January 31, 2002

The Honorable Magalie Roman Salas
Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, D.C. 20426

Re: California Independent System Operator Corporation,
Docket No. ER02-____-000
Amendment No. 42 to the ISO Tariff

Dear Secretary Salas:

Pursuant to Section 205 of the Federal Power Act ("FPA"), 16 U.S.C. § 824d, and Sections 35.11 and 35.13 of the Commission's regulations, 18 C.F.R. §§ 35.11, 35.13, the California Independent System Operator Corporation ("ISO")[1] respectfully submits for filing an original and six copies of an amendment ("Amendment No. 42") to the ISO Tariff. Amendment No. 42 would modify the Tariff in the following respects:

- New provisions to facilitate participation in the ISO markets by eligible intermittent resources (*e.g.,* wind);

- Changes in allocation for ISO Settlement Charge Type 487;

- Changes in management of Intra-zonal Congestion; and

- Changes in the calculation of the Target Price for incremental and decremental Imbalance Energy bids.

Revised Tariff sheets reflecting the changes proposed herein are contained in Attachment A and black-lined Tariff sheets are contained in Attachment B.

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[1] Capitalized terms not otherwise defined herein are defined in the Master Definitions Supplement, ISO Tariff Appendix A, as filed August 15, 1997, and subsequently revised.

I. THE PROPOSED AMENDMENTS

The proposed modifications to the ISO Tariff have been conceptually approved by Motion of the ISO Board of Governors. They are designed to enhance participation in the ISO Markets; ensure fairness in Imbalance Energy cost allocation; respond to significant operational concerns; and prevent gaming. The ISO urges the Commission to act expeditiously in favor of the proposed modifications.

A. Intermittent Resources

1. Background

Wind generators and other intermittent Energy resources have special operational characteristics. Such units generally are unable to adjust their generation output to ISO Dispatch instructions. In addition, "as-available" Energy from intermittent resources is difficult to forecast accurately for more than one or two hours into the future due to the significant variability of the fuel source, *e.g.,* wind, sunlight.

Intermittent resources, especially those based on renewable Energy sources such as wind, can be competitively priced and at times displace Energy generated from non-renewable resources, such as traditional thermal generation. While development of significant new intermittent Energy resources in California is feasible, assured access to fixed price contracts is an important requirement for acquisition of project financing for many such projects. Intermittent resources often are at a disadvantage for such fixed price contracts since their output cannot be reasonably determined very far in advance. Moreover, through participation in ISO markets, intermittent resources are likely to incur charges for failing to follow their Schedules, and, as a result, they also may be unable to submit forward Schedules and instead be forced to take variable prices in the ISO Real Time Markets.

At its July 2001 meeting, the ISO Board of Governors directed ISO Management to work with representatives of the California Wind Energy Association, the American Wind Energy Association, the Independent Energy Producers Association, the California Department of Water Resources, the Governor's office, the investor-owned utilities and other interested parties to develop a consensus proposal for facilitating the participation of intermittent resources in ISO markets. Shared objectives include encouragement of investment in new wind, solar and other environmentally-benign intermittent Energy resources, a need for new rules for the scheduling of intermittent resources that will mitigate the variability of the financial impact of Imbalance Energy costs resulting when such resources inevitably go "off-schedule" (*e.g.,* when wind patterns change), help such projects gain access to debt financing, ensure operational reliability of the ISO Control Area while permitting grid access to such Energy resources and finally, minimize cost shifting to other Market Participants as may transpire through the effort to encourage a greater diversity in California's Energy resource portfolio.

As a result of the Intermittent Resource Working Group's efforts, a consensus was developed for the ISO to propose certain Tariff modifications to facilitate greater participation by intermittent resources.

2. Proposed Modifications

Eligible Intermittent Resources must meet both static and dynamic requirements to receive the treatment proposed herein for "Participating Intermittent Resources." Each such entity must execute the ISO's Participating Generator Agreement, install an ISO-approved meter, and install an ISO-approved Data Processing Gateway to permit the real-time telemetry of operation and meteorological data. Scheduling Coordinators for such Participating Intermittent Resources must submit Schedules that are consistent with an hourly Energy forecast that is developed under ISO supervision. The forecasting process is designed to provide statistically unbiased forecasts of generation output on an hourly basis. Participating Intermittent Resources will be assessed a fee to defray the ISO costs of the forecasting services.

The ISO proposes that all estimated Energy from Participating Intermittent Resources must be Scheduled in the Hour-Ahead Market, and that updated forecasts of Energy be available to the ISO thirty (30) minutes prior to the operating hour, to thereby minimize potential impact on ISO operations. The ISO also will monitor for any costs to the ISO and Market Participants and the impacts on ISO grid operations and reliability from unanticipated changes in Energy output from these intermittent resources. To further facilitate access to the ISO Controlled Grid and markets, the ISO also proposes certain modifications to the billing and settlement process for Participating Intermittent Resources. Specifically, settlement of Uninstructed Energy will be aggregated and netted across all BEEP Intervals in a calendar month. The net monthly deviation will be paid or charged at the monthly weighted average MCP. There is no change in the settlement of Uninstructed Energy for Scheduling Coordinators that do not represent Participating Intermittent Resources. The difference between what Participating Intermittent Resources are paid or charged for Uninstructed Imbalance Energy on the basis of net monthly deviations, and what they would have been paid or charged if such deviations had been settled by BEEP Interval, will be tracked in a balancing account and settled, as described *infra.*

The ISO proposes that ISO Settlement Charge Types ("CT") 487 and

114[2] charges to all Scheduling Coordinators initially be calculated to include deviations by Participating Intermittent Resources. Settlement of CT 487 and CT 114 with Scheduling Coordinators not representing Participating Intermittent Resources will be conducted on the basis of this initial calculation. Charges for Scheduling Coordinators representing Participating Intermittent Resources will be re-calculated by removing the charges for their uninstructed deviations. The CT 487 and CT 114 charges for Scheduling Coordinators representing Participating Intermittent Resources will be tracked across the calendar month and placed in a single balancing account. The net monthly amount in such an account will be allocated to all Scheduling Coordinators with negative uninstructed deviations *pro rata* as the proportion of their accumulated negative uninstructed deviation to the sum of all accumulated negative uninstructed deviation over the calendar month.[3] Lastly, given that the forecast models that will be used for hourly forecasting will be calibrated to be statistically unbiased, the ISO does not expect significant deviations for Participating Intermittent Resources and therefore the expected value of such allocation adjustments for deviations is expected to be small or zero.

B. Settlement Charge Type 487

1. Background

In December 2000, through adoption of ISO Tariff Amendment No. 33, the Commission authorized the ISO to establish a "soft" price cap for the purchase of real-time Imbalance Energy. 93 FERC ¶61,239 (2000), reh'g pending. In its April 26, 2001, Order, 95 FERC ¶61,115(2001), order on reh'g, 95 FERC ¶61,418 (2001), reh'g pending, the Commission replaced the soft price cap with a variable price cap determined by proxy bids that are based on the marginal operating costs of gas-fired units. If ISO real time Imbalance Energy requirements are such that the ISO needs to Dispatch only bids below the relevant mitigated price, the Market Clearing Price ("MCP") will be set by the highest bid price of those Dispatched bids. If ISO real time Imbalance Energy requirements are such that the ISO is required to Dispatch bids above the relevant mitigated price, the MCP will be set to the highest bid price of the Dispatched bids that are below the cap. In this way, the MCP will never exceed the mitigated price. Bids above the mitigated price, when Dispatched, are paid as bid, with the bidder receiving two payments: a CT 401 payment based on the MCP and a CT 487 payment that makes up the difference between the MCP and the bid price. The CT 487 payments (*i.e.,* "Above MCP Payments") are allocated to SCs having negative Uninstructed

[2] Charge Type 487 is "Allocation of Excess Costs for Instructed Energy" and Charge Type 114 is "Replacement Reserve Due ISO."

[3] Inasmuch as any Participating Intermittent Resources have uninstructed negative deviations, a commensurate portion of the cost (or benefit) of such deviations will accrue to Scheduling Coordinators representing Participating Intermittent Resources.

Energy during the same trading interval (*i.e.,* negative deviations). Above MCP Payments are subject to refund if the corresponding bids are determined by the Commission to be unjust or unreasonable.

The allocation methodology for ISO CT 487 became effective on December 12, 2000. In implementation, the ISO changed CT 487 from a regional allocation to a Control Area allocation. The ISO consistently allocates the entire amount of Above MCP Payments among those Scheduling Coordinators with negative deviations.

Under ideal operational conditions, the ISO would procure just enough Instructed Energy to balance the real time Energy requirements of the ISO Control Area. Under such optimal conditions, Market Participants causing negative deviations would pay for all of the resulting Above MCP Payments. There are certain operational conditions, however, when the amount of Instructed Energy exceeds the amount of negative deviations. Such over-procurement of Instructed Energy can occur for a number of reasons, including:

- When positive Instructed Energy is needed to balance Unaccounted For Energy ("UFE") in the System;
- When positive Instructed Energy is part of a pre-dispatch of ISO Control Area interties, that cannot be altered during the following operating hour; or
- When positive Instructed Energy is needed to balance other decremental instructions that may have been pre-dispatched.

2. Proposed Modifications

The ISO proposes to allocate to Negative Instructed Deviations a modified rate equal to the total Above MCP Payments divided by the greater of the total negative deviation in the System <u>or</u> the amount of positive Instructed Energy procured above the MCP. The modified rate will achieve the following:

- When the amount of Instructed Energy procured with a cost component above the MCP is less than or equal to the amount of negative deviation, the modified rate is the same as the existing rate and the entire Above MCP Payments are allocated to the Scheduling Coordinators with negative deviations; and
- When the amount of Instructed Energy procured with a cost component above the MCP is greater than the amount of negative

deviation, each Scheduling Coordinator with negative deviations will be assigned one (1) MWh of weighted average above MCP costs for each MWh of negative deviation. As a result, the total costs recovered through CT 487 will be less than the payments made through CT 481. The difference will be allocated to all Scheduling Coordinators based on their *pro rata* share of System metered Demand.

The following examples illustrate the proposed modification to calculation of the rate for CT 487:

Example 1: Instructed Energy Procured Above The MCP <= Negative Deviation

Instructed Energy at MCP = 100 MWh at $108
Instructed Energy above the MCP = 70 MWh at $120
Total system negative deviation = 100 MWh
Excess Costs (CT 481 Payment) = $ [70 * (120 – 108)] = $840

	Existing Scheme	Proposed Scheme
CT 487 Rate	$8.4/MWh ($840/100MWh)	$8.4/MWh ($840/100MWh)
Total CT 487 Charges	$840	$840

Example 2: Instructed Energy Procured Above The MCP > Negative Deviation

Instructed Energy at MCP = 100 MWh at $108
Instructed Energy above-MCP = 70 MWh at $120
Total system negative deviation = 10 MWh
Excess Costs (CT 481 Payment) = $ [70 * (120 – 108)] = $840

	Existing Scheme	Proposed Scheme
CT 487 Rate	$84/MWh ($840/10MWh)	$12/MWh ($840/70MWh)
Total CT 487 Charges	$840	$120MWh($12/10MWh)
New CT C Charges (allocated to metered demand)	N/A	$720 ($840-$120)

C. Intra-Zonal Congestion

1. Background

The ISO implemented its zonal congestion management market in 1998 under the assumption that most transmission congestion would occur *between* price zones (i.e. “inter-zonal congestion”) and that congestion *within* zones (i.e. “intra-zonal congestion”) would occur infrequently. Consequently, the ISO began operations with tools and a system to manage inter-zonal congestion in the forward markets, but with no comparable bid-based way to manage intra-zonal congestion in the forward markets.

The ISO has Reliability Must-Run ("RMR") contracts with generators that are required to run under certain conditions to maintain grid reliability. Thus the ISO has had some limited ability to dispatch RMR units, both before real-time and in real-time, to manage intra-zonal congestion. Owners of RMR Generating Units, concerned that the RMR contracts would interfere with the market prospects for their units, worked to narrow the ISO's ability to Dispatch RMR Generating Units under the RMR contracts. Ultimately, while the ISO maintained broad authority to increase a Generating Unit's output for reliability purposes through the RMR Contract, the ISO's ability to reduce such a unit's output under the RMR contract now is limited to reducing a unit's output to provide Ancillary Services.

The other tool the ISO has to manage intra-zonal congestion is the use of adjustment bids left over, *i.e.,* not Dispatched, from the forward congestion management process and incremental ("INC") and decremental ("DEC") supplemental energy bids ("INC bids" and "DEC bids," respectively). However, because the ISO does not manage intra-zonal congestion in the forward markets, these bids can only be used in real time for that purpose.

Since limited and specific criteria are used to designate RMR Generating Units,[4] such units were not available to solve every local reliability problem. This is especially true for problems that develop when transmission lines are taken off-line for maintenance or are forced out of service. Generators have realized that in situations where no RMR units could be used to mitigate intra-zonal congestion, the ISO must take a market bid out of economic merit order to re-dispatch generation to ensure reliability. Under these circumstances, supplemental Energy bid prices have increased significantly following the loss of a transmission line once generators became aware that their non-RMR units had to be re-dispatched to mitigate congestion resulting from this outage. Moreover, generators have discovered that, in situations where a transmission line was out for maintenance, requiring that the generation in that area be limited to prevent the remaining line(s) from overloading, they could schedule their unit(s) far beyond the limited local transfer capability in the forward markets and force the ISO to use their DEC bids in real-time to mitigate the resulting congestion – a process known as the "DEC game." While some DEC bids are positive, (*i.e.,* representing an amount the generator is willing to pay the ISO to reduce its output, effectively buying Energy from the ISO's Real Time Imbalance Energy Market to avoid having to generate that Energy), generators playing the DEC

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[4] The ISO designates RMR units based on the combination of a transmission line outage and a generator outage that has the greatest effect on the grid.

game often submit negative decremental bids – effectively requiring the ISO to pay *them* to *take* Energy from the ISO. While negative DEC bids and low, or even negative, prices possibly may be justifiable during System over-generation conditions, negative DEC bids submitted to the ISO under other conditions, and especially during periods of intra-zonal congestion, simply represent the exercise of local market power.

In response to this growing problem, the ISO submitted proposed Tariff Amendment No. 23 on November 10, 1999. Amendment No. 23 was intended to accomplish three things: 1) provide a new formula payment price for generation dispatched out-of-market (i.e., not according to a bid) as an alternative to the ISO's Hourly Ex Post Price, which generators claimed did not always cover their costs; 2) allow the ISO to Dispatch units out-of-market, and pay either the Hourly Ex Post Price or the new formula price to mitigate intra-zonal congestion, even when the generator had submitted a bid, if there was not a competitive supply (*i.e.,* from at least three non-affiliated suppliers) of available bids; and 3) allocate such Dispatch costs to the Participating Transmission Owner in whose area the congestion occurred.[5]

In its January 7, 2000 order,[6] the Commission accepted the new formula price for out-of-market calls and the new cost allocation methodology but rejected extending the ISO's authority to Dispatching units that had submitted bids through out-of-market calls to manage intra-zonal congestion. The Commission further directed the ISO to reform its approach to congestion management, noting:

> "[t]he ISO's proposal does not address what the ISO has identified as a fundamental flaw in the overall congestion management scheme, i.e. the intrazonal congestion program approved for the ISO is premised on competitive market solutions and now the ISO has learned that there may never be a competitive market in any circumstance involving intrazonal congestion. …. This strikes at the heart of the existing approach and calls out for the design of a comprehensive replacement congestion management approach."

January 7 Order, 90 FERC at 61,013-14.

To comply with the Commission's directive, the ISO undertook a comprehensive year-long stakeholder process to develop an alternate

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[5] Reliability Must-Run costs are allocated to the Participating Transmission Owners in whose area the RMR units are located.

[6] *Order Accepting For Filing in Part and Rejecting In Part Proposed Tariff Amendment and Directing Reevaluation of Approach to Addressing Intrazonal Congestion* 90 FERC ¶ 61,006 (2000) ("January 7 Order").

comprehensive congestion management system. However, the ISO was unable to file a proposal for an alternate congestion management system due to the crises that engulfed the California electricity markets, which necessarily focused the ISO's efforts on these matters and away from congestion management reform from late 2000 through the present time. The ISO has kept the Commission informed of the status of its congestion management redesign efforts through a series of reports.[7] In November 2001, the ISO designated a Market Design Team, which has prepared and released a high-level market redesign proposal and discussed this proposal with stakeholder groups the week of January 14, 2002.

Meanwhile, the problems of intra-zonal congestion management and the "DEC game" have continued. In a 2001 case emblematic of the problem of the market power that can be exercised through having to use unrestrained market bids to mitigate intra-zonal congestion, one supplier agreed to refund $8 million to the California ISO following an investigation directed by the Commission on this practice.[8] More recently, the addition of new generating units in California, whose output is badly needed during peak System conditions, often contributes to intra-zonal congestion and increased the opportunities generators have for playing the DEC game during off-peak conditions. Figure 1 shows the increase in intra-zonal costs experienced by the ISO in 2001:

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7 Status reports were filed on March 30, 2001, July 31, 2001 and October 31, 2001.

8 *Order Approving Stipulation and Consent Agreement,* 95 FERC 61,167

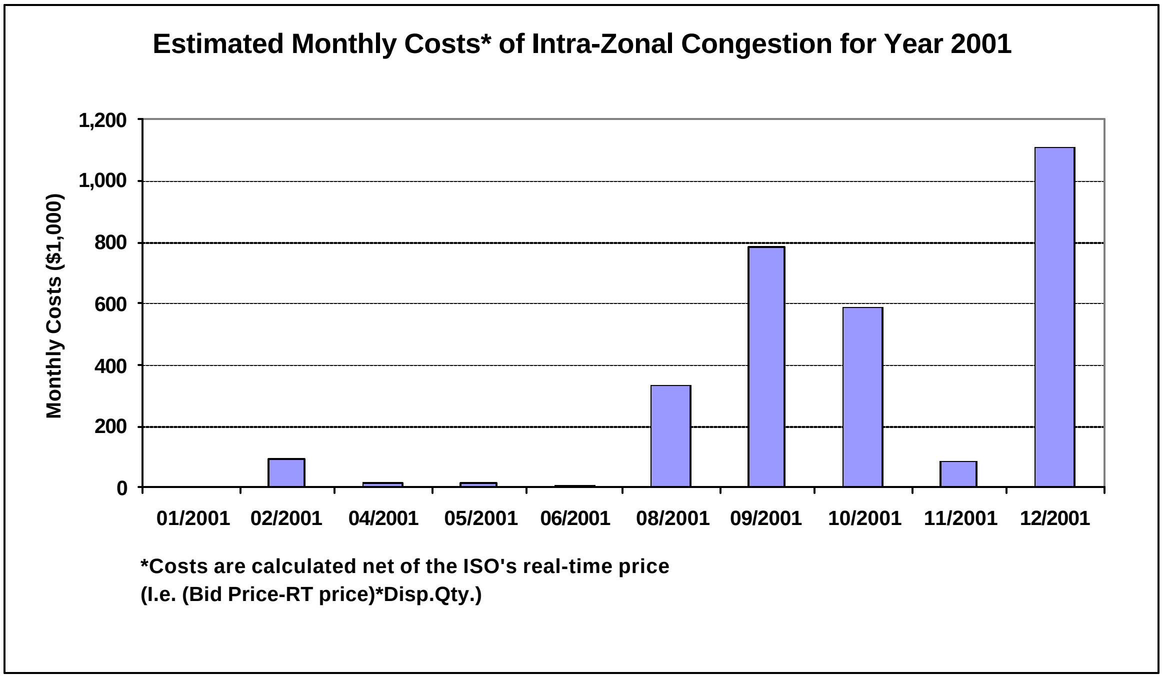

Figure 1

The ISO's Department of Market Analysis and the Commission's Market Oversight and Enforcement Staff have confronted generators playing the DEC game with negative DEC bids, sometimes successfully, but nothing in the ISO Tariff currently precludes generators from engaging in this behavior. Moreover, the ISO's inability to effectively deal with some intra-zonal congestion, including the DEC game, in the forward markets, results in an increasing burden for the ISO's real-time operations personnel. Though the ISO will comply with the Commission's requirement to submit a comprehensive plan for market redesign, including a congestion management redesign, by May 1, 2001, the ISO believes that certain actions must be in place before Summer 2002 to allow the ISO to deal effectively with this growing problem.

Moreover, the ISO is not alone in recognizing its urgent need for the ability to stop market gaming through use of negative DEC bids. The California Electricity Oversight Board ("CEOB"), in its January 15, 2002, "Complaint Requesting An Immediate Cease And Desist Order And Expansion Of 'Must-Offer' Requirement Or, In The Alternative, An Evidentiary Hearing With Fast-Track Processing,"[9] requested that the Commission require all suppliers with a Participating Generator Agreement and scheduled to run to submit to the ISO DEC bids based on avoided cost methodology.

[9] Docket No. EL02-51-000 (2002) ("CEOB Complaint").

The CEOB Complaint specifically notes that:

> "[a]nti-competitive decremental bidding reflects continued efforts by suppliers to take advantage of California's dysfunctional market structures as well as infrastructure constraints. The presence of intra-zonal congestion facilitates the profitability of anti-competitive decremental bids. . . . . Unlike inter-zonal congestion, which refers to congestion across congestion zones, i.e., Path 15, the CAISO currently does not have a process to alleviate intra-zonal congestion in the forward market. [FN omitted]. Instead, the CAISO mitigated intra-zonal congestion in real-time and pay each supplier "as-bid." The limited geographic area of the congestion limits the number of responses capable of relieving the constraint. The result is local market power. The CAISO has observed an increase in "localized market power events" involving "large negative decremental energy bids" to reduce scheduled output. [FN omitted].
>
> The Commission has, therefore, left a gap open for gaming the CAISO's decremental energy market. Suppliers have taken advantage by exercising market power through anti-competitive, unjust and unreasonable negative decremental bids."

CEOB Complaint at 8-9.

Figure 2 below shows how the DEC game has grown through 2001:

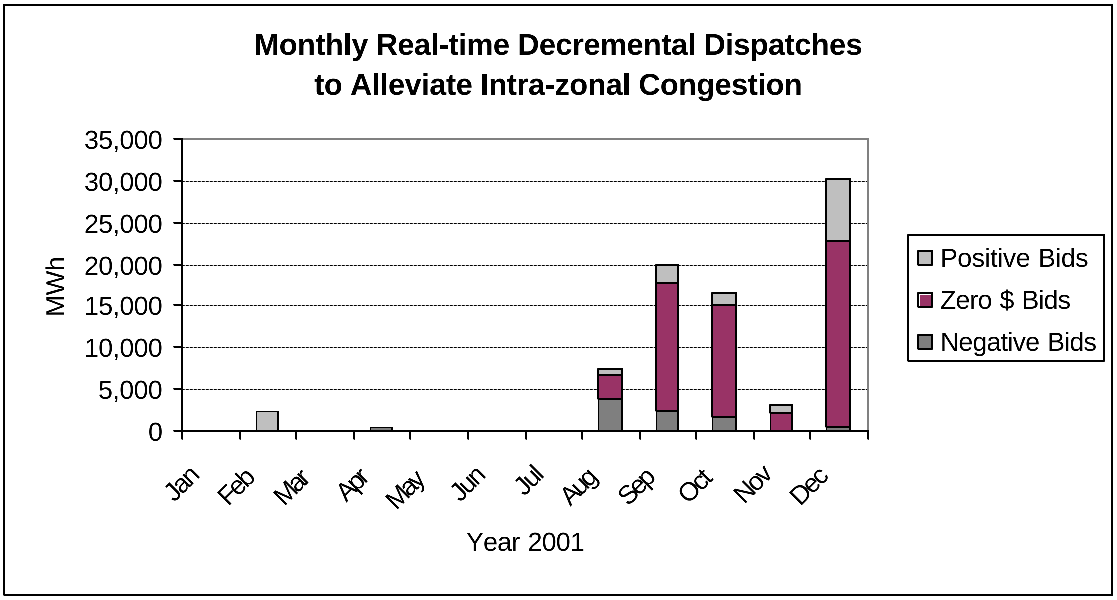

Figure 2

As noted *supra*, while efforts by ISO staff and Commission enforcement staff to discourage suppliers from submitting negative DEC bids have decreased the number of those bids, a $0/MWh DEC bid, which essentially constitutes an offer to not purchase Energy but merely take it from the ISO *for free*, thereby saving the cost of generating it instead, clearly represents the exercise of market power. It is an exercise of market power because a supplier reasonably would be expected to purchase Energy and avoid the cost of generating that Energy at a positive price just below the cost of generating that Energy themselves, and not at $0/MWh.

2. Proposed Modifications

The ISO proposes two actions. First, to eliminate the DEC game, the ISO proposes that the Commission grant to the ISO the ability to limit generators' Schedules in the forward market if the ISO determines that intra-zonal congestion would occur if generators' Schedules were not limited. Using the best information available, ISO staff will determine aggregate intra-zonal transfer limits two days before the operating day. The ISO will allocate these limits to those generators operating in this area, based on the generators' operating capability and cost.[10] The ISO then will publish those

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10 While the ISO would have preferred a market-based methodology for limiting those schedules, the ISO ultimately concluded that, since the DEC game flourishes in areas where there is a limited and, therefore, non-competitive pool of units, from which the ISO could solicit offers to limit schedules, that the ISO must limit schedules based on unit capacity and cost. Moreover, to fully extinguish the DEC game, a generator cannot somehow profit from

limits. If generators do not submit Schedules that adhere to those published limits, the ISO will adjust their Schedules with no compensation for the adjustment. This will ensure that generators cannot submit infeasible Schedules with which they could force the ISO to accept non-competitive DEC bids.

Second, to effectively mitigate congestion that may arise unpredictably in real-time while also preventing the exercise of local market power, the ISO seeks from the Commission authority to mitigate bids in real-time to the unit's cost-based proxy price if the ISO is required to use those bids to mitigate intra-zonal congestion. This authority that the ISO seeks is completely consistent with the authority already granted by the Commission to other Independent System Operators. The authority to cap bids when local congestion occurs clearly reflects the reality that local reliability problems give rise to market power for which there is no competitive solution – not in California, or in any other state.

The ISO notes that in June 2001, PJM filed a proposed amendment to its operating agreement and tariff that would extend PJM's existing authority to cost-cap must-run units beyond the day-ahead market to the real-time market as well. PJM stated that its experience over the last few years shows that it should also have the ability to cost-cap must-run units in real time, in order to prevent the exercise of market power if a transmission constraint should occur unexpectedly, so as to render, unexpectedly, a resource a must-run unit.[11]

The Commission approved this request on August 28, 2001, stating:

> "If, however, a transmission constraint occurs so as to make that unit a must-run resource, the generator could earn its high price, and that price would also become the LMP for the particular load pocket for that day. As PJM notes in its answer, this scenario has, in fact, occurred. PJM's MMU thus concluded that PJM should have the authority to cost-cap must-run units in real time in order to prevent the exercise of market power, and this proposal was approved by PJM's stakeholders. We find that PJM has persuasively demonstrated that, absent the authority to cost-cap in real time, consumers would be subject to the exercise of market power by generators, and that PJM

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the imposition of these limits, and so the ISO proposes to limit forward schedules without compensating generators for the adjustments required to adhere to the scheduling limits.

[11] PJM defines must-run units as "generation resources that…as a result of transmission constraints…must be run to ensure the reliability of service in the PJM control area". *PJM FERC Electric Tariff at 249.*

> requires authority to cost-cap must-run units in real time to prevent the exercise of market power in real time.
>
> * * *
>
> While no one (including PJM) can predict precisely when and where a transmission constraint may occur in real time, as stated above, a generator located within a load pocket can assume that a transmission constraint may occur so as to make its unit a must-run resource. Moreover, as described above, a generator need not predict with certainty that it will be designated a must-run resource in order to be able to exercise market power – it need only bid its generation into the market at an excessively high price, and over the course of time, it will, likely, at certain times, be designated a must-run resource. Thus, the fact that generators cannot predict exactly when they might be designated a must-run resource does not eliminate the need for PJM to be able to cost-cap units in real time so as to prevent must-run generators from exercising market power."

<u>PJM Interconnection, L.L.C.,</u> 96 FERC ¶ 61,233, 61,936 (2001).

The findings in the Commission's order cited above and PJM's arguments hold regardless of whether congestion management is done on a nodal or zonal market structure. Since a competitive INC bid would reflect the cost of generation, an obvious mitigation measure for a unit that is already on-line is to set the mitigated INC bid to the higher of the unit's operating cost or the real time MCP (plus the 10% adder for the sale in the California market mandated by the Commission in it's June 19, 2001 order[12] as long as that provision is in effect). Similarly, the lower of a generating unit's operating cost or the real time MCP also would serve as an appropriately mitigated DEC bid since it would also represent the price at which a generator would be willing to reduce its output, avoid fuel and variable operating and maintenance costs, and instead purchase Energy from the ISO's Imbalance Energy Market.

The ISO is aware of certain shortcomings of its current zonal congestion management model and already has publicly announced its intention to move to a locational marginal pricing model that will address all grid congestion in the forward markets. On the other hand, the ISO believes that the problems discussed *supra* require it to seek immediate authority to limit Schedules in congested local areas to the physical limits of the System. Moreover, the authority to mitigate bids to eliminate locational market power is a feature of all market designs, including those of PJM and the New York

[12] 95 FERC ¶61,418 (2001).

Independent System Operator.[13] The Commission must not deny California the similar ability to mitigate bids that must be taken out of price merit order due to reliability needs.

D. Target Price

1. Background

Since inception, the ISO's Real Time Imbalance Energy Market has struggled with quantities of bids whose prices overlap (the "Price Overlap"). The Price Overlap is an unpredictable quantity of bids from Scheduling Coordinators who are willing to buy real-time Energy (i.e., reduce generator output) at prices higher than the prices at which other Scheduling Coordinators are willing to sell real-time energy (i.e., increase generator output). In a market with real-time trading opportunities, overlapping bids would become mutually beneficial trades between buyers and sellers and the Price Overlap would be eliminated by these trades. In the design of the ISO's Real Time Imbalance Market, however, there is no opportunity for Scheduling Coordinators to execute such trades, nor is the ISO permitted to execute trades on behalf of Scheduling Coordinators.

A Price Overlap is always possible even if it does not exist among the bids of any given Scheduling Coordinator. This is because, as shown in Figure 1 below, the total of the decremental and incremental Imbalance Energy bids offered into the ISO Imbalance Energy Market are submitted by multiple Scheduling Coordinators and are likely to overlap in price within the merit ordering of the BEEP stack.

The Price Overlap is an indication of profitable trade opportunity among Market Participants since Imbalance Energy can be exchanged (purchased from incremental bids and sold to decremental bids) at a mutually beneficial price. This price has been traditionally called "Target Price" and lies somewhere within the Price Overlap. Given the ISO's ten-minute interval market structure, the Price Overlap should be eliminated in order to produce a monotonically non-decreasing aggregate Imbalance Energy bid curve. Such a bid curve is essential to ensure that each of the ten-minute interval prices be consistent with and reflective of the Imbalance Energy requirements in each such interval. Without eliminating the Price Overlap, under the ISO's

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[13] Concerning the PJM market design, see *PJM Interconnection, L.L.C.*, 86 FERC ¶ 61,247 (1999); and *Atlantic City Electric Co., et al.*, 86 FERC ¶ 61,248 (1999), *clarified*, 86 FERC ¶ 61,310 (1999). Concerning the New York Independent System Operator market design, see *Central Hudson Gas & Electric Corp, et al.*, 89 FERC ¶ 61,196 (1999); and *Central Hudson Gas & Electric Corp, et al.*, 90 FERC ¶ 61,317 (2000), *clarified*, 91 FERC ¶ 61,154 (2000).

current one-sided Imbalance Energy auction mechanism,[14] the ten-minute interval price may alternate from low to high as the Imbalance Energy requirement changes sign from positive to negative across ten-minute intervals. Such alternations in price yield flawed economic signals that fail to provide proper incentives for real-time response. Figure 3 demonstrates that, absent elimination of the Price Overlap, for an Imbalance Energy requirement alternating between 10 MW and –10 MW, the price will alternate between $30/MWh and $200/MWh, with the high price at intervals of Energy surplus and the low price at intervals of Energy shortfall. Such price signals are confusing and create perverse incentives in the ISO markets.

