

Move that the Board of Governors authorize ISO Management to implement the proposed Ancillary Service Redesign plan and file the appropriate tariff amendments at the FERC.

Market Surveillance Committee Meeting

The Market Surveillance Committee met on the day that this memo is being finalized and discussed the ISO's proposed March 1 filing elements.

The MSC views on the proposed filing in general will be discussed at the Market issues Committee meeting. The MSC's specific views on the Rational Buyer proposal are stated below.

The MSC is concerned about the way in which Management proposes to settle for AS after using the Rational Buyer procedure. Management proposes to ensure that no Market Participant be disadvantaged from the Rational Buyer change, compared to the prices that would have been paid under the existing procurement method.

For example, if the ISO procured some less-expensive Spinning Reserve to substitute for more-expensive Non-Spinning Reserve, the market-clearing price for Spinning Reserve would be increased even though the ISO's cost would be reduced overall. The ISO's proposed settlement method would limit the new price for Spinning Reserve to that in the absence of Rational Buyer, with the "additional" cost picked up by purchasers of Non-Spinning Reserve, who were the ones benefiting from the substitution.

However, the MSC opposes this approach and strongly supports settling strictly on the new prices that result from the Rational Buyer changes. (In the above example, the Spinning Reserve price would rise, based on the new purchase amounts.)

The MSC opposes the adjustment of settlement process for both economic and simplicity considerations. It also believes that the equity concerns addressed by the Management proposal will be better mitigated by changes in market behavior that will occur when the new approach is in place.

Management will address these concerns at the Market Issues Committee meeting.

Background - January 1999 Board approval

At its January 28, 1999 meeting, the Board approved Management's recommendation to target five redesign elements for summer 1999 implementation. Further, because software resources are critical to these redesign elements, Management recommended a priority for implementation, which was also approved by the Board. The elements, in the approved order of priority for development, are:

1. Auction design changes (Rational Buyer) - This will adjust the ISO's specific AS requirements to optimize the cost of procurement for Ancillary Services while still utilizing SC bids in their merit order. To address stakeholder concerns, the ISO committed that no single SC would pay a price above what it would have paid in the absence of this feature.

2. Uninstructed deviations compromise proposal and use of Replacement Reserve: This addresses uninstructed energy deviations by units supplying Supplemental Energy bids in the BEEP stack and will remove the incentives that currently exist for generating units to ignore ISO dispatch instructions.

Included in this proposal is a modification to the ISO's procurement of Replacement Reserve, where additional Replacement Reserve will be purchased during times when SC scheduled load falls significantly short of ISO forecasted load. SCs will be allocated costs for the extra replacement reserve based on the obligation they cause through under-scheduling load or over-scheduling generation. The replacement reserve proposal is also intended to improve ISO operation by reducing or eliminating emergency, out-of-area purchases that were required in 1998 to address the under-scheduled load issue.

3. Automation of BEEP instructions: This will automate dispatch instructions from the ISO, reducing manual phone notifications that have been used previously. This provides the ISO dispatchers a tool to utilize the entire BEEP stack and mitigate a cause for skipped bids.

4. Separate Pricing of "Regulation up" and "Regulation down" services. Currently the ISO procures "Reg up" and "Reg down" separately, but a common market-clearing price is used, at the higher price of the two services (i.e., based on the price of the scarcer service). This software change will allow for separate pricing.

5. Implementation of Inter-SC trades for AS - This software change will allow bilateral AS trades between SCs which will encourage self-provision. This flexibility will increase market participants' options for procuring Ancillary Services.

Note that completion of the **Participating Load Agreement** is part of the redesign activity for implementation by summer 1999, but it is not included in the prioritization above because it does not require software changes. The Participating Load Agreement will further facilitate participation of dispatchable loads in the AS markets, increasing the ability of loads to avoid high market prices.

