

**18      Attachment C -Formulas For Determining Bid Production Cost Guarantee Payments**

## 18.1 Supplemental Payments to Generators and Demand Resources

Three supplemental payments for Generators are described in this attachment: (i) Day-Ahead Bid Production Cost guarantees; (ii) Real-time Bid Production guarantees for all intervals except maximum generation pickups and large event reserve pickups; and (iii) Real-time Bid Production Cost guarantees for maximum generation pickups and large event reserve pickups. Generators shall be eligible for these payments under the circumstances described in Article 4 and Rate Schedule 15.4 of this ISO Services Tariff.

Demand Side Resources that are committed to provide non-synchronized Operating Reserves shall be treated the same as Generators with respect to the determination of supplemental payments. Demand Reduction Providers that provide Demand Reductions in the Day-Ahead Market shall be eligible for supplemental payments under Section 18.2, but not this Section 18.1. Demand Side Resources committed in the Day-Ahead market to provide synchronized Operating Reserves shall be eligible for supplemental payments under Section 18.4.1. Demand Side Resources committed in the real-time market to provide synchronized Operating Reserves or Regulation Service shall be eligible for supplemental payments under Section 18.4.2.

### 18.1.1 Day-Ahead Bid Production Cost Guarantee Formulas

Day-Ahead Bid Production Cost Guarantee =

$$\sum_{g \in G} \max \left[ \sum_{h=1}^{24} \left( \begin{aligned} & \frac{EH_{gh}^{DA}}{MGH_{gh}^{DA}} + MGC_{gh}^{DA} MGH_{gh}^{DA} + SUC_{gh}^{DA} NSUH_{gh}^{DA} \\ & - LBM P_{gh}^{DA} EH_{gh}^{DA} - NASR_{gh}^{DA} \end{aligned} \right), 0 \right]$$

Where:

$G$	=	set of Generators;
$EH_{gh}^{DA}$	=	Energy scheduled Day-Ahead to be produced by Generator $g$ in hour $h$ expressed in terms of MW;
$MGH_{gh}^{DA}$	=	Energy scheduled Day-Ahead to be produced by the minimum generation segment of Generator $g$ in hour $h$ expressed in terms of MW;
$C_{gh}^{DA}$	=	Bid cost submitted by Generator $g$ , or when applicable the mitigated Bid cost curve for Generator $g$ , in the Day-Ahead Market for hour $h$ expressed in terms of \$/MWh;
$MGC_{gh}^{DA}$	=	Minimum Generation Bid by Generator $g$ , or when applicable the mitigated Minimum Generation Bid for Generator $g$ , for hour $h$ in the Day-Ahead Market, expressed in terms of \$/MW;
$SUC_{gh}^{DA}$	=	Start-Up Bid by Generator $g$ , or when applicable the mitigated Start-Up Bid for Generator $g$ , in hour $h$ into the Day-Ahead Market expressed in terms of \$/start;
$NSUH_{gh}^{DA}$	=	number of times Generator $g$ is scheduled Day-Ahead to start up in hour $h$ ;
$LBMP_{gh}^{DA}$	=	Day-Ahead LBMP at Generator $g$ 's bus in hour $h$ expressed in \$/MWh;
$NASR_{gh}^{DA}$	=	Net Ancillary Services revenue, expressed in terms of \$, paid to Generator $g$ as a result of having been committed to produce Energy for the LBMP Market and/or Ancillary Services Day- Ahead to operate in hour $h$ is computed by summing the following: (1) Voltage Support Service payments received by that Generator for that hour, if it is not a Supplier of Installed Capacity and has been scheduled to operate in that hour; (2) Regulation Service payments made to that Generator for all Regulation Service it is scheduled Day-Ahead to provide in that hour, less that Generator's Day-Ahead Bid to provide that amount of Regulation Service in that hour (unless the Bid exceeds the payments that Generator receives for providing Regulation Service that was committed to produce Energy for the LBMP Market and/or Ancillary Services Day-Ahead, in which case this component shall be zero); and (3) payments made to that Generator for providing Spinning Reserve and synchronized 30-Minute Reserve in that hour if it is committed Day-Ahead to provide such reserves in that hour, less that Generator's Day-Ahead Bid to provide Spinning Reserve and synchronized 30-Minute Reserve in that hour.