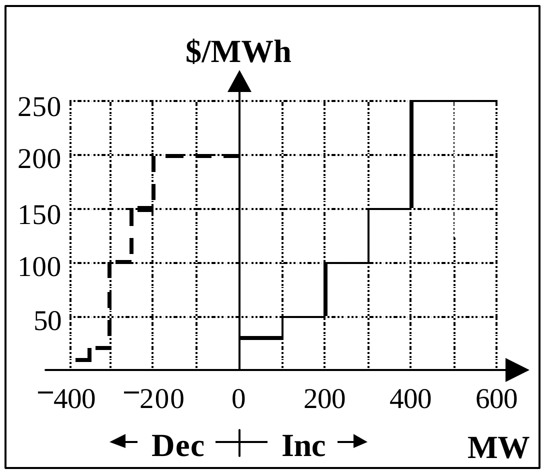

Figure 3. Price Overlap

To remove price confusion and instability, the ISO Real Time Market design eliminates the Price Overlap, by creating an aggregate Imbalance Energy merit order bid stack that is a monotonic non-decreasing bid curve. A Target Price replaces all bid prices that lie within the overlap. The original Target Price was the MCP that would result if the overlapping bids were matched and called in merit order. As shown in Figure 4, such a Target Price is calculated as the intersection between the incremental supply curve and the mirror image of the decremental supply curve over the price axis. All incremental bids lower than the Target Price are set equal (i.e. increased) to the Target Price, and all decremental bids higher than the Target Price are set equal (i.e. decreased) to the Target Price, with the result being a monotonic non-decreasing aggregate supply curve, as shown in Figure 4.

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[14] The current Imbalance Energy procurement is based on selecting bids in merit order to meet the Imbalance Energy requirement, rather than a full economic dispatch.

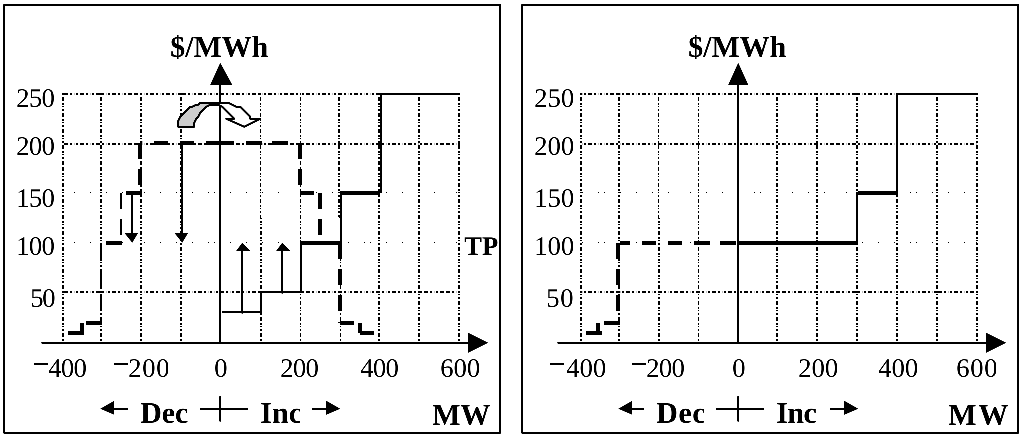

Figure 4. Price Overlap Elimination by Target Price

Stated otherwise, since inception of the ISO, the Target Price has been a problem because the ISO has not been permitted to take the economically rational action of "clearing the Price Overlap," by accepting all overlapping bids and requiring the bidders to actually buy and sell Energy at the resulting Target Price. The ISO's lack of ability to clear the Price Overlap has allowed Scheduling Coordinators to manipulate the Target Price when the ISO needed to procure Imbalance Energy by submitting unrealistically high offers to buy Energy, thereby artificially raising the Target Price, while at the same time obtaining Dispatch priority by submitting unrealistically low offers to sell Energy, knowing that the ISO could not Dispatch their decremental bids, but would pay their Dispatched incremental bids the elevated price.

In April 2000, the ISO tried to eliminate this gaming opportunity by changing its method for calculating the Target Price. This modification set the Target Price to be the greater of $0/MWh or the lowest price incremental bid. However, as market conditions changed during the Summer of 2001 the Target Price again became problematic. By submitting a $0/MWh incremental bid, even for a very small MW quantity, Scheduling Coordinators were able to set the Target Price to $0/MWh in periods in which the ISO needed no incremental Imbalance Energy, thus resetting all decremental bid prices to zero. This distorts the price signals and enables Market Participants to buy back Energy for free.

On September 1, 2000, the ISO changed its Real Time Energy Market to include ten-minute settlements. A component of the ten-minute settlements is the creation of two real-time prices: an incremental and a decremental price ("INCE price" and "DEC price," respectively). If the ISO Dispatches bids only in one direction, the INC price and the DEC price are the same. However, if in a ten-minute interval the Imbalance Energy requirements force the ISO to change from an incremental mode to a decremental mode, the ISO could have different INC and DEC prices. To the extent the INC and DEC prices are different, Uninstructed Energy is settled based on the unfavorable price. For example, positive Uninstructed Energy is paid the DEC price while positive Instructed Energy is paid the INC price. While the two-price system provided incentives not to deviate, many Market Participants complained about the complexity of the two-price system. Furthermore, the two-price settlement, in conjunction with the modified Target Price, reduced incentives to bid into the Regulation Up market since Regulation Energy was paid at the $0/MWh decremental MCP.

On October 29, 2001, the ISO reverted to the original single Target Price methodology, but limited its application to feasible bids and available proxy bids only. This reversion to the single Target Price was another attempt by the ISO to reduce the opportunities for gaming the Target Price. Now, after trying to solve the problem of gaming the Target Price with both one and two Target Prices, the ISO has determined that the best solution, rather than trying to craft a better Target Price formula, is to go to the root of the problem and eliminate the design constraint that prevents the ISO from dispatching overlapping bids. Therefore, as detailed below, the ISO proposes to eliminate use of Target Price.

Even while implementation of a single price system and elimination of the Target Price will produce significant benefits, including increased price transparency for Market Participants, the ISO notes that such a single price acts to increase frequency and quantities of uninstructed deviations. Table 1 shows that uninstructed deviations have increased in both the hourly and ten-minute Settlement regimes at the ISO. As a result, also as detailed below, the ISO also proposes Tariff modifications to provide for narrowly tailored explicit penalties to be levied against Scheduling Coordinators for uninstructed deviations that are beyond a tolerance band for generating unit performance.

Table 1. Average Monthly Positive and Negative Uninstructed Deviations

Period	**Average Net Positive Deviation from Generation** [15]	**Average Net Negative Deviation from Generation**
Jun – Aug 2000	**959.9 MW**	**557.0 MW**
June	895.0	632.8
July	882.8	564.4
August	1099.8	476.2
Sept – Nov 2000	**479.1**	**620.1**
September	569.3	591.1
October	362.5	609.8
November	509.6	659.6
Dec 2000 – Feb 2001	**659.9**	**829.7**
December	721.7	659.7
January	531.6	866.8
February	729.0	978.3
Mar – May 2001	**297.1**	**808.9**
March	298.4	720.2
April	287.8	859.7
May	304.7	848.7

[15] Net deviations are shown because Scheduling Coordinators are allowed to offset positive deviations from some of their resources with negative deviations from other resources, in real time. The net positive deviations are averaged for intervals in which individual Scheduling Coordinators have positive values, and net negative deviations are averaged for intervals in which individual Scheduling Coordinators have negative values. Because the output of resources that are providing Regulation will vary within a time period, the results reported here exclude resources for which Regulation bids have been accepted during the specific interval. Although generators that are providing Regulation are included in the overall calculation of uninstructed deviations for settlements purposes, Automatic Generation Control ("AGC") equipment will attempt to keep a generator's output within its regulating range, and will vary its output within the regulating range in response to system conditions. Thus, only deviations outside the regulating range would be truly uninstructed from an operational perspective, without a review of plant-specific operations. Such deviations have initially decreased since the implementation of ten-minute markets, but are small compared to the uninstructed deviations of generators that are not providing Regulation due to the effectiveness of AGC equipment, as shown in the following table (showing the sum of plant-specific uninstructed deviations rather than netting deviations across each Scheduling Coordinator's portfolio):

Month (Year 2000)	Average Positive Deviation Outside Regulating Range	Average Negative Deviations Outside Regulating Range
June	35.8 MW	44.7 MW
July	30.8	36.3
August	41.5	40.4
September	31.4	27.0
October	12.0	20.8
November	5.8	18.4

Jun – Aug 2001	**382.6**	**981.2**
June	549.9	1087.2
July	322.0	974.5
August	278.1	882.1

2. Proposed Modification For Clearing the Price Overlap

The ISO proposes to implement a procedure whereby it will issue Dispatch instructions to all overlapping bids, thus requiring bidders to actually buy Energy (*i.e.,* reduce generation) or sell Energy (*i.e.,* increase generation) at the applicable ten-minute price. Figure 5 illustrates the result of the ISO proposal: the specific creation of a monotonically non-decreasing aggregate supply curve where the Dispatched incremental bids become available as decremental offers and Dispatched decremental bids become available as incremental offers.

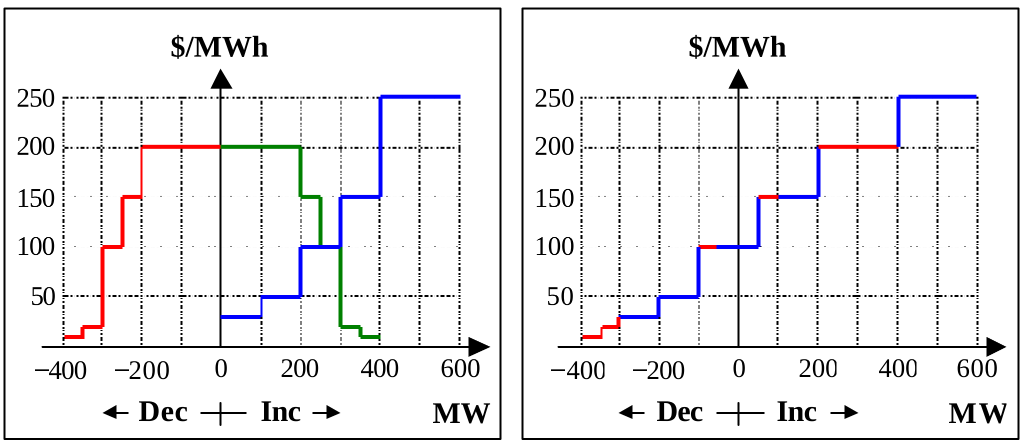

Figure 5. Elimination of the Price Overlap

Thus, by clearing the Price Overlap for each ten-minute interval, the separate INC and DEC prices converge to a single MCP. As a result, the proposed changes will simplify ISO real-time pricing by setting a single interval MCP.

3. Uninstructed Deviations

In developing the instant proposed modifications to the ISO Tariff, designed to deter unintended consequences of increased uninstructed deviations, the ISO seeks to balance operational requirements for maintaining System reliability with maximum operational flexibility for suppliers and accommodation of specific operating requirements of certain Market

Participants. The proposed modifications include penalties for certain uninstructed deviations, which the ISO carefully has designed to serve as a targeted and specific incentive mechanism for Market Participants to minimize uninstructed deviations and to be a fair penalty for those Market Participants that persist in deviating from submitted schedules and Dispatch instructions.

The ISO believes that some penalty beyond the replacement cost of energy must be imposed on a unit for failing to deliver according to a Dispatch instruction. A supplier with more than one generating unit could otherwise profit by increasing the MCP for all of its generating units by failing to deliver from that one unit. Since the ISO deems Dispatch instructions to be delivered, the unit that failed to deliver both is paid the MCP for the amount of Energy in its Dispatch instruction and charged the MCP for the amount of Energy it fails to deliver. Without a penalty, if the unit is dispatched but delivers nothing, the payments and charges completely offset each other. However, as a negative consequence, because the ISO still requires the Energy, it then is forced to call on the next bid in merit order in the BEEP stack, thereby raising the MCP. To provide an incentive for Scheduling Coordinators to comply with Dispatch instructions and specifically to discourage this market-manipulating behavior, the ISO proposes this modest penalty.

4. Proposed Modifications for Uninstructed Deviations

The proposed modifications specifically are designed to provide to Market Participants flexibility in complying with their Dispatch Operating Point[16] ("DOP") along with reasonable operational flexibility for generating resources. The ISO proposes to continue to issue unit-specific Dispatch instructions and to continue to settle on a unit-specific basis. However, Scheduling Coordinators could aggregate generators interconnected at a single ISO grid bus point for purposes of determination of the Uninstructed Deviation Penalty, thus effectively gaining the ability to net deviations from units located at a single point. The ISO also will allow for the net determination of penalties for other aggregations of generating units, as approved by the ISO on a case-specific basis.[17] Moreover, the ISO's proposed modifications will allow suppliers to have the flexibility to deviate from their DOP by a reasonable amount without incurring any penalties. The ISO believes that this latitude of compliance flexibility is sufficient to take into account unintentional deviations that occur as a result of unit operations while

[16] "Dispatch Operating Point" has been proposed as a defined term in the Master Definition section of the tariff.

[17] The ISO will develop a process to allow Market Participants to propose aggregations of generating units that are not at individual transmission bus points. Market Participants proposing unit aggregations will be required to demonstrate that the units aggregated are interchangable, function as a single entity, and will not affect grid reliability.

being sufficiently stringent enough to provide incentives to Scheduling Coordinators to maintain expected unit output. In addition to the flexibility provided to generating units, the instant proposed modifications will allow Metered Sub-System and self-serving Load Market Participants the ability to load-follow, with Uninstructed Deviation Penalties only applying to the net ISO-expected Energy deliveries. Finally, the ISO proposes that entities with limited control over their output, such as intermittent resources and units providing regulation, be exempted from the uninstructed deviation penalty provision.

The ISO notes for the Commission that the proposed Target Price methodology and uninstructed deviation tolerance and penalty provisions have been developed through a thorough and iterative stakeholder process. Specifically, the ISO held four focus sessions with stakeholders, and learned that, while there was little disagreement with the need to eliminate the Target Price, there was concern about the details of the penalties associated with the uninstructed deviations. As a result of those sessions, the ISO modified its proposal in significant ways. First, as discussed *supra*, the ISO proposes to permit some netting of uninstructed deviations so long as all of the resources whose Uninstructed Energy is netted are Scheduled by the same Scheduling Coordinator and also deliver all such Energy into the ISO Controlled Grid at the same point. This approach was a departure from the original proposal in which the ISO was recommending that the uninstructed deviation be applied strictly on a resource-specific basis.

The second significant accommodation was a change in the tolerance band for uninstructed deviations. The ISO's initial proposal to use a tolerance band of 3 MW or 3% of the instructed operating level. The ISO based this initial recommendation on empirical historical deviations, but many stakeholders felt it to be too restrictive and, given the penalty provision for positive deviations above the tolerance band, would encourage risk-adverse suppliers to bias generation downward. Accordingly, the ISO agreed to increase the tolerance band to be the greater of 5 MW or 3% of the maximum operating limit of the resource[18] (*i.e.,* Pmax).

The proposed penalties for positive uninstructed deviations will be the quantity of Uninstructed Imbalance Energy in excess of the tolerance band multiplied by a price that initially will be equal to 100% of the corresponding BEEP Interval Ex Post price. Thus the net effect of the uninstructed deviation penalty and the settlement for positive uninstructed deviations beyond the tolerance band will be that the supplier will not be paid for any such Energy. The uninstructed deviation penalty for negative uninstructed deviations will equal the amount of Uninstructed Imbalance Energy in excess of the

[18] "Resource" in this instance may be defined as the aggregated units, net expected generation for MSS, delivered Regulation range or scheduled load for PLA.

tolerance band multiplied by a price that will be set initially equal to 25% of the corresponding BEEP Interval Ex Post price. Thus the net effect of the uninstructed deviation penalties and uninstructed Imbalance Energy settlement will be that this energy will be charged at 125% of the corresponding BEEP Interval Ex Post price.

The ISO respectfully notes for the Commission that it is not alone is confronting the problem of uninstructed deviations in real-time markets. Other Independent System Operators across the country have a tolerance band for uninstructed deviations, ranging from ±1.5% on a net QSE basis for ERCOT to NYISO's ±3% on an individual resource basis. As summarized in Table 2 below, the ISO's proposed modifications regarding uninstructed deviations is fully consistent with other Independent System Operator practices, policies and authority as has been granted by the Commission.

	Dead-band for Energy	**Penalty within Dead-band**	**Over-generation Charges**	**Under-generation Charges**	**Notes**
Proposed CAISO	**Greater of 5 MW or +/- 3% of expected generation from MSS: greater of 5 MW or +/- 3% of bus generation or Unit P_{max}, as applicable**	**N/A**	**No Pay for deviations above dead-band**	**MCP + 25% of interval MCP for deviations below dead-band**	**SCs may nominate for non-bus-level aggregation of units**
ERCOT	±1.5% of QSE Schedules + instructions ±5.0 MW of expected interval generation	N/A	Graduated up to 100%, depending on system conditions	Graduated up to 100%, depending on system conditions	Dead-band may be reduced to ±1%, ±3% day ahead if ERCOT sees that "price chasing" exists.
PJM	No Dead-band	N/A	N/A for network service	N/A for network service	Penalty for schedules point-to-point MWh deviations, ±1.5% (±2 MW) band. Also, resources deviating beyond 10% of the instructed ("economic") base point are not eligible to set the price (LMP).
ISO – NE	(Under-generation only) 2.5% of claimed capacity or any deviation > 10 MW Also must be > 1 MW	N/A	Sanctions	Forfeit of all TMSR, TMNSR and TMOR payments for deviation period	Failure to provide services in real-time: Admin. Penalty = \$1000/event; + Formula penalty = 50% of ECP

NYISO	Lesser of ±3% of unit upper operating limit or three times unit response rate	N/A Paid / Charged LBMP	100% (No payment for gen above dead-band. No charge during reserve deficiencies)	MCP_{reg} x under-generated MW	NYISO reserves the right to change dead-band as needed. Units that are off-dispatch can chase the real time price between their hour-ahead schedule and intersection of real-time MCP with their bid curve (with a 3% tolerance band).

Table 2. Uninstructed Generation Policies Among ISOs

In further elaboration, the ISO notes that PJM has the least amount of additional charge to discourage uninstructed deviations and that, for network service customers, there are no additional charges beyond the replacement cost of energy as is determined by the locational market-clearing price. All of the other Independent System Operators (*e.g.,* ERCOT, ISO-NE, and NYISO) assess some additional charges to generators undertaking uninstructed deviations. ERCOT measures deviations on the net Qualified Scheduling Entity (QSE) basis (which is similar to a Scheduling Coordinator at the ISO). ISO-NE and NYISO assess the uninstructed deviation charges on a resource specific basis. ERCOT attempts to only assess deviation charges when uninstructed deviations caused or contributed to problematic system conditions by looking at the aggregate deviation from schedule on the resources providing regulation. NYISO has adopted a similar process by relaxing positive deviation charges when it has a system reserve deficiency.

To better illustrate the operation and impact on Market Participants of the ISO's proposed uninstructed deviation penalty, two examples are set forth below. Example 1 illustrates the difference between implementing deviations on a unit-level v. bus-level of aggregation, while Example 2 represents the impact of penalties on Metering Sub-System Market Participants.

Example 1: Unit versus Bus-level Uninstructed Deviation Penalty Assessment

Assumptions:

- Participant Schedules Generation at unit-level
- Changes in net generation delivered to ISO system are subject to Uninstructed Deviation charges
- Participant can not net generation with other generation metered at different bus

Unit Level	Bus-level
Forward Schedule: Gen 1 = 140 MW of 160 MW Pmax Gen 2 = 140 MW of 160 MW Pmax Gen 3 = 120 MW of 180 MW Pmax **Real-time:** Gen. 1 increases 20 MW = 160 MW Gen. 2 decreases 20 MW = 120 MW **Result:** Gen. 1 deviation = +20 MW. No payment for 15 MW Gen. 2 deviation = -20 MW. Charged MCP for 20 MW + penalty of MCP*.25) for 15 MW	**Forward Schedule:** Gen 1 = 140 MW of 160 MW Pmax Gen 2 = 140 MW of 160 MW Pmax Gen 3 = 120 MW of 180 MW Pmax **Real-time:** Gen. 1 increases 20 MW = 160 MW Gen. 2 decreases 20 MW = 120 MW **Result:** Gen. 1 paid MCP * 20 MW Gen. 2 charged MCP * 20 MW No deviation charges or penalties applied

Example 2: MSS with Load and Generation Metered at Same Bus Uninstructed Deviation Penalty Assessment

Assumptions:

- MSS schedules Load and Generation
- MSS could load-follow without incurring Uninstructed Deviation Charges
- Increase generation in response to increase in own-load at same metered bus
- Decrease generation in response to decrease in own-load at same metered bus
- Changes in net generation delivered to ISO subject to Uninstructed Deviation charges

Forward Schedule: Load = 100 MW Gen. = 100 MW **Real-time:** Load increases 20 MW = 120 MW	**Forward Schedule:** Load = 100 MW Gen. = 100 MW **Real-time:** Load increases 20 MW = 120 MW

Gen. increases 20 MW = 120 MW **Result:** ➢ Increase in load offset by increase in generation ➢ Same net generation delivered to grid NO UNINSTRUCTED DEVIATION	Gen. Increases 10 MW = 110 MW **Result:** ➢ Increase in load only partially offset by increase in generation ➢ Net gen. delivered to grid decreases by 10 MW. Charged MCP for 10 MW + penalty of (MCP*.25) for 5 MW

II. EFFECTIVE DATE

The ISO respectfully requests that the Commission approve these Tariff revisions within the regular 60-day schedule, *i.e.,* April 1, 2002, consistent with the Commission's Rules of Practice and Procedure 18 C.F.R. § 35.3.

III. COMMUNICATIONS

Communications regarding this filing should be addressed to the following individuals, whose names should be placed on the official service list established by the Secretary with respect to this submittal:

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IV. SERVICE

The ISO has served copies of this letter, and all attachments, on the Public Utilities Commission of the State of California, the California Energy Commission, the California Electricity Oversight Board, and on all parties with effective Scheduling Coordinator Service Agreements under the ISO Tariff. In addition, the ISO is posting this transmittal letter and all attachments on the ISO's Home Page.

V. ATTACHMENTS

The following documents, in addition to this letter, support this filing:

Attachment A	Revised Tariff Sheets
Attachment B	Black-lined Tariff provisions
Attachment C	Notice of this filing, suitable for publication in the Federal Register (also provided in electronic format).

Two extra copies of this filing are also enclosed. Please stamp these copies with the date and time filed and return them to the messenger.

Please feel free to contact the undersigned is you have any questions concerning this matter.

Yours truly,

Charles F. Robinson
Margaret A. Rostker
Counsel for The California Independent
System Operator Corporation

Enclosures

ATTACHMENT A

2.2.6.5 Scheduling Deliveries. Including in its Schedules to be submitted to the ISO under this ISO Tariff, the Demand, Generation and Transmission Losses necessary to give effect to trades with other Scheduling Coordinators;

2.2.6.6 Tracking and Settling Trades. Tracking and settling all intermediate trades among the entities for which it serves as Scheduling Coordinator;

2.2.6.7 Ancillary Services. Providing Ancillary Services in accordance with Section 2.5;

2.2.6.8 Annual and Weekly Forecasts. Submitting to the ISO the forecasted weekly peak Demand on the ISO Controlled Grid and the forecasted Generation capacity. The forecasts shall cover a period of twelve (12) months on a rolling basis;

2.2.6.9 ISO Protocols. Complying with all ISO Protocols and ensuring compliance by each of the Market Participants which it represents with all applicable provisions of the ISO Protocols;

2.2.6.10 Interruptible Imports. Identifying any Interruptible Imports included in its Schedules; and

2.2.6.11 Participating Intermittent Resources. Submitting Schedules consistent with the technical standards for Participating Intermittent Resources adopted by the ISO and published on the ISO Home Page.

2.2.7 Operations of a Scheduling Coordinator.

2.2.7.1 Maintain Twenty-four (24) Hour Scheduling Centers. Each Scheduling Coordinator shall operate and maintain a twenty-four (24) hour, seven (7) days per week, scheduling center. Each Scheduling Coordinator shall designate a senior member of staff as its scheduling center manager who shall be responsible for operational communications with the ISO and who shall have sufficient authority to commit and bind the Scheduling Coordinator.

changes to the Suggested Adjusted Schedules, all of the Suggested Adjusted Schedules shall become the Final Schedules. The Final Schedules shall serve as the basis for Settlement between the ISO and each Scheduling Coordinator.

2.2.9 [Not Used]

2.2.10 Information to be Provided by the ISO to all Scheduling Coordinators.

By 6:00 p.m. two days prior to a Trading Day, the ISO shall publish on WEnet information, including the following to all Scheduling Coordinators for each Settlement Period of the Trading Day:

2.2.10.1 Scheduled Line Outages. Scheduled transmission line Outages;

2.2.10.2 [Not Used]

2.2.10.3 Forecast Loop-Flow. Forecast Loop Flow over ISO Inter-zonal Interfaces and Scheduling Points;

2.2.10.4 Advisory Demand Forecasts. Advisory Demand Forecasts by location;

2.2.10.5 Updated Transmission Loss Factors. Updated Generation Meter Multipliers reflecting Transmission Losses to be supplied by each Generating Unit and by each import into the ISO Control Area;

2.2.10.6 Ancillary Services. Expected Ancillary Services requirement by reference to Zones for each of the reserve Ancillary Services; and

2.2.10.7 Forecasted Congested Intra-zonal interface information. The total transfer limits of Intra-zonal interfaces which the ISO forecasts to be Congested and the scheduling limits for generating units constrained by that Congestion. Scheduling limits for Generating Units whose output is constrained by the same Congested Intra-zonal interface shall be allocated pro rata based on each

Generating Unit's current operating capability and, for thermal Generating Units, cost data on file with the ISO. The scheduling limit for each Generating Unit constrained by the same Congested Intra-zonal interface shall be determined by the following equation:

$SL_g = (OC_g) - ((\text{Sum } g{:=}1 \text{ to } N\ (OC_g)) - TC_{cong}) * (OC_g * C_g) / (\text{Sum } g{:=}1 \text{ to } N\ (OC_g * C_g))$

where:

SL_g = Scheduling Limit for Generating Unit g

OC_g = Current Operating Capability for Generating Unit g

C_g = Average Cost of Generator g ($/MWh) at the Current Operating Capability for Generating Unit g

TC_{cong} = Congested Transfer Capability of the Intra-zonal interface

N = number of Generating Units constrained by the Congested Intra-zonal interface

In the event that both thermal and non-thermal Generating Units must have their respective Scheduling limits reduced on a pro rata basis, only current operating capability will be used to determine the scheduling limits.

2.2.10.8 [Not Used]

2.2.16 Relationship Between ISO and Participating Loads

The ISO shall only accept bids for Supplemental Energy or Ancillary Services, or Schedules for self-provision of Ancillary Services, from Loads if such Loads are Participating Loads which meet standards adopted by the ISO and published on the ISO Home Page. The ISO shall not schedule Energy or Ancillary Services from a Participating Load other than through a Scheduling Coordinator.

2.2.17 Relationship Between ISO and Eligible Intermittent Resources and Between the ISO and Participating Intermittent Resources

The ISO shall not schedule Energy from an Eligible Intermittent Resource other than through a Scheduling Coordinator. Settlement with Participating Intermittent Resources that meet the scheduling obligations established in the technical standards for Participating Intermittent Resources adopted by the ISO and published on the ISO Home Page shall be as provided in this ISO Tariff. No adjustment bids or Supplemental Energy bids may be submitted on behalf of Participating Intermittent Resources. Any Eligible Intermittent Resource that is not a Participating Intermittent Resource, or any Participating Intermittent Resource for which Adjustment Bids or Supplemental Energy bids are submitted, or that fails to meet the scheduling obligations established in the technical standards for Participating Intermittent Resources adopted by the ISO and published on the ISO Home Page, shall be scheduled and settled as a Generating Unit for the associated Settlement Periods.

2.3 System Operations under Normal and Emergency Operating Conditions.

2.3.1 ISO Control Center Operations.

2.3.1.1 ISO Control Center.

2.3.1.1.1 Establish ISO Control Center. The ISO shall establish a WSCC approved Control Area and control center to direct the operation of all facilities forming part of the ISO Controlled Grid, Reliability Must-Run Units and Generating Units providing Ancillary Services.

2.3.1.1.2 Establish Back-up Control Facility. The ISO shall establish back-up control facilities remote from the ISO Control Center sufficient to enable the ISO to continue to direct the operation of the ISO Controlled Grid, Reliability Must-Run Units and Generating Units providing Ancillary Services in the event of the ISO Control Center becoming inoperable.

2.3.1.1.3 ISO Control Center Authorities. The ISO shall have full authority, subject to Section 2.3.1.2 to direct the operation of the facilities referred to in Section 2.3.1.1.2 including (without limitation), to:

(a) direct the physical operation by the Participating TOs of transmission facilities under the Operational Control of the ISO, including (without limitation) circuit

2.3.3.6.4 The amount used to compensate each applicable Participating TO and Participating Generator, as described in Section 2.3.3.6.3, shall be charged to the Scheduling Coordinators in proportion to their metered Demand (including exports) during the Settlement Period(s) of the originally scheduled Outage.

2.3.3.7 The ISO Outage Coordination Office shall provide notice to the Operator of the approval or disapproval of any requested Maintenance Outage. Additionally, the ISO Outage Coordination Office shall notify any Connected Entity that may in the reasonable opinion of the ISO Outage Coordination Office be directly affected by an Approved Maintenance Outage. The content of and procedures for such notice shall be established by the ISO.

2.3.3.8 Final Approval. On the day on which an Approved Maintenance Outage is scheduled to commence, the Operator shall contact the ISO Control Center for final approval of the Maintenance Outage. No Maintenance Outage shall commence without such final approval (including the time of release, in hours and minutes) being obtained from the ISO Control Center whose decision shall be final.

2.3.3.9 Forced Outages.

2.3.3.9.1 Coordination of all Forced Outages (consistent with Section 2.3.3.4) will be through the single point of contact between the Operator and the ISO Control Center.

2.3.3.9.2 All notifications of Forced Outages shall be communicated to the ISO Control Center with as much notice as possible in order that the necessary security analysis and ISO Controlled Grid assessments may be performed. If prior notice of a Forced Outage cannot be given, the Operator shall notify the ISO of the Forced Outage within thirty (30) minutes after it occurs.

2.5.22.2 General Principles. The ISO shall base real time dispatch of Generating Units, System Units, Loads and System Resources on the following principles:

(a) the ISO shall dispatch Generating Units, System Units, and System Resources providing Regulation service to meet NERC and WSCC Area Control Error (ACE) performance requirements;

(b) once ACE has returned to zero, the ISO shall determine whether the Regulation Generating Units, System Units, and System Resources are operating at a point away from their preferred operating point. The ISO shall then adjust the output of Generating Units, System Units, and System Resources available (either providing Spinning Reserve, Non-Spinning Reserve, Replacement Reserve or offering Supplemental Energy) to return the Regulation Generating Units, System Units, and System Resources to their preferred operating points to restore their full regulating margin;

(c) the ISO shall economically dispatch Generating Units, System Units, Loads and System Resources only to meet its Imbalance Energy requirements and eliminate any Price Overlap between incremental and decremental energy bids;

(d) subject to Section 2.5.22.3 and its subparts, the ISO shall select the Generating Units, System Units, Loads and System Resources to be dispatched to meet its Imbalance Energy requirements and eliminate any Price Overlap based on a merit order of Energy bid prices;

(e) subject to Section 2.5.22.3 and its subparts, the ISO shall not discriminate between Generating Units, System Units, Loads and System Resources other than based on price, and the effectiveness (e.g., location and ramp rate) of the resource concerned to respond to the fluctuation in Demand or Generation;

2.5.22.6 **Real Time Dispatch.** The ISO shall economically dispatch Generating Unit, Load, System Unit or System Resource that is effective to meet Imbalance Energy requirements and eliminate any Price Overlap in real time, subject to the limitation on the Dispatch of Spinning Reserve and Non-Spinning Reserve set forth in Section 2.5.22.3. The ISO shall determine that additional output is needed if the current output levels of the Regulation Generating Units, System Units, and System Resources exceed their preferred operating points by more than a specified threshold (to be determined by the ISO). The ISO shall determine that less output is needed if the output levels of the Regulation Generating Units, System Units, and System Resources fall below their preferred operating points by more than a specified threshold (to be determined by the ISO). To minimize the cost of providing Imbalance Energy, the ISO shall economically increase or reduce Demand or Energy output from Generating Units, Loads, System Units or System Resources according to their incremental Supplemental Energy bid prices (or, for Generating Units, Loads, System Units and System Resources providing Ancillary Services, their Energy Bid prices).

