

1. Balancing Market Energy

1.1. Description

The Power Supplier Balancing Market Energy settlement (\$) is intended to credit or charge Market Participants acting as Power Suppliers for Balancing Market energy sold or purchased in the NYISO Balancing Energy Market. This settlement accounts for energy variations in a generator's real-time dispatch from what is sold in the NYISO DAM and/or via DAM Transaction Schedules.

Since this settlement addresses energy variations from the DAM, it can be either a credit or a charge to the Power Supplier. The Power Supplier will be charged for balancing market energy in cases where the generator sold more energy in the DAM and/or via DAM Transaction Schedules than it is dispatched in Real-Time (RT < DAM). Otherwise, the Power Supplier will be credited for balancing market energy in cases where the generator sold less energy in the DAM and/or via DAM Transaction Schedules than it is dispatched in Real-Time (RT > DAM).

The Power Supplier Balancing Market Energy settlement is based on the Power Supplier's Real-Time actual generation minus its Total Scheduled Transaction Energy minus its DAM Sold Energy (MW) at a given generator, multiplied times the three corresponding bus Real-Time price (\$/MW) components (energy, loss, and congestion). The settlement is determined at the Real Time Dispatch (RTD) dispatch interval (~5-minute) for each Power Supplier - Generator where Balancing Market Energy.

The total settlement is the sum of 3 components as follows:

- *Energy Settlement* - Power Supplier Settlement for energy sold to or purchased from the NYISO Balancing Energy Market.
- *Losses Settlement* - Power Supplier Settlement to compensate for naturally occurring energy losses due to resistance in transmission lines created by energy sales/purchases in the NYISO Balancing Energy Market.
- *Congestion Settlement* - Power Supplier Settlement for congestion created/eliminated on the NYCA system by energy sales/purchases in the NYISO Balancing Energy Market.

1.2. Business Rules

1.2.1 Core Settlement

1.2.1.1 Eligibility

Power Suppliers will be credited for Balancing Market Energy (\$) if:

- The Power Supplier's generator sells balancing market energy (MW) to the NYISO Balancing Energy Market (RTD Gen BalMkt Energy (MW) > 0).

Power Suppliers will be charged for Balancing Market Energy (\$) if:

- The Power Supplier's generator purchases balancing market energy (MW) from the NYISO Balancing Energy Market (RTD Gen BalMkt Energy (MW) < 0).

1.2.1.2 Required Data Elements

1.2.1.2.1 Determinants

Title	Business Description
Gen PTID	Generator PTID is a number representing the unique point identifier for a generator.
Hr DAM Sched Gen (MW)	Day Ahead Scheduled Generation (MW) is a number representing the amount of generation scheduled by the NYISO for the given generator in the Day Ahead Market (total scheduled for a generator in the DAM, including day-ahead scheduled transactions and NYISO Day-Ahead Market energy sales)
Hr DAM Sched Trans :Gen (MW)	Day Ahead Scheduled Transactions (MW) is a number representing the total amount of energy scheduled by the NYISO for all transactions for a given generator, for a given hour
RTD RT Sched Trans :Gen (MW)	Real-Time Scheduled Transaction (MW) is a number representing the total amount of transaction energy for all transactions injected at a given generator, for an SCD interval.
RTD AGC Basepoint (MW)	Automatic Generation Control Basepoint (MW) is a number representing the amount of generator energy scheduled, including generator regulation control, by the NYISO during real-time dispatch for the generator; ~6 second time intervals communicated to the generator to support real-time generation dispatch
RTD Basepoint (MW)	Real Time Dispatch Basepoint (MW) is a number representing the average amount of energy scheduled by the NYISO during the real-time dispatch for the generator; calculated over approximately 5 minute time intervals communicated to support generation dispatch; i.e. the average of the AGC Basepoints during the interval.
Hr Gen Upper Op Limit (MW)	Hourly Generator Upper Operating Limit (MW) is a number indicating the maximum operating capacity for a generator during the given operating status interval.

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Title	Business Description
RTD Energy Pmt Limit (MW)	Energy Payment Limit (MW) is a number representing the maximum amount of generation for which a balancing market energy payment is applicable
RTD Gen Adjusted Energy (MW)	Generator Adjusted Energy (MW) is a number representing the BAS-determined output of the generator for the interval. It is calculated by allocating Hourly Gen Meter Energy (MWh) provided by the Transmission Owners) to the SCD level based upon Average Actual (MW) (captured for NYISO SCADA and integrated by PTS).
Hr Out of Merit Type Desc	Hourly Out of Merit Type Description represents the reason for an out of economic merit dispatch for the given generator and hour.
Hr Out of Merit Type ID	Hourly Out of Merit Type ID is a number representing the reason for an out of economic merit dispatch for the given generator and hour.
RTD In Service Ind	In Service Indicator is a character representing whether or not the generator is in service (physically connected and providing energy onto the NYISO electrical grid)
RTD Interval Seconds	RTD Interval Seconds is a number representing the number of seconds in the RTD interval
RTD On Control Ind	On Control Indicator is a character representing whether or not the generator is on NYISO regulation control
Reserve Pickup Ind	Reserve Pick Up Indicator is a character which indicates whether the RTD-CAM interval was initiated as a reserve pickup.
RTD PURPA Units Class Type	PURPA Class Type is a character representing the class of the PURPA Generator (Class 1 or Class 2)
RTD RT Energy Price :Gen (\$/MW)	Real-Time Energy Price (\$/MW) is a number representing the price of energy at a generator bus (LBMP energy component)
RTD RT Loss Price :Gen (\$/MW)	Real-Time Loss Price (\$/MW) is a number representing the price of loss at a generator bus (LBMP loss component)
RTD RT Cong Price :Gen (\$/MW)	Real-Time Congestion Price (\$/MW) is a number representing the price of congestion at a generator bus (LBMP congestion component)
Hr DAM Energy Price :Gen (\$/MW)	Hourly Day Ahead Market Energy Price - Generator (\$/MW) is a number representing the price of energy at a generator bus (LBMP energy component)

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Title	Business Description
Hr DAM Loss Price :Gen (\$/MW)	Hourly Day Ahead Market Loss Price - Generator (\$/MW) is a number representing the price of losses at a generator bus (LBMP loss component)
Hr DAM Cong Price :Gen (\$/MW)	Hourly Day Ahead Market Congestion Price - Generator (\$/MW) is a number representing the price of congestion at a generator bus (LBMP congestion component)
RTD RT Sched Trans :GilboaPump (MW)	RTD Real-Time Scheduled Transactions - Gilboa Pump Bus (MW) is a number representing the total amount of real-time scheduled transaction energy (MW) at the Gilboa generator's pumping/load bus for the given SCD-interval.
Hr DAM Sched Load :GilboaPump (MW)	Hourly Day Ahead Market (DAM) Scheduled Load Gilboa Pump Bus (MW) is a number representing the total amount of load purchased at the Gilboa generator's pumping/load bus from the NYISO Day-Ahead Market for the given hour.

1.2.1.2.2 Intermediates

Title	Business Description
RTD Gen BalMkt Basis (MW)	RTD Generation Balancing Market Basis (MW) is a number representing the generation output value used as the basis for the determination of the amount of the given generator's balancing market energy (MW), for the given RTD-interval.
RTD Gen BalMkt Energy (MW)	Generation Balancing Market Energy (MW) is a number representing the total amount of energy that is settled in the NYISO Balancing Market for a given generator for a given RTD interval. The value is determined as follows: Generator Adjusted Energy - Day-Ahead Scheduled Energy - (RT Transactions Scheduled - DA Transactions Scheduled)
RTD RT Total Price :Gen (\$/MW)	Total Real-Time Price (\$/MW) is a number representing the total LBMP price of a generator bus
RTD BalMkt Energy Stlmnt :Gen (\$)	Balancing Market Energy Settlement - Generator (\$) is a number representing the BAS-determined amount of a generator's balancing energy market energy component settlement
RTD BalMkt Loss Stlmnt :Gen (\$)	Balancing Market Loss Settlement - Generator (\$) is a number representing the BAS-determined amount of a generator's balancing energy market loss component settlement

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Title	Business Description
RTD BalMkt Cong Stlmnt :Gen (\$)	Balancing Market Congestion Settlement - Generator (\$) is a number representing the BAS-determined amount of a generator's balancing energy market congestion component settlement

1.2.1.2.3 Results

Title	Business Description
RTD Total BalMkt Stlmnt :Gen (\$)	Total Balancing Market Settlement - Generator (\$) is a number representing the BAS-determined amount of a generator's total balancing energy market settlement; sum of the balancing energy market energy, loss, and congestion component settlements

1.2.1.2.4 Algorithm:

RTD Total BalMkt Stlmnt :Gen (\$) is calculated as:

$$\text{RTD Total BalMkt Stlmnt :Gen ($) = RTD BalMkt Energy Stlmnt :Gen ($) + RTD BalMkt Loss Stlmnt :Gen ($) - RTD BalMkt Cong Stlmnt :Gen ($)}$$

Where:

$$\text{RTD BalMkt Energy Stlmnt :Gen ($) = RTD Gen BalMkt Energy (MW) * RTD RT Energy Price :Gen (\$/MW) * \{RTD Interval Seconds \div 3,600 seconds\}^1}$$

$$\text{RTD BalMkt Loss Stlmnt :Gen ($) = RTD Gen BalMkt Energy (MW) * RTD RT Loss Price :Gen (\$/MW) * \{RTD Interval Seconds \div 3,600 seconds\}}$$

$$\text{RTD BalMkt Cong Stlmnt :Gen ($) = RTD Gen BalMkt Energy (MW) * RTD RT Cong Price :Gen (\$/MW) * \{RTD Interval Seconds \div 3,600 seconds\}}$$

And SCD Gen BalMkt Energy (MW) is calculated as follows:

$$\text{RTD Gen BalMkt Energy (MW) = [Max\{RTD Gen BalMkt Basis (MW), 0\} - Hr DAM Sched Gen (MW) - \{RTD RT Sched Trans :Gen (MW) - Hr DAM Sched Trans :Gen (MW)\}]}$$

Where the determination of RTD Gen BalMkt Basis (MW) varies under a couple of different scenarios:

1. In Service Generators
2. Off Service Generators

¹ RTD Interval Seconds ÷ 3,600 seconds is used to settle by time weighting the calculation over the interval period.

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3. PURPA Generators
4. Gilboa Generators
5. Following a Reserve Pickup
6. Capacity Limited Resources (CLR)

(1) For an In Service (RTD In Service Ind = “Y” or “R”):

If the generator under-generated during the interval, or the given RTD-Interval was a Reserve Pickup Interval (RTD Gen Adjusted Energy (MW) < RTD Basepoint (MW) or Reserve Pickup Ind = “Y”):

$$\text{RTD Gen BalMkt Basis (MW)} = \text{RTD Gen Adjusted Energy (MW)}$$

Else the generator produced as expected or over-generated during the interval (RTD Gen Adjusted Energy (MW) >= RTD Basepoint (MW)):

$$\text{RTD Gen BalMkt Basis (MW)} = \text{RTD Basepoint (MW)}$$

NOTE: If RTD RT Total Price :Gen (\$/MW) < 0 (negative prices), RTD Gen BalMkt Basis (MW) = RTD Gen Adjusted Energy (MW) instead of RTD Basepoint (MW).

NOTE: NYISO implemented the Energy Payment Limit (EPL) (MW) feature on 08/29/2001 to allow generators to chase real-time market prices within defined limits. This market change impacted the determination of a generator’s balancing market basis (MW) as follows:

- Prior to 08/29/2001, no impact (determined as noted above).
- On or after 08/29/2001, RTD Energy Pmt Limit (MW) would be used in place of RTD Basepoint (MW) in the above algorithm for non-regulating generators.
- With implementation of SMD 2, the EPL will apply to over generation only and will be equal to the lesser of 3% of the unit’s UOL or 3 times its response rate.

(2) For an Off Service (RTD In Service Ind = “N”) generator:

If RTD Gen Adjusted Energy (MW) <= 1

$$\text{RTD Gen BalMkt Basis (MW)} = 0.$$

(3) RTD Gen BalMkt Basis (MW) is determined for PURPA qualified generators as follows:

$$\text{RTD Gen BalMkt Basis (MW)} = \text{RTD Gen Adjusted Energy (MW)}$$

NOTE: PURPA generators are always paid based upon their Adjusted Energy. Furthermore, PURPA Class 1 (PURPA Units Class Type = Class 1) generation is designed to service a specific load/host. Therefore, PURPA Class 1 Bilateral Transactions are either increased or decreased such that Balancing Market Energy equals zero. This ensures that Class 1 Resources do not purchase or sell wholesale energy in the Balancing Market.

(4) For Gilboa generators, RTD Gen BalMkt Energy (MW) is determined as follows:

If the Gilboa generator is “GILBOA” (Gen PTID = 23599) and the settlement date < 06/01/2000, or is “GILBOA 1” (Gen PTID = 23756) and the settlement date >= 06/01/2000:

RTD Gen BalMkt Energy (MW) =

$$[\text{Max}\{\text{RTD Gen BalMkt Basis (MW), 0}\} - \text{Hr DAM Sched Gen (MW)} - \{\text{RTD RT Sched Trans :Gen (MW)} - \text{Hr DAM Sched Trans :Gen (MW)}\} + \text{RTD RT Sched Trans :GilboaPump (MW)} + \text{Hr DAM Sched Load :GilboaPump (MW)}]$$

Where:

$$\text{RTD Gen BalMkt Basis (MW)} = \text{RTD Gen Adjusted Energy (MW)}$$

NOTE: For GILBOA generators, RTD Gen Adjusted Energy (MW) can be calculated as a negative value.

(5) *Following a Reserve Pickup:*

If an RTD interval is the result of Reserve Pickup (Reserve Pickup Ind = “Y”), the RTD Gen Adjusted Energy (MW) value is used (RTD Gen BalMkt Basis (MW) = RTD Gen Adjusted Energy (MW)) above all other values for 3 consecutive RTD intervals. This is an override to the rules mentioned in the above algorithm. Since Operating Reserve resources are dispatched at emergency rates during a reserve pickup, resources over generating are rewarded for providing faster resolution to the system constraint prompting the reserve pickup.

(6) *Capacity Limited Resources (CLR) are handled slightly differently than above as follows:*

If Hr Out of Merit Type Desc = “CAPACITY LIMITED RESOURCE” (Hr Out of Merit Type ID = 20):

RTD BalMkt Energy Stlmnt :Gen (\$) =

$$[\text{RTD Gen CLR Energy (MW)} * \text{Hr DAM Energy Price :Gen (\$/MW)} * \{\text{RTD Interval Seconds} \div 3,600 \text{ seconds}\}] +$$

$$[\text{RTD Gen BalMkt Energy (MW)} * \text{RTD RT Energy Price :Gen (\$/MW)} * \{\text{RTD Interval Seconds} \div 3,600 \text{ seconds}\}]$$

RTD BalMkt Loss Stlmnt :Gen (\$) =

$$[\text{RTD Gen CLR Energy (MW)} * \text{Hr DAM Loss Price :Gen (\$/MW)} * \{\text{RTD Interval Seconds} \div 3,600 \text{ seconds}\}] +$$

$$[\text{RTD Gen BalMkt Energy (MW)} * \text{RTD RT Loss Price :Gen (\$/MW)} * \{\text{RTD Interval Seconds} \div 3,600 \text{ seconds}\}]$$

RTD BalMkt Cong Stlmnt :Gen (\$) =

$$[\text{RTD Gen CLR Energy (MW)} * \text{Hr DAM Cong Price :Gen (\$/MW)} * \{\text{RTD Interval Seconds} \div 3,600 \text{ seconds}\}] +$$

$$[\text{RTD Gen BalMkt Energy (MW)} * \text{RTD RT Cong Price :Gen (\$/MW)} * \{\text{RTD Interval Seconds} \div 3,600 \text{ seconds}\}]$$

And RTD Gen CLR Energy (MW) & RTD Gen BalMkt Energy (MW) are calculated as follows:

$$\text{RTD Gen BalMkt Energy (MW)} = [\text{Max}\{\text{RTD Gen BalMkt Basis (MW), 0}\} - \text{Hr Gen Upper Op Limit (MW)} - \text{RTD RT Sched Trans :Gen (MW)}]$$

If Hr Gen Upper Op Limit (MW) <= 0 THEN

$$\text{RTD Gen CLR Energy (MW)} = \text{Hr DAM Sched Gen (MW)} - \text{Hr DAM Sched Trans :Gen (MW)}$$

Else

$$\text{RTD Gen CLR Energy (MW)} = \text{Hr Gen Upper Op Limit (MW)} - \{\text{Hr DAM Sched Gen (MW)} - \text{Hr DAM Sched Trans :Gen (MW)}\}$$

1.2.1.3 Additional Calculations:

Gen Adjusted Energy (MW) can be calculated as:

Please see Appendix A, Figure 1.6 for more information on how a generator’s adjusted energy (MW) is determined.

RTD RT Total Price :Gen (\$/MW) can also be calculated as:

$$\text{RTD RT Total Price :Gen (\$/MW)} = \text{RTD RT Energy Price :Gen (\$/MW)} + \text{RTD RT Loss Price :Gen (\$/MW)} - \text{RTD RT Cong Price :Gen (\$/MW)}$$

RTD Gen BalMkt Energy (MWh) can also be calculated as:

$$\text{RTD Gen BalMkt Energy (MWh)} = \text{RTD Gen BalMkt Energy (MW)} * \{\text{RTD Interval Seconds} \div 3,600 \text{ seconds}\}$$

1.2.1.3.1 Hourly Settlement Totals

1.2.1.3.1.1 Determinants

Title	Business Description
RTD Gen BalMkt Energy (MW)	Generation Balancing Market Energy (MW) is a number representing the total amount of energy that is settled in the NYISO Balancing Market for a given generator for a given RTD interval. The value is determined as follows: Generator Adjusted Energy - Day-Ahead Scheduled Energy - (RT Transactions Scheduled - DA Transactions Scheduled)
RTD BalMkt Energy Stlmt :Gen (\$)	Balancing Market Energy Settlement - Generator (\$) is a number representing the BAS-determined amount of a generator’s balancing energy market energy component settlement

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Title	Business Description
RTD BalMkt Loss Stlmnt :Gen (\$)	Balancing Market Loss Settlement - Generator (\$) is a number representing the BAS-determined amount of a generator's balancing energy market loss component settlement
RTD BalMkt Cong Stlmnt :Gen (\$)	Balancing Market Congestion Settlement - Generator (\$) is a number representing the BAS-determined amount of a generator's balancing energy market congestion component settlement
RTD Total BalMkt Stlmnt :Gen (\$)	Total Balancing Market Settlement - Generator (\$) is a number representing the BAS-determined amount of a generator's total balancing energy market settlement; sum of the balancing energy market energy, loss, and congestion component settlements

1.2.1.3.1.2 Intermediates

None

1.2.1.3.1.3 Results

Title	Business Description
Hr Gen BalMkt Energy (MW)	Generation Balancing Market Energy (MW) is a number representing the total amount of energy that is settled in the NYISO Balancing Market for a given generator for a given RTD interval. The value is determined as follows: Generator Adjusted Energy - Day-Ahead Scheduled Energy - (RT Transactions Scheduled - DA Transactions Scheduled)
Hr BalMkt Energy Stlmnt :Gen (\$)	Balancing Market Energy Settlement - Generator (\$) is a number representing the BAS-determined amount of a generator's balancing energy market energy component settlement
Hr BalMkt Loss Stlmnt :Gen (\$)	Balancing Market Loss Settlement - Generator (\$) is a number representing the BAS-determined amount of a generator's balancing energy market loss component settlement
Hr BalMkt Cong Stlmnt :Gen (\$)	Balancing Market Congestion Settlement - Generator (\$) is a number representing the BAS-determined amount of a generator's balancing energy market congestion component settlement
Hr Total BalMkt Stlmnt :Gen (\$)	Total Balancing Market Settlement - Generator (\$) is a number representing the BAS-determined amount of a generator's total balancing energy market settlement; sum of the balancing energy market energy, loss, and congestion component settlements

1.2.1.3.1.4 Algorithms:

Hr Gen BalMkt Energy (MW) is calculated as:

$$\sum \text{RTD Gen BalMkt Energy (MW) for all RTD intervals of the hour}$$

Hr BalMkt Energy Stlmnt :Gen (\$) is calculated as:

$$\sum \text{RTD BalMkt Energy Stlmnt :Gen ($) for all RTD intervals of the hour}$$

Hr BalMkt Loss Stlmnt :Gen (\$) is calculated as:

$$\sum \text{RTD BalMkt Loss Stlmnt :Gen ($) for all RTD intervals of the hour}$$

Hr BalMkt Cong Stlmnt :Gen (\$) is calculated as:

$$\sum \text{RTD BalMkt Cong Stlmnt :Gen ($) for all RTD intervals of the hour}$$

Hr Total BalMkt Stlmnt :Gen (\$) is calculated as:

$$\sum \text{RTD Total BalMkt Stlmnt :Gen ($) for all RTD intervals of the hour}$$

1.2.1.3.2 Daily Settlement Totals

1.2.1.3.2.1 Determinants

Title	Business Description
Hr Gen BalMkt Energy (MW)	Generation Balancing Market Energy (MW) is a number representing the total amount of energy that is settled in the NYISO Balancing Market for a given generator for a given RTD interval. The value is determined as follows: Generator Adjusted Energy - Day-Ahead Scheduled Energy - (RT Transactions Scheduled - DA Transactions Scheduled)
Hr BalMkt Energy Stlmnt :Gen (\$)	Balancing Market Energy Settlement - Generator (\$) is a number representing the BAS-determined amount of a generator's balancing energy market energy component settlement
Hr BalMkt Loss Stlmnt :Gen (\$)	Balancing Market Loss Settlement - Generator (\$) is a number representing the BAS-determined amount of a generator's balancing energy market loss component settlement
Hr BalMkt Cong Stlmnt :Gen (\$)	Balancing Market Congestion Settlement - Generator (\$) is a number representing the BAS-determined amount of a generator's balancing energy market congestion component settlement
Hr Total BalMkt Stlmnt :Gen (\$)	Total Balancing Market Settlement - Generator (\$) is a number representing the BAS-determined amount of a generator's total balancing energy market settlement; sum of the balancing energy market energy, loss, and congestion component settlements

1.2.1.3.2.2 Intermediates

None

1.2.1.3.2.3 Results

Title	Business Description
Day Gen BalMkt Energy (MW)	Generation Balancing Market Energy (MW) is a number representing the total amount of energy that is settled in the NYISO Balancing Market for a given generator for a given RTD interval. The value is determined as follows: Generator Adjusted Energy - Day-Ahead Scheduled Energy - (RT Transactions Scheduled - DA Transactions Scheduled)
Day BalMkt Energy Stlmnt :Gen (\$)	Balancing Market Energy Settlement - Generator (\$) is a number representing the BAS-determined amount of a generator's balancing energy market energy component settlement
Day BalMkt Loss Stlmnt :Gen (\$)	Balancing Market Loss Settlement - Generator (\$) is a number representing the BAS-determined amount of a generator's balancing energy market loss component settlement
Hr BalMkt Cong Stlmnt :Gen (\$)	Balancing Market Congestion Settlement - Generator (\$) is a number representing the BAS-determined amount of a generator's balancing energy market congestion component settlement
Hr Total BalMkt Stlmnt :Gen (\$)	Total Balancing Market Settlement - Generator (\$) is a number representing the BAS-determined amount of a generator's total balancing energy market settlement; sum of the balancing energy market energy, loss, and congestion component settlements

1.2.1.3.2.4 Algorithms:

Day Gen BalMkt Energy (MW) is calculated as:

$$\sum \text{Hr Gen BalMkt Energy (MW) for all hours of the day}$$

Day BalMkt Energy Stlmnt :Gen (\$) is calculated as:

$$\sum \text{Hr BalMkt Energy Stlmnt :Gen ($) for all hours of the day}$$

Day BalMkt Loss Stlmnt :Gen (\$) is calculated as:

$$\sum \text{Hr BalMkt Loss Stlmnt :Gen ($) for all hours of the day}$$

Day BalMkt Cong Stlmnt :Gen (\$) is calculated as:

$$\sum \text{Hr BalMkt Cong Stlmnt :Gen ($) for all hours of the day}$$

Day Total BalMkt Stlmnt :Gen (\$) is calculated as:

$$\sum \text{Hr Total BalMkt Stlmnt :Gen ($) for all hours of the day}$$

2. DAM Spinning Reserve Availability

2.1. Description

The Day-Ahead Market (DAM) Spinning Availability settlement is intended to compensate Power Suppliers who offer their generator's capacity as Spinning Reserve Service to the NYISO in the DAM.

