

Tab 1: MD02 Language not yet effective

IMPORTANT NOTICE:

The MD02 supplementary section includes approved language from Amendments 44 (Docket No. ER02-1656) and 54 (Docket No. ER03-1046), which will not become effective until the ISO gives notice that the software necessary to implement Phase 1B of MD02 has been developed and is ready for use. It also includes, shown in highlight, pending language from compliance filings in these dockets which were made on October 29, 2002, November 21, 2003, and March 11, 2004; the language from these filings will not be effective until both approval by FERC and notice of development of the Phase 1B software have been given.

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

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

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

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

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

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

2.2.6.11 Participating Intermittent Resources. Submitting Schedules consistent with the ISO Protocols; and

2.2.6.12 Compliance with Environmental Constraints, Operating Permits and Applicable Law. Submitting Ancillary Services bids, Adjustment Bids and Supplemental Energy bids so that any service provided in accordance with such bids does not violate environmental constraints, operating permits or applicable law. All submitted bids must reflect resource limitations and other constraints as such are required to be reported to the ISO Control Center.

2.2.7 Operations of a Scheduling Coordinator.

2.2.7.1 Maintain Twenty-four (24) Hour Scheduling Centers. Each Scheduling Coordinator shall operate and maintain a twenty-four (24) hour, seven (7) days per week, scheduling center. Each Scheduling Coordinator shall designate a senior member of staff as its scheduling center manager who

shall be responsible for operational communications with the ISO and who shall have sufficient authority to commit and bind the Scheduling Coordinator.

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

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

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

2.3.3.9 Forced Outages.

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

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

longer-term basis pursuant to Section 2.3.5.1.3 if necessary to meet reliability criteria. The ISO Governing Board must approve all long-term Replacement Reserve contracts. The ISO shall contract for Voltage Support annually (or for such other period as the ISO may determine is economically advantageous) and on a daily or hourly basis as required to maintain System Reliability. The ISO shall contract annually (or for such other period as the ISO may determine is economically advantageous) for Black Start Generation.

2.5.6 Technical Requirements for Providing Ancillary Services.

All Generating Units, System Units, Loads and System Resources providing Ancillary Services shall comply with the technical requirements set out in Sections 2.5.6.1 to 2.5.6.4 below relating to their operating capabilities, communication capabilities and metering infrastructure. No Scheduling Coordinator shall be permitted to submit a bid to the ISO for the provision of an Ancillary Service from a Generating Unit, System Unit, Load or System Resource, or to submit a Schedule for self-provision of an Ancillary Service from that Generating Unit, System Unit, Load or System Resource, unless the Scheduling Coordinator is in possession of a current certificate issued by the ISO confirming that the Generating Unit, System Unit, Load or System Resource complies with the ISO's technical requirements for providing the Ancillary Service concerned. Scheduling Coordinators can apply for Ancillary Services certificates in accordance with the ISO's Protocols for considering and processing such applications. The ISO shall have the right to inspect Generating Units, Loads or the individual resources comprising System Units and other equipment for the purposes of the issue of a certificate and periodically thereafter to satisfy itself that its technical requirements continue to be met. If at any time the ISO's technical requirements are not being met, the ISO may withdraw the certificate for the Generating Unit, System Unit, Load or System Resource concerned.

2.5.14 The Regulation Auction.

Bid Information. Each Scheduling Coordinator j shall submit the following information for each Generating Unit or System Unit i for each Settlement Period t of the following Trading Day:

- (a) bidder name/Identification Code;
- (b) resource identification (name and Location Code);
- (c) the date for which the bid applies;
- (d) maximum operating level (MW);
- (e) minimum operating level (MW);
- (f) ramp rate (MW/Min) $Ramp_{ijt}$;
- (g) the upward and downward range of generating capacity over which Generating Unit or System Unit i from Scheduling Coordinator j is willing to provide Regulation for Settlement Period t ($Cap_{ijt}max$ (MW) where $Cap_{ijt}max \leq \text{Period}_{minutes} * Ramp_{ijt}$. $\text{Period}_{minutes}$ is established by the ISO, by giving Scheduling Coordinators twenty-four (24) hours advance notice, within a range from a minimum of 10 minutes to a maximum of 30 minutes. Bidders shall offer upward and downward range for Regulation service; and
- (h) the bid price of the capacity reservation, stated separately for Regulation Up and Regulation Down ($CapRes_{ijt}$ (\$/MW)).

If the bid is for the provision of Regulation from an external import of a System Resource, each Scheduling Coordinator j shall submit the following information for each System Resource i for each Settlement Period t of the following Trading Day:

- (a) bidder name/Identification Code;
- (b) type of market (Day-Ahead or Hour-Ahead) and Trading Day;
- (c) Scheduling Point;
- (d) interchange ID code;
- (e) external Control Area ID;
- (f) Schedule ID (NERC ID number) and complete WECC tag;
- (g) preferred bid flag, a "YES" indicates a bid and a "NO" indicates a self-provided schedule;
- (h) the contract reference number, if applicable;
- (i) maximum operating level (MW);
- (j) minimum operating level (MW);
- (k) ramp rate (MW/Min) $Ramp_{ijt}$;
- (l) the upward and downward range of generating capacity over which System Resource i from Scheduling Coordinator j is willing to provide Regulation for Settlement Period t ($Cap_{ijt,max}$ (MW)) where $Cap_{ijt,max} \leq \text{Period}_{minutes} * Ramp_{ijt}$. $\text{Period}_{minutes}$ is established by the ISO, by giving Scheduling Coordinators twenty-four (24) hours advance notice, within a range from a minimum of 10 minutes to a maximum of 30 minutes. Bidders shall offer upward and downward range for Regulation service; and

- (m) the bid price of the capacity reservation, stated separately for Regulation Up and Regulation Down ($CapRes_{ijt}$ (\$/MW)).

Bid Evaluation. Based on the quantity and location of the system requirements, the ISO shall select Generating Units, System Units, and System Resources with the bids, which minimize the sum of the total bids of the Generating Units, System Units, and System Resources selected for Regulation Up or Regulation Down, subject to two constraints:

- (a) the sum of the selected bid capacities must be greater than or equal to the required Regulation capacity; and
- (b) each Generating Unit's, System Unit's, or System Resource's bid capacity must be less than or equal to that Generating Unit's, System Unit's, or System Resource's ramp rate times $Period_{minutes}$.

The total bid for each Generating Unit, System Unit, or System Resource is calculated by multiplying the capacity reservation bid price by the bid capacity.

Thus, subject to any locational requirements, the ISO will accept winning Regulation bids in accordance with the following criteria:

$$\text{Min } \sum_{i,j} \text{TotalBid}_{ijt}$$

Subject to

$$\sum_{i,j} Cap_{ijt} \geq Requirement_t \text{ and } Cap_{ijt} \leq Cap_{ijtmax}$$

2.5.15 The Spinning Reserve Auction.

Bid Information. If the bid is for the provision of Spinning Reserve from a Generating Unit or System Unit, each Scheduling Coordinator j must submit the following information for each Generating Unit or System Unit i for each Settlement Period t of the following Trading Day:

- (a) bidder name/Identification Code;
 - (b) resource identification (name and Location Code);
 - (c) the date for which the bid applies;
 - (d) maximum operating level (MW);
 - (e) minimum operating level (MW);
 - (f) ramp rate (MW/min);
 - (g) MW additional capability synchronized to the system, immediately responsive to system frequency, and available within 10 minutes ($Cap_{ijt}max$) for Generating Unit i, or System Unit I, from Scheduling Coordinator j, for Settlement Period t.
 - (h) bid price of capacity reserved ($CapRes_{ijt}$ (\$/MW));
- and
- (i) an indication whether the capacity reserved would be 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.

If the bid is for the provision of Spinning Reserve from an external import of a System Resource, each Scheduling Coordinator j must submit the following information for each external import of a System Resource i for each Settlement Period t of the following Trading Day:

- (a) bidder name/Identification Code;
 - (b) the date for which the bid applies;
 - (c) ramp rate if applicable (MW/Min);
 - (d) MW additional capability synchronized to the system, immediately responsive to system frequency and available at the point of interchange with the ISO Control Area, within 10 minutes ($Cap_{ijt,max}$) of the ISO calling for the external import of System Resource i , from Scheduling Coordinator j , for Settlement Period t ;
 - (e) bid price of capacity reserved ($CapRes_{ijt}$ (\$/MW));
- and
- (f) an indication whether the capacity reserved would be 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

Bid Evaluation. Based on the quantity and location of the system requirements, the ISO shall select the Generating Units, System Units and external imports of System Resources with the bids which minimize the sum of the total bids of the Generating Units, System Units and external imports of System Resources selected subject to two constraints:

- (a) the sum of the selected bid capacities must be greater than or equal to the required Spinning Reserve capacity; and
- (b) each Generating Unit's, System Unit's or external import's bid capacity must be less than or equal to that Generating Unit's, System Unit's or external import's ramp rate times 10 minutes.

The price payable to Scheduling Coordinators for Spinning Reserve Capacity not included in the ISO's Final Day-Ahead Schedules but made available in accordance with amended Ancillary Services supplier schedules issued in accordance with Section 2.5.21 shall be the bid price of the Spinning Reserve capacity reserved ($CapRes_{ijt}(\$/MW)$).

2.5.16 The Non-Spinning Reserve Auction.

Bid information. If the bid is for the provision of Non-Spinning Reserve from a Generating Unit or System Unit, each Scheduling Coordinator j must submit the following information for each Generating Unit or System Unit i for each Settlement Period t of the following Trading Day:

- (a) bidder name/Identification Code;
 - (b) Generating Unit or System Unit identification (name and Location Code);
 - (c) the date for which the bid applies;
 - (d) maximum operating level (MW);
 - (e) minimum operating level (MW);
 - (f) ramp rate (MW/Min);
 - (g) the MW capability available within 10 minutes (Cap_{ijtmax});
 - (h) the bid price of the capacity reserved ($CapRes_{ijt}(\$/MW)$);
 - (i) time to synchronization following notification (min);
- and
- (j) an indication whether the capacity reserved would be 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.

If the bid is for the provision of Non-Spinning Reserve from an external import of a System Resource, each Scheduling Coordinator j must submit the following information for each external import of a System Resource i for each Settlement Period t of the following Trading Day:

- (a) bidder name/Identification Code;
- (b) the date for which the bid applies;
- (c) ramp rate if applicable (MW/Min);
- (d) the MW capability available at the point of interchange with the ISO Control Area, within 10 minutes (Cap_{ijtmax}) of the ISO calling for the external import of System Resource i , from Scheduling Coordinator j , for Settlement Period t ;
- (e) the bid price of the capacity reserved ($CapRes_{ijt}(\$/MW)$); and
- (f) an indication whether the capacity reserved would be 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.

If the bid is for the provision of Non-Spinning Reserve from a Load located within the ISO Control Area, each Scheduling Coordinator j must submit the following information for each Load i for each Settlement Period t of the following Trading Day:

- (a) bidder name/Identification Code;
- (b) Load identification name and Location Code;
- (c) the date for which the bid applies;
- (d) Demand reduction available within 10 minutes (Cap_{ijtmax});

- (g) the bid price of the capacity reserved ($CapRes_{ijt}(\$/MW)$); and
- (h) an indication whether the capacity reserved would be available for Demand reduction only in the event of the occurrence of an unplanned Outage, a Contingency or an imminent or actual System Emergency

Bid Evaluation. Based on the quantity and location of the system requirements, the ISO shall select the Generating Units, System Units, Loads or external imports of System Resources with the bids which minimize the sum of the total bids of the Generating Units, System Units, Loads or external imports of System Resources selected subject to two constraints:

- (a) the sum of the selected bid capacities must be greater than or equal to the required Non-Spinning Reserve capacity; and
- (b) each Generating Unit's, System Unit's, Load's or external import's bid capacity must be less than or equal to that Generating Unit's, System Unit's, Load's or external import's ramp rate (or time to interruption in the case of a Load offering Demand reduction) times the difference between 10 minutes and the time to synchronize in the case of a Generating Unit or System Unit or to interruption in the case of a Load. The total bid for each Generating Unit, System Unit, Load or external import of a System Resource is calculated by multiplying the capacity reservation bid by the bid capacity.

for each Generating Unit or System Unit i for each Settlement Period t of the following Trading Day:

- (a) bidder name/Identification Code;
- (b) Generating Unit or System Unit identification (name and Location Code);
- (c) the date for which the bid applies;
- (d) maximum operating level (MW);
- (e) minimum operating level (MW);
- (f) ramp rate (MW/Min);
- (g) the MW capacity available within 60 minutes ($Cap_{ij,max}$);
- (h) the bid price of the capacity reserved ($CapRes_{ij}$ (\$/MW)); and
- (i) time to synchronize following notification (min).

If the bid is for the provision of Replacement Reserve from an external import of a System Resource, each Scheduling Coordinator j must submit the following information for each external import of a System Resource i for each Settlement Period t of the following Trading Day:

- (a) bidder name/Identification Code;
- (b) the date for which the bid applies;
- (c) ramp rate applicable (MW/Min);
- (d) the MW capability available at the point of interchange with the ISO Control Area, within 60 minutes ($Cap_{ij,max}$) of the ISO calling for the external import of System Resource i , from Scheduling Coordinator j , for Settlement Period t ; and

- (e) bid price of capacity reserved ($CapRes_{ij,t}$ (\$/MW)).

If the bid is for the provision of Replacement Reserve from a Load located within the ISO Control Area, each Scheduling Coordinator j must submit the following information for each Load i for each Settlement Period t of the following Trading Day:

- (a) bidder name/Identification Code;
- (b) Load identification (name and Location Code);
- (c) the date for which the bid applies;
- (d) the Demand reduction available within 60 minutes (Cap_{ijt} (MW));
- (e) time to interruption following notification (min);
- (f) maximum allowable curtailment duration (hr); and
- (g) the bid price of the capacity reserved ($CapRes_{ijt}$ (\$/MW)).

Bid Evaluation. Based on the quantity and location of the system requirements, the ISO shall select the Generating Units, System Units, Loads or external imports of System Resources with the bids which minimize the sum of the total bids of the Generating Units, System Units, Loads or external imports of System Resources selected subject to two constraints:

- (a) the sum of the selected bid capacities must be greater than or equal to the required Replacement Reserve capacity; and

locational requirements, the ISO shall select the least costly Generating Units from a computerized merit order stack to back down to produce additional Voltage Support in each location where Voltage Support is needed.

The ISO shall pay to the Scheduling Coordinator for that Participating Generator the opportunity cost of reducing Energy output to enable reactive energy production. This opportunity cost shall be:

$$\text{Max}\{0, \text{Zonal Settlement Interval Ex Post Price} - \text{Generating Unit bid price}\} \times$$
reduction in Energy output (MW).

If necessary, the ISO shall develop a regulatory cost-based determination of marginal operating cost to be used in place of the Generating Unit bid price.

2.5.19 Black Start Capability and Energy Output.

As of the ISO Operations Date, the ISO will contract for Black Start capability and Energy with owners of Reliability Must-Run Units and Black Start Generators. Public utilities under the FPA will be paid rates capped at the FERC authorized cost base rates unless and until FERC authorizes different pricing. The ISO shall pay owners of Reliability Must-Run Units for Black Start Energy output through their Scheduling Coordinators. The ISO shall pay Black Start Generators for Black Start Energy output directly.

2.5.20 Obligations for and Self-Provision of Ancillary Services.

2.5.20.1 Ancillary Service Obligations. Each Scheduling Coordinator shall be assigned a share of the total Regulation, Spinning Reserve, Non-Spinning and Replacement Reserve requirements by the ISO. Any references in this Tariff to the Ancillary Service "Regulation" shall be read as referring to "Regulation Up" or "Regulation Down". The

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 WECC Area Control Error (ACE) performance requirements;
- (b) 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 and project the Imbalance Energy requirements based on the forecasted Demand for the next Dispatch Interval. The ISO shall then Dispatch Generating Units, System Units, and System Resources available (either providing Spinning Reserve, Non-Spinning Reserve, Replacement Reserve or offering Supplemental Energy) to meet the projected Imbalance Energy requirements for the next Dispatch Interval and return the Regulation Generating Units, System Units, and System Resources to their preferred operating points to restore their full regulating margin;
- (c) the ISO shall economically Dispatch Generating Units, System Units, Loads and System Resources only to meet its Imbalance Energy requirements and eliminate any Price Overlap between Energy Bids subject to resource and transmission system Constraints;
- (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 constrained optimization method to minimize the overall cost of Imbalance Energy subject to resource and transmission system Constraints;
- (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 Dispatch Interval.

2.5.22.3 Ancillary Services Dispatch. The ISO may Dispatch Generating Units, Loads, System Units and System Resources contracted to provide Ancillary Services (either procured through the ISO's competitive market, or self-provided by Scheduling Coordinators) to supply Imbalance Energy. During normal operating conditions, the ISO shall Dispatch the following resources to supply Imbalance Energy: (i) those Generating Units, Loads, System Units and System Resources having offered Supplemental Energy bids, (ii) those Generating Units, Loads, System Units and System Resources contracted to provide Replacement Reserve and (iii) those Generating Units, Loads, System Units and System Resources that have contracted to provide Spinning and Non-Spinning Reserve, except for those resources that have indicated that the capacity reserved would be 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 a threatened or actual System Emergency, the ISO may also Dispatch all other Generating Units, Loads, System Units and System Resources contracted to provide Spinning Reserve or Non-Spinning Reserve to supply Imbalance Energy. If a Generating Unit, Load, System Unit or System Resource, which is supplying Operating Reserve, is Dispatched to provide Imbalance Energy, the ISO shall

replace the Operating Reserve from the same or another resource within the time frame specified in the WECC guidelines.

2.5.22.3.1 Dispatch of Competitively Procured and Self-Provided Ancillary Services.

Generating Units and Loads selected in the ISO competitive auction or self-provided shall be Dispatched based on their Energy Bids as described in Dispatch Protocol Section 8.6.2, subject to the limitation on the Dispatch of Spinning Reserve and Non-Spinning Reserve set forth in Section 2.5.22.3.

2.5.22.3.2 Dispatch of Self-Provided Ancillary Services. Where a Scheduling Coordinator has chosen to self-provide the whole of the additional Operating Reserve required to cover any Interruptible Imports which it has scheduled and has identified specific Generating Units, Loads, System Units or System Resources as the providers of the additional Operating Reserve concerned, the ISO shall Dispatch only the designated Generating Units, Loads, System Units or System Resources in the event of the ISO being notified that the Interruptible Import is being curtailed. For all other Ancillary Services

which are being self-provided the Energy Bid shall be used to determine the Dispatch, subject to the limitation on the Dispatch of Spinning Reserve and Non-Spinning Reserve set forth in Section 2.5.22.3.

2.5.22.4 Supplemental Energy Bids. In addition to the Generating Units, Loads and System Resources which have been scheduled to provide Ancillary Services in the Day-Ahead and Hour-Ahead Markets, the ISO may Dispatch Generating Units, Loads or System Resources for which Scheduling Coordinators have submitted Supplemental Energy bids.

2.5.22.4.1 Timing of Supplemental Energy Bids.

Supplemental Energy bids must be submitted to the ISO no later than sixty (60) minutes prior to the operating hour. Bids may also be submitted at any time after the Day-Ahead Market closes. These Supplemental Energy bids cannot be withdrawn after sixty (60) minutes prior to the Settlement Period.

2.5.22.4.2 Form of Supplemental Energy Bid Information.

Supplemental Energy bids must include the information specified in Schedules and Bids Protocol Section 6.1.

2.5.22.5 [Not Used]

2.5.22.6 Real-Time Dispatch. The ISO shall economically Dispatch each Generating Unit, **Curtable Demand**, 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 deviate from their preferred operating points by more than a specified threshold (to be determined by the ISO), or to meet the projected Imbalance Energy requirements for the next Dispatch Interval. The ISO shall employ a multi-interval constrained optimization methodology (RTD Software) to calculate an optimal dispatch for each Dispatch Interval within a time horizon that shall extend to the end of the next hour. The ISO shall Dispatch resources that have submitted Energy Bids over the time horizon to meet forecasted Imbalance Energy requirements minimizing the Imbalance Energy procurement cost over the entire time horizon, subject to resource and transmission system constraints. However, Dispatch Instructions shall be issued for the next Dispatch Interval only. The ISO also shall instruct resources to start up or shut down over the time horizon based on their submitted and validated Start-Up Fuel Costs, Minimum Load Costs and Energy Bids. These resources shall receive binding start-up or shut-down pre-dispatch instructions as required by their startup time. The ISO shall only start resources that can start within the time horizon. The ISO may shut down resources that do not need to be on-line if constraints within the time horizon permit. However, resources providing Regulation or Spinning Reserve shall not be shut down. On-line resources providing Non-Spinning or Replacement Reserve shall also not be eligible for shutdown, unless their minimum down time does not exceed 10 minutes.

2.5.22.6.1 Resource Constraints.

The RTD Software shall enforce the following resource physical constraints:

- a) Minimum and maximum operating resource limits. Outages and limitations due to transmission clearances shall be reflected in these limits. The more restrictive operating or regulating limit shall be used for resources providing Regulation so that the RTD Software shall not Dispatch them outside their regulating range.
- b) Forbidden Operating Regions. Resources can only be ramped through these regions. The RTD Software shall not Dispatch resources within their Forbidden Operating Regions unless at the maximum applicable ramp rate to clear the Forbidden Operating Region in consecutive Dispatch Intervals.
- c) Operational ramp rates and start-up times. The submitted operational ramp rate as provided for in SBP Section 6.5 shall be used for all Dispatch Instructions. Each Energy Bid shall be Dispatched only up to the amount of Imbalance Energy that can be provided within the Dispatch Interval based on the applicable operational ramp rate. The Dispatch Instruction shall consider the relevant start-up time as provided for in SBP Section 6.6, if the resource is off-line, the relevant ramp rate function, and any prior commitments such as schedule changes across hours and previous Dispatch Instructions. The start-up time shall be determined from the start-up time function and when the resource was last shut down. The start-up time shall not apply if the corresponding resource is on-line or expected to start.
- d) Maximum number of daily start-ups. The RTD Software shall not cause a resource to exceed its daily maximum number of start-ups.
- e) Minimum up and down time. The RTD Software shall not start up off-line resources before their minimum down time expires and shall not shut down on-line resources before their minimum up time expires.
- f) Operating (Spinning and Non-Spinning) Reserve. The RTD Software shall Dispatch Spinning and Non-Spinning Reserve subject to the limitations set forth in Section 2.5.22.3.

- g) Hourly Pre-Dispatch. If Dispatched, each System Resource flagged for Hourly Pre-Dispatch in the next hour shall be Dispatched to operate at a constant level over the entire hour. The RTD Software shall perform the Hourly Pre-Dispatch for each hour once prior to the operating hour. Hourly Pre-Dispatched System Resources shall be Pre-Dispatched in merit order, but shall be price-takers, *i.e.*, shall not set the price. The Hourly Pre-Dispatch shall not subsequently be revised by the RTD Software.

2.5.22.6.2 Transmission System Constraints.

RTD shall use a Zonal DC network model where all nodes within a Zone would be collapsed into a single equivalent "Zonal bus." The constraints using the Zonal network model shall be the following:

- a) Power balance constraint in each Zone. The system Imbalance Energy requirement shall be calculated on a Zonal basis. The power balance constraints shall dictate an optimal Dispatch that would eliminate the Imbalance Energy requirement in all Zones, subject to (b) below.
- b) Inter-Zonal Interface constraints. These constraints shall limit the net active power flow on Inter-Zonal Interfaces at or below their transfer limits. For Inter-Zonal Interfaces between the ISO Control Area and another Control Area, inter-Zonal transfer capacity shall be reserved for awarded Ancillary Services from System Resources not already Dispatched.

2.5.22.6.3 Inter-hour Dispatch of Resources Without Real-Time Energy Bids.

Real-time Dispatch Instructions shall be issued for each Dispatch Interval as needed to prescribe the ramp between a resource's Final Hour-Ahead Schedule in one hour to its Final Hour-Ahead Schedule in the immediately succeeding operating hour. Such Dispatch Instructions shall be based on the lesser of: 1) the applicable operational ramp rate as provided for in SBP Section 6.5 and 2) the ramp rate associated with the Standard Ramp. The Dispatch

Instructions for ramping of Generating Units without Real-time Energy Bids in both operating hours shall begin 10 minutes prior to the start of each operating hour and shall end no sooner than 10 minutes after and no later than 50 minutes after the start of each operating hour.

Energy resulting from the Standard Ramp shall be deemed Standard Ramping Energy and will be settled in accordance with SABP Appendix D-1 Section 2.1.2. Energy resulting from any ramp extending beyond the Standard Ramp will be deemed Ramping Energy Deviation and will be settled in accordance with SABP Appendix D-1 Section 2.1.2.

2.5.22.6.4 Inter-hour Dispatch of Resources With Real-Time Energy Bids.

Real-time Dispatch Instructions associated with the ramp between a resource's Final Hour-Ahead Schedule in one hour to its Final Hour-Ahead Schedule in the immediately succeeding operating hour shall be determined optimally by the RTD Software if the ISO has bids for either or both relevant operating hours. For any operating hour(s) for which bids have been submitted Dispatch Instructions will be optimized such that the Dispatch Operating Point is within the bid range(s). For any operating hour without submitted bids Dispatch Instructions will be optimized such that the Dispatch Operating Point conforms to the schedule within the operating hour.

Energy resulting from the Standard Ramp shall be deemed Standard Ramping Energy and will be settled in accordance with SABP Appendix D Section 2.1.2. Energy resulting from any ramp extending beyond the Standard Ramp will be deemed Ramping Energy Deviation and will be settled in accordance with SABP Appendix D Section 2.1.2. Energy delivered or consumed as a result of ISO Dispatch of a resource's Energy Bid in one operating hour to a Dispatch Operating Point such that the resource cannot return to its successive operating hour Final Hour-Ahead Schedule by the beginning of the next operating hour is Residual Energy and shall be settled as Instructed Imbalance Energy as provided for in SABP Appendix D Section 2.1.2 and also may be eligible for recovery of its applicable Energy Bid costs in accordance with Section 11.2.4.1.1.1. Similarly, Energy delivered or consumed as a result of ISO Dispatch of a

resource's Energy Bid in a future operating hour to a Dispatch Operating Point different from its current operating hour Final Hour-Ahead Schedule prior to the end of the current operating hour is also considered Residual Energy and shall be settled as Instructed Imbalance Energy as provided for in SABP Appendix D Section 2.1.2 and also may be eligible for recovery of its applicable Energy Bid costs in accordance with Section 11.2.4.1.1.1. When Ramping Energy Deviation and Residual Energy coexist within a given Dispatch Interval, the Ramping Energy Deviation shall be the portion of Instructed Imbalance Energy that is produced or consumed within the schedule-change band defined by the Final Hour-Ahead Schedules of the two consecutive Settlement Periods; the Residual Energy shall be the portion of Instructed Imbalance Energy that is produced or consumed outside the schedule-change band.

2.5.22.7 Inter-Zonal Congestion. In the event of Inter-Zonal Congestion in real time, the ISO shall procure Imbalance Energy as described in Section 2.5.22.6.

2.5.22.8 Intra-Zonal Congestion. Except as provided in Section 5.2, in the event of Intra-Zonal Congestion in real time, the ISO shall adjust resources in accordance with Sections 7.2.6.1 and 7.2.6.2.

2.5.22.9 Recovery of Operating Reserve. If procured Operating Reserve is used to meet Imbalance Energy requirements, such Operating Reserve may be recovered by the ISO's replacing the associated Imbalance Energy through the Dispatch of other Energy Bids in merit order to allow the resources that were providing Energy from the procured Operating Reserve to return to their operating point before the provided the Energy from the Operating Reserves.

Any additional real-time Operating Reserve needs may be met through unloaded capacity from RMR resources.