Once a bid has been accepted by the ISO, the database shall be adjusted to reflect the change in status of the bid. Once a decremental bid has been used by the ISO, it will then be included in the incremental part of the database with an incremental bid equal to its decremental price bid. Once an incremental bid has been used by the ISO it will then be included in the decremental part of the database with a decremental bid equal to its incremental price bid.

wishes, to Dispatch. The recipient Scheduling Coordinator shall ensure that the Dispatch instruction is communicated immediately to the operator of the Generating Unit, System Unit, external import of System Resources or Load concerned. The ISO may, with the prior permission of the Scheduling Coordinator concerned, communicate with and give Dispatch instructions to the operators of Generating Units, System Units, external imports of System Resources and Loads directly without having to communicate through their appointed Scheduling Coordinator. The recipient of a Dispatch instruction shall confirm the Dispatch. The ISO shall record the communications between the ISO and Scheduling Coordinators relating to Dispatch instructions in a manner that permits auditing of the Dispatch instructions, and of the response of Generating Units, System Units, external imports of System Resources and Loads to Dispatch instructions.

The ISO Protocols govern the content, issue, receipt, confirmation and recording of Dispatch instructions.

2.5.22.11 Failure to Conform to Dispatch Instructions. All Scheduling Coordinators, Participating Generators, owners or operators of Curtailable Demands and operators of System Resources providing Ancillary Services (whether self provided or procured by the ISO) or whose Supplemental Energy bids have been accepted by the ISO shall be obligated to respond or to secure response to the ISO's Dispatch instructions in accordance with their terms, and to be available and capable of doing so, for the full duration of the Settlement Period. Dispatch Instructions will be deemed delivered and associated Energy will be settled as Instructed Imbalance Energy in accordance with Section 11.2.4.1.1. If a Generating Unit, Curtailable Demand or System Resource is unavailable or incapable of responding to a Dispatch instruction, or fails to respond to a Dispatch instruction in accordance with its terms, the Generating Unit, Curtailable Demand or System Resource:

(a) shall be declared and labeled as non-conforming to the ISO's instructions unless it has notified the ISO of an event that prevents it from performing its obligations within 30 minutes of the onset of such event;

(b) cannot set the BEEP Interval Ex Post Price; and the Scheduling Coordinator for the Participating Generator, owner or operator of the Curtailable Demand or System Resource concerned shall have Uninstructed Imbalance Energy due to the difference between the Generating Unit's, Curtailable Demand's or System Resource's instructed and actual output (or Demand). The Uninstructed Imbalance Energy shall be subject to the settlement for Uninstructed Imbalance Energy in accordance with Section 11.2.4.1 and the Uninstructed Deviation Penalty in accordance with Section 11.2.4.1.2. This applies whether the Ancillary Services concerned are contracted or self provided.

The ISO will develop additional mechanisms to deter Generating Units, Curtailable Demand and System Resources from failing to perform according to Dispatch instructions, for example reduction in payments to Scheduling Coordinators, or suspension of the Scheduling Coordinator's Ancillary Services certificate for the Generating Unit, Curtailable Demand or System Resource concerned.

2.5.23 Pricing Imbalance Energy.

2.5.23.1 General Principles. Instructed and Uninstructed Imbalance Energy shall be priced using the BEEP Interval Ex Post Prices. The BEEP Interval Ex Post Prices shall be based on the bid of the marginal Generating Unit, System Unit, Load or System Resource dispatched by the ISO to increase or reduce Demand or Energy output in each BEEP Interval as provided in Section 2.5.23.2.1.

The marginal bid is

the highest bid that is accepted by the ISO's BEEP Software for increased energy supply or the lowest bid that is accepted by the ISO's BEEP Software for reduced energy supply.

When an Inter-Zonal Interface is operated at the capacity of the interface (whether due to scheduled uses of the interface, or decreases in the capacity of the interface), the marginal prices in some Zones may differ from one another. In such cases, the ISO will determine separate Ex Post Prices for the Zones.

The ISO will respond to the Dispatch instructions issued by the BEEP Software to the extent practical in the time available and acting in accordance with Good Utility Practice. The ISO will record the reasons for any variation from the Dispatch instructions issued by the BEEP Software.

2.5.23.2 Determining Ex Post Prices.

2.5.23.2.1 BEEP Interval Ex Post Prices. For each BEEP Interval, the ISO will compute updated supply and demand curves, using the Generating Units, System Units, Loads and System Resources dispatched according to the ISO's BEEP Software during that time period to meet Imbalance Energy requirements and to eliminate any Price Overlap. The BEEP Interval Ex Post Price is equal to the bid price of the marginal resource accepted by the ISO for Dispatch, subject to any limitation applicable under Section 2.5.23.3. For each BEEP Interval of the Settlement Period, BEEP will compute the Ex Post Price so that it is:

a) greater than or equal to the prices of accepted incremental bids;

b) smaller than or equal to the prices of unaccepted incremental bids;

c) smaller than or equal to the prices of unaccepted incremental bids; and

d) greater than or equal to prices of unaccepted decremental bids.

In the event of Inter-Zonal Congestion, the ISO will develop supply and demand curves separately for each Zone separated by congestion.

2.5.23.2.2 Hourly Ex Post Price. The Hourly Ex Post Price in Settlement Period t in each Zone will equal the Energy weighted average of the BEEP Interval Prices in each Zone, calculated as follows:

$$HP_{xt} = \frac{\sum_b |Q_{bxt}| P_{bxt}}{\sum_b |Q_{bxt}|}$$

Where:

HP_{xt} is the Hourly Ex Post Price in Zone x;

P_{bxt} is the BEEP Interval Ex Post Price during BEEP Interval b in Zone x; and

$Q_{bx}t$ *is the total* Instructed Imbalance Energy during BEEP Interval b in Zone x.

If the ISO declares a System Emergency, e.g. during times of supply scarcity, and involuntary load shedding occurs during the real time Dispatch, the ISO shall set the Hourly Ex Post Price at the Administrative Price.

2.5.23.2.3 Price for Uninstructed Deviations for Participating Intermittent Resources.

Deviations associated with each Participating Intermittent Resource in a Scheduling Coordinator's zonal portfolio shall be settled as provided in Section 11.2.4.5.1 at the monthly weighted average BEEP Interval Ex Post Price, where the weights are the quantities of Instructed Imbalance Energy associated with each BEEP Interval Ex Post Price.

2.5.23.3 Temporary Limitation on BEEP Interval Ex Post Prices

2.5.23.3.1 Limitation. Notwithstanding any other provision of the ISO Tariff, the BEEP Interval Ex Post Price shall not exceed the applicable Non-Emergency Clearing Price Limit (NECPL) during the corresponding hour. Scheduling Coordinators for Generating Units, System Units, and System Resources that submit bids above the applicable NECPL for the supply of Imbalance Energy shall be paid in accordance with their bids, but only for the portion of Instructed Imbalance Energy that is actually delivered.

2.5.23.3.2 [Not Used]

2.5.23.3.3 [Not Used]

2.5.24 Verification of Performance of Ancillary Services.

Availability of both contracted and self provided Ancillary Services shall be verified by the ISO by unannounced testing of Generating Units, Loads and System Resources, by auditing of

2.5.26.2 Rescission of Payments for Unavailability. If capacity scheduled into the ISO's Ancillary Services markets from a Generating Unit, Curtailable Demand, System Unit or System Resource is unavailable during the relevant BEEP Interval, then payments will be rescinded as described herein. For self-provided Ancillary Services, the payment obligation shall be equivalent to that which would arise if the Ancillary Services had been bid into each market in which they were scheduled.

2.5.26.2.1 If the ISO determines that a Scheduling Coordinator has supplied Uninstructed Imbalance Energy to the ISO during a BEEP Interval from the capacity of a Generating Unit, System Unit or System Resource that is obligated to supply Spinning Reserve, Non-Spinning Reserve, or Replacement Reserve to the ISO during such BEEP Interval, payments to the Scheduling Coordinator representing the Generating Unit, System Unit or System Resource for the Ancillary Service capacity used to supply Uninstructed Imbalance Energy shall be eliminated to the extent of the deficiency, except to the extent (i) the deficiency in the availability of Ancillary Service capacity from the Generating Unit, System Unit or System Resource is attributable to control exercised by the ISO in that BEEP Interval through AGC operation, an RMR Dispatch Notice, or dispatch to avoid an intervention in Market operations or to prevent a System Emergency; or (ii) a penalty is imposed under Section 2.5.26.1 with respect to the deficiency.

2.5.26.2.2 If the metered Demand of a Curtailable Demand is insufficient to deliver the full amount of the Non-Spinning and Replacement Reserve to which that Curtailable Demand is obligated in that BEEP Interval, then the related capacity payments will be rescinded to the extent of that deficiency as explained in Section 2.5.26.2.4 and 2.5.26.2.5, unless a penalty is imposed on that Curtailable Demand for that BEEP Interval under Section 2.5.26.1.

2.5.26.2.3 [Not Used]

2.5.26.2.4 This Section 2.5.26.2.4 shall not apply to the capacity payment for any particular Ancillary Service if the Zonal Market Clearing Price determined in accordance with Sections 2.5.15, 2.5.16 or 2.5.17 is less than or equal to zero. For those Ancillary Services for which such Zonal Market Clearing Prices are greater than zero, the payment for Ancillary Service capacity otherwise payable under Section 2.5.27.2, 2.5.27.3, and/or 2.5.27.4 shall be reduced by one sixth of the product of the applicable prices and the amount of Ancillary Service capacity from which the Generating Unit, Curtailable Demand, System Unit or System Resource has supplied Uninstructed Imbalance Energy in a BEEP Interval. If a Scheduling Coordinator schedules Ancillary Services through both the Day-Ahead and Hour-Ahead Markets, capacity payments due the Scheduling Coordinator from each market will be rescinded in proportion to the amount of capacity sold to the ISO in each market. The amount of capacity for which payments will be rescinded shall equal the value $UnavailAncServMW_{ixt}$, as defined in Section 11.2.4.1, applied to each Generating Unit, System Unit and System Resource supplying the Ancillary Service or the value $UnavailDispLoadMW_{ixt}$, as also defined in Section 11.2.4.1, applied to the Curtailable Demand supplying the Ancillary Service.

2.5.26.2.5 Payment shall be eliminated first for any Spinning Reserve capacity for which the Generating Unit, Curtailable Demand, System Unit or System Resource would otherwise be entitled to payment. If the amount of Ancillary Service capacity from which the Generating Unit, System Unit or System Resource has supplied Uninstructed Imbalance Energy exceeds the amount of Spinning Reserve capacity for which it would otherwise be entitled to receive payment, payment shall be eliminated for Non-Spinning

Reserve capacity, and then for Replacement Reserve capacity, until payment has been withheld for the full amount of Ancillary Service capacity from which the Generating Unit, Curtailable Demand, System Unit or System Resource supplied Uninstructed Imbalance Energy.

2.5.26.2.6 For each BEEP Interval in which a Generating Unit, Curtailable Demand, System Unit or System Resource fails to actually supply Energy from Spinning Reserve, Non-Spinning Reserve or Replacement Reserve capacity in accordance with a Dispatch instruction, or supplies only a portion of the Energy specified in the Dispatch Instruction, the capacity payment will be pro-rated to reflect the unavailability in that BEEP Interval of the difference between (1) the total MW of the particular Ancillary Service scheduled in that Settlement Period and (2) the amount of Energy, if any, supplied in response to the Dispatch instruction in that BEEP Interval.

2.5.26.3 Rescission of Payments When Dispatch Instruction is Not Followed

If the total metered output of a Generating Unit, Curtailable Demand, System Unit or System Resource is insufficient to supply the amount of Instructed Imbalance Energy associated with a Dispatch instruction issued in accordance with a bid on Spinning Reserve, Non-Spinning Reserve, or Replacement Reserve in any BEEP Interval, then the capacity payment associated with the difference between the total scheduled amount of each Ancillary Service for which Insufficient Energy was delivered, and the actual output attributed to the response to the Dispatch instruction on each Ancillary Service, shall be rescinded. However, no capacity payment shall be rescinded if the shortfall in the metered output of the Generating Unit, Curtailable Demand, System Unit, or System Resource is less than a deadband amount published by ISO on the ISO Home Page at least twenty-four hours prior to the BEEP Interval. For any BEEP Interval with respect to which no deadband amount has been published by the ISO, the deadband amount shall be zero MWH. If the Generating Unit, Curtailable Demand, System Unit or System Resource is scheduled to provide more than one Ancillary Service in the Settlement Period, then the actual output will be attributed first to Replacement Reserve, then to Non-Spinning Reserve, and finally to Spinning Reserve, and the capacity payments associated with the balance of each Ancillary Service shall be rescinded. If the same Ancillary Service is scheduled in both the Day Ahead and Hour Ahead Markets, then payments shall be rescinded in proportion to the amount of each Ancillary Service scheduled in each market.

2.5.26.4 Penalties applied pursuant to Section 2.5.26.1, and payments rescinded pursuant to Section 2.5.26.2 and 2.5.26.3 shall be redistributed to Scheduling Coordinators in proportion to ISO Control Area metered Demand for the same Trading Day.

2.5.26.5 If the ISO determines that non-compliance of a Load, Generating Unit, System Unit or System Resource, with an operating order or Dispatch instruction from the ISO, or with any other applicable technical standard under the ISO Tariff, causes or exacerbates system conditions for which the WSCC imposes a penalty on the ISO, then the Scheduling Coordinator of such Load, Generating Unit, System Unit or System Resource shall be assigned that portion of the WSCC penalty which the ISO reasonably determines is attributable to such non-compliance, in addition to any other penalties or sanctions applicable under the ISO Tariff.

2.5.26.6 [Not Used]

[Not Used]

2.5.27.1 Regulation.

Regulation Up and Regulation Down payments shall be calculated separately.

Quantities. The following quantity definitions shall be used for each Scheduling Coordinator in the settlement process:

$AGCUpQDA_{xt}$ = the Scheduling Coordinator's total quantity of Regulation Up capacity in Zone X sold through the ISO auction at bids at or below the level specified in Section 2.5.27.7, and scheduled Day-Ahead j for Settlement Period t.

$AGCDownQDA_{xt}$ = the Scheduling Coordinator's total quantity of Regulation Down capacity in Zone X sold through the ISO auction at bids at or below the level specified in Section 2.5.27.7, and scheduled Day-Ahead j for Settlement Period t.

$EnQInst_{xt}$ = Instructed Imbalance Energy increase or decrease in Zone X in real time Dispatch for each BEEP Interval b of Settlement Period t, determined in accordance with the ISO Protocols.

Prices. The prices in the Settlement process for Regulation Up and Regulation Down shall be those determined in Section 2.5.14 for bids at or below the level specified in Section 2.5.27.7 and prices determined in accordance with Section 2.5.27.7 for bids above that level.

Adjustment: penalty described in Section 2.5.26.1.

$PAGCUpDA_{xt}$ = the market clearing price, PAGC, in Zone X for Regulation Up capacity in the Day-Ahead market for Settlement Period t.

Scheduling Coordinators for Generating Units providing Regulation Down capacity through the ISO auction shall receive the following payments for Regulation Down:

$AGCDownPay_{xt} = AGCDownQDA_{xt} * PAGCDownDA_{xt} - Adjustment$

Scheduling Coordinators for Generating Units shall receive the following payment for Energy output from Regulation in accordance with the settlement for Instructed Imbalance Energy under Section 11.2.4.1:

$$\sum_i [(EnQInst_{ixt} * BEEPIntervalExPostPriceinZoneX) + REPAi_{xt}]$$

$REPA_{ixt}$ = the Regulation Energy Payment Adjustment for Generating Unit i in Zone X for Settlement Period t calculated as follows:

$[(R_{UPixt} * C_{UP}) + (R_{DNixt} * C_{DN})] * \max(\$20/MWh, P_{xt})$

Where

R_{UPixt} = the upward range of generating capacity for the provision of Regulation from Generating Unit i in Zone X included in the bid accepted by the ISO for Generating Unit i for Settlement Period t, weighted in proportion to the ISO's need for upward Regulation. The weighting factors will be specified within a range from 0-100 percent. The weighting factors will be set at the discretion of the ISO based on system conditions, and will be set at a level that will provide sufficient incentive to the market to supply upward Regulation for the ISO's purposes of satisfying WSCC criteria and NERC control performance standards. The ISO shall post the weighting factors consistent with the ISO Weighting Procedure, posted on the ISO website.

R_{DNixt} = the downward range of generating capacity for the provision of Regulation for Generating Unit i in Zone X included in the bid accepted by the ISO for Generating Unit i for Settlement Period t, weighted in proportion to the ISO's need for downward Regulation. The weighting factors will be specified within a range from 0-100 percent. The weighting factors will be set at the discretion of the ISO based on system conditions, and will be set at a level that will provide sufficient incentive to the market to supply downward Regulation for the ISO's purposes of satisfying WSCC criteria and NERC control performance standards. The ISO shall post the weighting factors consistent with the ISO Weighting Procedure, posted on the ISO website.

C_{UP} = 0

C_{DN} = 0

P_{xt} = the Hourly Ex Post Price for Zone X in Settlement Period t.

The ISO may modify the value of the constants C_{UP} or C_{DN} within a range of 0-1 either generally in regard to all hours or specifically in regard to particular times of the day, after the ISO Governing Board approves such modification, by a notice issued by the Chief

If $ReplObligTotal_{xt} > TotalDeviations_{xt}$ then:

$$DevReplOblig_{xjt} = \left[Max\left(0, \sum_i GenDev_{ijxt}\right) - Min\left(0, \sum_i LoadDev_{ijxt}\right)\right]$$

If $ReplObligTotal_{xt} < TotalDeviations_{xt}$ then:

$$DevReplOblig_{xjt} = \frac{ReplObligTotal_{xt}}{TotalDeviations_{xt}} * \left[Max\left(0, \sum_i GenDev_{ijxt}\right) - Min\left(0, \sum_i LoadDev_{ijxt}\right)\right]$$

where,

$$TotalDeviations_{xt} = \sum_j \left[Max\left(0, \sum_i GenDev_{ijxt}\right) - Min\left(0, \sum_i LoadDev_{ijxt}\right)\right]$$

$GenDev_{ijxt}$ = The deviation between scheduled and actual Energy Generation for Generator i represented by Scheduling Coordinator j in Zone x during Settlement Period t as referenced in SABP Appendix D.

$LoadDev_{ijxt}$ = The deviation between scheduled and actual Load consumption for resource i represented by Scheduling Coordinator j in Zone x during Settlement Period t as referenced in SABP Appendix D.

$DevReplOblig_{xt}$ is total deviation Replacement Reserve in Zone x for Settlement Period t.

$ReplObligTotal_{xt}$ is total Replacement Reserve Obligation in zone x for Settlement Period t.

Remaining Replacement Reserve for Scheduling Coordinator j in Zone x for Settlement Period t is calculated as follows:

(ii) if the ISO is required to call for the involuntary curtailment of firm Load to maintain Applicable Reliability Criteria during the System Emergency, an additional charge equal to $1,000 for each MWh of the Dispatch instruction with which the Participating Generator does not comply.

5.6.3.2 A Participating Generator shall not be subject to penalties pursuant to Section 5.6.3.1 if the Participating Generator can demonstrate to the ISO that it failed to comply with such a Dispatch instruction either because: (a) the Generating Unit, System Unit or System Resource that was the subject of the Dispatch instruction was physically incapable of responding in accordance with the instruction, provided that if such Participating Generator has not notified the ISO in advance that the Generating Unit, System Unit or System Resource was unavailable or de-rated, such Generating Unit, System Unit or System Resource will be presumed to be available; or (b) compliance with such Dispatch instruction would have resulted in a violation of an applicable requirement of state or Federal law, which requirement cannot be waived. A Participating Generator must notify ISO operations staff of its reason for failing to comply with the Dispatch instruction in accordance with Section 2.3.3.9.2 and must provide information to the ISO that verifies the reason the Participating Generator failed to comply with the Dispatch instruction within 72 hours of the operating hour in which the instruction is issued. Disputes concerning the cause of a Participating Generator's failure to comply with an ISO Dispatch instruction shall be subject to the Dispute Resolution provisions set forth in Section 13 of this ISO Tariff.

5.7 Interconnection to the ISO Controlled Grid.

5.7.1 Submitting Requests to Interconnect.

Any existing or prospective Generator that requests interconnection to the ISO Controlled Grid shall submit a request to interconnect to the Participating TO or UDC that will supply the

7.2.5.2.7 If inadequate Adjustment Bids have been submitted to schedule Inter-Zonal Interface capacity on an economic basis and to the extent that scheduling decisions cannot be made on the basis of economic value, the ISO will allocate the available Inter-Zonal Interface capacity to Scheduling Coordinators in proportion to their respective proposed use of that capacity as indicated in their Schedules and shall curtail scheduled Generation and Demand to the extent necessary to ensure that each Scheduling Coordinator's Schedule remains balanced.

7.2.5.2.8 The ISO will publish information prior to the Day-Ahead Market, between the iterations of the Day-Ahead Market, and prior to the Hour-Ahead Market, to assist the Scheduling Coordinators to construct their Adjustment Bids so as to actively participate in the management of Congestion and the valuation of Inter-Zonal Interfaces. This information may include the ISO's most-current information regarding: potentially Congested paths, projected transmission uses, projected hourly Loop Flows across Inter-Zonal Interfaces, scheduled line Outages, forecasts of expected system-wide Load, the ISO's Ancillary Services requirements, Generation Meter Multipliers, and power flow outputs.

7.2.5.2.8 The ISO will also publish information, once it is available, regarding tentative prices for the use of Inter-Zonal Interfaces, and Generation shift factors for the use of Inter-Zonal Interfaces, which indicate the relative effectiveness of Generation shifts in alleviating Congestion.

7.2.6 Intra-Zonal Congestion Management.

7.2.6.1 Complying with Intra-Zonal Congestion Scheduling Limits. Scheduling Coordinators shall submit Initial Preferred Day-Ahead schedules that comply with the forecast Intra-zonal Congestion scheduling limits posted by the ISO in accordance with Section 2.2.10.7. If the schedules submitted by Scheduling Coordinators do not comply with these limits, the ISO shall publish Suggested Adjusted Schedules which reflect these scheduling limits. If the Final schedules submitted by Scheduling Coordinators in response to the Suggested Adjusted Schedules do not comply with the scheduling limits, the ISO shall adjust the Scheduling Coordinator's Final Day-Ahead Schedules to match the scheduling limits by adjusting resources in the Scheduling Coordinator's portfolio as necessary to ensure balanced Final Day-Ahead Schedules. Scheduling Coordinators whose portfolios are adjusted by the ISO to enforce these scheduling limits shall not be compensated for these adjustments. The ISO shall also enter the unit's scheduling limits in the Outage scheduling system.

7.2.6.1.1 [Not used]

7.2.6.1.2 [Not Used]

7.2.6.1.3 [Not Used]

7.2.6.1.4 [Not Used]

7.2.6.1.5 [Not Used]

7.2.6.1.6 [Not Used]

7.2.6.2 Intra-Zonal Congestion During Initial Period. Except as provided in Sections 2.2.10.7, 5.2, 7.2.6.1 and 11.2.4.4, the ISO will perform Intra-Zonal Congestion Management in real time using available Adjustment Bids and Imbalance Energy bids, based on their effectiveness and in merit order, to minimize the cost of alleviating Congestion. If the Adjustment Bid or Imbalance Energy bid from a Generating Unit the ISO must Dispatch to manage Intra-Zonal Congestion is not the next bid in merit order, the ISO shall set the price of that bid equal to the proxy price of that Generating Unit as determined in accordance with Section 2.5.23.3.4 and Dispatch that Generating Unit pursuant to that adjusted bid to manage Intra-Zonal Congestion. The Scheduling Coordinator for that Generating Unit shall then be 1) paid the higher of its proxy price as determined in accordance with Section 2.5.23.3.4 or the BEEP Interval Ex Post Price for incremental Dispatch, or 2) charged the lower of its proxy price as determined in accordance with Section 2.5.23.3.4 or the BEEP Interval Ex Post Price for decremental Dispatch. In the event no Adjustment Bids or Imbalance Energy bids are available, the ISO will exercise its authority to direct the redispatch of resources as allowed under the Tariff, including Section 11.2.4.4.

7.2.6.3 Cost of Intra-Zonal Congestion Management. The net of the amounts paid by the ISO to the Scheduling Coordinators and the amounts charged to the Scheduling Coordinators will be calculated and charged to all Scheduling Coordinators through a Grid Operations Charge, as described in Section 7.3.2.

7.2.7 Creation, Modification and Elimination of Zones.

7.2.7.1 Active Zones. The Active Zones are as set forth in Appendix I to this ISO Tariff.

7.2.7.2 Modifying Zones. The ISO shall monitor usage of the ISO Controlled Grid to determine whether new Zones should be created, or whether existing Zones should be eliminated, in accordance with the following procedures.

7.2.7.2.1 If over a 12-month period, the ISO finds that within a Zone the cost to alleviate the Congestion on a path is equivalent to at least 5 percent of the product of the rated capacity of the path and the weighted average High Voltage Access Charge and Low

(4) Imbalance Energy charges;

(5) Usage Charges;

(6) High Voltage Access Charges and Transition Charges;

(7) Wheeling Access Charges;

(8) Voltage Support and Black Start charges; and

(9) Reliability Must-Run Charges

11.2 Calculations of Settlements.

The ISO shall calculate, account for and settle the following charges in accordance with this ISO Tariff.

11.2.1 Grid Management Charge.

The Grid Management Charge will be levied in accordance with Section 8 of this ISO Tariff.

11.2.2 Grid Operations Charge.

The Grid Operations Charge will be levied in accordance with Section 7.3.2 of this ISO Tariff.

11.2.3 Ancillary Services

The ISO shall calculate, account for and settle charges and payments for Ancillary Services as set out in Sections 2.5.27.1 to 4, and 2.5.28.1 to 4 of this ISO Tariff.

11.2.4 Imbalance Energy.

The ISO shall calculate, account for and settle Imbalance Energy in the Real Time Market for each BEEP Interval Period for the relevant Zone or Scheduling Point within the ISO Controlled

Grid. Imbalance Energy is the difference between the Metered Quantity and the Energy that corresponds to the final Hour-Ahead Schedule. Instructed Imbalance Energy is the portion of Imbalance Energy that is produced or consumed due to Dispatch instructions. The Instructed Imbalance Energy will be calculated based on all Dispatch instructions taking into account applicable ramp rates and time delays. All Dispatch instructions shall be deemed delivered. The remaining Imbalance Energy constitutes Uninstructed Imbalance Energy, and will be calculated based on the difference between the Metered Quantity and the Generator's Dispatched Operating Point.

11.2.4.1 Net Settlements for Uninstructed Imbalance Energy.

Uninstructed Imbalance Energy attributable to each Scheduling Coordinator for each Settlement Period in the relevant Zone shall be deemed to be sold or purchased, as the case may be, by the ISO and charges or payments for Uninstructed Imbalance Energy shall be settled by debiting or crediting, as the case may be, the Scheduling Coordinator with an amount for each BEEP Interval in accordance with Section 2.5.23.2.1.

11.2.4.1.1 Settlement for Instructed Imbalance Energy

Instructed Imbalance Energy attributable to each Scheduling Coordinator in each BEEP Interval shall be deemed to be sold or purchased, as the case may be, by the ISO and charges or payments for Instructed Imbalance Energy shall be settled by debiting or crediting, as the case may be, the Scheduling Coordinator with an amount for each BEEP Interval in accordance with Section 2.5.23.

11.2.4.1.2 Penalties for Uninstructed Imbalance Energy

The ISO shall charge Scheduling Coordinators Uninstructed Deviation Penalties for Uninstructed Imbalance Energy resulting from resource deviations outside a tolerance band from their dispatched operating point, for dispatched resources, or their final Hour-Ahead Schedule otherwise. The Dispatched Operating Point will take into account the expected ramping of a resource as it moves to a new Hour-Ahead Schedule at the top of each hour and as it responds to Dispatch instructions. The Uninstructed Deviation Penalty will be applied as follows:

a) The Uninstructed Deviation Penalty will be calculated and assessed in each BEEP Interval in hours that Section 5.6.3 is in effect; the ISO has not declared a Staged System Emergency; or parts of hours except when Section 5.6.3 is in effect;

b) The Uninstructed Deviation Penalty will not apply to Interconnection Schedules because such Schedules are deemed delivered. However, dynamic Interconnection Schedules, to the extent they deviate without instruction from their final Hour-Ahead Schedule, and real-time instructions for Energy from Interconnection Schedule bids that are declined, will be subject to the Uninstructed Deviation Penalty;

c) The Uninstructed Deviation Penalty will not apply to Load, other than Participating Load; for Participating Load, the Uninstructed Deviation Penalty will not apply for the duration of the relevant Minimum Down Time;

d) The Uninstructed Deviation Penalty will not apply to constrained resources for the duration of the relevant startup/shutdown and Minimum Up/Down Times;

e) The Uninstructed Deviation Penalty will not apply to Regulatory Must-Run Generation or Participating Intermittent Resources that meet the scheduling obligations established in the technical standards for Participating intermittent Resources adopted by the ISO and published on the ISO Home Page or Regulatory Must-Run Generation. No other applicable charges will be affected by this exemption. Uninstructed Deviation Penalty also will not apply to Qualifying Facilities that have not executed a Participating Generator Agreement (PGA), pending resolution of QF-PGA issues at the Commission;

f) For Metered Subsystems (MSS), the Uninstructed Deviation Penalty will apply to the net injection (System Unit generation plus import minus MSS load and export) into the ISO Controlled Grid;

g) The Uninstructed Deviation Penalty will not apply to Generators providing Regulation to the extent that the Generators' Uninstructed Deviations are within the range of their actual Regulation range;

h) The Uninstructed Deviation Penalty will be calculated and assessed for each resource separately, however, resources represented by the same Scheduling Coordinator and connected to the same ISO Controlled Grid bus and voltage level can be aggregated for purposes of Uninstructed Deviation Penalty determination. Other levels of aggregation for purposes of the Uninstructed Deviation Penalty will be considered on a case-by-case basis based on an ISO review of impact on the ISO Controlled Grid;

i) The tolerance band for the application of the Uninstructed Deviation Penalties to Generators or aggregated Generators initially will be the Energy produced in a BEEP Interval by the greater of five (5) MW or three percent (3%) of the relevant generating unit's maximum output (P_{max}), as registered in the Master File;

j) The tolerance band for the application of the Uninstructed Deviation Penalties to Participating Loads initially will be equal to the Energy produced in a BEEP Interval by the greater of five (5) MW or three percent (3%) of the relevant final Hour-Ahead Schedule;

k) The Uninstructed Deviation Penalty will not apply when the BEEP Interval Ex Post Price is negative or zero;

l) The Uninstructed Deviation Penalty for positive Uninstructed Imbalance Energy will be the amount of the Uninstructed Imbalance Energy in excess of the tolerance band multiplied by a price that initially will be equal to 100% of the corresponding BEEP Interval Ex Post Price; and the net effect of the Uninstructed Deviation Penalty and the Settlement for positive Uninstructed Imbalance Energy beyond the tolerance band will be that the ISO will not pay for such Energy;

m) The Uninstructed Deviation Penalty for negative Uninstructed Imbalance Energy will be the amount of the Uninstructed Imbalance Energy in excess of the tolerance band multiplied by a price that initially will be initially equal to 25% of the corresponding BEEP Interval Ex Post Price; and the net effect of the Uninstructed Deviation Penalty and Uninstructed Imbalance Energy settlement initially will be that any such Energy will be charged at 125% of the corresponding BEEP Interval Ex Post Price;

n) The Uninstructed Deviation Penalty will not apply to deviations from Energy delivered as part of a scheduled test so long as the test has been scheduled by the Scheduling Coordinator with the ISO or the ISO has initiated as test for the purposes of validating unit performance;

o) The Uninstructed Deviation Penalty will apply to Out of Market (OOM) transactions; and

p) Generating Units, Curtailable Demands and dispatchable Interconnection resources with negative Uninstructed Imbalance Energy will be exempted from the Uninstructed Deviation Penalty if the Generating Unit, Curtailable Demand or dispatchable Interconnection resource was physically incapable of delivering the expected Energy, provided that the Generating Unit, Curtailable Demand or dispatchable Interconnection resource had notified the ISO within 30 minutes of the onset of an event that prevents the resource from performing its obligations. A Generating Unit, Curtailable Demand or dispatchable Interconnection resource must notify ISO operations staff of its reasons for failing to deliver the expected Energy in accordance with Section 2.3.3.9.2 and must provide information to the ISO that verifies the reason the resource failed to comply with the Dispatch instruction within 72 hours of the operating hour in which the instruction is issued.

The ISO may modify the value of the Uninstructed Deviation Penalty tolerance band or method for calculation of the rate of the Uninstructed Deviation Penalty, after the ISO Board of Governors approves any such modification, by a notice issued by the Chief Executive Officer of the ISO and posted on the ISO Internet "Home Page," at http//www.caiso.com, or such other Internet address as the ISO may publish from time to time, specifying the date and time from which the modification shall take effect, which shall be not less than seven (7) days after the Notice is issued.