The DAM Spinning Availability settlement is based upon the Spinning Reserve Service capacity scheduled for the generator and the corresponding DAM Spinning Reserve Market Clearing Price (MCP). It is determined at the hourly-level for each generator scheduled to provide this service in the DAM.

Power Suppliers that bid in to the DAM as Flexible will have spinning reserve bids based upon their response rate. These units must submit a \$ availability bid, which may be zero. Null availability bids will cause the entire bid to be rejected in entirety.

Power Suppliers offering their generators into NYISO's DAM Spinning Reserve Service market must be synchronous to the NYCA transmission grid in real-time, and capable of providing that reserve energy within 10-minutes of a reserve pickup.

2.2. Business Rules

2.2.1 Core Settlement

2.2.1.1 Eligibility

Generators will receive a payment for DAM Spinning Reserve Availability (\$) if the following condition exists:

- The generator is scheduled to provide such service in the DAM, and
Hr DAM Sched Spin Avail (MWh) > 0

The following are conditions for when DAM Spinning Reserve Availability (\$) does not apply:

- Power Suppliers located outside of the NYCA are not able to participate in NYISO Power Supplier Ancillary Services markets at the present time.
- Gen AS Pricing Region Ind = "EXT" for a particular generator.

2.2.1.2 Required Data Elements

2.2.1.2.1 Determinants

Title	Business Description
Gen AS Pricing Region Ind	Generator Ancillary Service Pricing Region Indicator represents whether the given generator is located in the NYISO East or West Ancillary Service Pricing Region
Hr DAM Spin Price East (\$/MW)	Hourly Day Ahead Market Spinning Operating Reserves Price East (\$/MW) is a number representing the east hourly market clearing price for DAM Spinning Operating Reserves service based on the set of generators in the East Ancillary Service Pricing Region selected by SCUC.
Hr DAM Spin Price West (\$/MW)	Hourly Day Ahead Market Spinning Operating Reserves Price West (\$/MW) is a number representing the west hourly market clearing price for DAM Spinning Operating Reserves service based on the set of generators in the West Ancillary Service Pricing Region selected by SCUC.
Hr DAM Sched Spin Avail (MWh)	Hourly Day Ahead Market Scheduled Spinning Operating Reserves Availability (MWh) is a number representing the amount of Day Ahead Market Spinning Operating Reserves service the given generator is scheduled to provide for the given hour.

2.2.1.2.2 Intermediates

None

2.2.1.2.3 Results

Title	Business Description
Hr DAM Spin Avail Stlmnt (\$)	Hourly Day Ahead Market Spinning Operating Reserves Availability Settlement (\$) is a number representing the settlement amount for the availability of Day Ahead Market Spinning Operating Reserves service for the given generator, for the given hour.

2.2.1.2.4 Algorithm

Hr DAM Spin Avail Stlmnt (\$) is calculated as:

$$\text{Hr DAM Spin Avail Stlmnt (\$)} = \text{Hr DAM Sched Spin Avail (MWh)} * \text{Hr DAM Spin Price (\$/MW)}$$

NOTE: The Hr DAM Spin Price (\$/MW) is based on the given generator’s location within the NYISO AS pricing regions (Gen AS Pricing Region Ind): East or West (Hr DAM Spin Price East (\$/MW), Hr DAM Spin Price West (\$/MW)).

2.2.1.3 Additional Calculations

2.2.1.3.1 Daily Settlement Totals

2.2.1.3.1.1 Determinants

Title	Business Description
Hr DAM Sched Spin Avail (MWh)	Hourly Day Ahead Market Scheduled Spinning Operating Reserves Availability (MWh) is a number representing the amount of Day Ahead Market Spinning Operating Reserves service the given generator is scheduled to provide for the given hour.
Hr DAM Spin Avail Stlmnt (\$)	Hourly Day Ahead Market Spinning Operating Reserves Availability Settlement (\$) is a number representing the settlement amount for the availability of Day Ahead Market Spinning Operating Reserves service for the given generator, for the given hour.

2.2.1.3.1.2 Intermediates

None

2.2.1.3.1.3 Results

Title	Business Description
Day DAM Sched Spin Avail (MWh)	Daily Day Ahead Market Scheduled Spinning Operating Reserves Availability (MWh) is a number representing the amount of Day Ahead Market Spinning Operating Reserves service the given generator is scheduled to provide for the given day.
Day DAM Spin Avail Stlmnt (\$)	Daily Day Ahead Market Spinning Operating Reserves Availability Settlement (\$) is a number representing the settlement amount for the availability of Day Ahead Market Spinning Operating Reserves service for the given generator, for the given day.

2.2.1.3.1.4 Algorithm

Day DAM Sched Spin Avail (MWh) is calculated as:

Day DAM Sched Spin Avail (MWh) = \sum Hr DAM Sched Spin Avail (MWh) for all hours of the day.

And:

Day DAM Spin Avail Stlmnt (\$) is calculated as:

Day DAM Spin Avail Stlmnt (\$) = \sum Hr DAM Spin Avail Stlmnt (\$) for all hours of the day.

3. DAM 10-Minute Non-Synchronous Reserve

3.1. Description

The Day-Ahead Market (DAM) 10-Minute Non-Synchronous Reserve Availability settlement is intended to compensate Power Suppliers who offer their generator’s capacity as 10-Minute Non-Synchronous Reserve Service to the NYISO in the DAM.

The DAM 10-Minute Non-Synchronous Reserve Availability settlement is based upon the 10-Minute Non-Synchronous Reserve Service capacity scheduled for the generator and the corresponding DAM 10-Minute Non-Synchronous Reserve Market Clearing Price (MCP). It is determined at the hourly-level for each generator scheduled to provide this service in the DAM.

Power Suppliers that qualify to participate in the 10-Minute Non-Synchronous Reserve market in the DAM will have 10-Minute Non-Synchronous Reserve bids based upon their Upper Operating Limit (UOL). These units must submit a \$ availability bid, which may be zero. Null availability bids will cause the entire bid to be rejected in entirety.

Power Suppliers offering their generators into NYISO’s DAM 10-Minute Non-Synchronous Reserve Service market must be non-synchronous to the NYCA transmission grid in real-time, and capable of providing that reserve energy within 10-minutes of a reserve pickup

3.2. Business Rules

3.2.1 Core Settlement

3.2.1.1 Eligibility

Generators will receive a payment for DAM 10-Minute Non-Synchronous Reserve Availability (\$) if the following condition exists:

- The generator is scheduled to provide such service in the DAM, and
 $\text{Hr DAM Sched 10NSync Avail (MWh)} > 0$.

The following are conditions for when DAM 10-Minute Non-Synchronous Reserve Availability (\$) does not apply:

- Power Suppliers located outside of the NYCA are not able to participate in NYISO Power Supplier Ancillary Services markets at the present time.
- **Gen AS Pricing Region Ind = “EXT” for a particular generator.**

3.2.1.2 Required Data Elements

3.2.1.2.1 Determinants

Title	Business Description
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Gen AS Pricing Region Ind	Generator Ancillary Service Pricing Region Indicator represents whether the given generator is located in the NYISO East or West Ancillary Service Pricing Region.
Hr DAM 10NSync Price East (\$/MW)	Hourly Day Ahead Market 10-Minute Non-Synchronous Operating Reserves Price East (\$/MW) is a number representing the east hourly market clearing price for DAM 10-Minute Non-Synchronous Operating Reserves Service based on the set of generators in the East Ancillary Services Pricing Region selected by SCUC.
Hr DAM 10NSync Price West (\$/MW)	Hourly Day Ahead Market 10-Minute Non-Synchronous Operating Reserves Price West (\$/MW) is a number representing the west hourly market clearing price for DAM 10-Minute Non-Synchronous Operating Reserves Service based on the set of generators in the West Ancillary Services Pricing Region selected by SCUC.
Hr DAM Sched 10NSync Avail (MWh)	Hourly Day Ahead Market Scheduled 10-Minute Non-Synchronous Operating Reserves Availability (MWh) is a number representing the amount of Day Ahead Market 10-Minute Non-Synchronous Operating Reserves Service the given generator is scheduled to provide for the given hour.

3.2.1.2.2 Intermediates

None

3.2.1.2.3 Results

Title	Business Description
Hr DAM 10NSync Avail Stlmnt (\$)	Hourly Day Ahead Market 10-Minute Non-Synchronous Operating Reserves Availability Settlement (\$) is a number representing the settlement amount for the availability of Day Ahead Market 10-Minute Non-Synchronous Operating Reserves service for the given generator, for the given hour.

3.2.1.2.4 Algorithm

Hr DAM 10NSync Avail Stlmnt (\$) is calculated as:

Hr DAM 10NSync Avail Stlmnt (\$) =

Hr DAM Sched 10NSync Avail (MWh) * Hr DAM 10NSync Price (\$/MW)

NOTE: The Hr DAM 10NSync Price (\$/MW) is based on the given generator’s location within the NYISO AS pricing regions (Gen AS Pricing Region Ind): East or West (Hr DAM 10NSync Price East (\$/MW), Hr DAM 10NSync Price West (\$/MW)).

3.2.1.3 Additional Calculations

3.2.1.3.1 Daily Settlement Totals

3.2.1.3.1.1 Determinants

Title	Business Description
Hr DAM Sched 10NSync Avail (MWh)	Hourly Day Ahead Market Scheduled 10-Minute Non-Synchronous Operating Reserves Availability (MWh) is a number representing the amount of Day Ahead Market 10-Minute Non-Synchronous Operating Reserves Service the given generator is scheduled to provide for the given hour.
Hr DAM 10NSync Avail Stlmnt (\$)	Hourly Day Ahead Market 10-Minute Non-Synchronous Operating Reserves Availability Settlement (\$) is a number representing the settlement amount for the availability of Day Ahead Market 10-Minute Non-Synchronous Operating Reserves service for the given generator, for the given hour.

3.2.1.3.1.2 Intermediates

None

3.2.1.3.1.3 Results

Title	Business Description
Day DAM Sched 10NSync Avail (MWh)	Daily Day Ahead Market Scheduled 10-Minute Non-Synchronous Operating Reserves Availability (MWh) is a number representing the amount of Day Ahead Market 10-Minute Non-Synchronous Operating Reserves Service the given generator is scheduled to provide for the given day.
Day DAM 10NSync Avail Stlmnt (\$)	Daily Day Ahead Market 10-Minute Non-Synchronous Operating Reserves Availability Settlement (\$) is a number representing the settlement amount for the availability of Day Ahead Market 10-Minute Non-Synchronous Operating Reserves service for the given generator, for the given day.

3.2.1.3.1.4 Algorithm

Day DAM Sched 10NSync Avail (MWh) is calculated as:

Day DAM Sched 10NSync Avail (MWh) = \sum Hr DAM Sched 10NSync Avail (MWh) for all hours of the day.

And:

Day DAM 10NSync Avail Stlmnt (\$) is calculated as:

Day DAM 10NSync Avail Stlmnt (\$) = \sum Hr DAM 10NSync Avail Stlmnt (\$) for all hours of the day.

4. DAM 30-Minute Reserve

4.1. Description

The Day-Ahead Market (DAM) 30-Minute Reserve Availability settlement is intended to compensate Power Suppliers who offer their generator’s capacity as 30-Minute Reserve Service to the NYISO in the DAM.

The DAM 30-Minute Reserve Availability settlement is based upon the 30-Minute Reserve Service capacity scheduled for the generator and the corresponding DAM 30-Minute Reserve Market Clearing Price (MCP). It is determined at the hourly-level for each generator scheduled to provide this service in the DAM.

Power Suppliers that qualify to participate in the 30-Minute Reserve market in the DAM will have 30-Minute Reserve bids based upon their Upper Operating Limit (UOL). These units must submit a \$ availability bid, which may be zero. Null availability bids will cause the entire bid to be rejected in entirety.

Power Suppliers offering their generators into NYISO’s DAM 30-Minute Reserve Service market must be capable of providing that reserve energy within 30-minutes following commitment by RTC.

4.2. Business Rules

4.2.1 Core Settlement

4.2.1.1 Eligibility

Generators will receive a payment for DAM 30-Minute Reserve Availability (\$) if the following condition exists:

- The generator is scheduled to provide such service in the DAM, and
 $\text{Hr DAM Sched 30Min Avail (MWh)} > 0.$

The following are conditions for when DAM 30-Minute Reserve Availability (\$) does not apply:

- Power Suppliers located outside of the NYCA are not able to participate in NYISO Power Supplier Ancillary Services markets at the present time.
 - Gen AS Pricing Region Ind = “EXT” for a particular generator.

4.2.1.2 Required Data Elements

4.2.1.2.1 Determinants

Title	Business Description
Gen AS Pricing Region Ind	Generator Ancillary Service Pricing Region Indicator represents whether the given generator is located in the NYISO East or West Ancillary Service Pricing Region
Hr DAM 30Min	Hourly Day Ahead Market 30-Minute Operating Reserves Price East (\$/MW) is a number representing the east hourly market

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Price East (\$/MW)	clearing price for DAM 30-Minute Operating Reserves Service based on the set of generators in the East Ancillary Services Pricing Region selected by SCUC.
Hr DAM 30Min Price West (\$/MW)	Hourly Day Ahead Market 30-Minute Operating Reserves Price West (\$/MW) is a number representing the west hourly market clearing price for DAM 30-Minute Operating Reserves Service based on the set of generators in the West Ancillary Services Pricing Region selected by SCUC.
Hr DAM Sched 30Min Avail (MWh)	Hourly Day Ahead Market Scheduled 30-Minute Operating Reserves Availability (MWh) is a number representing the amount of Day Ahead Market 30-Minute Operating Reserves Service the given generator is scheduled to provide for the given hour.

4.2.1.2.2 Intermediates

None

4.2.1.2.3 Results

Title	Business Description
Hr DAM 30Min Avail Stlmnt (\$)	Hourly Day Ahead Market 30-Minute Operating Reserves Availability Settlement (\$) is a number representing the settlement amount for the availability of Day Ahead Market 30-Minute Operating Reserves service for the given generator, for the given hour.

4.2.1.2.4 Algorithm

Hr DAM 30Min Avail Stlmnt (\$) is calculated as:

Hr DAM 30Min Avail Stlmnt (\$) =

Hr DAM Sched 30Min Avail (MWh) * Hr DAM 30Min Price (\$/MW)

NOTE: The Hr DAM 30Min Price (\$/MW) is based on the given generator’s location within the NYISO AS pricing regions (Gen AS Pricing Region Ind): East or West (Hr DAM 30Min Price East (\$/MW), Hr DAM 30Min Price West (\$/MW)).

4.2.1.3 Additional Calculations

4.2.1.3.1 Daily Settlement Totals

4.2.1.3.1.1 Determinants

Title	Business Description
Hr DAM Sched 30Min Avail (MWh)	Hourly Day Ahead Market Scheduled 30-Minute Operating Reserves Availability (MWh) is a number representing the amount of Day Ahead Market 30-Minute Operating Reserves Service the given generator is scheduled to provide for the given hour.
Hr DAM 30Min Avail Stlmnt (\$)	Hourly Day Ahead Market 30-Minute Operating Reserves Availability Settlement (\$) is a number representing the settlement amount for the availability of Day Ahead Market 30-Minute Operating Reserves service for the given generator, for the given hour.

4.2.1.3.1.2 Intermediates

None

4.2.1.3.1.3 Results

Title	Business Description
Day DAM Sched 30Min Avail (MWh)	Daily Day Ahead Market Scheduled 30-Minute Operating Reserves Availability (MWh) is a number representing the amount of Day Ahead Market 30-Minute Operating Reserves Service the given generator is scheduled to provide for the given day.
Day DAM 30Min Avail Stlmnt (\$)	Daily Day Ahead Market 30-Minute Operating Reserves Availability Settlement (\$) is a number representing the settlement amount for the availability of Day Ahead Market 30-Minute Operating Reserves service for the given generator, for the given day.

4.2.1.3.1.4 Algorithm

Day DAM Sched 30Min Avail (MWh) is calculated as:

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Day DAM Sched 30Min Avail (MWh) = \sum Hr DAM Sched 30Min Avail (MWh) for all hours of the day.

And:

Day DAM 30Min Avail Stlmnt (\$) is calculated as:

Day DAM 30Min Avail Stlmnt (\$) = \sum Hr DAM 30Min Avail Stlmnt (\$) for all hours of the day.

5. Balancing Spinning Reserve

5.1. Description

The Balancing Spinning Reserve settlement is intended to compensate Power Suppliers who offer their generator’s capacity as Spinning Reserve Service to the NYISO in the Real Time (RT) Market.

The Balancing Spinning Reserve settlement is based upon the Balancing Spinning Reserve Service capacity scheduled for the generator and the corresponding RT spinning Reserve Market Clearing Price (MCP). The Balancing Spinning Reserve Service capacity scheduled is the net of the generator’s RT and DAM spinning Reserve Service schedules. It is determined at the RTD level for each generator scheduled to provide this service in the DAM or real-time.

Power Suppliers that bid as Flexible and are accepted for energy in the RT market will be in the RT Spinning Reserve market. Bids are created based on the unit’s response rate and given a \$0 availability bid. Any lost opportunity costs (LOC) are incorporated into the MCP.

5.2. Business Rules

5.2.1 Core Settlement

5.2.1.1 Eligibility

Generators will have a Balancing Spinning Reserve Settlement (\$) if the following condition exists:

- The generator is scheduled to provide such service in the DAM or RT market

5.2.1.2 Required Data Elements

5.2.1.2.1 Determinants

Title	Business Description
Gen AS Pricing Region Ind	Generator Ancillary Service Pricing Region Indicator represents whether the given generator is located in the NYISO East or West Ancillary Service Pricing Region.
RTD Interval Seconds	RTD Interval Seconds is a number representing the number of seconds in the RTD interval
RTD RT Spin Price East (\$/MW)	RTD Real Time Spinning Operating Reserves Price East (\$/MW) is a number representing the east real time market clearing price for RT Spinning Operating Reserves service based on the set of generators in the East Ancillary Service Pricing Region selected by RTD.
RTD RT Spin Price West (\$/MW)	RTD Real Time Spinning Operating Reserves Price West (\$/MW) is a number representing the west hourly market clearing price for RT Spinning Operating Reserves service based on the set of generators in the West Ancillary Service Pricing Region selected by RTD.

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Hr DAM Sched Spin Avail (MWh)	Hourly Day Ahead Market Scheduled Spinning Operating Reserves Availability (MWh) is a number representing the amount of Day Ahead Market Spinning Operating Reserves service the given generator is scheduled to provide for the hour containing the given RTD interval.
RTD RT Sched Spin Avail (MWh)	Hourly Day Ahead Market Scheduled Spinning Operating Reserves Availability (MWh) is a number representing the amount of Day Ahead Market Spinning Operating Reserves service the given generator is scheduled to provide for the hour containing the given RTD interval.
RTD RT Sched Spin Avail (MWh)	RTD Real Time Market Scheduled Spinning Operating Reserves Availability (MWh) is a number representing the amount of Real Time Market Spinning Operating Reserves service the given generator is scheduled to provide for the given RTD interval.

5.2.1.2.2 Intermediates

Title	Business Description
RTD Bal Sched Spin Avail (MWh)	RTD Balancing Scheduled Spinning Operating Reserves Availability (MWh) is a number representing the amount of Balancing Spinning Operating Reserves Service the given generator is scheduled to provide for the given RTD interval. This is the net difference between RT and DAM Spinning Operating Reserves Availability (MWh) values.