2.5.22.10 Dispatch Instructions.

All Dispatch Instructions except those for the Dispatch of Regulation (which will be communicated by direct digital control signals to Generating Units and, for System Resources, through dedicated communication links which satisfy the ISO's standards for external imports of Regulation) will be communicated electronically, except that, at the ISO's discretion, Dispatch Instructions may be communicated by telephone, or fax. Except in the case of deteriorating system conditions or emergency, and except for instructions for the Dispatch of Regulation, the ISO will send all Dispatch Instructions to the Scheduling Coordinator for the Generating Unit, System Unit, Load or System Resource, which it

wishes to Dispatch. The recipient Scheduling Coordinator shall ensure that the Dispatch Instruction is communicated immediately to the operator of the Generating Unit, System Unit, external import of System Resources or Load concerned. The ISO may, with the prior permission of the Scheduling Coordinator concerned, communicate with and give Dispatch Instructions to the operators of Generating Units, System Units, external imports of System Resources and Loads directly without having to communicate through their appointed Scheduling Coordinator. The recipient of a Dispatch Instruction shall confirm the Dispatch in accordance with DP 4.4. The ISO shall record the communications between the ISO and Scheduling Coordinators relating to Dispatch Instructions in a manner that permits auditing of the Dispatch Instructions, and of the response of Generating Units, System Units, external imports of System Resources and Loads to Dispatch Instructions.

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

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

- (a) shall be declared and labeled as non-conforming to the ISO's instructions unless it has notified the ISO of an event that prevents it from performing its obligations within 30 minutes of the onset of such event through a SLIC log entry. Notification of non-compliance via the Automated Dispatch System (ADS) will not supplant nor serve as the official notification mechanism to the ISO;
- (b) cannot set the Dispatch Interval Ex Post Price pursuant to Section 2.5.23.2.1.2; and

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

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

2.5.23 Pricing Imbalance Energy.

2.5.23.1 General Principles. Instructed and Uninstructed Imbalance Energy shall be paid or charged the applicable Resource-Specific Settlement Interval Ex Post Price or the Zonal Settlement Interval Ex Post Price. These prices are determined using the Dispatch Interval Ex Post Prices. The Dispatch Interval Ex Post Prices shall be based on the bid of the marginal Generating Units, System Units, and Curtailable Demand dispatched by the ISO to increase or reduce Demand or Energy output in each Dispatch Interval as provided in Section 2.5.23.2.1.

The marginal bid is

the highest bid that is accepted by the ISO's RTD Software for increased energy Supply or the lowest bid that is accepted by the ISO's RTD Software for reduced energy Supply. In the event the lowest price decremental bid accepted by the ISO is greater and not equal to the highest priced incremental bid accepted, then the Dispatch Interval Ex-Post Price shall be equal to the highest incremental bid accepted when there is a non-negative Imbalance Energy system requirement and equal to the lowest accepted decremental bid when there is a negative Imbalance Energy requirement.

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

The ISO will respond to the Dispatch Instructions issued by the RTD 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 RTD Software.

2.5.23.2 Determining Ex Post Prices.

2.5.23.2.1 Dispatch Interval Ex Post Prices.

2.5.23.2.1.1 Computation. For each Dispatch Interval, the ISO will compute updated supply and demand curves, using the Generating Units, System Units, and Curtailable Demand Dispatched according to the ISO's RTD Software during that time period to meet Imbalance Energy requirements and to eliminate any Price Overlap. The Dispatch 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 2.5.23.2.1. In the event of Inter-Zonal Congestion, the ISO

will determine separate Dispatch Interval Ex Post Prices for each Zone or groups of Zones on either side of the Congested interface.

2.5.23.2.1.2 Eligibility. A resource constrained at an upper or lower operating limit, a boundary of a Forbidden Operating Region or dispatched for the maximum Energy deliverable based on its maximum applicable ramp rate cannot be marginal (*i.e.*, it cannot move in a particular direction) and thus is not eligible to set the Dispatch Interval Ex Post Price. System Resources are not eligible to set the Dispatch Interval Ex Post Price. A resource dispatched at its lower operating limit, if otherwise eligible, will be eligible to set the Dispatch Interval Ex Post Price if any portion of its Energy is necessary to serve Demand.

2.5.23.2.2 Hourly Ex Post Price. The Hourly Ex Post Price in a Settlement Period in each Zone will equal the absolute-value Energy-weighted average of the Dispatch Interval Ex Post Prices in each Zone, where the weights are the system total Instructed Imbalance Energy, except Regulation Energy, for the Dispatch Interval.

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

2.5.23.2.3 Price for Uninstructed Deviations for Participating Intermittent Resources.

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

2.5.23.3 [Not Used]

2.5.23.3.1 [Not Used]

2.5.23.3.1.1 [Not Used]

the ISO. The ISO's obligation to pay Start-Up Fuel Costs is limited to the obligation to pay Start-Up Fuel Cost Charges received. All disputes concerning payment of Start-Up Fuel Cost Invoices shall be subject to ISO ADR Procedures, in accordance with Section 13 of this ISO Tariff.

2.5.23.3.8 [Not Used]

2.5.23.3.8.1 [Not Used]

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

2.5.26.2.1 If the ISO determines that a Scheduling Coordinator has supplied Uninstructed Imbalance Energy to the ISO during a Settlement 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 Settlement Interval, payments to the Scheduling Coordinator representing the Generating Unit, System Unit or System Resource for the Ancillary Service capacity used to supply Uninstructed Imbalance Energy shall be eliminated to the extent of the deficiency, except to the extent (i) the deficiency in the availability of Ancillary Service capacity from the Generating Unit, System Unit or System Resource is attributable to control exercised by the ISO in that Settlement 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 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 Settlement 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 Settlement Interval under Section 2.5.26.1.

2.5.26.2.3 The ISO shall calculate the real-time ability of each Generating Unit and System Unit to deliver Energy from Ancillary Services capacity awarded or self-provided for each Settlement Interval based on its operational ramp rate as described in SBP Section 6.5, maximum operating capability, and actual telemetered output. If the Generating Unit or System Unit cannot deliver the full amount of Energy from the awarded or self-provided Spinning, Non-Spinning or Replacement Reserve for a Settlement Interval then Ancillary Services capacity payments for the amount of Energy that cannot be delivered for the particular Settlement Interval shall be rescinded.

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

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

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

2.5.26.2.6 For each Settlement 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 Settlement 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 Settlement Interval.

2.5.26.3 Rescission of Payments When Dispatch Instruction is Not Followed

If the total metered output of a Generating Unit, Curtailable Demand, System Unit or System Resource is insufficient to supply the amount of Instructed Imbalance Energy associated with a Dispatch Instruction issued in accordance with a bid on Spinning Reserve, Non-Spinning Reserve, or Replacement Reserve in any Settlement 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 Settlement Interval. For any Settlement 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 WECC 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 WECC 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

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 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 and scheduled Day-Ahead j for Settlement Period t.

$EnQInst_{xt}$ = Instructed Imbalance Energy increase or decrease in Zone X in real-time Dispatch for each Dispatch 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.

Adjustment: penalty described in Section 2.5.26.1.

$PAGCUpDA_{xt}$ = the Market Clearing Price, PAGC, in Zone X for Regulation Up capacity in the Day-Ahead Market for Settlement Period t.

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

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

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

$$\sum_i [(EnQInst_{ixt} * Zonal Settlement IntervalExPostPriceinZoneX) + REPA_{i,xt}]$$

REPA_{i,xt} = 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 WECC 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 WECC 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 to 1

C_{DN} = 0 to 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

$P_{spDA_{xt}}$ = Market Clearing Price, Psp, in Zone X for Spinning Reserve capacity in the Day-Ahead Market for Settlement Period t.

Payments. Scheduling Coordinators for Generating Units, System Units, or System Resources providing Spinning Reserve capacity through the ISO auction shall receive the following payments for Spinning Reserve capacity:

$$SpinPay_{xt} = SpinQDA_{xt} * P_{spDA_{xt-Adjustment}}$$

Scheduling Coordinators for Generating Units, System Units, or System Resources shall receive the following payments for Energy output from Spinning Reserve capacity:

$$EnQInst_{xt} * Resource-Specific Settlement Interval Ex Post Price_{xt}$$

2.5.27.3 Non-Spinning Reserve.

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

$NonSpinQDA_{xt}$ = the Scheduling Coordinator's total Quantity of Non-Spinning Reserve capacity in Zone X sold through the ISO's auction and scheduled Day-Ahead for Settlement Period t.

$EnQInst_{xt}$ = Instructed Imbalance Energy output or Demand reduction in Zone X in real-time Dispatch for Settlement Period t, supplied in accordance with the ISO Protocols.

Prices. The prices in the Settlement process for Non-Spinning Reserve shall be those determined in Section 2.5.16.

Payments. Scheduling Coordinators for Generating Units, System Units, System Resources, or Loads supplying Non-Spinning Reserve capacity through the ISO auction shall be paid the following for the Non-Spinning Reserve capacity:

$$NonspPay_{xt} = NonSpinQDA_{xt} * PnonspDA_{xt} - Adjustment$$

Scheduling Coordinators for Generating Units, System Units, System Resources or Loads shall receive the following payments for Energy output from Non-Spinning Reserve capacity:

$$EnQInst_{xt} * Resource-Specific Settlement Interval Ex Post Price_{xt}$$

2.5.27.4 Replacement Reserve.

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

$RepResQDA_{xt}$ = the Scheduling Coordinator's total quantity of Replacement Reserve capacity in Zone X sold through the ISO auction scheduled Day-Ahead for Settlement Period t, and from which Energy has not been generated.

$EnQInst_{xt}$ = Instructed Imbalance Energy output or Demand reduction in Zone X in real-time Dispatch for Settlement Period t, supplied in accordance with the ISO Protocols.

Prices. The prices in the Settlement process for Replacement Reserve shall be those determined in Section 2.5.17.

$Adjustment$ = penalty described in Section 2.5.26.1, or rescinded capacity payments described in Section 2.5.26.2 or 2.5.26.3.

$PRepResDA_{xt}$ = Market Clearing Price, PRepRes, in Zone X for Replacement Reserve capacity in the Day-Ahead Market for Settlement Period t.

Payments. Scheduling Coordinators for Generating Units, System Units, System Resources, or Loads providing Replacement Reserve capacity through the ISO auction shall receive the following payments for the portion of a Scheduling Coordinator's Replacement Reserve capacity from which Energy has not been generated:

$$RepResPay_{ijt} = (RepResQDA_{xt} -) * PRepResDA_{xt-Adjustment}$$

Scheduling Coordinators shall not receive capacity payments for the portion of a Scheduling Coordinator's Replacement Reserve capacity from which Energy has been generated. The payments for Energy output from Replacement Reserve capacity are calculated as follows:

$$EnQInst_{ijt} * Resource-Specific Settlement Interval Ex Post Price_{xt}$$

2.5.27.5 Voltage Support. The total payments for each Scheduling Coordinator shall be the sum of the short-term procurement payments, based on opportunity cost, as described in Section 2.5.18, and the payments under long-term contracts.

2.5.27.6 Black Start.

Quantities. The following quantities shall be used in the Settlement process:

$EnQBS_{ijt}$ = Energy output from Black Start made by Generating Unit i from Scheduling Coordinator j (or Black Start Generator j, as the case may be) for Settlement Period t, pursuant to the ISO's order to produce.

Prices. The prices used in the Settlement process are those described in the contracts referred to in Section 2.5.19.

$Adjustment$ = penalty described in Section 2.5.26.1.

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

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

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

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

where,

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

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

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

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

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

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

RMR Owner (but not both) will be entitled to enforce any claim arising from an unpaid ISO Invoice, and only one party will be a "disputing party" under the dispute resolution process specified in the relevant RMR Contract with respect to such claim so that the Responsible Utility will not be subject to duplicative claims or recoveries. The RMR Owner shall have the right to control the disposition of claims against the Responsible Utility for non-payments that result in payment defaults by the ISO under a Reliability Must-Run Contract. To that end, in the event of non-payment by the Responsible Utility of amounts due under the ISO Invoice, the ISO will not take any action to enforce its rights against the Responsible Utility unless the ISO is requested to do so by the RMR Owner. The ISO shall cooperate with the RMR Owner in a timely manner as necessary or appropriate to most fully effectuate the RMR Owner's rights related to such enforcement, including using its best efforts to enforce the Responsible Utility's payment obligations if, as, to the extent, and within the time frame, requested by the RMR Owner. The ISO shall intervene and participate where procedurally necessary to the assertion of a claim by the RMR Owner.

5.2.7.3 If a Responsible Utility first executed a TCA after April 1, 1998 (a "New Responsible Utility") and if:

- (i) the senior unsecured debt of the New Responsible Utility is rated or becomes rated at less than A- from Standard & Poor's ("S&P") or A3 from Moody's Investment Services ("Moody's"), and
- (ii) Such ratings do not improve to A- or better from S&P or A3 or better from Moody's within 60 days,

the New Responsible Utility shall issue and confirm to the ISO an irrevocable and unconditional letter of credit in an amount equal to three times the highest monthly payment invoiced by the ISO to the New Responsible Utility (or the prior Responsible

[Page Not Used]

If a Must-Offer Generator fails to submit a Supplemental Energy bid for any portion of its Available Generation for any Dispatch Interval, the unbid quantity of the Must-Offer Generator's Available Generation will be deemed by the ISO to be bid at the Must-Offer Generator's Proxy Price for that hour if: (i) the applicable Generating Unit is a gas-fired unit and (ii) the Must-Offer Generator has provided the ISO with adequate data in compliance with Sections 2.5.23.3.3 and 5.11.3 for the applicable Generating Unit. For all other Generating Units owned or controlled by a Must-Offer Generator, the unbid quantity of the Must-Offer Generator's Available Generation will be deemed by the ISO to be bid and settled in accordance with Section 11.2. In order to dispatch resources providing Imbalance Energy in proper merit order, the ISO will insert this unbid quantity into the Must-Offer Generator's Supplemental Energy bid curve above any lower-priced segments of the bid curve and below any higher-priced segments of the bid curve as necessary to maintain a non-decreasing bid curve over the entire range of the Must-Offer Generator's Available Generation.

5.11.6 Waiver of Must-Offer Obligation

Must-Offer Generators may seek a waiver of the obligation to offer all available capacity, as set forth in Section 5.11.4 of this ISO Tariff, for one or more of their Generating Units for periods other than Self-Commitment Periods, which are defined as the hours when Must-Offer Generators submit Energy Schedules or are awarded Ancillary Services bids or self-provision schedules. Self-Commitment Periods determined from Day-Ahead Schedules shall be extended by the ISO as necessary to accommodate Generating Unit minimum up and down times such that the scheduled operation is feasible.

5.11.6.1 Recovery of Minimum Load Costs By Must-Offer Generators

5.11.6.1.1 Eligibility

Units from Must-Offer Generators that incur Minimum Load Costs during Self-Commitment Periods or during hours for which the ISO has granted to them a waiver shall not be eligible to recover such costs for such hours. When a Must-Offer Generator is awarded Ancillary Services in the Hour-Ahead Market or has a Final Hour-Ahead Schedule other than a Schedule to a unit-specific Demand ID used for the purpose of scheduling minimum load energy as set forth in Section 5.11.6, the Must-Offer Generator shall not be eligible to recover Minimum Load Costs for any such hours within a Waiver Denial Period. When, on a 10-minute Settlement Interval basis, a Must-Offer Generator generating at minimum load in compliance with the must-offer obligation, produces a quantity of Energy that varies by more than the Tolerance Band, the Must-Offer Generator shall not be eligible to recover Minimum Load Costs for any such Settlement Intervals during hours within a Waiver Denial Period. When, on a Settlement Interval basis, a Must-Offer Generator's resource produces a quantity of Energy above minimum load due to an ISO Dispatch Instruction, the Must-Offer Generator shall recover its Minimum Load Costs and its bid costs, as set forth in Section 11.2.4.1.1.1, for any such Settlement Intervals during hours within a Waiver Denial Period, irrespective of deviations outside of its Tolerance Band. Subject to the foregoing eligibility restrictions set forth in this section, the ISO shall guarantee recovery of the Minimum Load Costs of an otherwise eligible Must-Offer Generator for each Settlement Interval during hours within a Waiver Denial Period as follows: (1) First, ISO will pre-dispatch for real-time the minimum load Energy from Must-Offer Generators that have been denied waivers for each hour within a Waiver Denial Period; (2) This minimum load Energy will be accounted as Instructed

Imbalance Energy for each Settlement Interval within the relevant hour and be settled at the Resource-Specific Settlement Interval Ex Post Price; (3) To the extent the Instructed Imbalance Energy payments are not sufficient to cover the generator's Minimum Load Cost for the hour as defined in Section 5.11.6.1.2 of this Tariff, the generator will also receive an uplift payment for its Minimum Load Cost compensation for the relevant eligible Settlement Intervals of hours during the Waiver Denial Period that the Generating Unit runs at minimum load in compliance with the must-offer obligation; and (4) To the extent the Generator is dispatched for real time Imbalance Energy above its minimum load for any Dispatch Interval within an hour during the Waiver Denial Period, the Generator will be eligible for Bid Cost Recovery, as set forth in Section 11.2.4.1.1.1.

5.11.6.1.2 Minimum Load Costs

The Minimum Load Costs shall be calculated as the sum, for all eligible hours in the Waiver Denial Period and Settlement Periods in which the unit generated in response to an ISO Dispatch Instruction, of: 1) the product of the unit's average heat rate (as determined by the ISO from the data provided in accordance with Section 2.5.23.3.3) at the unit's relevant minimum operating level or Dispatchable minimum operating level as set forth in the ISO Master File or as amended through notification to the ISO via SLIC and the proxy figure for natural gas costs posted in the ISO Home Page in effect at the time and the unit's relevant minimum operating level or Dispatchable minimum operating level as set forth in the ISO Master File or as amended through notification to the ISO via SLIC; and 2) the product of the unit's relevant minimum operating level or Dispatchable minimum operating level as set forth in the ISO Master File or as amended through notification to the ISO via SLIC; and \$6.00/MWh.

5.11.6.1.3 Invoicing Minimum Load Costs

The ISO shall determine each Scheduling Coordinator's Minimum Load Costs and make payments for these costs as part of the ISO's market settlement process. Scheduling Coordinators may

5.12 [Not Used]

5.13 Energy Bids.

5.13.1 Energy Bid Definition.

A single Energy Bid curve per resource per hour shall be used in: (a) the real-time Hourly Pre-Dispatch as set forth in Dispatch Protocol 8.6.3, and (b) Dispatch in the Real Time Markets. A corresponding operational ramp rate as provided for in SBP Section 6.5 shall be submitted along with the single Energy Bid curve and shall be used in determination of Dispatch Instructions pursuant to Section 2.5.22.6.1(c).

The Energy Bid shall be a staircase price (\$/MWh) versus quantity (MW) curve of up to 10 segments. The Energy Bid shall be submitted to the real-time Imbalance Energy market using the Supplemental Energy Bid template. The Energy Bid curve shall be monotonically increasing, i.e., the price of a subsequent segment shall be greater than the price of a previous segment. Subject to the foregoing, sellers may increase or decrease bids in the ISO Real Time Market for capacity associated with those parts of the bid curve that were not accepted in or before the Hour-Ahead Market. For capacity associated with those parts of the bid curve previously accepted in or before the Hour-Ahead Market, sellers may only submit lower bids in subsequent markets. Each Forbidden Operating Region must be represented by only one bid segment.

5.13.2 Energy Bid Submission.

5.13.2.1 Real Time Market. Bids shall be submitted for use in the real-time Hourly Pre-Dispatch in DP 8.6.3(j) and the Real-Time Economic Dispatch up to sixty (60) minutes prior to the Operating Hour. Resources required to offer their Available Generation in accordance with Section 5.11.4 shall be required to submit Energy Bids for 1) all of their Available Generation and 2) any Ancillary Services capacity awarded or self-provided in the Day-Ahead or Hour-Ahead Ancillary Services markets. In the absence of submitted bids, default bids will be used for resources required to offer their Available Generation in accordance with Section 5.11.4. Resources not required to offer their Available Generation in accordance with Section 5.11.4 that were awarded or self-provided Ancillary Services capacity must submit an Energy Bid for no less than the amount of awarded or self-provided Ancillary Services capacity. Resources not required to offer their Available Generation in accordance with Section 5.11.4 may voluntarily submit Energy Bids. Submitted Energy Bids shall be subject to the Damage Control Bid Cap as set forth in Section 28.1 and to the Mitigation Measures set forth in Appendix A to the Market Monitoring and Information Protocol.

7.2.1.4 Elimination of Potential Transmission Congestion. The ISO's Day-Ahead and Hour-Ahead scheduling procedures will eliminate potential Inter-Zonal Congestion by:

7.2.1.4.1 scheduling the use of Inter-Zonal Interfaces by the Scheduling Coordinators who place the highest value on those rights, based on the Adjustment Bids that are submitted by Scheduling Coordinators; and

7.2.1.4.2 rescheduling Scheduling Coordinators' resources (but so that Intra-Zonal transmission limits are not violated) using the Adjustment Bids that are submitted by Scheduling Coordinators.

7.2.1.5 Elimination of Real-Time Inter-Zonal Congestion. In its management of Inter-Zonal Congestion in real time, the ISO will issue Dispatch Instructions as necessary to relieve Inter-Zonal Congestion by Dispatching Generation or Demand, as necessary, based on the Energy Bids in accordance with Dispatch Protocol Section 8.3.

7.2.2 General Requirements for the ISO's Congestion Management. The ISO's Congestion Management in the Day-Ahead Market and Hour-Ahead Market shall:

7.2.2.1 only operate if the Scheduling Coordinators do not eliminate Congestion voluntarily;

7.2.2.2 adjust the Schedules submitted by Scheduling Coordinators only as necessary to alleviate Congestion;

7.2.2.3 maintain separation between the resource portfolios of different Scheduling Coordinators, by not arranging any trades between Scheduling Coordinators as part of the Inter-Zonal Congestion Management process;

7.2.4.1.2 The Adjustment Bids will be used by the ISO to determine the marginal value associated with each Congested Inter-Zonal Interface.

7.2.4.1.3 [Not used]

7.2.4.1.4 The ISO shall use Energy Bids from Generating Units and from other resources in the ISO's real-time system operation, for increasing resources' output for Intra-Zonal Congestion Management to decrement Generation in order to accommodate Overgeneration conditions, including Reliability Must-Run Generation which the ISO requests under Reliability Must-Run Contracts.

7.2.4.1.5 To facilitate trades amongst Scheduling Coordinators, the ISO will develop procedures to publish Adjustment Bids of those Scheduling Coordinators who authorize the publication of their identity and/or Adjustment Bids. Scheduling Coordinators will then be able to utilize this information to conduct trades to aid Congestion Management.

7.2.4.2 Submission of Adjustment Bids.

7.2.4.2.1 Each Scheduling Coordinator is required to submit a preferred operating point for each of its resources. However, a Scheduling Coordinator is not required to submit an Adjustment Bid for a resource.

7.2.4.2.2 The minimum MW output level specified for a resource, which may be zero MW, and the maximum MW output level specified for a resource must be physically realizable by the resource.

7.2.4.2.3 The Scheduling Coordinator's preferred operating point for each resource must be within the range of the Adjustment Bids.

7.2.4.2.4 Adjustment Bids can be revised by Scheduling Coordinators after the Day-Ahead Market has closed for consideration in the Hour-Ahead Market and, after the Hour-

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 Incremental Bids. With regard to incremental bids, except as provided in Sections 5.2, 7.2.6.1 and 11.2.4.2, the ISO will perform Intra-Zonal Congestion Management in real time using available Imbalance Energy bids, based on their effectiveness and in merit order, to minimize the cost of alleviating Congestion. In the event no Imbalance Energy bids are available, the ISO will exercise its authority to direct the Redispatch of resources as allowed under the Tariff, including Section 2.4.4.

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

7.2.7 Creation, Modification and Elimination of Zones.

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

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

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

Redispatch cost will be recovered for each Settlement Period through the Grid Operations Charge, which shall be paid to the ISO by all Scheduling Coordinators in proportion to their metered Demands within the Zone with Intra-Zonal Congestion, and scheduled exports from the Zone with Intra-Zonal Congestion to a neighboring Control Area, provided that, with respect to Demands within an MSS in the Zone and scheduled exports from the MSS to a neighboring Control Area, a Scheduling Coordinator shall be required to pay Grid Operations Charges only with respect to Intra-Zonal Congestion, if any, that occurs on an interconnection between the MSS and the ISO Controlled Grid, and with respect to Intra-Zonal Congestion that occurs within the MSS, to the extent the Congestion is not relieved by the MSS Operator.

7.4 Transmission Losses.

7.4.1 Obligation to Provide for Transmission Losses.

Each Scheduling Coordinator shall ensure that it schedules sufficient Generation to meet both its Demand and Transmission Losses responsibilities as determined in accordance with this Section 7.4. Scheduling Coordinators for Generators, System Units and System Resources are responsible for their respective proportion of Transmission Losses as determined in accordance with Section 7.4.2. For each Final Hour-Ahead Schedule, each Scheduling Coordinator representing Generators or System Units shall elect through the flag described in SBP Section 2.1.1 to either: 1) generate sufficient additional energy to meet its respective Transmission Losses or 2) be financially responsible for its respective transmission loss obligation based on the Imbalance Energy procured on its behalf by the ISO. In the ISO Imbalance Energy market, all Scheduling Coordinators for Generators, System Units, and System Resources must be financially responsible for all respective Transmission Losses associated with their respective Imbalance Energy Dispatch Instructions in real time, based on the Imbalance Energy procured on their behalf by the ISO. A Scheduling Coordinator for an MSS Operator that has elected

to follow Load will be responsible for its transmission loss obligation pursuant to Sections 23.12.1 and 23.16.4.

7.4.1.1 Settlement of Transmission Loss Obligations.

For a Scheduling Coordinator that elects to not or may not, self-provide for its transmission loss obligation, the ISO will procure Imbalance Energy on the Scheduling Coordinator's behalf for each relevant Dispatch Interval and explicitly settle its transmission loss obligation for each applicable Settlement Interval. For a resource under an ISO Dispatch Instruction for Imbalance Energy, transmission loss obligations shall be settled at the Resource-Specific Settlement Interval Ex Post Price. For a resource not under an ISO Dispatch Instruction for Imbalance Energy, transmission loss obligations shall be settled at the simple average of the two applicable Dispatch Interval Ex Post Prices as defined in Section 2.5.23.2.1. Allocation of transmission loss obligation settlement shall be treated consistent with Instructed Imbalance Energy pursuant to Section 11.2.4.2.1.

7.4.2 Determination of Transmission Losses.

The total Demand that may be served by a Generating Unit, in a given hour, taking account of Transmission Losses, is equal to the product of the total Metered Quantity of that Generating Unit in that hour and the Ex Post Generation Meter Multiplier calculated by the ISO in the hour for that Generator location except in accordance with Section 7.4.3. The Ex Post Generation Meter Multiplier shall be greater than one (1) where the Generating Unit's contribution to the ISO Controlled Grid reduces Transmission Losses and shall be less than one (1) where the Generating Unit's contribution to the system increases Transmission Losses. All Generating Units supplying Energy to the ISO

- (4) Imbalance Energy charges;
- (5) Usage Charges;
- (6) High Voltage Access Charges and Transition Charges;
- (7) Wheeling Access Charges;
- (8) Voltage Support and Black Start charges; and
- (9) Reliability Must-Run Charges; and
- (10) Default Interest Charges.

11.2 Calculations of Settlements.

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

11.2.1 Grid Management Charge.

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

11.2.2 Grid Operations Charge.

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

11.2.3 Ancillary Services

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

11.2.4 Imbalance Energy.

The ISO shall calculate, Dispatch and account for Imbalance Energy for each Dispatch Interval and settle Imbalance Energy in the Real Time Market for each Settlement Interval 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 Demand Take-Out Point, Generating Unit, System Unit or System Resource for which a Scheduling Coordinator has a Final Hour-Ahead Schedule or Metered Quantity, for each Settlement Interval, 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 Settlement Interval in accordance with Section 2.5.23.2.1. Positive or negative Uninstructed Imbalance Energy as described in SABP Appendix D, Section 2.1.1 shall be paid or charged the Resource-Specific Settlement Interval Ex Post Price or the Zonal Settlement Interval Ex Post Price, as the case may be.