Also note that two other vital elements of the AS Redesign were approved by the Board in November 1998 and targeted for implementation before summer 1999. These elements are:

- **No-pay provision for AS capacity that is not available in real-time,**
- **Billing AS costs based on metered demand.**

In its February 9, 1999 order, FERC approved Amendment 13 that incorporated tariff language for these two changes.

Refinements since the January Board meeting

More detailed work on the plan elements since the January board meeting, including development of the tariff language, has led to further refinement of the redesign elements and identification of several implementation questions. Most of these issues were discussed with market participants at the February 10 Market Issues Forum (MIF) meeting and in subsequent communications. They are not policy issues that the Board must approve but are summarized here for Board information. The key issues raised include the following:

1. Inter-SC trades of AS - Market Participants raised a concern about the ISO plan to trade obligations vs. trading the service itself. We believe that subsequent communication will clarify this, and that the concerns which were raised can all be resolved within the ISO proposed design.

2. Rational Buyer – Several Settlements implementation issues were raised regarding the provision of supporting information for charges on the settlement statements. The following two options being considered to transmit sufficient data to the SCs to verify and validate their statements:

Option A: Provide one set of prices and quantities on settlement statements, and provide back-up information needed for statement validation on the PMI. This is the ISO preferred approach.

Option B: Provide all necessary information, i.e. both sets of prices and quantities and the K factor, in the settlement statements. This would require the addition of charge types to the settlement statements and changes in the templates.

Initial feedback from stakeholders seemed to favor Option A, and because information transparency is so important to stakeholders, the ISO is reviewing this issue further with a stakeholder working group.

3. Replacement Reserve – Scheduling Coordinators have raised questions about how they can mitigate the risk of being assigned replacement reserve obligations. The ISO has prepared an explanation of options for self-provision that will address this concern. This explanation is included as Attachment C. Management believes that the risk of Market Participants incurring significant additional costs under this Replacement Reserve allocation is less than that faced in the summer of 1998 due to out-of-area bilateral purchases.

Later in 1999, the ISO and market participants will evaluate the remaining elements in the revised list of 20 AS redesign elements considered (see Attachment A). This evaluation will consider the operating experience of the summer of 1999 with the redesign elements implemented, along with other software development priorities, to determine which elements might be pursued next. At this time, the ISO anticipates that the remaining high priority items would be pursued next.

Price Caps

As mentioned earlier, the Board does not need to decide on raising price caps this month. FERC, however, does require that the ISO's long-term plan for price caps be a part of the March 1 filing.

In the October 28, 1998 AES Order, FERC required the ISO to develop and file a comprehensive proposal to remedy the identified problems in its AS markets.¹ In its January 27, 1999 order, FERC rejected the ISO's specific BEEP Cap proposal but, in so doing, it gave the ISO the complete authority and discretion to impose price caps at whatever levels the ISO deems appropriate.² The FERC stated:

“Accordingly, we direct the ISO to address its concerns about the real-time energy market in the same manner that it is addressing its concerns about the other markets it operates, subject to the requirement that, in its March 1, 1999 filing, the ISO explain and justify its longer term plans. Until that time, the ISO may adopt a purchase price cap for imbalance energy at whatever level it deems necessary and appropriate. As in the case of the purchase price cap for ancillary services, the imbalance cap would allow the ISO to limit the prices that it pays for imbalance energy. Consistent with our orders on ancillary services, we authorize the ISO to waive tariff provisions, to the extent necessary, to implement the purchase price cap.” (footnotes omitted)

86 FERC ¶ 61,059, Slip Op. at 7 (1999). Thus, while the FERC gave the ISO broad authority to impose price caps, it wants the ISO to explain and justify its longer-term plans in the March 1, 1999 filing. FERC also wants the ISO to explain whether it will continue to use its discretion to impose price caps and, if so, the criteria under which it will exercise its discretion in the future.