The ISO may modify the value of the Uninstructed Deviation Penalty tolerance band or method for calculation of the rate of the Uninstructed Deviation Penalty, after the ISO Board of Governors approves any such modification, by a notice issued by the Chief Executive Officer of the ISO and posted on the ISO Internet "Home Page," at http//www.caiso.com, or such other Internet address as the ISO may publish from time to time, specifying the date and time from which the modification shall take effect, which shall be not less than seven (7) days after the Notice is issued.

11.2.4.2 Payment Options for ISO Dispatch Orders

With respect to all resources which have not bid into the Imbalance Energy or Ancillary Services markets but which have been dispatched by the ISO to avoid an intervention in market operations, to prevent or relieve a System Emergency, or to satisfy a locational requirement, the ISO shall calculate, account for and, if applicable, settle deviations from the Final Schedule submitted on behalf of each such resource, with the relevant most recent similar days for the same Settlement Period for which the resource is dispatched; 2) an Energy payment equal to the average calculated using the PX Day-Ahead, PX Hour-Ahead and ISO Real-Time Market Energy prices for the three (3) most recent similar days for the same Settlement Period for which the resource is dispatched; 3) such resource's verifiable start-up fuel costs, if the start-up was solely attributable to the ISO's dispatch instruction and if the Scheduling Coordinator provides the resource's start-up fuel costs to the ISO within thirty (30) Business Days from the Settlement Period for which the resource is dispatched; and 4) verifiable daily gas imbalance charges, if any, that are solely attributable to the ISO's dispatch instruction and that the Scheduling Coordinator or Generator was not able to eliminate or reduce despite the application of best efforts, if the Scheduling Coordinator provides the resource's daily gas imbalance charges to the ISO within thirty (30) Business Days from the Settlement Period for which the resource is dispatched. References to "similar days" in this Section refer to Business Days when the resource is dispatched on a Business Day and otherwise to days that are not Business Days.

To the extent a Scheduling Coordinator does not specify a payment option, the ISO will apply the payment provisions of Section 11.2.4.1.

11.2.4.2.1 Allocation of Costs Resulting From Dispatch Instructions

Pursuant to Section 11.2.4.1, the ISO may, at its discretion, Dispatch any Participating Generator, Participating Load and dispatchable Interconnection resource that has not bid into the Imbalance Energy or

Ancillary Services markets, to avoid an intervention in market operations or to prevent or relieve a System Emergency. Such Dispatch may result from, among other things, planned and unplanned transmission facility outages; bid insufficiency in the Ancillary Services and Real-Time Energy markets; and location-specific requirements of the ISO. The cost associated with each Dispatch instruction is broken into two components:

a) the portion of the Energy payment at or below the Market Clearing Price (“MCP”) for the BEEP Interval, and

b) the portion of the Energy payment above the MCP, if any, for the BEEP Interval.

For each BEEP Interval, costs above the MCP incurred by the ISO for such Dispatch instructions necessary as a result of a transmission facility outage or in order to satisfy a location-specific requirement in that BEEP Interval shall be payable to the ISO by the Participating Transmission Owner in whose Service Area the transmission facility is located or the location-specific requirement arose. The costs incurred by the ISO for such Dispatch instructions for reasons other than for a transmission facility outage or a location-specific requirement will be recovered in the same way as for Instructed Imbalance energy.

11.2.4.2.2 Allocation of Above-MCP Costs

For each BEEP Interval, the above-MCP costs incurred by the ISO as a result of Instructed Imbalance Energy and Dispatch instructions for reasons other than for a transmission facility outage or a location-specific requirement shall be charged to Scheduling Coordinators as follows. Each Scheduling Coordinator’s charge shall be the lesser of:

(a) the pro rata share of the total above-MCP costs based upon the ratio of each Scheduling Coordinator's Net Negative Uninstructed Deviations to the total System Net Negative Uninstructed Deviations; or

(b) the amount obtained by multiplying the Scheduling Coordinator's Net Negative Uninstructed Deviation for each BEEP Interval and a weighted average price. The weighted average price is equal to the total above-MCP costs divided by the MWh delivered as a result of ISO instructions with a cost component above the MCP.

The difference between ISO charges to Scheduling Coordinators with Net Negative Uninstructed Deviations and the total above-MCP costs incurred by the ISO due to Instructed Imbalance Energy and Dispatch instructions for reasons other than for a transmission facility outage or a location-specific requirement shall be allocated amongst all Scheduling Coordinators in that BEEP Interval pro rata based on their metered Demand, including Exports.

The Scheduling Coordinator shall be exempt from the allocation of above-MCP costs in a BEEP interval f the Scheduling Coordinator has sufficient incremental Energy bids from physically available resources in the Imbalance Energy market to cover the net negative Uninstructed Deviation in the given interval of a resource and the prices of these Energy bids do not exceed the applicable NECPL.

11.2.4.3 Unaccounted For Energy (UFE)

For settlement purposes, UFE is treated as Imbalance Energy. For each BEEP Interval the ISO will calculate UFE on the ISO Controlled Grid, for each UDC Service Area. The UFE will be settled as Imbalance Energy at the BEEP Interval Ex Post Price. UFE attributable to meter measurement errors, load profile errors, Energy theft, and distribution loss deviations will be allocated to each Scheduling Coordinator based on the ratio of their metered Demand (including exports to neighboring Control Areas) within the relevant UDC Service Area to total metered Demand within the UDC Service Area.

11.2.4.4 High Voltage Access Charges and Transition Charges will be levied in accordance with Section 7.1 of this ISO Tariff and Appendix F, Schedule 3.

11.2.4.5 Participating Intermittent Resources

11.2.4.5.1 Uninstructed Energy by Participating Intermittent Resources

Uninstructed Imbalance Energy associated with deviations by a Participating Intermittent Resource shall be settled as provided in this Section 11.2.4.5.1 for every Settlement Period in which such Participating Intermittent Resource meets the scheduling requirements established in the technical standards for Participating Intermittent Resources adopted by the ISO and published on the ISO Home Page. In each Settlement Period such requirements are met, the Participating Intermittent Resource shall be exempt from the charges (payments) for Uninstructed Imbalance Energy. Instead, the net Uninstructed Imbalance Energy in each BEEP Interval shall be assigned to a deviation account specific to each Participating Intermittent Resource. The net balance in each deviation account at the end of each calendar month shall be paid (or charged) to the Scheduling Coordinator for the associated Participating Intermittent Resource at the average price specified in Section 2.5.23.2.3 of the ISO Tariff. If the above- referenced scheduling requirements for Participating Intermittent Resources are not met, then charges (payments) for Uninstructed Imbalance Energy during such Settlement Periods shall be determined in accordance with Section 11.2.4.1.

11.2.4.5.2 Adjustment of Other Charges Related to Participating Intermittent Resources

Charges pursuant to Section 2.5.28.4 or Section 11.2.4.2.2 to Scheduling Coordinators representing Participating Intermittent Resources shall exclude the effect of uninstructed deviations by Participating Intermittent Resources that have scheduled in accordance with the technical standards for Participating Intermittent Resources adopted by the ISO and published on the ISO Home Page. The amount of such adjustments shall be accumulated and settled as provided in Section 11.2.4.5.3.

11.2.4.5.3 Allocation of Costs From Participating Intermittent Resources

The charges (payments) for Uninstructed Imbalance Energy that would have been calculated if the BEEP Interval deviations by each Participating Intermittent Resource were priced at the appropriate BEEP Interval Ex Post Price specified in Section 2.5.23.2.1 shall be assigned to a monthly balancing account for all Participating Intermittent Resources in the ISO Control Area. The balance in such account at the end of each month shall be netted against the aggregate payments (charges) by Scheduling Coordinators on behalf of Participating Intermittent Resources pursuant to Section 11.2.4.5.1. The resulting balance, together with the adjustments to charges in each BEEP Interval or Settlement Period pursuant to Section 11.2.4.5.2 shall be assigned to each Scheduling Coordinator in the same proportion that such Scheduling Coordinator's aggregate Net Negative Uninstructed Deviations in that month bears to the aggregate Net Negative Uninstructed Deviations for all Scheduling Coordinators in the Control Area in that month.

11.2.4.5.4 Payment of Forecasting Fee

A fee to defray the costs of the implementation of the technical standards for Participating Intermittent Resources shall be assessed to Scheduling Coordinators for Participating Intermittent Resources as specified in Schedule 4 of Appendix F.

Direct Access Generation	An Eligible Customer who is selling Energy or Ancillary Services through a Scheduling Coordinator.
Dispatch	The operating control of an integrated electric system to: i) assign specific Generating Units and other sources of supply to effect the supply to meet the relevant area Demand taken as Load rises or falls; ii) control operations and maintenance of high voltage lines, substations, and equipment, including administration of safety procedures; iii) operate interconnections; iv) manage Energy transactions with other interconnected Control Areas; and v) curtail Demand.
Dispatch Instruction	An instruction by the ISO to a resource for increasing or decreasing its energy supply or demand from the Hour-Ahead Schedule to a specified operating point.
Dispatch Operating Point	The expected operating point of a resource that has received a Dispatch Instruction. The resource is expected to operate at the Dispatch Operating Point after completing the Dispatch Instruction, taking into account any relevant ramp rate and time delays. Energy expected to be produced or consumed above or below the Final Hour-Ahead Schedule in response to a Dispatch Instruction constitutes Instructed Imbalance Energy. For resources that have not received a Dispatch Instruction, the Dispatch Operating Point defaults to the corresponding Final Hour-Ahead Schedule.
Dispatchable Loads	Load which is the subject of an Adjustment Bid.
Distribution System	The distribution assets of a TO or UDC.

EEP (Electrical Emergency Plan)	A plan to be developed by the ISO in consultation with UDCs to address situations when Energy reserve margins are forecast to be below established levels..
Effective Price	The price, applied to undelivered Instructed Imbalance Energy, calculated by dividing the absolute value of the total payment or charge for Instructed Imbalance Energy by the absolute value of the total Instructed Imbalance Energy, for the Settlement Period; provided that, if both the total payment or charge and quantity of Instructed Imbalance Energy for the Settlement Period are negative, the Effective Price shall be multiplied by -1.0 (minus one).
Electric Capacity	The continuous demand-carrying ability for which a Generating Unit, or other electrical apparatus is rated, either by the user or by the manufacturer.

Eligible Customer	(i) any utility (including Participating TOs, Market Participants and any power marketer), Federal power marketing agency, or any person generating Energy for sale or resale; Energy sold or produced by such entity may be Energy produced in the United States, Canada or Mexico; however, such entity is not eligible for transmission service that would be prohibited by Section 212(h)(2) of the Federal Power Act; and (ii) any retail customer taking unbundled transmission service pursuant to a state retail access program or pursuant to a voluntary offer of unbundled retail transmission service by the Participating TO.
Eligible Intermittent Resource	A Generating Unit, the output of which is not marketed under a contract pursuant to the Public Utilities Regulatory Policy Act of 1978, that is powered solely by 1) wind, 2) solar energy, or 3) hydroelectric potential derived from small conduit water distribution facilities that do not have storage capability.
Eligible Regulatory Must-Take Generation	Regulatory Must-Take Generation which (i) has been approved as Regulatory Must-Take Generation by a Local Regulatory Authority within California, and (ii) is owned or produced by a Participating TO or UDC which has provided direct access to its End-Use Customers and serves load in the ISO Control Area.
Eligible Regulatory Must-Run Generation	Regulatory Must-Run Generation which (i) has been approved as Regulatory Must-Run Generation by a Local Regulatory Authority within California, and (ii) is owned or produced by a Participating TO or UDC which has provided direct access to its End-Use Customers and serves load in the ISO Control Area.
Emergency Startup	A startup order from the ISO delivered to a Generator in response to a System Emergency.

Energy	The electrical energy produced, flowing or supplied by generation, transmission or distribution facilities, being the integral with respect to time of the instantaneous power, measured in units of watt-hours or standard multiples thereof, e.g., 1,000 Wh=1kWh, 1,000 kWh=1MWh, etc.
Energy Bid	The price at or above which a Generator has agreed to produce the next increment of Energy.
Energy Efficiency Services	Services that are intended to assist End-Users in achieving savings in their use of Energy or increased efficiency in their use of Energy.
Entitlements	The right of a Participating TO obtained through contract or other means to use another entity's transmission facilities for the transmission of Energy.
Environmental Dispatch	Dispatch designed to meet the requirements of air quality and other environmental legislation and environmental agencies having authority or jurisdiction over the ISO.
Environmental Quality	In relation to Energy, means Energy which involves production sources that reduce harm to the environment.
Equipment Clearances	The process by which the ISO grants authorization to another party to connect or disconnect electric equipment interconnected to the ISO Controlled Grid.
Ex Post GMM	GMM that is calculated utilizing the real time Power Flow Model in accordance with Section 7.4.2.1.2.
Ex Post Price	The Hourly Ex Post Price or the BEEP Interval Ex Post Price.
Ex Post Transmission Loss	Transmission Loss that is calculated based on Ex Post GMM.

Hourly Ex Post Price The Energy-weighted average of the BEEP Interval Ex Post Prices in each Zone during each settlement period. The Hourly Ex Post Price will vary between Zones if Congestion is present. This price is used in the Regulation Energy Payment Adjustment and in RMR settlements.

Hydro Spill Generation Hydro-electric Generation in existence prior to the ISO Operations Date that: i) has no storage capacity and that, if backed down, would spill; ii) has exceeded its storage capacity and is spilling even though the generators are at full output, or iii) has inadequate storage capacity to prevent loss of hydro-electric Energy either immediately or during the forecast period, if hydro-electric Generation is reduced; iv) has increased regulated water output to avoid an impending spill.

Identification Code An identification number assigned to each Scheduling Coordinator by the ISO.

Imbalance Energy Imbalance Energy is Energy from Regulation, Spinning and Non-spinning Reserves, or Replacement Reserve, or Energy from other Generating Units, System Units, System Resources, or Loads that are able to respond to the ISO's request for more or less Energy.

Inactive Zone All Zones which the ISO Governing Board has determined do not have a workably competitive Generation market and as set out in Appendix I to the ISO Tariff.

ISO Market	Any of the markets administered by the ISO under the ISO Tariff, including, without limitation, Imbalance Energy, Ancillary Services, and FTRs.
ISO Memorandum Account	The memorandum account established by each California IOU pursuant to California Public Utility Commission Order D. 96-08-038 date August 2, 1996 which records all ISO startup and development costs incurred by that California IOU.
ISO Metered Entity	a) any one of the following entities that is directly connected to the ISO Controlled Grid: i. a Generator other than a Generator that sells all of its Energy (excluding any Energy consumed by auxiliary load equipment electrically connected to that Generator at the same point) and Ancillary Services to the UDC in whose Service Area it is located; ii. an Eligible Customer; or iii. an End-User other than an End-User that purchases all of its Energy from the UDC in whose Service Area it is located; and (b) any one of the following entities: i. a Participating Generator; ii. a Participating TO in relation to its Tie Point Meters with other TOs or Control Areas; iii. a Participating Load; or iv. a Participating Intermittent Resource.
ISO Operations Date	The date on which the ISO first assumes Operational Control of the ISO Controlled Grid.
ISO Outage Coordination Office	The office established by the ISO to coordinate Maintenance Outages in accordance with Section 2.3.3 of the ISO Tariff.

Order No. 889	The final rule issued by FERC entitled "Open Access Same-Time Information System (formerly Real Time Information Networks) and Standards of Conduct," 61 Fed. Reg. 21,737 (May 10, 1996), FERC Stats. & Regs., Regulations Preambles [1991-1996] ¶ 31,035 (1996), Order on Rehearing, Order No. 889-A, 78 FERC ¶ 61,221 (1997), as it may be amended from time to time.
Original Participating TO	A Participating TO that was a Participating TO as of January 1, 2000.
Outage	Disconnection or separation, planned or forced, of one or more elements of an electric system.
Overgeneration	A condition that occurs when total Generation exceeds total Demand in the ISO Control Area.
Participating Buyer	A Direct Access End-User or a wholesale buyer of Energy or Ancillary Services through Scheduling Coordinators.
Participating Intermittent Resource	One or more Eligible Intermittent Resources that meets the requirements of the technical standards for Participating Intermittent Resources adopted by the ISO and published on the ISO Home Page.
Participating Load	An entity providing Curtailable Demand, which has undertaken in writing to comply with all applicable provisions of the ISO Tariff, as they may be amended from time to time.

Participating Seller or Participating Generator	A Generator or other seller of Energy or Ancillary Services through a Scheduling Coordinator over the ISO Controlled Grid from a Generating Unit with a rated capacity of 1 MW or greater, or from a Generating Unit providing Ancillary Services and/or Imabalance Energy through an aggregation arrangement approved by the ISO, which has undertaken to be bound by the terms of the ISO Tariff, in the case of a Generator through a Participating Generator Agreement.

Preliminary Settlement Statement	The initial statement issued by the ISO of the calculation of the Settlements and allocation of the charges in respect of all Settlement Periods covered by the period to which it relates.
Price Overlap	The price range of bids for Supplemental Energy or Energy associated with Ancillary Services bids for any BEEP Interval that includes decremental and incremental Energy Bids where the price of the decremental Energy Bids exceeds the price of the incremental Energy Bids.
Project Sponsor	A Market Participant or group of Market Participants or a Participating TO that proposes the construction of a transmission addition or upgrade in accordance with Section 3.2 of the ISO Tariff.
PX (Power Exchange)	The California Power Exchange Corporation, a state chartered, nonprofit corporation charged with providing a Day-Ahead forward market for Energy in accordance with the PX Tariff. The PX is a Scheduling Coordinator and is independent of both the ISO and all other Market Participants.
PX Auction Activity Rules	The rules by which bids submitted to and validated by the PX may be modified or withdrawn during a PX Energy market auction.
PX Participant	An entity that is authorized to buy or sell Energy or Ancillary Services through the PX, and any agent authorized to act on behalf of such entity.
PX Protocols	The rules, protocols, procedures and standards attached to the PX Tariff as Appendix E, promulgated by the PX (as amended from time to time) to be complied with by the PX and Market Participants in relation to operation and participation in the PX Markets.

PX Tariff The California Power Exchange Operating Agreement and Tariff, dated March 31, 1997, as it may be modified from time to time.

Unaccounted for Energy (UFE)	UFE is the difference in Energy, for each UDC Service Area and Settlement Period, between the net Energy delivered into the UDC Service Area, adjusted for UDC Service Area Transmission Losses (calculated in accordance with Section 7.4.2), and the total metered Demand within the UDC Service Area adjusted for distribution losses using Distribution System loss factors approved by the Local Regulatory Authority. This difference is attributable to meter measurement errors, power flow modeling errors, energy theft, statistical Load profile errors, and distribution loss deviations.
Uncontrollable Force	Any act of God, labor disturbance, act of the public enemy, war, insurrection, riot, fire, storm, flood, earthquake, explosion, any curtailment, order, regulation or restriction imposed by governmental, military or lawfully established civilian authorities or any other cause beyond the reasonable control of the ISO or Market Participant which could not be avoided through the exercise of Good Utility Practice.
Uninstructed Deviation Penalty	The penalty as set forth in Section 11.2.4.1.2 of this ISO Tariff.
Uninstructed Imbalance Energy	The real time change in Generation or Demand other than that instructed by the ISO or which the ISO Tariff provides will be paid at the price for Uninstructed Imbalance Energy.
Unit Commitment	The process of determining which Generating Units will be committed (started) to meet Demand and provide Ancillary Services in the near future (e.g., the next Trading Day).
Usage Charge	The amount of money, per 1 kW of scheduled flow, that the ISO charges a Scheduling Coordinator for use of a specific congested Inter-Zonal Interface during a given hour.

ISO Tariff Appendix F

Schedule 4

Participating Intermittent Resources Forecasting Fee

A charge up to $.10 per MWh shall be assessed on the metered Energy from Participating Intermittent Resources. The amount of the charge shall be specified in the technical standards for Participating Intermittent Resources adopted by the ISO and published on the ISO Home Page.

(g) time of notification of the Dispatch Instruction; and

(h) any other information which the ISO considers relevant.

DP 4.4 Acknowledgement of Dispatch Instructions

The recipient of a Dispatch Instruction shall confirm the Dispatch Instruction. Dispatch Instructions communicated by the ISO either electronically or by fax shall be confirmed electronically in accordance with ISO procedures. Dispatch instructions communicated verbally shall be confirmed by repeating the Dispatch instructions to the ISO. Dispatch Instructions of Imbalance Energy will be deemed delivered and settled as such.

DP 5 ISO FACILITIES AND EQUIPMENT

DP 5.1 ISO Facility and Equipment Outages

The ISO has installed redundant control centers, communication systems and computer systems. Most, but not necessarily all, equipment problems or failures should be transparent to Participants. This DP 5 addresses some situations when Participants could be affected, but it is impossible to identify and plan for every type of equipment problem or failure. Real time situations will be handled by the real time ISO dispatchers. The ISO control room in Folsom is the Primary ISO Control Center and the ISO control room in Alhambra is the Backup ISO Control Center.

DP 5.2 WEnet Unavailable

DP 5.2.1 Unavailable Critical Functions of WEnet

During a total disruption of the WEnet several critical functions of the ISO will not be available including:

(a) the Scheduling Infrastructure (SI) computer will not be able to communicate with SCs to receive any type of updated Schedule information;

(b) the SI computer will not be able to communicate Congestion Management information and Schedule changes to the SCs; and

(c) the ISO will not be able to communicate general information, including emergency information, to any Participants.

DP 5.2.2 Communications during WEnet Unavailability

During any period of WEnet unavailability, the ISO shall:

(a) make all reasonable efforts to keep Participants aware of current ISO Controlled Grid status using voice communications;

(f) managing Intra-Zonal Congestion in real time after use of available Adjustment Bids.

DP 8.6.3 Basis for Real Time Dispatch

The ISO shall base real time Dispatch of Generating Units, Curtailable Demands and Interconnection schedules on the following principles:

(a) the ISO shall dispatch Generating Units and dispatchable Interconnection schedules providing Regulation service to meet WSCC and NERC Area Control Error (ACE) performance criteria;

(b) in each BEEP Interval, the ISO shall determine if the Regulation Generating Units and dispatchable Interconnection schedules are operating at a point away from their Set Point. The ISO shall then adjust the output of Generating Units, Curtailable Demands, and dispatchable Interconnection schedules (either providing Spinning Reserve, Non-Spinning Reserve, Replacement Reserve, or Supplemental Energy) to return the Regulation Generating Units and dispatchable Interconnection schedules to their Set Points to restore their full regulating margin;

(c) in each BEEP Interval, the ISO shall dispatch Generating Units, Curtailable Demands and dispatchable Interconnection schedules to meet its balancing Energy requirements and eliminate any Price Overlap between decremental and incremental Bids, thereby, dispatching the relevant resources in real time for economic trades either between SCs or within a SC's portfolio;

(d) the ISO shall select the Generating Units, Curtailable Demands and dispatchable Interconnection schedules to be dispatched to meet its balancing Energy requirements based on the merit order stack of Energy bid prices produced by BEEP;

(e) the ISO shall not discriminate between Generating Units, Curtailable Demands and dispatchable Interconnection schedules other than based on price, and the effectiveness (location and ramp rate) of the resource concerned to respond to the fluctuation in Demand or Generation;

(f) Generating Units, Curtailable Demands or dispatchable Interconnection schedules shall be dispatched during the Settlement Period only until the next variation in Generation or Demand or the end of the Settlement Period, whichever is sooner. In dispatching such resources, the ISO is not making any commitment beyond the Settlement Period, as to the duration of their operation, nor the level of their output or Demand;

(g) The ISO will not differentiate between Ancillary Services procured by the ISO and Ancillary Services which are being self-provided;

(h) Within BEEP, once a decremental bid has been used by the ISO, it will then be included in the incremental part of the database with its incremental bid equal to its decremental price bid. Once an incremental bid has been used by the ISO it will then be included in the decremental part of the database with a decremental bid equal to its incremental price;

(i) The bid ramp rate of a resource will be considered by the BEEP Software in determining the amount of Instructed Imbalance Energy by BEEP Interval, and such consideration may result in Instructed Imbalance Energy in BEEP Intervals subsequent to the BEEP Interval to which the Dispatch Instruction applies;

(j) The ISO will pre-dispatch Supplemental Energy bids from Interconnection schedules, subject to hourly pre-dispatch as indicated in SBP 6.1.3, prior to the beginning of each hour consistent with applicable WSCC interchange scheduling practices, assuring that any price overlap between such decremental and incremental Energy Bids will be eliminated. Instructed Imbalance Energy from hourly pre-dispatched bids will be paid or charged the average of interval prices for the hour.

DP 8.7 Ancillary Services Requirements

The following requirements apply to the Dispatch of Ancillary Services in real time:

DP 8.7.1 Regulation

(a) Regulation provided from Generating Units or System Resources must meet the standards specified in the ASRP;

(b) the ISO will dispatch Regulation in merit order of Energy bid prices as determined by the EMS;

(c) in the event of an unscheduled increase in system Demand or a shortfall in Generation output and Regulation margin drops below a predetermined value, the ISO will use scheduled Operating Reserve, Replacement Reserve or Supplemental Energy to restore Regulation margin; and

(d) when scheduled Operating Reserve is used for restoration of Regulation reserve, the ISO shall arrange for the replacement of that Operating Reserve (see DP 8.7.4);

DP 8.7.2 Operating Reserve

(a) Spinning Reserve:

(i) Spinning Reserve provided from Generating Units and Interconnection schedules must meet the standards specified in the ASRP;

(ii) the ISO will dispatch Spinning Reserve as may be required to meet the Applicable Reliability Criteria;

(iii) the ISO may dispatch Spinning Reserve as balancing Energy to return Regulation Generating Units to their Set Points and restore full Regulation margin; and

(iv) the ISO will dispatch Spinning Reserve in merit order of Energy bid prices as determined by BEEP;

(c) UDC Disconnect Load

The ISO shall have the authority to direct a UDC to disconnect Load from the ISO Controlled Grid if necessary to avoid an anticipated System Emergency or to regain Operational Control over the ISO Controlled Grid during an actual System Emergency.

(d) UDC Load Curtailment Programs

As an additional resource for maintaining reliability and managing System Emergencies, the ISO may notify UDCs when the conditions exist which require the UDCs to implement their Load curtailment programs. The UDCs will exercise their best efforts, including seeking any necessary regulatory approvals, to enable the ISO to rely on their curtailment rights at specified levels of Operating Reserve.

DP 10.4.2 Load Curtailment

A SC may specify that Load will be reduced at specified Market Clearing Prices or offer the right to exercise Load curtailment to the ISO as an Ancillary Service or utilize Load curtailment itself (by way of self provision of Ancillary Services) as Non-Spinning Reserve or Replacement Reserve. The ISO, at its discretion, may require direct control over such Curtailable Demand to assume response capability for managing System Emergencies. The ISO may establish standards for automatic communication of curtailment instructions to implement Load curtailment as a condition for accepting any offered Load curtailment as an Ancillary Service.

DP 11 ALGORITHMS TO BE USED

The ISO shall develop dispatch algorithms for use by the ISO for dispatching Generating Units, Curtailable Demands and Interconnection schedules in accordance with the ISO Tariff.

DP 12 INFORMATION MANAGEMENT

The ISO shall provide all Participants with non-discriminatory access to information concerning the status of the ISO Controlled Grid by posting such information on the WEnet, or other similar computer communications device, or by telephone or facsimile in the event of computer systems failure.

DP 13 AMENDMENTS TO THE PROTOCOL

If the ISO determines a need for an amendment to this Protocol, the ISO will follow the requirements as set forth in Section 16 of the ISO Tariff.

(e) the MW and $/MWh values for each Generating Unit for which a Supplemental Energy bid is being submitted consistent with this SBP 6.

A Physical Scheduling Plant shall be treated as a single Generating Unit for Supplemental Energy bid purposes.

SBP 6.1.2 Demand Section of Supplemental Energy Bid Data

Each SC offering Supplemental Energy to the ISO will submit the following information for each Demand for each Settlement Period:

(a) SC's ID code;

(b) name of Demand; and

(c) the MW and $/MWh values for each Demand for which a Supplemental Energy bid is being submitted consistent with this SBP 6.

SBP 6.1.3 External Import Section of Supplemental Energy Bid Data

Each SC offering Supplemental Energy to the ISO will submit the following information for each external import for each Settlement Period;

(a) SC's ID code;

(b) name of Scheduling Point;

(c) interchange ID (the name of the selling entity, the buying entity, and a numeric identifier);

(d) external Control Area ID;

(e) Schedule ID (NERC ID number);

(f) complete WSCC tag;

(g) ramp rate (MW/minute);

(h) the MW and $/MWh values for each external import for which a Supplemental Energy bid is being submitted consistent with this SBP 6; and

(i) indication whether the Supplemental Energy bid applies to hourly pre-dispatch or to BEEP Interval dispatch.

SBP 6.2 Format of Supplemental Energy Bids

The SC's preferred operating point for each resource must be within the range of the Supplemental Energy bids. The minimum MW output level specified for a resource, which may be zero MW (or negative for pumped storage resources), and the maximum MW output level specified for a resource must be physically achievable by the resource. All submitted Supplemental Energy bids must be in the form of a monotonically non-decreasing staircase function for Generating Units and external imports and a monotonically non-increasing staircase function for Demands. These staircase functions will be composed of up to eleven (11) ordered pairs (i.e., ten (10) steps or price bands) of quantity/price information, with a single ramp rate associated with the actual System Emergency. In the event of an unplanned Outage, a Contingency or threatened or actual System Emergency, all Energy bids associated with Spinning and Non-Spinning Reserve may be included in the merit order stack. In the event of Inter-Zonal Congestion, separate merit order stacks will be created for each Zone. The information in the merit order stack shall be provided to the real time dispatcher through the BEEP (Balancing Energy and Ex-Post Pricing) Software.

Where, in any BEEP Interval, the highest decremental Energy Bid in the merit order stack is higher than the lowest incremental Energy Bid, the BEEP Software will eliminate the Price Overlap by actually dispatching all those incremental and decremental bids which fall within the overlap.

References to incremental Energy Bids include references to Demand reduction bids, and for the purpose of applying this algorithm a reduction in Demand shall be treated as an equivalent increase in Generation.

SP 11.3 Use of the Merit Order Stack

The merit order stack, as described in SP 11.2, can be used to supply Energy for:

(a) satisfying needs for Imbalance Energy (differences between actual and scheduled Generation, Demand and external imports/exports) in real time;

(b) managing Inter-Zonal Congestion in real time;

(c) supplying Energy necessary to allow resources providing Regulation service to return to the base point of their regulating ranges in real time;

(d) recovering Operating Reserves utilized in real time;

(e) procuring additional Voltage Support required from resources beyond their power factor ranges in real time; and

(f) managing Intra-Zonal Congestion in real time after use of available Adjustment Bids.

SP 12 AMENDMENTS TO THE PROTOCOL

If the ISO determines a need for an amendment to this Protocol, the ISO will follow the requirements as set forth in Section 16 of the ISO Tariff.

$DevReplOblig_{jxt}$ is the Scheduling Coordinator's obligation for deviation Replacement Reserve in Zone x in the Settlement Period t and $RemRepl_{jxt}$ is the Scheduling Coordinator's obligation for remaining Replacement Reserve in Zone x for Settlement Period t.

$SelfProv_{jxt}$ is Scheduling Coordinator's Replacement Reserve self provision in Zone x for Settlement Period t.

$NetInterSCTrades_{jxt}$ is the sale of Replacement Reserve less the purchase of Replacement Reserve through Inter-Scheduling Coordinator Trades by Scheduling Coordinator j in Zone x for Settlement Period t.

Deviation Replacement Reserve for Scheduling Coordinator i in Zone x for Settlement Period t is calculated as follows:

If $ReplObligTotal_{xt} > TotalDeviations_{xt}$ then:

$$DevReplOblig_{xjt} = \left[Max\left(0, \sum_i GenDev_{ijxt}\right) - Min\left(0, \sum_i LoadDev_{ijxt}\right)\right]$$

If $ReplObligTotal_{xt} < TotalDeviations_{xt}$ then:

$$DevReplOblig_{xjt} = \frac{ReplObligTotal_{xt}}{TotalDeviations_{xt}} * \left[Max\left(0, \sum_i GenDev_{ijxt}\right) - Min\left(0, \sum_i LoadDev_{ijxt}\right)\right]$$

where,

$$TotalDeviations_{xt} = \sum_j \left[Max\left(0, \sum_i GenDev_{ijxt}\right) - Min\left(0, \sum_i LoadDev_{ijxt}\right)\right]$$

$GenDev_{ijxt}$ = The deviation between scheduled and actual Energy generation for Generator i represented by Scheduling Coordinator I in Zone x during Settlement Period t as referenced in SABP Appendix D.

