RT BPCG General Description

Other than to add RRA to the revenue stream, the equation for real-time BPCG in RTS has not changed. However, the definition of several of the terms has changed. This FRS will detail those changes.

The equation defining the real-time BPCG calculation is as follows:

Real-time BPCG =

$$\sum_{g \in G} Max \left\{ \sum_{i=1}^{N} \left[\left(\int_{EI_{gi}^{DA}}^{EI_{gi}^{RT}} C_{gi}^{RT} + MGC_{gi}^{RT} \times \left(MGI_{gi}^{RT} - MGI_{gi}^{DA} \right) + SUC_{gi}^{RT} \times \left(NSUI_{gi}^{RT} - NSUI_{gi}^{DA} \right) - LBMP_{gi}^{RT} \times \left(EI_{gi}^{RT} - EI_{gi}^{DA} \right) \right) \times {s_i}/{3600} \right. \right.$$
$$\left. \left. - \left(NASR_{gi}^{TOT} - NASR_{gi}^{DA} \right) - RRA_{gi} \right] , 0 \right\}$$

where:

s_i = number of seconds in interval i;

G = set of Generators;

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;

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 $/MWh;

SUC_{gi}^{RT} = Start-Up Bid by Generator g (which shall be deemed to be zero in the case of SC-Fixed and SC-Flexible Generators), or when applicable the mitigated Start-Up Bid for Generator g, for the hour that includes RTD interval i expressed in terms of $/MWh;

$NSUI_{gi}^{RT}$ = number of times Generator g started up in the hour that includes RTD interval i;

$NSUI_{gi}^{DA}$ = number of times Generator g is scheduled Day-Ahead to start up in hour that includes RTD interval i;

$LBMP_{gi}^{RT}$ = real-time LBMP at Generator g's bus in RTD interval i expressed in terms of $/MWh;

N = number of eligible RTD intervals in 24-hour day excluding any maximum generation pickups or large event reserve pickups and excluding any RTD intervals where $EI_{gi}^{RT} < EI_{gi}^{DA}$;

$RTSen_{ig}$ = 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 express in terms of MW;

EOP_{ig} = the EOP of Generator g in interval i expressed in terms of MW;

EI_{gi}^{RT} = if $EOP_{ig} > AEI_{ig}$ then $Min\left(Max\left(AEI_{ig}, RTSen_{ig}\right), EOP_{ig}\right)$ and $Max\left(Min\left(AEI_{ig}, RTSen_{ig}\right), EOP_{ig}\right)$ otherwise;

EI_{gi}^{DA} = Energy scheduled in the DAM to be produced by Generator g in the hour that includes RTD interval i expressed in terms of MW;

$NASR_{gi}^{TOT}$ = Net Ancillary Services scheduled paid to Generator g as a result of either having been committed Day-Ahead 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 Bids(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(s0 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;
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 $NASR_{gi}^{DA}$ for the hour that includes interval i by $s_i\big/3600$.

RRA_{gi} = Regulation Revenue Adjustment for Generator g in RTD interval i expressed in terns of \$.