11.2.4.1.1 Settlement for Instructed Imbalance Energy

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

11.2.4.1.1.1 Bid Cost Recovery for Generating Units, System Units and Curtailable Demand.

The ISO shall determine, for each Trading Day, for each Generating Unit, System Unit and Curtailable Demand, Dispatched in the Real Time Market pursuant to Section 2.5.22, whether there exists a surplus or deficit in that resource's recovery of its Energy Bid costs, that are less than or equal to the Maximum Bid Level, through Instructed Imbalance Energy credits, as set forth in Section 11.2.4.1.1. This determination of market revenue surplus or deficit shall be calculated as the difference between: 1) the Instructed Imbalance Energy payment as based on the

relevant Resource-Specific Settlement Interval Ex Post Price and 2) the resource's Energy Bid cost for each Settlement Interval. Bid cost recovery payment will be based on Settlement Intervals in which the resource did not: 1) recover its Energy Bid costs, and 2) generated or consumed an amount of Energy equal to its schedule, any Dispatch Instructions and its applicable Tolerance Band. **The Tolerance Band requirement will not apply to Must-Offer Generators that produce a quantity of Energy above minimum load due to an ISO Dispatch Instruction.** These Settlement Intervals will be netted against all Settlement Intervals in which the Instructed Imbalance Energy payments to the resource exceeded its Energy Bid costs. The resulting total bid cost recovery payment is then divided equally amongst the same Settlement Intervals to yield a per-Settlement Interval bid cost recovery payment. **For non-must offer resources,** this per-Settlement Interval bid cost recovery payment shall then be paid to each Settlement Interval in which the resource generated or consumed an amount of Energy equal to its schedule, any Dispatch Instructions and its applicable Tolerance Band. **For must-offer resources, this per-Settlement Interval bid cost recovery payment shall be made in each interval the unit was instructed by the ISO to operate above its minimum load, or returning to its minimum load from a prior ISO instruction.** Payments for un-recovered bid costs for portions of Energy associated with bids above the Maximum Bid Level will not be netted with other surpluses or deficits and are subject to recall if the such bids above have not been adequately justified pursuant to Section 28.1.2. Energy Bid cost recovery associated with Residual Energy as provided for in Section 2.5.22.6.4 shall be based on the Energy Bids for the previous or next operating hour, whichever the case may be, upon which the Dispatch Instruction was based.

11.2.4.1.1.2 Bid Cost Recovery for System Resources

The ISO shall determine, for each Settlement Period, for each System Resource submitting bids in the Real Time Market pursuant to Section 2.5.22, whether there exists a surplus or deficit in that resource's recovery of its Energy Bid costs. This determination of market revenue surplus or deficit shall be calculated as the difference between: 1) the Instructed Imbalance Energy payment as based on the simple average of the relevant Dispatch Interval Ex Post Prices for each Settlement Period and 2) the resource's Energy Bid cost for each Settlement Period. An uplift payment will be made as necessary for each Settlement Period to assure that the System Resource recovers its Energy Bid costs for the quantity of Energy delivered. Payments for un-recovered bid costs for portions of Energy associated with bids above the Maximum Bid Level are subject to recall if such bids have not been adequately justified pursuant to Section 28.1.2.

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 Dispatch Operating Point, for dispatched resources, or their Final Hour-Ahead Schedule otherwise. The Dispatch 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 for negative Uninstructed Imbalance Energy will be calculated and assessed in each Settlement Interval. The Uninstructed Deviation Penalty for positive Uninstructed Imbalance Energy will be calculated and assessed in each Settlement Interval in which the ISO has not declared a Staged System Emergency;

- b) The Uninstructed Deviation Penalty will apply to pre-Dispatched bids from non-dynamically scheduled System Resources identified, when such a pre-Dispatch Instruction is issued more than 40 minutes prior to the relevant Operating Hour, subject to the following conditions: i) The Uninstructed Deviation Penalty will only apply to the pre-Dispatched amount of the bid that is declined or not delivered, ii) the Uninstructed Deviation Penalty will not apply to a portion of a pre-Dispatched bid that is subsequently not delivered at the direction of a Control Area, including the ISO, due to a curtailment of transmission capability or to prevent curtailment of native firm load occurring subsequent to issuing the pre-Dispatch Instruction, iii) the Uninstructed Deviation Penalty will not apply to uninstructed energy resulting from declining subsequent intra-hour Dispatch Instructions. Dynamically scheduled System Resources, to the extent they deviate from their Final Hour-Ahead Schedule plus any real-time Dispatch Instructions, will be subject to the Uninstructed Deviation Penalty;
- c) The Uninstructed Deviation Penalty will not apply to Load or Curtailable Demand;
- d) [Not Used]
- 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 Eligible Intermittent Resources Protocol. No other applicable charges will be affected by this exemption. The Uninstructed Deviation Penalty also will not apply to Qualifying Facilities (QFs) that have not executed a Participating Generator Agreement (PGA), pending resolution of QF-PGA issues at FERC;
- f) For the Scheduling Coordinator of an MSS that has elected to follow the MSS Load and associated Transmission Losses pursuant to Section 23.12, the deviation penalties in Sections 23.12.2.1 and 23.12.2.2 will apply. For the Scheduling Coordinator of an MSS

that has not elected to follow the MSS Load, the Uninstructed Deviation Penalties in this Section 11.2.4.1.2 will apply;

- g) The Uninstructed Deviation Penalty will apply to Generating Units providing Regulation and dynamically scheduled System Resources providing Regulation to the extent that Uninstructed deviations from such resources exceed each resource's actual Regulation range plus the applicable Tolerance Band. Resources providing Regulation and generating within their relevant Regulating range (or outside their relevant Regulating range as a direct result of ISO control or instruction) will be deemed to have zero deviations for purposes of the Uninstructed Deviation Penalty.
- h) The Uninstructed Deviation Penalty will be calculated and assessed for each resource individually, except that as specified in this Section, Uninstructed deviations from individual resources may be aggregated. Uninstructed deviations can be aggregated for resources that: 1) are represented by the same Scheduling Coordinator, 2) are connected to the same ISO Controlled Grid bus and voltage level, and 3) are not Reliability Must Run Condition 2 resources. The ISO will consider, on a case-by-case basis, requests to aggregate Uninstructed deviations amongst resources represented by the same Scheduling Coordinator based on an ISO review of impact on the ISO Controlled Grid. The ISO may temporarily suspend any aggregation as needed to ensure reliability. The applicable Pmax of aggregated groups of resources will exclude units that are not operating;
- i) [Not Used]
- j) [Not Used]
- k) The Uninstructed Deviation Penalty will not apply when the Zonal Settlement 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 equal to 100% of the corresponding Zonal Settlement Interval Ex Post Price. 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 equal to 50% of the corresponding Zonal Settlement 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 the test for the purposes of validating unit performance;
- o) The Uninstructed Deviation Penalty shall apply to any excess Energy delivered from or any shortfall of Energy not delivered from an out-of-market (OOM) transaction involving a Generating Unit or a System Unit once the ISO and the supplier have agreed upon the time of, duration of, and the amount of Energy to be delivered in the OOM transaction. The Uninstructed Deviation Penalty shall apply to firm OOM transactions with System Resources to the extent the System Resource fails to deliver the agreed-to Energy or over-delivers the agreed-to Energy if that over- or under-delivery was due to action taken by or not taken by the System Resource and not the result of action taken by a Control Area operator due to a curtailment of firm transmission capability or to prevent curtailment of native firm load occurring subsequent to issuing the pre-Dispatch Instruction;

- p) Generating Units with Uninstructed Imbalance Energy will be exempted from the Uninstructed Deviation Penalty if the Generating Unit was physically incapable of delivering the expected Energy, provided that the Generating Unit had notified the ISO within 30 minutes of the onset of an event that prevents the resource from performing its obligations. A Generating Unit must notify ISO operations staff of its reasons for failing to deliver the expected Energy in accordance with Section 2.3.3.9.5 and must provide information to the ISO that verifies the reason the resource failed to comply with the Dispatch instruction within 48 hours of the operating hour in which the instruction is issued;
- q) **Adjustments to any Generating Unit, Curtailable Demand and System Resource Final Hour-Ahead Schedules made in accordance with the terms of Existing Contracts shall not be subject to Uninstructed Deviation Penalties.**
- r) Any changes made to Schedules prior to the ISO issuing Final Hour-Ahead Schedules shall not be subject to Uninstructed Deviation Penalties.
- s) Uninstructed Deviation Penalties shall not be charged to any deviation from a Dispatch Instruction that does not comply with the requirements set forth in the Dispatch Protocol.

- t) Amounts collected as Uninstructed Deviation Penalties shall first be assigned to reduce the portion of above-MCP costs that would otherwise be assigned pro rata to all Scheduling Coordinators in that Settlement Interval pursuant to Section 11.2.4.2.2. Any remaining portion of amounts collected as Uninstructed Deviation Penalties after satisfying these sequential commitments shall be treated in accordance with SABP 6.5.2.
- u) Condition 2 RMR Units shall be exempt from Uninstructed Deviation Penalties.

most recent similar days for the same Settlement Period for which the resource is dispatched; 2) an Energy payment equal to the average calculated using the ISO Real Time Market Energy prices for the three (3) most recent similar days for the same Settlement Period for which the resource is dispatched; 3) such resource's verifiable Start-Up Fuel Costs, if the start-up was solely attributable to the ISO's Dispatch Instruction and if the Scheduling Coordinator provides the resource's Start-Up Fuel Costs to the ISO within thirty (30) Business Days from the Settlement Period for which the resource is dispatched; and 4) verifiable daily gas imbalance charges, if any, that are solely attributable to the ISO's Dispatch Instruction and that the Scheduling Coordinator or Generator was not able to eliminate or reduce despite the application of best efforts, if the Scheduling Coordinator provides the resource's daily gas imbalance charges to the ISO within thirty (30) Business Days from the Settlement Period for which the resource is dispatched. References to "similar days" in this Section refer to Business Days when the resource is dispatched on a Business Day and otherwise to days that are not Business Days.

To the extent a Scheduling Coordinator does not specify a payment option, the ISO will apply the payment provisions of the payment option described in Section 11.2.4.2(a).

11.2.4.2.1 Allocation of Costs Resulting From Dispatch Instructions

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

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

- a) the portion of the Energy payment at or below the Market Clearing Price ("MCP") for the Settlement Interval, and
- b) the portion of the Energy payment above the MCP, if any, for the Settlement Interval.

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

11.2.4.2.2 Allocation of Above-MCP Costs For Accepted Bids

For each Settlement Interval, the at or below-MCP costs incurred as a result of accepted bids in the ISO Imbalance Energy Markets shall be allocated in accordance with 11.2.4.1. Allocation of above-MCP costs for accepted bids in the ISO Imbalance Energy Markets shall be in accordance with this Section 11.2.4.2.2 as follows.

11.2.4.2.2.1 Allocation of Bid Costs Above the Maximum Bid Level

For each Settlement Interval, costs that are both above the MCP and above the Maximum Bid Level, incurred by the ISO as a result of Instructed Imbalance Energy and Dispatch instructions for reasons other than for a transmission facility Outage or a location-specific requirement shall

be charged to Scheduling Coordinators as follows in a three-step process. First, each Scheduling Coordinator's charge shall be the lesser of:

- (a) the pro rata share of the total costs that are both above the MCP and above the Maximum Bid Level based upon the ratio of each Scheduling Coordinator's Net Negative Uninstructed Deviations to the total system Net Negative Uninstructed Deviations; or
- (b) the amount obtained by multiplying the Scheduling Coordinator's Net Negative Uninstructed Deviation for each Settlement Interval and a weighted average price. The weighted average price is equal to the total costs that are both above the MCP and above the Maximum Bid Level divided by the MWh delivered as a result of ISO instructions with a cost component above the MCP.

Second, any remaining unallocated costs shall be reduced pursuant to Section 11.2.4.1.2.

Third, any remaining unallocated costs shall be allocated amongst all Scheduling Coordinators in that Settlement Interval pro rata based on their metered Demand, including exports.

A Scheduling Coordinator shall be exempt from the first allocation step of costs that are both above the MCP and above the Maximum Bid Level in a Settlement Interval if the Scheduling Coordinator has sufficient incremental Energy bids from physically available resources in the Imbalance Energy market to cover its Net Negative Uninstructed Deviation in the given Settlement Interval and the prices of such Energy bids do not exceed the applicable Maximum Bid Level as set forth in Section 28.1.2 of this Tariff.

11.2.4.2.2 Allocation of Bid Costs Above-MCP and Below the Maximum Bid Level

For each Settlement Interval, the total unrecovered costs pursuant to Section 11.2.4.1.1.1 that are above the MCP and below the Maximum Bid Level for each Trading Day will be allocated pro-rata to each Scheduling Coordinator based on its metered Demand. For a Scheduling Coordinator of an MSS Operator that has elected to follow Load, allocation of such unrecovered costs will be based on net metered Demand.

11.2.4.3 Unaccounted For Energy (UFE)

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

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

11.2.4.5 Participating Intermittent Resources

11.2.4.5.1 Uninstructed Energy and Transmission Losses by Participating Intermittent Resources

Uninstructed Imbalance Energy associated with deviations by a Participating Intermittent Resource and Transmission Losses 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 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 Settlement Interval, together with the transmission loss obligation calculated in accordance with Section 7.4.1.1, 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 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 Settlement Interval deviations by each Participating Intermittent Resource were priced at the appropriate **Dispatch** Interval Ex Post Price 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 Settlement 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 forecasting service for Participating Intermittent Resources shall be assessed to Scheduling Coordinators for Participating Intermittent Resources as specified in Schedule 4 of Appendix F.

Coordinator for the MSS Operator shall not be obligated to bear any share of the ISO's costs for any summer Demand reduction program or for any summer reliability Generation procurement program pursuant to ISO Tariff Section 2.3.5.1.8 for the calendar year for which the demonstration is made.

23.16.3 If the ISO is compensating Generating Units for Emissions Costs, Start-Up Fuel Costs and Minimum Load Costs, and if MSS Operator charges the ISO for the Emissions Costs, Start-Up Fuel Costs and Minimum Load Costs, of the Generating Units serving the Load of the MSS, then the Scheduling Coordinator for the MSS shall bear its proportionate share of the total amount of those costs incurred by the ISO based on the MSS gross metered Demand and exports and the Generating Units shall be made available to the ISO through the submittal of Supplemental Energy bids. If the MSS Operator chooses not to charge the ISO for the Emissions Costs, Start-Up Fuel Costs and Minimum Load Costs of the Generating Units serving the Load of the MSS, then the Scheduling Coordinator for the MSS shall bear its proportionate share of the total amount of those costs incurred by the ISO based on the MSS's net metered Demand and exports. The MSS Operator shall make the election whether to charge the ISO for these costs on an annual basis on November 1 for the following calendar year.

23.16.4 The Scheduling Coordinator for the MSS shall be responsible for Transmission Losses, in accordance with the ISO Tariff, only within the MSS, at any points of interconnection between the MSS and the ISO Controlled Grid, and for the delivery of Energy to the MSS or from the MSS, provided the MSS Operator fulfills its obligation to provide for Transmission Losses on the transmission facilities forming part of the MSS. A Generation Meter Multiplier shall be assigned to the Generating Units on the MSS at the Points of Interconnection for use of the ISO Controlled Grid. That GMM shall be 1.0 for all Generating Units within the MSS that are located at or behind a Point of Interconnection, to the extent that the Load at the Point of Interconnection for that portion of the MSS exceeds the amount of Generation produced by the Generating Units connected to that portion of the MSS, except that a GMM shall be calculated by the ISO for

Energy produced pursuant to a Dispatch instruction from the ISO.

23.16.5 If the MSS Operator has elected to follow its Load in accordance with Section 23.12, then the MSS is not eligible to receive bid cost recovery as provided for in Section 11.2.4.1.1.1 and the Scheduling Coordinator for the MSS shall be allocated costs associated with bid cost recovery on a net Metered Demand basis. If the MSS Operator has elected to not follow its Load in accordance with Section 23.12, then the MSS is eligible to receive bid cost recovery as provided for in Section 11.2.4.1.1.1, if applicable, subject to resource-specific performance review, and the Scheduling Coordinator for the MSS shall be allocated costs associated with bid cost recovery on a gross metered Demand basis.

24. [NOT USED]

25. [NOT USED]

26. TEMPORARY CHANGES TO ANCILLARY SERVICES PENALTIES

26.1 Application and Termination

The temporary change, respecting Ancillary Services penalties, set out in Section 26.2 shall continue in effect until such time as the Chief Executive Officer of the ISO issues a Notice of Full-Scale Operations, 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 on which this Section 26 shall cease to apply, which date shall be not less than seven (7) days after the Notice of Full-Scale Operations is issued.

26.2 For so long as this Section 26.2 remains in effect, Scheduling Coordinators shall not be liable for the penalties specified in Section 2.5.26 of the ISO Tariff if, as a result of limitations associated with the ISO's Congestion Management software, the scheduled output of the resource from which the Scheduling Coordinator has committed to provide an Ancillary Service is adjusted by the ISO to a level that conflicts with the Scheduling Coordinator's Ancillary Service capacity commitments, thereby resulting in a failed availability test.

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which the Scheduling Coordinator is willing to increase the output of the resource and sell Energy from that resource to the ISO (or, in the case of a Dispatchable Load, decrease the Demand); and (vi) for the ranges between each of the MW values less than the preferred operating point, corresponding prices (in \$/MWh) for which the Scheduling Coordinator is willing to decrease the output of the resource and purchase Energy from the ISO at the resource's location (or, in the case of a Dispatchable Load, increase the Demand). This data for an Adjustment Bid must result in a monotonically increasing curve.

Administrative Price

The price set by the ISO in place of a Market Clearing Price when, by reason of a System Emergency, the ISO determines that it no longer has the ability to maintain reliable operation of the ISO Controlled Grid relying solely on the economic Dispatch of Generation. This price will remain in effect until the ISO considers that the System Emergency has been contained and corrected.

Affiliate

An entity, company or person that directly, or indirectly through one or more intermediaries, controls, or is controlled by, or is under common control with the subject entity, company, or person.

AGC (Automatic Generation Control)

Generation equipment that automatically responds to signals from the ISO's EMS control in real time to control the power output of electric generators within a prescribed area in response to a change in system frequency, tie-line loading, or the relation of these to each other, so as to maintain the target system frequency and/or the established interchange with other areas within the predetermined limits.

enhancement.

(e) A long-term debt rating of not less than any one of the following: (i) A- by Standard and Poor's Corporation; (ii) A- by Fitch Ratings; or (iii) A3 by Moody's Investors Service. This rating shall be an issuer, or counterparty rating, without the benefit of credit enhancement.

With respect to whether security must be posted for payment of all charges:

(f) A federal agency shall be deemed to have an Approved Credit Rating if its financial obligations under the ISO Tariff are backed by the full faith and credit of the United States.

(g) A California state agency shall be deemed to have an Approved Credit Rating if its financial obligations under the ISO Tariff are backed by the full faith and credit of the State of California.

(h) Another credit rating approved by the ISO Governing Board.

Approved Load Profile

Local Regulatory Authority approved Load profiles applied to cumulative End-Use Meter Data in order to allocate consumption of Energy to Settlement Periods.

Approved Maintenance Outage

A Maintenance Outage which has been approved by the ISO through the ISO Outage Coordination Office.

Automatic Mitigation Procedure (AMP)

The market power mitigation procedure described in MMIP Appendix A.

**Available Transfer
Capacity**

For a given transmission path, the capacity rating in MW of the path established consistent with ISO and WECC transmission capacity rating guidelines, less any reserved uses applicable to the path.

Balanced Schedule

A Schedule shall be deemed balanced when Generation, adjusted for Transmission Losses equals forecast Demand with respect to all entities for which a Scheduling Coordinator schedules.

Balancing Account

An account set up to allow periodic balancing of financial transactions that, in the normal course of business, do not result in a zero balance of cash inflows and outflows.

Black Start

The procedure by which a Generating Unit self-starts without an external source of electricity thereby restoring power to the ISO Controlled Grid following system or local area blackouts.

Black Start Generator

A Participating Generator in its capacity as party to an Interim Black Start Agreement with the ISO for the provision of Black Start services, but shall exclude Participating Generators in their capacity as providers of Black Start services under their Reliability Must-Run Contracts.

Bulk Supply Point

A UDC metering point.

Business Day

A day on which banks are open to conduct general banking business in California.

C.F.R.

Code of Federal Regulations.

Circular Schedule

A Schedule or set of Schedules that creates a closed loop of Energy Schedules between the ISO Controlled Grid and one or more other Control Areas that do not have a source and sink in separate Control Areas, which includes Energy scheduled in a counter direction over a Congested Inter-Zonal Interface through two or more Scheduling Points. A closed loop of Energy Schedules that includes a transmission segment on the Pacific DC Intertie shall not be a Circular Schedule because such a Schedule directly changes power flows on the network and can mitigate Congestion between SP15 and NP15.

Critical Protective System Facilities and sites with protective relay systems and Remedial Action Schemes that the ISO determines may have a direct impact on the ability of the ISO to maintain system security and over which the ISO exercises Operational Control.

CTC (Competition Transition Charge) A non-bypassable charge that is the mechanism that the California Legislature and the CPUC mandated to permit recovery of costs stranded as a result of the shift to the new market structure.

Curtailable Demand Demand from a Participating Load that can be curtailed at the direction of the ISO in the real-time Dispatch of the ISO Controlled Grid. Scheduling Coordinators with Curtailable Demand may offer it to the ISO to meet Non-Spinning Reserve or Replacement Reserve requirements.

Data Adequacy Requirement Any applicable minimum data requirements of the state agency responsible for generation siting or of any Local Regulatory Authority.

Day-Ahead Relating to a Day-Ahead Market or Day-Ahead Schedule.

Day-Ahead Market The forward market for Energy and Ancillary Services to be supplied during the Settlement Periods of a particular Trading Day that is conducted by the ISO and other Scheduling Coordinators and which closes with the ISO's acceptance of the Final Day-Ahead Schedule.

Day-Ahead Schedule A Schedule prepared by a Scheduling Coordinator or the ISO before the beginning of a Trading Day indicating the levels of Generation and Demand scheduled for each Settlement Period of that Trading Day.

Default GMM Pre calculated GMM based on historical Load and interchange levels.

- Direct Assignment Facility** The transmission facilities necessary to physically and electrically interconnect a New Facility Operator to the ISO Controlled Grid at the point of Interconnection.
- Dispatch** The operating control of an integrated electric system to:
- i) assign specific Generating Units and other sources of supply to effect the supply to meet the relevant area Demand taken as Load rises or falls; ii) control operations and maintenance of high voltage lines, substations, and equipment, including administration of safety procedures; iii) operate interconnections; iv) manage Energy transactions with other interconnected Control Areas; and v) curtail Demand.
- Dispatch Instruction** An instruction by the ISO to a resource for increasing or decreasing its energy supply or demand from the Hour-Ahead Schedule to a specified operating point.
- Dispatch Interval** The time period, which may range between five (5) and thirty (30) minutes, over which the ISO's RTD Software measures deviations in Generation and Demand, and selects Ancillary Service and Supplemental Energy resources to provide balancing Energy in response to such deviations. The Dispatch Interval shall be five (5) minutes. Following a decision by the ISO Governing Board, the ISO may, by seven (7) days' notice published on the ISO's Home Page, at <http://www.caiso.com> (or such other internet address as the ISO may publish from time to time), increase or decrease the Dispatch Interval within the range of five (5) to thirty (30) minutes.

Dispatch Interval Ex Post Prices

The price of Imbalance Energy determined each Dispatch Interval based on 1) the Imbalance Energy requirements in that Dispatch Interval, and 2) the Energy Bid price of the resource eligible to set the price. The Dispatch Interval Ex Post Price is used to determine other prices used to settle Imbalance Energy.

Dispatch Operating Point

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

Dispatchable Load

Load which is the subject of an Adjustment Bid.

Distribution System

The distribution assets of an IOU or Local Publicly Owned
Electric Utility.

**EEP (Electrical
Emergency Plan)**

A plan to be developed by the ISO in consultation with UDCs to
address situations when Energy reserve margins are forecast
to be below established levels.

Entitlements

The right of a Participating TO obtained through contract or other means to use another entity's transmission facilities for the transmission of Energy.

Environmental Dispatch

Dispatch designed to meet the requirements of air quality and other environmental legislation and environmental agencies having authority or jurisdiction over the ISO.

Ex Post GMM

GMM that is calculated utilizing the real-time Power Flow Model in accordance with Section 7.4.2.1.2.

Ex Post Price

The Hourly Ex Post Price, the Dispatch Interval Ex Post Price, the Resource-Specific Settlement Interval Ex Post Price, or the Zonal Settlement Interval Ex Post Price.

Ex Post Transmission Loss

Transmission Loss that is calculated based on Ex Post GMM.

Final Hour-Ahead Schedule

The Hour-Ahead Schedule of Generation and Demand that has been approved by the ISO as feasible and consistent with all other Schedules based on the ISO's Hour-Ahead Congestion Management procedures.

Final Invoice

The invoice due from a RMR Owner to the ISO at termination of the RMR Contract.

Final Schedule

A Schedule developed by the ISO following receipt of a Revised Schedule from a Scheduling Coordinator.

Final Settlement Statement

The restatement or recalculation of the Preliminary Settlement Statement by the ISO following the issue of that Preliminary Settlement Statement.

Forbidden Operating Region

The operating region of a resource wherein the resource cannot operate in a stable manner and must ramp through at maximum ramp capacity.

Forced Outage

An Outage for which sufficient notice cannot be given to allow the Outage to be factored into the Day-Ahead Market or Hour-Ahead Market scheduling processes.

Forward Scheduling Charge

The component of the Grid Management Charge that provides for the recovery of the ISO's costs, including, but not limited to the costs of providing the ability to Scheduling Coordinators to forward schedule Energy and Ancillary Services and the cost of processing accepted Ancillary Service bids. For purposes of the Forward Scheduling Charge, a schedule is represented by each Final Hour-Ahead Schedule with a value other than 0 MW submitted to the scheduling infrastructure/scheduling

application system (import, export, Load, Generation, inter-Scheduling Coordinator trade, and Ancillary Services, including self-provided Ancillary Services) submitted to the ISO's scheduling infrastructure. The formula for determining the Forward Scheduling Charge is set forth in Appendix F, Schedule 1, Part A of this Tariff.

FPA

Parts II and III of the Federal Power Act, 16 U.S.C. § 824 et seq., as they may be amended from time to time.

FTR (Firm Transmission Right)

A contractual right, subject to the terms and conditions of the ISO Tariff, that entitles the FTR Holder to receive, for each hour of the term of the FTR, a portion of the Usage Charges received by the ISO for transportation of energy from a specific originating Zone to a specific receiving Zone and, in the event of an uneconomic curtailment to manage Day-Ahead Congestion, to a Day-Ahead scheduling priority higher than that of a Schedule using Converted Rights capacity that does not have an FTR.

Hourly Ex Post Price

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

Hourly Pre-Dispatch

The process in which the ISO Dispatches Energy Bids from System Resources before the start of the next Settlement Period for the entire duration of that Settlement Period.

Hydro Spill Generation

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

Identification Code

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

Imbalance Energy

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

Inactive Zone

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

incurred as a result of the use of the transmission by a third-party and minus c) the charges paid by the New Participating TO pursuant to Section 7.3.1.7, to the extent such charges are incurred by the Scheduling Coordinator of the New Participating TO on Congested Inter-Zonal Interfaces that are associated with the Section 9.4.3 FTRs provided to the New Participating TO. The component of New FTR Revenue represented by item 2) immediately above shall not be less than zero for any hour.

Net Negative Uninstructed Deviation

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

Order No. 889

The final rule issued by FERC entitled "Open Access Same-Time Information System (formerly Real Time Information Networks) and Standards of Conduct," 61 Fed. Reg. 21,737 (May 10, 1996), FERC Stats. & Regs., Regulations Preambles [1991-1996] ¶¶ 31,035 (1996), Order on Rehearing, Order No. 889-A, 78 FERC ¶¶ 61,221 (1997), as it may be amended from time to time.

Original Participating TO

A Participating TO that was a Participating TO as of January 1, 2000.

Outage

Disconnection, separation or reduction in capacity, planned or forced, of one or more elements of an electric system.

Overgeneration

A condition that occurs when total Generation exceeds total Demand in the ISO Control Area.

Participating Buyer

A Direct Access End-User or a wholesale buyer of Energy or Ancillary Services through Scheduling Coordinators.