$LoadDev_{ijxt}$ = The deviation between scheduled and actual Load consumption for resource I represented by Scheduling Coordinator iin Zone x during Settlement Period t as referenced in SABP Appendix D.

$DevReplOblig_{xt}$ is total deviation Replacement Reserve in Zone x for Settlement Period t.

$ReplObligTotal_{xt}$ is total Replacement Reserve Obligation in Zone x for Settlement Period t.

Remaining Replacement Reserve for Scheduling Coordinator j in Zone x for Settlement Period t is calculated as follows:

$$RemRepl_{xjt} = \frac{MeteredDemand_{jxt}}{TotalMeteredDemand_{xt}} * TotalRemRepl_{xt}$$

APPENDIX D

IMBALANCE ENERGY CHARGE COMPUTATION

D 1 Purpose of charge

The Imbalance Energy charge is the term used for allocating the cost of not only the Imbalance Energy (the differences between scheduled and actual Generation and Demand), but also any Unaccounted for Energy (UFE) and any errors in the forecasted Transmission Losses as represented by the GMMs. Any corresponding cost of Dispatched Replacement Reserve Capacity that is not allocated as an Ancillary Service is also included along with the Imbalance Energy charge.

D 2 Fundamental formulae

D 2.1.1 Uninstructed Imbalance Energy Charges on Scheduling Coordinators

Uninstructed Imbalance Energy attributable to each Scheduling Coordinator in each Settlement Period in the relevant Zone shall be deemed to be sold or purchased, as the case may be, by the ISO and charges or payments for Uninstructed Imbalance Energy shall be settled by debiting or crediting, as the case may be, the Scheduling Coordinator with an amount for each BEEP Interval of each Settlement Period calculated in accordance with the following formulae:

$$DevC = \sum_i GenDevC_i + \sum_i LoadDevC_i + \sum_q ImpDevC_q + \sum_q ExpDevC_q + UFEC$$

$$ASSEDevC = \sum_i ASSEGenDevC_i + \sum_i ASSELoadDevC_i + \sum_q ASSEImpDevC_q$$

$$DevC_{bjxt} = NetDev_{bjxt} * BIP_{bxt}$$

$$NetDev_{bjxt} = \begin{pmatrix} \sum_{i \in SC_j} GenDev_{bixt} - \sum_{i \in SC_j} LoadDev_{bixt} + \\ \sum_{q \in SC_j} ImpDev_{bqxt} - \sum_{q \in SC_j} ExpDev_{bqxt} \end{pmatrix}$$

Where P_{bxt} is the BEEP Interval Price for Imbalance Energy in Zone x during BEEP Interval b in Settlement Period t.

The deviation quantity between scheduled and actual Energy Generation for Generator i represented by Scheduling Coordinator j in Zone x during BEEP Interval b of Settlement Period t is calculated as follows:

$$GenDev_{bixt} = GenDev'_{bixt} + UnavailAncServMW_{bixt}$$
$$GenDev'_{bixt} = G_{s,bixt} * GMM_{f,ixt} - \left[\left(G_{a,bixt} - G_{\mathrm{adj},bixt}\right) * GMM_{a} - G_{\mathrm{a/s},bixt} - G_{\mathrm{s/e},bixt}\right]$$

Where:

If the BEEP Interval Ex Post Price is negative or zero, then:

$UnavailAncServMW_{bixt} = 0$

If the BEEP Interval Ex Post Price is positive, then:

$$UnavailAncServMW_{bixt} =$$
$$\max\left(0, \min\left(-GenDev'_{bixt}, G_{a,bixt} * GMM_{a,ixt} - \left[\frac{P_{\max,ixt}}{HBI} * GMM_{a,ixt} - \max\left(0, \frac{G_{\mathrm{oblig},ixt}}{HBI} - G_{\mathrm{a/s},bixt}\right)\right]\right)\right)$$

The value of $G_{a,bixt}$ for Generation scheduled on behalf of Participating Generators for each BEEP Interval in each Settlement Period shall be the actual meter data aggregated on a 10-minute basis. The value of $G_{s,bixt}$ for Generation scheduled on behalf of Participating Generators for each BEEP Interval in each Settlement Period shall be determined as follows for BEEP Intervals 2 through 5:

$$G_{s,bixt} = \frac{G_{s,ixt}}{HIB}$$

For BEEP Interval 1 and BEEP Interval 6, implicit Dispatch instructions for ramping will be applied to adjust the Schedules attributed to those BEEP Intervals as follows:

$$G_{s,6ixt} = \left(\frac{G_{s,ixt}}{HIB}\right) - \left(\frac{\left(G_{s,ixt+1} - G_{s,ixt}\right)}{4\,HIB}\right)$$

The value of $G_{s,bit}$ and $G_{a,bit}$ for Generation which has not undertaken in writing to be bound by the ISO Tariff in accordance with Article 5 shall be determined as follows for all six BEEP Intervals:

$$G_{s,bixt} = \frac{G_{s,ixt}}{HIB}$$

$$G_{a,bixt} = \frac{G_{a,ixt}}{HIB}$$

The deviation quantity between scheduled and actual Load consumption for Load i represented by Scheduling Coordinator j in Zone x during BEEP Interval b of Settlement Period t is calculated as follows:

$$LoadDev_{bixt} = LoadDev'_{bixt} - UnavailDispLoadMW_{bixt}$$
$$LoadDev'_{bixt} = L_{s,bixt} - \left(L_{a,bixt} - L_{\mathrm{adj},bixt} + L_{\mathrm{a/s},bixt} + L_{\mathrm{s/e},bixt}\right)$$

Where:

If the BEEP Interval Ex Post Price for decremental Energy is negative or zero, then:

$UnavailDispLoadMW_{bixt} = 0$

If the BEEP Interval Ex Post Price for Imbalance Energy is positive, then:

$$UnavailDispLoadMW_{bixt} =$$

$$\max\left(0, \min\left(LoadDev'_{bixt}, \max\left(0, \frac{L_{\text{oblig},ixt}}{HBI} - L_{\text{a/s},bixt}\right) - L_{a,bixt}\right)\right)$$

The value of $L_{a/s,bixt}$, $L_{s/e,bixt}$ and $L_{\text{adj},bixt}$ are determined on a 10-minute basis. The value of L_a for Load scheduled on behalf of Participating Loads for each BEEP Interval in each Settlement Period shall be the actual meter data aggregated on a 10-minute basis. The value of $L_{s,bixt}$ for Load scheduled on behalf of Participating Loads for each BEEP Interval in each Settlement Period t, shall be determined as follows:

For BEEP Intervals 2 through 5,

$$L_{s,bit} = \frac{L_{s,it}}{HIB}$$

For BEEP Interval 1 and BEEP Interval 6, implicit Dispatch instructions for ramping will be applied to adjust the schedules attributed to those BEEP Intervals as follows:

$$L_{s,1ixt} = \left(\frac{L_{s,ixt}}{HIB}\right) - \left(\frac{(L_{s,ixt} - L_{s,ixt-1})}{4HIB}\right)$$

$$L_{s,6ixt} = \left(\frac{L_{s,ixt}}{6}\right) + \left(\frac{(L_{s,ixt+1} - L_{s,ixt})}{4HIB}\right)$$

The value of $L_{s,bixt}$ and $L_{a,bixt}$ for Loads that are not Participating Loads shall be determined as follows for all six BEEP Intervals:

$$L_{s,bixt} = \frac{L_{s,ixt}}{HIB}$$

$$L_{a,bixt} = \frac{L_{a,ixt}}{HIB}$$

Where $L_{a,ix}$ is Load i hourly metered quantity for Settlement Period t.

The deviation quantity between forward scheduled and Real Time adjustments to Energy imports*, adjusted for losses, for Scheduling

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* Note that this deviation is a difference between a forward Market value and a Real Time value. It is not inadvertent energy.

Point q represented by Scheduling Coordinator j into Zone x during each BEEP Interval b of each Settlement Period t is calculated as follows:

$$ImpDev_{bqxt} = I_{s,bqxt} * GMM_{f,qxt} - \left(I_{a,bqxt} - I_{\mathrm{adj},bqxt} + I_{a/s,bqxt}\right) * GMM_{a,qxt} + I_{a/s,bqxt} * GMM_{a,qxt}$$

The values of $I_{a/s,bqxt}$, $I_{a,bqxt}$ and $I_{adj,bqxt}$ are determined on a 10-minute basis. The value of $I_{s,bqxt}$ in all BEEP Intervals shall be determined as follows:

$$I_{s,bqxt} = \frac{I_{s,qxt}}{HIB}$$

The deviation quantity between forward scheduled and Real Time adjustments to Energy exports* for Scheduling Point q represented by Scheduling Coordinator j from Zone x during BEEP Interval b for Settlement Period *t* is calculated as follows:

$$ExpDev_{bqxt} = E_{s,bqxt} - E_{a,bqxt} - E_{\mathrm{adj},bqxt}$$

The values of $E_{a,bqxt}$ and $E_{\mathrm{adj},bqxt}$ are determined on a 10-minute basis. The value of $E_{s,qit}$ in all BEEP Intervals shall be determined as follows:

$$E_{s,bqxt} = \frac{E_{s,qxt}}{HIB}$$

D 2.1.2 Instructed Imbalance Energy Charges on Scheduling Coordinators

Implicit Dispatch instructions for ramping Energy shall be calculated based on Final Hour Ahead Schedules for Energy to result in a linear ramp by all Participating Generators and Participating Loads beginning 10 minutes prior to the start, and ending 10 minutes after the start of each Settlement Period. Ramping Energy shall be deemed delivered and settled at a price of zero dollars per MWh.

The amount of Instructed Imbalance Energy to be delivered in each BEEP Interval will be determined based on the ramp rates and time delays bid in accordance with SBP 5 and 6 and shall be deemed delivered to the ISO Controlled Grid. Any excess delivery or shortfall will be accounted for as Uninstructed Imbalance Energy. Payment due a Load, Generator, Import or Export for Instructed Imbalance Energy to be delivered in a BEEP Interval shall be calculated based on the actual Energy delivered to the ISO Grid in accordance with the Dispatch instruction.

Instructed Imbalance Energy in each BEEP Interval shall be paid, if positive, or charged, if negative, the corresponding BEEP Interval Ex Post Price.

Due to ramp rate limitations, resources responding to Dispatch Instructions that revert partially or wholly Dispatch Instructions issued earlier within the same hour may generate or consume Instructed Imbalance Energy bid at prices higher or lower than the BEEP Interval Ex Post Price, respectively. This residual Instructed Imbalance Energy which may cross hourly boundaries, shall be priced based on the applicable BEEP Interval Ex Post Price for the BEEP Interval to which the original Dispatch instruction applied.

Subject to the above conditions, the Instructed Imbalance Energy charge for each BEEP Interval b of each Settlement Period t for Scheduling Coordinator j for Zone x is calculated using the following formulas:

The instructed Generation deviation payment/charge is calculated as follows:

$$IGDC_{ib} = G_{ib} * P_b$$

The instructed Load deviation payment/charge is calculated as follows:

$$ILDC_{bixt} = -\left(L_{a/s,bixt} + L_{se,bixt}\right) * P_{bxt}$$

The instructed import deviation payment/charge is calculated as follows:

$$IIDC_{bqxt} = -\left(I_{a/s,bqxt} + I_{se,bqxt}\right) * P_{bxt}$$

D 2.2 Unaccounted for Energy Charge

The Unaccounted for Energy Charge on Scheduling Coordinator j for each BEEP Interval b of each Settlement Period t for each relevant Zone is calculated in the following manner:

The UFE for each utility service territory *k* is calculated as follows,

$$UFE_{UDC,bkt} = \sum_{q \in UDC_k} I_{a,bqxt} - \sum_{q \in UDC_k} E_{a,bqxt} + \sum_{i \in UDC_k} G_{a,bixt} - \sum_{i \in UDC_k} L_{a,bixt} - TL_{bkt}$$

The Transmission Loss TL_{bkt} for BEEP Interval b of Settlement Period t for utility service territory k is calculated as follows:

$$TL_{bkt} = \left(\sum_i \left[G_{a,bixt} * (1 - GMM_{a,ixt}) \right] + \sum_q \left[I_{a,bqxt} * (1 - GMM_{a,qxt}) \right] \right) * \frac{PFL_{kt}}{\sum_k PFL_{kt}}$$

Where PFL_{kt} are the transmission losses for utility service territory k as calculated by a power flow solution for Settlement Period t, consistent with the calculation of final forecasted Generation Meter Multipliers.

Each metered demand point z in utility service territory k, either ISO grid connected or connected through UDC k, is allocated a portion of the UFE as follows:

$$UFE_{bixt} = UFE_{UDC,bkt} * \frac{L_{bixt}}{\sum_{i \in UDC_k} L_{bixt}}$$

The UFE charge for Scheduling Coordinator j for BEEP Interval b of Settlement Period t in Zone x is calculated as follows:

$$UFEC_{jxt} = \left(\sum_{i \in SC_j} UFE_{bixt} \right) * P_{bxt}$$

D 2.3 Hourly Ex Post Price

The Hourly Ex Post Price in Zone x in Settlement Period t is determined as follows:

$$HP_{xt} = \frac{\sum_b |Q_{bxt}| P_{bxt}}{\sum_b |Q_{bxt}|}$$

Where Q_{bxt} is the total Instructed Imbalance Energy during BEEP Interval b in Zone x in Settlement Period t.

D 3 Meaning of terms in the formulae

D 3.1 $DevC_{bjxt}$ – $

The Uninstructed Imbalance Energy charge on Scheduling Coordinator j during BEEP Interval b in Settlement Period t in Zone x.

D 3.2 **$GenDev_{bixt}$ – MWh**

The deviation between scheduled and actual Energy Generation for Generator i in Zone x during BEEP Interval b in Settlement Period t.

D 3.3 **$LoadDev_{bixt}$ – MWh**

The deviation between scheduled and actual Load consumption for Load i in Zone x during BEEP Interval b in Settlement Period t.

D 3.4 **$ImpDev_{bqxt}$ – MWh**

The deviation between forward scheduled and Real Time adjustments to Energy imports, as adjusted for losses, for Scheduling Point q in Zone x during BEEP Interval b in Settlement Period t.

D 3.5 **$ExpDev_{bqxt}$ – MWh**

The deviation between forward scheduled and Real Time adjustments to Energy exports for Scheduling Point q in Zone x during BEEP Interval b in Settlement Period t.

D 3.6 **$G_{s,ixt}$ – MWh**

The scheduled Generation of Generator i in Zone x in Settlement Period t as a result of both the Day-Ahead Final Schedule and the Hour-Ahead Final Schedule.

D 3.6.1 **$G_{s,ixt-1}$ – MWh**

The scheduled Generation of Generator i in Zone x in Settlement Period t–1 as a result of both the Day-Ahead Final Schedule and the Hour-Ahead Final Schedule.

D 3.6.2 **$G_{s,ixt+1}$ – MWh**

The scheduled Generation of Generator i in Settlement Period t+1 as a result of both the Day-Ahead Final Schedule and the Hour-Ahead Final Schedule.

D 3.6.3 **$G_{adj,bixt}$ – MWh**

The Deviation of Generator i in Zone x ordered by the ISO in BEEP Interval b in Settlement Period t according to Section 7.2.6.2, or for settlement according to Section 11.2.4.2.

D 3.7 **$G_{a,bixt}$ – MWh**

The total actual metered Generation of Generator i in Zone x during BEEP Interval b in Settlement Period t.

D 3.8 **$G_{oblig,ixt}$ – MWh**

The total Spinning, Non-Spinning, and Replacement Reserve committed capacity of Generator i in Zone x in Settlement Period t, as reflected in the final Ancillary Services Schedules.

D 3.9 **$G_{a/s,bixt}$ – MWh**

The Energy generated from Ancillary Service resource i in Zone x due to ISO dispatch instructions. This value will be calculated based on the expected Instructed Imbalance Energy during BEEP Interval b in Settlement Period t for which such Ancillary Services dispatch instruction(s) applies.

D 3.9.1 **$G_{s/e,bixt}$ –MWh**

The Energy generated from Supplemental Energy resource i in Zone x due to ISO dispatch instructions. This value will be calculated based on the expected Instructed Imbalance Energy during BEEP Interval b in Settlement Period t for which such Supplemental Energy dispatch instruction(s) applies.

D 3.10 **$GMM_{f,ixt}$ – fraction**

The forecasted Generation Meter Multiplier (GMM) for Generator i in Zone x in Settlement Period t as provided to the Scheduling Coordinator by the ISO in advance of the operation of the Day-Ahead Market.

D 3.11 **$GMM_{f,qxt}$ – fraction**

The forecasted Generation Meter Multiplier for an Energy import at Scheduling Point q in Zone x in Settlement Period t as provided to the Scheduling Coordinator by the ISO in advance of the Day-Ahead Market.

D 3.12 **$GMM_{a,ixt}$ – fraction**

The final forecasted Generation Meter Multiplier (GMM) for a Generator i in Zone x in Settlement Period t as calculated by the ISO at the hour-ahead stage (but after close of the Hour-Ahead Market).

D 3.13 **$GMM_{a,qxt}$ – fraction**

The forecasted Generation Meter Multiplier for an Energy import at Scheduling Point q in Zone x in Settlement Period t as provided to the Scheduling Coordinator by the ISO after close of the Hour-Ahead Market.

D 3.14 **$L_{s,bixt}$ – MWh**

The scheduled Demand of Demand i in Zone x during BEEP Interval b in Settlement Period t as a result of both the Day-Ahead Final Schedule and the Hour-Ahead Final Schedule.

D 3.15 **$L_{a,bixt}$ – MWh**

The actual metered Demand of Demand i in Zone x during BEEP Interval b in Settlement Period t.

D 3.15.1 **$L_{a,ixt}$ – MWh**

The actual metered Demand of Demand i in Zone x in Settlement Period t.

D 3.15.2 **$L_{adj,bixt}$**

The Deviation of Demand i in Zone x ordered by the ISO in BEEP Interval b in Settlement Period t according to Section 7.2.6.2, or for settlement according to Section 11.2.4.2.

D 3.16 **$L_{oblig,ixt}$**

The total Non-Spinning and Replacement Reserve comitted capacity of Load i in Zone x in Settlement Period t, as reflected in the final Ancillary Services Schedules.

D 3.17 **$L_{a/s,bixt}$ – MWh**

The Energy reduction by curtailable Load i in Zone x due to ISO dispatch of Ancillary Services from such curtailable Load (i.e., Load bidding into the Ancillary Services markets). This value will be calculated based on the expected Instructed Imbalance Energy during BEEP Interval b in Settlement Period t for which such Ancillary Services dispatch instruction(s) applies.

D 3.17.1 **$L_{s/e,bixt}$ – MWh**

The Energy reduction by curtailable Load i in Zone x due to ISO dispatch of Supplemental Energy from such curtailable Load. This value will be calculated based on the projected impact of the expected Instructed Imbalance Energy during BEEP Interval b in Settlement Period t

D 3.18 **$L_{s,qxt}$ – MWh**

The total scheduled Energy import of Scheduling Coordinator j through Scheduling Point q in Settlement Period t as a result of both the Day-Ahead Final Schedule and the Hour-Ahead Final Schedule.

D 3.19 **$L_{a,bqxt}$ – MWh**

The total actual Energy import of Scheduling Coordinator j through Scheduling Point q in BEEP Interval b during BEEP Interval b in Settlement Period t. This is deemed to be equal to the scheduled Energy over the same interval.

D 3.20 **$I_{adj,bqxt}$ – MWh**

The deviation in real time import of Scheduling Coordinator j through Scheduling Point q in BEEP Interval b during BEEP Interval b in Settlement Period t ordered by the ISO for congestion management, overgeneration, etc. or a result of an import curtailment. This value will be calculated based on the projected impact of the Dispatch instruction(s) (or curtailment event) between the close of the Hour-Ahead Market and the end of the BEEP Interval for which such Dispatch Instructions(s) (or curtailment event) applies.

D 3.21 **$I_{a/s,bqxt}$ – MWh**

The Energy generated from Ancillary Service System Resources of Scheduling Coordinator j through Scheduling Point q in BEEP Interval b during BEEP Interval b in Settlement Period t pursuant to Existing Contracts or Supplemental Energy from interties due to ISO's Dispatch instruction.

D 3.22 **$E_{s,qxt}$ – MWh**

The total scheduled Energy export of Scheduling Coordinator j through Scheduling Point q in Settlement Period t as a result of both the Day-Ahead Final Schedule and the Hour-Ahead Final Schedule.

D 3.23 **$E_{a,bqxt}$ – MWh**

The total actual Energy export of Scheduling Coordinator j through Scheduling Point q in BEEP Interval b of Settlement Period t. This is deemed to be equal to the total scheduled Energy export during the same interval.

D 3.24 **$E_{adj,bqxt}$ – MWh**

The deviation in Real Time export of Scheduling Coordinator j through Scheduling Point q in BEEP Interval b during BEEP Interval b in Settlement Period t ordered by the ISO for Congestion Management, Overgeneration, etc. or as a result of an export curtailment. This value will be calculated based on the projected impact of the Dispatch Instruction(s) (or curtailment event) between the close of the Hour-Ahead Market and the end of the BEEP Interval for which such Dispatch Instruction (or curtailment event) applies.

D 3.25 **P_{bxt} – $/MWh**

The Ex Post Price for Imbalance Energy in Zone x during BEEP Interval b in Settlement Period t.

D 3.25.1 **[Not Used]**

D 3.26 **$UFEC_{jxt}$ – $**

The Unaccounted for Energy Charge for Scheduling Coordinator j in Zone x in Settlement Period t. It is the cost for the Energy difference between the net Energy delivered into each UDC Service Area, adjusted for UDC Service Area Transmission Losses (calculated in accordance with ISO Tariff Section 7.4.3), and the total metered Demand within that UDC Service Area adjusted for distribution losses using Distribution System loss factors approved by the Local Regulatory Authority.

This Energy difference (UFE) is attributed to meter measurement errors, power flow modeling errors, energy theft, statistical Load profile errors, and distribution loss deviations.

D 3.27 **$UFE_{UDC,bkt}$ – MWh**

The Unaccounted for Energy (UFE) for utility service territory k.

D 3.28 **UFE – MWh**

The portion of Unaccounted for Energy (UFE) allocated to metering point z.

D 3.29 **[Not Used]**

D 3.30 **[Not Used]**

D 3.31 **[Not Used]**

D 3.32 **[Not Used]**

D 3.33 **[Not Used]**

D 3.34 **[Not Used]**

D 3.35 **[Not Used]**

D 3.36 **[Not Used]**

D 3.37 **TL_{bkt} – MWh**

The Transmission Losses per BEEP Interval b of Settlement Period t in utility service territory k.

D 3.38 **$IGDC_{bixt}$ – $**

The Instructed Imbalance Energy payments/charges for Generator i in Zone x during BEEP Interval b in Settlement Period t.

D 3.39 **$ILDC_{bixt}$ – $**

The Instructed Imbalance Energy payments/charges for Load i in Zone x during BEEP Interval b in Settlement Period t.

D 3.40 **$IIDC_{bqxt}$ – $**

The Instructed Imbalance Energy payments/charges for import at Scheduling Point q during BEEP Interval b in Settlement Period t.

D 3.41 [Not Used]

D 3.42 [Not Used]

D 3.43 [Not Used]

D 3.44 [Not Used]

D 3.45 HBI – Number

The number of BEEP Intervals in Settlement Period t, currently set to 6.

D 3.46 [Not Used]

D 3.47 [Not Used]

D 3.48 $P_{max,ixt}$ – MW

The maximum capability at which Energy and Ancillary Services may be scheduled from the Generating Unit or System Resource i.

D 3.49 [Not Used]

ATTACHMENT B

2.2.6.9 ISO Protocols. Complying with all ISO Protocols and ensuring compliance by each of the Market Participants which it represents with all applicable provisions of the ISO Protocols; ~~and~~

2.2.6.10 Interruptible Imports. Identifying any Interruptible Imports included in its Schedules; and

2.2.6.11 Participating Intermittent Resources. Submitting Schedules consistent with the technical standards for Participating Intermittent Resources adopted by the ISO and published on the ISO Home Page.

* * *

2.2.10 Information to be Provided by the ISO to all Scheduling Coordin~~f~~ators.

By 6:00 p.m. two days prior to a Trading Day, the ISO shall publish on WEnet information, including the following to all Scheduling Coordinators for each Settlement Period of the Trading Day:

* * *

2.2.10.5 Updated Transmission Loss Factors. Updated Generation Meter Multipliers reflecting Transmission Losses to be supplied by each Generating Unit and by each import into the ISO Control Area; ~~and~~

2.2.10.6 Ancillary Services. Expected Ancillary Services requirement by reference to Zones for each of the reserve Ancillary Services~~.~~; and

2.2.10.7 Forecasted Congested Intra-zonal interface information. The total transfer limits of Intra-zonal interfaces which the ISO forecasts to be Congested and the scheduling limits for generating units constrained by that Congestion. Scheduling limits for Generating Units whose output is constrained by the same Congested Intra-zonal interface shall be allocated pro rata based on each Generating Unit's current operating capability and, for thermal Generating Units, cost data on file with the ISO. The scheduling limit for each Generating Unit constrained by the same Congested Intra-zonal interface shall be determined by the following equation:

$SL_g = (OC_g) – ((\text{Sum } g:=1 \text{ to } N\ (OC_g)) – TC_{cong}) * (OC_g * C_g) / (\text{Sum } g:=1 \text{ to } N\ (OC_g * C_g))$

where:

SL_g = Scheduling Limit for Generating Unit g

OC_g = Current Operating Capability for Generating Unit g

C_g = Average Cost of Generator g ($/MWh) at the Current Operating Capability for Generating Unit g

TC_{cong} = Congested Transfer Capability of the Intra-zonal interface

N = number of Generating Units constrained by the Congested Intra-zonal interface

In the event that both thermal and non-thermal Generating Units must have their respective Scheduling limits reduced on a pro rata basis, only current operating capability will be used to determine the scheduling limits. **[~~Not Used~~]**

* * *

2.2.16 Relationship Between ISO and Participating Loads

The ISO shall only accept bids for Supplemental Energy or Ancillary Services, or Schedules for self-provision of Ancillary Services, from Loads if such Loads are Participating Loads which meet standards adopted by the ISO and published on the ISO Home Page. The ISO shall not schedule Energy or Ancillary Services from a Participating Load other than through a Scheduling Coordinator.

2.2.17 Relationship Between ISO and Eligible Intermittent Resources and Between the ISO and Participating Intermittent Resources

The ISO shall not schedule Energy from an Eligible Intermittent Resource other than through a Scheduling Coordinator. Settlement with Participating Intermittent Resources that meet the scheduling obligations established in the technical standards for Participating Intermittent Resources adopted by the ISO and published on the ISO Home Page shall be as provided in this ISO Tariff. No adjustment bids or Supplemental Energy bids may be submitted on behalf of Participating Intermittent Resources. Any Eligible Intermittent Resource that is not a Participating Intermittent Resource, or any Participating Intermittent Resource for which Adjustment Bids or Supplemental Energy bids are submitted, or that fails to meet the scheduling obligations established in the technical standards for Participating Intermittent Resources adopted by the ISO and published on the ISO Home Page, shall be scheduled and settled as a Generating Unit for the associated Settlement Periods.

* * *

2.3.3.9.2 All notifications of Forced Outages shall be communicated to the ISO Control Center with as much notice as possible in order that the necessary security analysis and ISO Controlled Grid assessments may be performed. If prior notice of a Forced Outage cannot be given, the Operator shall notify the ISO of the Forced Outage ~~immediately~~ within thirty (30) minutes after it occurs.

* * *

2.5.22.2 General Principles. The ISO shall base real time dispatch of Generating Units, System Units, Loads and System Resources on the following principles:

(a) the ISO shall dispatch Generating Units, System Units, and System Resources providing Regulation service to meet NERC and WSCC Area Control Error (ACE) performance requirements;

(b) once ACE has returned to zero, the ISO shall determine whether the Regulation Generating Units, System Units, and System Resources are operating at a point away from their preferred operating point. The ISO shall then adjust the output of Generating Units, System Units, and System Resources available (either providing Spinning Reserve, Non-Spinning Reserve, Replacement Reserve or offering Supplemental Energy) to return the Regulation Generating Units, System Units, and System Resources to their preferred operating points to restore their full regulating margin;

(c) the ISO shall economically dispatch Generating Units, System Units, Loads and System Resources only to meet its Imbalance Energy requirements and eliminate any Price Overlap between incremental and decremental energy bids~~. The ISO shall not dispatch such resources in real time for economic trades either between Scheduling Coordinators or within a Scheduling Coordinator portfolio~~;

(d) subject to Section 2.5.22.3 and its subparts, the ISO shall select the Generating Units, System Units, Loads and System Resources to be dispatched to meet its Imbalance Energy requirements and eliminate any Price Overlap based on a merit order of Energy bid prices;

(e) subject to Section 2.5.22.3 and its subparts, the ISO shall not discriminate between Generating Units, System Units, Loads and System Resources other than based on price, and the effectiveness (e.g., location and ramp rate) of the resource concerned to respond to the fluctuation in Demand or Generation;

(f) Generating Units, System Units, Loads and System Resources shall be dispatched during the operating hour only until the next variation in Demand or the end of the operating hour, whichever is sooner. In dispatching such resources, the ISO makes no further commitment as to the duration of their operation, nor the level of their output or Demand, except to the extent that a Dispatch instruction causes Energy to be delivered in a different BEEP Interval.

* * *

2.5.22.6 Real Time Dispatch. The ISO shall ~~select the least-cost~~economically dispatch Generating Unit, Load, System Unit or System Resource that is effective to meet Imbalance Energy requirements and eliminate any Price Overlap in real time, subject to the limitation on the Dispatch of Spinning Reserve and Non-Spinning Reserve set forth in Section 2.5.22.3. The ISO shall determine that additional output is needed if the current output levels of the Regulation Generating Units, System Units, and System Resources exceed their preferred operating points by more than a specified threshold (to be determined by the ISO). The ISO shall determine that less output is needed if the output levels of the Regulation Generating Units, System Units, and System Resources fall below their preferred operating points by more than a specified threshold (to be determined by the ISO). To minimize the cost of providing Imbalance Energy, the ISO shall economically increase or reduce Demand or Energy output from Generating Units, Loads, System Units or System~~:~~

~~(a) if additional Energy output, or Demand reduction, is needed, the ISO shall Dispatch additional output or reduce Demand from Generating Units, Loads, System Units or System~~ Resources according to ~~in ascending order of~~ their incremental Supplemental Energy bid prices (or, for Generating Units, Loads, System Units and System Resources providing Ancillary Services, their Energy Bid prices).

~~(b) if the ISO is required to reduce Energy output from Generating Units, Loads, System Units or System Resources, the ISO shall dispatch down Generating Units, Loads, System Units and System Resources in descending order of their decremental Supplemental Energy bid prices~~

~~(or, for Generating Units, Load, System Units and System Resources providing Ancillary Services their Energy Bid prices).~~

Once a bid has been accepted by the ISO, the database shall be adjusted to reflect the change in status of the bid. Once a decremental bid has been used by the ISO, it will then be included in the incremental part of the database with an incremental bid equal to its decremental price bid. Once an incremental bid has been used by the ISO it will then be included in the decremental part of the database with a decremental bid equal to its incremental price bid. ~~In the event that the ISO subsequently needs to decrement output, it will initially decrement the Generating Units, Loads, System Units or System Resources incremented previously, and then continue down the merit order of the decremental bids.~~

* * *

2.5.22.11 Failure to Conform to Dispatch Instructions. All Scheduling Coordinators, Participating Generators, owners or operators of Curtailable Demands and operators of System Resources providing Ancillary Services (whether self provided or procured by the ISO) or whose Supplemental Energy bids have been accepted by the ISO shall be obligated to respond or to secure response to the ISO's Dispatch instructions in accordance with their terms, and to be available and capable of doing so, for the full duration of the Settlement Period. Dispatch Instructions will be deemed delivered and associated Energy will be settled as Instructed Imbalance Energy in accordance with Section 11.2.4.1.1. If a Generating Unit, Curtailable Demand or System Resource is unavailable or incapable of responding to a Dispatch instruction, or fails to respond to a Dispatch instruction in accordance with its terms, the Generating Unit, Curtailable Demand or System Resource:

(a) shall be declared and labeled as non-conforming to the ISO's instructions unless it has notified the ISO of an event that prevents it from performing its obligations within 30 minutes of the onset of such event;

(b) cannot set the BEEP~~eep~~ Interval Ex Post Price; and

the Scheduling Coordinator for the Participating Generator, owner or operator of the Curtailable Demand or System Resource concerned shall ~~pay to the ISO~~ have Uninstructed Imbalance Energy due to the difference between the Generating Unit's, Curtailable Demand's or System Resource's instructed and actual output (or Demand). The Uninstructed Imbalance Energy shall be subject to the settlement for Uninstructed Imbalance Energy in accordance with Section 11.2.4.1 and the Uninstructed Deviation Penalty in accordance with ~~at the Beep Interval Ex Post Price in accordance with~~ Section 11.2.4.1.2. ~~This applies whether the Ancillary Services concerned are contracted or self provided. actual output (or Demand) at the Hourly Ex Post Price in accordance with Section 11.2.4.1.~~ This applies whether the Ancillary Services concerned are contracted or self provided.