### 18.1.2 Real-Time Bid Production Guarantee Formulas for All Imports and Real-Time Bid Production Guarantee Formulas for All Intervals With No Maximum Generation Pickups or Large Event Reserve Pickups for All Other Generators

Real-Time Bid Production Cost Guarantee =

$$\sum_{g \in G} \max \left\{ \sum_{i=1}^N \left( \left( \frac{EI_{gi}^{RT} + MGC_{gi}^{RT} (MGI_{gi}^{RT} - MGI_{gi}^{DA})}{EI_{gi}^{DA}} \right) * \frac{S_i}{3600} - LBMP_{gi}^{RT} (EI_{gi}^{RT} - EI_{gi}^{DA}) \right) + \sum_{j=1}^L (SUC_{gj}^{RT} (NSUI_{gj}^{RT} - NSUI_{gj}^{DA})) \right\}, 0$$

$$- (NASR_{gi}^{TOT} - NASR_{gi}^{DA}) - RRAP_{gi} + RRAC_{gi}$$

where:

$S_i$  = number of seconds in RTD interval i;

$C_{gi}^{RT}$  = Bid cost submitted by Generator g, or when applicable the mitigated Bid cost for Generator g, in the RTD for the hour that includes RTD interval i expressed in terms of \$/MWh, except in hours in which the NYISO has increased Generator g's minimum operating level, either (i) at the Generator's request, or (ii) in order to reconcile the ISO's dispatch with the Generator's actual output or to address reliability concerns that arise because the Generator is not following Base Point Signals, in which case  $C_{gi}^{RT}$  shall be deemed to be zero;

$MGI_{gi}^{RT}$  = metered Energy produced by minimum generation segment of Generator g in RTD interval i expressed in terms of MW;

$MGI_{gi}^{DA}$  = Energy scheduled Day-Ahead to be produced by minimum generation segment of Generator g in RTD interval i expressed in terms of MW;

$MGC_{gi}^{RT}$  = Minimum Generation Bid by Generator g, or when applicable the mitigated Minimum Generation Bid for Generator g, in the Real-Time Market for the hour that includes RTD interval i, expressed in terms of \$/MW;

$SUC_{gj}^{RT}$  = Start-Up Bid by Generator g, or when applicable the mitigated Start-Up Bid for Generator g, for the hour that includes interval j into RTD expressed in terms of \$/start, except that  $SUC_{gj}^{RT}$  shall be deemed to be zero in the cases of (i) Self-Committed Fixed and Self-Committed Flexible Generators, (ii) Generators that are economically committed by RTC or

RTD that have 10-minute start-up times that are not synchronized and producing Energy within 20 minutes after their scheduled start time, and (iii) Generators that are economically committed by RTC that have greater than 10-minute start-up times that are not synchronized and producing Energy within 45 minutes after their scheduled start time. Rules addressing the handling of Start-Up Bids submitted by Generators that are committed via SRE under particular factual circumstances are set forth below;