In the ISO's March 1 filing, Management will outline the main elements most important for workably competitive markets. Those are:

- Acceptable resolution of RMR DA scheduling issues
- Implementation of critical AS Redesign elements, namely:
 - Billing based on metered demand
 - No-pay provisions for AS Capacity
 - Rational Buyer
 - Compromise proposal for uninstructed deviations and change in Replacement Reserve allocation
 - Automated BEEP
 - Reg up, Reg down priced separately
 - Inter-SC trades of AS

We expect that the Board will review the issue of price caps at its May 1999 meeting and make a determination regarding the caps after considering the status of these elements. The Board could decide that not all of the AS elements are required before the caps could be increased, although Rational Buyer has been considered as crucial to any increase. This approach will give the Board the flexibility to assess the effectiveness of RMR reform and AS Redesign at that time and then raise the price caps when it is prudent to do so.

The ISO will propose to FERC retention of its discretion to impose caps as long as there is a substantive risk of monopoly power having a significant impact on the cost of AS in the ISO

¹ 85 FERC ¶ 61,123 at 61,462

² 86 FERC ¶ 61,059 Slip Op. At 6-7 (1999)
CS/SRSKF

markets. Longer term, the ISO expects that a "circuit breaker" mechanism will be appropriate to protect the market from very erratic behavior.

On a longer-term basis, ISO Management believes that price caps must be raised even further. At the November 1998 meeting on BEEP price caps, the Board contemplated moving the caps to \$2500 in October 1999.

The ISO believes that caps are required somewhere near the \$2500 level to encourage the full development of demand elasticity in this market. A major review will occur in the Fall of 1999 based on experience with the summer operation.

At that time, the ISO, along with the Market Surveillance Committee, will provide FERC with its assessment as to the appropriate next steps with regard to market improvements and price caps. At a point in the future when there is adequate demand elasticity, we anticipate eliminating price caps and installing a "circuit breaker" approach on a long-term basis that would intervene if the market became highly erratic or unworkable.

On a shorter-term basis, the concept of a "safety net" has been discussed once the caps are raised above \$250. This concept is discussed in the next section.

Safety Net

The concept of a "safety net" has been recommended by some market participants, Board members, and the Market Surveillance Committee to provide a means for the ISO to monitor market performance and take corrective actions in an orderly fashion if signs of significant, remaining market design flaws are discovered. The topic has engendered stakeholder concern, because it could result again in lower caps, which may send incorrect pricing signals to the market.

The ISO understands this concern and believes that a robust market demands that a high hurdle be set for implementation of the safety net. Prices that approach or reach the price cap during times of high load demand are not necessarily bad. Prices that behave erratically or inconsistently are a greater concern.

The notion of a safety net also presents a threshold question for the Board regarding reflects the level of delegation that might be granted to Management. The delegation of authority would be the decision about lowering caps in the event that market flaws are discovered, causing erratic pricing.

Board members might question whether a safety net is necessary, given the relative ease with which a Board meeting can be called. However, in the summer, vacation scheduling can make it difficult to get a quorum on a short-noticed Board conference call. Again, this is not a matter that needs to be decided this month, but it is a very important issue that the Board, Management, stakeholders, and the Market Surveillance Committee should consider and collaborate on to reach an approach in May that best serves the market.

Attachment B describes a draft safety net proposal. A version of this was reviewed with Market Participants at the February 10 Market Issues Forum.

There were differing views expressed by the Market Participants regarding the level of specificity that was needed and reasonable. The major concern expressed had a common theme: Market

Participants want to minimize implementation of the safety net approach. The ISO agrees and intends to set a "high hurdle" safety net only for very significant market flaws.

Schedule for summer 99 implementation

As discussed with the Board in January, software resources are stretched in 1999, and there are other major projects demanding these resources, notably Year 2000 testing, FTR implementation, and TO Debit. These changes, along with the redesign elements, will place a major strain on these limited resources, for both the ISO and its vendors.

In January, Management discussed a June 1, 1999 target implementation date for all but Inter-SC Trades, which would follow in a few weeks. Though this target remains, it appears unlikely that all the needed software will be ready concurrently, and implementation will likely be staged as different elements are ready. The tariff filing has been prepared to allow for this staged implementation.

