

#### 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  $Cap_{ijt}max \leq Period_{minutes} * Ramp_{ijt}$   $Period_{minutes}$  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;
- (h) the bid price of the capacity reservation, stated separately for Regulation Up and Regulation Down ( $CapRes_{ijt}$  (\$/MW));
- (i) the bid price of the Energy output from the reserved capacity ( $EnBid_{ijt}$ (\$/MWh));

**Bid Evaluation.** Based on the quantity and location of the system requirements, the ISO shall select Generating Units and System Units with the bids, which minimize the sum of the total bids of the Generating Units and System Units 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 or System Unit's bid capacity must be less than or equal to that Generating Unit's or System Units ramp rate times  $Period_{minutes}$

The total bid for each Generating Unit or System Unit 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

$$\sum_{i,j} \text{Cap}_{ijt} \geq \text{Requirement}_t \text{ and } \text{Cap}_{ijt} \leq \text{Cap}_{ijtmax}$$

Where

$$\text{TotalBid}_{ijt} = \text{CapRes}_{ijt} * \text{Cap}_{ijt}$$

$\text{Requirement}_t$  = Amount of upward and downward movement capacity required

**Price Determination.** The price payable to Scheduling Coordinators for Regulation Capacity made available for upward and downward movement in accordance with the ISO's [Final Day Ahead Schedules](#) shall, for each Generating Unit and System Unit concerned, be the zonal market clearing price as follows:

$$\text{PAGC}_x = \text{MCP}_{xt}$$

Where:

The zonal market clearing ( $\text{MCP}_{xt}$ ) price is the highest priced winning Regulation Capacity bid in Zone X based on the capacity reservation bid price i.e.

$$\text{MCP}_{xt} = \text{Max} (\text{CapRes}_{ijt}) \text{ in zone } x \text{ for Settlement Period } t$$

The ISO's auction does not compensate the Scheduling Coordinator for the minimum Energy output of Generating Units or System Units bidding to provide Regulation. Therefore, disposition of any minimum Energy associated with Regulation selected in the ISO's Ancillary Services markets is the responsibility of the Scheduling Coordinator selling the Regulation.

[The price payable to Scheduling Coordinators for Regulation 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 Regulation Capacity reserved \( \$\text{CapRes}\_{ijt}\$  \(\\$/MW\)\).](#)

### 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));
- (i) bid price of Energy output from reserved capacity ( $EnBid_{ijt}$  (\$/MWh)).

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));
- (f) bid price of Energy output from reserved capacity ( $EnBid_{ijt}$  (\$/MWh)).

**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 total bid for each Generating Unit, System Unit or external import of a System Resource is calculated by multiplying the capacity reservation bid price by the bid capacity.

Thus, subject to any locational requirements, the ISO will select the winning Spinning Reserve bids in accordance with the following criteria:

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

Subject to

$$\sum_{i,j} \text{Cap}_{ijt} \geq \text{Requirement}_t$$

$$\text{Cap}_{ijt} \leq \text{Cap}_{ijt} \text{max}$$

Where

$$\text{TotalBid}_{ijt} = \text{Cap}_{ijt} * \text{CapRes}_{ijt}$$

$\text{Requirement}_t$  = the amount of Spinning Reserve capacity required

**Price Determination.** The price payable to Scheduling Coordinators for Spinning Reserve Capacity made available in accordance with the ISO's Final Day Ahead Schedules Ancillary Services schedules shall, for each Generating Unit or external import of a System Resource concerned be the zonal market clearing price for Spinning Reserve calculated as follows:

$$P_{sp_{xt}} = MCP_{xt}$$

Where the zonal market clearing price ( $MCP_{xt}$ ) for Spinning Reserve is the highest priced winning Spinning Reserve capacity bid in Zone X based on the capacity reservation bid price, i.e.:

$$MCP_{xt} = \text{Max}(CapRes_{ijt}) \text{ in zone } x \text{ for Settlement Period } t$$

The ISO's auction does not compensate a Scheduling Coordinator for the minimum Energy output of Generating Units, System Units or System resources bidding to provide Spinning Reserve. Therefore, any minimum Energy output associated with Spinning Reserve selected in the ISO's auction is the responsibility of the Scheduling Coordinator selling the Spinning Reserve.

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 ( $Cap_{ijt}max$ );
- (h) the bid price of the capacity reserved ( $CapRes_{ijt}(\$/MW)$ );
- (i) time to synchronization following notification (min);
- (j) the bid price of the Energy output from the reserved capacity ( $EnBid_{ijt}(\$/MWh)$ ).

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 ( $Cap_{ijt}max$ ) 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) the bid price of Energy output from reserved capacity ( $EnBid_{ijt}(\$/MWh)$ ).

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) the Demand reduction available within 10 minutes ( $Cap_{ijt}max$ );
- (e) time to interruption following notification (min);
- (f) maximum allowable curtailment duration (hr);
- (g) the bid price of the capacity reserved ( $CapRes_{ijt}(\$/MW)$ );
- (h) the bid price for Demand reduction from the reserved capacity ( $EnBid_{ijt}(\$/MWh)$ ).