The ISO will develop additional mechanisms to deter Generating Units, Curtailable Demand and System Resources from failing to perform according to Dispatch instructions, for example reduction in payments to Scheduling Coordinators, or suspension of the Scheduling Coordinator's Ancillary Services certificate for the Generating Unit, Curtailable Demand or System Resource concerned.

2.5.23 Pricing Imbalance Energy.

2.5.23.1 General Principles. Instructed and Uninstructed Imbalance Energy shall be priced using the BEEP Interval Ex Post Prices. The BEEP Interval Ex Post Prices shall be based on the bid of the marginal Generating Unit~~s~~, System Unit~~s~~, Load~~s~~ ~~and~~ or System Resource~~s~~ dispatched by the ISO to increase or reduce Demand or Energy output in each BEEP Interval as provided in Section 2.5.23.2.1.

The marginal bid is ~~Generating Unit, System Unit, Load or System Resource provides~~

~~(a) Incremental Energy if Generation output is increased, or Demand reduced, or~~

~~(b) Decremental Energy if Generation output is decreased, or Demand increased.~~

~~For Incremental Energy, the marginal bid is the Generating Unit, System Unit, Load or System Resource with~~ the highest bid that is accepted by the ISO's BEEP Software for increased energy supply or ~~Generation, or reduced Demand. For Decremental Energy, the marginal bid is the Generating Unit, System Unit, Load or System Resource with~~ the lowest bid that is accepted by the ISO's BEEP Software for reduced energy supply~~Generation or increased Demand~~.

When an Inter-Zonal Interface is operated at the capacity of the interface (whether due to scheduled uses of the interface, or decreases in the capacity of the interface), the marginal ~~incremental~~

~~or decremental bid~~ prices in some Zones may differ from one another. In such cases, the ISO will determine separate Ex Post Prices for the Zones.

The ISO will respond to the Dispatch instructions issued by the BEEP Software to the extent practical in the time available and acting in accordance with Good Utility Practice. The ISO will record the reasons for any variation from the Dispatch instructions issued by the BEEP Software.

2.5.23.2 Determining Ex Post Prices.

2.5.23.2.1 BEEP Interval Ex Post Prices For each BEEP Interval, the ISO will compute ~~an~~ updated supply and demand curves, using the Generating Units, System Units, Loads and System Resources dispatched according to the ISO's BEEP Software during that time period to meet Imbalance Energy requirements and to eliminate any Price Overlap. The BEEP Interval Ex Post Price is equal to the bid price of the marginal resource accepted by the ISO for Dispatch, subject to any limitation applicable under Section 2.5.23.3. For each BEEP Interval of the Settlement Period, BEEP will compute the Ex Post Price so that it is: ~~an incremental Ex Post Price and a decremental Ex Post Price. The BEEP Interval Ex Post Price for incremental Energy will be the highest incremental marginal bid selected by the BEEP software in the corresponding BEEP Interval. The BEEP Interval Ex Post Price for decremental Energy will be the lowest price decremental marginal bid selected by the BEEP software in the corresponding BEEP Interval. If only decremental Imbalance Energy is dispatched in a BEEP Interval, then the BEEP Interval Ex Post Price for incremental Energy will be equal to the BEEP Interval Ex Post Price for decremental Energy. If only incremental Imbalance Energy is dispatched in a BEEP Interval, then the BEEP Interval Ex Post Price for decremental Energy will be equal to the BEEP Interval Ex Post Price for incremental Energy.~~

a) greater than or equal to the prices of accepted incremental bids;

b) smaller than or equal to the prices of unaccepted incremental bids;

c) smaller than or equal to the prices of unaccepted incremental bids; and

d) greater than or equal to prices of unaccepted decremental bids.

In the event of Inter-Zonal Congestion, the ISO will develop ~~a dispatch price curve, and the BEEP Interval Ex Post Prices for each Zone where congestion exists~~supply and demand curves separately for each Zone separated by congestion.

2.5.23.2.2 Hourly Ex Post Price ~~Applicable to Uninstructed Deviations~~. The Hourly Ex Post Price in Settlement Period t in each ~~zone~~ Zone will equal the Energy weighted average of the BEEP Interval ~~Charges~~ Prices in each Zone, calculated as follows:

$$\cancel{PHourExPostx = \frac{(\sum_{ji} |MWh_{jix}| * BIP_{ix})}{\sum_{ji} |MWh_{jix}|}}$$

$$HP_{xt} = \frac{\sum_{b} |Q_{bxt}| P_{bxt}}{\sum_{b} |Q_{bxt}|}$$

Where:

~~$PHourExPost_x$~~ = HP_{xt} is the Hourly Ex Post Price in Zone x;

P_{bxt} is the BEEP Interval Ex Post Price during BEEP Interval b in Zone x; and

$Q_{bx}t$ is the total

~~BIP_{ix} = BEEP Interval Ex Post Price~~

~~*J*=the number of Scheduling Coordinators with instructed deviations~~

~~MWH_{jix}=the~~ Instructed Imbalance Energy ~~for Scheduling Coordinator j for the~~during BEEP Interval ~~i~~ b in Zone x.

If the ISO declares a System Emergency, e.g. during times of supply scarcity, and involuntary load shedding occurs during the real time Dispatch, the ISO shall set the Hourly Ex Post Price at the Administrative Price.

2.5.23.2.3 Price for Uninstructed Deviations for Participating Intermittent Resources.

Deviations associated with each Participating Intermittent Resource in a Scheduling Coordinator's zonal portfolio shall be settled as provided in Section 11.2.4.5.1 at the monthly weighted average BEEP Interval Ex Post Price, where the weights are the quantities of Instructed Imbalance Energy associated with each BEEP Interval Ex Post Price.

2.5.23.3 Temporary Limitation on BEEP Interval Ex Post Prices

2.5.23.3.1 Limitation. Notwithstanding any other provision of the ISO Tariff, the BEEP Interval Ex Post Price shall not exceed ~~$150~~the applicable Non-Emergency Clearing Price Limit (NECPL) during the corresponding hour. Scheduling Coordinators for Generating Units, System Units, and System Resources that submit bids above ~~$150~~the applicable NECPL for the supply of Imbalance Energy shall be paid in accordance with their bids, but only for the amount of Instructed Imbalance Energy that is actually delivered. ~~if accepted for Dispatch by the ISO~~.

2.5.23.3.2 ~~**Charges for Certain Instructed Imbalance Energy.** Amounts paid to Scheduling Coordinators in accordance with Section 2.5.23.3.1 for Instructed Imbalance Energy from Generating Units, System Units and System Resources at bids above $150 shall be charged to Scheduling Coordinators such that the charge to each Scheduling Coordinator shall be pro rata based upon the same proportion as the Scheduling Coordinator's Net Negative Uninstructed Deviations for the BEEP Interval bears to the total Net Negative Uninstructed Deviations of all Scheduling Coordinators for the BEEP Interval. Such charge shall apply in lieu of any charge specified in the ISO Tariff for such Instructed Imbalance Energy based on the BEEP Interval Ex Post Price.~~**[Not Used]**

2.5.23.3.3 [Not Used]

* * *

2.5.26.2.1 If the ISO determines that a Scheduling Coordinator has supplied Uninstructed Imbalance Energy to the ISO during a BEEP Interval from the capacity of a Generating Unit, System Unit or System Resource that is obligated to supply Spinning Reserve, Non-Spinning Reserve, or Replacement Reserve to the ISO during such BEEP Interval, payments to the Scheduling Coordinator representing the Generating Unit, System Unit or System Resource for the Ancillary Service capacity used to supply Uninstructed Imbalance Energy~~ and for Energy supplied from such capacity~~ shall be eliminated to the extent of the deficiency, except to the extent (i) the deficiency in the availability of Ancillary Service capacity from the Generating Unit, System Unit or System Resource is attributable to control exercised by the ISO in that BEEP Interval through AGC operation, an RMR Dispatch Notice, or dispatch to avoid an intervention in Market operations or to prevent a System Emergency; or (ii) a penalty is imposed under Section 2.5.26.1 with respect to the deficiency.

2.5.26.2.2 If the metered Demand of a Curtailable Demand is insufficient to deliver the full amount of the Non-Spinning and Replacement Reserve to which that Curtailable Demand is obligated in that BEEP Interval, then the related capacity payments will be rescinded to the extent of that deficiency as explained in Section 2.5.26.2.4 and 2.5.26.2.5, unless a penalty is imposed on that Curtailable Demand for that BEEP Interval under Section 2.5.26.1.

2.5.26.2.3 ~~The payment for Energy to be eliminated shall be determined in accordance with Section 11.2.4.1.~~ **[Not Used]**

* * *

2.5.26.2.6 For each BEEP Interval in which a Generating Unit, Curtailable Demand, System Unit or System Resource fails to actually supply Energy from Spinning Reserve, Non-Spinning Reserve or Replacement Reserve capacity in accordance with a Dispatch instruction, or supplies only a portion of the Energy specified in the Dispatch Instruction, the capacity payment will be pro-rated to reflect the unavailability in that BEEP Interval of the difference between (1) the total MW of the particular Ancillary Service scheduled in that Settlement Period and (2) the amount of Energy, if any, supplied in response to the Dispatch instruction in that BEEP Interval.

2.5.26.3 Rescission of Payments When Dispatch Instruction is Not Followed

If the total metered output of a Generating Unit, Curtailable Demand, System Unit or System Resource is insufficient to ~~deliver~~ supply the amount of Instructed Imbalance Energy associated with a Dispatch instruction issued in accordance with a bid on Spinning Reserve, Non-Spinning Reserve, or Replacement Reserve in any BEEP Interval, then the capacity payment associated with the difference between the total scheduled amount of each Ancillary Service for which Insufficient Energy was delivered, and the actual output attributed to the response to the Dispatch instruction on each Ancillary Service, shall be rescinded. However, no capacity payment shall be rescinded if the shortfall in the metered output of the Generating Unit, Curtailable Demand, System Unit, or System Resource is less than a deadband amount published by ISO on the ISO Home Page at least twenty-four hours prior to the BEEP Interval. For any BEEP Interval with respect to which no deadband amount has been published by the ISO, the deadband amount shall be zero MWH. If the Generating Unit, Curtailable Demand, System Unit or System Resource is scheduled to provide more than one Ancillary Service in the Settlement Period, then the actual output will be attributed first to Replacement Reserve, then to Non-Spinning Reserve, and finally to Spinning Reserve, and the capacity payments associated with the balance of each Ancillary Service shall be rescinded. If the same Ancillary Service is scheduled in both the Day Ahead and Hour Ahead Markets, then payments shall be rescinded in proportion to the amount of each Ancillary Service scheduled in each market.

2.5.26.4 Penalties applied pursuant to Section 2.5.26.1, and payments rescinded pursuant to Section 2.5.26.2 and 2.5.26.3 shall be redistributed to Scheduling Coordinators in proportion to ISO Control Area metered Demand ~~and scheduled exports~~ for the same Trading Day.

2.5.26.5 **I**f the ISO determines that non-compliance of a Load, Generating Unit, System Unit or System Resource, with an operating order or Dispatch instruction from the ISO, or with any other applicable technical standard under the ISO Tariff, causes or exacerbates system conditions for which the WSCC imposes a penalty on the ISO, then the Scheduling Coordinator of such Load, Generating Unit, System Unit or System Resource shall be assigned that portion of the WSCC penalty which the ISO reasonably determines is attributable to such non-compliance, in addition to any other penalties or sanctions applicable under the ISO Tariff.

2.5.26.6 ~~**Temporary Exemption from Rescission of Energy Payments** Any Participating Load that has entered into a Participating Load Agreement and has responded to a Dispatch instruction will be exempt from the requirements of Section 2.5.26.2.3 in the hour of the Dispatch and for the following two (2) hours during the period beginning on June 15, 2000 and ending on the date specified in a notice ("Notice Terminating Temporary Exemption") to be issued by the ISO. Such notice shall be posted on the ISO Home Page and distributed to Market Participants via e-mail at least seven (7) calendar days in advance of the termination of this temporary exemption.~~ **[Not Used]**

* * *

2.5.27.1 Regulation.

Regulation Up and Regulation Down payments shall be calculated separately.

Quantities. The following quantity definitions shall be used for each Scheduling Coordinator in the settlement process:

$AGCUpQDA_{xt}$ = the Scheduling Coordinator's total quantity of Regulation Up capacity in Zone X sold through the ISO auction at bids at or below the level specified in Section 2.5.27.7, and scheduled Day-Ahead j for Settlement Period t.

$AGCDownQDA_{xt}$ = the Scheduling Coordinator's total quantity of Regulation Down capacity in Zone X sold through the ISO auction at bids at or below the level specified in Section 2.5.27.7, and scheduled Day-Ahead j for Settlement Period t.

~~$EnQUnst_{xt}$~~ $EnQInst_{xt}$ = ~~Uninstructed~~ Instructed Imbalance Energy increase or decrease in Zone X in real time Dispatch for each BEEP Interval b of Settlement Period t, determined in accordance with the ISO Protocols.

Prices. The prices in the Settlement process for Regulation Up and Regulation Down shall be those determined in Section 2.5.14 for bids at or below the level specified in Section 2.5.27.7 and prices determined in accordance with Section 2.5.27.7 for bids above that level.

Adjustment: penalty described in Section 2.5.26.1.

$PAGCUpDA_{xt}$ = the market clearing price, PAGC, in Zone X for Regulation Up capacity in the Day-Ahead market for Settlement Period t.

$PAGCDownDA_{xt}$ = the market clearing price, PAGC, in Zone X for Regulation Down capacity in the Day-Ahead market for Settlement Period t.

Payments. Scheduling Coordinators for Generating Units providing Regulation Up capacity through the ISO auction shall receive the following payments for Regulation Up:

$AGCUpPay_{xt} = AGCUpQDA_{xt} * PAGCUpDA_{xt} - Adjustment$

Scheduling Coordinators for Generating Units providing Regulation Down capacity through the ISO auction shall receive the following payments for Regulation Down:

$AGCDownPay_{xt} = AGCDownQDA_{xt} * PAGCDownDA_{xt} – Adjustment$

Scheduling Coordinators for Generating Units shall receive the following payment for Energy output from Regulation in accordance with the settlement for ~~Uninstructed~~ Instructed Imbalance Energy under Section 11.2.4.1~~.~~:

$$\cancel{\sum_i [(EnQUnst_{ixt} * HourlyExPostPriceinZoneX) + REPA_{ixt}]}$$

$$\sum_i [(EnQInst_{ixt} * BEEPIntervalExPostPriceinZoneX) + REPA_{ixt}]$$

$REPA_{ixt}$ = the Regulation Energy Payment Adjustment for Generating Unit i in Zone X for Settlement Period t calculated as follows:

$$[(R_{UPixt} * C_{UP}) + (R_{DNixt} * C_{DN})] * \max(\$20/MWh, P_{xt})$$

Where

R_{UPixt} = the upward range of generating capacity for the provision of Regulation from Generating Unit i in Zone X included in the bid accepted by the ISO for Generating Unit i for Settlement Period t, weighted in proportion to the ISO's need for upward Regulation. The weighting factors will be specified within a range from 0-100 percent. The weighting factors will be set at the discretion of the ISO based on system conditions, and will be set at a level that will provide sufficient incentive to the market to supply upward Regulation for the ISO's purposes of satisfying WSCC criteria and NERC control performance standards. The ISO shall post the weighting factors consistent with the ISO Weighting Procedure, posted on the ISO website.

R_{DNixt} = the downward range of generating capacity for the provision of Regulation for Generating Unit i in Zone X included in the bid accepted by the

ISO for Generating Unit i for Settlement Period t, weighted in proportion to the ISO's need for downward Regulation. The weighting factors will be specified within a range from 0-100 percent. The weighting factors will be set at the discretion of the ISO based on system conditions, and will be set at a level that will provide sufficient incentive to the market to supply downward Regulation for the ISO's purposes of satisfying WSCC criteria and NERC control performance standards. The ISO shall post the weighting factors consistent with the ISO Weighting Procedure, posted on the ISO website.

C_{UP} = ~~1~~0

C_{DN} = ~~1~~0

P_{xt} = the Hourly Ex Post Price for Zone X in Settlement Period t.

The ISO may modify the value of the constants C_{UP} or C_{DN} within a range of 0-1 either generally in regard to all hours or specifically in regard to particular times of the day, after the ISO Governing Board approves such modification, by a notice issued by the Chief Executive Officer of the ISO and posted on the ISO Internet "Home Page," at http//www.caiso.com, or such other Internet address as the ISO may publish from time to time, specifying the date and time from which the modification shall take effect, which shall be not less than seven (7) days after the Notice is issued.

REPA shall not be payable unless the Generating Unit is available and capable of being controlled and monitored by the ISO Energy Management System over the full range of its Scheduled Regulation capacity for the entire Settlement Period at least the ramp rates (increase and decrease in MW/minute) stated in its bid. In addition, the total Energy available (R_{UP} plus R_{DN}) may be adjusted to be only R_{UP} or only R_{DN}, a percentage of R_{UP} or R_{DN}, or the sum of R_{UP} and R_{DN}, depending on the needs of the ISO for each direction of Regulation service.

* * *

2.5.28.4 Replacement Reserve. The user rate per unit of Replacement Reserve obligation for each Settlement Period t for each Zone x shall be as follows:

$$ReplRate_{xt} = \frac{(PRepResDA_{xt} * OrigReplReqDA_{xt}) + (PRepResHA_{xt} * OrigReplReqHA_{xt})}{OrigReplReqDA_{xt} + OrigReplReqHA_{xt}}$$

where

$OrigReplReqDA_{xt}$ = Replacement Reserve requirement net of self-provision in the Day-Ahead Market before consideration of any substitutions pursuant to Section 2.5.3.6.

$OrigReplReqHA_{xt}$ = Incremental *c*hange in the Replacement Reserve requirement net of self-provision between the Day-Ahead Market and the Hour-Ahead Market before consideration of any substitutions pursuant to Section 2.5.3.6.

$PRepResDA_{xt}$ is the Market Clearing Price for Replacement Reserve in the Day-Ahead Market for Zone *x* in Settlement Period *t*.

$PRepResHA_{xt}$ is the Market Clearing Price for Replacement Reserve in the Hour-Ahead Market for Zone *x* in Settlement Period *t*.

For each Settlement Period t, each Scheduling Coordinator shall pay to the ISO a sum calculated as follows for each $Zone_x$:

$ReplRate_{xt} * ReplOblig_{jxt}$

where

$ReplOblig_{jxt} = DevReplOblig_{jxt} + RemRepl_{jxt} - SelfProv_{jxt} + NetInterSCTrades_{jxt}$

$DevReplOblig_{jxt}$ is the Scheduling Coordinator's obligation for deviation Replacement Reserve in Zone x in the Settlement Period t and $RemRepl_{jxt}$ is the Scheduling Coordinator's obligation for remaining Replacement Reserve in Zone x for Settlement Period t.

$SelfProv_{jxt}$ is Scheduling Coordinator's Replacement Reserve self provision in Zone x for Settlement Period t.

$NetInterSCTrades_{jxt}$ is the sale of Replacement Reserve less the purchase of Replacement Reserve through Inter-Scheduling Coordinator Trades by Scheduling Coordinator j in Zone x for Settlement Period t.

Deviation Replacement Reserve for Scheduling Coordinator j in Zone x for Settlement Period t is calculated as follows:

If $ReplObligTotal_{xt} > TotalDeviations_{xt}$ then:

$$DevReplOblig_{xjt} = \left[Max\left(0, \sum_i GenDev_{ijxt}\right) - Min\left(0, \sum_i LoadDev_{ijxt}\right)\right]$$

If $ReplObligTotal_{xt} < TotalDeviations_{xt}$ then:

$$DevReplOblig_{xjt} = \frac{ReplObligTotal_{xt}}{TotalDeviations_{xt}} * \left[Max\left(0, \sum_i GenDev_{ijxt}\right) - Min\left(0, \sum_i LoadDev_{ijxt}\right)\right]$$

where,

$$TotalDeviations_{xt} = \sum_j \left[Max\left(0, \sum_i GenDev_{ijxt}\right) - Min\left(0, \sum_i LoadDev_{ijxt}\right)\right]$$

$GenDev_{ijxt}$ = The deviation between scheduled and actual Energy Generation for Generator i represented by Scheduling Coordinator j in Zone x during Settlement Period t as referenced in ~~Section 11.2.4.1~~SABP Appendix D.

$LoadDev_{ijxt}$ = The deviation between scheduled and actual Load consumption for resource i represented by Scheduling Coordinator j in Zone x during Settlement Period t as referenced in SABP Appendix D~~Section 11.2.4.1~~.

$DevReplOblig_{xt}$ is total deviation Replacement Reserve in Zone x for Settlement Period t.

$ReplObligTotal_{xt}$ is total Replacement Reserve Obligation in zone x for Settlement Period t.

Remaining Replacement Reserve for Scheduling Coordinator j in Zone x for Settlement Period t is calculated as follows:

$$RemRepl_{xjt} = \frac{MeteredDemand_{jxt}}{TotalMeteredDemand_{xt}} * TotalRemRepl_{xt}$$

where:

$MeteredDemand_{jxt}$ is the Scheduling Coordinator's total metered Demand excluding exports in Zone x for Settlement Period t.

$TotalMeteredDemand_{xt}$ is total metered Demand excluding exports in Zone x for Settlement Period t.

$TotalRemRepl_{xt} = Max[0, ReplObligTotal_{xt} + TotalSelfProv_{xt} - DevReplOblig_{xt}]$

* * *

5.6.3.2 A Participating Generator shall not be subject to penalties pursuant to Section 5.6.3.1 if the Participating Generator can demonstrate to the ISO that it failed to comply with such a Dispatch instruction either because: (a) the Generating Unit, System Unit or System Resource that was the subject of the Dispatch instruction was physically incapable of responding in accordance with the instruction, provided that if such Participating Generator has not notified the ISO in advance that the Generating Unit, System Unit or System Resource was unavailable or de-rated, such Generating Unit, System Unit or System Resource will be presumed to be available; or (b) compliance with such Dispatch instruction would have resulted in a violation of an applicable requirement of state or Federal law, which requirement cannot be waived. A Participating Generator must notify ISO operations staff of its reason for failing to comply with the Dispatch instruction ~~within the operating hour that the instruction is issued~~ in accordance with Section 2.3.3.9.2 and must provide information to the ISO that verifies the reason the Participating Generator failed to comply with the Dispatch instruction within 72 hours of the operating hour in which the instruction is issued. Disputes concerning the cause of a Participating Generator's failure to comply with an ISO Dispatch instruction shall be subject to the Dispute Resolution provisions set forth in Section 13 of this ISO Tariff.

* * *

7.2.6 Intra-Zonal Congestion Management.

7.2.6.1 **Complying with Intra-Zonal Congestion Scheduling Limits.** Scheduling Coordinators shall submit Initial Preferred Day-Ahead schedules that comply with the forecast Intra-zonal Congestion scheduling limits posted by the ISO in accordance with Section 2.2.10.7. If the schedules submitted by Scheduling Coordinators do not comply with these limits, the ISO shall publish Suggested Adjusted

Schedules which reflect these scheduling limits. If the Final schedules submitted by Scheduling Coordinators in response to the Suggested Adjusted Schedules do not comply with the scheduling limits, the ISO shall adjust the Scheduling Coordinator's Final Day-Ahead Schedules to match the scheduling limits by adjusting resources in the Scheduling Coordinator's portfolio as necessary to ensure balanced Final Day-Ahead Schedules. Scheduling Coordinators whose portfolios are adjusted by the ISO to enforce these scheduling limits shall not be compensated for these adjustments. The ISO shall also enter the unit's scheduling limits in the Outage scheduling system.

~~**[Not used]**~~

7.2.6.1.1 [Not used]

7.2.6.1.2 [Not Used]

7.2.6.1.3 [Not Used]

7.2.6.1.4 [Not Used]

7.2.6.1.5 [Not Used]

7.2.6.1.6 [Not Used]

7.2.6.2 Intra-Zonal Congestion During Initial Period. Except as provided in Sections 2.2.10.7, 5.2, 7.2.6.1 and 11.2.4.~~2~~4, the ISO will perform Intra-Zonal Congestion Management in real time using available Adjustment Bids and Imbalance Energy bids, based on their effectiveness and in merit order, to minimize the cost of alleviating Congestion. If the Adjustment Bid or Imbalance Energy bid from a Generating Unit the ISO must Dispatch to manage Intra-Zonal Congestion is not the next bid in merit order, the ISO shall set the price of that bid equal to the proxy price of that Generating Unit as determined in accordance with Section 2.5.23.3.4 and Dispatch that Generating Unit pursuant to that adjusted bid to manage Intra-Zonal Congestion. The Scheduling Coordinator for that Generating Unit shall then be 1) paid the higher of its proxy price as determined in accordance with Section 2.5.23.3.4 or the BEEP Interval Ex Post Price for incremental Dispatch, or 2) charged the lower of its proxy price as determined in accordance with Section 2.5.23.3.4 or the BEEP Interval Ex Post Price for decremental

Dispatch. In the event no Adjustment Bids or Imbalance Energy bids are available, the ISO will exercise its authority to direct the redispatch of resources as allowed under the Tariff, including Section 11.2.4. ~~2 and 2.4.~~4.

7.2.6.3 Cost of Intra-Zonal Congestion Management. The net of the amounts paid by the ISO to the Scheduling Coordinators and the amounts charged to the Scheduling Coordinators will be calculated and charged to all Scheduling Coordinators through a Grid Operations Charge, as described in Section 7.3.2.

* * *

11.2.4 Imbalance Energy.

The ISO shall calculate, account for and settle Imbalance Energy in the Real Time Market for each ~~Settlement~~ BEEP Interval Period for the relevant Zone or Scheduling Point within the ISO Controlled Grid. Imbalance Energy is the difference between the Metered Quantity and the Energy that corresponds to the final Hour-Ahead Schedule. Instructed Imbalance Energy is the portion of Imbalance Energy that is produced or consumed due to Dispatch instructions. The Instructed Imbalance Energy will be calculated based on all Dispatch instructions taking into account applicable ramp rates and time delays. All Dispatch instructions shall be deemed delivered. The remaining Imbalance Energy constitutes Uninstructed Imbalance Energy, and will be calculated based on the difference between the Metered Quantity and the Generator's Dispatched Operating Point.

11.2.4.1 Net Settlements for Uninstructed Imbalance Energy.

Uninstructed Imbalance Energy attributable to each Scheduling Coordinator for each Settlement Period in the relevant Zone shall be deemed to be sold or purchased, as the case may be, by the ISO and charges or payments for Uninstructed Imbalance Energy shall be settled by debiting or crediting, as the case may be, the Scheduling Coordinator with an amount for each BEEP Interval ~~of each Settlement Period equal to the product of the net deviation in the Zone or Zones, as appropriate, and the appropriate BEEP Interval Ex Post Price determined~~ in accordance with Section 2.5.23.2.1.

~~The ISO shall develop protocols and procedures for the monitoring of persistent intentional excessive imbalances by Scheduling Coordinators and for the imposition of appropriate sanctions and/or penalties to deter such behavior.~~

11.2.4.1.1 Settlement for Instructed Imbalance Energy

Instructed Imbalance Energy attributable to each Scheduling Coordinator ~~j in each Settlement Period t in the relevant Zone~~ in each BEEP Interval shall be deemed to be sold or ~~purshased~~purchased, as the case may be, by the ISO and charges or payments for Instructed Imbalance Energy shall be settled by debiting or crediting, as the case may be, the Scheduling Coordinator with an amount for each BEEP Interval ~~of each Settlement Period~~ in accordance with Section 2.5.23.

11.2.4.1.2 Penalties for Uninstructed Imbalance Energy

The ISO shall charge Scheduling Coordinators Uninstructed Deviation Penalties for Uninstructed Imbalance Energy resulting from resource deviations outside a tolerance band from their dispatched operating point, for dispatched resources, or their final Hour-Ahead Schedule otherwise. The Dispatched Operating Point will take into account the expected ramping of a resource as it moves to a new Hour-Ahead Schedule at the top of each hour and as it responds to Dispatch instructions. The Uninstructed Deviation Penalty will be applied as follows:

a) The Uninstructed Deviation Penalty will be calculated and assessed in each BEEP Interval in hours that Section 5.6.3 is in effect; the ISO has not declared a Staged System Emergency; or parts of hours except when Section 5.6.3 is in effect;

b) The Uninstructed Deviation Penalty will not apply to Interconnection Schedules because such Schedules are deemed delivered. However, dynamic Interconnection Schedules, to the extent they deviate without instruction from their final Hour-Ahead Schedule, and real-time instructions for Energy from Interconnection Schedule bids that are declined, will be subject to the Uninstructed Deviation Penalty;

c) The Uninstructed Deviation Penalty will not apply to Load, other than Participating Load; for Participating Load, the Uninstructed Deviation Penalty will not apply for the duration of the relevant Minimum Down Time;

d) The Uninstructed Deviation Penalty will not apply to constrained resources for the duration of the relevant startup/shutdown and Minimum Up/Down Times;

e) The Uninstructed Deviation Penalty will not apply to Regulatory Must-Run Generation or Participating Intermittent Resources that meet the scheduling obligations established in the technical standards for Participating intermittent Resources adopted by the ISO and published on the ISO Home Page or Regulatory Must-Run Generation. No other applicable charges will be affected by this exemption. Uninstructed Deviation Penalty also will not apply to Qualifying Facilities that have not executed a Participating Generator Agreement (PGA), pending resolution of QF-PGA issues at the Commission;

f) For Metered Subsystems (MSS), the Uninstructed Deviation Penalty will apply to the net injection (System Unit generation plus import minus MSS load and export) into the ISO Controlled Grid;

g) The Uninstructed Deviation Penalty will not apply to Generators providing Regulation to the extent that the Generators' Uninstructed Deviations are within the range of their actual Regulation range;

h) The Uninstructed Deviation Penalty will be calculated and assessed for each resource separately, however, resources represented by the same Scheduling Coordinator and connected to the same ISO Controlled Grid bus and voltage level can be aggregated for purposes of Uninstructed Deviation Penalty determination. Other levels of aggregation for purposes of the Uninstructed Deviation Penalty will be considered on a case-by-case basis based on an ISO review of impact on the ISO Controlled Grid;

i) The tolerance band for the application of the Uninstructed Deviation Penalties to Generators or aggregated Generators initially will be the Energy produced in a BEEP Interval by the greater of five (5) MW or three percent (3%) of the relevant generating unit's maximum output (P_{max}), as registered in the Master File;

j) The tolerance band for the application of the Uninstructed Deviation Penalties to Participating Loads initially will be equal to the Energy produced in a BEEP Interval by the greater of five (5) MW or three percent (3%) of the relevant final Hour-Ahead Schedule;

k) The Uninstructed Deviation Penalty will not apply when the BEEP Interval Ex Post Price is negative or zero;

l) The Uninstructed Deviation Penalty for positive Uninstructed Imbalance Energy will be the amount of the Uninstructed Imbalance Energy in excess of the tolerance band multiplied by a price that initially will be equal to 100% of the corresponding BEEP Interval Ex Post Price; and the net effect of the Uninstructed Deviation Penalty and the Settlement for positive Uninstructed Imbalance Energy beyond the tolerance band will be that the ISO will not pay for such Energy;

m) The Uninstructed Deviation Penalty for negative Uninstructed Imbalance Energy will be the amount of the Uninstructed Imbalance Energy in excess of the tolerance band multiplied by a price that initially will be initially equal to 25% of the corresponding BEEP Interval Ex Post Price; and the net effect of the Uninstructed Deviation Penalty and Uninstructed Imbalance Energy settlement initially will be that any such Energy will be charged at 125% of the corresponding BEEP Interval Ex Post Price;

n) The Uninstructed Deviation Penalty will not apply to deviations from Energy delivered as part of a scheduled test so long as the test has been scheduled by the Scheduling Coordinator with the ISO or the ISO has initiated as test for the purposes of validating unit performance;

o) The Uninstructed Deviation Penalty will apply to Out of Market (OOM) transactions; and

p) Generating Units, Curtailable Demands and dispatchable Interconnection resources with negative Uninstructed Imbalance Energy will be exempted from the Uninstructed Deviation Penalty if the Generating Unit, Curtailable Demand or dispatchable Interconnection resource was physically incapable of delivering the expected Energy, provided that the Generating Unit, Curtailable Demand or dispatchable Interconnection resource had notified the ISO within 30 minutes of the onset of an event that prevents the resource from performing its obligations. A Generating Unit, Curtailable Demand or dispatchable Interconnection resource must notify ISO operations staff of its reasons for failing to deliver the expected Energy in accordance with Section 2.3.3.9.2 and must provide information to the ISO that verifies the reason the resource failed to comply with the Dispatch instruction within 72 hours of the operating hour in which the instruction is issued.