5.2.1.2.3 Results

Title	Business Description
RTD Bal Spin Avail Stlmnt (\$)	RTD Balancing Spinning Operating Reserves Availability Settlement (\$) is a number representing the settlement amount for availability of Balancing Spinning Operating Reserves Service for the given generator, for the given RTD interval.

5.2.1.2.4 Algorithm

RTD Bal Spin Avail Stlmnt (\$) is calculated as:

$$\text{RTD Bal Spin Avail Stlmnt (\$)} = \text{RTD Bal Sched Spin Avail (MWh)} * \text{RTD RT Spin Price}$$

Where:

$$\text{RTD Bal Sched Spin Avail (MWh)} = [\text{RTD RT Sched Spin Avail (MWh)} - \text{Hr DAM Sched Spin Avail (MWh)}] \times \text{RTD Interval Seconds} \div 3600$$

NOTE: The RTD RT Spin Price (\$/MW) is based on the given generator’s location within the NYISO AS pricing regions (Gen AS Pricing Region Ind): East or West (RTD RT Spin Price East (\$/MW), RTD RT Spin Price West (\$/MW)).

5.2.1.3 Additional Calculations

5.2.1.3.1 Hourly Settlement Totals

5.2.1.3.1.1 Determinants

Title	Business Description
RTD Bal Sched Spin Avail (MWh)	Spinning Operating Reserves Availability (MWh) is a number representing the amount of Balancing Spinning Operating Reserves Service the given generator is scheduled to provide for the given RTD interval. This is the net difference between RT and DAM Spinning Operating Reserves Availability (MWh) values
RTD Bal Spin Avail Stlmnt (\$)	RTD Balancing Spinning Operating Reserves Availability Settlement (\$) is a number representing the settlement amount for availability of Balancing Spinning Operating Reserves Service for the given generator, for the given RTD interval

5.2.1.3.1.2 Intermediates

None

5.2.1.3.1.3 Results

Title	Business Description
Hr Bal Sched Spin Avail (MWh)	Hourly Balancing Scheduled Spinning Operating Reserves Availability (MWh) is a number representing the amount of Balancing Spinning Operating Reserves Service the given generator is scheduled to provide for the given hour. This is the net difference between RT and DAM Spinning Operating Reserves Availability (MWh) values

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Hr Bal Spin Avail Stlmnt (\$)	Hourly Balancing Spinning Operating Reserves Availability Settlement (\$) is a number representing the settlement amount for availability of Balancing Spinning Operating Reserves Service for the given generator, for the given hour.
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5.2.1.3.1.4 Algorithm

Hr Bal Sched Spin Avail (MWh) is calculated as:

Hr Bal Sched Spin Avail (MWh) = \sum RTD Bal Sched Spin Avail (MWh) for all RTD intervals in the hour

And

Hr Bal Spin Avail Stlmnt (\$) is calculated as:

Hr Bal Spin Avail Stlmnt (\$) = \sum RTD Bal Spin Avail Stlmnt (\$) for all RTD intervals in the hour

5.2.1.3.2 Daily Settlement Totals

5.2.1.3.2.1 Determinants

Title	Business Description
Hr Bal Sched Spin Avail (MWh)	Hourly Balancing Scheduled Spinning Operating Reserves Availability (MWh) is a number representing the amount of Balancing Spinning Operating Reserves Service the given generator is scheduled to provide for the given hour. This is the net difference between RT and DAM Spinning Operating Reserves Availability (MWh) values
Hr Bal Spin Avail Stlmnt (\$)	Hourly Balancing Spinning Operating Reserves Availability Settlement (\$) is a number representing the settlement amount for availability of Balancing Spinning Operating Reserves Service for the given generator, for the given hour.

5.2.1.3.2.2 Intermediates

None

5.2.1.3.2.3 Results

Title	Business Description
Day Bal Sched Spin Avail (MWh)	Daily Balancing Scheduled Spinning Operating Reserves Availability (MWh) is a number representing the amount of Balancing Spinning Operating Reserves Service the given generator is scheduled to provide for the given day. This is the net difference between RT and DAM Spinning Operating Reserves Availability (MWh) values.
Day Bal Spin Avail Stlmnt (\$)	Daily Balancing Spinning Operating Reserves Availability Settlement (\$) is a number representing the settlement amount for availability of Balancing Spinning Operating Reserves Service for the given generator, for the given day.

5.2.1.3.2.4 Algorithm

Day Bal Sched Spin Avail (MWh) is calculated as:

Day Bal Sched Spin Avail (MWh) = \sum Hr Bal Sched Spin Avail (MWh) for all hours in the day.

And

Day Bal Spin Avail Stlmnt (\$) is calculated as:

Day Bal Spin Avail Stlmnt (\$) = \sum Hr Bal Spin Avail Stlmnt (\$) for all hours in the day.

6. Balancing 10-Minute Non-Synchronous Reserve

6.1. Description

The Balancing 10-Minute Non-Synchronous Reserve settlement is intended to compensate Power Suppliers who offer their generator’s capacity as 10-Minute Non-Synchronous Reserve Service to the NYISO in the Real Time (RT) Market.

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The Balancing 10-Minute Non-Synchronous Reserve settlement is based upon the Balancing 10-Minute Non-Synchronous Reserve Service capacity scheduled for the generator and the corresponding RT 10-Minute Non-Synchronous Reserve Market Clearing Price (MCP). The Balancing 10-Minute Non-Synchronous Reserve Service capacity scheduled is the net of the generator’s RT and DAM 10-Minute Non-Synchronous Reserve Service schedules. It is determined at the RTD level for each generator scheduled to provide this service in the DAM or real time.

Power Suppliers that qualify to participate in the 10-Minute Non-Synchronous Reserve market in the RT market will have 10-Minute Non-Synchronous Reserve bids based upon their Upper Operating Limit (UOL) and are given an availability bid of \$0. Any lost opportunity costs (LOC) are incorporated into the MCP.

Power Suppliers offering their generators into NYISO’s real time 10-Minute Non-Synchronous Reserve Service market must be non-synchronous to the NYCA transmission grid in real-time, and capable of providing that reserve energy within 10-minutes of a reserve pickup.

6.2. Business Rules

6.2.1 Core Settlement

6.2.1.1 Eligibility

Generators will have a Balancing 10-Minute Non-Synchronous Reserve Settlement (\$) if the following condition exists:

- The generator is scheduled to provide such service in the DAM or RT market

6.2.1.2 Required Data Elements

6.2.1.2.1 Determinants

Title	Business Description
Gen AS Pricing Region Ind	Generator Ancillary Service Pricing Region Indicator represents whether the given generator is located in the NYISO East or West Ancillary Service Pricing Region.
RTD Interval Seconds	RTD Interval Seconds is a number representing the number of seconds in the RTD interval
RTD RT 10NSync Price East (\$/MW)	RTD Real Time 10-Minute Non-Synchronous Operating Reserves Price East (\$/MW) is a number representing the east real time market clearing price for RT 10-Minute Non-Synchronous Operating Reserves service based on the set of generators in the East Ancillary Service Pricing Region selected by RTD.
RTD RT 10NSync Price West (\$/MW)	RTD Real Time 10-Minute Non-Synchronous Operating Reserves Price West (\$/MW) is a number representing the west hourly market clearing price for RT 10-Minute Non-Synchronous Operating Reserves service based on the set of generators in the West Ancillary Service Pricing Region selected by RTD.
Hr DAM Sched 10NSync Avail (MWh)	Scheduled 10-Minute Non-Synchronous Operating Reserves Availability (MWh) is a number representing the amount of Day Ahead Market 10-Minute Non-Synchronous Operating Reserves service the given generator is scheduled to provide for the hour containing the given RTD interval.
RTD RT Sched 10NSync Avail (MWh)	RTD Real Time Market Scheduled 10-Minute Non-Synchronous Operating Reserves Availability (MWh) is a number representing the amount of Real Time Market 10-Minute Non-Synchronous Operating Reserves service the given generator is scheduled to provide for the given RTD interval.

6.2.1.2.2 Intermediates

Title	Business Description
RTD Bal Sched 10NSync Avail (MWh)	RTD Balancing Scheduled 10-Minute Non-Synchronous Operating Reserves Availability (MWh) is a number representing the amount of Balancing 10-Minute Non-Synchronous Operating Reserves Service the given generator is scheduled to provide for the given RTD interval. This is the net difference between RT and DAM 10-Minute Non-Synchronous Operating Reserves Availability (MWh) values.

6.2.1.2.3 Results

Title	Business Description
RTD Bal 10NSync Avail Stlmnt (\$)	RTD Balancing 10-Minute Non-Synchronous Operating Reserves Availability Settlement (\$) is a number representing the settlement amount for availability of Balancing 10-Minute Non-Synchronous Operating Reserves Service for the given generator, for the given RTD interval.

6.2.1.2.4 Algorithm

RTD Bal 10NSync Avail Stlmnt (\$) is calculated as:

RTD Bal 10NSync Avail Stlmnt (\$) =

RTD Bal Sched 10NSync Avail (MWh) * RTD RT 10NSync Price

Where:

RTD Bal Sched 10NSync Avail (MWh) =

$[RTD RT Sched 10NSync Avail (MWh) - Hr DAM Sched 10NSync Avail (MWh)] \times RTD Interval$
 Seconds $\div 3600$

NOTE: The RTD RT 10NSync Price (\$/MW) is based on the given generator’s location within the NYISO AS pricing regions (Gen AS Pricing Region Ind): East or West (RTD RT 10NSync Price East (\$/MW), RTD RT 10NSync Price West (\$/MW)).

6.2.1.3 Additional Calculations

6.2.1.3.1 Hourly Settlement Totals

6.2.1.3.1.1 Determinants

Title	Business Description
RTD Bal Sched 10NSync Avail (MWh)	RTD Balancing Scheduled 10-Minute Non-Synchronous Operating Reserves Availability (MWh) is a number representing the amount of Balancing 10-Minute Non-Synchronous Operating Reserves Service the given generator is scheduled to provide for the given RTD interval. This is the net difference between RT and DAM 10-Minute Non-Synchronous Operating Reserves Availability (MWh) values
RTD Bal 10NSync Avail Stlmnt (\$)	RTD Balancing 10-Minute Non-Synchronous Operating Reserves Availability Settlement (\$) is a number representing the settlement amount for availability of Balancing 10-Minute Non-Synchronous Operating Reserves Service for the given generator, for the given RTD interval

6.2.1.3.1.2 Intermediates

None

6.2.1.3.1.3 Results

Title	Business Description
Hr Bal Sched 10NSync Avail (MWh)	Hourly Balancing Scheduled 10-Minute Non-Synchronous Operating Reserves Availability (MWh) is a number representing the amount of Balancing 10-Minute Non-Synchronous Operating Reserves Service the given generator is scheduled to provide for the given hour. This is the net difference between RT and DAM 10-Minute Non-Synchronous Operating Reserves Availability (MWh) values
Hr Bal 10NSync Avail Stlmnt (\$)	Hourly Balancing 10-Minute Non-Synchronous Operating Reserves Availability Settlement (\$) is a number representing the settlement amount for availability of Balancing 10-Minute Non-Synchronous Operating Reserves Service for the given generator, for the given hour.

6.2.1.3.1.4 Algorithm

Hr Bal Sched 10NSync Avail (MWh) is calculated as:

Hr Bal Sched 10NSync Avail (MWh) = \sum RTD Bal Sched 10NSync Avail (MWh) for all RTD intervals in the hour

And

Hr Bal 10NSync Avail Stlmnt (\$) is calculated as:

Hr Bal 10NSync Avail Stlmnt (\$) = \sum RTD Bal 10NSync Avail Stlmnt (\$) for all RTD intervals in the hour

6.2.1.3.2 Daily Settlement Totals

6.2.1.3.2.1 Determinants

Title	Business Description
Hr Bal Sched 10NSync Avail (MWh)	Hourly Balancing Scheduled 10-Minute Non-Synchronous Operating Reserves Availability (MWh) is a number representing the amount of Balancing 10-Minute Non-Synchronous Operating Reserves Service the given generator is scheduled to provide for the given hour. This is the net difference between RT and DAM 10-Minute Non-Synchronous Operating Reserves Availability (MWh) values
Hr Bal 10NSync Avail Stlmnt (\$)	Hourly Balancing 10-Minute Non-Synchronous Operating Reserves Availability Settlement (\$) is a number representing the settlement amount for availability of Balancing 10-Minute Non-Synchronous Operating Reserves Service for the given generator, for the given hour.

6.2.1.3.2.2 Intermediates

None

6.2.1.3.2.3 Results

Title	Business Description
Day Bal Sched 10NSync Avail (MWh)	Daily Balancing Scheduled 10-Minute Non-Synchronous Operating Reserves Availability (MWh) is a number representing the amount of Balancing 10-Minute Non-Synchronous Operating Reserves Service the given generator is scheduled to provide for the given day. This is the net difference between RT and DAM 10-Minute Non-Synchronous Operating Reserves Availability (MWh) values.
Day Bal 10NSync Avail Stlmnt (\$)	Daily Balancing 10-Minute Non-Synchronous Operating Reserves Availability Settlement (\$) is a number representing the settlement amount for availability of Balancing 10-Minute Non-Synchronous Operating Reserves Service for the given generator, for the given day.

6.2.1.3.2.4 Algorithm

Day Bal Sched 10NSync Avail (MWh) is calculated as:

Day Bal Sched 10NSync Avail (MWh) = \sum Hr Bal Sched 10NSync Avail (MWh) for all hours in the day.

And

Day Bal 10NSync Avail Stlmnt (\$) is calculated as:

Day Bal 10NSync Avail Stlmnt (\$) = \sum Hr Bal 10NSync Avail Stlmnt (\$) for all hours in the day.

7. Balancing 30-Minute Reserve

7.1. Description

The Balancing 30-Minute Reserve settlement is intended to compensate Power Suppliers who offer their generator’s capacity as 30-Minute Reserve Service to the NYISO in the Real Time (RT) Market.

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The Balancing 30-Minute Reserve settlement is based upon the Balancing 30-Minute Reserve Service capacity scheduled for the generator and the corresponding RT 30-Minute Reserve Market Clearing Price (MCP). The Balancing 30-Minute Reserve Service capacity scheduled is the net of the generator’s RT and DAM 30-Minute Reserve Service schedules. It is determined at the RTD level for each generator scheduled to provide this service in the DAM or real time.

Power Suppliers that qualify to participate in the 30-Minute Reserve market in the RT market will have 30-Minute Reserve bids based upon their Upper Operating Limit (UOL) and are given an availability bid of \$0. Any lost opportunity costs (LOC) are incorporated into the MCP.

Power Suppliers offering their generators into NYISO’s DAM 30-Minute Reserve Service market must be capable of providing that reserve energy within 30-minutes following commitment by RTC.

7.2. Business Rules

7.2.1 Core Settlement

7.2.1.1 Eligibility

Generators will have a Balancing 30-Minute Reserve Settlement (\$) if the following condition exists:

- The generator is scheduled to provide such service in the DAM or RT market

7.2.1.2 Required Data Elements

7.2.1.2.1 Determinants

Title	Business Description
Gen AS Pricing Region Ind	Generator Ancillary Service Pricing Region Indicator represents whether the given generator is located in the NYISO East or West Ancillary Service Pricing Region.
RTD Interval Seconds	RTD Interval Seconds is a number representing the number of seconds in the RTD interval
RTD RT 30Min Price East (\$/MW)	RTD Real Time 30-Minute Operating Reserves Price East (\$/MW) is a number representing the east real time market clearing price for RT 30-Minute Operating Reserves service based on the set of generators in the East Ancillary Service Pricing Region selected by RTD.
RTD RT 30Min Price West (\$/MW)	RTD Real Time 30-Minute Operating Reserves Price West (\$/MW) is a number representing the west hourly market clearing price for RT 30-Minute Operating Reserves service based on the set of generators in the West Ancillary Service Pricing Region selected by RTD.
Hr DAM Sched 30Min Avail (MWh)	Hourly Day Ahead Market Scheduled 30-Minute Operating Reserves Availability (MWh) is a number representing the amount of Day Ahead Market 30-Minute Operating Reserves service the given generator is scheduled to provide for the hour containing the given RTD interval.
RTD RT Sched 30Min Avail (MWh)	RTD Real Time Market Scheduled 30-Minute Operating Reserves Availability (MWh) is a number representing the amount of Real Time Market 30-Minute Operating Reserves service the given generator is scheduled to provide for the given RTD interval.

7.2.1.2.2 Intermediates

Title	Business Description
RTD Bal Sched 30Min Avail (MWh)	RTD Balancing Scheduled 30-Minute Operating Reserves Availability (MWh) is a number representing the amount of Balancing 30-Minute Operating Reserves Service the given generator is scheduled to provide for the given RTD interval. This is the net difference between RT and DAM 30-Minute Operating Reserves Availability (MWh) values.

7.2.1.2.3 Results

Title	Business Description
RTD Bal 30Min Avail Stlmnt (\$)	RTD Balancing 30-Minute Operating Reserves Availability Settlement (\$) is a number representing the settlement amount for availability of Balancing 30-Minute Operating Reserves Service for the given generator, for the given RTD interval.

7.2.1.2.4 Algorithm

RTD Bal 30Min Avail Stlmnt (\$) is calculated as:

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RTD Bal 30Min Avail Stlmnt (\$) =

RTD Bal Sched 30Min Avail (MWh) * RTD RT 30Min Price

Where:

RTD Bal Sched 30Min Avail (MWh) =

[RTD RT Sched 30Min Avail (MWh) - Hr DAM Sched 30Min Avail (MWh)] × RTD Interval Seconds ÷ 3600

NOTE: The RTD RT 30Min Price (\$/MW) is based on the given generator’s location within the NYISO AS pricing regions (Gen AS Pricing Region Ind): East or West (RTD RT 30Min Price East (\$/MW), RTD RT 30Min Price West (\$/MW)).

7.2.1.3 Additional Calculations

7.2.1.3.1 Hourly Settlement Totals

7.2.1.3.1.1 Determinants

Title	Business Description
RTD Bal Sched 30Min Avail (MWh)	RTD Balancing Scheduled 30-Minute Operating Reserves Availability (MWh) is a number representing the amount of Balancing 30-Minute Operating Reserves Service the given generator is scheduled to provide for the given RTD interval. This is the net difference between RT and DAM 30-Minute Operating Reserves Availability (MWh) values
RTD Bal 30Min Avail Stlmnt (\$)	RTD Balancing 30-Minute Operating Reserves Availability Settlement (\$) is a number representing the settlement amount for availability of Balancing 30-Minute Operating Reserves Service for the given generator, for the given RTD interval

7.2.1.3.1.2 Intermediates

None

7.2.1.3.1.3 Results

Title	Business Description
Hr Bal Sched 30Min Avail (MWh)	Hourly Balancing Scheduled 30-Minute Operating Reserves Availability (MWh) is a number representing the amount of Balancing 30-Minute Operating Reserves Service the given generator is scheduled to provide for the given hour. This is the net difference between RT and DAM 30-Minute Operating Reserves Availability (MWh) values
Hr Bal 30Min Avail Stlmnt (\$)	Hourly Balancing 30-Minute Operating Reserves Availability Settlement (\$) is a number representing the settlement amount for availability of Balancing 30-Minute Operating Reserves Service for the given generator, for the given hour.

7.2.1.3.1.4 Algorithm

Hr Bal Sched 30Min Avail (MWh) is calculated as:

Hr Bal Sched 30Min Avail (MWh) = \sum RTD Bal Sched 30Min Avail (MWh) for all RTD intervals in the hour

And

Hr Bal 30Min Avail Stlmnt (\$) is calculated as:

Hr Bal 30Min Avail Stlmnt (\$) = \sum RTD Bal 30Min Avail Stlmnt (\$) for all RTD intervals in the hour

7.2.1.3.2 Daily Settlement Totals

7.2.1.3.2.1 Determinants

Title	Business Description
Hr Bal Sched 30Min Avail (MWh)	Hourly Balancing Scheduled 30-Minute Operating Reserves Availability (MWh) is a number representing the amount of Balancing 30-Minute Operating Reserves Service the given generator is scheduled to provide for the given hour. This is the net difference between RT and DAM 30-Minute Operating Reserves Availability (MWh) values
Hr Bal 30Min Avail Stlmnt (\$)	Hourly Balancing 30-Minute Operating Reserves Availability Settlement (\$) is a number representing the settlement amount for availability of Balancing 30-Minute Operating Reserves Service for the given generator, for the given hour.

7.2.1.3.2.2 Intermediates

None

7.2.1.3.2.3 Results

Title	Business Description
Day Bal Sched 30Min Avail (MWh)	Daily Balancing Scheduled 30-Minute Operating Reserves Availability (MWh) is a number representing the amount of Balancing 30-Minute Operating Reserves Service the given generator is scheduled to provide for the given day. This is the net difference between RT and DAM 30-Minute Operating Reserves Availability (MWh) values.
Day Bal 30Min Avail Stlmnt (\$)	Daily Balancing 30-Minute Operating Reserves Availability Settlement (\$) is a number representing the settlement amount for availability of Balancing 30-Minute Operating Reserves Service for the given generator, for the given day.

7.2.1.3.2.4 Algorithm

Day Bal Sched 30Min Avail (MWh) is calculated as:

Day Bal Sched 30Min Avail (MWh) = \sum Hr Bal Sched 30Min Avail (MWh) for all hours in the day.

And

Day Bal 30Min Avail Stlmnt (\$) is calculated as:

Day Bal 30Min Avail Stlmnt (\$) = \sum Hr Bal 30Min Avail Stlmnt (\$) for all hours in the day.

8. DAM NYCA Supplier Regulation Service

8.1. Description

The Day Ahead Market (DAM) Regulation Service Availability settlement is intended to compensate Power Suppliers who offer their generator’s capacity as Regulation Service to the NYISO in the DAM.

The purpose for Regulation & Frequency Response Service is to ensure sufficient capacity to balance supply with system demand during real time operation and to assist in maintaining scheduled Interconnection frequency at 60 hertz. Regulation Service is accomplished by committing on-line generators whose outputs are increased or decreased, predominately through the use of Automatic Generation Control (AGC), as necessary to follow changes in system load. Generators are not obligated to provide Regulation Service unless they have been offered to the market and scheduled by the NYISO to supply the service.

