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~~ISO protocols.

<p align="center">* * *</p>

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

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:

<p align="center">* * *</p>

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]**

* * *

2.2.17 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~~ ISO protocols 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~~ISO protocols, shall be scheduled and settled as a Generating Unit for the associated Settlement Periods (except that the Forecasting FEE shall apply in such 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 ~~within thirty (30) minutes~~immediately 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. The ISO shall not dispatch such resources in real time for economic trades either between Scheduling Coordinators or within a Scheduling Coordinator portfolio~~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;

(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 ~~economically dispatch~~select the least-cost
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~~ 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~~pay the ISO 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 Units, System Units, Loads ~~or~~and System Resources 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 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 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 ~~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~~ a dispatch price curve, and the BEEP Interval Ex Post Prices for each Zone where congestion exists.

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 ~~Prices~~ Charges in each Zone, calculated as follows:

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

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

Where:

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

BIP_{ix}= BEEP Interval Ex Post Price

J=the number of Scheduling Coordinators with instructed deviations

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

~~Q_{bxt} is the total~~ Instructed Imbalance Energy for Scheduling Coordinator j for the ~~during~~ BEEP Interval ~~b~~ i 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.

* * *

2.5.23.3   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~~$150. Scheduling Coordinators for Generating Units, System Units, and System Resources that submit bids above ~~the applicable NECPL~~$150 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.

* * *

2.5.26.2.1 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]**

<center>* * *</center>

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~~ deliver 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 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 ~~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]**

<div align="center">* * *</div>

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.

~~$EnQInst_{xt}$~~ $EnQUnst_{xt}$ = ~~Instructed~~ Uninstructed 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 ~~Instructed~~ Uninstructed Imbalance Energy under Section 11.2.4.1~~.~~.

$$\sum_i [(EnQUnst_{xt} * HourlyExPostPriceinZoneX) + REPAi_{xt}]$$

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

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~~1

C_{DN} = ~~0~~1

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.

<div align="center">* * *</div>

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:

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

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 ~~SABP Appendix D~~Section 11.2.4.1.

$LoadDev_{ijxt}$ = 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 Section 11.2.4.1~~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:

$$RemRepl_{xjt} = \frac{MeteredDemand_{jxt}}{TotalMeteredDemand_{xt}} * TotalRe\,m\,Re\,pl_{xt}$$

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 ~~in accordance with Section 2.3.3.9.2~~within the operating hour that the instruction is issued 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.~~4~~2, 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.

<p align="center">* * *</p>

11.2.4 Imbalance Energy.

The ISO shall calculate, account for and settle Imbalance Energy in the Real Time Market for each ~~BEEP Interval~~Settlement 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 BEEP IntervalSettlement Period t in the relevant zone shall be deemed to be sold or purschased, 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.

* * *

11.2.4.3   Unaccounted For Energy (UFE)

For settlement purposes, UFE is treated as Imbalance Energy. For each BEEP IntervalSettlement Period, 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 at the BEEP Interval Ex Post Pricein Section 11.2.4.1. 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.

11.2.4.5.1   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~~ISO

Protocols. 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~~ISO protocols. 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~~ forecasting service for Participating Intermittent Resources shall be assessed to Scheduling Coordinators for Participating Intermittent Resources as specified in Schedule 4 of Appendix F.

* * *

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.

* * *

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~~.

* * *

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 PageISO Protocols.

* * *

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~~, Curtailable Demands, and dispatchable~~and 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 ~~and eliminate any Price Overlap between decremental and incremental Energy Bids, thereby, dispatching the relevant~~. The ISO shall not dispatch such 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 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~~ 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.

* * *

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.

* * *

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) Softwaresoftware.

Where, in any BEEP IntervalSettlement Period, the highest decremental Energy Bid in the merit order stack is higher than the lowest incremental

Energy Bid, the BEEP ~~Software~~ software will eliminate the Price ~~Overlap~~ <ins>overlap</ins> by ~~actually dispatching~~<ins>determining the target price for</ins> all those incremental and decremental bids which fall within the overlap. <ins>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.</ins>

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.

<center>* * *</center>

SABP Appendices

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 *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.