The ISO may modify the value of the Uninstructed Deviation Penalty tolerance band or method for calculation of the rate of the Uninstructed Deviation Penalty, after the ISO Board of Governors approves any such modification, by a notice issued by the Chief Executive Officer of the ISO and posted on the ISO Internet "Home Page," at http//www.caiso.com, or such other Internet address as the ISO may publish from time to time, specifying the date and time from which the modification shall take effect, which shall be not less than seven (7) days after the Notice is issued.

* * *

11.2.4.2.1 Allocation of Costs Resulting From ~~ISO~~ Dispatch ~~Orders~~Instructions

Pursuant to Section 11.2.4.~~2~~1, the ISO may, at its discretion, D~~d~~ispatch any Participating Generator, Participating Load and ~~import~~ dispatchable Interconnection resource that has not bid into the Imbalance Energy or Ancillary Services markets, to avoid an intervention in market operations or to prevent or relieve a System Emergency. Such D~~d~~ispatch may result from, among other things, planned and unplanned transmission facility outages; bid insufficiency in the Ancillary Services and Real-Time Energy markets; and location-specific requirements of the ISO. The cost associated with each Dispatch instruction is broken into two components:

(a) the portion of the Energy payment at or below the Market Clearing Price ("MCP") for the BEEP Interval, and

(b) the portion of the Energy payment above the MCP, if any, for the BEEP Interval.

For each ~~settlement interval, all costs~~BEEP Interval, costs above the MCP incurred by the ISO for such Dispatch instructions necessary as a result of a transmission facility outage or in order to satisfy a location-specific requirement in that ~~settlement interval~~BEEP Interval shall be payable to the ISO by the Participating Transmission Owner in whose Service Area the transmission facility is located or the location-specific requirement arose. ~~For each settlement interval, all~~The costs incurred by the ISO for such Dispatch instructions for reasons other than for a transmission facility outage or a location-specific requirement ~~in that settlement interval shall be charged to each Scheduling Coordinator~~will be recovered in the same way as for Instructed Imbalance energy.

11.2.4.2.2 Allocation of Above-MCP Costs

For each BEEP Interval, the above-MCP costs incurred by the ISO as a result of Instructed Imbalance Energy and Dispatch instructions for reasons other than for a transmission facility outage or a location-specific requirement shall be charged to Scheduling Coordinators as follows. Each Scheduling Coordinator's charge shall be the lesser of:

(a) the pro rata share of the total above-MCP costs based upon the ratio of each Scheduling Coordinator's Net Negative Uninstructed Deviations to the total System Net Negative Uninstructed Deviations; or

(b) the amount obtained by multiplying the Scheduling Coordinator's Net Negative Uninstructed Deviation for each BEEP Interval and a weighted average price. The weighted average price is equal to the total above-MCP costs divided by the MWh delivered as a result of ISO instructions with a cost component above the MCP.

The difference between ISO charges to Scheduling Coordinators with Net Negative Uninstructed Deviations and the total above-MCP costs incurred by the ISO due to Instructed Imbalance Energy and Dispatch instructions for reasons other than for a transmission facility outage or a location-specific requirement shall be allocated amongst all Scheduling Coordinators in that BEEP Interval pro rata based on their metered Demand, including Exports~~in each settlement interval~~.

The Scheduling Coordinator shall be exempt from the allocation of above-MCP costs in a BEEP interval if the Scheduling Coordinator has sufficient incremental Energy bids from physically available resources in the Imbalance Energy market to cover the net negative Uninstructed Deviation in the given interval of a resource and the prices of these Energy bids do not exceed the applicable NECPL.

11.2.4.3 Unaccounted For Energy (UFE)

For settlement purposes, UFE is treated as Imbalance Energy. For each ~~Settlement Period,~~BEEP Interval the ISO will calculate UFE on the ISO Controlled Grid, for each UDC Service Area. The UFE will be ~~included in the net settlements for~~ settled as Imbalance Energy ~~in Section 11.2.4.1~~at the BEEP Interval Ex Post Price. UFE attributable to meter measurement errors, load profile errors, Energy theft, and distribution loss deviations will be allocated to each Scheduling Coordinator based on the ratio of their metered Demand (including exports to neighboring Control Areas) within the relevant UDC Service Area to total metered Demand within the UDC Service Area.

11.2.4.4 High Voltage Access Charges and Transition Charges will be levied in accordance with Section 7.1 of this ISO Tariff and Appendix F, Schedule 3.

11.2.4.5 Participating Intermittent Resources~~[Not Used]~~

11.2.4.5.1 Uninstructed Energy by Participating Intermittent Resources

Uninstructed Imbalance Energy associated with deviations by a Participating Intermittent Resource shall be settled as provided in this Section 11.2.4.5.1 for every Settlement Period in which such Participating Intermittent Resource meets the scheduling requirements established in the technical standards for Participating Intermittent Resources adopted by the ISO and published on the ISO Home Page. In each Settlement Period such requirements are met, the Participating Intermittent Resource shall be exempt from the charges (payments) for Uninstructed Imbalance Energy. Instead, the net Uninstructed Imbalance Energy in each BEEP Interval shall be assigned to a deviation account specific to each Participating Intermittent Resource. The net balance in each deviation account at the end of each calendar month shall be paid (or charged) to the Scheduling Coordinator for the associated Participating Intermittent Resource at the average price specified in Section 2.5.23.2.3 of the ISO Tariff. If the above-referenced scheduling requirements for Participating Intermittent Resources are not met, then charges (payments) for Uninstructed Imbalance Energy during such Settlement Periods shall be determined in accordance with Section 11.2.4.1.

11.2.4.5.2 Adjustment of Other Charges Related to Participating Intermittent Resources

Charges pursuant to Section 2.5.28.4 or Section 11.2.4.2.2 to Scheduling Coordinators representing Participating Intermittent Resources shall exclude the effect of uninstructed deviations by Participating Intermittent Resources that have scheduled in accordance with the technical standards for Participating Intermittent Resources adopted by the ISO and published on the ISO Home Page. The amount of such adjustments shall be accumulated and settled as provided in Section 11.2.4.5.3.

11.2.4.5.3 Allocation of Costs From Participating Intermittent Resources

The charges (payments) for Uninstructed Imbalance Energy that would have been calculated if the BEEP Interval deviations by each Participating Intermittent Resource were priced at the appropriate BEEP Interval Ex Post Price specified in Section 2.5.23.2.1 shall be assigned to a monthly balancing account for all Participating Intermittent Resources in the ISO Control Area. The balance in such account at the end of each month shall be netted against the aggregate payments (charges) by Scheduling Coordinators on behalf of Participating Intermittent Resources pursuant to Section 11.2.4.5.1. The resulting balance, together with the adjustments to charges in each BEEP Interval or Settlement Period pursuant to Section 11.2.4.5.2 shall be assigned to each Scheduling Coordinator in the same proportion that such Scheduling Coordinator's aggregate Net Negative Uninstructed Deviations in that month bears to the aggregate Net Negative Uninstructed Deviations for all Scheduling Coordinators in the Control Area in that month.

11.2.4.5.4 Payment of Forecasting Fee

A fee to defray the costs of the implementation of the technical standards for Participating Intermittent Resources shall be assessed to Scheduling Coordinators for Participating Intermittent Resources as specified in Schedule 4 of Appendix F.

* * *

Dispatch Instruction	An instruction by the ISO to a resource for increasing or decreasing its energy supply or demand from the Hour-Ahead Schedule to a specified operating point.
Dispatch Operating Point	The expected operating point of a resource that has received a Dispatch Instruction. The resource is expected to operate at

the Dispatch Operating Point after completing the Dispatch Instruction, taking into account any relevant ramp rate and time delays. Energy expected to be produced or consumed above or below the Final Hour-Ahead Schedule in response to a Dispatch Instruction constitutes Instructed Imbalance Energy. For resources that have not received a Dispatch Instruction, the Dispatch Operating Point defaults to the corresponding Final Hour-Ahead Schedule.

* * *

Eligible Intermittent Resource	A Generating Unit, the output of which is not marketed under a contract pursuant to the Public Utilities Regulatory Policy Act of 1978, that is powered solely by 1) wind, 2) solar energy, or 3) hydroelectric potential derived from small conduit water distribution facilities that do not have storage capability.

* * *

Ex Post Price	The Hourly Ex Post Price or the BEEP Interval Ex Post Price~~s~~.

* * *

Hourly Ex Post Price	The Energy-weighted average of the BEEP Interval Ex Post Prices ~~price charged or paid to Scheduling Coordinators Responsible for Participating Generators and Participating Buyers for Imbalance Energy~~ in each Zone during each settlement period. The Hourly Ex Post ~~price~~ Price will vary between Zones if Congestion is present. ~~The Hourly Ex Post Price is the Energy weighted average of the BEEP Interval Ex Post Prices in each Zone during each Settlement Period.~~ This price is used in the Regulation Energy Payment Adjustment and in RMR settlements.

* * *

ISO Metered Entity	a) any one of the following entities that is directly connected to the ISO Controlled Grid:

i. a Generator other than a Generator that sells all of its Energy (excluding any Energy consumed by auxiliary load equipment electrically connected to that Generator at the same point) and Ancillary Services to the UDC in whose Service Area it is located;

ii. an Eligible Customer; or

iii. an End-User other than an End-User that purchases all of its Energy from the UDC in whose Service Area it is located; and

(b) any one of the following entities:

i. a Participating Generator;

ii. a Participating TO in relation to its Tie Point Meters with other TOs or Control Areas; ~~or~~

iii. a Participating Load; or

iv. a Participating Intermittent Resource.

* * *

Net Negative Uninstructed Deviation

The real time change in Generation or Demand associated with underscheduled Load (i.e., Load that appears unscheduled in real time) and overscheduled Generation (i.e., Generation that is scheduled in forward markets and does not appear in real time). Deviations are netted for each BEEP Interval, apply to a Scheduling Coordinator's entire portfolio, and include Load, Generation, Imports and Exports.

* * *

Participating Intermittent Resource	One or more Eligible Intermittent Resources that meets the requirements of the technical standards for Participating Intermittent Resources adopted by the ISO and published on the ISO Home Page.

* * *

Price Overlap	The price range of bids for Supplemental Energy or Energy associated with Ancillary Services bids for any BEEP Interval that includes decremental and incremental Energy Bids where the price of the decremental Energy Bids exceeds the price of the incremental Energy Bids.

* * *

Uninstructed Deviation Penalty	The penalty as set forth in Section 11.2.4.1.2 of this ISO Tariff.

* * *

ISO Tariff Appendix F

Schedule 4

Participating Intermittent Resources Forecasting Fee

A charge up to $.10 per MWh shall be assessed on the metered Energy from Participating Intermittent Resources. The amount of the charge shall be specified in the technical standards for Participating Intermittent Resources adopted by the ISO and published on the ISO Home Page.

DP 4.4 Acknowledgement of Dispatch Instructions

The recipient of a Dispatch Instruction shall confirm the Dispatch Instruction. Dispatch ~~instructions~~ Instructions communicated by the ISO either electronically or by fax shall be confirmed electronically in accordance with ISO procedures. Dispatch instructions communicated verbally shall be confirmed by repeating the Dispatch instructions to the ISO. Dispatch Instructions of Imbalance Energy will be deemed delivered and settled as such.

* * * * *

DP 8.6.3 Basis for Real Time Dispatch

The ISO shall base real time Dispatch of Generating Units, Curtailable Demands and Interconnection schedules on the following principles:

(a) the ISO shall dispatch Generating Units and dispatchable Interconnection schedules providing Regulation service to meet WSCC and NERC Area Control Error (ACE) performance criteria;

(b) in each BEEP Interval, the ISO shall determine if the Regulation Generating Units and dispatchable Interconnection schedules are operating at a point away from their Set Point. The ISO shall then adjust the output of Generating Units, ~~and~~ Curtailable Demands, and dispatchable Interconnection schedules (either providing Spinning Reserve, Non-Spinning Reserve, Replacement Reserve, or Supplemental Energy) to return the Regulation Generating Units and dispatchable Interconnection schedules to their Set Points to restore their full regulating margin;

(c) in each BEEP Interval, the ISO shall dispatch Generating Units, Curtailable Demands and dispatchable Interconnection schedules ~~only~~ to meet its balancing Energy requirements~~. The ISO shall not dispatch such~~ and eliminate any Price Overlap between decremental and incremental Energy Bids, thereby, dispatching the relevant resources in real time for economic trades either between SCs or within a SC's portfolio;

(d) the ISO shall select the Generating Units, Curtailable Demands and dispatchable Interconnection schedules to be dispatched to meet its balancing Energy requirements based on the merit order stack of Energy bid prices produced by BEEP;

(e) the ISO shall not discriminate between Generating Units, Curtailable Demands and dispatchable Interconnection schedules other than based on price, and the effectiveness (location and ramp rate) of the resource concerned to respond to the fluctuation in Demand or Generation;

(f) Generating Units, Curtailable Demands or dispatchable Interconnection schedules shall be dispatched during the Settlement Period only until the next variation in Generation or Demand or the end of the Settlement Period, whichever is sooner. In dispatching such resources, the ISO is not making any commitment beyond the Settlement Period, as to the duration of their operation, nor the level of their output or Demand;

(g) The ISO will not differentiate between Ancillary Services procured by the ISO and Ancillary Services which are being self-provided;

(h) Within BEEP, once a decremental bid has been used by the ISO, it will then be included in the incremental part of the database with its incremental bid equal to its decremental price bid. Once an incremental bid has been used by the ISO it will then be included in the decremental part of the database with a decremental bid equal to its incremental price~~.~~; ~~In the event that the ISO subsequently needs to decrement output, it will initially decrement the Generating Units or Interconnection schedules incremented previously, and then continue down the merit order of the decremental bids; and~~

(i) The bid ramp rate of a resource will be considered by the BEEP S~~s~~oftware in determining the amount of Instructed Imbalance Energy by BEEP Interval, and such consideration may result in Instructed Imbalance Energy in BEEP Intervals subsequent to the BEEP Interval to which the Dispatch ~~instruction~~ Instruction applies;~~.~~

(j) The ISO will pre-dispatch Supplemental Energy bids from Interconnection schedules, subject to hourly pre-dispatch as indicated in SBP 6.1.3, prior to the beginning of each hour consistent with applicable WSCC interchange scheduling practices, assuring that any price overlap between such decremental and incremental Energy Bids will be eliminated. Instructed Imbalance Energy from hourly pre-dispatched bids will be paid or charged the average of interval prices for the hour.

* * * * *

DP 11 ALGORITHMS TO BE USED

The ISO shall develop dispatch algorithms for use by the ISO for dispatching Generating Units, ~~and~~ Curtailable Demands and Interconnection schedules in accordance with the ISO Tariff.

SP 11.2 Stacking of the Energy Bids

The sources of Imbalance Energy described in SP 11.1 will be arranged in order of increasing Energy bid prices to create a merit order stack for use in accordance with the DP. This merit order stack will be arranged without regard to the source of the Energy bid except that Energy bids associated with Spinning and Non-Spinning Reserve shall not be included in the merit order stack during normal operating conditions if the capacity associated with such bids has been designated as available to supply Imbalance Energy only in the event of the occurrence of an unplanned Outage, a Contingency or an imminent or actual System Emergency. In the event of an unplanned Outage, a Contingency or threatened or actual System Emergency, all Energy bids associated with Spinning and Non-Spinning Reserve may be included in the merit order stack. In the event of Inter-Zonal Congestion, separate merit order stacks will be created for each Zone. The information in the merit order stack shall be provided to the real time dispatcher through the BEEP (Balancing Energy and Ex-Post Pricing) S~~s~~oftware.

Where, in any ~~Settlement Period~~BEEP Interval, the highest decremental Energy Bid in the merit order stack is higher than the lowest incremental Energy Bid, the BEEP S~~s~~oftware will eliminate the Price O~~o~~verlap by ~~determining a target price for~~ actually dispatching all those incremental and decremental bids which fall within the overlap. ~~All decremental Energy Bids higher than the target price will be decreased to the target price. All incremental Energy Bids lower than the target price will be increased to the target price.~~

References to incremental Energy Bids include references to Demand reduction bids, and for the purpose of applying this algorithm a reduction in Demand shall be treated as an equivalent increase in Generation.

SBP 6.1.3 External Import Section of Supplemental Energy Bid Data

Each SC offering Supplemental Energy to the ISO will submit the following information for each external import for each Settlement Period;

(a) SC's ID code;

(b) name of Scheduling Point;

(c) interchange ID (the name of the selling entity, the buying entity, and a numeric identifier);

(d) external Control Area ID;

(e) Schedule ID (NERC ID number);

(f) complete WSCC tag;

(g) ramp rate (MW/minute); ~~and~~

(h) the MW and $/MWh values for each external import for which a Supplemental Energy bid is being submitted consistent with this SBP 6; and~~.~~

(i) indication whether the Supplemental Energy bid applies to hourly pre-dispatch or to BEEP Interval dispatch.

C 2.2.3 Replacement Reserve

The user rate per unit of Replacement Reserve obligation for each Settlement Period t for each Zone x shall be as follows:

$$ReplRate_{xt} = \frac{(PRepResDA_{xt} * OrigReplReqDA_{xt}) + (PRepResHA_{xt} * OrigReplReqHA_{xt})}{OrigReplReqDA_{xt} + OrigReplReqHA_{xt}}$$

where:

$OrigReplReqDA_{xt}$ = Replacement Reserve requirement net of self-provision in the Day-Ahead Market before consideration of any substitutions pursuant to Section 2.5.3.6.

$OrigReplReqHA_{xt}$ = Incremental change in the Replacement Reserve requirement net of self-provision between the Day-Ahead Market and the Hour-Ahead Market before consideration of any substitutions pursuant to Section 2.5.3.

$PRepResDA_{xt}$ is the Market Clearing Price for Replacement Reserve in the Day-Ahead Market for Zone *x* in Settlement Period *t*.

$PRepResHA_{xt}$ is the Market Clearing Price for Replacement Reserve in the Hour-Ahead Market for Zone *x* in Settlement Period *t*.

For each Settlement Period t, each Scheduling Coordinator shall pay to the ISO a sum calculated as follows for each Zone x:

$ReplRate_{xt} * ReplOblig_{jxt}$

where

$ReplOblig_{jxt} = DevReplOblig_{jxt} + RemRepl_{jxt} - SelfProv_{jxt} + NetInterSCTrades_{jxt}$

$DevReplOblig_{jxt}$ is the Scheduling Coordinator's obligation for deviation Replacement Reserve in Zone x in the Settlement Period t and $RemRepl_{jxt}$ is the Scheduling Coordinator's obligation for remaining Replacement Reserve in Zone x for Settlement Period t.

$SelfProv_{jxt}$ is Scheduling Coordinator's Replacement Reserve self provision in Zone x for Settlement Period t.

$NetInterSCTrades_{jxt}$ is the sale of Replacement Reserve less the purchase of Replacement Reserve through Inter-Scheduling Coordinator Trades by Scheduling Coordinator j in Zone x for Settlement Period t.

Deviation Replacement Reserve for Scheduling Coordinator i in Zone x for Settlement Period t is calculated as follows:

If $ReplObligTotal_{xt} > TotalDeviations_{xt}$ then:

$$DevReplOblig_{xjt} = \left[Max\left(0, \sum_i GenDev_{ijxt}\right) - Min\left(0, \sum_i LoadDev_{ijxt}\right)\right]$$

If $ReplObligTotal_{xt} < TotalDeviations_{xt}$ then:

$$DevReplOblig_{xjt} = \frac{ReplObligTotal_{xt}}{TotalDeviations_{xt}} * \left[Max\left(0, \sum_i GenDev_{ijxt}\right) - Min\left(0, \sum_i LoadDev_{ijxt}\right)\right]$$

where,

$$TotalDeviations_{xt} = \sum_j \left[Max\left(0, \sum_i GenDev_{ijxt}\right) - Min\left(0, \sum_i LoadDev_{ijxt}\right)\right]$$

$GenDev_{ijxt}$ = The deviation between scheduled and actual Energy generation for Generator i represented by Scheduling Coordinator I in Zone x during Settlement Period t as referenced in ~~Section 11.2.4.1~~SABP Appendix D.

$LoadDev_{ijxt}$ = The deviation between scheduled and actual Load consumption for resource I represented by Scheduling Coordinator iin Zone x during Settlement Period t as referenced in SABP Appendix D~~Section 11.2.4.1~~.

$DevReplOblig_{xt}$ is total deviation Replacement Reserve in Zone x for Settlement Period t.

$ReplObligTotal_{xt}$ is total Replacement Reserve Obligation in Zone x for Settlement Period t.

Remaining Replacement Reserve for Scheduling Coordinator j in Zone x for Settlement Period t is calculated as follows:

$$RemRepl_{xjt} = \frac{MeteredDemand_{jxt}}{TotalMeteredDemand_{xt}} * TotalRemRepl_{xt}$$

where:

$MeteredDemand_{jxt}$ is the Scheduling Coordinator's total metered Demand excluding exports in Zone x for Settlement Period t.

$TotalMeteredDemand_{xt}$ is total metered Demand excluding exports in Zone x for Settlement Period t.

$TotalRemRepl_{xt} = Max[0, ReplObligTotal_{xt} - DevReplOblig_{xt}]$

* * *

APPENDIX D

IMBALANCE ENERGY CHARGE COMPUTATION

D 1 Purpose of charge

The Imbalance Energy charge is the term used for allocating the cost of not only the Imbalance Energy (the differences between scheduled and actual Generation and Demand), but also any Unaccounted for Energy (UFE) and any errors in the forecasted Transmission Losses as represented by the GMMs. Any corresponding cost of Dispatched Replacement Reserve Capacity that is not allocated as an Ancillary Service is also included along with the Imbalance Energy charge.

D 2 Fundamental formulae

D 2.1.1 Uninstructed Imbalance Energy Charges on Scheduling Coordinators

Uninstructed Imbalance Energy attributable to each Scheduling Coordinator in each Settlement Period in the relevant Zone shall be deemed to be sold or purchased, as the case may be, by the ISO and charges or payments for Uninstructed Imbalance Energy shall be settled by debiting or crediting, as the case may be, the Scheduling

Coordinator with an amount for each BEEP Interval of each Settlement Period calculated in accordance with the following formulae:

$$DevC = \sum_i GenDevC_i + \sum_i LoadDevC_i + \sum_q ImpDevC_q + \sum_q ExpDevC_q + UFEC$$

$$ASSEDevC = \sum_i ASSEGenDevCi + \sum_i ASSELoadDevCi + \sum_q ASSEImpDevCq$$

$$DevC_{bjxt} = NetDev_{bjxt} * BIP_{bxt}$$

~~Where:~~

$$\cancel{NetDev_{bjxt} = \left[\sum_i GenDev_{bixt} - \sum_i LoadDev_{bixt} + \sum_q ImpDev_{bq-xt} - \sum_q ExpDev_{bq-xt}\right]}$$ ~~If $NetDev_{bjxt}$ < 0, then~~

~~BIP_{bxt} = BEEP Interval Price for decremental Energy for BEEP Interval b in Settlement Period t.~~

~~If $NetDev_{bjxt}$ > 0, then~~

~~BIP_{bxt} = BEEP Interval Price for incremental Energy in Zone x for BEEP Interval b in Settlement Period t.~~

~~The deviation quantity between scheduled and actual Energy Generation for Generator i represented by Scheduling Coordinator j in Zone x during each BEEP Interval b of each Settlement Period t is calculated as follows:~~

$$\cancel{GenDev_{ixbt} = \left[\left(G_{sb}\right)*GMM_f - \left[\left(G_a - G_{b,adj}\right)*GMM_a - G_{b,a/s} - G_{b,s/e}\right] - \frac{UnavailAncServMW_{bx}}{HBI}\right]}$$

$$NetDev_{bjxt} = \left(\begin{array}{l} \sum_{i \in SC_j} GenDev_{bixt} - \sum_{i \in SC_j} LoadDev_{bixt} + \\ \sum_{q \in SC_j} ImpDev_{bqxt} - \sum_{q \in SC_j} ExpDev_{bqxt} \end{array}\right)$$

Where P_{bxt} is the BEEP Interval Price for Imbalance Energy in Zone x during BEEP Interval b in Settlement Period t.

The deviation quantity between scheduled and actual Energy Generation for Generator i represented by Scheduling Coordinator j in Zone x during BEEP Interval b of Settlement Period t is calculated as follows:

$$GenDev_{bixt} = GenDev'_{bixt} + UnavailAncServMW_{bixt}$$
$$GenDev'_{bixt} = G_{s,bixt} * GMM_{f,ixt} - \left[\left(G_{a,bixt} - G_{adj,bixt}\right) * GMM_a - G_{a/s,bixt} - G_{s/e,bixt}\right]$$

Where:

If the BEEP Interval Ex Post Price ~~for decremental Energy~~ is negative or zero, then:

~~$UnavailAncServMW_{ix}$~~ $UnavailAncServMW_{bixt}$ = 0

If the BEEP Interval Ex Post Price ~~for decremental Energy is greater than or equal to zero~~is positive, then:

$$UnavailAncServMW_{bixt} = \max\left(0, \min\left(-GenDev'_{bixt}, G_{a,bixt} * GMM_{a,ixt} - \left[\frac{P_{\max,ixt}}{HBI} * GMM_{a,ixt} - \max\left(0, \frac{G_{oblig,ixt}}{HBI} - G_{a/s,bixt}\right)\right]\right)\right)$$

~~$UnavailAncServMW_{ix} = Max[-(G_{i,oblig} - G_{a/s*6}) Min[0, Pmax - G_{a*6} - (G_{i,oblig} - G_{a/s}*6)]]$~~

The value of $G_{a,bixt}$ for Generation scheduled on behalf of Participating Generators for each BEEP Interval in each Settlement Period shall be the actual meter data aggregated on a 10-minute basis. The value of $G_{s,bixt}$ for Generation scheduled on behalf of Participating Generators for each BEEP Interval in each Settlement Period shall be determined as follows for BEEP Intervals 2 through 5:

$$G_{s,bixt} = \frac{G_{s,ixt}}{HIB}$$

~~$$G_{s,b} = \frac{G_s}{6}$$~~

For BEEP Interval 1 and BEEP Interval 6, implicit Dispatch instructions for ramping will be applied to adjust the Schedules attributed to those BEEP Intervals as follows:

$$G_{s,6ixt} = \left(\frac{G_{s,ixt}}{HIB}\right) - \left(\frac{\left(G_{s,ixt+1} - G_{s,ixt}\right)}{4\,HIB}\right)$$

The value of $G_{s,bit}$ and $G_{a,bit}$ for Generation which has not undertaken in writing to be bound by the ISO Tariff in accordance with Article 5 shall be determined as follows for all six BEEP Intervals:

$$G_{s,bixt} = \frac{G_{s,ixt}}{HIB}$$

$$G_{a,bixt} = \frac{G_{a,ixt}}{HIB}$$

The deviation quantity between scheduled and actual Load consumption for Load i represented by Scheduling Coordinator j in Zone x during BEEP Interval b of Settlement Period t is calculated as follows:

$$LoadDev_{bixt} = LoadDev'_{bixt} - UnavailDispLoadMW_{bixt}$$
$$LoadDev'_{bixt} = L_{s,bixt} - \left(L_{a,bixt} - L_{adj,bixt} + L_{a/s,bixt} + L_{s/e,bixt}\right)$$

Where:

If the BEEP Interval Ex Post Price for decremental Energy is negative or zero, then:

$UnavailDispLoadMW_{bixt} = 0$

If the BEEP Interval Ex Post Price for Imbalance Energy is positive, then:

$$UnavailDispLoadMW_{bixt} =$$

$$\max\left(0, \min\left(LoadDev'_{bixt}, \max\left(0, \frac{L_{\text{oblig},ixt}}{HBI} - L_{\text{a/s},bixt}\right) - L_{a,bixt}\right)\right)$$

The value of $L_{a/s,bixt}$, $L_{s/e,bixt}$ and $L_{\text{adj},bixt}$ are determined on a 10-minute basis. The value of L_a for Load scheduled on behalf of Participating Loads for each BEEP Interval in each Settlement Period shall be the actual meter data aggregated on a 10-minute basis. The value of $L_{s,bixt}$ for Load scheduled on behalf of Participating Loads for each BEEP Interval in each Settlement Period t, shall be determined as follows:

For BEEP Intervals 2 through 5,

$$L_{s,bit} = \frac{L_{s,it}}{HIB}$$

$$\cancel{G_{s,1} = \left(\frac{G_s}{6}\right) - \left(\frac{(G_s - G_{s-1})}{24}\right)}$$

$$\cancel{G_{s,6} = \left(\frac{G_s}{6}\right) + \left(\frac{(G_{s+1} - G_s)}{24}\right)}$$

~~The value of G_s and G_a for Generation which has not undertaken in writing to be bound by the ISO Tariff in accordance with Article 5 shall be determined as follows for all six BEEP Intervals:~~

$$\cancel{G_{s,b} = \frac{G_{s,t}}{6}}$$

$$\cancel{G_a = \frac{G_{at}}{6}}$$

~~The deviation quantity between scheduled and actual Load consumption for Load i represented by Scheduling Coordinator j in Zone x for each BEEP Interval of each Settlement Period t is calculated as follows:~~

$$\cancel{LoadDev_{ibxt} = L_{sb} - \left[\left(L_a - L_{b,adj}\right) + L_{b,a/s} + L_{b,s/e} - \frac{UnavailDispLoadMW_{bx}}{HBI}\right]}$$

~~Where;~~

~~If the BEEP Interval Ex Post Price for decremental Energy is negative, then:~~

$$\cancel{UnavailDispLoadMW_{ix} = 0}$$

~~If the BEEP Interval Ex Post Price for decremental Energy is greater than or equal to zero, then:~~

$$\cancel{UnavailDispLoadMW_{ix} = Max[0, [((L_{i,\,oblig}) - L_{a/s}*6) - (L_a*6]]}$$

~~The value of $L_{b,a/s}$, $L_{b,s/e}$ and L_{adj} are determined on a 10-minute basis. The value of L_a for Load scheduled on behalf of Participating Loads for each BEEP Interval in each Settlement Period shall be the actual meter data aggregated on a 10-minute basis. The value of L_{sb} for Load scheduled on behalf of Participating Loads for each BEEP Interval in each Settlement Period t, shall be determined as follows:~~

~~For BEEP Intervals 2 through 5,~~

$$\cancel{L_{sb} = \frac{L_s}{6}}$$

For BEEP Interval 1 and BEEP Interval 6, implicit Dispatch instructions for ramping will be applied to adjust the schedules attributed to those BEEP Intervals as follows:

$$L_{s,1ixt} = \left(\frac{L_{s,ixt}}{HIB}\right) - \left(\frac{\left(L_{s,ixt} - L_{s,ixt-1}\right)}{4\,HIB}\right)$$

$$L_{s,6ixt} = \left(\frac{L_{s,ixt}}{6}\right) + \left(\frac{\left(L_{s,ixt+1} - L_{s,ixt}\right)}{4\,HIB}\right)$$

$$\cancel{L_{s,1} = \left(\frac{L_s}{6}\right) - \left(\frac{\left(L_s - L_{s-1}\right)}{24}\right)}$$

$$\cancel{L_{s,6} = \left(\frac{L_s}{6}\right) + \left(\frac{\left(L_{s+1} - L_s\right)}{24}\right)}$$

The value of ~~L_{sb}~~ $L_{s,bixt}$ and ~~L_a~~ $L_{a,bixt}$ for Loads that are not Participating Loads shall be determined as follows for all six BEEP Intervals:

$$L_{s,bixt} = \frac{L_{s,ixt}}{HIB}$$

$$L_{a,bixt} = \frac{L_{a,ixt}}{HIB}$$

$$\cancel{L_{sb} = \frac{L_S}{6}}$$

$$\cancel{L_a = \frac{L_{at}}{6}}$$

Where ~~L_{at}~~ $L_{a,ix}$ is Load i hourly metered quantity for Settlement Period t.