The DAM Regulation Service Availability settlement is based upon the Regulation Service capacity scheduled for the generator and the corresponding DAM Regulation Service Market Clearing Price (MCP). It is determined at the hourly-level for each generator scheduled to provide this service in the DAM.

Power Suppliers offering their generators into NYISO’s DAM Regulation Service market must be capable of providing that regulation and frequency response energy adjustments in the given regulation interval (~6 seconds).

8.2. Business Rules

8.2.1 Core Settlement

8.2.1.1 Eligibility

Generators scheduled in the NYISO Day Ahead Market (DAM) Regulation and Frequency Response Service market are eligible to receive the DAM Regulation and Frequency Response Service Availability settlement.

$$\text{Hr DAM Sched Reg Avail (MWh)} > 0$$

8.2.1.2 Required Data Elements

8.2.1.2.1 Determinants

Title	Business Description
Hr DAM Reg Price (\$/MW)	Hourly Day Ahead Market Regulation Price (\$/MW) is a number representing the hourly market clearing price for the DAM regulation service being provided by generators in the NYISO control area.
Hr DAM Sched Reg Avail (MWh)	Hourly Day Ahead Market Scheduled Regulation Availability (MWh) is a number representing the amount of regulation availability scheduled by the NYISO for the given generator in the Day Ahead Market for the given hour.

8.2.1.2.2 Intermediates

None

8.2.1.2.3 Results

Title	Business Description
Hr DAM Reg Avail Stlmnt (\$)	Hourly Day Ahead Market Regulation Availability Settlement (\$) is a number representing the BAS-determined DAM regulation settlement for the generator for the hour.

8.2.1.2.4 Algorithm

Hr DAM Reg Avail Stlmnt (\$) is calculated as:

$$\text{Hr DAM Reg Avail Stlmnt (\$)} = \text{Hr DAM Sched Reg Avail (MWh)} \times \text{Hr DAM Reg Price (\$/MW)}$$

8.2.1.1 Additional Calculations

8.2.1.1.1 Daily Settlement Totals

8.2.1.1.1.1 Determinants

Title	Business Description
Hr DAM Reg Avail Stlmnt (\$)	Hourly Day Ahead Market Regulation Availability Settlement (\$) is a number representing the BAS-determined DAM regulation settlement for the generator for the hour.

8.2.1.1.1.2 Intermediates

None

8.2.1.1.1.2 Results

Title	Business Description
Day DAM Reg Avail Stlmnt (\$)	Daily Day Ahead Market Regulation Availability Settlement (\$) is a number representing the BAS-determined DAM regulation settlement for the generator for the day.

8.2.1.1.1.3 Algorithm

Day DAM Reg Avail Stlmnt (\$) is calculated as:

$$\text{Day DAM Reg Avail Stlmnt (\$)} = \sum \text{Hr DAM Reg Avail Stlmnt (\$)} \text{ for all hours in the given day.}$$

9. Balancing Regulation Service

9.1. Description

The Balancing Regulation Service Availability settlement is intended to compensate Power Suppliers who offer their generator’s capacity as Regulation Service to the NYISO via the Real Time (RT) Market.

The purpose for Regulation Service is to ensure sufficient capacity to balance supply with system demand during real time operation and to assist in maintaining scheduled Interconnection frequency at 60 hertz. Regulation Service is accomplished by committing on-line generators whose outputs are increased or decreased, predominately through the use of Automatic Generation Control (AGC), as necessary to follow changes in system load. Generators are not obligated to provide Regulation Service unless they have been offered to the market and scheduled by the NYISO to supply the service.

The Balancing Regulation Service Availability settlement is based upon the Regulation Service capacity scheduled for the generator, the corresponding RT Regulation Service Market Clearing Price (MCP), and any required adjustment due to generator non-performance (see below). It is determined at the RTD level for each generator scheduled to provide this service in the balancing regulation market.

Power Suppliers offering their generators into NYISO’s Balancing Regulation Service market must be capable of providing that regulation energy adjustments in the given regulation interval (~6 seconds).

9.2. Business Rules

9.2.1 Core Settlement

9.2.1.1 Eligibility

Generators scheduled in the NYISO Day Ahead or Real Time Regulation Service market are eligible to receive the Balancing Regulation Service Availability settlement.

9.2.1.2 Required Data Elements

9.2.1.2.1 Determinants

Title	Business Description
RTD Interval Seconds	RTD Interval Seconds is a number representing the number of seconds in the RTD interval.
RTD RT Reg Price (\$/MW)	RTD Real Time Regulation Price (\$/MW) is a number representing the real time market clearing price for the RT regulation service being provided by generators in the NYISO control area.
Hr DAM Sched Reg Avail (MWh)	Hourly Day Ahead Market Scheduled Regulation Availability (MWh) is a number representing the amount of regulation availability scheduled by the NYISO for the given generator in the Day Ahead Market for the given hour.
RTD RT Sched Reg Avail (MW)	RTD Real Time Scheduled Regulation Availability (MWh) is a number representing the amount of regulation availability scheduled by the NYISO for the given generator by RTD for the given RTD interval.
RTD Performance Index	RTD Performance Index is a number representing a measurement of regulation performance as calculated by the NYISO Performance Tracking System (values are between 0 and 1).

9.2.1.2.2 Intermediates

Title	Business Description
RTD Bal Sched Reg Avail (MWh)	RTD Balancing Scheduled Regulation Availability (MWh) is a number representing the amount of balancing regulation availability scheduled by the NYISO for the given generator by RTD, for the given RTD interval.

9.2.1.2.3 Results

Title	Business Description
RTD Bal Reg Avail Stlmt (\$)	RTD Balancing Regulation Availability Settlement (\$) is a number representing the BAS-determined supplemental regulation settlement for the generator for the RTD interval.

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9.2.1.2.4 Algorithm

RTD Bal Reg Avail Stlmnt (\$) is calculated as:

$$\text{RTD Bal Reg Avail Stlmnt (\$)} = \text{RTD Bal Sched Reg Avail (MWh)} \times \text{RTD RT Reg Price (\$/MW)}$$

Where:

$$\text{RTD Bal Sched Reg Avail (MWh)} = [(\text{RTD RT Sched Reg Avail (MW)} \times \text{RTD Performance Index}) - \text{Hr DAM Sched Reg Avail (MWh)}] \times \text{RTD Interval Seconds} \div 3600$$

9.2.1.3 Additional Calculations

9.2.1.3.1 Hourly Settlement Totals

9.2.1.3.1.1 Determinants

Title	Business Description
RTD Bal Sched Reg Avail (MWh)	RTD Balancing Scheduled Regulation Availability (MWh) is a number representing the amount of balancing regulation availability scheduled by the NYISO for the given generator by RTD, for the given RTD interval.
RTD Bal Reg Avail Stlmnt (\$)	RTD Balancing Regulation Availability Settlement (\$) is a number representing the BAS-determined supplemental regulation settlement for the generator for the RTD interval.

9.2.1.3.1.2 Intermediates

None

9.2.1.3.2 Results

Title	Business Description
Hr Bal Sched Reg Avail (MWh)	Hourly Balancing Scheduled Regulation Availability (MWh) is a number representing the amount of balancing regulation availability scheduled by the NYISO for the given generator for the given hour.
Hr Bal Reg Avail Stlmnt (\$)	Hourly Balancing Regulation Availability Settlement (\$) is a number representing the BAS-determined supplemental regulation settlement for the generator for the hour.

9.2.1.3.3 Algorithm

Hr Bal Sched Reg Avail (MWh) is calculated as:

$$\sum \text{RTD Bal Sched Reg Avail (MWh) for all RTD intervals in the given hour.}$$

Hr Bal Reg Avail Stlmnt (\$) is calculated as:

$$\sum \text{RTD Bal Reg Avail Stlmnt (\$) for all RTD intervals in the given hour.}$$

9.2.1.3.4 Daily Settlement Totals

9.2.1.3.4.1 Determinants

Title	Business Description
Hr Bal Sched Reg Avail (MWh)	Hourly Balancing Scheduled Regulation Availability (MWh) is a number representing the amount of balancing regulation availability scheduled by the NYISO for the given generator for the given hour.
Hr Bal Reg Avail Stlmnt (\$)	Hourly Balancing Regulation Availability Settlement (\$) is a number representing the BAS-determined supplemental regulation settlement for the generator for the hour.

9.2.1.3.4.2 Intermediates

None

9.2.1.3.5 Results

Title	Business Description
Day Bal Sched Reg Avail (MWh)	Daily Balancing Scheduled Regulation Availability (MWh) is a number representing the amount of balancing regulation availability scheduled by the NYISO for the given generator for the given day.
Day Bal Reg Avail Stlmnt (\$)	Daily Balancing Regulation Availability Settlement (\$) is a number representing the BAS-determined supplemental regulation settlement for the generator for the day.

9.2.1.3.6 Algorithm

Day Bal Sched Reg Avail (MWh) is calculated as:

$$\sum \text{Hr Bal Sched Reg Avail (MWh) for all hours in the given day.}$$

Day Bal Reg Avail Stlmnt (\$) is calculated as:

$$\sum \text{Hr Bal Reg Avail Stlmnt ($) for all hours in the given day.}$$

10. Regulation Revenue Adjustments for Regulation Units

10.1. Description

The Regulation Revenue Adjustment (\$) is intended to properly compensate Power Suppliers for balancing energy if they are also providing Regulation Service in the real-time market.

Regulating units will settle for balancing energy at the lesser of the average AGC basepoint or actual output. In addition, the unit will receive or pay a Regulation Revenue Adjustment (RRA), which insures that the unit receives full compensation for energy produced or that the ISO does not overpay the unit for energy reserve and paid for in the Regulation market.

Whether the RRA becomes a charge or payment is dependent on two conditions;

1. The relationship of the lesser of the AGC basepoint or actual to the RTD basepoint and
2. The relationship of the LBMP to the unit bid.

10.2. Business Rules

10.2.1 Core Settlement

10.2.1.1 Eligibility

Power Suppliers will be eligible for RRA under the rules described in this document if the following conditions exist:

- The unit is Flexible with a real-time energy schedule from RTD
- The unit has received a real-time schedule for Regulation Service from RTD.

10.2.1.2 Required Data Elements

10.2.1.2.1 Determinants

Title	Business Description
RTD Avg AGC Basepoint (MW)	Average Automatic Generation Control Basepoint is a number representing the arithmetic average of a given generator's AGC basepoints during a given RTD interval.
RTD Basepoint (MW)	Real Time Dispatch Basepoint (MW) is a number representing the average amount of energy scheduled by the NYISO during the real time dispatch for the generator, calculated over nominal 5-minute time intervals communicated to support generation dispatch.
RTD Gen Adjusted Energy (MW)	Real Time Dispatch generator Adjusted Energy (MW) is a number representing the BAS determined output of the generator for the interval. It is calculated by allocating Hourly Gen Meter Energy (MWh) provided by the Transmission Owners to the RTD level based upon Average Actual (MW) (captured for NYISO SCADA and integrated by PTS).
RTD Interval Seconds	RTD Interval Seconds is a number representing the number of seconds in the RTD interval.
RTD RT Energy Price: Gen (\$/MW)	Real Time Energy Price: Generator (\$/MW) is a number representing the price of energy at the generator bus (LBMP energy component).
RTD RT Loss Price: Gen (\$/MW)	Real Time Loss Price: Generator (\$/MW) is a number representing the price of losses at the generator bus (LBMP loss component)
RTD RT Cong	Real Time Congestion Price: Generator (\$/MW) is a number representing the price of congestion at the generator bus (LBMP

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Price: Gen (\$/MW)	congestion component)
Hr RT Gen Bid: Gen n (MW)	Real Time Market Generator Bid: Generation n (MW) is a number representing the amount of generation (MW) bid in the <i>n</i> th block, submitted by the Generator in the generation bid.
Hr RT Gen Bid: Price n (\$/MWh)	Real Time Generator Bid: Price n (\$/MWh) is a number represent the bid price of generation (\$/MWh) bid in the <i>n</i> th block, submitted by the Generator in the generation bid.

10.2.1.2.2 Intermediates

Title	Business Description
RTD RT Total Price: Gen (\$/MWh)	Real Time Total Price: Generator (\$/MWh) is a number representing the total LBMP price of a generator bus.

10.2.1.2.3 Results

Title	Business Description
RTD RRA: Gen (\$)	Regulation Revenue Adjustment: Gen (\$) is a number representing an additional payment or charge made to power suppliers that are regulating in the real time market.

10.2.1.2.4 Algorithm

If:

Avg AGC Basepoint (MW) > RTD Basepoint (MW): Gen

Then:

RTD RRA: Gen (\$) is defined as:

The area bounded by:

- A vertical line at RTD Basepoint (MW)
- A vertical line at the maximum of RTD Basepoint (MW) or lesser of Avg AGC Basepoint (MW) or RTD Gen Adjusted Energy (MW)
- A horizontal line at RTD RT Total Price: Gen (\$/MWh)
- The bid curve

Else:

RTD RRA: Gen (\$) is defined as:

The negative of the area bounded by:

- A vertical line at the minimum of RTD Basepoint (MW) or greater of Avg AGC Basepoint (MW) or RTD Gen Adjusted Energy (MW)
- A vertical line at RTD Basepoint (MW)
- A horizontal line at RTD RT Total Price: Gen (\$/MWh)
- The bid curve

Where:

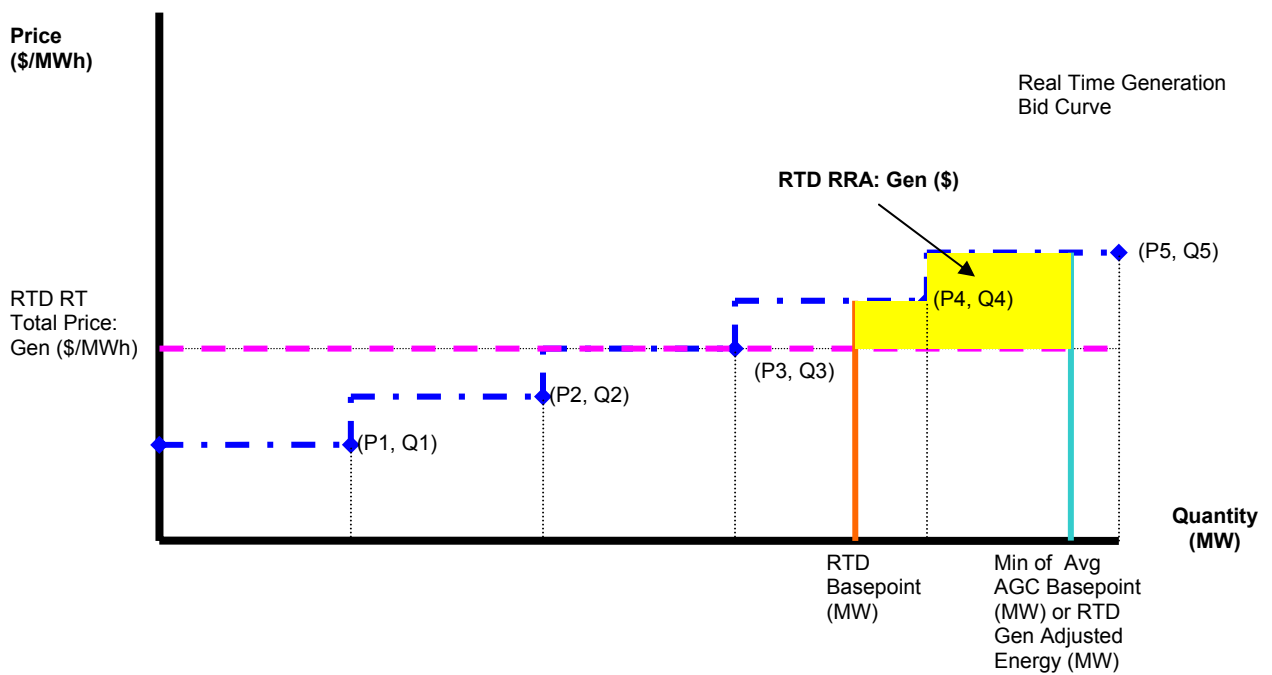
RTD RT Total Price: Gen = RTD RT Energy Price: Gen (\$/MW) + RTD RT Loss Price: Gen (\$/MW) + RTD RT Cong Price: Gen (\$/MW)

This is illustrated by the following examples where:

$Q_n = \text{Hr RT Gen Bid: Gen } n \text{ (MW)}$

$P_n = \text{Hr RT Gen Bid: Price } n \text{ ($/MWh)}$

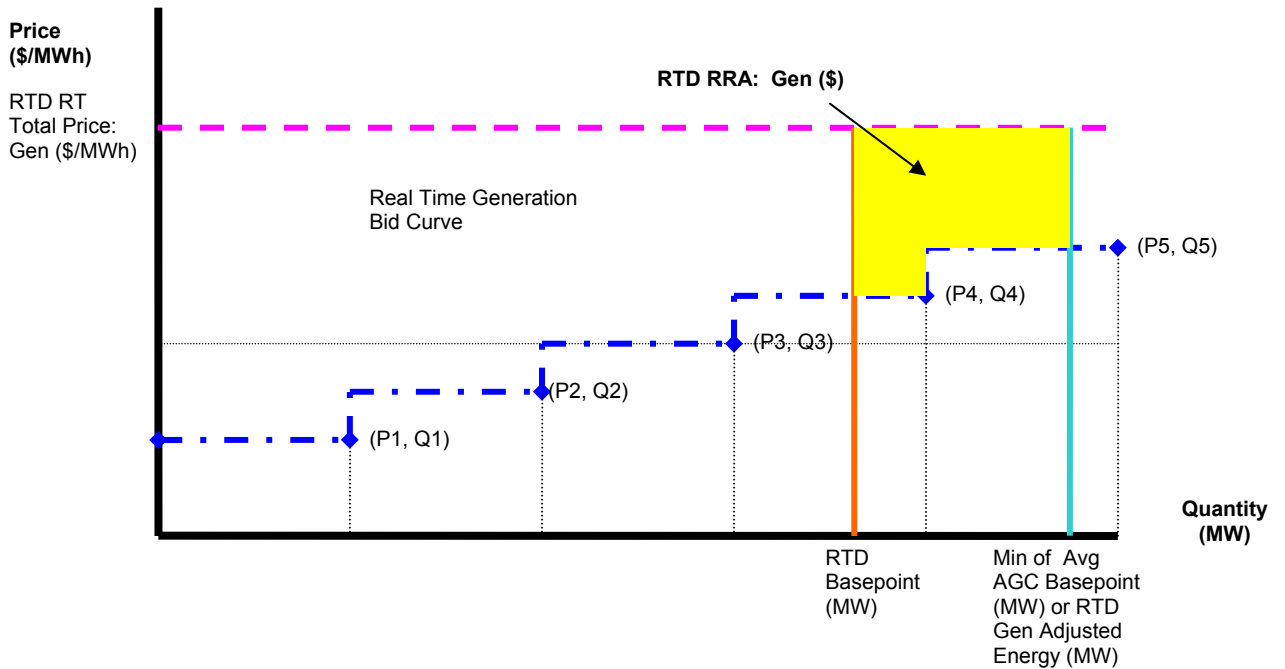
Example 1: If the RTD Basepoint is less than the Avg AGC Basepoint and RTD RT Total Price: Gen (\$/MWh) is less than the bid, the RRA will be a payment to the generator, illustrated as follows:



$$\text{RTD RRA: Gen (\$)} = \{ [(Q4 - \text{RTD Basepoint (MW)}) * (P4 - \text{RTD RT Total Price: Gen (\$/MWh)})] \\
 + [(\text{Min(Avg AGC Basepoint (MW))} - Q4) * (P5 - \text{RTD RT Total Price: Gen (\$/MWh)})] \} * \text{RTD Interval Seconds}/3600$$

In this case, the result will be a positive number or a payment to the generator.

Example 2: If the RTD Basepoint is less than the Avg AGC Basepoint and the RTD RT Total Price: Gen (\$/MWh) is greater than the bid, the RRA will be a charge to the generator, illustrated as follows:



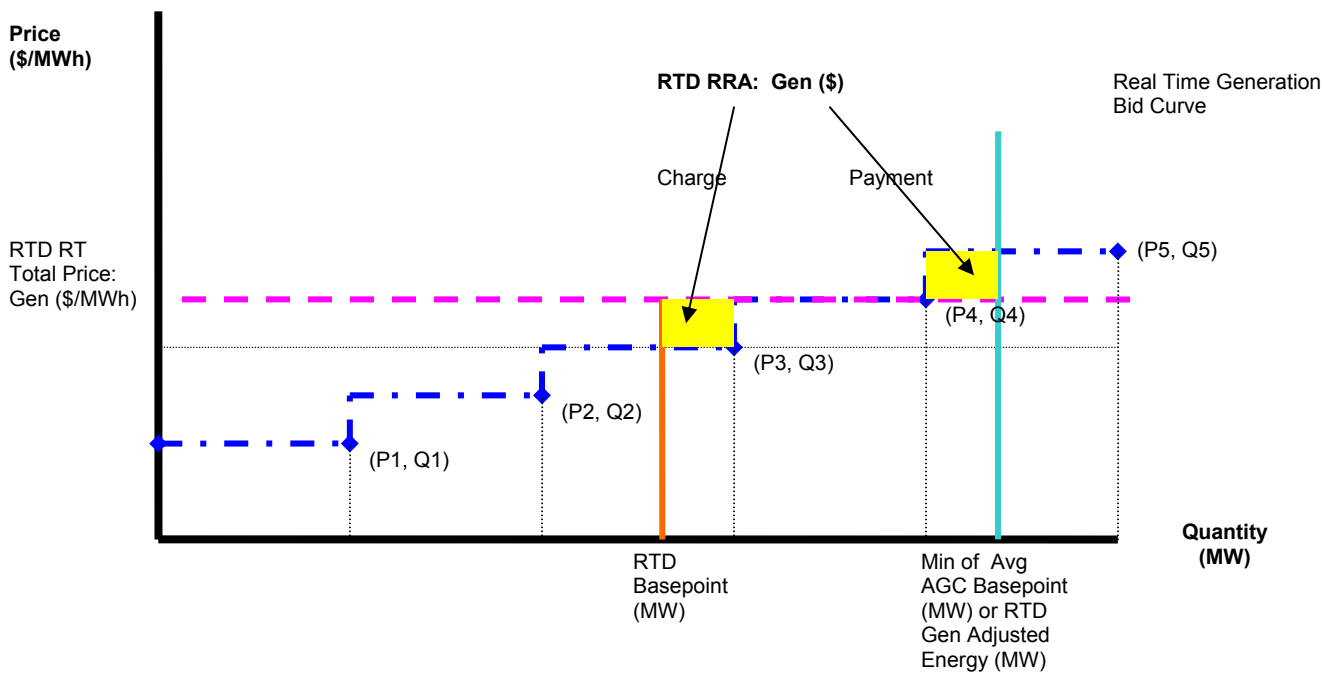
$$\text{RTD RRA: Gen (\$)} = \{[(Q4 - \text{RTD Basepoint (MW)}) * (P4 - \text{RTD RT Total Price: Gen (\$/MWh)})]\}$$

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$$+ \left[(\text{Min}(\text{Avg AGC Basepoint (MW)}) - Q4) * (P5 - \text{RTD RT Total Price: Gen (\$/MWh)}) \right] * \text{RTD Interval Seconds}/3600$$

In this case, the result will be a negative number or a charge to the generator.