**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.

Thus subject to any locational requirements, the ISO will accept the winning Non-Spinning Reserve bids in accordance with the following criteria:

$$\text{Min} \sum_{i,j} Totalbid_{ijt}$$

Subject to

$$\sum_{i,j} Cap_{ijt} \geq Requirement_t$$

$$Cap_{ijt} \leq Cap_{ijt}max$$

Where

$$TotalBid_{ijt} = Cap_{ijt} * CapRes_{ijt}$$

Requirement<sub>t</sub> = the amount of Non-Spinning Reserve capacity required

**Price Determination.** The price payable to Scheduling Coordinators for Non-Spinning Reserve

Capacity made available in accordance with the ISO's Final Day-Ahead Ancillary Services schedules shall for each Generating Unit, System Unit, Load or external import of a System Resource concerned be the zonal market clearing price for Non-Spinning Reserve calculated as follows:

$$P_{nonsp_{xt}} = MCP_{xt}$$

Where the zonal market clearing price ( $MCP_{xt}$ ) for Non-Spinning Reserve is the highest priced winning Non-Spinning Reserve bid in Zone X based on the capacity reservation bid price,

i.e.:

$$MCP_{xt} = Max(CapRes_{ijt}) \text{ in zone } x \text{ for Settlement Period } t$$

The price payable to Scheduling Coordinators for Non-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 Non-Spinning Capacity reserved ( $CapRes_{ijt}$  (\$/MW)).



### 2.5.17 The Replacement Reserve Auction

**Bid Information.** If the bid is for the provision of Replacement 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 capacity available within 60 minutes ( $Cap_{ijt}max$ );
- (h) the bid price of the capacity reserved ( $CapRes_{ijt} (\$/MW)$ );
- (i) time to synchronize following notification (min);
- (j) the bid price of the Energy output from the reserved capacity ( $EnBid_{ijt} (\$/MWh)$ ).

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 ( $Cap_{ijt}max$ ) 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) bid price of Energy output from reserved capacity ( $EnBid_{ijt} (\$/MWh)$ ).

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);
- (g) the bid price of the capacity reserved ( $CapRes_{ijt}$  (\$/MW));
- (h) the bid price of the Demand reduction from the reserved capacity ( $EnBid_{ijt}$  (\$/MWh)).

**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
- (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 60 minutes and the time to synchronize in the case of Generating Unit or System Unit, or to interruption in the case of Load.

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

Thus, subject to any locational requirements, the ISO will select the winning Replacement Reserve bids in accordance with the following criteria:

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

Subject to

$$\sum_{i,j} \text{Cap}_{ijt} \geq \text{Requirement}_t$$

$$\text{Cap}_{ijt} \leq \text{Cap}_{ijt} \text{max}$$

Where

$$\text{TotalBid}_{ijt} = \text{Cap}_{ijt} * \text{CapRes}_{ijt}$$

$\text{Requirement}_t$  = the amount of Replacement Reserve capacity

**Price Determination.** The price payable to Scheduling Coordinators for Replacement Reserve

Capacity made available in accordance with the ISO's Final Day-Ahead Schedules Ancillary Services schedules shall, for each Generating Unit, System Unit, Load or external import of a System Resource, be the zonal market clearing price for Replacement Reserve calculated as follows:

$$P_{\text{RepRes}_{xt}} = MCP_{xt}$$

Where the zonal market clearing price ( $MCP_{xt}$ ) for Replacement Reserve is the highest priced winning Replacement Reserve bid in Zone X based on the capacity reservation bid price,

i.e.:

$$MCP_{xt} = \text{Max}(\text{CapRes}_{ijt}) \text{ in zone } x \text{ for Settlement Period } t.$$

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

## SABP APPENDIX C

### C 3.3            **PAGCUpDA<sub>xt</sub> - \$/MW**

In the case of Capacity made available in accordance with the ISO's Final Day-Ahead Schedules, the Day-Ahead Market Clearing Price for units exempt from FERC Ancillary Service rate caps or the bid price for those Units subject to the cap for Regulation Up Capacity in the Day-Ahead Market for Trading Interval t in Zone x. In the case of 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, the bid price for the unit for Regulation Capacity in Zone x for Trading Interval t.

### C 3.21            **PSpinDA<sub>xt</sub> - \$/MW**

In the case of Capacity made available in accordance with the ISO's Final Day-Ahead Schedules, the Day-Ahead Market Clearing Price for units exempt from FERC Ancillary Service rate caps or the bid price for those units subject to the cap for Spinning Reserve Capacity in Zone x for Trading Interval t. In the case of 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, the bid price for the unit for Spinning Reserve Capacity in Zone x for Trading Interval t.

### C 3.35            **PNonSpinDA<sub>xt</sub> - \$/MW**

In the case of Capacity made available in accordance with the ISO's Final Day-Ahead Schedules, the Day-Ahead Market Clearing Price for units exempt from FERC Ancillary Service rate caps or the bid price for those units subject to the cap for Non-Spinning Reserve capacity for Trading Interval t in Zone x. In the case of 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, the bid price for the unit for Non-Spinning Reserve Capacity in Zone x for Trading Interval t.

### C 3.50            **PRepIDA<sub>xt</sub> - \$/MW**

In the case of Capacity made available in accordance with the ISO's Final Day-Ahead Schedules, the Day-Ahead Market Clearing Price for units exempt from FERC Ancillary Service rate caps or the bid price for those units not subject to the cap for Replacement Reserve capacity in Zone x for Trading Interval t. In the case of 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, the bid price for the unit for Replacement Reserve Capacity in Zone x for Trading Interval t.