$PRepResDA_{xt}$ 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 ~~SABP Appendix D~~Section 11.2.4.1. |

$LoadDev_{ijxt}$ = 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 Section 11.2.4.1~~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:

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

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:

$$NetDev_{bjxt} = \left[\sum_i GenDev_{bixt} - \sum_i LoadDev_{bixt} + \sum_q ImpDev_{bq\text{-}xt} - \sum_q ExpDev_{bq\text{-}xt} \right]$$ 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:

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

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

~~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:

$UnavailAncServMW_{bixt}$ = 0

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

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

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

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:

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

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

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:

$$LoadDev_{bixt} = LoadDev'_{bixt} - UnavailDispLoadMW_{bixt}$$

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

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 $L_{\text{a/s},bixt}$, $L_{\text{s/e},bixt}$ 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,

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

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

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

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:

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

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

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:

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

<u>Where;</u>

<u>If the BEEP Interval Ex Post Price for decremental Energy is negative, then:</u>

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

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

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

<u>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:</u>

<u>For BEEP Intervals 2 through 5,</u>

$$\underline{L_{sb} = \frac{L_s}{6}}.$$

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:

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

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

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

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

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:

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

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

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

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

~~Where~~ $L_{a\underline{t},ix}$ 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:

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

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

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

For BEEP Intervals 1 through 6,

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

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:

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

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,

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

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:

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

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

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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.

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

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

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:

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

The values of $E_{a,bqxt}$ and $E_{adj,bqxt}$ 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 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. 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

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:

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

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

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

$$ILDC_{ib} = L_{ib} * P_b$$

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

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

$$IIDC_{gb} = I_{gb} * P_b$$

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

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,

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

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.

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

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 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 $I_{adj,bqxt}{}_{b,adj}$ **– 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~~ Trading 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~~ E_s.

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~~ Trading Interval for which such Dispatch Instruction (or curtailment event) applies.

D 3.25 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 P_{eff} – $

Effective Price for Instructed Imbalance Energy for the relevant Settlement Period.

~~[Not Used]~~

D 3.26 $UFEC_{j\text{xt}}$ – $

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 ~~each~~ the 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~~ the UDC Service Area adjusted for distribution losses using Distribution System loss factors approved by the Local Regulatory Authority.

This ~~Energy~~ difference (UFE) ~~is attributed~~which is attributable 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 $E_{UFE\_UDC\_k}$ ~~$UFE_{UDC,bkt}$~~– 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 $RRDC_j$

The Replacement Reserve Capacity Dispatch Charge for Scheduling Coordinator j for Trading Interval t.

~~[Not Used]~~

D 3.30 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]

~~[Not Used]~~

D 3.31 G_k – MWh

The total metered Generation in BEEP Interval b of Settlement Period t in utility service territory k.

~~[Not Used]~~

D 3.32 D_z – MWh

The Demand including Exports in BEEP Interval b of Settlement Period t at metered point z.

~~[Not Used]~~

D 3.33 I_k **– MWh**

The total metered imports into utility service territory k in BEEP Interval b of Settlement Period t.

~~[Not Used]~~

D 3.34 E_k **– MWh**

The total metered exports from utility service territory k in BEEP Interval b of Settlement Period t.

~~[Not Used]~~

D 3.35 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.

~~[Not Used]~~

D 3.36 LPM_k **– MWh**

The calculated total of the Load Profile metering in utility service territory k per BEEP Interval b of Settlement Period t.

~~[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 $IGDC_{ib}$ **- $**

The total of instructed Generation deviation payments/charges for Scheduling Coordinator j in BEEP Interval b of Settlement Period t.

~~$IGDC_{bixt}$ – $~~

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

D 3.39 $ILDC_{ib}$ **- $**

The total of instructed Load deviation payments/charges for Scheduling Coordinator j in BEEP Interval b of Settlement Period t.

~~$ILDC_{bixt}$ – $~~

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

D 3.40 $IIDC_{ib}$ **- $**

The total of instructed import deviation payments/charges for Scheduling Coordinator j in BEEP Interval b of Settlement Period t.

~~$IIDC_{bqxt}$ – $~~

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

D 3.41 G_{ib} **- MW**

Instructed Energy for Generating Unit i during BEEP Interval b.

[Not Used]

D 3.42   **L$_{ib}$ - MW**

Instructed Energy for Load i during BEEP Interval b.

[Not Used]

D 3.43   **I$_{iqb}$ – MW**

Instructed Energy for import q during BEEP Interval b

[Not Used]

D 3.44   **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.

[Not Used]

D 3.45   **HBI – Number**

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

D 3.46   **ReplObligRatio$_{jxt}$ – fraction**

$$ReplObligRatio_{jxt} = \frac{ReplOblig_{jxt}}{\sum_j ReplOblig_{jxt}}$$

where:

ReplOblig$_{jxt}$ is the replacement reserve capacity obligation as defined in Appendix C Section 3.67.

[Not Used]

D 3.47   **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.

[Not Used]

D 3.48   **PMax$_i$P$_{max,ixt}$ – MW**

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   **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.

[Not Used]