Tariff changes and Stakeholder comments

On February 9, 1999, the ISO sent Market Participants draft tariff language and requested comments by February 12, 1999. Recognizing the short time frame for providing comments, the ISO committed at the February MIF to a good-faith effort to consider and, where appropriate, incorporate into Management's submission to the Board or presentation at the Board meeting, major comments submitted after February 12 but before noon Feb 19.

As of Thursday, February 18 (8:00am), the ISO had received comments from five entities: Independent Energy Producers ("IEP"), Enron, Sacramento Municipal Utility District (SMUD), California Public Utilities Commission (CPUC), and California Power Exchange (PX).

CPUC: The CPUC's comments are on the draft safety net proposal. The CPUC questions whether the proposal adequately explains what the ISO intends to do about price caps and what the criteria are in the immediate future (e.g., this summer). Management believes this memo and the attachments adequately address the CPUC's concerns.

SMUD: SMUD had two suggested changes for the draft tariff language. In one comment, SMUD proposes to add a sentence to section 2.5.20.5.2 of the ISO Tariff. The changes in this section 2.5.20.5.2 pertain to billing based on metered demand and self-provision of ancillary services. SMUD's proposal is to add, after the first sentence of section 2.5.20.5.2, the following: "Changes to ancillary services that are self-provided pursuant to Existing Contracts will be implemented pursuant to the terms of those contracts and the RPTO agreement." The ISO believes that this change is not necessary because the RPTO agreement already provides the needed flexibility.

SMUD's second change pertains to the allocation of Replacement Reserves and section C 2.2.3 of Appendix C to the Settlement and Billing Protocol. In the fourth subsection, beginning with the word "where," the third line, SMUD requests that the ISO strike the words "metered load" and replace them with "Metered Demand". SMUD states that this would avoid confusion and correctly use defined terms in the ISO Tariff.

Given the definition of "demand" in the ISO Tariff, use of the term "Metered Demand" would imply metered load and exports. However, Replacement Reserve is not intended to be allocated to scheduled Exports; therefore, the tariff language should use the term "Metered Load, excluding Exports."

IEP: IEP questions how the ISO's proposed changes for replacement reserves and uninstructed deviations would apply to intermittent generation resources such as wind. IEP states that Scheduling Coordinators who have a portfolio of intermittent resources face real time deviations due to forecast errors as well as changes in load. While continuing to work through technical changes in the draft tariff language, IEP seeks assurances that intermittent resources will not be penalized based on unavoidable characteristics of their fuel sources.

IEP's concerns are mitigated to some degree by the fact that the uninstructed deviation proposal will be applied to Scheduling Coordinators ("SC") on a zonal portfolio basis. Thus, to the extent an intermittent resource does not generate what it is scheduled to provide, its SC will have the opportunity to adjust for the deviation with other resources in its portfolio. An intermittent resource can also mitigate its risk of uninstructed deviations (and being allocated Replacement Reserves costs) if it conservatively schedules its resource on those days it is likely to be called upon by the ISO.

Enron: Enron submitted comments on five aspects of the draft tariff language. Three of the comments noted confusing sentences and/or poor construction of the draft provisions. Management will clarify these provisions. The two remaining comments addressed the design of certain aspects of Management's proposal.

First, Enron questioned whether Inter-SC trades should be implemented by having the trades involve a trade of the Ancillary Service ("AS") obligations. Management believes its proposal to implement Inter-SC trades is flexible and accommodates Enron's concerns. Further discussions with Enron are ongoing to add clarification and resolve this issue.

Enron's second comment concerns Management's proposed alternatives regarding self provision of AS in the Hour Ahead (HA) market. Self provision of AS in the HA market is an issue that was not addressed in Amendment No. 13 and the changes regarding billing based on metered demand.

If no limits are set for changes between Day Ahead and Hour Ahead self-provision gaming opportunities and potential cost shifting will exist. For example, a Market Participant that correctly anticipates higher Hour Ahead prices may self-provide in the Day Ahead market, withdraw that self-provision in the Hour Ahead market, and profitably bid the same capacity.