$NSUI_{gj}^{RT}$	=	number of times Generator g started up in the hour that includes RTD interval j;
$NSUI_{gj}^{DA}$	=	number of times Generator g is scheduled Day-Ahead to start up in the hour that includes RTD interval j;
$LBMP_{gi}^{RT}$	=	Real-Time LBMP at Generator g's bus in RTD interval i expressed in terms of \$/MWh;
N	=	except for imports, the number of eligible RTD intervals in the day excluding intervals in which there are any maximum generation pickups or large event reserve pickups and the three RTD intervals following the termination of the large event reserve pickup or maximum generation pickup (which are addressed separately in subsection 18.1.3 below) and excluding any RTD intervals where $EI_{gi}^{RT}$ is less than or equal to $EI_{gi}^{DA}$ ; <i>provided, however</i> , for imports, the variable N is the number of eligible RTD intervals in the day excluding any RTD intervals where $EI_{gi}^{RT}$ is less than or equal to $EI_{gi}^{DA}$ ;
L	=	all intervals in the day
$EI_{gi}^{RT}$	=	if $EOP_{ig} > AEI_{ig}$ then $\min(\max(AEI_{ig}, RTSen_{ig}), EOP_{ig})$ and $\max(\min(AEI_{ig}, RTSen_{ig}), EOP_{ig})$ otherwise
$EI_{gi}^{DA}$	=	Energy scheduled in the Day-Ahead Market to be produced by Generator g in the hour that includes RTD interval i expressed in terms of MW.
$RTSen_{ig}$	=	Real-time Energy scheduled for Generator g in interval i, and calculated as the arithmetic average of the 6-second AGC Base Point Signals sent to Generator g during the course of interval i expressed in terms of MW;
$AEI_{ig}$	=	average Actual Energy Injection by Generator g in interval i but not more than $RTSen_{ig}$ plus any Compensable Overgeneration expressed in terms of MW;
$EOP_{ig}$	=	the Economic Operating Point of Generator g in interval i expressed in terms of MW;

- $NASR_{gi}^{TOT}$  = Net Ancillary Services scheduled revenue paid to Generator g as a result of either having been committed Day-Ahead to operate in hour that includes RTD interval i or having operated in interval i is computed by summing the following: (1) Voltage Support Service payments received by that Generator for that RTD interval, if it is not a Supplier of Installed Capacity; (2) Regulation Service payments that would be made to that Generator for that hour based on a Performance Index of 1, less the Bid(s) placed by that Generator to provide Regulation Service in that hour at the time it was committed to produce Energy for the LBMP Market and/or Ancillary Services to do so (unless the Bid(s) exceeds the payments that Generator receives for providing Regulation Service, in which case this component shall be zero); (3) payments made to that Generator for providing Spinning Reserve or synchronized 30-Minute Reserve in that hour, less the Bid placed by that Generator to provide such reserves in that hour at the time it was scheduled to do so; and (4) Lost Opportunity Cost payments made to that Generator in that hour as a result of reducing that Generator's output in order for it to provide Voltage Support Service.
- $NASR_{gi}^{DA}$  = The proportion of the Day-Ahead net Ancillary Services revenue that is applicable to interval i calculated by multiplying the  $NASR_{gh}^{DA}$  for the hour that includes interval i by  $s_i/3600$ .
- $RRAP_{gi}$  = Regulation Revenue Adjustment Payment for Generator g in RTD interval i expressed in terms of \$.
- $RRAC_{gi}$  = Regulation Revenue Adjustment Charge for Generator g in RTD interval i expressed in terms of \$.

Time periods including reserve pickups, and time periods following a reserve pickup in which the dispatch of a given Generator is constrained by its downward ramp rate, will not be included in the above calculation of supplemental payments for that Generator.

If a Generator has been committed via SRE and its SRE schedule immediately precedes or follows a real-time commitment that did not result from a Day-Ahead commitment, the Generator's Start-Up Bid included in its daily real-time Bid Production Cost guarantee calculation for this contiguous real-time commitment period shall be the Start-Up Bid submitted in response to the SRE request (subject to mitigation, where appropriate). If a Generator has been committed via SRE and its SRE schedule immediately precedes or follows a real-time schedule that resulted from a Day-Ahead commitment, then the Generator's Start-Up Bid

included in its daily real-time Bid Production Cost guarantee calculation for this contiguous real-time commitment period shall be set to zero.

Supplemental payments to Generators that trip before completing their minimum run-time (for Generators that were not scheduled to run Day-Ahead) or before running for the number of hours they were scheduled to operate (for Generators scheduled to run Day-Ahead) may be reduced by the ISO, per ISO Procedures.