Participating Intermittent Resource

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

Participating Load

An entity providing Curtailable Demand, which has undertaken in writing to comply with all applicable provisions of the ISO Tariff, as they may be amended from time to time.

Participating Seller or Participating Generator

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

Preliminary Settlement Statement

The initial statement issued by the ISO of the calculation of the Settlements and allocation of the charges in respect of all Settlement Periods covered by the period to which it relates.

Price Overlap

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

Project Sponsor

A Market Participant or group of Market Participants or a Participating TO that proposes the construction of a transmission addition or upgrade in accordance with Section 3.2 of the ISO Tariff.

Proxy Price

The value determined for each gas-fired Generating Unit owned or controlled by a Must-Offer Generator in accordance with Section 2.5.23.3.4.

PTO Service Territory

The area in which an IOU, a Local Public Owned Electric Utility, or federal power marketing administration that has turned over its transmission facilities and/or Entitlements to ISO Operational Control **is** obligated to provided electric service to Load. A PTO Service Territory may be comprised of the Service Areas of more than one Local Public Owned Electric Utility, if they are operating under an agreement with the ISO for aggregation of their MSS and their MSS Operator is designated as the Participating TO.

Replacement Reserve

Generating capacity that is dedicated to the ISO, capable of starting up if not already operating, being synchronized to the ISO Controlled Grid, and Ramping to a specified operating level within a sixty (60) minute period, the output of which can be continuously maintained for a two hour period. Also, Curtailable Demand that is capable of being curtailed within sixty minutes and that can remain curtailed for two hours.

Request for Expedited Interconnection Procedures

A written request, submitted pursuant to Section 5.7.3.1.1 of the ISO Tariff, by which a New Facility Operator can request expedited processing of its Interconnection Application.

Resource-Specific Settlement Interval Ex Post Price

The Resource-Specific Settlement Interval Ex Post Price will equal the Energy-weighted average of the applicable Dispatch Interval Ex Post Prices for each Settlement Interval taking into account each resource's Instructed Imbalance Energy, except Regulation Energy. The Resource-Specific Settlement Interval Ex Post Price shall apply to those resources that are capable of responding to ISO Dispatch Instructions.

Responsible Utility

The utility which is a party to the TCA in whose PTO Service Territory the Reliability Must-Run Unit is located or whose PTO Service Territory is contiguous to the PTO Service Territory in which a Reliability Must-Run Unit owned by an entity outside of the ISO Controlled Grid is located.

Revenue Requirement

The revenue level required by a utility to cover expenses made on an investment, while earning a specified rate of return on the investment.

Revised Adjusted RMR Invoice

The monthly invoice issued by the RMR Owner to the ISO pursuant to the RMR Contract reflecting any appropriate revisions to the Adjusted RMR Invoice based on the ISO's validation and actual data for the billing month.

Revised Estimated RMR Invoice

The monthly invoice issued by the RMR Owner to the ISO pursuant to the RMR Contract reflecting appropriate revisions to the Estimated RMR Invoice based on the ISO's validation of the Estimated RMR Invoice.

Revised Schedule

A Schedule submitted by a Scheduling Coordinator to the ISO following receipt of the ISO's Suggested Adjusted Schedule.

RMR Owner

The provider of services under a Reliability Must-Run Contract.

Real-Time Dispatch (RTD) Software

The security constrained optimal dispatch and ex post pricing software used by the ISO to determine which Ancillary Service and Supplementary Energy resources to Dispatch and to calculate the Ex Post Prices.

SCADA (Supervisory Control and Data Acquisition)

A computer system that allows an electric system operator to remotely monitor and control elements of an electric system.

SC Agreement

An agreement between a Scheduling Coordinator and the ISO whereby the Scheduling Coordinator agrees to comply with all ISO rules, protocols and instructions, as those rules, protocols and instructions may be amended from time to time.

SC Applicant

An applicant for certification by the ISO as a Scheduling Coordinator.

<u>Settlement</u>	Process of financial settlement for products and services purchased and sold undertaken by the ISO under Section 11 of the ISO Tariff. Each Settlement will involve a price and a quantity.
<u>Settlement Account</u>	An Account held at a bank situated in California, designated by a Scheduling Coordinator or a Participating TO pursuant to the Scheduling Coordinator's SC Agreement or in the case of a Participating TO, Section 2.2.1 of the TCA, to which the ISO shall pay amounts owing to the Scheduling Coordinator or the Participating TO under the ISO Tariff.
<u>Settlement Interval</u>	The time period, which is equal to or a multiple of the Dispatch Interval, over which the ISO settles deviations in Generation and Demand from Final Hour-Ahead Schedules.
<u>Settlement Period</u>	For all ISO transactions the period beginning at the start of the hour, and ending at the end of the hour. There are twenty-four Settlement Periods in each Trading Day, with the exception of a Trading Day in which there is a change to or from daylight savings time.
<u>Settlement Quality Meter Data</u>	Meter Data gathered, edited, validated, and stored in a settlement-ready format, for Settlement and auditing purposes.
<u>Settlement Statement</u>	Either or both of a Preliminary Settlement Statement or Final Settlement Statement.
<u>Settlement Statement Re-run</u>	The re-calculation of a Settlement Statement in accordance with the provisions of the ISO Tariff including any protocol of the ISO.
<u>Settlements, Metering, and Client Relations Charge</u>	The component of the Grid Management Charge that provides for the recovery of the ISO's costs, including, but not limited to the costs of maintaining customer account data, providing

Severance Fee

The charge or periodic charge assessed to customers to recover the reasonable uneconomic portion of costs associated with Generation-related assets and obligations, nuclear decommissioning, and capitalized Energy efficiency investment programs approved prior to August 15, 1996 and as defined in the California Assembly Bill No. 1890 approved by the Governor on September 23, 1996.

Scheduling and Logging system for the ISO of California (SLIC)

A logging application that allows Market Participants to notify the ISO when a unit's properties change due to physical problems. Users can modify the maximum and minimum output of a unit, as well as the ramping capability of the unit.

Spinning Reserve

The portion of unloaded synchronized generating capacity that is immediately responsive to system frequency and that is capable of being loaded in ten minutes, and that is capable of running for at least two hours.

Standard Ramp (-ing)

A ramp calculated from two consecutive Final Hour Ahead Schedules that results in a straight trajectory between 10 minutes before the start of an operating hour to 10 minutes after the start of the operating hour

Standby Rate

A rate assessed a Standby Service Customer by the Participating TO that also provides retail electric service, as approved by the Local Regulatory Authority, or FERC, as applicable, for Standby Service which compensates the Participating TO, among other things, for costs of High Voltage Transmission Facilities.

Standby Service

Service provided by a Participating TO that also provides retail electric service, which allows a Standby Service Customer, among other things, access to High Voltage Transmission Facilities for the delivery of backup power on an instantaneous basis to ensure that Energy may be reliably delivered to the Standby Service Customer in the event of an outage of a Generating Unit serving the customer's Load.

Standby Service Customer

A retail End-Use Customer of a Participating TO that also provides retail electric service that receives Standby Service and pays a Standby Rate.

Standby Transmission Revenue

The transmission revenues, with respect to cost of both High Voltage Transmission Facilities and Low Voltage Transmission Facilities, collected directly from Standby Service Customers through charges for Standby Service.

<u>Start-Up Fuel Cost Charge</u>	The charge determined in accordance with Section 2.5.23.3.7.
<u>Start-Up Fuel Cost Demand</u>	The level of Demand specified in Section 2.5.23.3.7.3.
<u>Start-Up Fuel Cost Invoice</u>	The invoice submitted to the ISO in accordance with Section 2.5.23.3.7.6.
<u>Start-Up Fuel Cost Trust Account</u>	The trust account established in accordance with Section 2.5.23.3.7.2.
<u>Start-Up Fuel Costs</u>	The cost of the fuel consumed by a particular G enerating U nit from the time of first fire, the time of receipt of an ISO Dispatch instruction, or the time the unit was last synchronized to the grid, whichever is later, until the time the generating unit is synchronized or re-synchronized to the grid and producing Energy. Start-Up Fuel Costs are determined by multiplying the actual amount of fuel consumed by the proxy gas price as determined in accordance with Section 2.5.23.3.4 at the time the fuel is consumed.

<u>Take-Out Point</u>	The metering points at which a Scheduling Coordinator Metered Entity or ISO Metered Entity takes delivery of Energy.
<u>Tax Exempt Debt</u>	Municipal Tax Exempt Debt or Local Furnishing Bonds.
<u>Tax Exempt Participating TO</u>	A Participating TO that is the beneficiary of outstanding Tax Exempt Debt issued to finance any electric facilities, or rights associated therewith, which are part of an integrated system including transmission facilities the Operational Control of which is transferred to the ISO pursuant to the TCA.
<u>TCA (Transmission Control Agreement)</u>	The agreement between the ISO and Participating TOs establishing the terms and conditions under which TOs will become Participating TOs and how the ISO and each Participating TO will discharge their respective duties and responsibilities, as may be modified from time to time.
<u>Tie Point Meter</u>	A revenue meter, which is capable of providing Settlement Quality Meter Data, at a Scheduling Point or at a boundary between UDCs within the ISO Controlled Grid.
<u>TO (Transmission Owner)</u>	An entity owning transmission facilities or having firm contractual rights to use transmission facilities.
<u>TO Tariff</u>	A tariff setting out a Participating TO's rates and charges for transmission access to the ISO Controlled Grid and whose other terms and conditions are the same as those contained in the document referred to as the Transmission Owners Tariff approved by FERC as it may be amended from time to time.
<u>Tolerance Band</u>	The tolerance band expressed in terms of Energy (MWh) for the performance requirement for Generating Units and System Units for each Settlement Interval will equal the greater of the absolute value of: 1) 5 MW divided by number of Settlement Intervals per Settlement Period or 2) three percent

(3%) of the relevant Generating Unit's or System Unit's maximum output (Pmax), as registered in the Master File, divided by number of Settlement Intervals per Settlement Period.

The tolerance band expressed in terms of Energy (MWh) for the performance requirement for Participating Loads for each Settlement Interval will equal the greater of the absolute value of: 1) 5 MW divided by number of Settlement Intervals per Settlement Period or 2) three percent (3%) of the applicable Final Hour-Ahead Schedule or ISO Dispatch amount divided by number of Settlement Intervals per Settlement Period.

The Tolerance Band shall not be applied to System Resources.

Trading Day

The twenty-four hour period beginning at the start of the hour ending 0100 and ending at the end of the hour ending 2400 daily, except where there is a change to and from daylight savings time.

Unaccounted for Energy (UFE)

UFE is the difference in Energy, for each utility Service Area and Settlement Period, between the net Energy delivered into the utility Service Area, adjusted for utility Service Area Transmission Losses (calculated in accordance with Section 7.4.2), and the total metered Demand within the utility Service Area adjusted for distribution losses using Distribution System loss factors approved by the Local Regulatory Authority. This difference is attributable to meter measurement errors, power flow modeling errors, energy theft, statistical Load profile errors, and distribution loss deviations.

Uncontrollable Force

Any act of God, labor disturbance, act of the public enemy, war, insurrection, riot, fire, storm, flood, earthquake, explosion, any curtailment, order, regulation or restriction imposed by governmental, military or lawfully established civilian authorities or any other cause beyond the reasonable control of the ISO or Market Participant which could not be avoided through the exercise of Good Utility Practice.

Uninstructed Deviation Penalty
Uninstructed Imbalance Energy

The penalty as set forth in Section 11.2.4.1.2 of this ISO Tariff.
The real-time change in Generation or Demand other than that instructed by the ISO or which the ISO Tariff provides will be paid at the price for Uninstructed Imbalance Energy.

Unit Commitment

The process of determining which Generating Units will be committed (started) to meet Demand and provide Ancillary Services in the near future (e.g., the next Trading Day).

Usage Charge

The amount of money, per 1 kW of scheduled flow, that the ISO charges a Scheduling Coordinator for use of a specific Congested Inter-Zonal Interface during a given hour.

**Zonal Settlement Interval
Ex Post Price**

The Zonal Settlement Interval Ex Post Price in a Settlement Interval in each Zone will equal the absolute-value Energy-weighted average of the Dispatch Interval Ex Post Prices in each Zone, where the weights are the system total Instructed Imbalance Energy, except Regulation Energy, for the Dispatch Interval.

DISPATCH PROTOCOL (DP)

DP 1 OBJECTIVES, DEFINITIONS AND SCOPE

DP 1.1 Objectives

The objectives of this Protocol are:

- (a) to implement those sections of the ISO Tariff which involve real-time and emergency operations;
- (b) to describe the real-time Dispatch of the Ancillary Services specified in the Ancillary Services Requirements Protocol (ASRP);
- (c) to describe the operational activities of the ISO after all commitments have been made in the Hour-Ahead Market as described in the Scheduling Protocol (SP);
- (d) to describe the use of Supplemental Energy bids received by the ISO in accordance with the Schedules and Bids Protocol (SBP); and
- (e) to describe how the ISO will meet the operational requirements of NERC and WECC guidelines.

DP 1.2 Definitions

DP 1.2.1 Master Definitions Supplement

Any word or expression defined in the Master Definitions Supplement to the ISO Tariff shall have the same meaning where used in this Protocol. A reference to a Section or an Appendix is a reference to a Section or an Appendix of the ISO Tariff. References to DP are to this Protocol or to the stated paragraph of this Protocol.

DP 1.2.2 Special Definitions for this Protocol

In this Protocol, the following words and expressions shall have the meanings set opposite them:

“Backup ISO Control Center” means the ISO Control Center located in Alhambra, California.

DP 3 SCHEDULING AND REAL-TIME INFORMATION

DP 3.1 Final Schedules

The scheduling process described in the SP will produce for the ISO real-time dispatchers for each Settlement Period of the Trading Day a Final Schedule consisting of the combined commitments contained in the Final Day-Ahead Schedules and the Final Hour-Ahead Schedules for the relevant Settlement Period. The Final Schedule will include information with respect to:

- (a) Generation schedules;
- (b) Demand schedules;
- (c) Ancillary Services schedules based on the ISO's Ancillary Services auction;
- (d) Ancillary Services schedules, based on SCs' ISO accepted schedules and forecast load, for self-provided Ancillary Services;
- (e) Interconnection schedules between the ISO Control Area and other Control Areas; and
- (f) Inter-Scheduling Coordinator Energy Trades.

DP 3.2 Supplemental Energy

In addition to the Final Schedules, Supplemental Energy bids will be available to the ISO real-time dispatchers, as described in the SBP, by sixty (60) minutes prior to the start of the Settlement Period to which such Supplemental Energy bids apply.

DP 3.3 SC Intertie Schedules

In accordance with the SBP and the SP, SCs shall provide the ISO with Interconnection schedules prepared in accordance with all NERC, WECC and ISO requirements. The provisions of the SBP and the SP shall apply to real-time changes in Interconnection schedules under Existing Contracts.

DP 3.4 Information to be Supplied by SCs

DP 3.4.1 SC Dispatch

Each SC shall be responsible for the scheduling and Dispatch of Generation and Demand in accordance with its Final Schedule.

DP 3.4.2 Generator or Interconnection Schedule Change

Each SC shall keep the ISO apprised of any change or potential change in the current status of all Generating Units, Interconnection schedules and Inter-Scheduling Coordinator Energy Trades. This will

include any changes in Generating Unit capacity that could affect planned Dispatch and conditions that could affect the reliability of a Generating Unit. Each SC shall immediately pass to the ISO any information which it receives from a Generator which the Generator provides to the SC pursuant to DP 3.7. Each SC shall immediately pass to the ISO any information it receives from a MSS Operator which the MSS Operator provides to the SC pursuant to DP 3.9.

DP 3.4.3 Verbal and Electronic Communication with Generators

Normal verbal and electronic communication of Dispatch Instructions between the ISO and Generators will be via the relevant SC. Each SC must immediately pass on to the Generator concerned any communication for the Generator which it receives from the ISO. If the ISO considers that there has been a failure at a particular point in time or inadequate response over a particular period of time by the Generating Units to the Dispatch Instruction, the ISO will notify the relevant SC. The ISO may, with the prior permissions of the Scheduling Coordinator concerned, communicate with and give Dispatch Instructions to the operators of Generating Units and Loads directly without having to communicate through their appointed Scheduling Coordinator. In situations of deteriorating system conditions or emergency, the ISO reserves the right to communicate directly with the Generator(s) as required to ensure System Reliability.

DP 3.4.4 Consequences of a Failure to Respond or Inadequate Response

The ISO may apply penalties, fines, economic consequences or the sanctions referred to in DP 9.5.2 for any failure or inadequate response under DP 3.4.3 to the SC representing the Generator responsible for such failure or inadequate response (which may be appropriately weighted to reflect its seriousness) subject to any necessary FERC approval.

DP 3.5 Information to be Supplied by UDCs

DP 3.5.1 UDC Status Change

Each UDC shall keep the ISO informed of any change or potential change in the status of its transmission lines and station equipment at the point of interconnection with the ISO Controlled Grid. Each UDC shall keep the ISO informed as to any event or circumstance in the UDC's service territory that could affect the reliability of the ISO Controlled Grid. This would include adverse weather conditions, fires, bomb threats, etc.

DP 3.5.2 UDC Outage Scheduling

Each UDC shall schedule all equipment Outages (or Outages of other equipment that could affect the ISO Controlled Grid) at the point of

DP 3.8.4 Operational Metering

All provisions in this section DP 3.8 refer to information and data obtained from metering used for Control Area operations and not metering used for billing and settlement.

DP 3.9 [Not Used]

DP 3.9.1 [Not Used]

DP 3.9.2 [Not Used]

DP 3.9.3 [Not Used]

DP 3.9.4 [Not Used]

DP 3.9.5 [Not Used]

DP 4 METHODS OF COMMUNICATIONS

DP 4.1 Methods of Transmitting Dispatch Instructions

DP 4.1.1 Full-Time Communications Facility Requirement

Each Participant must provide a communications facility manned twenty-four (24) hours a day, seven (7) days a week capable of receiving Dispatch Instructions issued by the ISO.

DP 4.2 Recording of Dispatch Instructions

The ISO shall maintain records of all electronic, fax and verbal communications related to a Dispatch instruction. The ISO shall maintain a paper or electronic copy of all Dispatch instructions delivered by fax and all Dispatch instructions delivered electronically. The ISO shall record all voice conversations that occur related to Dispatch instructions on the Dispatch Instruction communication equipment. These records, copies and recordings may be used by the ISO to audit the Dispatch Instruction, and to verify the response of the Participant concerned to the Dispatch Instruction.

DP 4.3 Contents of Dispatch Instructions

Dispatch Instructions shall include the following information as appropriate:

- (a) exchange of operator names;
- (b) specific resource being Dispatched;
- (c) specific MW value and price point of the resource being Dispatched;
- (d) specific type of instruction (action required);
- (e) time the resource is required to begin initiating the Dispatch Instruction;
- (f) time the resource is required to achieve the Dispatch Instruction;

- (g) time of notification of the Dispatch Instruction; and
- (h) any other information which the ISO considers relevant.

DP 4.4 Acknowledgement of Dispatch Instructions

The recipient of a Dispatch Instruction shall confirm the Dispatch Instruction. Dispatch Instructions communicated by the ISO either electronically or by fax shall be confirmed electronically in accordance with ISO procedures. Dispatch instructions communicated verbally shall be confirmed by repeating the Dispatch instructions to the ISO.

DP 5 ISO FACILITIES AND EQUIPMENT

DP 5.1 ISO Facility and Equipment Outages

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

DP 5.2 WEnet Unavailable

DP 5.2.1 Unavailable Critical Functions of WEnet

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

- (a) the Scheduling Infrastructure (SI) computer will not be able to communicate with SCs to receive any type of updated Schedule information;
- (b) the SI computer will not be able to communicate Congestion Management information and Schedule changes to the SCs; and
- (c) the ISO will not be able to communicate general information, including emergency information, to any Participants.

DP 5.2.2 Communications during WEnet Unavailability

During any period of WEnet unavailability, the ISO shall:

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

DP 6.9 Security Monitoring

The ISO shall be the Reliability Coordinator for the California Area. As Reliability Coordinator, the ISO, in conjunction with the other WECC Reliability Coordinators, will be responsible for the stable and reliable operation of the Western Interconnection in accordance with the WECC Regional Security Plan.

DP 6.9.1 Reliability Coordinator

As Reliability Coordinator, the ISO may direct activities as appropriate to curtail Schedules, Dispatch Generation or impose transfer limitations as necessary to relieve grid Congestion, mitigate potential overloads or eliminate operation outside of existing Nomogram criteria.

DP 6.9.2 Authority of WECC Reliability Coordinators

- (a) The Reliability Coordinator has the final authority to direct operations before, during and after problems or disturbances that have regional impacts. The WECC Security Monitoring plans include collaboration with sub-regional Reliability Coordinators and Control Area operators to determine actions for anticipated problems. If there is insufficient time, or mutual concurrence is not reached, the Reliability Coordinator is authorized to direct actions and the control area operators must comply.
- (b) In the event of any situation occurring which is outside those problems already identified in the list of known problems, the Reliability Coordinator shall have the responsibility and authority to implement whatever measures are necessary to maintain System Reliability. Those actions include but are not limited to; interchange curtailment, generation Dispatch adjustment (real power, reactive power and voltage), transmission configuration adjustments, special protection activation, load curtailment and any other action deemed necessary to maintain System Reliability.
- (c) The Reliability Coordinator shall also have the responsibility and authority to take action in its sub-region for problems in another sub-region that it may help resolve. This must be accomplished at the request of and in coordination with the Reliability Coordinators of the other sub-regions.

**DP 7 REAL-TIME OPERATIONAL ACTIVITIES –
THE HOUR PRIOR TO THE SETTLEMENT PERIOD**

DP 7.1 Schedule Confirmation

In the hour prior to the beginning of the Settlement Period, the ISO will review and evaluate the current system operating conditions to ensure sufficient Energy and Ancillary Services resources are available for the next Settlement Period. The ISO will:

- (a) verify that each SC's Ancillary Services obligations are scheduled as required. The ISO will procure additional Ancillary Services if insufficient resources are scheduled;
- (b) verify any Supplemental Energy bids received up to thirty (30) minutes prior to the Settlement Period, for increases or decreases in Energy output which it may require for the Settlement Period; and
- (c) verify that with currently anticipated operating conditions there is sufficient transfer capacity on the ISO Controlled Grid to implement all Final Schedules.

DP 7.2 Confirm Interchange Transaction Schedules (ITSs)

Also in the hour prior to the beginning of the Settlement Period the ISO will:

- (a) adjust interchange transaction schedules (ITSs) as required under Existing Contracts in accordance with the procedures in the SBP and the SP for the management of Existing Contracts;
- (b) adjust ITSs as required by changes in transfer capability of transmission paths occurring after close of the Hour-Ahead Market; and
- (c) agree on ITS changes with adjacent Control Area Operators.

DP 7.3 Supplemental Energy Bids

Supplemental Energy bids may be submitted to the ISO no later than sixty (60) minutes prior to the beginning of the Settlement Period in accordance with the format and content requirements of the SBP. These Supplemental Energy bids cannot be withdrawn after sixty (60) minutes prior to the beginning of the Settlement Period. A System Resource that identifies its bid as a Hourly Pre-Dispatch bid will only be pre-dispatched and will not be subject to any intra-hour Redispatch except as necessary to maintain inter-Control Area transmission reliability.

DP 7.4 Intra-Zonal Congestion Management

In the hour prior to the beginning of the Settlement Period the ISO may adjust SCs' Final Schedules to alleviate Intra-Zonal Congestion. Except in those instances where the ISO calls Reliability Must-Run Units as provided in Section 5.2 of the ISO Tariff, the ISO will adjust resources in accordance with DP 8.4 and DP 8.5.

**DP 8 REAL-TIME OPERATIONAL ACTIVITIES –
THE SETTLEMENT PERIOD**

DP 8.1 Settlement Period

DP 8.1.1 Responsibility of the ISO in Real-Time Dispatch

During real-time Dispatch, the ISO, using RTD Software will be responsible for Dispatching Generating Units, Curtailable Demands and Interconnection schedules to meet real-time imbalances between actual and scheduled Demand and Generation and to relieve Congestion, if necessary, to ensure System Reliability and to maintain Applicable Reliability Criteria.

DP 8.1.2 [Not Used]

**DP 8.2 Generating Units, Loads and Interconnection Schedules
Dispatched for Congestion**

The ISO will use the RTD Software to alleviate Inter-Zonal Congestion as described in DP 8.3. The ISO will manage Intra-Zonal Congestion in real time as set forth in Section 7.2.6.

DP 8.3 Inter-Zonal Congestion

DP 8.3.1 Treatment by Zone

If there is Inter-Zonal Congestion in real time, the ISO's RTD Software shall increase Generation and/or reduce Demand separately for each Zone to optimally Dispatch available resources to resolve the Congestion.

**DP 8.3.2 Selection of Generating Unit or Load to Increase Generation or
Reduce Demand**

Where the ISO determines that it is necessary to increase Generation or reduce Demand in a Zone in order to relieve Inter-Zonal Congestion the ISO shall select in merit order, the Generating Unit within the Zone (or the Interconnection schedule in a Control Area adjacent to the Zone) with a non-zero capacity remaining to increment which has the lowest incremental bid price (\$/MWh) or the Curtailable Demand located within the Zone (or the Interconnection schedule in a Control Area adjacent to the Zone) with a non-zero capacity remaining to reduce which has the lowest Demand reduction bid price.

DP 8.3.3 Selection of Generating Unit to Reduce Generation

Where the ISO determines that it is necessary to reduce Generation in a Zone in order to relieve Inter-Zonal Congestion, the ISO shall select in merit order the Generating Unit within the Zone with a non-zero capacity remaining to decrement which has the highest decremental bid price.

DP 8.4 Intra-Zonal Congestion

Except as provided in Section 5.2 of the ISO Tariff, in the event of Intra-Zonal Congestion, the ISO shall adjust Generating Units and Curtailable Demands (or Interconnection schedules of System Resources in the Control Areas) to alleviate the Constraints as described in Section 7.2.6.

DP 8.5 Additional Congestion Relief

In the event that there are insufficient resources which provide financial bids to mitigate Inter-Zonal and Intra-Zonal Congestion, Final Schedules which do not rely on Existing Contracts will be adjusted in real time by allocating transmission capacity on a pro rata basis. Final Schedules which rely on Existing Contracts will be adjusted in real time by allocating transmission capacity in accordance with the operating instructions submitted under SBP 3.3. With respect to facilities financed with Local Furnishing Bonds the ISO shall adjust Final Schedules in real time in a fashion consistent with Section 2.1.3 and 7.1.6.3 of the ISO Tariff, Appendix B of the TCA, and Operating Procedures governing the use of such facilities.

DP 8.6 Real-Time Dispatch Application

DP 8.6.1 Real-Time Dispatch

During real time, the ISO shall Dispatch Generating Units, Curtailable Demands and Interconnection schedules to meet imbalances between actual and scheduled Demand and Generation.

In addition, the ISO may need to purchase additional Ancillary Services if Ancillary Services arranged in advance are used to provide balancing Energy, and such depletion needs to be recovered to meet System Reliability contingency requirements.

DP 8.6.2 Utilization of the Energy Bids

The ISO will use the Energy Bids to Dispatch Supplemental Energy and Ancillary Services to procure balancing Energy for:

- (a) satisfying needs for Imbalance Energy;
- (b) mitigating Inter-Zonal Congestion;
- (c) allowing resources providing Regulation service to return to the preferred operating point within their regulating ranges;
- (d) allowing recovery of Operating Reserves utilized in real-time operations;
- (e) procuring additional Voltage Support required from resources beyond their power factor ranges in real time; and

- (f) Dispatching System Resources and Dispatchable Loads and increasing Generating Units' output to manage Intra-Zonal Congestion in real time using Energy Bids Dispatched out of sequence.