Recognizing this gaming opportunity, Management is proposing that a SC pay the Hour Ahead price to replace any *decrease* in Day Ahead self-provision. With regard to *increases* in Hour Ahead self-provision, Management proposed two alternative approaches. Under Alternative (1), the ISO would impose no limits on increases in Hour Ahead self-provision, but self-provision in excess of a Scheduling Coordinator's total obligation (including the effect of any trades) would be given no additional credit. Under Alternative (2), increases in self-provision would be limited to the Ancillary Service obligation estimated to be associated with incremental load scheduled in the Hour Ahead market.

Enron prefers Alternative (1) because it is, in its opinion, a more market-based approach than imposing absolute limits. Management recommends Alternative (2), because physical limits on changes in Hour Ahead self-provision are not unreasonably restrictive and should be included to reduce the risk of cost-shifting.

PX: The PX submitted five comments focusing on the Rational Buyer proposal.

- The first comment states the PX concern that the current Rational Buyer concept not become the permanent design for this feature. The ISO has stated earlier that, after the experience gained this summer, the Rational Buyer concept will be examined to determine if further changes are warranted. (Some of the changes discussed earlier include simultaneous evaluation and iterative bidding procedures, among others.)
- The second comment expresses PX concerns about incentives that might result from the Rational Buyer structure, in two areas:
 - Suppliers would have an incentive to change their bids to negate the impact of the Rational Buyer procedure. The ISO agrees, but we do not see this as a problem. In Management's opinion, such changes are likely to be in a desirable direction, where higher-valued services would end up being priced above lower-value services.
 - Distortions (such as extra market transactions) would be introduced by the presence of different price signals to buyers and sellers. This is the same concern expressed by the Market Surveillance Committee and, as noted above, Management will respond to it at the Market Issues Committee meeting.
- The third comment expresses PX concerns that the Rational Buyer algorithm will be implemented without market testing. The ISO is conducting tests of the algorithm to evaluate its impact based on historical bidding behavior. However, only observation and review of actual bidding behavior after implementation can determine the true effect of this market change.
- The fourth comment requests an independent (non-ISO) review of 1999 results. The ISO will request that the Market Surveillance Committee carry out an ex-post review of the operation of the Rational Buyer in early 2000.
- The fifth comment requests ISO consideration of a contingency plan in case the Rational Buyer algorithm imposes adverse impacts. The safety net procedure is, in fact, the ISO's contingency plan in case the Rational Buyer, or any other aspect of the market, does not operate as expected.

Tariff language

Proposed Tariff language is being finalized and will be provided under separate cover.

Attachment A
List of Ancillary Service Redesign Elements Considered

Throughout the September – December 1998 timeframe, the problems with the Ancillary Services markets were more clearly defined, in cooperation with the Market Participants. The ISO and the Market Participants identified 33 separate potential redesign elements that could address these problems.

Some of these elements were combined because of interrelationships or because a modification to one element would accomplish the objectives of multiple elements. This reduced the list of 33 elements to 20, which was the basis for discussion and prioritization at the Stakeholder Forum on December 14. The list of 20 appears below, together with the prioritization developed at the meeting.

Priority	Grade	Element Number	AS Redesign Element
H		2.	Address uninstructed deviations (formerly Min-Max, being addressed with the compromise proposal.
H	2	3.	Multiple Ramp Rates
H	~2	4.	Separate BEEP Stacks
H	~1	5. /17.	Automated BEEP / Scheduling Improvements
	3	6. /18.	Ramping requirement, load following and reg energy payment option
H	1	7. /12.	Inter-SC Ancillary Service Trades (Approach: Trade “Obligation” – and address preservation of firmness of imports.)
H	2	8.	Cong/ASM Integration (relates to 28, 14, 11, 12)
	3	11.	AS Import limits; and import of regulation
H	1	13.	Ability to bid and self-provide from same unit (Current Phase II)
H	2	14.	Use of non-firm exports for non-spin and replacement reserves
H	1	15.	Simultaneous Auction (not product substitution)
H	1	16. /31.	Use of replacement reserves and proper cost recovery
	3	19.	Black Start
	3	20.	Voltage Support
H	1	21.	Demand participation and aggregation
H	~1	26.	Reg up/Reg down priced separately
	3	27.	Buy Back of AS
H	2	28.	AS Exports (necessary but not ready for July 1 implementation)
	3	32.	Energy of RMR AS (who pays, PTOs or SCs?)
	3	33.	AS procurement in Real Time