In the event that the ISO re-institutes penalties for poor Regulation Service performance under Section 15.3.8 of Rate Schedule 3 such penalties will not be taken into account when calculating supplemental payments under this Attachment C.

### 18.1.3 Real-Time Bid Production Cost Guarantees for Intervals With Maximum Generation Pickups or Large Event Reserve Pickups

Real-Time Bid Production Cost Guarantee Payment =

$$\sum_{g \in G} \left[ \sum_{i=1}^M \max \left( \begin{aligned} & \left( \frac{EI_{gi}^{RT}}{EI_{gi}^{DA}} \int C_{gi}^{RT} + MGC_{gi}^{RT} (MGI_{gi}^{RT} - MGI_{gi}^{DA}) \right) * \frac{S_i}{3600} \\ & - LBMP_{gi}^{RT} (EI_{gi}^{RT} - EI_{gi}^{DA}) \end{aligned} \right), 0 \right] \\ - \left( NASR_{gi}^{TOT} - NASR_{gi}^{DA} \right) - RRAP_{gi} + RRAC_{gi}$$

where:

M = number of intervals in which there are maximum generation pickups or large event reserve pickups in the 24-hour day and the three RTD intervals following the termination of the large event reserve pickup or maximum generation pickup, but excluding any intervals in which there are maximum generation pickups or large event reserve pickups where  $EI_{gi}^{RT}$  is less than or equal to  $EI_{gi}^{DA}$ ;

The definition of all other variables is identical to those defined in Section 18.1.2 above.

## **18.2 Supplemental Payments for Curtailment Initiation Costs**

A supplemental payment for Curtailment Initiation Costs shall be made when the Curtailment Initiation Cost Bid and the Demand Reduction Bid price offered by a Demand Reduction Provider for any Demand Reduction committed by the ISO in the Day-Ahead market over the [twenty-four (24) hour] day exceeds Day-Ahead LBMP revenue, provided however that Supplemental payments made to Demand Reduction Providers that fail to complete their scheduled reductions may be reduced by the ISO, pursuant to ISO Procedures.



### **18.3 Supplemental Payments for Special Case Resources**

A supplemental payment for Minimum Payment Nominations shall be made when the Minimum Payment Nomination for any Special Case Resource committed by the ISO exceeds the LBMP revenue received for performance by that Special Case Resource provided, however, that the ISO shall set to zero the Minimum Payment Nomination for Special Case Resource Capacity in each interval in which such capacity was scheduled Day-Ahead to provide Operating Reserves, Regulation Service or Energy.

#### **18.4 Supplemental Payments for Demand Side Resources providing Synchronized Operating Reserves**

- A. A supplemental payment to a Demand Side Resource with a synchronized Operating Reserves or Regulation Service schedule in the Day-Ahead Market shall be calculated by setting to zero all terms provided in Section 18.1.1 of this Attachment C, with which Day-Ahead supplemental payments are calculated, with the exception of the term  $NASR_{gh}^{DA}$  which shall be calculated pursuant to its description.
- B. A supplemental payment to a Demand Side Resource with a synchronized Operating Reserves schedule in the real-time Market shall be calculated by setting to zero all terms provided in Section 18.1.2 of this Attachment C, with which real-time supplemental payments are calculated, with the exception of the terms  $NASR_{gi}^{DA}$  and  $NASR_{gi}^{TOT}$ , which shall be calculated pursuant to their descriptions.

Generators with start-up times of greater than twenty-four (24) hours will have their start-up cost Bids equally prorated over the course of each day included in their start-up period. Consequently, units whose start-ups are aborted will receive a prorated portion of those payments, based on the portion of the start-up sequence they have completed (e.g., if a unit with a seventy-two (72) hour start-up time has its start-up sequence aborted after forty-eight (48) hours, it would receive two-thirds (2/3) of its start-up cost Bid).