ATTACHMENT C

FORMULAS FOR DETERMINING ~~MINIMUM GENERATION AND START-UPAND CURTAILMENT INITIATION COST~~BID PRODUCTION COST GUARANTEE PAYMENTS

I. Supplemental Payments to Generators

~~Minimum Generation and Start Up Payment =~~

Three supplemental payments for Generators are described in this attachment: (i) Day-Ahead ~~Minimum Generation and Start-Up Payment +~~Bid Production Cost guarantee; (ii) Real-~~Time Market Minimum Generation~~time Bid Production guarantee 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 ~~Start-Up Payment;~~large event reserve pickups. Generators shall be eligible for these payments under the circumstances described in Article 4 and Rate Schedule 4 of this ISO Services Tariff.

A. Day-Ahead ~~Minimum Generation and Start-Up Payment =~~Bid Production Cost Guarantee Formulas

Day-Ahead Bid Production Cost Guarantee =

$$\sum_{g\in G} \max\left[\sum_{h=1}^{24}\left(\begin{array}{l}\int_{MGH_{gh}^{DA}}^{EH_{gh}^{DA}} C_{gh}^{DA} + MGC_{gh}^{DA}\, MGH_{gh}^{DA} + SUC_{gh}^{DA}\, NSUH_{gh}^{DA} \\ - LBMP_{gh}^{DA}\, EH_{gh}^{DA} - NASR_{gh}^{DA}\end{array}\right),0\right]$$

~~Real-Time Market Minimum Generation and Start-Up Payment =~~

Where:

G = set of Generators;

~~EH_{gi}^{DA}~~EH_{gh}^{DA} = Energy scheduled Day-Ahead to be produced by Generator g in hour ~~i~~h expressed in terms of MW;

~~MGH_{gi}^{DA}~~MGH_{gh}^{DA} = Energy scheduled Day-Ahead to be produced by the minimum generation segment of Generator g in hour ~~i~~h expressed in terms of MW;

~~C_{gi}^{DA} =~~ C_{gh}^{DA} = Bid cost submitted by Generator g, or when applicable the mitigated Bid cost curve ~~made by~~for Generator g, in the Day-Ahead Market for hour ~~i~~h expressed in terms of $/MWh;

~~MGC_{gi}^{DA} = minimum generation cost~~MGC_{gh}^{DA} = Minimum Generation Bid by Generator g, or when applicable the mitigated Minimum Generation Bid for Generator g, for hour ~~i~~h in the Day-Ahead Market, expressed in terms of $/MW;

~~SUC_{gi}^{DA}~~SUC_{gh}^{DA} = ~~start~~Start-~~up cost bid~~Up Bid by Generator g, or when applicable the mitigated Start-Up Bid for Generator g, in hour ~~i~~h into the Day-Ahead Market expressed in terms of $/start;

~~$NSUH_{gi}^{DA}$~~$NSUH_{gh}^{DA}$ = number of times Generator g is scheduled Day-Ahead to start up in hour ~~i~~h;

~~$LBMP_{gi}^{DA}$~~$LBMP_{gh}^{DA}$ = Day-Ahead LBMP at Generator g's bus in hour ~~i~~h expressed in terms of $/MWh;

~~N = number of SCD intervals in 24-hour day;~~

~~EI_{gi}^{RT} = metered Energy produced by Generator g in SCD interval i;~~

~~EI_{gi}^{DA} = Energy scheduled in the Day-Ahead Market to be produced by Generator g in SCD interval i;~~

~~$NASR_{gi}^{DA}$~~ $NASR_{gh}^{DA}$ = 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 ~~i~~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, adjusted for that Generator's performance~~ 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) ~~Availability~~ payments made to that Generator for providing Spinning Reserve and non-synchronized 30-Minute Reserve in that hour if it is committed Day- Ahead to provide ~~Spinning~~such ~~Reserve~~reserves in that hour, less that Generator's Day-Ahead Bid to provide Spinning Reserve and non-synchronized 30-Minute Reserve in that hour.