The items marked in the table with (H) are candidates for highest priority implementation. All other items are expected to be included in the long-term project. 1=high, ~1=almost high, 2=medium, ~2=almost medium, 3 = low

Attachment B

MARKET DESIGN SAFETY NET

A Proposed Process for Determining and Mitigating Remaining Flaws in the ISO's Market Design

EXECUTIVE SUMMARY

This proposal for a Safety Net is primarily a proposed *process*: it formalizes (and compresses somewhat) the events that took place between last July's price spikes and this month's FERC filing. The proposed process includes an observation program, a provision for fast action by ISO Management to impose or lower price caps if a market crisis is observed, and follow-up notification and diagnostic work to be presented to the ISO Governing Board.

With or without a safety net, the ISO Management and Market Surveillance Unit will monitor market behavior. If adverse market pricing or behavior is observed suggesting a review of the price caps, the Staff will present that to the board for consideration. The safety net approach would delegate that authority to the Staff to make decisions on price caps if it appeared that action was required before the next scheduled board meeting. This outline addresses the design of tools to allow the ISO to identify and respond appropriately should such problems arise.

ISSUE STATEMENT

In response to the market conditions of July 1998, the ISO set a "damage control" cap on ancillary-service capacity prices. There followed a period of fact-finding by the ISO MSC and the PX MMC, who identified a lack of workable competition which was related, at least in part, to several flaws in the design of the ISO's markets.

In its October 27 ruling, FERC confirmed the ISO's authority to set a price cap, stating that "some form of price constraint is needed until the market design flaws are corrected," and ordered the ISO to prepare a market redesign package that would permit the caps on AS capacity prices to be raised. This Safety Net proposal is a process, or framework for action, that supports the proposed market redesign package.

The Safety Net proposal represents a formalization of the response of the ISO to evidence of serious failures in the ISO's markets. The proposal incorporates several features of the ISO response to the July 1998 price spikes, including:

- initial observation of significant evidence of serious market dysfunction;
- rapid response of ISO Management, imposing or lowering price caps to limit damage;
- diagnosis of specific causes of market failure;
- review and, if necessary, modification of price cap;
- identification and implementation of remedies based on diagnosis; and

- raising of price caps.

The Safety Net is proposed as a procedure for taking emergency action, followed by review and remedy, not a specific formula or formulae. ISO Management proposes specific oversight by the ISO Governing Board, along with consultation with the ISO's stakeholders and the Market Surveillance Committee.

OBSERVATION

ISO Management's proposed plan for observation of the market to identify crises has two main elements: first is the regular observation of prices for patterns indicative of market failure; second is a monitoring plan to detect supply insufficiency.

The price observation program would be based on the understanding that, under conditions of workable competition, market-clearing prices for a good or service will reflect the marginal cost of providing the good. Several consequences of that relationship support the Safety Net observation program:

- As demand expands and contracts during the course of a day, the cost required to meet that demand increases and decreases. Relatively smooth changes in prices from hour to hour are therefore expected. On the other hand, large and erratic hour-to-hour changes in Energy or AS capacity prices may indicate poorly functioning markets.
- AS capacity prices compensate suppliers for the profit opportunities foregone from not selling Energy. In general these prices should be less, per MW, than the price of Energy, since the cost of providing Reserves does not include the fuel and maintenance costs associated with providing the same amount of Energy. Persistent and substantial failure of this condition—repeated large excesses of AS capacity prices over Day-Ahead, Hour-Ahead, and real-time Energy prices—would be strong indicators of poorly functioning markets. Some such excesses are to be expected: market participants make imperfect predictions of market-clearing Energy prices in their computation of opportunity costs and formulation of AS capacity bids, and will often overestimate the Energy price, which in some cases may lead to a higher market-clearing price for capacity than for Energy.
- Large and persistent differences in prices under similar load and supply conditions could also be strong evidence against of market design flaws.
- Failures of generating capacity to bid Energy or capacity into the appropriate markets at prices that are equal to, or even significantly above, the cost to provide either Energy or AS capacity could be evidence of an exercise of market power and consequent market failure.

In observing supply sufficiency, an important premise is that insufficient actual capacity and the resulting high scarcity prices are not indications of market power. On the contrary, they provide the necessary signals or incentives for investment.

Inadequate bids when sufficient supply exists is also a possible cause of high prices. In this case, the high prices are a possible indication of market power or market design problems.

ISO Management does not believe that a Safety Net action is appropriate in all cases in which very high prices might be observed. In particular, in the case of an absolute shortage of physical supply, high prices provide a strong signal to the market to resolve the supply inadequacy. Similarly, in some cases, high prices encourage institutional innovations, such as the development of programs of economic load curtailment and other methods of identifying load's price elasticity of demand. ISO Management's observation of supply adequacy is therefore oriented towards behavior either under the control of the ISO in its role as a market designer, or under the direct and intentional control of market participants.

The key elements of the ISO's observation of supply conditions include:

SAFETY NET ACTION

The Safety Net action may involve the announcement of lower caps on the bids accepted to provide Ancillary Service capacity and/or Energy (including supplemental-Energy bids). These caps might apply to individual hours and markets. In taking action, ISO Management will take into account the effects of interactions between the various AS capacity and Energy markets.

ISO Management cannot specify the values of bid insufficiency, prevalence or frequency of pivotal bidders, or frequencies or levels of various price conditions that will be necessary to justify Safety Net action. The Safety Net procedures would be invoked by ISO Management following observation of serious evidence of major market failure indicating a need for immediate mitigation to prevent serious harm to the market. It is not Management's objective, however, to use the Safety Net procedures to mitigate the temporary and minor exercise of market power, or to interfere with necessary scarcity-price signals.

When a safety net action is taken the ISO Management will inform the Board and market immediately. Within 2 days the Management will notify the Board of the reasons for the action, and the matter will be discussed at the next scheduled Board meeting. At that time, the management will present to the board a review of the safety net implementation, the status of diagnosis, and recommended future actions, including market redesign, further review by the Board and MSC, etc.

APPENDIX C

“DEVIATION” REPLACEMENT RESERVE

The ISO is proposing to rely on bid and self-provided “Deviation” Replacement Reserve to assure sufficient resources are available in real time to serve load. Benefits include higher quality BEEP stack, reduced Regulation requirements, and far fewer out-of-market calls. The ISO will only procure Deviation Replacement Reserve when there is a risk that insufficient market resources will be available in the Imbalance Energy market.

The cost of Deviation Replacement Reserve is proposed to be assigned to under-scheduled Load and over-scheduled Generation on a zonal portfolio basis. This allows a Scheduling Coordinator with an increased load at one location, to reduce another load in the zone, or to replace a Generator outage or deration in real time with other resources in the same zone.

The purpose of this paper is to respond to issues raised at the Market Issues Forum of February 10.

HOW CAN A SCHEDULING COORDINATOR MITIGATE THE RISK OF FORECAST ERROR IN HOUR AHEAD SCHEDULING?