Example 3: If the RTD Basepoint is less than the Avg AGC Basepoint and the RTD RT Total Price: Gen (\$/MWh) is greater than the bid over part of the curve and RTD RT Total Price: Gen (\$/MWh) is less than the bid over part of the curve, the RRA may be a payment or a charge to the generator, illustrated as follows:

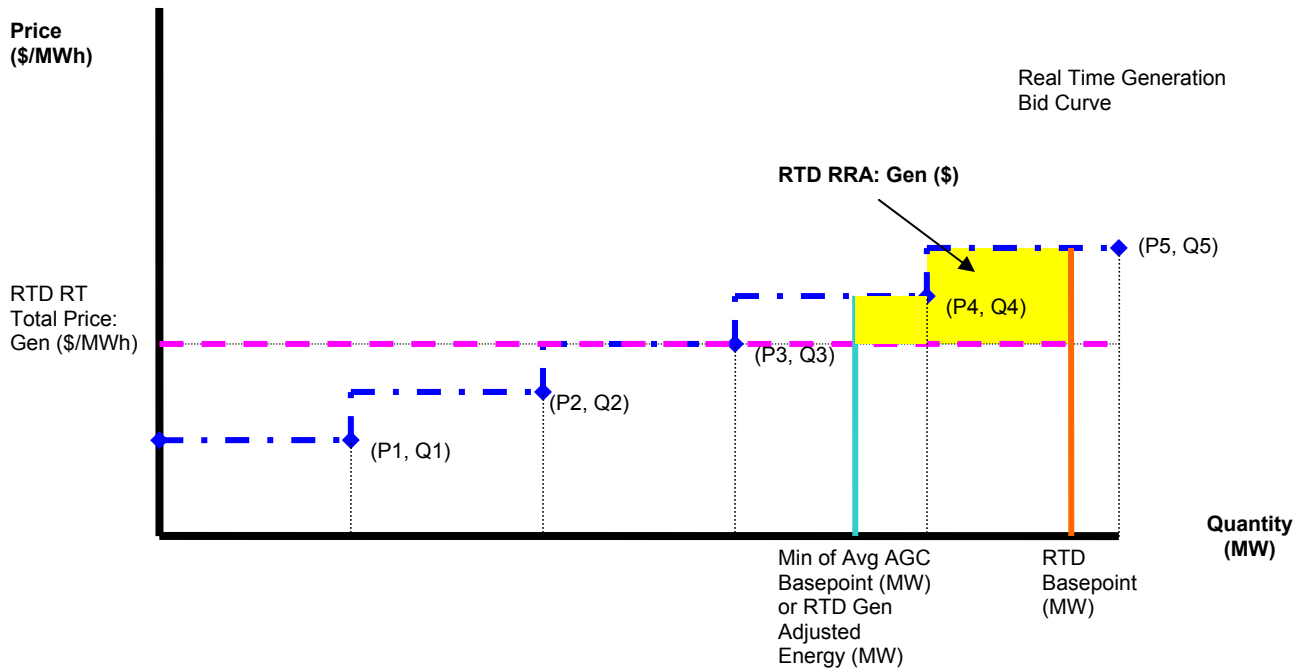


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$$\text{RTD RRA: Gen (\$)} = \{[(Q3 - \text{RTD Basepoint (MW)}) * (P3 - \text{RTD RT Total Price: Gen (\$/MWh)})] + [(\text{Min(Avg AGC Basepoint (MW))} - Q4) * (P5 - \text{RTD RT Total Price: Gen (\$/MWh)})]\} * \text{RTD Interval Seconds}/3600$$

In this case, the result will be a positive or negative number representing a payment or charge to the generator.

Example 4: If the RTD Basepoint is greater than the Avg AGC Basepoint and the RTD RT Total Price: Gen (\$/MWh) is less than the bid, the RRA will be a charge to the generator, illustrated as follows:



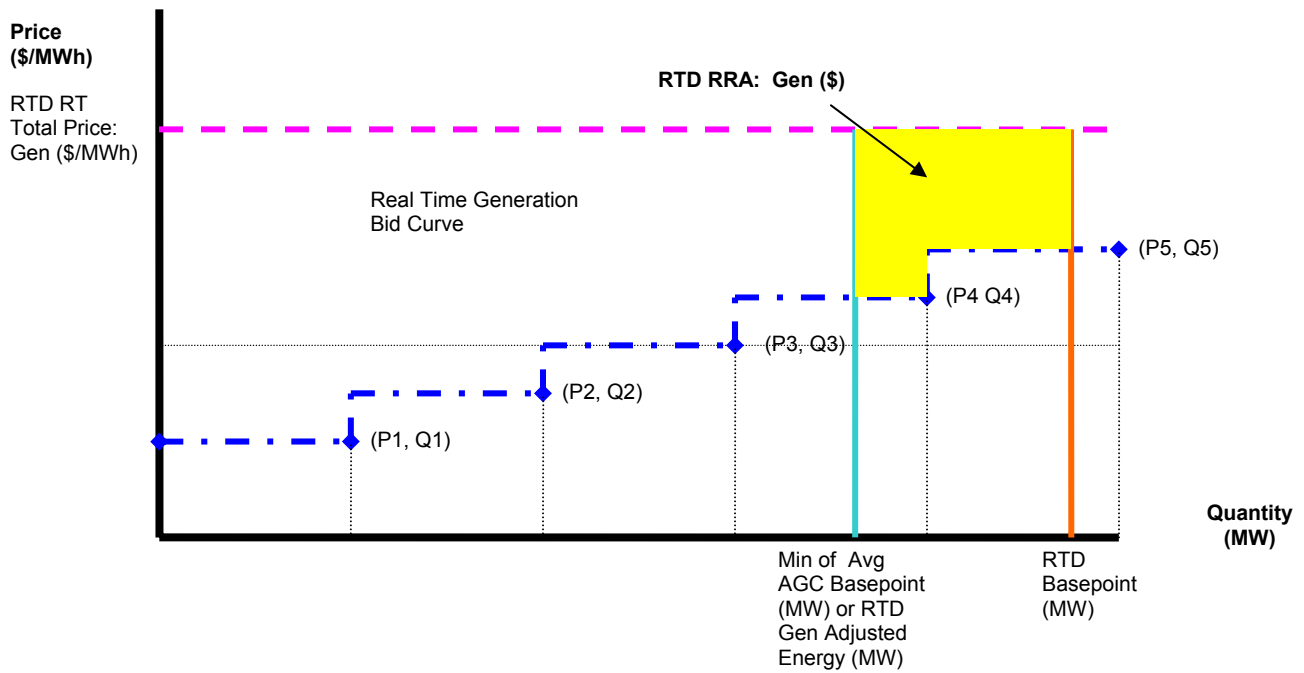
$$\text{RTD RRA: Gen (\$)} = \{[(Q4 - \text{RTD Basepoint (MW)}) * (P5 - \text{RTD RT Total Price: Gen (\$/MWh)})]\}$$

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$$+ \left[(\text{Min}(\text{ Avg AGC Basepoint (MW)}) - Q4) * (\text{P4} - \text{RTD RT Total Price: Gen (\$/MWh)}) \right] * \text{RTD Interval Seconds}/3600$$

In this case, the result will be a negative number or a charge to the generator.

Example 5: If RTD Basepoint is greater than the Avg AGC Basepoint and the RTD RT Total Price: Gen (\$/MWh) is greater than the bid, the RRA will be a payment to the generator, illustrated as follows:

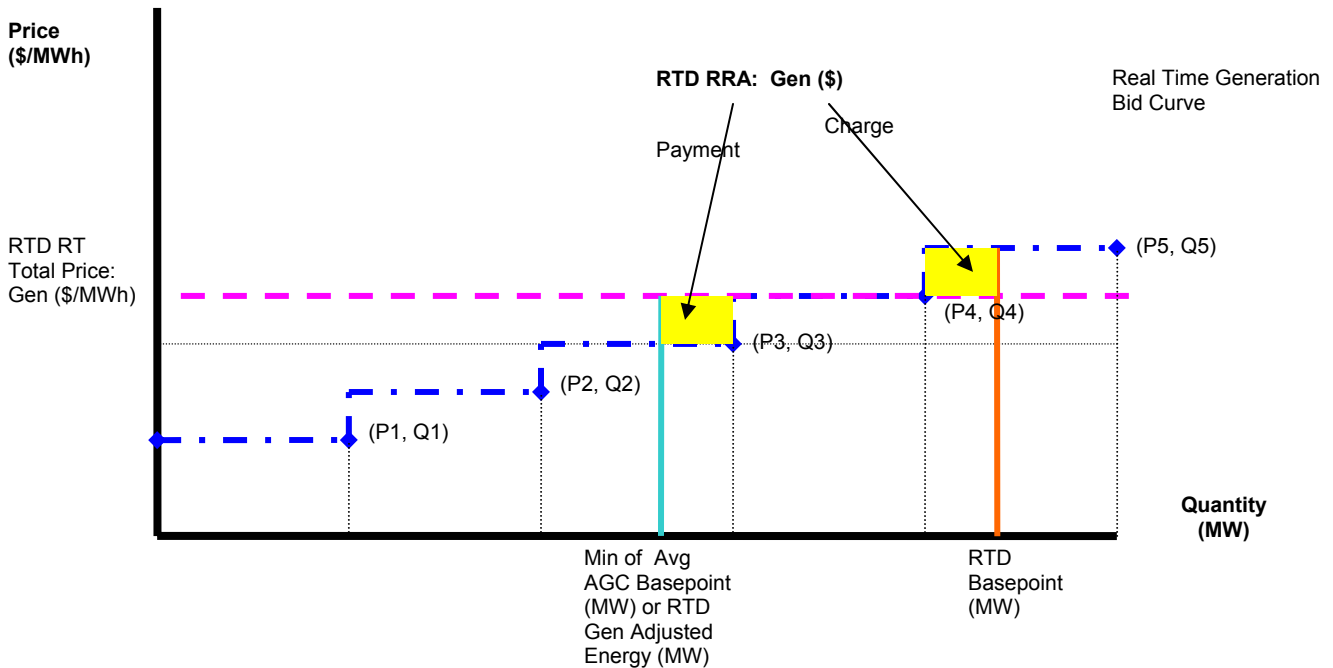


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$$\text{RTD RRA: Gen (\$)} = \{[(Q4 - \text{RTD Basepoint (MW)}) * (P5 - \text{RTD RT Total Price: Gen (\$/MWh)})] + [(\text{Min(Avg AGC Basepoint (MW))} - Q4) * (P4 - \text{RTD RT Total Price: Gen (\$/MWh)})]\} * \text{RTD Interval Seconds}/3600$$

In this case, the result will be a positive number or a payment to the generator.

Example 6: If RTD Basepoint is greater than the Avg AGC Basepoint and the RTD RT Total Price: Gen (\$/MWh) is greater than the bid over part of the curve and RTD RT Total Price: Gen (\$/MWh) is less than the bid over part of the curve, the RRA may be a payment or a charge to the generator, illustrated as follows:



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$$\text{RTD RRA: Gen (\$)} = \{[(Q4 - \text{RTD Basepoint (MW)}) * (P5 - \text{RTD RT Total Price: Gen (\$/MWh)})] + [(Min(\text{Avg AGC Basepoint (MW)}) - Q3) * (P3 - \text{RTD RT Total Price: Gen (\$/MWh)})]\} * \text{RTD Interval Seconds}/3600$$

In this case, the result will be a positive or negative number representing a payment or charge to the generator.

10.2.1.3 Additional Calculations

10.2.1.3.1 Hourly Settlement Totals

10.2.1.3.1.1 Determinants

Title	Business Description
RTD RRA: Gen (\$)	Regulation Revenue Adjustment: Gen (\$) is a number representing an additional payment or charge made to power suppliers that are regulating in the real time market.

10.2.1.3.1.2 Intermediates

None (P1, Q1)

10.2.1.3.2 Results

Title	Business Description
Hr RRA: Gen (\$)	Regulation Revenue Adjustment: Gen (\$) is a number representing an additional payment or charge made to power suppliers that are regulating in the real time market.

10.2.1.3.3 Algorithm

Hr RRA: Gen (\$) = \sum RTD RRA: Gen (\$) for all RTD intervals in the given hour.

10.2.1.3.4 Daily Settlement Totals

10.2.1.3.4.1 Determinants

Title	Business Description
Hr RRA: Gen (\$)	Regulation Revenue Adjustment: Gen (\$) is a number representing an additional payment or charge made to power suppliers that are regulating in the real time market.

10.2.1.3.4.2 Intermediates

None

10.2.1.3.5 Results

Title	Business Description
Day RRA: Gen	Regulation Revenue Adjustment: Gen (\$) is a number representing an additional payment or charge made to power suppliers that are

(\$)	regulating in the real time market.
------	-------------------------------------

10.2.1.3.6 Algorithm

Day RRA: Gen (\$) = \sum Hr RRA: Gen (\$) for all hours in the given day.

11. Determination of a Supplier’s Economic Operating Point

11.1. Description

A unit’s Economic Operating Point (EOP) is required in the calculation of real-time Bid Production Cost Guarantee (BPCG) payments and Day Ahead Margin Assurance Payments (DAMAP). The EOP is defined as the point where the real-time LBMP intersects the Supplier’s bid cost curve.

11.2. Business Rules

11.2.1 Core Settlement

11.2.1.1 Eligibility

This calculation is only used for unit’s eligible for real-time BPCG payments or DAMAP.

11.2.1.2 Required Data Elements

11.2.1.2.1 Determinants

Title	Business Description
RTD RT Energy Price: Gen (\$/MW)	Real Time Energy Price: Generator (\$/MW) is a number representing the price of energy at the generator bus (LBMP energy component).
RTD RT Loss Price: Gen (\$/MW)	Real Time Loss Price: Generator (\$/MW) is a number representing the price of losses at the generator bus (LBMP loss component)
RTD RT Cong Price: Gen (\$/MW)	Real Time Congestion Price: Generator (\$/MW) is a number representing the price of congestion at the generator bus (LBMP congestion component)
Hr RT Gen Bid: Gen n (MW)	Real Time Market Generator Bid: Generation n (MW) is a number representing the amount of generation (MW) bid in the <i>n</i> th block, submitted by the Generator in the generation bid.
Hr RT Gen Bid: Price n (\$/MWh)	Real Time Generator Bid: Price n (\$/MWh) is a number represent the bid price of generation (\$/MWh) bid in the <i>n</i> th block, submitted by the Generator in the generation bid.
RTD Basepoint (MW)	Real Time Dispatch Basepoint (MW) is a number representing the average amount of energy scheduled by the NYISO during the real time dispatch for the generator, calculated over nominal 5-minute time intervals communicated to support generation dispatch

11.2.1.2.2 Intermediates

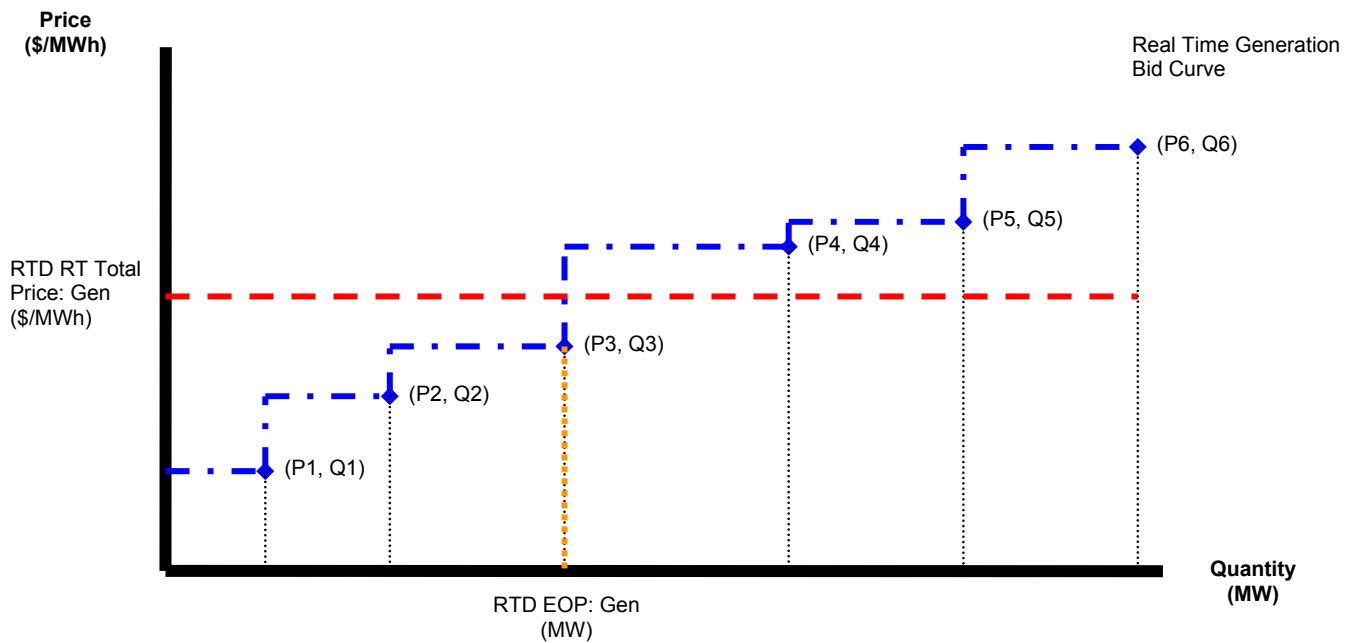
Title	Business Description
RTD RT Total Price: Gen (\$/MWh)	Real Time Total Price: Generator (\$/MWh) is a number representing the total LBMP price of a generator bus.

11.2.1.2.3 Results

Title	Business Description
RTD EOP: Gen (MW)	Economic Operating Point: Generator (MW) is a number representing the intersection of the Real time Total Price: Generator (\$/MWh) with the unit’s bid curve.