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 WEC and NERC Area Control Error (ACE) performance criteria;
- (b) in each Dispatch Interval, following the loss of a resource and once ACE has returned to zero, the ISO shall determine if the Regulation Generating Units and Dispatchable Interconnection schedules are operating at a point away from their Set Point. The ISO shall then adjust the output of Generating Units, Curtailable Demands, and Dispatchable Interconnection schedules (either providing Spinning Reserve, Non-Spinning Reserve, Replacement Reserve, or Supplemental Energy) to return the Regulation Generating Units and Dispatchable Interconnection schedules to their Set Points to restore their full regulating margin;
- (c) in each Dispatch Interval, the ISO shall Dispatch Generating Units, Curtailable Demands and Dispatchable Interconnection schedules to meet its balancing Energy requirements and eliminate any Price Overlap between Energy Bids, thereby, Dispatching the relevant resources in real time for economic trades either between SCs or within a SC's portfolio;
- (d) the ISO shall select the Generating Units, Curtailable Demands and Dispatchable Interconnection schedules to be Dispatched to meet its balancing Energy requirements in merit order according to their Energy Bids;
- (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, or to resolve Inter-Zonal Congestion;
- (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 may make commitments beyond the current Settlement Period;
- (g) The ISO will not differentiate between Ancillary Services procured by the ISO and Ancillary Services which are being self-provided;

(h) [Not Used]

- (i) The operational ramp rate(s) of a resource will be considered by the RTD Software in determining the amount of Instructed Imbalance Energy by Dispatch Interval, and such consideration may result in Instructed Imbalance Energy in Dispatch Intervals prior to or subsequent to the Dispatch Interval to which the Dispatch Instruction applies;
- (j) System Resources identified as Dispatchable within the operating hour pursuant to SBP Section 6.1.3 shall be Dispatched optimally through the RTD Software. Such bids will be settled pursuant to Section 11.2.4.1.1.2;
- (k) The ISO will pre-dispatch Energy Bids from System Resources, subject to Hourly Pre-Dispatch as indicated in SBP 6.1.3, prior to the beginning of each hour consistent with applicable WECC interchange scheduling practices, assuring that any Price Overlap between such decremental and incremental Energy Bids will be eliminated. Such bids will be settled pursuant to Section 11.2.4.1.1.2.

DP 8.7 Ancillary Services Requirements

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

DP 8.7.1 Regulation

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

- (b) the ISO will Dispatch Regulation in merit order of Energy bid prices as determined by the EMS;
- (c) in the event of an unscheduled increase in system Demand or a shortfall in Generation output and Regulation margin drops below a predetermined value, the ISO will use scheduled Operating Reserve, Replacement Reserve or Supplemental Energy to restore Regulation margin; and
- (d) when scheduled Operating Reserve is used for restoration of Regulation reserve, the ISO shall arrange for the replacement of that Operating Reserve (see DP 8.7.4);

DP 8.7.2 Operating Reserve

- (a) Spinning Reserve:
 - (i) Spinning Reserve provided from Generating Units and Interconnection schedules must meet the standards specified in the ASRP;
 - (ii) the ISO will Dispatch Spinning Reserve as may be required to meet the Applicable Reliability Criteria;
 - (iii) the ISO may Dispatch Spinning Reserve as balancing Energy to return Regulation Generating Units to their Set Points and restore full Regulation margin; and
 - (iv) the ISO will Dispatch Spinning Reserve in merit order of Energy bid prices as determined by the RTD Software;

- (b) Non-Spinning Reserve:
 - (i) Non-Spinning Reserve provided from Generating Units, Demands, and external imports of System Resources must meet the standards specified in the ASRP;
 - (ii) the ISO may Dispatch Non-Spinning Reserve in place of Spinning Reserve to meet Applicable Reliability Criteria;
 - (iii) the ISO will Dispatch Non-Spinning Reserve in merit order of Energy bid prices as determined by the RTD Software; and
 - (iv) the ISO may Dispatch Non-Spinning Reserve to replace Spinning Reserve if there is a shortfall in Spinning Reserve because of a deficiency of balancing Energy;

DP 8.7.3 Replacement Reserve

- (a) Replacement Reserve provided from Generating Units, Curtailable Demands and Interconnection schedules must meet the standards specified in the ASRP;
- (b) the ISO will utilize Replacement Reserve to replace Operating Reserve that has been Dispatched due to a shortfall in Generation or an increase in Demand;
- (c) the ISO may Dispatch Replacement Reserve to replace Operating Reserve that has been Dispatched for balancing Energy; and
- (d) the ISO will Dispatch Replacement Reserve in merit order of Energy Bid prices as determined by RTD;

DP 8.7.4 Replacement of Operating Reserve

- (a) in the event of an un-forecasted increase in system Demand or a shortfall in Generation output, the ISO shall utilize Replacement Reserve to restore Operating Reserve;
- (b) if pre-arranged Operating Reserve is used to meet balancing Energy requirements, the ISO may replace such Operating Reserve by Dispatch of additional balancing Energy available from Supplemental Energy bids;
- (c) any additional Operating Reserve needs may also be met the same way;
- (d) where the ISO elects to rely upon Supplemental Energy bids, the ISO shall select the resources with the lowest incremental Energy Bid price as established by RTD; and
- (e) if the ISO restores Operating Reserve through utilization of Replacement Reserve, the ISO is not required to replace the utilized Replacement Reserve;

DP 8.7.5 Voltage Support

- (a) Voltage Support provided from Generating Units shall meet the standards specified in the ASRP;
- (b) the ISO may Dispatch Generating Units to increase or decrease MVar output within the power factor limits of 0.9 lagging to 0.95 leading (or within other limits specified by the ISO in any exemption granted pursuant to Section 2.5.3.4 of the ISO Tariff) at no cost to the ISO when required for System Reliability;
- (c) may Dispatch each Generating Unit to increase or decrease MVar output outside of established power factor limits, but within the range of the Generating Unit's capability curve, at a price calculated in accordance with ISO Tariff;
- (d) If Voltage Support is required in addition to that provided pursuant to DP 8.7.5 (b) and (c), the ISO will reduce output of Participating Generators certified in accordance with the ASRP. The ISO will select Participating Generators in the vicinity where such additional Voltage Support is required; and
- (e) the ISO will monitor voltage levels at Interconnections to maintain them in accordance with the applicable Inter-Control Area Agreements.

DP 8.7.6 Black Start

- (a) Black Start shall meet the standards specified for Black Start in the ASRP; and
- (b) the ISO will Dispatch Black Start as required in accordance with the applicable Black Start agreement.

DP 8.8 Real-Time Management of Overgeneration Conditions

In the event that Overgeneration conditions occur during real time, the ISO will direct the SCs to take the steps described in Section 2.3.4 of the ISO Tariff and SCs shall implement ISO directions without delay.

DP 9 DISPATCH INSTRUCTIONS

DP 9.1 ISO Dispatch Authority

DP 9.1.1 Range of ISO Authority

The ISO has full authority to:

- (a) direct the physical operation of the ISO Controlled Grid, including (without limitation) circuit breakers, switches, voltage control equipment, protective relays, metering and Load Shedding equipment;
- (b) commit Reliability Must-Run Generation, except that the ISO shall only commit Reliability Must-Run Generation for Ancillary Services capacity according to Section 5.2 of the Tariff;

- (c) order a change in operating status of voltage control equipment;
- (d) take required action to prevent against uncontrolled losses of load or Generation;
- (e) control the output of Generating Units and Interconnection schedules scheduled to provide Ancillary Services or offering Supplemental Energy;
- (f) Dispatch Curtailable Demand which has been scheduled to provide Non-Spinning Reserve or Replacement Reserve; and
- (g) require the operation of resources which are at the ISO's disposal in a System Emergency, as described in DP 10.

DP 9.1.2 Exercise of the ISO's Authority

The ISO will exercise its authority under DP 9.1.1 by issuing Dispatch Instructions to the relevant Participants using the relevant communications method described in DP 4.

DP 9.2 Participant Responsibilities

DP 9.2.1 Compliance with Dispatch Instructions

All Participants within the ISO Control Area shall comply fully and promptly with the ISO's Dispatch Instructions unless such operation would impair public health or safety. Shedding Load for a System Emergency does not constitute impairment to public health or safety.

DP 9.2.2 Notification of Non-Compliance with a Dispatch Instruction

In the event that, in carrying out the Dispatch Instruction, an unforeseen problem arises (relating to plant operations or equipment, personnel or the public safety), the recipient of the Dispatch Instruction must notify the ISO or, in the case of a Generator, the relevant SC immediately. The relevant SC shall notify the ISO of the problem immediately.

DP 9.3 Dispatch Instructions for Generating Units and Curtailable Demand

The ISO may issue Dispatch Instructions covering:

- (a) Ancillary Services;
- (b) Supplemental Energy, which may be used for:
 - (i) Congestion Management;
 - (ii) provision of Imbalance Energy; or
 - (iii) replacement of an Ancillary Service;
- (c) agency operation of Generating Units, Curtailable Demands or Interconnection schedules, for example:
 - (i) output or Demand that can be Dispatched to meet Applicable Reliability Criteria;
 - (ii) Generating Units that can be Dispatched for Black Start;

(iii) Generating Units that can be Dispatched to maintain governor control regardless of their Energy schedules;
or

(d) the operation of voltage control equipment applied on Generating Units as described in the ASRP.

DP 9.4 Response Required by Generators to ISO Dispatch Instructions

DP 9.4.1 Action Required by Generators

Generators must:

- (a) comply with Dispatch Instructions immediately upon receipt and shall respond in accordance with Good Utility Practice;
- (b) meet voltage criteria in accordance with the provisions specified in the ISO Tariff and ASRP;
- (c) meet the applicable operational ramp rates as provided for in SBP 6.5;
- (d) respond to Dispatch Instructions for Ancillary Services within the time periods required by ASRP except in a System Emergency, when DP 10 will apply; and (in the case of Generating Units providing Regulation) respond to electronic signals from the EMS; and
- (e) respond to a Dispatch Instruction issued for the start-up or shut down of a Generating Unit, within the time frame stated in the Instruction.

DP 9.4.2 Qualifying Facilities

Where a Qualifying Facility ("QF") has entered into an agreement with a PTO before March 31, 1997 for the supply of Energy to the PTO (an "Existing Agreement"), the ISO will follow the instructions provided by the parties to the Existing Agreement regarding the provisions of the Existing Agreement in the performance of its functions relating to Outage Coordination, and not require a QF to take any action that would interfere with the QF's obligations under the Existing Agreement. Each QF will make reasonable efforts to comply with the ISO's instructions during a System Emergency without penalty for failure to do so.

DP 9.5 Failure to Comply with Dispatch Instructions

DP 9.5.1 Obligation to Comply

All entities 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 to the ISO's Dispatch Instructions in accordance with their terms. If a Dispatched Generating Unit, Curtailable Demand or System Resource 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 Dispatch Instruction;

(b) shall not be eligible to set the Dispatch Interval Ex Post Price.

DP 9.5.2 Sanctions

The ISO will develop additional mechanisms to deter Generating Units and Loads in the ISO or other Control Areas from failing to respond at a particular time or adequately respond over a particular period of time to a Dispatch Instruction or failing to perform according to Dispatch Instructions, for example, reduction in payments to SCs or suspension of the SC's Ancillary Services certificate for the Generating Unit, Curtailable Demand or System Resource concerned.

DP 10 EMERGENCY OPERATIONS

DP 10.1 Notifications by ISO

The ISO will provide the following notifications to Participants to communicate unusual system conditions or emergencies.

DP 10.1.1 System alert

ISO will give a system Alert Notice when the operating requirements of the ISO Controlled Grid are marginal because of Demand exceeding forecast, loss of major Generation or loss of transmission capacity that has curtailed imports into the ISO Control Area, or if the Hour-Ahead Market is short on scheduled Energy and Ancillary Services for the ISO Control Area.

DP 10.1.2 System warning

The ISO will give a system warning notice when the operating requirements for the ISO Controlled Grid are not being met in the Hour-Ahead Market, or the quantity of Regulation, Spinning Reserve, Non-Spinning Reserve, Replacement Reserve and Supplemental Energy available to the ISO is not acceptable for the Applicable Reliability Criteria. This system warning notice will notify Participants that the ISO will, acting in accordance with Good Utility Practice, take such steps as it considers necessary to ensure compliance with Applicable Reliability Criteria, including the negotiation of Generation through processes other than competitive bids.

DP 10.1.3 System Emergency

When, in the judgement of the ISO, the System Reliability of the ISO Controlled Grid is in danger of instability, voltage collapse or under-frequency caused by transmission or Generation trouble in the ISO Control Area, or events outside of the ISO Control Area that could result in a cascade of events throughout the WECC grid, the ISO will declare a System Emergency. This declaration may include a notice to suspend the Day-Ahead, Hour-Ahead and Real Time Markets, authorize full use of Black Start Generation, initiate full control of manual Load Shedding, authorize the curtailment of Curtailable Demand (even though not scheduled as an Ancillary Service). The ISO will reduce the System Emergency declaration to a lower alert status when it is satisfied, after conferring with Reliability Coordinators within the WECC that the major contributing factors have been corrected, all

(c) UDC Disconnect Load

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

(d) UDC Load Curtailment Programs

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

DP 10.4.2 Load Curtailment

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

DP 11 ALGORITHMS TO BE USED

The ISO shall develop Dispatch algorithms for use by the ISO for Dispatching Generating Units and Curtailable Demands in accordance with the ISO Tariff.

DP 12 INFORMATION MANAGEMENT

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

DP 13 AMENDMENTS TO THE PROTOCOL

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

2 CONDUCT WARRANTING MITIGATION

2.1 Definitions

The following definitions are applicable to this Appendix A:

"Economic Market Clearing Prices" are the Market Clearing Prices for a particular resource at the location of that particular resource at the time the resource was either Scheduled or was Dispatched by the ISO. Economic Market Clearing Prices may originate from the Day-Ahead Energy market, the Hour-Ahead Energy market (when these markets are in place), or ISO real-time Imbalance Energy market. The Economic Market Clearing Price for the ISO real-time Imbalance Energy market shall be the Dispatch Interval Ex Post Price, unless the resource cannot change output level within the hour (i.e., the resource is not amenable to intra-hour real-time Dispatch instructions), or it is a System Resource. Economic Market Clearing Prices for the ISO real-time Imbalance Energy market for resources that cannot change output level within one Dispatch Interval and System Resources shall be the simple average of the relevant Dispatch Interval Ex Post Prices for each hour.

"Electric Facility" shall mean an electric resource, including a Generating Unit, System Unit, or a Participating Load.

2.2 Conduct Subject to Mitigation

Mitigation Measures may be applied: (i) to the bidding, scheduling, or operation of an "Electric Facility"; or (ii) as specified in Section 2.4 below.

2.3 Conditions for the Imposition of Mitigation Measures

2.3.1 In general, the ISO shall consider a Market Participant's conduct to be inconsistent with competitive conduct if the conduct would not be in the economic interest of the Market Participant in the absence of market power. The categories of conduct that are inconsistent with competitive conduct include, but may not be limited to, the three categories of conduct specified in Section 2.4 below.

2.4.2 Mitigation Measures may also be imposed to mitigate the market effects of a rule, standard, procedure, design feature, or known software imperfection of an ISO Market that allows a Market Participant to manipulate market prices or otherwise impair the efficient operation of that market, pending the revision of such rule, standard, procedure design feature, or software defect to preclude such manipulation of prices or impairment of efficiency.

2.4.3 Taking advantage of opportunities to sell at a higher price or buy at a lower price in a market other than an ISO Market shall not be deemed a form of withholding or otherwise inconsistent with competitive conduct.

2.4.4 The ISO shall monitor ISO Markets for other categories of conduct, whether by a single firm or by multiple firms acting in concert, that have material effects on prices in an ISO Market or other payments. The ISO shall: (i) seek to amend the foregoing list as may be appropriate to include any such conduct that would substantially distort or impair the competitiveness of any of the ISO Markets; and (ii) seek such other authorization to mitigate the effects of such conduct from the FERC as may be appropriate.

3 CRITERIA FOR IMPOSING MITIGATION MEASURES

3.1 Identification of Conduct Inconsistent with Competition

Conduct that may potentially warrant the imposition of a mitigation measure includes the categories described in Section 2.4 above. The thresholds listed in Section 3.1.1 below shall be used to identify substantial departures from competitive conduct indicative of an absence of workable competition.

3.1.1 Conduct Thresholds for Identifying Economic Withholding

The following thresholds shall be employed by the ISO to identify economic withholding that may warrant the mitigation of the bid from a resource and shall be determined with respect to a reference level determined as specified in Section 3.1.1.1:

For Energy Bids to be Dispatched as Imbalance Energy through the RTD Software: the lower of a 200 percent increase or \$100/MWh increase in the bid with respect to its Reference Level.

3.2 Material Price Effects

3.2.1 Market Impact Thresholds

In order to avoid unnecessary intervention in the ISO Market, Mitigation Measures for economic withholding shall not be imposed unless conduct identified as specified above causes or contributes to a material change in one or more of the ISO Market Clearing Prices (MCPs). Initially, the thresholds to be used by the ISO to determine a material price effect shall be as follows:

For Energy Bids to be Dispatched as Imbalance Energy through the RTD Software: the lower of an increase of 200 percent or \$50 per MWh in the projected Hourly Ex Post Price at any location (Zone or node) commensurate with the relevant pricing structure in effect in accordance with the ISO Tariff.

For Energy Bids to be Dispatched out of economic merit order to manage Intra-Zonal Congestion: if the price of the bid is \$50/MWh or 200 percent greater than the Dispatch Interval Ex Post Price at that location (Zone or node) commensurate with the relevant pricing structure in effect in accordance with the ISO Tariff.

Accepted and justified bids above the applicable soft cap, as set forth in Section 28.1.2 of this Tariff, will not be eligible to set the Market Clearing Price. Such bids shall be included in the Market Impact test, however, and, for purposes of this test only, shall be assumed to be eligible to set the Market Clearing Price.

3.2.2 Price Impact Analysis

3.2.2.1 Bids to be Dispatched as Imbalance Energy.

The ISO shall determine the effect on prices of questioned conduct through automated computer modeling and analytical methods. An Automatic Mitigation Procedure (AMP) shall identify bids that have exceeded the conduct thresholds and shall compute the change in projected Hourly Ex Post Prices as a result of simultaneously setting all such bids to their Reference Levels. If a change in the projected Hourly Ex Post Price exceeds the Impact threshold stated in Section 3.2.1, those bids would be kept mitigated at their default bid levels as specified in Section 4.2.2 below.

3.2.2.2 Bids to be Dispatched out of economic merit order to manage Intra-Zonal Congestion. If the price of the bid is \$50/MWh or 200 percent greater than the Dispatch Interval Ex Post Price at that location (Zone or node) commensurate with the relevant pricing structure in effect in accordance with the ISO Tariff, the bid price shall be mitigated to the reference price and the Scheduling Coordinator for that resource shall be paid the greater of the reference price or the relevant Dispatch Interval Ex Post Price. Bids mitigated in accordance with this Section 3.2.2.2 shall not set the Dispatch Interval Ex Post Price.

3.2.3 Section 205 Filings

In addition, the ISO shall make a filing under Section 205 of the Federal Power Act with FERC seeking authorization to apply an appropriate mitigation measure to conduct that departs significantly from the conduct that would be expected under competitive market conditions but does not rise to the thresholds specified in Section 3.1.1 above, unless the ISO determines, from information provided by the Market Participant or Parties that would be subject to mitigation or other information available to the ISO that the conduct is attributable to legitimate competitive market forces or incentives. The following are examples of conduct that are deemed to depart significantly from the conduct that would be expected under competitive market conditions:

- (e) The Mitigation Measures shall not be applied to Energy Bids projected to be Dispatched as Imbalance Energy through the RTD Software in the hours in which all Zonal Ex Post Prices are projected to be below \$91.87/MWh. If the Zonal Dispatch Interval Ex Post Price is projected to be above \$91.87/MWh in any ISO Zone, the Mitigation Measures shall be applied to all bids, except those from System Resources, in all ISO Zones. The ISO will apply Mitigation Measures to all bids taken out of merit order to address Intra-Zonal Congestion.
- (f) The Mitigation Measures shall not be applied to bids below \$25/MWh.
- (g) The posting of the MCP may be delayed if necessary for the completion of automated mitigation procedures.
- (h) Bids not mitigated under these Mitigation Measures shall remain subject to mitigation by other procedures specified in the ISO Tariff as may be appropriate.

4.3 Sanctions for Physical Withholding

The ISO may report a Market Participant the ISO determines to have engaged in physical withholding, including providing the ISO false information regarding the derating or outage of an Electric Facility, to the Federal Energy Regulatory Commission in accordance with Section 2.3.3.9.5 of the ISO Tariff. In addition, a Market Participant that fails to operate a Generating Unit in conformance with ISO Dispatch Instructions shall be subject to the penalties set forth in Section 11.2.4.1.2 of the ISO Tariff.

4.4 Duration of Mitigation Measures

Bids will be mitigated only in the specific hour that they violate the price and market impact thresholds.

5 FERC-ORDERED MEASURES

In addition to any mitigation measures specified above, the ISO shall administer, and apply when appropriate in accordance with their terms, such other mitigation measures as it may be directed to implement by order of the FERC.

6 DISPUTE RESOLUTION

- (c) The captions and headings in this Protocol are inserted solely to facilitate reference and shall have no bearing upon the interpretation of any of the terms and conditions of this Protocol.
- (d) This Protocol shall be effective as of the ISO Operations Date.
- (e) References to time are references to the prevailing Pacific Time.

SBP 1.3 Scope

SBP 1.3.1 Scope of Application to Parties

The SBP applies to the following entities:

- (a) Scheduling Coordinators (SCs);
- (b) Participating Transmission Owners (PTOs); and
- (c) the Independent System Operator (ISO).

SBP 1.3.2 Liability of the ISO

Any liability of the ISO arising out of or in relation to this Protocol shall be subject to Section 14 of the ISO Tariff as if references to the ISO Tariff were references to this Protocol.

SBP 2 SCHEDULES AND NOTIFICATIONS

SBP 2.1 Contents of Schedules and Adjustment Bid Data

SCs must comply with the ISO Data Templates and Validation Rules document, which contains the format for submission of Schedules and bid. Except as noted, each of the following data sections can be submitted up to seven (7) days in advance.

SBP 2.1.1 Generation Section of a Balanced Schedule and Adjustment Bid Data

The Generation section of a Balanced Schedule will include the following information for each Generating Unit:

- (a) SC's ID code;
- (b) type of market (Day-Ahead or Hour-Ahead) and Trading Day;
- (c) name of Generating Unit scheduled;
- (d) type of Schedule: Preferred or Revised (refer to the SP for details);
- (e) priority type, if applicable, to the Settlement Period (use OTHER if scheduling the use of Existing Contract rights or RLB_MUST_RUN) for Reliability Must-Run Generation;
- (f) contract reference number for Reliability Must-Run Generation;
- (g) transmission loss self-provision flag (LOSS CMP FLG): "Yes" indicates that Dispatch Instructions provided to the Generating

Unit will include Transmission Losses associated with the unit's Final Hour-Ahead Schedule as determined by the relevant GMM;

- (h) Congestion Management flag – “Yes” indicates that any Adjustment Bid submitted under item (l) below should be used in the Day-Ahead or Hour-Ahead Market;

- (i) publish Adjustment Bid flag, which will not be functional on the ISO Operations Date. In the future, "Yes" will indicate that the SC wishes the ISO to publish its Adjustment Bids;
- (j) Generating Unit ramp rate in MW/minute;
- (k) hourly scheduled Generating Unit output in MWh (the ISO will multiply these values by the hourly Generation Meter Multipliers), including any zero values, for each Settlement Period of the Trading Day (in the case of a Day-Ahead Schedule) and for the relevant Settlement Period (in the case of an Hour-Ahead Schedule); and
- (l) the MW and \$/MWh values for each Generating Unit for which an Adjustment Bid is being submitted consistent with SBP 4.

SBP 2.1.2 Demand Section of a Balanced Schedule and Adjustment Bid Data

The Demand section of a Balanced Schedule will include the following information for each Demand location:

- (a) SC's ID code;
- (b) type of market (Day-Ahead or Hour-Ahead) and Trading Day;
- (c) Demand ID – Demand location (which must be the name of a Demand Zone, Load group or bus);
- (d) type of Schedule: Preferred or Revised (refer to the SP for details);
- (e) hourly scheduled MWh for each Settlement Period of the Trading Day that uses the Existing Contract indicated in (e) above (which values should be less than or equal to the values indicated in (i) below);
- (f) Congestion Management flag – "Yes" indicates that any Adjustment Bid submitted for a Dispatchable Load under item (i) below should be used;
- (g) publish Adjustment Bid flag, which will not be functional on the ISO Operations Date. In the future, "Yes" will indicate that the SC wishes the ISO to publish its Adjustment Bids;
- (h) hourly scheduled MWh, including any zero values, for each Settlement Period of the Trading Day (in the case of a Day-Ahead Schedule) and for the relevant Settlement Period (in the case of an Hour-Ahead Schedule);
- (i) the MW and \$/MWh values for each Dispatchable Load for which an Adjustment Bid is being submitted consistent with SBP 4; and
- (j) requisite NERC tagging data.

SBP 2.1.3 External Import/Export Section of a Balanced Schedule and Adjustment Bid Data

The external import/export section of a Balanced Schedule will include the following information for each import or export:

- (a) SC's ID code;
- (b) type of market (Day-Ahead or Hour-Ahead) and Trading Day;
- (c) Scheduling Point (the name);
- (d) type of Schedule: Preferred or Revised (refer to the SP for details);
- (e) interchange ID (the name of the selling entity, the buying entity, and a numeric identifier);
- (f) Energy type – firm (FIRM), non-firm (NFRM) or dynamic (DYN) or Wheeling (WHEEL);
- (g) external Control Area ID;
- (h) priority type, if applicable, to the Settlement Period (use OTHER if scheduling the use of Existing Contract rights or RLB_MUST_RUN for Reliability Must-Run Generation);
- (i) contract reference number for Reliability Must-Run Generation or Existing Contract (or set of interdependent Existing Contracts);
- (j) contract type – transmission (TRNS), Energy (ENGY) or both (TR_EN);
- (k) Schedule ID (NERC ID number);
- (l) Congestion Management flag - "Yes" indicates that any Adjustment Bid submitted for an external import/export in item (q) below should be used;
- (m) publish Adjustment Bid flag, which will not be functional on the ISO Operations Date. In the future, "Yes" will indicate that the SC wishes the ISO to publish its Adjustment Bids;
- (n) complete WECC tag;
- (o) hourly scheduled external imports/exports in MWh (the ISO will multiply these values by the hourly Generation Meter Multipliers), including any zero values, for each Settlement Period of the Trading Day (in the case of a Day-Ahead Schedule) and for the relevant Settlement Period (in the case of an Hour-Ahead Schedule) and with external imports into the ISO Controlled Grid reported as negative quantities and external exports from the ISO Controlled Grid reported as positive quantities;

- (p) the MW and \$/MWh values for each external import/export for which an Adjustment Bid is being submitted consistent with SBP 4; and
- (q) for dynamically scheduled imports only, the transmission loss self-provision flag (LOSS_CMP_FLG): "Yes" indicates that Dispatch Instructions provided to the resource will include Transmission Losses associated with the resource's Final Hour-Ahead Schedule as determined by the relevant GMM.

SBP 2.1.4 Inter-Scheduling Coordinator Energy Trades ("Internal Imports/Exports") Section of a Balanced Schedule

In the event of an Inter-Scheduling Coordinator Energy Trade, the SCs who are parties to that trade must agree on a Zone in which the trade will be deemed to take place ("Trading Zone") and notify the ISO accordingly. The purpose of designating a Trading Zone is to provide for the allocation of Usage Charges which may arise in connection with the trade. The Inter-Scheduling Coordinator Energy Trades section of a Schedule will include the following information for each Inter-Scheduling Coordinator Trade:

- (a) SC's ID code;
- (b) type of market (Day-Ahead or Hour-Ahead) and Trading Day;
- (c) trading SC (buyer or seller);
- (d) type of Schedule: Preferred or Revised (refer to the SP for details);
- (e) Trading Zone;
- (f) Schedule type – Energy (ENGY);
- (g) hourly scheduled MWh, including any zero values, for each Settlement Period of the Trading Day (in the case of a Day-Ahead Schedule) and for the relevant Settlement Period (in the case of an Hour-Ahead Schedule), with internal imports into the SC reported as negative quantities and internal exports from the SC reported as positive quantities;
- (h) Congestion Management flag – "Yes" indicates that Adjustment Bid submitted under (k) below should be used;
- (i) publish Adjustment Bid flag – "Yes" indicates that the SC wishes the ISO to publish its Adjustment Bid.
- (j) the Generating Unit or Dispatchable Load that is the source or recipient of Energy traded; and
- (k) the MW and \$/MWh values for each Generating Unit or Dispatchable Load that is the source or recipient of Energy traded.