Deviation Replacement Reserve is procured when the supply available to the Imbalance Energy market is forecast to be deficient. The concept for assigning the cost of Deviation Replacement Reserve is to assure that SCs pay for the Replacement Reserve procurement that they caused. An SC can mitigate its risk of forecast error in its schedules through several means. Below are some of the options:

- 1) Accept the risk of under-scheduling – Pay for Replacement Reserve plus Imbalance Energy at the Hourly Ex Post Price.
- 2) Bias forward market energy schedules – Over-procure Energy in the forward markets, with repayment at the Hourly Ex Post price.
- 3) Self-provide Replacement Reserve – If the ISO has a net requirement Hour Ahead, then a credit will accrue for any excess self-provision, leaving the SC responsible only for the capacity necessary to serve its load.

A Scheduling Coordinator can choose among these strategies based on its risk preferences and the quality and timing of its load forecast.

ISSUES AND SOLUTIONS

Under-scheduled Load and Real Time Balancing

Some Scheduling Coordinators may under-schedule, and then balance loads and resources in real time, thereby avoiding reliance on the Imbalance Energy Market. How does such an SC avoid a Replacement Reserve obligation?

A Scheduling Coordinator can effectively balance loads and resources in real time by self-providing Replacement Reserve in the DA or HA market. By bidding the self-provided Replacement Reserve energy at its marginal cost (rather than generating without regard to the value of Energy) an SC is assured of being no worse off. In fact, if Imbalance Energy prices are lower than the marginal energy cost, the resource would not be called and the SC would be served out of the Imbalance Energy market, providing a net benefit.

If, alternatively, a Scheduling Coordinator prefers that such self-provided Replacement Reserve be block loaded, then an Energy price of zero could be bid. If the Scheduling Coordinator prefers that its Replacement Reserve not be dispatched, then a high price could be bid.

Over-scheduled Load

A Scheduling Coordinator who has over-scheduled load would likely choose not to deviate from its scheduled generation in real time. Doing so will avoid allocation of Deviation Replacement Reserve, and the excess Energy would be compensated at the Hourly Ex Post Price. There is no opportunity cost for the capacity involved, leaving the adequacy of the Hourly Ex Post Price as the only risk.

Over-Generation Conditions

When the ISO has over-generation conditions, some SCs are able to increase unscheduled loads to absorb the excess generation. One Market Participant has argued that this proposal will result in SCs being less able to absorb such surpluses due to the risk of assignment of charges for Deviation Replacement Reserve if load is under-scheduled. It is important to note that minimal purchases of Replacement Reserve are likely to be made during times of overgeneration. Also Replacement Reserve prices would tend to be low during periods of overgeneration. So the impact on the market of this allocation during overgeneration is considered small.

Ten Minute Dispatch Increases costs

Self-provided Replacement Reserve is not assured of dispatch across an entire hour, or across multiple hours. One Market Participant argues that the measures noted above do not mitigate the risk that capacity costs will be increased since a block dispatch cannot be made. Bidding zero across the hours that the block of Energy is intended to be dispatched can largely mitigate this limitation.

Does the Replacement Reserve Allocation discourage Real-Time Balancing?

One Market Participant argues that the intent of the proposed policy appears to be to discourage real time market participation and load balancing. No such disincentive is intended, and the benefits of real time balancing can be preserved. However, the ISO must assure sufficient resources are available, and increased burden on the market would result if the allocation of Replacement Reserve were based on another method.

For example, one Market Participant suggested that if the objective were to encourage better forecasts and better real time load management, then all Replacement Reserve should be assigned based on metered load. Again, the allocation has been designed so that the SCs that cause the need for Replacement Reserve pay for it. If the cost was allocated across all metered loads, then there is little incentive to balance loads and resources in real-time.

Another alternative would be to use net deviations to assign Replacement Reserve, but this would increase uncertainty and shift costs to the market. Under this scenario, an SC could underschedule load during DA and HA markets (which may cause the ISO to procure additional Replacement Reserve), then balance their schedule in real-time and pay nothing for the Deviation Replacement Reserve procurement they caused.

The ISO's proposed cost allocation will provide a strong incentive to Scheduling Coordinators to assure that they have sufficient capacity during the critical periods.