11.2.1.2.4 Algorithm

If RTD RT Total Price: Gen (\$/MWh) intersects the unit's bid cost curve at a vertical segment, RTD EOP: Gen (MW) can be represented as follows:

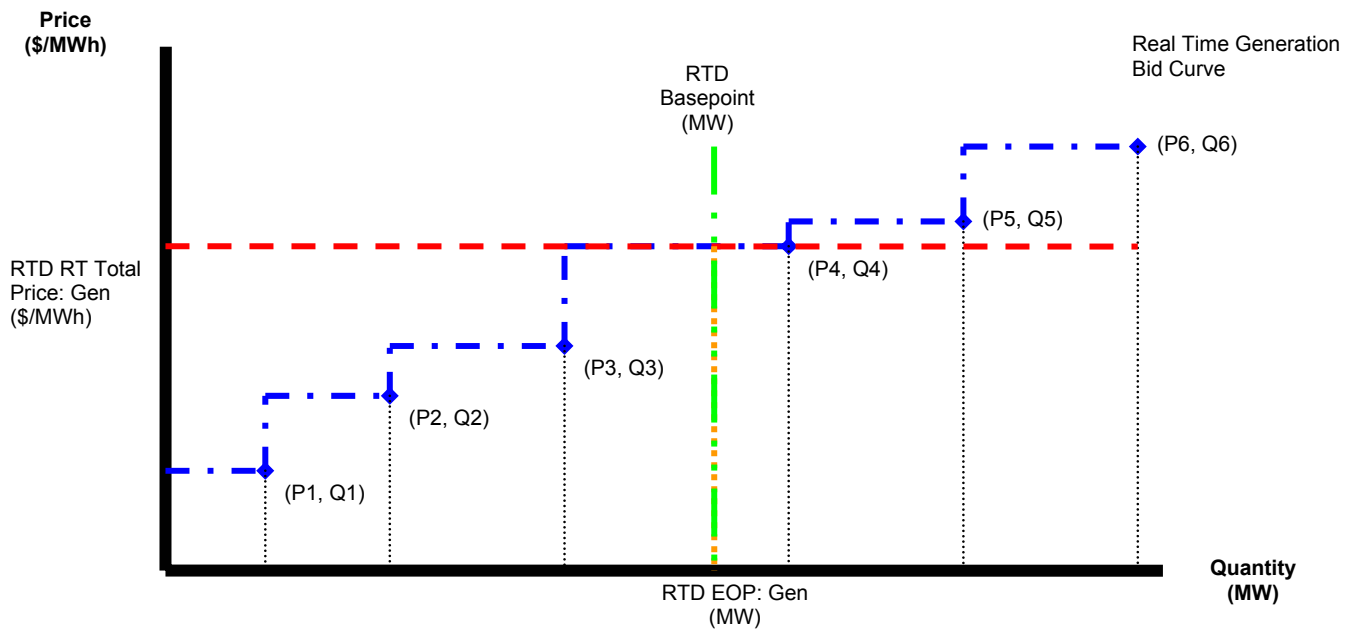


Where:

P_n = Hr RT Gen Bid: Price n (\$/MWh)
 Q_n = Hr RT Gen Bid: Gen n (MW)

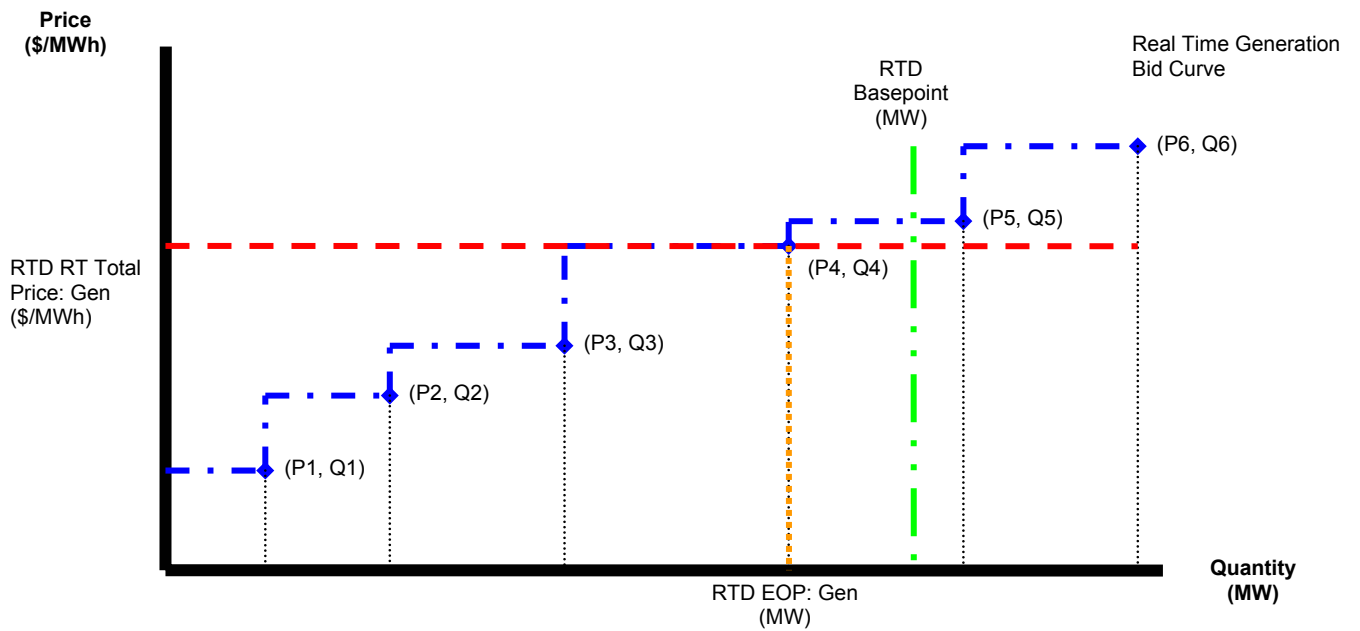
Else:

If RTD Basepoint (MW) intersects the bid curve at a point equal to the intersection of RTD RT Total Price: Gen (\$/MWh):



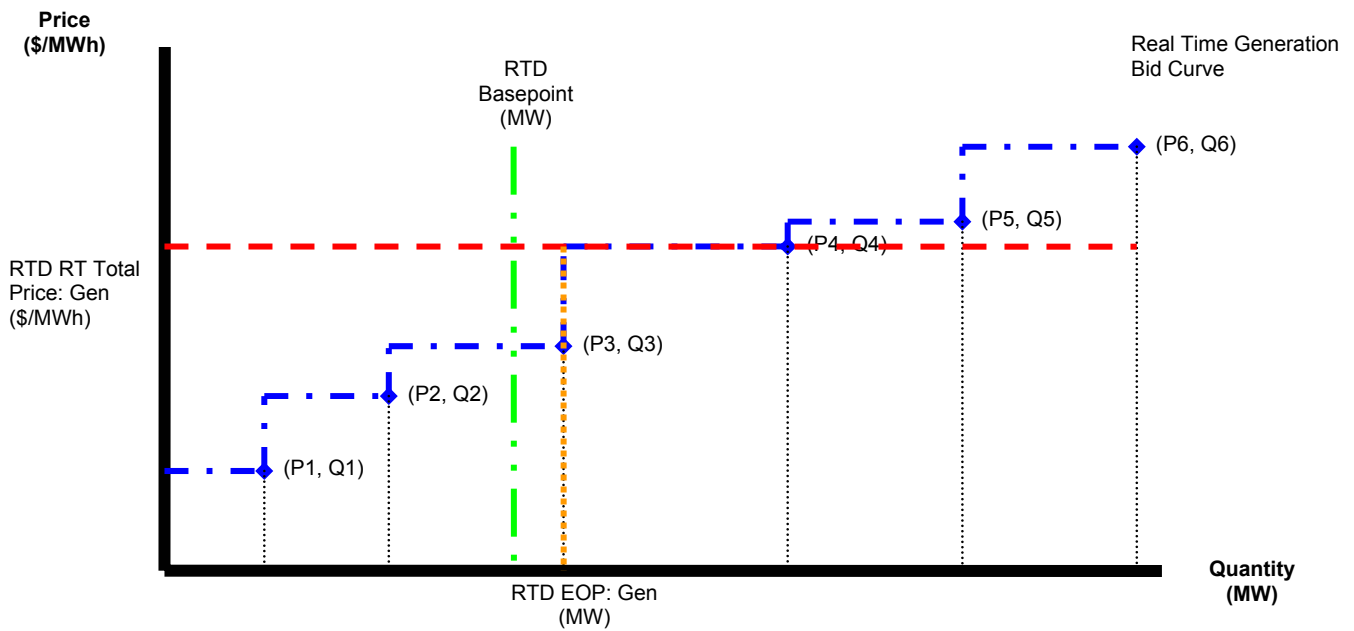
$$\text{RTD EOP: Gen (MW)} = \text{RTD Basepoint (MW)}$$

If RTD Basepoint (MW) intersects the bid curve at a point higher than the intersection of RTD RT Total Price: Gen (\$/MWh):



RTD EOP: Gen (MW) = P4 = Hr RT Gen Bid: Price 4 (\$/MWh)

If RTD Basepoint (MW) intersects the bid curve at a point below the intersection of RTD RT Total Price: Gen (\$/MWh):



$$\text{RTD EOP: Gen (MW)} = P3 = \text{Hr RT Gen Bid: Price 3 (\$/MWh)}$$

12. Day Ahead Margin Assurance Payment

12.1. Description

The Day-Ahead Market (DAM) Margin Assurance settlement (\$) is a payment for Power Suppliers that are required to purchase energy or ancillary services in the NYISO Balancing Market as a result of being dispatched below their DAM schedule by NYISO for reliability reasons. Therefore, this settlement guarantees a generator's DAM margin (profit) is not reduced by balancing market settlements in Real-Time due to NYISO scheduling.

The DAM Margin Assurance (\$) is calculated as the difference between balancing market charges and DAM Generation Bid incremental cost intended to address generators that are dispatched out of merit by the NYISO in real-time at values less than their DAM scheduled generation (MW).

This settlement can result from two different conditions: (1) generators dispatched below their DAM scheduled generation (MW) or moved out of merit by NYISO for reliability reasons, and (2) generators moved by a transmission owner for local reliability reasons (under the local reliability rules (LRR)). The settlement is the same in both cases.

This settlement is a payment (when related Balancing Market Cost > Bid Cost) to the Power Supplier. It is determined at the Real Time Dispatch (RTD) interval (~5-minute) for each generator dispatched below their DAM scheduled generation (MW).

The total settlement is the net of 2 major components as follows:

- *DAM Margin Assurance Balancing Market Cost* (\$) - The charges associated to the quantity (MW) a generator is required to purchase in the NYISO Balancing Market (at the real-time prices for energy, losses, congestion and ancillary services) as a result of being dispatched below its DAM schedule.
- *DAM Margin Assurance Bid Cost* (\$) - The generation incremental cost a Market Participant would save for not producing the energy and ancillary services equivalent to the quantity (MW) a generator is dispatched below its DAM schedule.

12.2. Business Rules

12.2.1 Core Settlement

12.2.1.1 Eligibility

Generators are eligible for DAM Margin Assurance (\$) if any of the following conditions exist:

- The generator is placed Out of Merit by NYISO for the following reasons: “COMMITTED FOR ISO RELIABILITY”, “OOM FOR TO LOCAL SECURITY”, “COMMITTED FOR ISO RESERVES”, or “OOM FOR ISO SECURITY”.
- The generator’s:
 - RTD Basepoint (MW) < Hr DAM Sched Gen (MW), and
 - Is not designated as a PURPA generator, and
 - Is on NYISO dispatch during the hour (Hr # Seconds On Dispatch > 0 & Hr RT Gen Bid On Dispatch Ind = “Y”).
- The generator’s RTD Gen Adjusted Energy (MW) must be greater than its RTD Reg Negative Error (MW). Otherwise, RTD DAM Margin Assurance (\$) = 0.

12.2.1.1.1 Results

12.2.1.1.2 Determinants

Title	Business Description
RTD EOP: Gen (MW)	Economic Operating Point: Generator (MW) is a number representing the intersection of the Real time Total Price: Generator (\$/MWh) with the unit’s bid curve.
Hr DAM Sched Gen (MW)	Day Ahead Scheduled Generation is a number representing the amount of generation scheduled by the NYISO for the given generator in the Day Ahead Market (total scheduled for a generator in the DAM, including day-ahead scheduled transactions and NYISO Day-Ahead Market energy sales).
RTD Basepoint (MW)	Real Time Dispatch Basepoint (MW) is a number representing the average amount of energy scheduled by the NYISO during the real time dispatch for the generator, calculated over nominal 5-minute time intervals communicated to support generation dispatch.
Hr DAM Sched Spin: Gen (MW)	Day Ahead Market Scheduled Spinning Reserve: Generator (MW) is a number representing the amount of Spinning Reserve scheduled by the NYISO for the given generator in the Day Ahead Market.
RTD RT Sched Spin: Gen (MW)	Real-Time Scheduled Spinning Reserve: Generator (MW) is a number representing the amount of Spinning Reserve scheduled by the NYISO for the given generator by RTD
Hr DAM Sched 10NSynch: Gen (MW)	Day Ahead Market Scheduled 10-minute Non-Synchronized Reserve: Generator (MW) is a number representing the amount of 10-minute Non-Synchronized Reserve scheduled by the NYISO for the given generator in the Day Ahead Market.
RTD RT Sched 10NSynch: Gen (MW)	Real-Time Scheduled 10-minute Non-Synchronized Reserve: Generator (MW) is a number representing the amount of 10-minute Non-Synchronized Reserve scheduled by the NYISO for the given generator by RTD.
Hr DAM Sched 30Min: Gen (MW)	Day Ahead Market Scheduled 30-minute Reserve: Generator (MW) is a number representing the amount of 30-minute Reserve scheduled by the NYISO for the given generator in the Day Ahead Market.
RTD RT Sched 30Min: Gen (MW)	Real-Time Scheduled 30-minute Reserve: Generator (MW) is a number representing the amount of 30-minute Reserve scheduled by the NYISO for the given generator by RTD.
Hr DAM Sched Reg: Gen (MW)	Day Ahead Market Regulation Price: Generator (\$/MW) is a number representing the price of Regulation Service for the NYCA.
RTD RT Sched Reg: Gen (MW)	Real-Time Scheduled Regulation: Generator (MW) is a number representing the amount of Regulation Service scheduled by the NYISO for the given generator by RTD.
RTD RT Gen Upper	Real-Time Generator Upper Operating Limit (MW) is a number indicating the maximum operating capacity for a generator during

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Op Limit (MW)	the given interval.
RTD Gen Adj Energy (MW)	Real Time Dispatch generator Adjusted Energy (MW) is a number representing the BAS determined output of the generator for the interval. It is calculated by allocating Hourly Gen Meter Energy (MWh) provided by the Transmission Owners to the RTD level based upon Average Actual (MW) (captured for NYISO SCADA and integrated by PTS).
RTD RT Energy Price: Gen (\$/MW)	Real Time Energy Price: Generator (\$/MW) is a number representing the price of energy at the generator bus (LBMP energy component).
RTD RT Loss Price: Gen (\$/MW)	Real Time Loss Price: Generator (\$/MW) is a number representing the price of losses at the generator bus (LBMP loss component)
RTD RT Cong Price: Gen (\$/MW)	Real Time Congestion Price: Generator (\$/MW) is a number representing the price of congestion at the generator bus (LBMP congestion component)
RTD RT Spin Price: Gen (\$/MW)	Real-Time Spinning Reserve Price: Generator (\$/MW) is a number representing the price of Spinning Reserve for the super-zone that includes the Generator bus.
RTD RT 10NSynch Price: Gen (\$/MW)	Real-Time 10-minute Non-Synchronized Reserve Price: Generator (\$/MW) is a number representing the price of Spinning Reserve for the super-zone that includes the Generator bus.
RTD RT 30Min Price: Gen (\$/MW)	Real-Time 30-minute Reserve Price: Generator (\$/MW) is a number representing the price of Spinning Reserve for the super-zone that includes the Generator bus.
RTD RT Reg Price: Gen (\$/MW)	Real-Time Regulation Price: Generator (\$/MW) is a number representing the price of Regulation Service for the NYCA.
Hr DAM Gen Bid: Gen n (MW)	Day Ahead Market Generator Bid: Generation n (MW) is a number representing the amount of generation (MW) bid in the <i>n</i> th block, submitted by the Generator in the generation bid.
Hr DAM Gen Bid: Price n (\$/MWh)	Day Ahead Market Generator Bid: Price n (\$/MWh) is a number representing the bid price of generation (\$/MWh) bid in the <i>n</i> th block, submitted by the Generator in the generation bid.
RTD RT Gen Bid: Gen n (MW)	Real Time Market Generator Bid: Generation n (MW) is a number representing the amount of generation (MW) bid in the <i>n</i> th block, submitted by the Generator in the generation bid
RTD RT Gen Bid: Price n (\$/MWh)	Real Time Market Generator Bid: Price n (\$/MWh) is a number representing the bid price of generation (\$/MWh) bid in the <i>n</i> th block, submitted by the Generator in the generation bid.
Hr DAM Reg Bid: Price (\$/MW)	Day Ahead Market Regulation Bid: Price (\$/MW) is a number representing the bid price of regulation (\$/MW), submitted by the Generator in the Regulation bid.
RTD RT Reg Bid: Price (\$/MW)	Real Time Market Regulation Bid: Price (\$/MW) is a number representing the bid price of regulation (\$/MW), submitted by the Generator in the Regulation bid
Hr DAM Spin Bid: Price (\$/MW)	Day Ahead Market Spinning Reserve Bid: Price (\$/MW) is a number representing the bid price of spinning reserve (\$/MW), submitted by the Generator in the Spinning Reserve bid.
Hr DAM 10 NonSynch Bid: Price (\$/MW)	Day Ahead Market 10 Minute Non-synchronized Reserve Bid: Price (\$/MW) is a number representing the bid price of 10 Minute Non-synchronized Reserve (\$/MW), submitted by the Generator in the 10 Minute Non-synchronized Reserve bid.
Hr DAM 30 Min Bid: Price (\$/MW)	Day Ahead Market 30 Minute Reserve Bid: Price (\$/MW) is a number representing the bid price of 30 Minute Reserve (\$/MW), submitted by the Generator in the 30 Minute Reserve bid.
Hr Out of Merit Type ID	Hourly Out of Merit Type ID is a number representing the reason for an out of economic merit dispatch for the given generator and hour.
Hr Out of Merit Type Desc	Hourly Out of Merit Type Description represents the reason for an out of economic merit dispatch for the given generator and hour.
RTD Interval Seconds	RTD Interval Seconds is a number representing the number of seconds in the RTD interval.

12.2.1.1.3 Intermediates

Title	Business Description
RTD RT Total Price: Gen (\$/MWh)	Real Time Total Price: Generator (\$/MWh) is a number representing the total LBMP price of a generator bus
RTD RT Sched Red (MW)	Real-Time Schedule Reduction (MW) in a number representing the reduction in the generator's schedule from the Day Ahead Market to the Real-Time Market.

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RTD Pot Red Gen (MW)	Potential Reduction Generation (MW) is a number representing the potential reduction in a generator's energy schedule.
RTD Pot Red Reg (MW)	Potential Reduction Regulation (MW) is a number representing the potential reduction in a generator's regulation schedule.
RTD Pot Red Spin (MW)	Potential Reduction Spinning Reserve (MW) is a number representing the potential reduction in a generator's spinning reserve schedule.
RTD Pot Red 10NSynch (MW)	Potential Reduction 10 Minute Non-synchronized Reserve (MW) is a number representing the potential reduction in a generator's 10 Minute Non-synchronized Reserve schedule.
RTD Pot Red 30 Min (MW)	Potential Reduction 30 Minute Reserve (MW) is a number representing the potential reduction in a generator's 30 Minute Reserve schedule.
RTD Act Red Reg (MW)	Actual Reduction Regulation (MW) is a number representing the actual reduction in a generator's regulation schedule.
RTD Act Red Spin (MW)	Actual Reduction Spinning Reserve (MW) is a number representing the actual reduction in a generator's spinning reserve schedule.
RTD Act Red 10NSynch (MW)	Actual Reduction 10 Minute Non-synchronized Reserve (MW) is a number representing the actual reduction in a generator's 10 Minute Non-synchronized Reserve schedule.
RTD Act Red 30 Min (MW)	Actual Reduction 30 Minute Reserve (MW) is a number representing the actual reduction in a generator's 30 Minute Reserve schedule.
RTD Adj DAM Gen (MW)	Adjusted Day Ahead Market Generation (MW) is a number representing the generator's adjusted Day Ahead Market energy schedule.
RTD Adj DAM Spin (MW)	Adjusted Day Ahead Market Spinning Reserve (MW) is a number representing the generator's adjusted Day Ahead Market spinning reserve schedule.
RTD Adj DAM 10NSynch (MW)	Adjusted Day Ahead Market 10 Minute Non-synchronized Reserve (MW) is a number representing the generator's adjusted Day Ahead Market 10 Minute Non-synchronized Reserve schedule.
RTD Adj DAM 30 Min (MW)	Adjusted Day Ahead Market 30 Minute Reserve (MW) is a number representing the generator's adjusted Day Ahead Market 30 Minute Reserve schedule.
RTD Adj DAM Reg (MW)	Adjusted Day Ahead Market Regulation (MW) is a number representing the generator's adjusted Day Ahead Market Regulation schedule
RTD Low Lim (MW)	Lower Limit (MW) is a number representing a lower bound on the generator's bid curve used in the DAMAP calculation.
RTD Up Lim (MW)	Upper Limit (MW) is a number representing an upper bound on the generator's bid curve used in the DAMAP calculation.
RTD Con DAMAP Gen (\$)	Contribution to Day Ahead Margin Assurance Payment Generation (\$) is a number representing the energy component of the DAMAP to the generator.
RTD Con DAMAP Reg (\$)	Contribution to Day Ahead Margin Assurance Payment Generation (\$) is a number representing the regulation component of the DAMAP to the generator.
RTD Con DAMAP Spin (\$)	Contribution to Day Ahead Margin Assurance Payment Spinning Reserve (\$) is a number representing the spinning reserve component of the DAMAP to the generator.
RTD Con DAMAP 10NSynch (\$)	Contribution to Day Ahead Margin Assurance Payment 10 Minute Non-synchronized Reserve (\$) is a number representing the 10 Minute Non-synchronized Reserve component of the DAMAP to the generator.
RTD Con DAMAP 30 Min (\$)	Contribution to Day Ahead Margin Assurance Payment 30 Minute Reserve (\$) is a number representing the 30 Minute Reserve component of the DAMAP to the generator.
RTD Con DAMAP (\$)	Contribution to Day Ahead Margin Assurance Payment (\$) is a number representing the contribution to DAMAP for the RTD interval for the hour calculated.

12.2.1.1.4 Results

Title	Business Description
Hr DAMAP (\$)	Day Ahead Margin Assurance Payment (\$) is a number representing the hourly DAMAP to a generator.