The deviation quantity between forward scheduled and Real Time adjustments to Energy imports*, adjusted for losses, for Scheduling Point q represented by Scheduling Coordinator j into ~~zone~~ Zone x during each BEEP Interval b of each Settlement Period t is calculated as follows:

$$ImpDev_{bqxt} = I_{s,bqxt} * GMM_{f,qxt} - \left(I_{a,bqxt} - I_{adj,bqxt} + I_{a/s,bqxt}\right) * GMM_{a,qxt} + I_{a/s,bqxt} * GMM_{a,qxt}$$

$$\cancel{ImpDev_q = I_{sb} * GMM_{fq} - [(I_a + I_{b,a/s} - I_{b,adj}) * GMM_{ahq}] + I_{b,a/s}}$$

The values of $I_{a/s,bqxt}$, $I_{a,bqxt}$ and $I_{adj,bqxt}$ ~~$I_{b,a/s}$, I_a and $I_{b,adj}$~~ are determined on a 10-minute basis. The value of $I_{s,bqxt}$ in all BEEP Intervals ~~I_{sb}~~ shall be determined as follows:

$$I_{s,bqxt} = \frac{I_{s,qxt}}{HIB}$$

The deviation quantity between forward scheduled and Real Time adjustments to Energy exports* for Scheduling Point q represented by Scheduling Coordinator j from Zone x during BEEP Interval b for Settlement Period *t* is calculated as follows:

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* Note that this deviation is a difference between a forward Market value and a Real Time value. It is not inadvertent energy.

$$ExpDev_{bqxt} = E_{s,bqxt} - E_{a,bqxt} - E_{\mathrm{adj},bqxt}$$

The values of $E_{a,bqxt}$ and $E_{\mathrm{adj},bqxt}$ are determined on a 10-minute basis. The value of $E_{s,qit}$ in all BEEP Intervals shall be determined as follows:

$$E_{s,bqxt} = \frac{E_{s,qxt}}{HIB}$$

~~For BEEP Intervals 1 through 6,~~

$$\cancel{I_{sb} = \frac{I_s}{6}}$$

~~The deviation quantity between forward scheduled and Real Time adjustments to Energy exports* for Scheduling Point q represented by Scheduling Coordinator j from Zone x for each BEEP Interval for each Settlement Period *t* is calculated as follows:~~

$$\cancel{ExpDev_q = E_{s,b} - E_a - E_{adj,b}}$$

~~The values of E_a and $E_{b,adj}$ are determined on a 10-minute basis. The value of $E_{s,b}$ shall be determined as follows:~~

~~For BEEP Intervals 1 through 6,~~

$$\cancel{E_{sb} = \frac{E_s}{6}}$$

~~The Hourly Ex Post Price applicable to uninstructed deviations in Settlement Period t in each zone will equal the Energy weighted average of the BEEP Interval charges in each zone, calculated as follows:~~

$$\cancel{P_{xt} = \frac{(\sum_{ji} |MWh_{jix}| * BIP_{ix})}{\sum_{ji} |MWh_{jix}|}}$$

~~Where:~~

~~*BIP_{ix}* = BEEP Interval Ex Post Prices to be used for settlement of Uninstructed Imbalance Energy. The BEEP Interval Price for incremental Energy will be charged to decremental uninstructed deviations in that interval, and the BEEP Interval Price for incremental Energy will be charged to incremental uninstructed deviations in that interval.~~

~~*P xt* = the Hourly Ex Post Price in Zone x~~

~~*MWH jix* = the Instructed Imbalance Energy for Scheduling Coordinator j for the BEEP Interval i in Zone *x*~~

D 2.1.2 Instructed Imbalance Energy Charges on Scheduling Coordinators

Implicit Dispatch instructions for ramping Energy shall be calculated based on Final Hour Ahead Schedules for Energy to result in a linear ramp by all Participating Generators and Participating Loads beginning 10 minutes prior to the start, and ending 10 minutes after the start of each Settlement Period. Ramping Energy shall be deemed delivered and settled at a price of zero dollars per MWh.

The amount of Instructed Imbalance Energy to be delivered in each BEEP Interval will be determined based on the ramp rates and time delays bid in accordance with SBP 5 and 6 and shall be deemed delivered to the ISO Controlled Grid. Any excess delivery or shortfall will be accounted for as Uninstructed Imbalance Energy. Payment due a Load, Generator, Import or Export for Instructed Imbalance Energy to be delivered in a

BEEP Interval shall be calculated based on the actual Energy delivered to the ISO Grid in accordance with the Dispatch instruction.

Instructed Imbalance Energy in each BEEP Interval shall be paid, if positive, or charged, if negative, the corresponding BEEP Interval Ex Post Price. ~~Instructed Imbalance Energy by an Import or Export is deemed delivered. The actual Energy delivered by a Load or Generator in response to Dispatch instructions will be determined by first attributing Energy deviations to any Energy associated with redispatch of that Load or Generation in that BEEP Interval according to Section 7.2.6.2, or to Dispatch orders to be settled in accordance with Section 11.2.4.2. If instructions for both incremental and decremental Energy are issued in a BEEP Interval, then any instructions described in the previous sentence for decremental Energy, together with any decremental Dispatch instructions on Supplemental Energy, shall be deemed delivered.~~

Due to ramp rate limitations, resources responding to Dispatch Instructions that revert partially or wholly Dispatch Instructions issued earlier within the same hour may generate or consume Instructed Imbalance Energy bid at prices higher or lower than the BEEP Interval Ex Post Price, respectively. This residual ~~Any remaining deviation will then be sequentially attributed to~~ Instructed Imbalance Energy which may cross hourly boundaries~~, first from Supplemental Energy, then from Replacement Reserve, then from Non-Spinning Reserve, and then from Spinning Reserve in that BEEP Interval.~~

~~Residual Instructed Imbalance Energy arising due to Dispatch instructions~~ shall be priced based on the applicable BEEP Interval Ex Post Price for the BEEP Interval to which the original Dispatch instruction applied. ~~If Instructed Imbalance Energy is to be delivered in the last BEEP Interval of the hour preceeding the Settlement Period to which a Dispatch instruction applies shall be settled at the applicable BEEP Interval Ex Post Price for the first BEEP Interval of the Settlement Period for which the bid was submitted.~~

Subject to the above conditions, the Instructed Imbalance Energy charge for each BEEP Interval b of each Settlement Period t for Scheduling Coordinator j for Zone x is calculated using the following formulas:

The instructed Generation deviation payment/charge is calculated as follows:

$IGDC_{ib} = G_{ib} * P_b$

$\cancel{IGDC_{ib} = G_{ib} * P_b}$

The instructed Load deviation payment/charge is calculated as follows:

$$ILDC_{bixt} = -\left(L_{a/s,bixt} + L_{se,bixt}\right) * P_{bxt} \quad \cancel{ILDC_{ib} = L_{ib} * P_b}$$

The instructed import deviation payment/charge is calculated as follows:

$$IIDC_{bqxt} = -\left(I_{a/s,bqxt} + I_{se,bqxt}\right) * P_{bxt} \quad \cancel{IIDC_{qb} = I_{qb} * P_b}$$

D 2.2 Unaccounted for Energy Charge

The Unaccounted for Energy Charge on Scheduling Coordinator j for each BEEP Interval b of each Settlement Period t for each relevant Zone is calculated in the following manner:

The UFE for each utility service territory *k* is calculated as follows,

$$UFE_{UDC,bkt} = \sum_{q \in UDC_k} I_{a,bqxt} - \sum_{q \in UDC_k} E_{a,bqxt} + \sum_{i \in UDC_k} G_{a,bixt} - \sum_{i \in UDC_k} L_{a,bixt} - TL_{bkt}$$

$$E_{UFE\_UDC\_k} = \left(I_k - E_k + G_k - \left(RTM_k + LPM_k\right) - TL_k\right)$$

~~The Transmission Loss calculation for each BEEP Interval of each Settlement Period t per relevant Zone for each utility service territory k is calculated as follows,~~

$$TL_k = Total\_TLRC_{Losses} * (UDC_k\_Branch_{Losses} / Total\_Branch_{Losses})$$

~~Where:~~

$$Total\_TLRC_{Losses} = \sum\left[G_a * \left(1 - GMM_a\right)\right] + \sum\left[I_a\left(1 - GMM_{aq}\right)\right]$$

$$Total\_Branch_{Losses} = \frac{\left(\sum UDC_k - Branch_{Losses}\right)}{6}$$

~~Each metered demand point, either ISO grid connected or connected through a UDC, is allocated a portion of the UFE as follows:~~

$$E_{UFE\_z} = \frac{D_z}{\sum_z D_z} E_{UFE\_UDC\_k}$$

~~The UFE charge for Scheduling Coordinator j for each BEEP Interval b of each Settlement Period t per relevant Zone is then,~~

$$UFEC_j = (\sum_z E_{UFE\_z}) * BIP_{bxt}$$

~~**D 3 Meaning of terms of formulae**~~

~~**D 3.1 IEC_j – $**~~

~~The Imbalance Energy charge on Scheduling Coordinator j in Trading Interval t for each relevant Zone.~~

~~**D 3.2 $GenDev_i$ – MWh**~~

~~The deviation between scheduled and actual Energy Generation for Generator i represented by Scheduling Coordinator j in Zone x during Trading Interval t.~~

~~**D 3.3 $LoadDev_i$ – MWh**~~

~~The deviation between scheduled and actual Load consumption for Generator i represented by Scheduling Coordinator j in Zone x during Trading Interval **t.**~~

~~**D 3.4 $ImpDev_q$ – MWh**~~

~~The deviation between forward scheduled and Real Time adjustments to Energy imports, as adjusted for losses, for Scheduling Point q represented by Scheduling Coordinator j into Zone x during Trading Interval t.~~

~~**D 3.5 $ExpDev_q$ – MWh**~~

~~The deviation between forward scheduled and Real Time adjustments to Energy exports for Scheduling Point q represented by Scheduling Coordinator j~~

~~from Zone x during Trading Interval t.~~

~~**D 3.6**~~ ~~**G_s – MWh**~~

~~The total scheduled Generation of Scheduling Coordinator j for Generator i in Settlement Period t as a result of both the Day-Ahead Final Schedule and the Hour-Ahead Final Schedule.~~

~~**D 3.6.1**~~ ~~**G_{s-1}**~~

~~The total scheduled Generation of Scheduling Coordinator j for Generator i in settlement Period t-1 as a result of both the Day-Ahead Final Schedule and the Hour-Ahead Final Schedule.~~

~~**D 3.6.2**~~ ~~**G_{s+1}**~~

~~The total scheduled Generation of Scheduling Coordinator j for Generator i in settlement Period t+1 as a result of both the Day-Ahead Final Schedule and the Hour-Ahead Final Schedule.~~

~~**D 3.6.3**~~ ~~**$G_{b,adj}$**~~

~~Is Deviation in real time ordered by the ISO in BEEP Interval b according to Section 7.2.6.2, or for settlement according to Section 11.2.4.2.~~

~~**D 3.7**~~ ~~**G_{at} - MWh**~~

~~The total actual metered Generation of Scheduling Coordinator j for Generator i in Settlement Period t.~~

~~**D 3.8**~~ ~~**G_{adj} – MWh**~~

~~Deviations in real time ordered by the ISO for purposes such as Congestion Management.~~

~~**D 3.9**~~ ~~**$G_{a/s}$ – MWh**~~

~~The Energy generated from Ancillary Service resource i due to ISO dispatch instructions. This value will be calculated based on the projected impact of the Ancillary Services dispatch instruction(s) over the time period within the Trading Interval for which such Ancillary Services dispatch instruction(s) applies.~~

~~**D 3.9.1**~~ ~~**$G_{s/e}$ -MWh**~~

~~The Energy generated from Supplemental Energy resource i due to ISO dispatch instructions. This value will be calculated based on the projected impact of the Supplemental Energy dispatch instruction(s) over the time period within the Trading Interval for which such Supplemental Energy dispatch instruction(s) applies.~~

~~**D 3.10**~~ ~~**GMM_f – fraction**~~

~~The forecasted Generation Meter Multiplier (GMM) for Generator i as provided to the Scheduling Coordinator by the ISO in advance of the operation of the Day-Ahead Market.~~

~~**D 3.11**~~ ~~**GMM_{fq} – fraction**~~

~~The forecasted Generation Meter Multiplier for an Energy import at Scheduling Point q as provided to the Scheduling Coordinator by the ISO in advance of the Day-Ahead Market.~~

~~**D 3.12 GMM_{ah} – fraction**~~

~~The final forecasted Generation Meter Multiplier (GMM) for a Generator i as calculated by the ISO at the hour-ahead stage (but after close of the Hour-Ahead Market).~~

~~**D 3.13 GMM_{ahq} – fraction**~~

~~The forecasted Generation Meter Multiplier for an Energy import at Scheduling Point q as provided to the Scheduling Coordinator by the ISO after close of the Hour-Ahead Market.~~

~~**D 3.14 L_s – MWh**~~

~~The total scheduled Demand of Scheduling Coordinator j for Demand i in Settlement Period t as a result of both the Day-Ahead Final Schedule and the Hour-Ahead Final Schedule.~~

~~**D 3.15 L_a – MWh**~~

~~The total actual metered Demand of Scheduling Coordinator j for Demand i in BEEP Interval b of Settlement Period t.~~

~~**D 3.15.1 L_{at} – MWh**~~

~~The total actual metered Demand of Scheduling Coordinator j for Demand i in Settlement Period t.~~

~~**D 3.15.2 $L_{b,adj}$**~~

~~Is Deviation in real time ordered by the ISO in BEEP Interval b according to Section 7.2.6.2, or for settlement according to Section 11.2.4.2.~~

~~**D 3.16 [Not Used]**~~

~~**D 3.17 $L_{a/s}$ – MWh**~~

~~The Energy reduction by curtailable Load due to ISO dispatch of Ancillary Services from such curtailable Load (i.e., Load bidding into the Ancillary Services markets). This value will be calculated based on the projected impact of the Ancillary Services dispatch instruction(s) over the time period within the Trading Interval for which such Ancillary Services dispatch instruction(s) applies.~~

~~**D 3.17.1 $L_{s/e}$ -MWh**~~

~~The Energy reduction by curtailable Load due to ISO dispatch of Supplemental Energy from such curtailable Load. This value will be calculated based on the projected impact of the Supplemental Energy dispatch instruction(s) over the time period within the Trading Interval for which such Supplemental Energy dispatch instruction(s) applies.~~

The Transmission Loss TL_{bkt} for BEEP Interval b of Settlement Period t for utility service territory k is calculated as follows:

$$TL_{bkt} = \left(\sum_i \left[G_{a,bixt} * (1 - GMM_{a,ixt}) \right] + \sum_q \left[I_{a,bqxt} * (1 - GMM_{a,qxt}) \right] \right) * \frac{PFL_{kt}}{\sum_k PFL_{kt}}$$

Where PFL_{kt} are the transmission losses for utility service territory k as calculated by a power flow solution for Settlement Period t, consistent with the calculation of final forecasted Generation Meter Multipliers.

Each metered demand point z in utility service territory k, either ISO grid connected or connected through UDC k, is allocated a portion of the UFE as follows:

$$UFE_{bixt} = UFE_{UDC,bkt} * \frac{L_{bixt}}{\sum_{i \in UDC_k} L_{bixt}}$$

The UFE charge for Scheduling Coordinator j for BEEP Interval b of Settlement Period t in Zone x is calculated as follows:

$$UFEC_{jxt} = \left(\sum_{i \in SC_j} UFE_{bixt} \right) * P_{bxt}$$

D 2.3 Hourly Ex Post Price

The Hourly Ex Post Price in Zone x in Settlement Period t is determined as follows:

$$HP_{xt} = \frac{\sum_b |Q_{bxt}| P_{bxt}}{\sum_b |Q_{bxt}|}$$

Where Q_{bxt} is the total Instructed Imbalance Energy during BEEP Interval b in Zone x in Settlement Period t.

D 3 Meaning of terms in the formulae

D 3.1 $DevC_{bjxt}$ – $

The Uninstructed Imbalance Energy charge on Scheduling Coordinator j during BEEP Interval b in Settlement Period t in Zone x.

D 3.2 $GenDev_{bixt}$ – MWh

The deviation between scheduled and actual Energy Generation for Generator i in Zone x during BEEP Interval b in Settlement Period t.

D 3.3 $LoadDev_{bixt}$ – MWh

The deviation between scheduled and actual Load consumption for Load i in Zone x during BEEP Interval b in Settlement Period t.

D 3.4 $ImpDev_{bqxt}$ – MWh

The deviation between forward scheduled and Real Time adjustments to Energy imports, as adjusted for losses, for Scheduling Point q in Zone x during BEEP Interval b in Settlement Period t.

D 3.5 $ExpDev_{bqxt}$ – MWh

The deviation between forward scheduled and Real Time adjustments to Energy exports for Scheduling Point q in Zone x during BEEP Interval b in Settlement Period t.

D 3.6 $G_{s,ixt}$ – MWh

The scheduled Generation of Generator i in Zone x in Settlement Period t as a result of both the Day-Ahead Final Schedule and the Hour-Ahead Final Schedule.

D 3.6.1 $G_{s,ixt-1}$ – MWh

The scheduled Generation of Generator i in Zone x in Settlement Period t–1 as a result of both the Day-Ahead Final Schedule and the Hour-Ahead Final Schedule.

D 3.6.2 **$G_{s,ixt+1}$ – MWh**

The scheduled Generation of Generator i in Settlement Period t+1 as a result of both the Day-Ahead Final Schedule and the Hour-Ahead Final Schedule.

D 3.6.3 **$G_{adj,bixt}$ – MWh**

The Deviation of Generator i in Zone x ordered by the ISO in BEEP Interval b in Settlement Period t according to Section 7.2.6.2, or for settlement according to Section 11.2.4.2.

D 3.7 **$G_{a,bixt}$ – MWh**

The total actual metered Generation of Generator i in Zone x during BEEP Interval b in Settlement Period t.

D 3.8 **$G_{oblig,ixt}$ – MWh**

The total Spinning, Non-Spinning, and Replacement Reserve committed capacity of Generator i in Zone x in Settlement Period t, as reflected in the final Ancillary Services Schedules.

D 3.9 **$G_{a/s,bixt}$ – MWh**

The Energy generated from Ancillary Service resource i in Zone x due to ISO dispatch instructions. This value will be calculated based on the expected Instructed Imbalance Energy during BEEP Interval b in Settlement Period t for which such Ancillary Services dispatch instruction(s) applies.

D 3.9.1 **$G_{s/e,bixt}$ –MWh**

The Energy generated from Supplemental Energy resource i in Zone x due to ISO dispatch instructions. This value will be calculated based on the expected Instructed Imbalance Energy during BEEP Interval b in Settlement Period t for which such Supplemental Energy dispatch instruction(s) applies.

D 3.10 **$GMM_{f,ixt}$ – fraction**

The forecasted Generation Meter Multiplier (GMM) for Generator i in Zone x in Settlement Period t as provided to the Scheduling Coordinator by the ISO in advance of the operation of the Day-Ahead Market.

D 3.11 **$GMM_{f,qxt}$ – fraction**

The forecasted Generation Meter Multiplier for an Energy import at Scheduling Point q in Zone x in Settlement Period t as provided to the Scheduling Coordinator by the ISO in advance of the Day-Ahead Market.

D 3.12 **$GMM_{a,ixt}$ – fraction**

The final forecasted Generation Meter Multiplier (GMM) for a Generator i in Zone x in Settlement Period t as calculated by the ISO at the hour-ahead stage (but after close of the Hour-Ahead Market).

D 3.13 **$GMM_{a,qxt}$ – fraction**

The forecasted Generation Meter Multiplier for an Energy import at Scheduling Point q in Zone x in Settlement Period t as provided to the Scheduling Coordinator by the ISO after close of the Hour-Ahead Market.

D 3.14 **$L_{s,bixt}$ – MWh**

The scheduled Demand of Demand i in Zone x during BEEP Interval b in Settlement Period t as a result of both the Day-Ahead Final Schedule and the Hour-Ahead Final Schedule.

D 3.15 **$L_{a,bixt}$ – MWh**

The actual metered Demand of Demand i in Zone x during BEEP Interval b in Settlement Period t.

D 3.15.1 **$L_{a,ixt}$ – MWh**

The actual metered Demand of Demand i in Zone x in Settlement Period t.

D 3.15.2 **$L_{adj,bixt}$**

The Deviation of Demand i in Zone x ordered by the ISO in BEEP Interval b in Settlement Period t according to Section 7.2.6.2, or for settlement according to Section 11.2.4.2.

D 3.16 **$L_{oblig,ixt}$**

The total Non-Spinning and Replacement Reserve committed capacity of Load i in Zone x in Settlement Period t, as reflected in the final Ancillary Services Schedules.

D 3.17 **$L_{a/s,bixt}$ – MWh**

The Energy reduction by curtailable Load i in Zone x due to ISO dispatch of Ancillary Services from such curtailable Load (i.e., Load bidding into the Ancillary Services markets). This value will be calculated based on the expected Instructed Imbalance Energy during BEEP Interval b in Settlement Period t for which such Ancillary Services dispatch instruction(s) applies.

D 3.17.1 **$L_{s/e,bixt}$ – MWh**

The Energy reduction by curtailable Load i in Zone x due to ISO dispatch of Supplemental Energy from such curtailable Load. This value will be calculated based on the projected impact of the expected Instructed Imbalance Energy during BEEP Interval b in Settlement Period t

D 3.18 **$I_{s,qxt}$ – MWh**

The total scheduled Energy import of Scheduling Coordinator j through Scheduling Point q in Settlement Period t as a result of both the Day-Ahead Final Schedule and the Hour-Ahead Final Schedule.

D 3.19 **$I_{a,bqxt}$ – MWh**

The total actual Energy import of Scheduling Coordinator j through Scheduling Point q in BEEP Interval b during BEEP Interval b in Settlement Period t. This is deemed to be equal to the ~~total~~ scheduled Energy ~~import I_s~~ over the same interval.

D 3.20 **$I_{\cancel{b,adj}\,adj,bqxt}$ – MWh**

The deviation in real time import of Scheduling Coordinator j through Scheduling Point q in BEEP Interval b during BEEP Interval b in Settlement Period t ordered by the ISO for congestion management, overgeneration, etc. or a result of an import curtailment. This value will be calculated based on the projected impact of the Dispatch instruction(s) (or curtailment event) between the close of the Hour-Ahead Market and the end of the ~~Trading~~ BEEP Interval for which such Dispatch Instructions(s) (or curtailment event) applies.

D 3.21 **$I_{a/s,bqxt}$ – MWh**

The Energy generated from Ancillary Service System Resources of Scheduling Coordinator j through Scheduling Point q in BEEP Interval b during BEEP Interval b in Settlement Period t pursuant to Existing Contracts or Supplemental Energy from interties due to ISO's Dispatch instruction.

D 3.22 **$E_{s,qxt}$ – MWh**

The total scheduled Energy export of Scheduling Coordinator j through Scheduling Point q in Settlement Period t as a result of both the Day-Ahead Final Schedule and the Hour-Ahead Final Schedule.

D 3.23 **$E_{a,bqxt}$ – MWh**

The total actual Energy export of Scheduling Coordinator j through Scheduling Point q in BEEP Interval b of Settlement Period t. This is deemed to be equal to the total scheduled Energy export ~~E_s~~during the same interval.

D 3.24 **$E_{adj,bqxt}$ – MWh**

The deviation in Real Time export of Scheduling Coordinator j through Scheduling Point q in BEEP Interval b during BEEP Interval b in Settlement Period t ordered by the ISO for Congestion Management, Overgeneration, etc. or as a result of an export curtailment. This value will be calculated based on the projected impact of the Dispatch Instruction(s) (or curtailment event) between the close of the Hour-Ahead Market and the end of the ~~Trading~~ BEEP Interval for which such Dispatch Instruction (or curtailment event) applies.

D 3.25 **~~P_{xt}~~ P_{bxt} – $/MWh**

The ~~Hourly~~ Ex Post Price for Imbalance Energy ~~for the relevant Trading Interval. This value is calculated as the weighted average of the 12 Five Minute Ex Post Prices in each Zone during each hour. The Five Minute Ex Post Price is equal to the bid price of the marginal resource accepted by the ISO for dispatch and deemed eligible to set the price during a five minute period.~~in Zone x during BEEP Interval b in Settlement Period t.

D 3.25.1 **[Not Used]~~P_{eff} – $~~**

~~Effective Price for Instructed Imbalance Energy for the relevant Settlement Period.~~

D 3.26 **$UFEC_{jxt}$ – $**

The Unaccounted for Energy Charge for Scheduling Coordinator j ~~is the cost representing the difference in Energy, for each UDC Service Area and Trading Interval,~~ in Zone x in Settlement Period t. It is the cost for the Energy difference between the net Energy delivered into ~~the~~ each UDC Service Area, adjusted for UDC Service Area Transmission Losses (calculated in accordance with ISO Tariff Section 7.4.3), and the total metered Demand within ~~the~~ that UDC Service Area adjusted for distribution losses using Distribution System loss factors approved by the Local Regulatory Authority.

This Energy difference (UFE) ~~which is attributable~~ is attributed to meter measurement errors, power flow modeling errors, energy theft, statistical Load profile errors, and distribution loss deviations ~~is multiplied by the Hourly Ex-Post Price~~.

D 3.27 **$UFE_{UDC,bkt}$ ~~$E_{UFE\_UDC\_k}$~~ – MWh**

The Unaccounted for Energy (UFE) for utility service territory k.

D 3.28 **~~E_{UFE_z}~~ UFE – MWh**

The portion of Unaccounted for Energy (UFE) allocated to metering point z.

D 3.29 **[Not Used]**~~**RRDC**$_j$~~

~~The Replacement Reserve Capacity Dispatch Charge for Scheduling Coordinator j for Trading Interval t.~~

D 3.30 **[Not Used]**~~**RRC – $**~~

~~The Dispatched Replacement Reserve Capacity Cost which is to be allocated to Scheduling Coordinators in proportion to their contributions to Imbalance Energy requirements. The RRC is, in turn, calculated as the total cost of Replacement Reserve capacity in Trading Interval t (as determined in the Hour-Ahead and Day-Ahead Markets) less the Undispatched Replacement Reserve Capacity Cost. [Note: Both these costs are dealt with in the Ancillary Services payments in Appendix C]~~

D 3.31 **[Not Used]**~~**G**$_k$ **– MWh**~~

~~The total metered Generation in BEEP Interval b of Settlement Period t in utility service territory k.~~

D 3.32 **[Not Used]**~~**D**$_z$ **– MWh**~~

~~The Demand including Exports in BEEP Interval b of Settlement Period t at metered point z.~~

D 3.33 **[Not Used]**~~**I**$_k$ **– MWh**~~

~~The total metered imports into utility service territory k in BEEP Interval b of Settlement Period t.~~

D 3.34 **[Not Used]**~~**E**$_k$ **– MWh**~~

~~The total metered exports from utility service territory k in BEEP Interval b of Settlement Period t.~~

D 3.35 **[Not Used]**~~**RTM**$_k$ **– MWh**~~

~~The Trading Interval t total of the real-time metering in utility service territory k in BEEP Interval b of Settlement Period t.~~

D 3.36 **[Not Used]**~~**LPM**$_k$ **– MWh**~~

~~The calculated total of the Load Profile metering in utility service territory k per BEEP Interval b of Settlement Period t.~~

D 3.37 ~~**TL**$_k$~~ **TL**$_{bkt}$ **– MWh**

The Transmission Losses per BEEP Interval b of Settlement Period t in utility service territory k.

D 3.38 **IGDC**$_{bixt}$ **– $**

The Instructed Imbalance Energy payments/charges for Generator i in Zone x during BEEP Interval b in Settlement Period t.~~**IGDC**$_{ib}$ **– $**~~

~~The total of instructed Generation deviation payments/charges for Scheduling Coordinator j in BEEP Interval b of Settlement Period t.~~

D 3.39 **ILDC**$_{bixt}$ **– $**

The Instructed Imbalance Energy payments/charges for Load i in Zone x during BEEP Interval b in Settlement Period t.

~~**ILDC**$_{ib}$ **– $**~~

~~The total of instructed Load deviation payments/charges for Scheduling Coordinator j in BEEP Interval b of Settlement Period t.~~

D 3.40 **$IIDC_{bqxt}$ – $**

The Instructed Imbalance Energy payments/charges for import at Scheduling Point q during BEEP Interval b in Settlement Period t.

~~**$IIDC_{ib}$ - $**~~

~~The total of instructed import deviation payments/charges for Scheduling Coordinator j in BEEP Interval b of Settlement Period t.~~

D 3.41 **[Not Used]** ~~**G_{ib} - MW**~~

~~Instructed Energy for Generating Unit i during BEEP Interval b.~~

D 3.42 **[Not Used]** ~~**L_{ib} - MW**~~

~~Instructed Energy for Load i during BEEP Interval b.~~

D 3.43 **[Not Used]** ~~**I_{iqb} – MW**~~

~~Instructed Energy for import q during BEEP Interval b~~

D 3.44 **[Not Used]** ~~**P_b – $/MWh**~~

~~The BEEP Incremental Ex Post Price for BEEP Interval b if the net instructed Energy for resources is positive, or the BEEP decremental Ex Post Price for BEEP Interval b if the net instructed Energy for resources is negative.~~

D 3.45 **HBI – Number**

The number of BEEP Intervals in Settlement Period t, currently set to 6.

D 3.46 **[Not Used]** ~~**$ReplObligRatio_{jxt}$ – fraction**~~

$$\cancel{ReplObligRatio_{jxt} = \frac{ReplOblig_{jxt}}{\sum_j ReplOblig_{jxt}}}$$

~~where:~~

~~*$ReplOblig_{jxt}$* is the replacement reserve capacity obligation as defined in Appendix C Section 3.67.~~

D 3.47 **[Not Used]** ~~**$G_{i, oblig}$**~~

~~The amount of Spinning Reserve, the amount of Non-Spinning Reserve, and the amount of Replacement Reserve that Generating Unit or System Resource i has been selected to supply to the ISO, as reflected in final Ancillary Services Schedules.~~

D 3.48 **$P_{max,ixt}$ – MW** ~~**$PMax_i$**~~

The maximum capability ~~(in MW)~~ at which Energy and Ancillary Services may be scheduled from the Generating Unit or System Resource i.

D 3.49 **[Not Used]** ~~**$L_{i, oblig}$**~~

~~The amount of Non-Spinning Reserve and Replacement Reserve that dispatchable Load i has been selected to supply to the ISO as reflected in final Ancillary Services schedules for Settlement Period t.~~

NOTICE OF FILING SUITABLE FOR PUBLICATION
IN THE FEDERAL REGISTER

UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

California Independent System Operator Corporation	**)** **)**	**Docket No. ER02-____-___**

Notice of Filing of Amendment No. 42 to the ISO Tariff

[ ]

Take notice that on January 31, 2002, the California Independent System Operator Corporation (ISO) submitted for filing Amendment No. 42 to the ISO Tariff. Amendment No. 42 would modify the Tariff to provide for the following: new provisions to facilitate participation in the ISO markets by eligible intermittent resources (*e.g.,* wind); changes in the allocation for settlement Charge Type 487; Changes in the management of Intra-zonal Congestion; and Changes in the calculation of the Target Price for incremental and decremental Imbalance Energy bids. The ISO requests that each of these modifications be made effective April 1, 2002.

The ISO has served copies of this filing upon the Public Utilities Commission of the State of California, the California Energy Commission, the California Electricity Oversight Board, and on all parties with effective Scheduling Coordinator Service Agreements under the ISO Tariff. In addition, the ISO is posting this filing on the ISO's Home Page.

Any person desiring to be heard or to protest said filing should file a motion to intervene or protest with the Federal Energy Regulatory Commission, 888 First Street, N.E., Washington, D.C. 20426, in accordance with Rules 211 and 214 of the Commission's Rules of Practice and Procedure (18 C.F.R. §§ 385.211, 385.214). All such motions and protests should be filed on or before [ ], 2002. Protests will be considered by the Commission to determine the appropriate action to be taken, but will not serve to make protestants parties to the proceedings. Any person wishing to become a party must file a motion to intervene. Copies of this filing are on file with the Commission and are available for public inspection. This filing may also be viewed on the Internet at <http://www.ferc.gov> using the "RIMS" link, select "Docket#" and follow the instructions (call 202-208-2222 for assistance). Comments, protests, and interventions may be filed electronically via the Internet in lieu of paper. See 18 C.F.R. § 385.2001(a)(1)(iii) and the instructions on the Commission's Internet site under the "e-Filing" link.

CERTIFICATE OF SERVICE

I hereby certify that I have this day served the foregoing document upon the Public Utilities Commission of the State of California, the California Energy Commission, the California Electricity Oversight Board, and on all parties with effective Scheduling Coordinator Service Agreements under the ISO Tariff.

Dated at Folsom, California this 31st day of January, 2002.

____

Margaret A. Rostker
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