B. Real-Time Bid Production Guarantee Formulas for All Intervals Except Maximum Generation Pickups and Large Event Reserve Pickups

Real-Time Bid Production Cost Guarantee =

$$\sum_{g\in G}\max\left[\sum_{i=1}^{N}\left(\left(\begin{array}{l}\int_{EI_{gi}^{DA}}^{EI_{gi}^{RT}} C_{gi}^{RT} + MGC_{gi}^{RT}\left(MGI_{gi}^{RT}-MGI_{gi}^{DA}\right)\\ + SUC_{gi}^{RT}\left(NSUI_{gi}^{RT}-NSUI_{gi}^{DA}\right) - LBMP_{gi}^{RT}\left(EI_{gi}^{RT}-EI_{gi}^{DA}\right)\end{array}\right)*\frac{s_i}{3600} \\ -\left(NASR_{gi}^{TOT}-NASR_{gi}^{DA}\right) - RRAP_{gi} + RRAC_{gi}\right),0\right]$$

where:

s_i = number of seconds in RTD interval i;

C_{gi}^{RT} = Bid cost ~~curve made~~submitted by Generator g, or when applicable the mitigated Bid cost for Generator g, in the ~~Real-Time dispatch~~RTD for the hour that includes ~~SCD~~RTD interval i expressed in terms of $/MWh;

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

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

SUC_{gi}^{RT} = ~~start-up cost bid~~Start-Up Bid by Generator g ~~in~~, or when applicable the mitigated Minimum Generation Bid for Generator g, for the hour that includes interval i into ~~Real-Time dispatch~~RTD expressed in terms of $/start;

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

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

$LBMP_{gi}^{RT}$ = Real-Time LBMP at Generator g's bus in ~~SCD~~RTD interval ~~i~~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 (which are addressed separately in subsection I.3 below);

EI_{gi}^{RT} = metered Energy produced by Generator g in RTD interval i, up to a maximum of the arithmetic average of the 6-second AGC Basepoint Signals sent to the Generator over the RTD interval expressed in terms of MW;

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;

December 18, 2000.

$NASR_{gi}^{TOT}$ = 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 ~~hour~~interval i is computed by summing the following: (1) Voltage Support Service payments received by that Generator for that ~~hour~~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~~, adjusted for that Generator's performance 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)~~ Availability~~ payments made to that Generator for providing Spinning Reserve or non-synchronized 30-Minute Reserve in that hour, less the Bid placed by that Generator to provide ~~Spinning~~such ~~Reserve~~reserves in that hour at the time it was scheduled to do so; and (4) ~~Payments made to that Generator in that hour for Energy in excess of that Generator's actual Energy injections (such payments may be made to providers of Regulation Service when the SCD signals sent to those Generators exceed the AGC Base Point Signals sent to those Generators); and (5)~~ Lost Opportunity Cost payments made to that ~~generator~~Generator in that hour as a result of reducing that Generator's output in order for it to provide Voltage Support ~~or Spinning Reserve~~Service.

$NASR_{gi}^{DA}$ = The proportion of the Day-Ahead net Ancillary Services revenue 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 ~~pick-ups~~pickups, and time periods following a reserve ~~pick-up~~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.

~~Also, in the above calculations, if a Supplier of Regulation Service moves above its SCD Base Point as a result of responding to the AGC Base Points sent to it, its Bid cost for producing that Energy will be deemed equal to its Bid at its SCD Base Point.~~

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

~~Penalty charges resulting from failure to provide an Ancillary Service~~ In the event that the ISO re-institutes penalties for poor Regulation Service performance under Section 8.0 of Rate Schedule 3 such penalties will not be taken into account when calculating supplemental payments ~~for that Supplier~~under this Attachment C.

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C. Real-Time Bid Production Cost Guarantees for Maximum Generation Pickups and Large Event Reserve Pickups

Real-Time Market Minimum Generation and Start-Up Payment =

$$\sum_{g\in G}\left[\sum_{i=1}^{M}\max\left(\left(\int_{EI_{gi}^{DA}}^{EI_{gi}^{RT}} C_{gi}^{RT} + MGC_{gi}^{RT}\left(MGI_{gi}^{RT}-MGI_{gi}^{DA}\right) + SUC_{gi}^{RT}\left(NSUI_{gi}^{RT}-NSUI_{gi}^{DA}\right) - LBMP_{gi}^{RT}\left(EI_{gi}^{RT}-EI_{gi}^{DA}\right)\right)*\frac{s_i}{3600} - \left(NASR_{gi}^{TOT}-NASR_{gi}^{DA}\right) - RRAP_{gi} + RRAC_{gi}, 0\right)\right]$$

where:

M = number of maximum generation pickups or large event reserve pickups in the 24 hour day;

The definition of all other variables is identical to those defined in section I.B above.

II. Supplemental ~~Payment~~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 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.

III. Supplemental ~~Payment~~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 during a Forecast Operating Reserve shortage exceeds the LBMP revenue received for performance by that Special Case Resource.

Generators with start-up times of greater than twenty-four (24) hours will have their ~~start~~Start-~~up cost~~ Up 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).

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