12.2.1.1.5 Algorithm

Hr DAMAP (\$) is calculated as:

Hr DAMAP (\$) = Max(0, \sum RTD Con DAMAP (\$) for all RTD intervals in the given hour)

Where

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$$\text{RTD Con DAMAP (\$)} = \{ \text{RTD Con DAMAP Gen (\$)} + \text{RTD Con DAMAP Reg (\$)} + \text{RTD Con DAMAP Spin (\$)} + \text{RTD Con DAMAP 10NSynch (\$)} + \text{RTD Con DAMAP 30 Min (\$)} \}$$

$$* \text{RTD Interval Seconds} / 3600$$

And

If RTD RT Sched Reg: Gen (MW) < RTD Adj DAM Reg (MW):

$$\text{RTD Con DAMAP Reg (\$)} = \{ \text{RTD Adj DAM 30 Min (MW)} - \text{RTD RT Sched Reg: Gen (MW)} \} * \{ \text{RT Reg Price: Gen (\$/MW)} - \text{Hr DAM Reg Bid: Price (\$/MW)} \}$$

Else:

$$\text{RTD Con DAMAP Reg (\$)} = \{ \text{RTD Adj DAM 30 Min (MW)} - \text{RTD RT Sched Reg: Gen (MW)} \} * \text{Max}[\{ \text{RT Reg Price: Gen (\$/MW)} - \text{RTD RT Reg Bid: Price (\$/MW)} \}, 0]$$

And

If RTD RT Sched Spin: Gen (MW) < RTD Adj DAM Spin (MW):

$$\text{RTD Con DAMAP Spin (\$)} = (\text{RTD Adj DAM Spin (MW)} - \text{RTD RT Sched Spin: Gen (MW)}) * (\text{RT Spin Price: Gen (\$/MW)} - \text{Hr DAM Spin Bid: Price (\$/MW)})$$

Else:

$$\text{RTD Con DAMAP Spin (\$)} = (\text{RTD Adj DAM Spin (MW)} - \text{RTD RT Sched Spin: Gen (MW)}) * \text{RT Spin Price: Gen (\$/MW)}$$

And

If RTD RT Sched 10NSynch: Gen (MW) < RTD Adj DAM 10NSynch (MW):

$$\text{RTD Con DAMAP 10NSynch (\$)} = (\text{RTD Adj DAM 10NSynch (MW)} - \text{RTD RT Sched 10NSynch: Gen (MW)}) * (\text{RT 10NSynch Price: Gen (\$/MW)} - \text{Hr DAM 10 NonSynch Bid: Price (\$/MW)})$$

Else:

$$\text{RTD Con DAMAP 10NSynch (\$)} = (\text{RTD Adj DAM 10NSynch (MW)} - \text{RTD RT Sched 10NSynch: Gen (MW)}) * \text{RT 10NSynch Price: Gen (\$/MW)}$$

And

If RTD RT Sched 30Min: Gen (MW) < RTD DAM Sched 30Min: Gen (MW):

$$\text{RTD Con DAMAP 30 Min (\$)} = (\text{RTD DAM Sched 30Min: Gen (MW)} - \text{RTD RT Sched 30Min: Gen (MW)}) * (\text{RT 30Min Price: Gen (\$/MW)} - \text{Hr DAM 30 Min Bid: Price (\$/MW)})$$

Else:

$$\text{RTD Con DAMAP 30 Min (\$)} = (\text{RTD DAM Sched 30Min: Gen (MW)} - \text{RTD RT Sched 30Min: Gen (MW)}) * \text{RT 30Min Price: Gen (\$/MW)}$$

12.2.1.2 Additional Calculations

12.2.1.2.1 Daily Settlement Totals

Title	Business Description
Hr DAMAP (\$)	Day Ahead Margin Assurance Payment (\$) is a number representing the hourly DAMAP to a generator

12.2.1.2.2 Intermediates

None

12.2.1.2.3 Results

Title	Business Description
Day DAMAP (\$)	Day Ahead Margin Assurance Payment (\$) is a number representing the hourly DAMAP to a generator

12.2.1.2.3.1 Algorithm

Day DAMAP (\$) is calculated as:

Day DAMAP (\$) = \sum Hr DAMAP (\$), for all hours of the day.

13. Real-Time Bid Production Cost Guarantee (BPCG)

13.1. Description

Real-Time Bid Production Cost Guarantee (BPCG) is the settlement (\$) by which NYISO guarantees internal power suppliers that a generator will not incur a net loss if a generator is committed (above that committed in the DAM), providing that the generator's operation and schedule meets the qualifying criteria. Bid production cost guarantee is comprised of the cost of production based on a generator's bid (minimum generation cost, bid production cost, and start-up cost) less the total revenues received for that generator (energy + net ancillary services margin + Voltage Support Service Lost Opportunity Costs (LOC) settlements + Regulation Revenue Adjustments).

The bid production cost guarantee payment made to suppliers is a daily settlement for each eligible generator. In order to receive a bid production cost guarantee payment, the sum of all hourly loss/profit values for a given day must result in a net loss (daily calculation result must be > \$0).

13.2. Business Rules

13.2.1 Core Settlement

13.2.1.1 Eligibility

Generators are eligible for Real-Time Bid Production Cost Guarantee (\$) if:

- A Generator's real-time eligible total costs (energy, ancillary services, and start-up) exceed its Balancing Market Energy settlement (\$).

The following are scenarios for which Real-Time Bid Production Cost (\$) does not apply:

- Real-Time Bid Production Cost is not calculated for:
 - PURPA Generators (SCD PURPA Units Class Type is Class 1 or 2 during the given interval).
 - Generators that are Out of Merit for the following reasons:
 - OOM GENERATOR REQUEST (3)
 - OOM FOR DMNC TESTING (25)

The following are scenarios for which Real-Time Startup Cost (\$) does not apply:

- The Generator did not produce energy in real-time (Hr Gen Avg Actual Energy (MW) <=0).
- The Generator served Transaction Contract schedules (RTD RT Sched Trans :Gen (MW) <> 0).
- The Generator is one of the following types of generators: Generator Type Description equals CURTAILABLE LOAD, SELF SUPPLY LOAD, MPM QUICK START, NORMAL QUICK START
- The Generator was eligible for start-up in the Day Ahead Market (Hr DAM Elig for Startup Cost Flag = "Y")
- Real-Time Bid Production Cost Guarantee is not calculated for "PURPA" Generators (RTD PURPA Units Class Type is not Class 1 or 2).

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Note: The real time Bid Production Cost Guarantee Payment is not calculated for RTD-CAM intervals where a large event reserve pickup or a max gen event occurs and for the three RTD intervals following. A separate calculation is done to cover shortfalls resulting from these events.

13.2.1.2 Required Data Elements

13.2.1.2.1 Determinants

Title	Business Description
RTD RRA: Gen (\$)	Regulation Revenue Adjustment: Gen (\$) is a number representing an additional payment or charge made to power suppliers that are regulating in the real time market.
RTD EOP: Gen (MW)	Economic Operating Point: Generator (MW) is a number representing the intersection of the Real time Total Price: Generator (\$/MWh) with the unit's bid curve.
RTD Gen Upper Op Limit (MW)	RTD Generator Upper Operating Limit (MW) is a number indicating the maximum operating capacity for a generator during the given period.
RTD BalMkt Energy Stlmnt :Gen (\$)	Balancing Market Energy Settlement - Generator (\$) is a number representing the BAS-determined amount of a generator's balancing energy market energy component settlement.
RTD BalMkt Loss Stlmnt :Gen (\$)	Balancing Market Loss Settlement - Generator (\$) is a number representing the BAS-determined amount of a generator's balancing energy market loss component settlement.
RTD BalMkt Cong Stlmnt :Gen (\$)	Balancing Market Congestion Settlement - Generator (\$) is a number representing the BAS-determined amount of a generator's balancing energy market congestion component settlement
Hr DAM Sched Gen (MW)	Day Ahead Scheduled Generation (MW) is a number representing the amount of generation scheduled by the NYISO for the given generator in the Day Ahead Market (total scheduled for a generator in the DAM, including day-ahead scheduled transactions and NYISO Day-Ahead Market energy sales).
Hr DAM Sched Trans :Gen (MW)	Day Ahead Scheduled Transactions (MW) is a number representing the total amount of energy scheduled by the NYISO for all transactions for a given generator, for a given hour.
RTD RT Sched Trans :Gen (MW)	Real-Time Scheduled Transaction (MW) is a number representing the total amount of transaction energy for all transactions injected at a given generator, for an RTD interval.
RTD Gen Adjusted Energy (MW)	Generator Adjusted Energy (MW) is a number representing the BAS-determined output of the generator for the interval. It is calculated by allocating Hourly Gen Meter Energy (MWh) provided by the Transmission Owners) to the RTD level based upon Average Actual (MW) (captured for NYISO SCADA and integrated by PTS).
RTD Basepoint (MW)	Real Time Dispatch Basepoint (MW) is a number representing the average amount of energy scheduled by the NYISO during the real-time dispatch for the generator; calculated over approximately 5 minute time intervals communicated to support generation dispatch.
Hr RT Sched Gen (MW)	Real Time Scheduled Generation (MW) is a number representing the amount of generation scheduled by the NYISO for the given generator in the Real Time Market by RTC.
Gen Type Desc	Generator Type Description represents the name of the type of Generator.
Hr Out of Merit Type Desc	Hourly Out of Merit Type Description represents the reason for an out of economic merit dispatch for the given generator and hour.
Hr Out of Merit Type ID	Hourly Out of Merit Type ID is a number representing the reason for an out of economic merit dispatch for the given generator and hour.
Hr Out of Merit Flag	Hourly Out of Merit Flag is a character representing whether or not the given generator was dispatched out of economic merit order during the hour.
RTD In Service Ind	In Service Indicator is a character representing whether or not the generator is in service (physically connected and providing energy onto the NYISO electrical grid).
RTD On Dispatch Ind	On Dispatch Indicator is a character representing whether or not the generator is being dispatched by the NYISO.
RTD PURPA Units Class Type	PURPA Class Type is a character representing the class of the PURPA Generator (Class 1 or Class 2).
Reserve Pickup Ind	Reserve Pick Up Indicator is a character which indicates whether the RTD-CAM interval was initiated as a reserve pickup

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Large Event Reserve Pickup Ind	Large Event Reserve Pick Up Indicator is a character which indicates whether the RTD-CAM interval was initiated as a large event reserve pickup
Hr Max Gen Flag	Hourly Maximum Generation Flag is a character representing whether or not the given generator is operating at its maximum output level for the given hour (values are Y or N).
RTD RT Energy Price :Gen (\$/MW)	Real-Time Energy Price (\$/MW) is a number representing the price of energy at a generator bus (LBMP energy component).
RTD RT Loss Price :Gen (\$/MW)	Real-Time Loss Price (\$/MW) is a number representing the price of loss at a generator bus (LBMP loss component).
RTD RT Cong Price :Gen (\$/MW)	Real-Time Congestion Price (\$/MW) is a number representing the price of congestion at a generator bus (LBMP congestion component).
RTD Interval Seconds	RTD Interval Seconds is a number representing the number of seconds in the RTD interval.
Hr DAM Gen Bid :Min Gen Cost (\$)	Day Ahead Market Generator Bid Minimum Generation Cost is a number representing the generation cost (\$) of operating at the minimum generation level during the interval, submitted by the Generator in a generation bid.
Hr DAM Gen Bid :Min Gen (MW)	Day Ahead Market Generator Bid Minimum Generation is a number representing the minimum generation level (MW) for the generator during the interval, submitted by the Generator in a generation bid.
Hr RTGen Bid Dispatch Seg :Block	Hourly Real Time Market Generation Bid Dispatch Segments - Block is a number representing the number of segments in the given RT generation bid (block generation bid type).
Hr RT Gen Bid :Min Gen Cost (\$)	Real Time Market Generator Bid Minimum Generation Cost is a number representing the generation cost (\$) of operating at the minimum generation level during the interval, submitted by the Generator in a generation bid.
Hr RT Gen Bid :Min Gen (MW)	Real Time Market Generator Bid Minimum Generation is a number representing the minimum generation level (MW) for the generator during the interval, submitted by the Generator in a generation bid.
RTD Bal Reg Avail Stlmnt (\$)	Real Time Balancing Regulation Availability Settlement (\$) is a number representing the BAS-determined supplemental regulation settlement for the generator for each RTD interval.
Hr DAM Sched Reg Avail (MWh)	Day Ahead Market Scheduled Regulation Availability (MWh) is a number representing the amount of regulation availability scheduled by the NYISO for the given generator in the Day Ahead Market.
RTD RT Sched Reg Avail (MW)	Real Time Scheduled Regulation Availability (MW) is a number representing the amount of regulation availability scheduled by the NYISO for the given generator for the RTD interval.
Hr DAM Reg Price (\$/MW)	Day Ahead Market Regulation Price: Generator (\$/MW) is a number representing the price of Regulation Service for the NYCA.
Hr DAM AS Bid Reg :Price (\$/MW)	Day Ahead Market Ancillary Service Regulation Bid Price (\$/MW) is a number representing the bid price of regulation service during the interval, submitted by the Generator in an ancillary service bid.
Hr RT AS Bid Reg :Price (\$/MW)	Real Time Market Ancillary Service Regulation Bid Price (\$/MW) is a number representing the bid price of regulation service during the interval, submitted by the Generator in an ancillary service bid.
RTD Bal Spin Avail Stlmnt (\$)	Real Time Balancing Spinning Reserves Availability Settlement (\$) is a number representing the settlement amount for availability of Balancing Spinning Reserves Service, for the given generator, for the given RTD interval.
Hr DAM Sched Spin Avail (MWh)	Day Ahead Market Scheduled Spinning Reserve Availability (MWh) is a number representing the amount of spinning reserve availability scheduled by the NYISO for the given generator in the Day Ahead Market.
DAM Spin Price: Gen (\$/MW)	Day Ahead Market Spinning Reserve Price: Generator (\$/MW) is a number representing the price of Spinning Reserve for the super-zone that includes the Generator bus.
Hr DAM AS Bid Spin :Price (\$/MW)	Day Ahead Market Ancillary Service Spinning Reserve Bid Price (\$/MW) is a number representing the bid price of spinning reserve service during the interval, submitted by the Generator in an ancillary service bid.
RTD RT Sched Spin Avail (MWh)	Real Time Scheduled Spinning Reserve Availability (MWh) is a number representing the amount of spinning reserve availability scheduled by the NYISO for the given generator in the RTD interval.
RTD Bal 30Sync Avail Stlmnt (\$)	Real Time Balancing 30-Minute Synchronized Reserves Availability Settlement (\$) is a number representing the settlement amount for availability of Balancing 30-Minute Synchronized Reserves Service, for the given generator, for the given RTD interval.
Hr DAM Sched 30Sync Avail (MWh)	Day Ahead Market Scheduled 30-Minute Synchronized Reserve Availability (MWh) is a number representing the amount of 30-Minute Synchronized reserve availability scheduled by the NYISO for the given generator in the Day Ahead Market.
Hr DAM AS Bid 30: Price (\$/MW)	Day Ahead Market Ancillary Service 30 Minute Reserve Bid Price (\$/MW) is a number representing the bid price of 30 Minute Reserve service during the interval, submitted by the Generator in an ancillary service bid.

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DAM 30Min Price: Gen (\$/MW)	Day Ahead Market 30-minute Reserve Price: Generator (\$/MW) is a number representing the price of Spinning Reserve for the super-zone that includes the Generator bus.
RTD RT Sched 30Sync Avail (MWh)	Real Time Scheduled 30-Minute Synchronized Reserve Availability (MWh) is a number representing the amount of 30-Minute Synchronized reserve availability scheduled by the NYISO for the given generator in the RTD interval
RTD VSS LOC Stlmnt (\$)	Voltage Support Service Lost Opportunity Cost Settlement (\$) is a number representing the BAS-determined voltage support service lost opportunity cost settlement for the generator for the interval.
Hr DAM Elig for Startup Cost Flag	Hourly Day Ahead Market Eligible for Startup Cost Flag is a character representing whether or not the given generator is eligible to possibly recover their DAM startup costs in the DAM Bid Production Cost Guarantee settlement (determined from a DAM Generation Bid - startup cost curve).
Hr RT Start Up Cost :RTS (\$)	Real-Time Startup Cost (\$) is a number representing the amount of generator RT start-up cost determined during the Real Time Scheduling (RTS) process.

13.2.1.2.2 Intermediates

Title	Business Description
RTD RT Total Price :Gen (\$/MW)	Total Real-Time Price (\$/MW) is a number representing the total LBMP price of a generator bus.
RTD Total BalMkt Stlmnt :Gen (\$)	Total Balancing Market Settlement - Generator (\$) is a number representing the BAS-determined amount of a generator's total balancing energy market settlement; sum of the balancing energy market energy, loss, and congestion component settlements.
RTD RT Energy Inject (MW)	Real-Time (RT) Energy Injection (MW) is a number representing the generation output value used as the basis for the determination of the amount of the given generator's real-time BPCG settlement (MW), for the given SCD-interval.
RTD Energy Pmt Limit (MW)	Energy Payment Limit (MW) is a number representing the upper limit that a generator could be paid for energy produced.
RTD NASR Reg (\$)	Real Time Net Ancillary Service Revenue (NASR) Regulation (\$) is a number representing the total net amount of balancing regulation and frequency control service revenue for the given RTD interval and generator.
Hr NASR Reg (\$)	Hourly Net Ancillary Service Revenue (NASR) Regulation (\$) is a number representing the total net amount of balancing regulation and frequency control service revenue for the given RTD interval and generator
RTD NASR Spin Res (\$)	Real Time Net Ancillary Service Revenue (NASR) Spinning Reserve (\$) is a number representing the total net amount of balancing spinning reserve service revenue for the given RTD interval and generator.
Hr NASR Spin Res (\$)	Hourly Net Ancillary Service Revenue (NASR) Spinning Reserve (\$) is a number representing the total net amount of balancing spinning reserve service revenue for the given RTD interval and generator.
RTD NASR 30 Min Synch Res (\$)	Real Time Net Ancillary Service Revenue (NASR) 30 Minute Synchronized Reserve (\$) is a number representing the total net amount of balancing 30 minute synchronized reserve service revenue for the given RTD interval and generator.
Hr NASR 30 Min Synch Res (\$)	Hourly Net Ancillary Service Revenue (NASR) 30 Minute Synchronized Reserve (\$) is a number representing the total net amount of balancing 30 minute synchronized reserve service revenue for the given RTD interval and generator
RTD RT Incremental Energy Cost (\$)	RTD Real-Time (RT) Incremental Energy Cost (\$) is a number representing the total amount of real-time bid production cost determined under the incremental energy portion of the generator's Real Time Generation Bid, which corresponds to the generator's real-time output, for the given generator and RTD-interval.
RTD DAM Incremental Energy Cost (\$)	RTD Day Ahead Market (DAM) Incremental Energy Cost (\$) is a number representing the total amount of real-time bid production cost determined under the incremental energy portion of the generator's Real Time Generation Bid, which corresponds to the generator's DAM commitments, for the given generator and RTD-interval.
RTD DAM Minimum Generation Cost (\$)	RTD Day Ahead Market (DAM) Minimum Generation Cost (\$) is a number representing the total amount of real-time minimum generation cost which corresponds to the generator's DAM commitments, determined from the generator's Real Time Generation Bid, for the given generator and RTD-interval.
RTD EPL Revenue (\$)	RTD Energy Payment Limit Revenue (\$) is a number representing the amount of real-time revenue associated with the generator's actual output up to it real-time economic dispatch basepoint (MW), for the given generator and RTD-interval.
RTD RT Energy Cost (\$)	Real-Time Energy Cost (\$) is a number representing the amount of total balancing market energy cost (derived from energy bid curves and schedules) for the given RTD dispatch interval and generator.
RTD RT Net Energy Cost (\$)	RTD Real-Time Net Energy Cost (\$) is a number representing the amount of total net balancing market energy cost that exceeds balancing market revenues for the given RTD dispatch interval and generator.
Hr RT Net Energy	Hourly Real-Time Net Energy Cost (\$) is a number representing the amount of total net balancing market energy cost that

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Cost (\$)	exceeds balancing market revenues for the given hour and generator.
Hr RT Net AS Rev (\$)	Hourly Real-Time Net Ancillary Service Revenue (\$) is a number representing the amount of total net balancing market ancillary service revenues (amount of cost greater than revenues) for the given hour and generator.
Hr RRA: Gen (\$)	Regulation Revenue Adjustment: Gen (\$) is a number representing an additional payment or charge made to power suppliers that are regulating in the real time market.
Hr RT Total Net Cost (\$)	Hourly Real-Time Total Net Cost (\$) is a number representing the amount of total net balancing market energy and real time ancillary service costs that exceed the corresponding balancing market revenues for the given hour and generator.
Day RT Total Net Cost (\$)	Daily Real-Time Total Net Cost (\$) is a number representing the amount of total net balancing market energy and real time ancillary service costs that exceed the corresponding balancing market revenues for the given day and generator.
Day RT Startup Cost (\$)	Daily Real Time Startup Cost (\$) is a number representing the amount of real time startup costs for a generator for the given day.

13.2.1.2.3 Results

Title	Business Description
Day RT BPCG Stlmnt (\$)	Real-Time Bid Production Cost Guarantee Settlement (\$) is a number representing the BAS-determined real-time bid production cost guarantee settlement for the given generator.