SBP 2.1.5 Inter-Scheduling Coordinator Ancillary Service Trades ("Internal Imports/Exports") Section of a Balanced Schedule

In the event of an Inter-Scheduling Coordinator Ancillary Service Trade, the SCs who are parties to that trade must agree on a Trading Zone in which the trade is deemed to take place and notify the ISO accordingly. The Ancillary Service obligations in the Trading Zone of each

cannot be found in the ISO's scheduling applications table of contract reference numbers), the scheduled use will be invalidated and the SC notified by the ISO's issuance of an invalidated usage information template.

SBP 4 ADJUSTMENT BIDS

Adjustment Bids will be used by the ISO for Inter-Zonal Congestion Management as described in the SP and are initially valid only for the markets into which they are bid, being the Day-Ahead Market or the Hour-Ahead Market. These Adjustment Bids will not be transformed into Supplemental Energy bids.

SBP 4.1 Content of Adjustment Bids

Adjustment Bids are contained in Preferred Schedules and Revised Schedules submitted by SCs for particular Generating Units (including Physical Scheduling Plants), Dispatchable Loads, external imports/exports, and Generating Units and Dispatchable Loads supporting Inter-Scheduling Coordinator Energy Trades.

Each SC is required to submit a preferred operating point for each Generating Unit, Dispatchable Load and external import/export (these quantities are presented in the SC's submitted Schedule as "Hourly MWh"). The SC's preferred operating point for each Generating Unit, Dispatchable Load and external import/export must be within the range of any Adjustment Bids to be used by the ISO. The minimum MW output level, which may be zero MW (or negative for pumped storage resources), and the maximum MW output level must be physically achievable.

SBP 4.2 Format of Adjustment Bids

Adjustment Bids will be presented in the form of a monotonically non-decreasing staircase function for Generating Units and external imports. Adjustment Bids will be presented in the form of a monotonically non-increasing staircase function for Dispatchable Loads and external exports. These staircase functions will be composed of up to eleven (11) ordered pairs (i.e., ten (10) steps or price bands) of quantity/price information. Adjustment Bids are submitted as an integral part of the SC's Balanced Schedule and must be related to each Generating Unit, Dispatchable Load and external import/export. SCs must comply with the ISO Data Templates and Validation Rules document, which contains the format for submission of Adjustment Bids.

SBP 5 ANCILLARY SERVICES

SCs must comply with the ISO Data Templates and Validation Rules document, which contains the format for submission of Ancillary Services schedules and bids. Additionally, SCs should refer to the Ancillary Services bid evaluation and scheduling principles contained in the SP. As also described in the SP, the resources constituting a System Unit which submitted Ancillary Services bids or schedules and which, as a result, has been accepted by the ISO to supply Ancillary Services in a Settlement Period must be disclosed to the ISO one (1) hour prior to the start of the Settlement Period.

SBP 5.1 Content of Ancillary Services Schedules and Bids

Ancillary Services in the Day-Ahead Market and the Hour-Ahead Market are comprised of the following: Regulation, Spinning Reserve, Non-Spinning Reserve and Replacement Reserve. Each Generating Unit (including Physical Scheduling Plants), System Unit, Curtailable Demand or System Resource for which a SC wishes to submit Ancillary Services Schedules and bids must meet the requirements set forth in the Ancillary Services Requirements Protocol (ASRP). The same resource capacity may be offered into more than one ISO Ancillary Service auction at the same time (the sequential evaluation of such multiple offers between Ancillary Services markets to eliminate double counting of capacity is described in the SP). In each category of Ancillary Service, the reference to "Revised" types of Schedules indicates a submittal which is part of a Revised Day-Ahead Schedule as described in the SP. Each of the following data sections can be submitted up to seven (7) days in advance. Ramp rates submitted as detailed below will be only used by the ISO for procuring capacity associated with the specific Ancillary Services. The ISO will issue real-time Dispatch Instructions for the Energy associated with the awarded capacity based upon the applicable operational ramp rate submitted with the single Energy Bid curve in accordance with SBP Section 6.5. There is no provision for external exports with regard to Ancillary Services bids. The functionality necessary to accept such bids does not exist in the ISO scheduling software.

SCs with Ancillary Services awards must submit a single Energy Bid curve in the Real Time Market to correspond to any awarded capacity for the relevant resources as described in SBP Section 6.

SBP 5.1.1 Regulation

SBP 5.1.1.1 Regulation: Generating Units or System Units

Each SC desiring to self-provide Regulation or to participate in the ISO's Regulation auction will submit the following information for each relevant Generating Unit or System Unit for each Settlement Period of the relevant Trading Day:

- (a) type of schedule: Regulation Ancillary Service (ANC_SRVC) or Revised Regulation Ancillary Service (REVISED_ANC_SRVC);
- (b) SC's ID code;

- (c) type of market (Day-Ahead or Hour-Ahead) and Trading Day;
- (d) Generating Unit or System Unit ID code;
- (e) preferred bid flag, a "YES" indicates a bid and a "NO" indicates a self-provided schedule;
- (f) upward and downward range of Generating Unit or System Unit capacity over which the Generating Unit or System Unit is offering to provide Regulation;
- (g) Generating Unit or System Unit operating limits (high and low MW);
- (h) Generating Unit or System Unit ramp rate (MW/minute); and
- (i) bid price for Regulation capacity (\$/MW).

SBP 5.1.1.2 Regulation: External Imports

Each SC desiring to self-provide Regulation or to participate in the ISO's Regulation auction will submit the following information for each relevant external import for each Settlement Period of the relevant Trading Day:

- (a) type of schedule: (Regulation Ancillary Service);
- (b) SC's ID code;
- (c) type of market (Day-Ahead or Hour-Ahead) and Trading Day;
- (d) Scheduling Point (the name)
- (e) interchange ID code (the name of the selling entity, buying entity and a numeric identifier);
- (f) external Control Area ID;
- (g) Schedule ID (NERC ID number);
- (h) complete WECC tag;
- (i) preferred bid flag, a "YES" indicates a bid and a "NO" indicates a self-provided schedule;
- (j) in the case of Existing contracts, the applicable contract reference number;
- (k) upward and downward range of System Resource capacity over which the System Resource is offering to provide Regulation;
- (l) System Resource operating limits (high and low MW);

- (m) ramp rate (MW/minute); and
- (n) bid price for Regulation capacity (\$/MW).

SBP 5.1.2 Spinning Reserve

SBP 5.1.2.1 Spinning Reserve: Generating Units or System Units

Each SC desiring to self-provide Spinning Reserve or to participate in the ISO's Spinning Reserve auction will submit the following information for each relevant Generating Unit or System Unit for each Settlement Period of the relevant Trading Day:

- (a) type of schedule: Spinning Reserve Ancillary Service (ANC_SRVC) or Revised Spinning Reserve Ancillary Service (REVISED_ANC_SRVC);
- (b) SC's ID code;
- (c) type of market (Day-Ahead or Hour-Ahead) and Trading Day;
- (d) Generating Unit or System Unit ID code;
- (e) preferred bid flag, a "YES" indicates a bid and a "NO" indicates a self-provided schedule;
- (f) Generating Unit or System Unit operating limits (high and low MW);
- (g) Spinning Reserve capacity (MW);
- (h) Generating Unit or System Unit ramp rate (MW/minute); and
- (i) bid price for Spinning Reserve capacity (\$/MW).

SBP 5.1.2.2 Spinning Reserve: External Imports/Exports

Each SC desiring to bid or self-provide Spinning Reserve will submit the following information for each relevant external import for each Settlement Period of the relevant Trading Day:

- (a) type of schedule: Spinning Reserve Ancillary Service (ANC_SRVC) or Revised Spinning Reserve Ancillary Service (REVISED_ANC_SRVC);
- (b) SC's ID code;
- (c) type of market (Day-Ahead or Hour-Ahead) and Trading Day;
- (d) Scheduling Point (the name);
- (e) interchange ID code (the name of the selling entity, buying entity and a numeric identifier);
- (f) external Control Area ID;

- (g) Schedule ID (NERC ID number);
- (h) complete WECC tag;
- (i) preferred bid flag, which must be set to "NO", indicating a self-provided schedule, until such time as the ISO's scheduling system is able to support Ancillary Services bids from external imports/exports;
- (j) export flag, a "YES" indicates an external export and a "NO" indicates an external import;
- (k) In the case of Existing Contracts, the applicable contract reference number;
- (l) Spinning Reserve capacity (MW);
- (m) ramp rate (MW/minute); and
- (n) bid price for Spinning Reserve capacity (\$/MW).

SBP 5.1.3 Non-Spinning Reserve

SBP 5.1.3.1 Non-Spinning Reserve: Generating Units or System Units

Each SC desiring to self-provide Non-Spinning Reserve or to participate in the ISO's Non-Spinning Reserve auction will submit the following information for each relevant Generating Unit or System Unit for each Settlement Period of the relevant Trading Day:

- (a) type of schedule: Non-Spinning Reserve Ancillary Service (ANC_SRVC) or Revised Non-Spinning Reserve Ancillary Service (REVISED_ANC_SRVC);
- (b) SC's ID code;
- (c) type of market (Day-Ahead or Hour-Ahead) and Trading Day;
- (d) Generating Unit or System Unit ID code;
- (e) preferred bid flag, a "YES" indicates a bid and a "NO" indicates a self-provided schedule;
- (f) time to synchronize following notification (less than ten (10) minutes mandatory);
- (g) Non-Spinning Reserve capacity available within ten (10) minutes following notification (MW);
- (h) Generating Unit or System Unit operating limits (high and low MW);
- (i) Generating Unit or System Unit ramp rate (MW/minute); and
- (j) bid price for Non-Spinning Reserve capacity (\$/MW).

SBP 5.1.3.2 Non-Spinning Reserve: Curtailable Demands

Each SC desiring to self-provide Non-Spinning Reserve or to participate in the ISO's Non-Spinning Reserve auction will submit the following information for each relevant Curtailable Demand for each Settlement Period of the relevant Trading Day:

- (a) type of schedule: Non-Spinning Reserve Ancillary Service (ANC_SRVC) or Revised Non-Spinning Reserve Ancillary Service (REVISED_ANC_SRVC);
- (b) SC's ID code;
- (c) type of market (Day-Ahead and Hour-Ahead) and Trading Day;
- (d) available Curtailable Demand ID code;
- (e) preferred bid flag, a "YES" indicates a bid and a "NO" indicates a self-provided schedule;
- (f) maximum allocation curtailment duration (hours) (CURT_HR);
- (g) time to interruption following notification (minutes);
- (h) amount of Curtailable Demand that can be interrupted within ten (10) minutes following notification (MW); and
- (i) bid price for Non-Spinning Reserve capacity (\$/MW).

SBP 5.1.3.3 Non-Spinning Reserve: External Imports/Exports

Each SC desiring to bid or self-provide Non-Spinning Reserve will submit the following information for each relevant external import for each Settlement Period of the relevant Trading Day:

- (a) type of schedule: Non-Spinning Reserve Ancillary Service (ANC_SRVC) or Revised Non-Spinning Reserve Ancillary Service (REVISED_ANC_SRVC);
- (b) SC's ID code;
- (c) type of market (Day-Ahead or Hour-Ahead) and Trading Day;
- (d) Scheduling Point (the name);
- (e) interchange ID code (the name of the selling entity, buying entity and a numeric identifier);
- (f) external Control Area ID;
- (g) Schedule ID (NERC ID number);
- (h) complete WECC tag;
- (i) preferred bid flag, which must be set to "NO", indicating a self-provided schedule;

- (j) export flag, a "YES" indicates an external export and a "NO" indicates an external import;
- (k) In the case of Existing Contracts, the applicable contract reference number;
- (l) time to synchronize following notification (less than ten (10) minutes mandatory);
- (m) Non-Spinning Reserve capacity (MW);
- (n) ramp rate (MW/minute); and
- (o) bid price for Non-Spinning Reserve capacity.

SBP 5.1.4 Replacement Reserve

SBP 5.1.4.1 Replacement Reserve: Generating Units or System Units

Each SC desiring to self-provide Replacement Reserve or to participate in the ISO's Replacement Reserve auction will submit the following information for each relevant Generating Unit or System Unit for each Settlement Period of the relevant Trading Day:

- (a) type of schedule: Replacement Reserve Ancillary Service (ANC_SRVC) or Revised Replacement Reserve Ancillary Service (REVISED_ANC_SRVC);
- (b) SC's ID code;
- (c) type of market (Day-Ahead or Hour-Ahead) and Trading Day;
- (d) Generating Unit or System Unit ID code;
- (e) preferred bid flag, a "YES" indicates a bid and a "NO" indicates a self-provided schedule;
- (f) time to synchronize following notification (less than sixty (60) minutes mandatory);
- (g) Generating Unit or System Unit operating limits (high and low MW);
- (h) Replacement Reserve capacity available within sixty (60) minutes following notification (MW);
- (i) Generating Unit or System Unit ramp rates (MW/minute); and
- (j) bid price for Replacement Reserve capacity (\$/MW).

SBP 5.1.4.2 Replacement Reserve: Curtailable Demands

Each SC desiring to self-provide Replacement Reserve or to participate in the ISO's Replacement Reserve auction will submit the following information for each relevant Curtailable Demand for each Settlement Period of the relevant Trading Day:

- (a) type of schedule: Replacement Reserve Ancillary Service (ANC_SRVC) or Revised Replacement Reserve Ancillary Service (REVISED_ANC_SRVC);
- (b) SC's ID code;
- (c) type of market (Day-Ahead or Hour-Ahead) and Trading Day;
- (d) Curtailable Demand ID code;
- (e) preferred bid flag, a "YES" indicates a bid and a "NO" indicates a self-provided schedule;
- (f) maximum allocation curtailment duration (hours) (CURT_HR);
- (g) time to reduction following notification (minutes);
- (h) amount of Curtailable Demand that can be interrupted within sixty (60) minutes following notification (MW);
- (i) Curtailable Demand reduction rate (MW/minute); and
- (j) bid price for Replacement Reserve capacity (\$/MW).

SBP 5.1.4.3 Replacement Reserve: External Imports

Each SC desiring to bid or self-provide Replacement Reserve will submit the following information for each relevant external import for each Settlement Period of the relevant Trading Day:

- (a) type of schedule: Replacement Reserve Ancillary Service (ANC_SRVC) or Revised Replacement Reserve Ancillary Service (REVISED_ANC_SRVC);
- (b) SC's ID code;
- (c) type of market (Day-Ahead or Hour-Ahead) and Trading Day;
- (d) Scheduling Point (the name);
- (e) interchange ID code (the name of the selling entity, buying entity and a numeric identifier);
- (f) external Control Area ID;
- (g) Schedule ID (NERC ID number);
- (h) complete WECC tag;

- (i) preferred bid flag, which must be set to "NO", indicating a self-provided schedule, until such time as the ISO's scheduling system is able to support Ancillary Services bids from external imports;
- (j) in the case of Existing Contracts, the applicable contract reference number;
- (k) time to synchronize following notification (less than sixty (60) minutes mandatory);
- (l) Replacement Reserve capacity (MW);
- (m) ramp rate (MW/minute); and
- (n) bid price for Replacement Reserve capacity (\$/MW).

SBP 5.2 Validation of Ancillary Services Bids

The ISO will verify that each Ancillary Services Schedule or bid conforms to the format specified for the relevant service. If the Ancillary Services Schedule or bid does not so conform, the ISO will send a notification to the SC notifying the SC of the errors in the Schedules and/or bids. SCs will comply with the ISO Data Templates and Validation Rules document, which contains the validation criteria for Ancillary Services Schedules and bids. Shown below are the two stages of validation carried out by the ISO:

SBP 5.2.1 Stage One Validation

During stage one validation, each incoming Ancillary Services schedule or bid will be validated to verify proper content, format and syntax. A technical validation will be performed to verify that a schedule or bid quantity of Regulation, Spinning Reserve, Non-Spinning Reserve or Replacement Reserve does not exceed the available capacity for Regulation, Operating Reserves and Replacement Reserve on the Generating Units, System Units, Curtailable Demands and external imports/exports scheduled or bid. The SC will be notified immediately through WEnet of any validation errors. For each error detected, an error message will be generated by the ISO in the SC's notification screen which will specify the nature of the error. The SC can then look at the notification messages to review the detailed list of errors, make changes, and resubmit if it is still within the timing requirements of the SP. The SC is also notified of successful validation via WEnet.

SBP 5.2.2 Stage Two Validation

Stage two validation will be conducted by the ISO in accordance with Appendix E of the ISO Tariff.

SBP 5.2.3 Validation Checks

The ISO's stage one validation checks are performed automatically whenever Ancillary Services Schedules and bids are submitted, as described in the SP. The ISO's stage two validation is performed automatically in accordance with the timing requirements described in the SP. A SC can also check whether its Ancillary Services Schedules and bids will pass the ISO's stage two validation by manually initiating validation of its Ancillary Services Schedules and bids, as described in the SP, at any time prior to the deadline for submission of Ancillary Services Schedules and bids. It is a SC's responsibility to perform such checks.

SBP 5.3 Buy Back of Ancillary Services

A Scheduling Coordinator who has sold or self-provided Regulation, Spinning Reserve, Non-Spinning Reserve or Replacement Reserve capacity to the ISO in the Day-Ahead Market shall be required to replace such capacity to the extent scheduled self-provision is decreased between the Day-Ahead and Hour-Ahead Markets, or to the extent the Ancillary Service associated with a Generating Unit, Curtailable Demand, or System Resource successfully bid in a Day-Ahead Ancillary Service Market is reduced in the Hour-Ahead Market, for any reason (other than the negligence or willful misconduct of the ISO, or a Scheduling Coordinator's involuntary decrease in such sold capacity or scheduled self-provision on the instruction of the ISO). The price for such replaced Ancillary Service shall be at the Market Clearing Price in the Hour-Ahead Market for the same Settlement Period for the Ancillary Service capacity concerned.

SBP 6 ENERGY BIDS

SCs must submit Energy Bids for resources providing Spinning, Non-Spinning, or Replacement Reserves. The upper portion of the Energy Bid that corresponds to the resource's available capacity up to the highest operating limit, shall be allocated to any awarded or self-provided Ancillary Services in the following order from higher to lower capacity: a) Regulation Up; b) Spinning Reserve; c) Non-Spinning Reserve; and d) Replacement Reserve. For resources providing Regulation Up, the upper regulating limit shall be used if it is lower than the highest operating limit. The remaining portion of the Energy Bid, if there is any, shall constitute Supplemental Energy. Supplemental Energy bids are available to the ISO for procurement and use for Imbalance Energy, additional Voltage Support and Congestion Management in the Real Time Market.

SBP 6.1 Content of Energy Bids

SBP 6.1.1 Generation Section of Energy Bid Data

Each SC offering Spinning, Non-Spinning, or Replacement Reserve, or Supplemental Energy to the ISO will submit the following information for each Generating Unit for each Settlement Period:

- (a) SC's ID code;
- (b) name of Generating Unit;
- (c) Generating Unit operating limits (high and low MW);
- (d) Generating Unit operational ramp rate in MW/minute;
- (e) Generating Unit startup time function in minutes;
- (f) Generating Unit startup cost function in \$/start;
- (g) Generating Unit Minimum Load Cost in \$/hr; and

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

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

SBP 6.1.2 Demand Section of Energy Bid Data

Each SC offering Spinning, Non-Spinning, or Replacement Reserve, or Supplemental Energy to the ISO will submit the following information for each Demand for each Settlement Period:

- (a) SC's ID code;
- (b) name of Demand;
- (c) Demand shutdown time in minutes;
- (d) Demand shutdown cost in \$/start;
- (e) Demand minimum curtailed load cost in \$/hr; and
- (f) the MW and \$/MWh values for each Demand for which a Supplemental Energy bid is being submitted consistent with this SBP 6.

SBP 6.1.3 External Import Section of Energy Bid Data

Each SC offering Spinning, Non-Spinning, or Replacement Reserve, or 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 WECC tag;
- (g) operational 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) minimum block of hours that bid must be dispatched; and
- (j) Flag indicating the bid must be capable available for intra-hour Redispatch. If this flag is set to no then the bid is indicating that the bid must be pre-dispatched and not re-dispatched during the real-time operating hour.

SBP 6.2 Format of Energy Bids

The SC's Final Hour-Ahead Schedule for each resource must be within the range of the Energy Bids. The minimum MW output level specified for a resource, which may be zero MW (or negative for pumped storage resources), and the maximum MW output level specified for a resource must be physically achievable by the resource. All submitted Energy Bids must be in the form of a monotonically increasing staircase

function for Demands. These staircase functions will be composed of up to eleven (11) ordered pairs (i.e., ten (10) steps or price bands) of quantity/price information, with an operational ramp rate associated with the

entire MW range as provided for in SBP Section 6.5. SCs must comply with the ISO Data Templates and Validation Rules document, which contains the format for submission of Energy Bids.

SBP 6.3 Timing of Submission of Energy Bids

For specific timeline requirements for the submission of Energy Bids see the Dispatch Protocol.

SBP 6.4 Validation of Energy Bids

The ISO will check whether Energy Bids comply with the format requirements and will notify a SC if its bid does not so comply. A SC can check whether its Energy Bids will pass the ISO's validation by manually initiating validation of its Energy Bids at any time prior to the deadline for submission of Energy Bids. It is the SC's responsibility to perform such checks. SCs must comply with the ISO Data Templates and Validation Rules document, which contains the validation criteria for Energy Bids.

SBP 6.5 Format and Validation of Operational Ramp Rates

The submitted operational ramp rate expressed in megawatts per minute (MW/min) as a function of the operating level, expressed in megawatts (MW), must be a staircase function with up to 10 segments defined by a set of 1 to 11 pairs, e.g., (50,1),(100,3),(200,2),(300,2). There is no monotonicity requirement for the operational ramp rate. The submitted operational ramp rate shall be validated as follows:

- The range of the submitted operational ramp rate must cover the entire capacity of the resource, from the minimum to the maximum operating capacity, as registered in the Master File for the relevant resource.
- The operating level entries must match exactly (in number, sequence, and value) the corresponding minimum and maximum operational ramp rate breakpoints, as registered in the Master File for the relevant resource.
- If a Scheduling Coordinator does not submit an operational ramp rate for a generating unit for a day, the ISO shall use the minimum ramp rate set forth in the Master File as the ramp rate for that unit for that day.
- The last ramp rate entry shall be equal to the previous ramp rate entry and represent the maximum operating capacity of the resource as registered in the Master File. The resulting operational ramp rate segments must lie between the minimum and maximum operational ramp rates, as registered in the Master File.
- The submitted operational ramp rate must be the same for each hour of the Trading Day, i.e., the operational ramp rate submitted for a given hour must be the same with the one(s) submitted earlier for previous hours in the same Trading Day.

- Outages that affect the submitted operational ramp rate must be due to physical constraints, reported in SLIC and are subject to ISO approval. All approved changes to the submitted operational ramp rate will be used in determination of

Dispatch Instructions for the shorter period of the balance of the Trading Day or duration of reported Outage.

- For all ISO Dispatch Instructions of Reliability Must Run resources the operational ramp rate will be the ramp rate declared in the Reliability Must Run Contract Schedule A.

SBP 6.6 Format and Validation of Startup and Shutdown Times

For a Generating Unit, the submitted startup time expressed in minutes (min) as a function of down time expressed in minutes (min) must be a staircase function with up to 10 segments defined by a set of 1 to 10 down time and startup time pairs. The startup time is the time required to start the resource if it is offline longer than the corresponding down time. The last segment will represent the time to start the unit from a cold start and will extend to infinity. The submitted startup time function shall be validated as follows:

- The first down time must be 0 min.
- The down time entries must match exactly (in number, sequence, and value) the corresponding down time breakpoints of the maximum startup time function, as registered in the Master File for the relevant resource.
- The startup time for each segment must not exceed the startup time of the corresponding segment of the maximum startup time function, as registered in the Master File for the relevant resource.
- The startup time function must be strictly monotonically increasing, i.e., the startup time must increase as down time increases.

For Curtailable Demand, a single shutdown time in minutes is the time required for the resource to shut down after receiving a Dispatch Instruction.

SBP 6.7 Format and Validation of Startup and Shutdown Costs

For a Generating Unit, the submitted startup cost expressed in dollars (\$) as a function of down time expressed in minutes (min) must be a staircase function with up to 10 segments defined by a set of 1 to 10 down time and startup cost pairs. The startup cost is the cost incurred to start the resource if it is offline longer than the corresponding down time. The last segment will represent the cost to start the resource from cold startup and will extend to infinity. The submitted startup cost function shall be validated as follows:

- The first down time must be 0 min.
- The down time entries must match exactly (in number, sequence, and value) the corresponding down time breakpoints of the cost-based startup cost function, as registered in the Master File for the relevant resource.

- The startup cost for each segment must not be negative and must not exceed the startup cost of the corresponding segment of the cost-based startup cost function, as registered in the Master File for the relevant resource. For gas-fired resources, the cost-based startup cost function shall be derived from the startup fuel function, as registered in the Master File for the relevant resource, and the applicable gas price index as approved by FERC.
- The startup cost function must be strictly monotonically increasing, i.e., the startup cost must increase as down time increases.

For Curtailable Demand, a single shutdown cost in \$ is the cost incurred to shut down the resource after receiving a Dispatch Instruction. The submitted shutdown cost must not be negative.

SBP 6.8 Format and Validation of Minimum Load Costs

For a Generating Unit, the submitted Minimum Load Cost expressed in dollars per hour (\$/hr) is the cost incurred for operating the unit at minimum load. The submitted Minimum Load Cost must not be negative and must not exceed the cost-based Minimum Load Cost, as registered in the Master File for the relevant resource. For gas-fired resources, the cost-based Minimum Load Cost shall be derived pursuant to Section 5.11.6.1.2.

For Curtailable Demand, the submitted Minimum Load Cost (\$/hr) is the cost incurred while operating the resource at reduced consumption after receiving a Dispatch Instruction. The submitted Minimum Load Cost must not be negative.

SBP 7 INTERFACE REQUIREMENTS

SBP 7.1 WEnet

WEnet provides the backbone on which any of three communications mechanisms will be utilized. These are:

- (a) use of a web browser such as Netscape;
- (b) use of File Transfer Protocol (FTP); or
- (c) use of an Application Programming Interface (API).

Details of the technical aspects of each of these mechanisms, including information on how to change mechanisms and back-up procedures for individual SC failures, will be made available by the ISO to SCs on request. It is assumed that each SC has made application for and signed a Scheduling Coordinator Agreement. As such, each SC will already be familiar with and have arranged the mechanism, including security arrangements, by which it will initially communicate with the ISO.

SBP 7.2 Templates

The ISO Data Templates and Validation Rules document provides a description of the templates which will be utilized to enter data into the ISO's systems. For each of the three communications mechanisms, data entry is as follows:

- (a) direct entry of data into the template screens through the use of a browser;
- (b) upload of ASCII delimited text through use of an upload button on the template screens which activates the FTP mechanism;
or

Congestion Management process will allocate Congested transmission to those users who value it the most and will charge all SCs for their allocated usage of Congested Inter-Zonal Interfaces on a comparable basis. All SCs within a Zone will see the same price for transmitting Energy across a Congested Inter-Zonal Interface, irrespective of the particular locations of their Generators, Demands and external imports/exports.

- (b) The ISO will determine the prices for the use of Congested Inter-Zonal Interfaces using the Adjustment Bids. The ISO will collect Usage Charges from SCs for their Scheduled use of Congested Inter-Zonal Interfaces. If Adjustment Bids are exhausted and Schedules are adjusted *pro rata*, the ISO will apply a default Usage Charge calculated in accordance with Section 7.3.1.3 of the ISO Tariff.
- (c) The ISO will rebate the Congestion revenues collected through the Usage Charges to the PTOs which own the Congested Inter-Zonal Interface in proportion to their respective ownership rights.