13.2.1.2.4 Algorithm

Real-Time Bid Production Cost Guarantee (\$) is calculated as:

$$\text{Day RT BPCG Stlmnt } (\$) = \text{Max} \{ \text{Day RT Total Net Cost } (\$) + \text{Day RT Startup Cost } (\$), 0 \}$$

Where Day RT Total Net Cost (\$) is calculated as:

$$\text{Day RT Total Net Cost } (\$) = \sum \text{Hr RT Total Net Cost } (\$), \text{ for all hours in a day.}$$

Where:

$$\text{Hr RT Total Net Cost } (\$) = \text{Hr RT Net Energy Cost } (\$) - \text{Hr RT Net AS Rev } (\$) - \text{Hr RRA: Gen } (\$)$$

And Hr RT Net Energy Cost (\$) is calculated as:

$$\text{Hr RT Net Energy Cost } (\$) = \sum \text{RTD RT Net Energy Cost } (\$), \text{ for all RTD-Intervals in an hour.}$$

Where:

$$\text{RTD RT Net Energy Cost } (\$) = \text{RTD RT Energy Cost } (\$) - \text{RTD Total BalMkt Stlmnt :Gen } (\$)$$

And RTD Total BalMkt Stlmnt :Gen (\$) is calculated as:

$$\text{RTD Total BalMkt Stlmnt :Gen } (\$) = \text{RTD BalMkt Energy Stlmnt :Gen } (\$) + \text{RTD BalMkt Loss Stlmnt :Gen } (\$) - \text{RTD BalMkt Cong Stlmnt :Gen } (\$)$$

And RTD RT Energy Cost (\$) is calculated as:

The determination of RTD RT Energy Cost (\$) varies under a few different scenarios, which are detailed in the following sections:

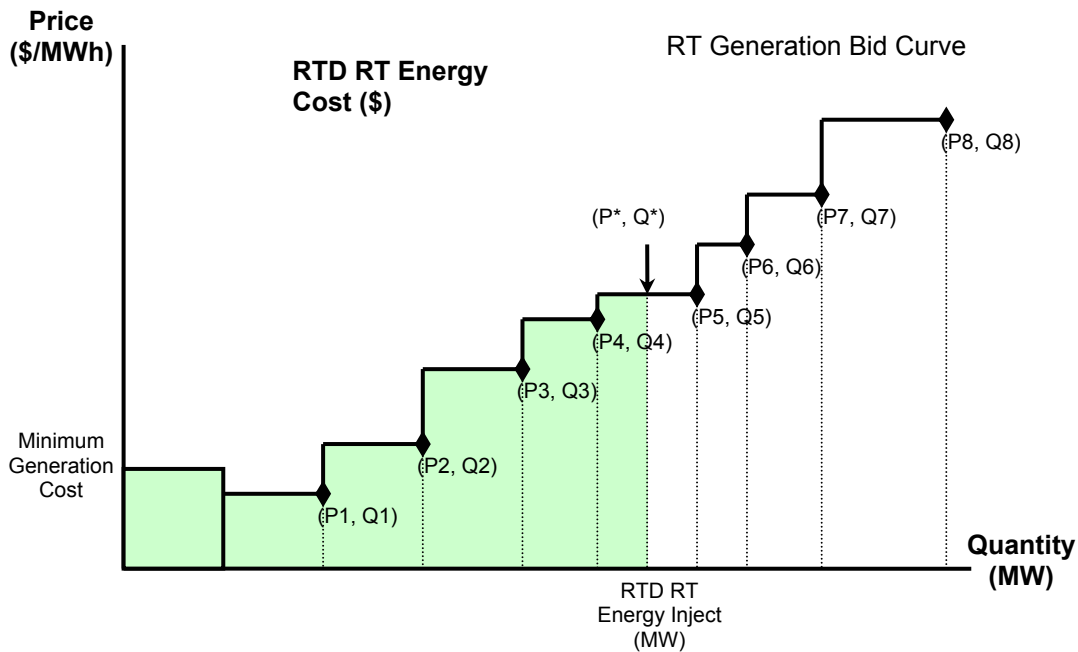
1. Generator is not eligible for any real-time energy cost guarantee during the interval.
 2. Generator was scheduled only in real-time (no DAM or transaction contract schedules).
 3. Generator was scheduled in the DAM and in real-time, and the DAM schedule (plus additional real-time schedule transactions) is *greater* than minimum generation (MW).
 4. Generator was scheduled in the DAM and in real-time, and the DAM schedule (plus additional real-time schedule transactions) is *less* than minimum generation (MW).
- (1) *RTD RT Energy Cost (\$)* by market rule is equal to the given generator's balancing market revenue (*Net Energy Cost (\$)* equals zero) for the given *RTD-Interval* if:
- A Generator's real-time dispatch schedule (MW) is less than or equal its DAM scheduled energy (MW) ($\text{RTD Basepoint (MW)} \leq \text{Hr DAM Sched Gen (MW)}$).
 - A Generator's real-time dispatch schedule (MW) is less than or equal to zero, and the generator was not placed Out of Merit ($\text{RTD Basepoint (MW)} \leq 0$ and $\text{Hr Out of Merit Flag} = \text{"N"}$).
 - The Generator was not producing energy during the interval ($\text{RTD Gen Adjusted Energy (MW)} \leq 0$).
 - The Generator was scheduled in the DAM ($\text{Hr DAM Sched Gen (MW)} > 0$) but was not on-dispatch ($\text{RTD On Dispatch Ind} = \text{"N"}$) during the interval in real-time and the generator was out of merit for one of the following reasons:
 - COMMITTED FOR ISO RELIABILITY (1)
 - OOM FOR TO LOCAL SECURITY (2)
 - COMMITTED FOR ISO RESERVES (4)
 - OOM FOR ISO SECURITY (5)
 - CAPACITY LIMITED RESOURCE (20)
 - ISO ENERGY LIMITED RES (21)
 - TO ENERGY LIMITED RES (22)
 - ISO VOLTAGE SUPPORT (23)
 - TO VOLTAGE SUPPORT (24)
 - ISO COM FAILURE (26)
 - TO COM FAILURE (27)
 - GENERATOR DERATE (28)

(2) *Generator is scheduled in Real Time but was NOT scheduled in the Day Ahead Market or via Transactions (RTD RT Sched Trans :Gen (MW) and Hr DAM Sched Gen (MW) = 0):*

RTD RT Energy Cost (\$) =

$$\{ \text{Hr RT Gen Bid: Min Gen Cost (\$)} + \text{RTD RT Incremental Energy Cost (\$)} \} * \{ \text{RTD Interval Seconds} \div 3,600 \text{ Seconds} \}$$

Where RTD RT Incremental Energy Cost (\$) is the sum of the Bid Production Cost under the Real Time Generation Bid for each dispatch segment from Hr RT Gen Bid :Min Gen (MW) to RTD RT Energy Inject (MW).



If the generator is off dispatch and the generator was out of merit for one of the following reasons:

- COMMITTED FOR ISO RELIABILITY (1)
- OOM FOR TO LOCAL SECURITY (2)
- COMMITTED FOR ISO RESERVES (4)
- OOM FOR ISO SECURITY (5)
- CAPACITY LIMITED RESOURCE (20)
- ISO ENERGY LIMITED RES (21)
- TO ENERGY LIMITED RES (22)
- ISO VOLTAGE SUPPORT (23)
- TO VOLTAGE SUPPORT (24)
- ISO COM FAILURE (26)
- TO COM FAILURE (27)
- GENERATOR DERATE (28)

RTD RT Energy Cost (\$) =

$$\{ \text{Hr RT Gen Bid :Min Gen Cost ($) - (Max\{RTD RT Incremental Energy Cost ($) + RTD EPL Revenue (\$)\}, 0) \} * \{ \text{RTD Interval Seconds} \div 3,600 \text{ Seconds} \}$$

Where RTD EPL Revenue (\$) =

$$\text{Max}[\text{Min}\{\text{RTD Gen Adjusted Energy (MW), RTD Energy Pmt Limit (MW)}\} - \text{RTD EOP: Gen (MW), 0}] * \text{RTD RT Total Price :Gen (\$/MW)}$$

Where RTD Energy Pmt Limit (MW) =

$$\text{RTD Basepoint (MW)} + (\text{RTD Gen Upper Op Limit (MW)} \times 1.03)$$

And RTD RT Incremental Energy Cost (\$) is the sum of the Bid Production Cost under the Real Time Generation Bid for each dispatch segment from Hr RT Gen Bid :Min Gen (MW) to the RTD Economic Basepoint (MW).

And RTD RT Total Price :Gen (\\$/MW) =

$$\text{RTD RT Energy Price :Gen (\$/MW)} + \text{RTD RT Loss Price :Gen (\$/MW)} - \text{RTD RT Cong Price :Gen (\$/MW)}$$

If there are no incremental bid points for the given generator and interval (Hr RT Gen Bid Dispatch Seg :Block = 0, or NULL), RT Energy Cost (\$) is determined as only the generator's Minimum Generation Costs (\$) provided on their Real Time Generation Bid, as follows:

RTD RT Energy Cost (\$) =

$$\text{Hr RT Gen Bid: Min Gen Cost ($) } * \{ \text{RTD Interval Seconds} \div 3,600 \text{ Seconds} \}$$

If the generator's RT energy injection is less than its Minimum Generation level (RTD RT BPCG En Inj (MW) < Hr RT Gen Bid: Min Gen (MW)), RT Energy Cost (\$) is equal to the generator's balancing market revenue in the given interval (Net Energy Cost (\$) equals zero):

$$\text{RTD RT Energy Cost ($) = RTD Total BalMkt Stlmnt: Gen (\$)}$$

(3) Generator is scheduled in the Day Ahead and Real Time Markets, and the DAM Schedule Generation plus any additional RT Transaction Schedule is greater than / equal to the generator's Minimum Generation level as defined by its Real Time Generation Bid (Hr DAM Sched Gen (MW) + Max\{RTD RT Sched Trans :Gen (MW) - Hr DAM Sched Trans :Gen (MW), 0\} >= Hr RT Gen Bid :Min Gen (MW))

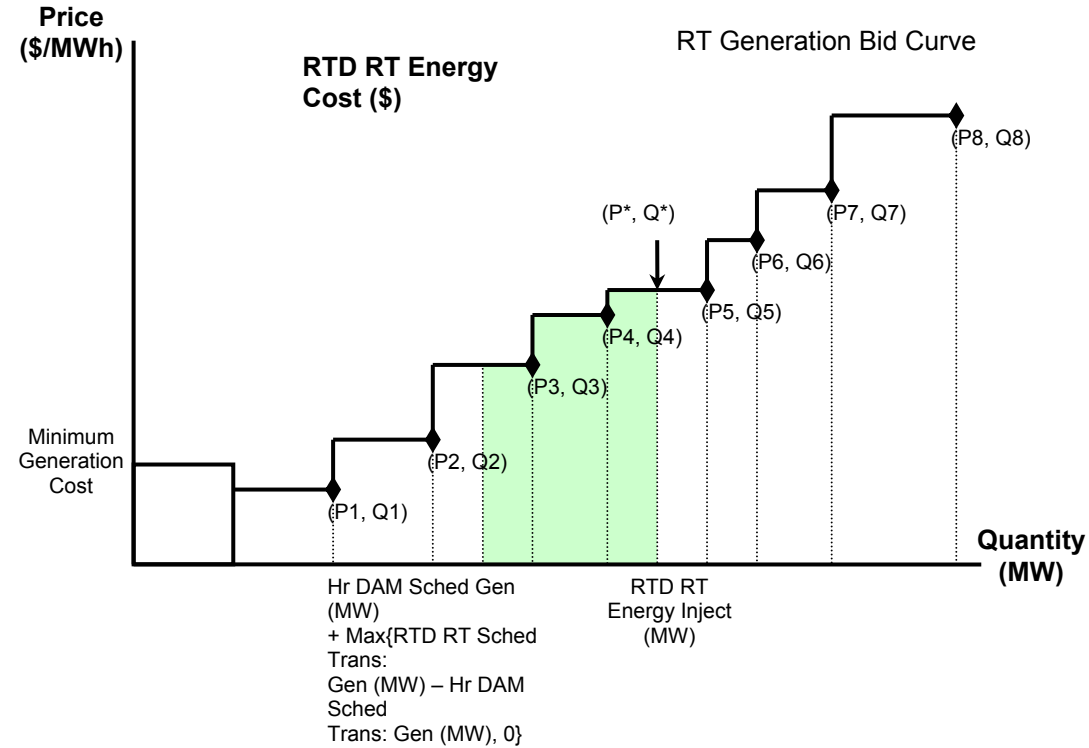
RTD RT Energy Cost (\$) =

$$\{ \text{RTD RT Incremental Energy Cost ($) - RTD DAM Incremental Energy Cost (\$)} \} * \{ \text{RTD Interval Seconds} \div 3,600 \text{ Seconds} \}$$

Where RTD RT Incremental Energy Cost (\$) is the sum of the Bid Production Cost under the Real Time Generation Bid for each dispatch segment from Hr RT Gen Bid :Min Gen (MW) to RTD RT Energy Inject (MW).

And RTD DAM Incremental Energy Cost (\$) is the sum of the Bid Production Cost under the Real Time Generation Bid for each dispatch segment from Hr RT

Gen Bid :Min Gen (MW) to Hr DAM Sched Gen (MW) + Max{RTD RT Sched Trans :Gen (MW) - Hr DAM Sched Trans :Gen (MW), 0}



Note the following exceptions:

If there are no incremental bid points for the given generator and interval (Hr RT Gen Bid Dispatch Seg :Block = 0, or NULL), RT Energy Cost (\$) is zero:

$$\text{RTD RT Energy Cost (\$)} = 0$$

If the generator's RT energy injection is less than its Minimum Generation level (RTD RT En Inj (MW) < Hr RT Gen Bid :Min Gen (MW)), RT Energy Cost (\$) is equal to the generator's balancing market revenue in the given interval (Net Energy Cost (\$) equals zero):

$$\text{RTD RT Energy Cost (\$)} = \text{RTD Total BalMkt Stlmnt :Gen (\$)}$$

(4) Generator is scheduled in the Day Ahead and Real Time Markets, and the DAM Schedule Generation plus any additional RT Transaction Schedule is less than the generator’s Minimum Generation level as defined by its RT Generation Bid (Hr RT Sched Gen (MW) + Max{RTD RT Sched Trans :Gen (MW) - Hr DAM Sched Trans :Gen (MW), 0} < Hr RT Gen Bid :Min Gen (MW))

RTD RT Energy Cost (\$) =

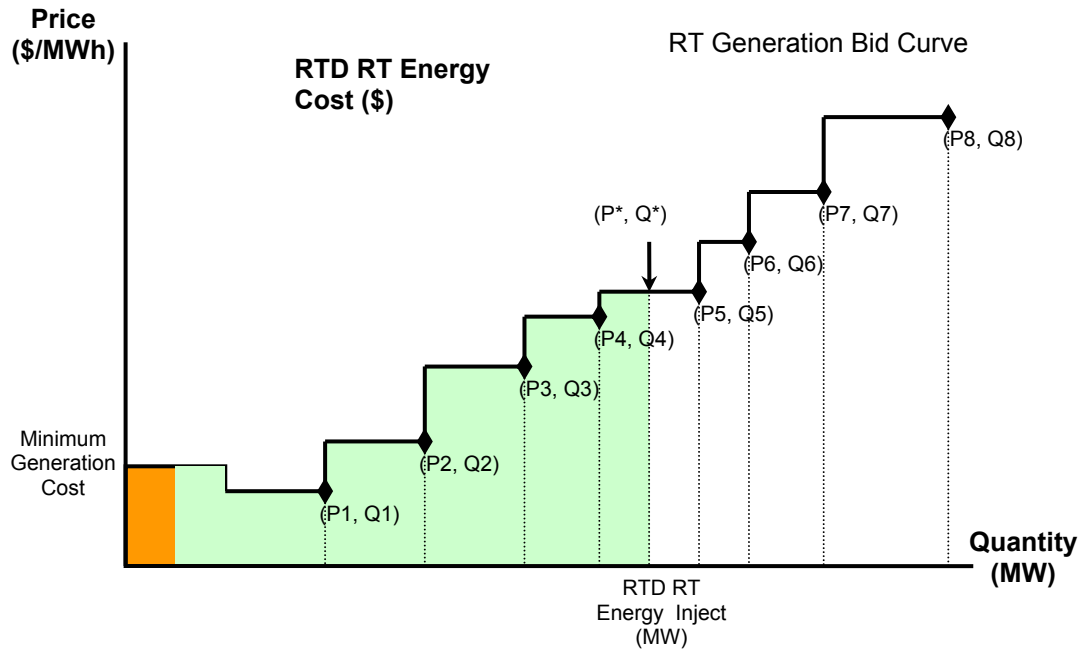
$$\{ \text{Hr RT Gen Bid :Min Gen Cost (\$)} + \text{RTD RT Incremental Energy Cost (\$)} - \text{RTD DAM Minimum Generation Cost (\$)} \} * \{ \text{RTD Interval Seconds} \div 3,600 \text{ Seconds} \}$$

Where RTD RT Incremental Energy Cost (\$) is the sum of the Bid Production Cost under the HAM Generation Bid for each dispatch segment from Hr RT Gen Bid :Min Gen (MW) to RTD RT Energy Inject (MW).

And RTD DAM Minimum Generation Cost (\$) =

$$\text{Hr RT Gen Bid :Min Gen Cost (\$)} *$$

$$\{ \text{Hr DAM Sched Gen (MW)} + \text{Max} \{ \text{RTD RT Sched Trans :Gen (MW)} - \text{Hr DAM Sched Trans :Gen (MW)}, 0 \} \} \div \text{Hr RT Gen Bid :Min Gen (MW)}$$



Note the following exceptions:

If there are no incremental bid points for the given generator and interval (Hr RT Gen Bid Dispatch Seg :Block = 0, or NULL), RT Energy Cost (\$) is determined as the generator's RT Minimum Generation Cost (\$) minus the amount of RT Minimum Generation Costs (\$) corresponding to its DAM Scheduled Generation plus any additional RT Transaction Schedules:

RTD RT Energy Cost (\$) =

{Hr RT Gen Bid :Min Gen Cost (\$) - RTD DAM Minimum Generation Cost (\$) } * {RTD Interval Seconds ÷ 3,600 Seconds}

Where RTD DAM Minimum Generation Cost (\$) =

Hr RT Gen Bid :Min Gen Cost (\$) *

{Hr DAM Sched Gen (MW) + Max{RTD RT Sched Trans :Gen (MW) - Hr DAM Sched Trans :Gen (MW), 0}} ÷ Hr RT Gen Bid: Min Gen (MW)}

If the generator's RT energy injection is less than its Minimum Generation level (RTD RT Energy Inject (MW) < Hr RT Gen Bid :Min Gen (MW)), RT Energy Cost (\$) is equal to the generator's balancing market revenue in the given interval (Net Energy Cost (\$) equals zero):

RTD RT Energy Cost (\$) = RTD Total BalMkt Stlmnt :Gen (\$)

And RTD RT Energy Inject (MW) is calculated as:

The determination of RTD Gen RT BPCG Basis (MW) varies under a couple of different scenarios:

1. Economic Operating Point greater than the Generator Adjusted Energy
2. Economic Operating Point less than or equal to the Generator Adjusted Energy

1. *Economic Operating Point greater than the Generator Adjusted Energy {RTD EOP: Gen (MW) > RTD Gen Adjusted Energy (MW)}:*

If the generator under-generated during the interval (RTD Gen Adjusted Energy (MW) < RTD Basepoint (MW)) and the Economic Operating Point is greater than the real time dispatch basepoint (RTD EOP: Gen (MW) > RTD Basepoint (MW)):

$$\text{RTD RT Energy Inject (MW)} = \text{RTD Basepoint (MW)}$$

If the generator under-generated during the interval (RTD Gen Adjusted Energy (MW) < RTD Basepoint (MW)) and the Economic Operating Point is less than or equal to the real time dispatch basepoint (RTD EOP: Gen (MW) ≤ RTD Basepoint (MW)):

$$\text{RTD RT Energy Inject (MW)} = \text{RTD EOP: Gen (MW)}$$

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If the generator over-generated during the interval (RTD Gen Adjusted Energy (MW) > RTD Basepoint (MW)):

$$\text{RTD RT Energy Inject (MW)} = \text{RTD Gen Adjusted Energy (MW)}$$

If the generator generated on schedule during the interval (RTD Gen Adjusted Energy (MW) = RTD Basepoint (MW)):

$$\text{RTD RT Energy Inject (MW)} = \text{RTD Gen Adjusted Energy (MW)}$$

2. Economic Operating Point less than or equal to the Generator Adjusted Energy {RTD EOP: Gen (MW) ≤ RTD Gen Adjusted Energy (MW)}:

If the generator over-generated during the interval (RTD Gen Adjusted Energy (MW) > RTD Basepoint (MW)) and the Economic Operating Point is greater than the real time dispatch basepoint (RTD EOP: Gen (MW) > RTD Basepoint (MW)):

$$\text{RTD RT Energy Inject (MW)} = \text{RTD EOP: Gen (MW)}$$

If the generator over-generated during the interval (RTD Gen Adjusted Energy (MW) > RTD Basepoint (MW)) and the Economic Operating Point is less than or equal to the real time dispatch basepoint (RTD EOP: Gen (MW) ≤ RTD Basepoint (MW)):

$$\text{RTD RT Energy Inject (MW)} = \text{RTD Basepoint (MW)}$$

If the generator underr-generated during the interval (RTD Gen Adjusted Energy (MW) < RTD Basepoint (MW)):

$$\text{RTD RT Energy Inject (MW)} = \text{RTD Gen Adjusted Energy (MW)}$$

If the generator generated on schedule during the interval (RTD Gen Adjusted Energy (MW) = RTD Basepoint (MW)):

$$\text{RTD RT Energy Inject (MW)} = \text{RTD Gen Adjusted Energy (MW)}$$

And Hr RT Net AS Rev (\$) is calculated as:

$$\text{Hr RT Net AS Rev (\$)} =$$

$$\text{Hr NASR Reg (\$)} + \text{Hr NASR Spin Res (\$)} + \text{Hr NASR 30 Min Synch Res (\$)} + \text{Hr VSS LOC Stlmnt (\$)}^2$$

Where:

$$\text{Hr NASR Reg (\$)} = \sum \text{RTD NASR Reg (\$)} \text{ for all RTD intervals in an hour}$$

Where:

$$\text{RTD NASR Reg (\$)} = \text{Hr DAM Sched Reg Avail (MWh)} \times (\text{Hr DAM Reg Price (\$/MW)} - \text{Hr DAM AS Bid Reg :Price (\$/MW)}) + \text{Max}(\text{RTD Bal Reg Avail Stlmnt (\$)}, 0)$$

² See section on Voltage Support Service Lost Opportunity Cost (LOC) settlement.

Where:

Hr NASR Spin Res (\$) = \sum RTD NASR Spin Res (\$) for all RTD intervals in the hour

Where:

RTD NASR Spin Res (\$) = Hr DAM Sched Spin Avail (MWh) \times (DAM Spin Price: Gen (\$/MW) - Hr DAM AS Bid Spin :Price (\$/MW)) + RTD Bal Spin Avail Stlmnt (\$)

Where:

Hr NASR 30 Min Synch Res (\$) = \sum RTD NASR 30 Min Synch Res (\$) for all RTD intervals in the hour

Where:

RTD NASR 30 Min Synch Res (\$) = Hr DAM Sched 30Sync Avail (MWh) \times (DAM 30Min Price: Gen (\$/MW) - Hr DAM AS Bid 30: Price (\$/MW)) + RTD Bal 30Sync Avail Stlmnt (\$)

And Hr RRA: Gen (\$) is calculated as:

Hr RRA: Gen (\$) = \sum RTD RRA: Gen (\$) for all RTD intervals in the hour.

And Day RT Startup Cost (\$) is calculated as:

Day RT Startup Cost (\$) =

\sum Hr RT Start Up Cost: RTS (\$), for all hours in a day.

NOTES:

- Real-Time Start-Up cost is a function of a generator’s actual down time during the Real-Time Market and its Start-Up cost curve (above any generator Start-Up cost incurred during the DAM). Start-Up cost is computed during NYISO’s Real Time Scheduling (RTS) process and provided to its Billing and Accounting System (BAS) for application to the power supplier Real-Time BPCG settlement.
- Start-Up cost is ineligible for recovery for generators that have bilateral commitments.