SP 11 CREATION OF THE REAL-TIME MERIT ORDER STACK

SP 11.1 Sources of Imbalance Energy

The following Energy Bids will be considered in the creation of the real-time merit order stack for Imbalance Energy:

- (a) Supplemental Energy Bids submitted in accordance with the SBP;
- (b) Ancillary Services Energy Bids (except for Regulation) submitted for specific Ancillary Services in accordance with the SBP for those resources which have been selected in the ISO's Ancillary Services auction to supply such specific Ancillary Services; and
- (c) Ancillary Services Energy Bids (except for Regulation) submitted for specific Ancillary Services in accordance with the SBP for those resources which SCs have elected to use to self-provide such specific Ancillary Services and for which the ISO has accepted such self-provision.

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

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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 RTD Software.

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

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

SP 11.3 Use of the Merit Order Stack

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

- (a) satisfying needs for Imbalance Energy (differences between actual and scheduled Generation, Demand and external imports/exports) in real time;
- (b) managing Inter-Zonal Congestion in real time;
- (c) supplying Energy necessary to allow resources providing Regulation service to return to the base point of their regulating ranges in real time;
- (d) recovering Operating Reserves utilized in real time;
- (e) procuring additional Voltage Support required from resources beyond their power factor ranges in real time; and
- (f) Dispatching System Resources and Dispatchable Loads and increasing Generating Units' output to manage Intra-Zonal Congestion in real time.

SP 12 AMENDMENTS TO THE PROTOCOL

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

APPENDIX B

GRID OPERATIONS CHARGE COMPUTATION

B 1 Purpose of charge

The Grid Operations Charge is a charge which recovers Redispatch costs incurred due to Intra-Zonal Congestion pursuant to Section 7.3.2 of the ISO Tariff. The Grid Operations Charge is paid by or charged to Scheduling Coordinators in order for the ISO to recover and properly redistribute the costs of adjusting the Balanced Schedules submitted by Scheduling Coordinators.

B 2 Fundamental formulae

B 2.1 Payments to SCs with incremented schedules

When it becomes necessary for the ISO to increase the output of a Scheduling Coordinator's Generating Unit_i or System Resource_i or reduce a Curtailable Demand_i in order to relieve Congestion within a Zone, the ISO will pay the Scheduling Coordinator. The amount that ISO pays the Scheduling Coordinator_j is the price specified in the Scheduling Coordinator's Imbalance Energy bid for the Generating Unit_i or System Resource_i or Curtailable Demand_i multiplied by the quantity of Energy Dispatched. The formula for calculating the payment to Scheduling Coordinator_j for each block_b of Energy of its bid curve in Trading Interval_t is:

$$INC_{bijt} = adjinc_{bijt} * \Delta inc_{bijt}$$

B 2.1.1 Total Payment for Trading Interval

The formula for calculating payment to Scheduling Coordinator_j whose Generating Unit_i or System Resource_i has been increased or Curtailable Demand_i reduced for all the relevant blocks_b of Energy in the Imbalance Energy bid curve of that Generating Unit or System Resource or Curtailable Demand in the same Trading Interval_t is:

$$PayTI_{ijt} = \sum_b INC_{bijt}$$

B 2.2 Charges to Scheduling Coordinators with decremented schedules

When it becomes necessary for the ISO to decrease the output of a Scheduling Coordinator's Generating Unit_i or System Resource_i in order to relieve Congestion within a Zone, the ISO will make a charge to the Scheduling Coordinator. The amount that the ISO will charge Scheduling Coordinator_j for decreasing the output of Generating Unit_i is

the decremental reference price specified for the Scheduling Coordinator as determined in accordance with Section 7.2.6.1 multiplied by the quantity of Energy Dispatched. The amount that the ISO will charge Scheduling Coordinator_j for decreasing the output of System Resource_i is the price specified in the Scheduling Coordinator's Imbalance Energy bid for System Resource_i multiplied by the quantity of Energy Dispatched. The formula for calculating the

charge to Scheduling Coordinator_j for each block_b of Energy in its decremental reference price or Imbalance Energy Bid in Trading Interval_t is:

$$DEC_{bijt} = adjdec_{bijt} * \Delta dec_{bijt}$$

B 2.2.1 Total Charge for Trading Interval

The formula for calculating the charge to Scheduling Coordinator_j whose Generating Unit_i or System Resource_i has been decreased for all the relevant blocks_b of Energy at the decremental reference price for Generating Unit_i, or Imbalance Energy bid for System Resource_i, in the same Trading Interval_t is:

$$ChargeTI_{ijt} = \sum_b DEC_{bijt}$$

B 2.3 Not Used

B 2.4 Net ISO Redispatch costs

The Trading Interval net Redispatch cost encountered by ISO to relieve Intra-Zonal Congestion is the sum of the amounts paid by the ISO to those Scheduling Coordinators whose Generation or System Resource was increased or Curtailable Demand was decreased during the Trading Interval less the sum of the amounts received by the ISO from those Scheduling Coordinators whose Generating Units or System Resource were decreased during the Trading Interval. The fundamental formula for calculating the net Redispatch cost is:

$$REDISPCONG_t = \sum_j PayTI_{ijt} - \sum_j ChargeTI_{ijt}$$

Note that $REDISPCONG_t$ can be either positive or negative. This means that it is possible for the ISO to generate either a net cost or a net income, for any given Trading Interval. In the event the ISO does not make use of equal amounts of incremental and decremental dispatched MWHs, then the net Redispatch cost becomes the sum of the amounts paid (or charged) by the ISO to those Scheduling Coordinators whose Generation or System Resource was increased (or decreased) or Curtailable Demand was decreased (or increased) during the Trading Interval less the sum of the amounts received by the ISO from Scheduling Coordinators through the Imbalance Energy Market.

B 2.5 Grid Operations Price

The grid operations price is the Trading Interval rate used by the ISO to apportion net Trading Interval Redispatch costs to Scheduling Coordinators within the Zone with Intra-Zonal Congestion. The grid operations price is calculated using the following formula:

$$GOP_t = \frac{REDISPCONG_t}{\sum_j QCharge_{jt} + \sum_j Export_{jt}}$$

B 2.6 Grid Operations Charge

The Grid Operations Charge is the vehicle by which the ISO recovers the net Redispatch costs. It is allocated to each Scheduling Coordinator in proportion to the Scheduling Coordinator's Demand in the Zone with Intra-Zonal Congestion and exports from the Zone with Intra-Zonal Congestion. The formula for calculating the Grid Operations Charge for Scheduling Coordinator_j in Trading Interval_t is:

$$GOC_{jt} = GOP_t * (QCharge_{jt} + EXPORT_{jt})$$

B 3 Meaning of terms of formulae

B 3.1 INC_{bijt} - \$

The payment from the ISO due to Scheduling Coordinator_j whose Generating Unit_i or System Resource_i is increased or Curtailable Load_j is reduced within a block_b of Energy in its Imbalance Energy bid in Trading Interval_t in order to relieve Intra-Zonal Congestion.

B 3.2 adjinc_{bijt} - \$/MWh

The incremental cost for the rescheduled Generating Unit_i or System Resource_i or Curtailable Load_j taken from the relevant block_b of Energy in the Imbalance Energy bid submitted by the Scheduling Coordinator_j or generated by the ISO for the Trading Interval_t.

B 3.3 Δinc_{bijt} - MW

The amount by which the Generating Unit_i or System Resource_i or Curtailable Load_j of Scheduling Coordinator_j for Trading Interval_t is increased by the ISO within the relevant block_b of Energy in its Imbalance Energy bid.

B 3.4 Pay_{Tl}_j_t - \$

The Trading Interval payment to Scheduling Coordinator_j whose Generating Unit_i has been increased or System Resource_i or Curtailable Load_j reduced in Trading Interval_t of the Trading Day.

B 3.5 DEC_{bijt} - \$

The charge to Scheduling Coordinator_j whose Generating Unit_i or System Resource_i is decreased for Trading Interval_t within a block_b of Energy at the decremental reference price for Generating Unit_i or in the Imbalance Energy bid for System Resource_i.

- B 3.6** **adjdec_{bijt} - \$/MWh**
The decremental cost for the rescheduled Generating Unit_i or System Resource_i taken from the relevant block_b of Energy at the decremental reference price for Generating Unit_i or Imbalance Energy bid for System Resource_i submitted by Scheduling Coordinator_j or generated by the ISO for the Trading Interval_t.
- B 3.7** **Δdec_{bijt} - MW**
The amount by which the Generating Unit_i or System Resource_i of Scheduling Coordinator_j for Trading Interval_t is decreased by ISO within the relevant block_b of Energy at the decremental reference price for Generating Unit_i or Imbalance Energy bid for System Resource_i.
- B 3.8** **ChargeT_{ij}t - \$**
The Trading Interval charge to Scheduling Coordinator_j whose Generating Unit_i or System Resource_i has been decreased in Trading Interval_t of the Trading Day.
- B 3.9** **Not Used**
- B 3.10** **Not Used**
- B 3.10.1** **Not Used**
- B 3.10.2** **Not Used**
- B 3.11** **REDISPCONG_t - \$**
The Trading Interval net cost to ISO to redispatch in order to relieve Intra-Zonal Congestion during Trading Interval_t.
- B 3.12** **GOP_t - \$/MWh**
The Trading Interval grid operations price for Trading Interval_t used by the ISO to recover the costs of Redispatch for Intra-Zonal Congestion Management.
- B 3.13** **GOC_{jt} - \$**
The Trading Interval Grid Operations Charge by the ISO for Trading Interval_t for Scheduling Coordinator_j in the relevant Zone with Intra-Zonal Congestion.
- B 3.14** **QCHARGE_{jt} – MWh**
The Trading Interval metered Demand within a Zone for Trading Interval_t for Scheduling Coordinator_j whose Grid Operations Charge is being calculated.
- B 3.15** **EXPORT_{jt} – MWh**
The total Energy for Trading Interval_t exported from the Zone to a neighboring Control Area by Scheduling Coordinator_j.

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 Load Take-Out Point, Generating Unit, System Unit, or System Resource for which a Scheduling Coordinator has a Final Hour-Ahead Schedule or Metered Quantity, for each Settlement Interval 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 Settlement Interval.

Uninstructed Imbalance Energy within a Settlement Interval shall be settled in two tiers that are defined in relation to the expected Energy associated with the Final Hour-Ahead Schedule, if any, and the Dispatch Instruction as follows:

- 1) Deviations from the expected Energy associated with a Dispatch Instruction resulting in: 1) under delivery of Instructed Imbalance Energy that is also equal to or greater than the Final Hour-Ahead Schedule, or 2) over delivery of Instructed Imbalance Energy that is also less than or equal to the Final Hour-Ahead Schedule constitutes tier 1 Uninstructed Imbalance Energy that shall be settled at a Resource-Specific Settlement Interval Ex Post Price as described in Appendix D 2.4.
- 2) Deviations from the expected Energy associated with a Dispatch Instruction resulting in: 1) over delivery of Instructed Imbalance Energy that is also greater than the Final Hour-Ahead Schedule, or 2) under delivery of Instructed Imbalance Energy that is also less than the Final Hour-Ahead Schedule constitutes tier 2 Uninstructed Imbalance Energy and shall be settled at the Zonal Settlement Interval Ex Post Price as described in Appendix D 2.5.

CALIFORNIA INDEPENDENT SYSTEM OPERATOR CORPORATION
FERC ELECTRIC TARIFF
FIRST REPLACEMENT VOLUME NO. II

Second Revised Sheet No. 689
Superseding First Revised Sheet No. 689

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Imbalance Energy is calculated as follows:

Generator Calculation for ISO Metered Entities:

$$IE_{i,h,o} = ME_{i,h,o} - SE_{i,h,o}$$

Load Calculation:

$$IE_{i,h,o} = SE_{i,h,o} - ME_{i,h,o}$$

System Resource Calculation:

$$IE_{i,h,o} = \sum_1^k \sum_1^v REAL_TIME_FLOW_{i,h,o,k,v} - SE_{i,h,o}$$

where,

$$SE_{i,h,o} = \frac{HAfn_{i,h}}{6}$$

$ME_{i,h,o}$ actual Meter Data for each resource i of each Settlement Interval o for each hour h .

Uninstructed Imbalance Energy is calculated as follows:

$$UIE_{i,h,o} = E_{i,h,o} - IIE_REG_{i,h,o}$$

where:

$$E_{i,h,o} = IE_{i,h,o} - \sum_1^k IIE_LOSS_{i,h,o,k} - \sum_1^k IIE_ML_{i,h,o,k} - \sum_1^k \sum_1^m IIE_PREDISPATCH_{i,h,o,k,m} - \sum_1^k RE_STANDARD_{i,h,o,k} - \sum_1^k RED_{i,h,o,k} - \sum_1^k \sum_1^m IIE_ECON_{i,h,o,k,m} - \sum_1^k \sum_1^L OOS_P_{i,h,o,k,L} - \sum_1^k \sum_1^L OOS_N_{i,h,o,k,L} - \sum_1^k \sum_1^m RIE_{i,h,o,k,m} - \sum_1^k IIE_RERATE_{i,h,o,k}$$

$IIE_REG_{i,h,o}$ is the Regulating Energy for resource i during Settlement Interval o in hour h

$$UIE_{1,i,h,o} = \begin{cases} \min \left(UIE_{i,h,o}, - \min \left(0, \sum_1^k \sum_1^m IIE_ECON_{i,h,o,k,m} + \sum_1^k \sum_1^m IIE_PREDISPATCH_{i,h,o,k,m} \right. \right. \\ \left. \left. + \sum_1^k \sum_1^L OOS_P_{i,h,o,k,L} + \sum_1^k \sum_1^L OOS_N_{i,h,o,k,L} + \sum_1^k RED_{i,h,o,k} \right. \right. \\ \left. \left. + \sum_1^k IIE_LOSS_{i,h,o,k} + \sum_1^k \sum_1^m RIE_{i,h,o,k,m} + \sum_1^k IIE_ML_{i,h,o,k} + \sum_1^k RERATE_{i,h,o,k} \right) \right) & \therefore UIE_{i,h,o} \geq 0 \\ \max \left(UIE_{i,h,o}, - \max \left(0, \sum_1^k \sum_1^m IIE_ECON_{i,h,o,k,m} + \sum_1^k \sum_1^m IIE_PREDISPATCH_{i,h,o,k,m} \right. \right. \\ \left. \left. + \sum_1^k \sum_1^L OOS_P_{i,h,o,k,L} + \sum_1^k \sum_1^L OOS_N_{i,h,o,k,L} + \sum_1^k RED_{i,h,o,k} \right. \right. \\ \left. \left. + \sum_1^k IIE_LOSS_{i,h,o,k} + \sum_1^k \sum_1^m RIE_{i,h,o,k,m} + \sum_1^k IIE_ML_{i,h,o,k} + \sum_1^k RERATE_{i,h,o,k} \right) \right) & \therefore UIE_{i,h,o} < 0 \end{cases}$$

$$UIE_{2,i,h,o} = UIE_{i,h,o} - UIE_{1,i,h,o}$$

$$UIEC_{i,h,o} = \left(-1 * UIE_{1,i,h,o} * STLMT_PRICE_{i,h,o} \right) + \left(-1 * UIE_{2,i,h,o} * ZONAL_EX_POST_PRICE_{j,h,o} \right)$$

D 2.1.2 Instructed Imbalance Energy Charges on Scheduling Coordinators

Standard Ramping Energy is Energy associated with a Standard Ramp and shall be deemed delivered and settled at a price of zero dollars per MWh.

Ramping Energy Deviation is Energy produced or consumed due to hourly schedule changes in excess of Standard Ramping Energy and shall be paid or charged, as the case may be, at a Resource-Specific Settlement Interval Ex Post Price calculated using the applicable Dispatch Interval Ex Post Prices as described in this Appendix D 2.4. For Scheduling Coordinators scheduling a MSS that has elected to follow its Load, this Ramping Energy Deviation will account for the units following Load.

Ramping Energy Deviation shall be settled as an explicit component of Instructed Imbalance Energy for each resource i in Dispatch Interval k of Settlement Interval o for hour h , and calculated as follows:

$$REDC_{i,h,o} = \left(\sum_1^k RED_{i,h,o,k} \right) * STLMT_PRICE_{i,h,o}$$

The amount of Instructed Imbalance Energy that will be deemed delivered in each Dispatch Interval will be based on Dispatch Instructions, as provided for in Section 2.5.22.6, and Final Hour-Ahead Schedules. The amount of Instructed Imbalance Energy to be settled in a Settlement Interval will be equal to the sum of all Instructed Imbalance Energy for all Dispatch Intervals within the relevant Settlement Interval. Instructed Imbalance Energy for each Settlement Interval shall be settled at the relevant Resource Specific Settlement Interval Ex Post Price. Generating Units, Participating Loads, and System Units may be eligible to recover their Energy Bid costs in accordance with Section 11.2.4.1.1.1. Instructed Imbalance Energy from System Resources shall be settled in accordance with Section 11.2.4.1.1.2.

The Instructed Imbalance Energy amount for each resource i in Settlement Interval o for hour h shall be determined as follows:

$$IIEC_{i,h,o} = \left(\sum_l^k \sum_l^m IIE_ECON_{i,h,o,k,m} + \sum_l^k \sum_l^m IIE_PREDISPATC H_{i,h,o,k,m} + \sum_l^k \sum_l^m RIE_{i,h,o,k,m} + \sum_l^k IIE_RERATE_{i,h,o,k} + \sum_l^k IIE_ML_{i,h,o,k} \right)$$

$$* STLMT_PRICE_{i,h,o} * (-1) + IIEC_OOS_{i,h,o} + REDC_{i,h,o} + IIEC_REG_{i,h,o}$$

Uninstructed Imbalance Energy is Imbalance Energy due to non-compliance with a Dispatch Instruction and shall be settled as provided for in SABP Appendix D Section 2.1.1.

D 2.2 Unaccounted for Energy Charge

The Unaccounted for Energy Charge on Scheduling Coordinator g in Settlement Interval o of Settlement Period h for each relevant Zone j is calculated in the following manner:

The UFE for each utility Service Area s , for which separate UFE calculation is performed, is calculated as follows,

$$UFE_{UDC,s,h,o} = \sum_{q \in UDC_s} I_{a,q,j,h,o} - \sum_{q \in UDC_s} E_{a,q,j,h,o} + \sum_{i \in UDC_s} G_{a,i,j,h,o} - \sum_{i \in UDC_s} L_{a,i,j,h,o} - TL_{s,h,o}$$

The Transmission Loss $TL_{s,h,o}$ in Settlement Interval o of Settlement Period h for utility Service Area s is calculated as follows:

$$TL_{s,h,o} = \left(\sum_i [G_{a,i,j,h,o} * (1 - GMM_{a,i,h})] + \sum_q [I_{a,q,j,h,o} * (1 - GMM_{a,q,h})] \right) * \frac{PFL_{s,h}}{\sum_s PFL_{s,h}}$$

Where $PFL_{s,h}$ are the Transmission Losses for utility Service Area s as calculated by a power flow solution for Settlement Period h , consistent with the calculation of final forecasted Generation Meter Multipliers.

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

$$UFE_{i,j,h,o} = UFE_{UDC,s,h,o} * \frac{L_{i,j,h,o}}{\sum_{i \in UDC_s} L_{i,j,h,o}}$$

The UFE charge for Scheduling Coordinator g for Settlement Interval o of Settlement Period h in Zone j is calculated as a charge or payment using the applicable Zonal Settlement Interval Ex Post Price as follows:

$$UFEC_{g,j,h,o} = \left(\sum_{i \in SC_g} UFE_{i,j,h,o} \right) * ZONAL_EX_POST_PRICE_{j,h,o}$$

D 2.3 Hourly Ex Post Price

The Hourly Ex Post Price is the Energy-weighted average of the Dispatch Interval Ex Post Prices in each Zone j during each Settlement Period using the absolute value of Instructed Imbalance Energy procured from all Participating Generators, Participating Load, System Units, and System Resources in each applicable Dispatch Interval. The Hourly Ex Post Price may vary between Zones if Congestion is present.

CALIFORNIA INDEPENDENT SYSTEM OPERATOR CORPORATION
FERC ELECTRIC TARIFF
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$$HP_{j,h} = \frac{\sum_1^p \sum_1^i |IIE_TOTAL_{j,i,h,p}| * EX_POST_PRICE_{j,h,o,p}}{\sum_1^p \sum_1^i |IIE_TOTAL_{j,i,h,p}|}$$

where,

p is the Dispatch Interval index for hour h .

D 2.4 Resource-Specific Settlement Interval Ex Post Price

The Resource-Specific Settlement Interval Ex Post Price is the weighted-average of the Dispatch Interval Ex Post Prices in each Settlement Interval using the Instructed Imbalance Energy from the respective Participating Generator, Participating Load, or System Resource, in each applicable Dispatch Interval. If there is no Instructed Imbalance Energy from a Participating Generator, Participating Load, or System Resource, in any of the applicable Dispatch Intervals, the Resource-Specific Settlement Interval Ex Post Price for that resource would be the simple average of the applicable Dispatch Interval Ex Post Prices in the Settlement Interval.

The Resource-Specific Settlement Interval Ex Post Price is calculated as follows:

$$STLMT_PRICE_{i,h,o} = \frac{\sum_1^k IIE_TOTAL_{i,h,o,k} * EX_POST_PRICE_{j,h,o,k}}{\sum_1^k IIE_TOTAL_{i,h,o,k}}$$

Where:

$$\begin{aligned} IIE_TOTAL_{i,h,o,k} = & \sum_1^m IIE_ECON_{i,h,o,k,m} + \sum_1^m IIE_PREDISPATCH_{i,h,o,k,m} + \\ & IIE_ML_{i,h,o,k} + \sum_1^m RIE_{i,h,o,k,m} + \sum_1^L OOS_P_{i,h,o,k,L} + \\ & \sum_1^L OOS_N_{i,h,o,k,L} + IIE_LOSS_{i,h,o,k} + RED_{i,h,o,k} + \sum_1^k IIE_RERATE_{i,h,o,k} \end{aligned}$$

D 2.5 Zonal Settlement Interval Ex Post Price

The Zonal Settlement Interval Ex Post Price is the weighted-average of the Dispatch Interval Ex Post Prices in each Settlement Interval using the absolute value of Instructed Imbalance Energy procured from all Participating Generators, Participating Load, System Units, and System Resources in each applicable Dispatch Interval. If there is no Instructed Imbalance Energy from a Participating Generator, Participating Load, or System Resource, in any of the applicable Dispatch Intervals, the Zonal Settlement Interval Ex Post Price for that Zone would be the simple average of the applicable Dispatch Interval Ex Post Prices in the Settlement Interval.

The Zonal Settlement Interval Ex Post Price is calculated as follows:

$$ZONAL_EX_POST_PRICE_{j,h,o} =$$

$$\frac{\sum_{p=1}^2 \sum_{i=1}^i |IIE_TOTAL_{i,h,p}| * EX_POST_PRICE_{j,h,o,p}}{\sum_{p=1}^2 \sum_{i=1}^i |IIE_TOTAL_{i,h,p}|}$$

where p is the Dispatch Interval index for hour h.

D 2.6 Calculation of Unrecovered Cost Payment for Generators

As set forth in 11.2.4.1.1.1, Generator resources will be eligible to recover their bid costs (less than or equal to the Maximum Bid Level) for extra-marginal Energy dispatched above Pmin, if such costs are not recovered from the net of expected revenues earned through participation in the ISO's Real Time Market during the Trade Day (24-hour period). The expected market revenue deficits will only be included in the calculation for Settlement Intervals the resource operates within its relevant Tolerance Band. Additionally, resources will not recover the amount of these bid recovery costs allocated to each Settlement Interval in those Settlement Intervals in which the resource is operating outside of its relevant Tolerance Band.

The Unrecovered Cost Payment for each resource *i* shall be determined for the Trade Day *d* then evenly divided over *n*-Settlement Intervals as follows:

$$COST_RECOVERY_{i,d} = \min\left(0, \sum_{h=1}^H \sum_{o=1}^O \left(PERF_STAT_{i,h,o} * MR_DEFICIT_{i,h,o} + MR_SURPLUS_{i,h,o} \right)\right)$$

where,

$MR_DEFICIT_{i,h,o}$ = Market Revenue deficit for resource *i* in hour *h* for Settlement interval *o* based on the difference between the expected revenues earned in the Settlement Interval and and/or its bid cost; $MR_SURPLUS_{i,h,o}$ = Market Revenue surplus for resource *i* in hour *h* for Settlement interval *o* based on the difference between the expected revenues earned in the Settlement Interval and/or its bid cost.

Resource *i* shall receive a share of its total cost recovery in each Settlement Interval *o* that is included in the $COST_RECOVERY_{i,d}$ calculation above if it operates within its relevant Tolerance Band during the relevant Settlement Interval *o*.

$$COST_RECOVERY_{i,h,o} = PERF_STAT_{i,h,o} * COST_RECOVERY_{i,d} / n$$

where,

n is the number of Settlement Intervals *o* that are included in the $COST_RECOVERY_{i,d}$ calculation for resource *i* in Trade Day *d*.

Calculation of Market Revenue Surplus or Deficit

The market revenue surplus or deficit for each resource *i* will be computed for each Settlement Interval *o* based on the difference between the revenues earned in the Settlement Interval at the relevant 10-minute Ex Post price and the resource's bid cost (less than or equal to the Maximum Bid Level) as follows:

$$MR_DIFF_{i,h,o} = \left(\sum_I^k \sum_I^m IIE_ECON_{i,h,o,k,m} + \sum_I^k \sum_I^m RIE_{i,h,o,k,m} \right) * STLMT_PRICE_{i,h,o} - BID_COST_{i,h,o} - BID_COST_RIE_{i,h,o}$$

for all incremental energy bid segments m with $IIE_PRICE_{i,h,o,k,m}$ and $RIE_PRICE_{i,h,o,k,m}$ less than or equal to the Maximum Bid Level and all decremental energy bid segments m with $IIE_PRICE_{i,h,o,k,m}$ and $RIE_PRICE_{i,h,o,k,m}$ greater than or equal to the Bid Floor.

$$MR_DEFICIT_{i,h,o} = \min(0, MR_DIFF_{i,h,o})$$

$$MR_SURPLUS_{i,h,o} = \max(0, MR_DIFF_{i,h,o})$$

where,

$$BID_COST_{i,h,o} = \left(\sum_I^k \sum_I^m IIE_ECON_{i,h,o,k,m} * IIE_PRICE_{i,h,o,k,m} \right)$$

$$BID_COST_RIE_{i,h,o} = \sum_I^k \sum_I^m RIE_{i,h,o,k,m} * RIE_PRICE_{i,h,o,k,m}$$

D 2.6.1 Tolerance Band and Performance Check

The ISO shall determine the Tolerance Band for each Settlement Interval o for PGA resources based on the data from the Master File as follows:

$$TOLERANCE_BAND_{i,h,o} = \pm \max(FIX_LIM, TOL_PERCENT * P_{max_i}) / 6$$

where,

FIX_LIM is a fixed MW limit and is initially equal to 5 MW.

$TOL_PERCENT$ is a fixed percentage and is initially equal to 3%. P_{max_i} is the maximum operating capacity in MW of resource i specified in the Master File.

The ISO shall determine the Tolerance Band for each Settlement Interval o for PLA resources as follows:

$$TOLERANCE_BAND_{i,h,o} = \pm \max(FIX_LIM, TOL_PERCENT * HAFin_{i,h}) / 6$$

where $HAFin_{i,h}$ is the Final Hour Ahead Energy Schedule.

Resources must operate within their relevant Tolerance Band in order to receive any above-Ex Post Price payments. The ISO shall determine the performance status of the resource for each Settlement Interval o .

A resource shall have met its performance requirement if its $UIE_{i,h,o}$ is within its relevant Tolerance Band. A resource meeting its performance requirement in Settlement Interval o will have a $PERF_STAT_{i,h,o} = 1$. A resource that has not met its performance requirement in Settlement Interval o will have a $PERF_STAT_{i,h,o} = 0$.

Must offer resources that produce a quantity of Energy above Minimum Load due to an ISO Dispatch Instruction are not subject to the Tolerance Band requirement for purposes of receiving either Minimum Load Cost Compensation, as defined in section 5.11.6.1.1, or Bid Cost Recovery, as set forth in section 11.2.4.1.1.1. Accordingly, the $PERF_STAT_{i,h,o}$ for eligible must offer resources, as defined in section 5.11.6.1.1, shall be set to 1, irrespective of deviations outside of the Tolerance Band.

System Resources do not have a Tolerance Band. Non-Participating Load Agreement (PLA) load resources are not subject to the performance requirement.

D 2.6.2 Unrecovered Costs Neutrality Allocation

For each Settlement Interval o , the total Unrecovered Costs for Trade Day d shall be allocated pro-rata to each Scheduling Coordinator g based on its Metered Demand, calculated as follows:

$$URC_ALLOC_{g,h,o} = M_{g,h,o} * Per\ Unit\ Price$$

where,

$M_{g,h,o}$ = the Metered Demand in the ISO Control Area for Scheduling Coordinator g in Settlement Interval o for hour h ;

$$Per\ Unit\ Price = \frac{-1 * \sum_1^i COST_RECOVERY_{i,h,o}}{\sum_1^g M_{g,h,o}}$$

D 2.6.3 Calculation of Unrecovered Cost Payment for System Resources

As set forward in Section 11.2.4.1.1.2, System Resources that are dispatched and deliver hourly-predispatched Instructed Imbalance Energy will be paid the higher of the simple average of the twelve Dispatch Interval Ex Post Prices for the hour or their Energy bid costs for the quantity of Energy delivered in each hour. The determination of the hourly uplift payment shall be determined as follows: (1) Market deficits or surpluses are calculated as the difference between the resource-specific price and the resource's (hourly) bid cost; (2) An hourly uplift payment will be determined for any amount less than zero; (3) This hourly amount will then be divided evenly by the relevant number of n -Settlement Intervals and paid this portion for each Settlement Interval of the hour.

The hourly-predispatched uplift payment is calculated as follows:

$$PREDISPATCH_UPLIFT_{i,h} = \min\left(0, \sum_1^o \left(\left(\sum_{k=1}^2 \sum_{l=1}^m IIE_PREDISPATCH_{i,h,o,k,m} \right) * STMLT_PRICE_{i,h,o} - \left(\sum_{k=1}^2 \sum_{l=1}^m IIE_PREDISPATCH_{i,h,o,k,m} * IIE_PRICE_{i,h,o,k,m} \right) \right) \right)$$

$$PREDISPATCH_PMT_{i,h,o} = PREDISPATCH_UPLIFT_{i,h} / n$$

where,

n is the relevant number of Settlement Intervals o in the relevant hour h for resource i.

for the portion of incremental energy bid segments with IIE PRICE_{i,h,o,k,m} less than or equal to the Maximum Bid Level and all decremental energy bid segments with IIE PRICE_{i,h,o,k,m} greater than or equal to the Bid Floor.

D 2.6.4 Allocation of Unrecovered Cost Payments for Hourly Pre-dispatched System Resources

For each Settlement Interval o, the total uplift payments (*PREDISPATCH_PMT_{i,h,o}*) for all hourly pre-dispatched System Resources will be included in the Excess Cost Payments to be allocated to a Scheduling Coordinator's Net Negative Deviation through allocation of excess costs and/or ISO metered Demand through excess cost neutrality allocation.

D 2.6.5 Excess Cost Payments for Instructed Incremental Energy Bids above the Maximum Bid Level

Incremental Instructed Imbalance Energy above the Maximum Bid Level will receive an additional Excess Cost Payment subject to operating within a resource's Tolerance Band.

Excess cost payments are calculated as follows:

$$EXCESS_COST_{i,h,o} = \left[\left(\sum_{k=1}^k \sum_{m=1}^m IIE_ECON_{i,h,o,k,m} + \sum_{k=1}^k \sum_{m=1}^m IIE_PREDISPATCH_{i,h,o,k,m} + \sum_{k=1}^k \sum_{m=1}^m RIE_{i,h,o,k,m} \right) * STLMT_PRICE_{i,h,o} - BID_COST_{i,h,o} - BID_COST_RIE_{i,h,o} \right] * PERF_STAT_{i,h,o}$$

for the portion of energy bid segments with IIE PRICE_{i,h,o,k,m} and RIE PRICE_{i,h,o,k,m} greater than the Maximum Bid Level.

D 2.7 Transmission Loss Obligation

The transmission loss obligation charge shall be determined as follows:
 For Generators:

$$TL_{i,h,o} = ME_{i,h,o} * (1 - GMMa_h)$$

For System Resources, the transmission loss obligation shall be determined as follows:

$$TL_{i,h,o} = \sum_l \sum_l^k \sum_l^v REAL_TIME_FLOW_{i,h,o,k,v} * (1 - GMMa_h)$$

The transmission loss charge will be calculated based on the following formulation:

$$TLC_{i,h,o} = - \sum_1^k IIE_LOSS_{i,h,o,k} * STLMT_PRICE_{i,h,o} + TL_{i,h,o} * STLMT_PRICE_{i,h,o}$$

D 2.8 Uninstructed Deviation Penalty Charges

For negative Uninstructed Deviation Penalty billable quantities where $UDP_BQ_{h,o} < 0$ and $ZONAL_EX_POST_PRICE_{j,h,o} > 0$,

$$UDP_NEG_Amt_i AMT_{i,h,o} = -1 * UDP_BQ_{i,h,o} * ZONAL_EX_POST_PRICE_{j,h,o} * .5$$

For positive UDP billable quantities where $UDP_BQ_{i,h,o} > 0$ and $ZONAL_EX_POST_PRICE_{j,h,o} > 0$, then

$$UDP_POS_AMT_{i,h,o} = UDP_BQ_{i,h,o} * ZONAL_EX_POST_PRICE_{j,h,o}$$

where,

$UDP_BQ_{i,o,h}$ is the Uninstructed Deviation Penalty (UDP) billable quantity in MWh for a resource, or aggregated resource, denoted by i for Settlement Interval o of hour h .

$UDP_POS_AMT_{i,o,h}$ or $UDP_NEG_AMT_{i,o,h}$ are the penalty amounts in Dollars for either an aggregated or individual resource i for Settlement Interval o of hour h .

The ISO will not calculate UDP settlement amounts for Settlement Intervals when the corresponding Zonal Settlement Interval Ex Post Price is negative or zero.

For an MSS that has elected to follow its own Load, the Scheduling Coordinator for the MSS Operator will be assessed the Uninstructed Deviation Penalty charges based on the Deviation Band and Deviation Price in Section 23.12.2 of the ISO Tariff.

D 2.9 Minimum Load Cost Compensation

The ISO shall calculate a Must-Offer Generator's Minimum Load Cost Compensation (MLCC), pursuant to section 5.11.6.1.1 of the ISO Tariff, as the market revenue deficit below its Minimum Load Cost as follows:

$$MLCC_{i,h,o} = PERF_STAT_{i,h,o} * [\min (0, MR_ML_{i,h,o} - MLC_{i,h,o})]$$

where:

The market revenue from Minimum Load Energy is indicated as

$$MR_ML_{i,h,o} = \sum_l^k IIE_ML_{i,h,o,k} * STLMT_PRICE_{i,h,o}$$

$MLC_{i,h,o}$ is the Minimum Load Cost for each resource i during Settlement Interval o of hour h , as defined in section 5.11.6.1.2 of the ISO Tariff.

The ISO will calculate the Tolerance Band $PERF_STAT_{i,h,o}$ for each resource i as defined in Section 2.6.1 of this Appendix D of SABP.

- D 3** **Meaning of terms in the formulae**
- D 3.1** **[Not Used]**

D 3.2 **[Not Used]**

D 3.3 **[Not Used]**

D 3.4 **[Not Used]**

D 3.5 **[Not Used]**

D 3.6 **[Not Used]**

D 3.6.1 **[Not Used]**

D 3.6.2 **[Not Used]**

D 3.6.3 **[Not Used]**

D 3.7 **$G_{a,i,j,h,o}$ – MWh**

The total actual metered Generation of Generator i in Zone j during Settlement Interval o during Settlement Period h.

D 3.8 **[Not Used]**

D 3.9 [Not Used]

D 3.9.1 [Not Used]

D 3.10 [Not Used]

D 3.11 [Not Used]

D 3.12 **$GMM_{a,i,h}$ – fraction**

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

D 3.13 **$GMM_{a,j,h}$ – fraction**

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

D 3.14 [Not Used]

D 3.15 **$L_{a,i,j,h,o}$ – MWh**

The actual metered Demand of Demand i in Zone j in Settlement Interval o during Settlement Period h .

D 3.15.1 [Not Used]

D 3.15.2 **[Not Used]**

D 3.16 **[Not Used]**

D 3.17 **[Not Used]**

D 3.17.1 **[Not Used]**

D 3.18 **[Not Used]**

D 3.19 **$I_{a,q,j,h,o}$ – MWh**
The total actual Energy import of Scheduling Coordinator g through
Scheduling Point q in Settlement Interval o during Settlement Period h.
This is deemed to be equal to the scheduled Energy over the same
interval.

D 3.20 **[Not Used]**

D 3.21 **[Not Used]**

D 3.22 **[Not Used]**

- D 3.23** **$E_{a,q,j,h,o}$ – MWh**
The total actual Energy export of Scheduling Coordinator g through Scheduling Point q in Settlement Interval o for Settlement Period h . This is deemed to be equal to the total scheduled Energy export during the same interval.
- D 3.24** **[Not Used]**
- D 3.25** **[Not Used]**
- D 3.25.1** **[Not Used]**
- D 3.26** **$UFEC_{jxt}$ – \$**
The Unaccounted for Energy Charge for Scheduling Coordinator j in Zone x in Settlement Period t . It is the cost for the Energy difference between the net Energy delivered into each utility Service Area, adjusted for utility Service Area Transmission Losses (calculated in accordance with ISO Tariff Section 7.4.2), and the total metered Demand within that utility Service Area adjusted for distribution losses using Distribution System loss factors approved by the Local Regulatory Authority.

This Energy difference (UFE) is attributed to meter measurement errors, power flow modeling errors, energy theft, statistical Load profile errors, and distribution loss deviations.
- D 3.27** **$UFE_{UDC,bkt}$ – MWh**
The Unaccounted for Energy (UFE) for utility Service Area k .
- D 3.28** **UFE – MWh**
The portion of Unaccounted for Energy (UFE) allocated to metering point z .
- D 3.29** **[Not Used]**

D 3.30	[Not Used]
D 3.31	[Not Used]
D 3.32	[Not Used]
D 3.33	[Not Used]
D 3.34	[Not Used]
D 3.35	[Not Used]
D 3.36	[Not Used]
D 3.37	TLs,h,o – MWh The Transmission Losses per Settlement Interval <i>o</i> in Settlement Period hour <i>h</i> in utility Service Area <i>s</i> .
D 3.38	[Not Used]
D 3.39	[Not Used]
D 3.40	[Not Used]

- D 3.41** [Not Used]
- D 3.42** [Not Used]
- D 3.43** [Not Used]
- D 3.44** [Not Used]
- D 3.45** [Not Used]
- D 3.46** [Not Used]
- D 3.47** [Not Used]
- D 3.48** [Not Used]
- D 3.49** **EX_POST_PRICE_{j,h,o,k} – \$/MWh**
The Ex-Post Price in Dispatch Interval *k* of Settlement Interval *o* in Settlement Period *h* in Zone *j*.
- D 3.50** **HRLY_EX_POST_PRICE_{j,h} – \$/MWh**
The energy-weighted Ex Post Price for Settlement Period *h* in Zone *j*.
- D 3.51** **STLMT_PRICE_{i,h,o} – \$/MWh**
The 10-minute Settlement price (Resource-Specific Settlement Interval Ex Post Price) for resource *i* in the Settlement Interval *o* for the Settlement Period *h*.
- D 3.52** **SE_{i,h,o} – MWh**
The Scheduled Energy from resource *i* during Settlement Interval *o* of Settlement Period *h*.
- D 3.53** **TOLERANCE_BAND_{i,h,o} – MWh**
The Tolerance Band limit for resource *i* during Settlement Interval *o* of Settlement Period *h*.
- D 3.54** **IIE_ECON_{i,h,o,k,m} – MWh**
The dispatched incremental or decremental Instructed Imbalance Energy (IIE) for resource *i* during Dispatch Interval *k* in Settlement Interval *o* of Settlement Period *h* for bid segment *m*.
Decremental Energy shall be represented as a negative quantity.
IIE_ECON_{i,h,o,k,m} shall be comprised of any of the four *IIE_TYPE*'s: SUPP, SPIN, NSPN or RPLC and be associated with its respective *IIE_PRICE_{i,h,o,k,m}*
- D 3.55** **IIE_PRICE_{i,h,o,k,m} – \$/MWh**
The bid price for energy bid segment *m* for resource *i* during Dispatch Interval *k* in Settlement Interval *o* of Settlement Period *h* for bid segment *m*
- D 3.56** **IIE_PREDISPATCH_{i,h,o,k,m} – MWh**
The Settlement Period pre-dispatched Energy for resource *i* during Dispatch Interval *k* of Settlement Interval *o* of Settlement Period *h* for bid segment *m* (MWh).

- D 3.57** **$RIE_{i,h,o,k,m}$ – MWh**
The Residual Energy for resource i during Dispatch Interval k in Settlement Interval o of Settlement Period h for bid segment m .
- D 3.58** **$RIE_PRICE_{i,h,o,k,m}$ – \$/MWh**
The reference bid price for the Residual Energy for resource i during Dispatch Interval k in Settlement Interval o of Settlement Period h for bid segment m .
- D 3.59** **$OOS_PRICE_{i,h,o,k,L}$ – \$/MWh**
The Settlement price for the Instructed Out of Stack Energy for resource i during Dispatch Interval k in Settlement Interval o of Settlement Period h for index number L .
- D 3.60** **$IIE_REG_{i,h,o}$ – MWh**
The Regulating Energy for resource i during Settlement Interval o in Settlement Period h .
- D 3.61** **$IIE_PREDISPATCH_{i,h,p}$ – MWh**
The Settlement Period pre-dispatched Energy for resource i during Dispatch Interval p of Settlement Period h .
- D 3.62** **$E_{i,h,o}$ – MWh**
Calculated as the difference of $IE_{i,h,o}$ and $IIE_TOTAL_{i,h,o,k}$ and is equal to the sum of Uninstructed Imbalance Energy and Regulating Energy of resource i during Settlement Interval o in Settlement Period h .
- D 3.63** **$IIEC_{i,h,o}$ – \$**
The Instructed Imbalance Energy payment (charge) for resource i during Settlement Interval o of Settlement Period h .
- D 3.64** **$IIEC_OOS_{i,h,o}$ – \$**
The total OOS Energy payment (charge) for resource i during Settlement Interval o of Settlement Period h .
- D 3.65** **$IIEC_OOS_P_{i,h,o}$ – \$**
The incremental Instructed OOS Imbalance Energy payment (charge) for resource i during Settlement Interval o of Settlement Period h .
- D 3.66** **$IIEC_OOS_N_{i,h,o}$ – \$**
The decremental Instructed OOS Imbalance Energy payment (charge) for resource i during Settlement Interval o of Settlement Period h .
- D 3.67** **$IIE_LOSS_{i,h,o,k}$ – MWh**
The transmission loss self-provided Energy from resource i during Dispatch Interval k in Settlement Interval o of Settlement Period h .
- D 3.68** **$IIE_ML_{i,h,o,k}$ – MWh**
The Imbalance Energy due to Minimum Load from resource i during Dispatch Interval k in Settlement Interval o of Settlement Period h .

- D 3.69** **IIE_TOTAL_{i,h,o,k} – MWh**
The total Instructed Imbalance Energy from all energy sources except Regulation for resource *i* during Dispatch Interval *k* in Settlement Interval *o* of Settlement Period *h*.
- D 3.70** **IIE_RERATE_{i,h,o,k} – MWh**
The SLIC derated Pmin or Pmax value as a result of an SC modifying its operating output level for a given resource *i* during Dispatch Interval *k* in Settlement Interval *o* of Settlement Period *h*.
- D 3.71** **UIE_{i,h,o} – MWh**
The total Uninstructed Imbalance Energy from resource *i* during Settlement Interval *o* of Settlement Period *h*.
- D 3.72** **UIE_1_{i,h,o} – MWh**
The Uninstructed Imbalance Energy attributed to non-compliance of *IIE_ECON* from resource *i* during Settlement Interval *o* of Settlement Period *h*.
- D 3.73** **UIE_2_{i,h,o} – MWh**
The Uninstructed Imbalance Energy exclusive of *UIE_1* from resource *i* during Settlement Interval *o* of Settlement Period *h*.
- D 3.74** **UIEC_{i,h,o} – \$**
The Uninstructed Imbalance Energy payment (charge) for resource *i* during Settlement Interval *o* of Settlement Period *h*.
- D 3.75** **ZONAL_EX_POST_PRICE_{j,h,o} – \$/MWh**
The energy weighted average Ex Post Price for Imbalance Energy for Zone *j* in Settlement Interval *o* for Settlement Period *h*.
- D 3.76** **ME_{i,h,o} – MWh**
The Metered Energy from resource *i* during Settlement Interval *o* of Settlement Period *h*.
- D 3.77** **RED_{i,h,o,k} – MWh**
The Ramping Energy Deviation from resource *i* during Dispatch Interval *k* in Settlement Interval *o* of Settlement Period *h*.
- D 3.78** **REDC_{i,h,o} – \$**
The Ramping Energy Deviation payment (charge) for resource *i* during Settlement Interval *o* of Settlement Period *h*.
- D 3.79** **MR_ML_{i,h,o} – \$**
The expected Real Time Market revenue from Minimum Load Energy for resource *i* in Settlement Interval *o* for Settlement Period *h*.
- D 3.80** **COST_RECOVERY_{i,d} – \$**
The Unrecovered Cost Payment for resource *i* for Trading Day *d*.

- D 3.81** **MR_DIFF_{i,h,o}**
is the market revenue surplus or deficit for resource *i* in Settlement Period *h* for Settlement Interval *o*.
- D 3.82** **MR_DEFICIT_{i,h,o} – \$**
The market revenue deficit for resource *i* in Settlement Period *h* for Settlement Interval *o*.
- D 3.83** **MR_SURPLUS_{i,h,o} – \$**
The market revenue surplus for resource *i* in Settlement Period *h* for Settlement Interval *o*.
- D 3.84** **PERF_STAT_{i,h,o} – True/False**
The performance status of resource *i* for Settlement Interval *o* of Settlement Period *h*. The performance status is equal to 1 (compliant) or 0 (non-compliant).
- D 3.85** **BID_COST_{i,h,o} – \$**
The bid costs for IIE, except OOS Energy and RIE, for resource *i* in Settlement Period *h* for Settlement interval *o*.
- D 3.86** **BID_COST_RIE_{i,h,o} – \$**
The bid costs for RIE for resource *i* in Settlement Period *h* for Settlement Interval *o*.
- D 3.87** **PREDISPATCH_PMT_{i,h,o} – \$**
The unrecovered bid cost payment for a Settlement Period pre-dispatched System Resource *i* in Settlement Interval *o* for Settlement Period *h*.
- D 3.88** **EXCESS_COST_{i,h,o} – \$**
The excess cost payment for resource *i* in Settlement Interval *o* for Settlement Period *h*.
- D 3.89** **TL_{i,h,o} – MWh**
The Transmission Loss Obligation for resource *i* during Settlement Interval *o* of Settlement Period *h*.
- D 3.90** **EXCESS_COST_ALLOC_{g,h,o} – \$**
The excess cost allocation for Scheduling Coordinator *g* in Settlement Period *h* for Settlement Interval *o*.
- D 3.91** **REAL_TIME_FLOW_{i,h,o,k,v} – MWh**
The real-time actual flow for intertie resource *i* during Dispatch Interval *k* during Settlement Interval *o* of Settlement Period *h* for Real Time Flow Type index *v*. Real Time Flow Type index *v* must be one of the following Energy types: FIRM NFIRM, SUPP, WHEEL, DYN, ESPN, ENSPN, OOM, ERPLC.
- D 3.92** **RE_STANDARD_{i,h,o,k} – MWh**

The Standard Ramping Energy from resource i during Dispatch Interval k of Settlement Interval o of Settlement Period h .

D 3.93 **OOS_P _{i,h,o,k,L} – MWh**

The incremental Out of Stack Energy for resource i during Dispatch Interval k in Settlement Interval o of Settlement Period h for index number L .

D 3.94 **OOS_N _{i,h,o,k,L} – MWh**

The decremental Out of Stack Energy for resource i during Dispatch Interval k in Settlement Interval o of Settlement Period h for index number L .

D 3.95 **URC_ALLOC _{g,h,o} – \$**

The unrecovered cost neutrality allocation for Scheduling Coordinator g in Settlement Interval o for Settlement Period h .

D 3.96 **IIE_TYPE _{i,h,o,k,m}**

is the energy type for $IIE_ECON_{i,h,o,k,m}$. Energy type is one of the following: Supplemental, Spin, Non-Spin or Replacement Reserve Energy.

UDP AGGREGATION PROTOCOL

UDP AGGREGATION PROTOCOL

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UAP 1 OBJECTIVE, DEFINITIONS, AND SCOPE

UAP 1.1 Objective

The UDP will be calculated and assessed for each resource individually, except that as specified in this Protocol, resources may be aggregated.

The objective of this protocol is to describe and standardize the process for reviewing and approving or denying aggregations used in calculating the UDP. It also describes the process for making changes to, temporarily restricting, or permanently suspending an existing UDP Aggregation.

UAP 1.2 Definitions

UAP 1.2.1 Master Definitions Supplement

Any word or expression defined in the Master Definition Supplement to the ISO Tariff shall have the same meaning where used in this Protocol. A reference to a Section or Appendix is to a Section or an Appendix of the ISO Tariff. References to UAP are to this Protocol or to the stated paragraph of this Protocol.

UAP 1.2.2 Special Definitions for this Protocol

In this Protocol, the following words and expressions shall have the following meanings:

“UDP” shall mean the penalty established in Section 11.2.4.1 of the ISO Tariff.

“UDP Aggregation” shall mean two or more units scheduled by the same Scheduling Coordinator with the same resource identification that are to be considered interchangeable for calculating the UDP.

“Uninstructed Deviation” shall mean a deviation from the resources’ Dispatch Operating Point.

UAP 1.3 Scope

There are two types of UDP Aggregation Classifications:

- (1) Basic UDP Aggregations: composed of Generating Units connected at the same substation and stepping up to the same voltage level bus bar, or
- (2) Custom UDP Aggregations: composed of Generating Units connected at different substations and/or different voltage levels, particularly where the Generating Units to be aggregated are separated by ISO Controlled Grid facilities. Examples of a proposed Custom UDP Aggregation include

hydroelectric units operating on a common watershed (but having multiple different interconnection points), or geothermal units fed from a common geothermal steam supply.

UAP 2 SUBMITTAL OF A REQUEST FOR UDP AGGREGATION

Requests for UDP Aggregation are submitted to the ISO and must include the following documentation:

- (1) A completed UDP Aggregation Request form, which is available for downloading on the ISO website;
- (2) A simplified electrical one-line diagram, which illustrates each resource, the connection of the resources to each other and to the ISO Control Area Grid;
- (3) For Custom UDP Aggregations, a detailed description that explains physical operating interrelationships between the units, or, if there are no interrelationships, how the units are compatible and why an aggregation of these units for the purpose of calculating Uninstructed Deviation Penalties is reasonable.

UAP 3 ISO REVIEW OF A UDP AGGREGATION REQUEST

Upon receipt of a completed request form and accompanying attachments, the ISO shall review the request according to the criteria outlined herein. For Basic UDP Aggregations, the ISO shall undertake its best efforts to review and approve or reject it within three weeks of receipt. Review of a request for a Custom UDP Aggregation may take longer in some cases, depending on the complexity of the proposed aggregation. If the ISO anticipates that it will take more than three weeks to process a request, the ISO shall inform the entity requesting the UDP Aggregation of the estimated processing time for the request.

UAP 3.1 Criteria for Reviewing a Request

UAP 3.1.1 Scheduling Coordinator and Interconnection Point

Uninstructed Deviations may be aggregated for resources that are:

- (1) Represented by the same Scheduling Coordinator and
- (2) Connected to the same ISO Controlled Grid bus and voltage level.

The ISO will consider, on a case-by-case basis, requests to aggregate Uninstructed Deviations among resources represented by the same Scheduling Coordinator but not sharing a common ISO Controlled Grid bus and voltage level. In particular, the ISO will consider whether the request concerns resources

related by a common flow of fuel which cannot be interrupted without a substantial loss of efficiency of the combined output of all components; whether the Energy production from one resource necessarily causes Energy production from other resource(s); and whether the operational arrangement of resources determines the overall physical efficiency of the combined output of all of the resources.

UAP 3.1.2 Additional Criteria

Additional eligibility criteria for a UDP Aggregation are as follows:

(1) Only Generating Units shall be eligible for UDP Aggregation. As a general rule, pump-generating Units (or a Physical Scheduling Plant [PSP] containing a pump-generating Unit) cannot be part of a UDP Aggregation. However, it is possible that generating Units could form a UDP Aggregation comprised entirely of pump-generating Units whose operation is uniform, that is, Units all operating in either Generation mode or all in pump mode, but never mixed.

(2) UDP Aggregations cannot include any of the following:

- (a) Load;
- (b) Condition 2 Reliability Must Run (RMR) Units;
- (c) Participating Intermittent Resources;
- (d) Generating Units less than 5 MW; or
- (e) Generating Units that span active or inactive Congestion Zones.

(3) The resources must have ISO direct telemetry and must be fully compliant with the ISO's direct telemetry standards.

(4) The Generating Units must exhibit the same effectiveness factors (factors within +/-10%) for managing inter- and -intra-zonal Constraints, under "normal/all elements in service" conditions, as well as during most local transmission outages.

(5) Custom UDP Aggregations involving units not directly connecting to the ISO Controlled Grid must recognize the transfer limits and status of the intermediate local facilities.

UAP 3.1.3 Approval of a Request

If a UDP Aggregation request is approved, the ISO shall create a new unique Resource ID, which reflects the identity or location of the units and stipulates the UDP Aggregation, but which cannot be used for scheduling purposes. The ISO shall inform the Scheduling Coordinator of the approval and ask the Scheduling Coordinator to confirm the desired start date of the UDP Aggregation. When that

confirmation has been received, the new aggregation will be entered into the ISO systems. Unless otherwise agreed to by the Scheduling Coordinator and the ISO, the UDP Aggregation will become effective on the first day of the month following approval. The Units in an approved UDP Aggregation are obligated to follow their individual schedules and instructions at all times.

UAP 3.1.4 Rejection of a Request

If the ISO determines that the proposed UDP Aggregation is likely to impact grid reliability or the reliability of transmission systems or equipment of intermediate entities between the relevant resources and the ISO grid, the request will be rejected. If the ISO rejects a request, the ISO shall inform the Scheduling Coordinator, and forward to it the reason for the rejection. The ISO may suggest alternative solutions if it has adequate time and data. The Scheduling Coordinator may choose to resubmit based on the ISO's recommendations, or to close the request.

UAP 4 MODIFICATIONS TO AN EXISTING UDP AGGREGATION

UAP.4.1 Temporary Restriction by the ISO

An approved UDP Aggregation shall be considered active until otherwise requested by the Scheduling Coordinator. However, the ISO may temporarily restrict the schedules of aggregated Units based upon changes in system conditions, operating constraints, and other relevant factors as needed to ensure ISO Controlled Grid reliability.

UAP 4.2 Permanent Suspension by the ISO

The ISO may permanently suspend previously approved UDP Aggregations based upon permanent or long-term changes in the ISO grid or other relevant factors that alter the effect of the UDP Aggregation upon the ISO Controlled Grid and/or transmission systems or equipment of intermediate entities.

The ISO shall write a report that explains the reason for the suspension and that specifies the effective date and time. The ISO will forward the report to the Scheduling Coordinator and take steps to have the aggregation removed from the ISO systems.

In the event that a resource in a UDP Aggregation changes from one Scheduling Coordinator to another, the UDP Aggregation will be suspended. In order to reinstate the aggregation, the new Scheduling Coordinator must submit a new request reflecting the change.

UAP 4.3 Request for Modification by a Scheduling Coordinator

A Scheduling Coordinator may request a modification to an existing aggregation up to once per calendar month. A request for modification will follow the same procedures as a new request.