New York Independent System Operator
Market Settlement Rules & Processes
Partial Set

Version 1.13

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1.1.1 Day-Ahead Market (DAM) Margin Assurance

1.1.1.1 Description

The Day-Ahead Market (DAM) Margin Assurance settlement ($) is a payment for Power Suppliers that are required to purchase energy in the NYISO Balancing Energy 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 energy settlements in Real-Time due to NYISO scheduling.

The DAM Margin Assurance ($) is calculated as the difference between balancing market charges and DAM bid production 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 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. However, if the generator is out of merit for LRR, please refer to the section titled Day-Ahead Market (DAM) Margin Assurance - Local Reliability Rules (LRR). This section refers to only the first condition (for NYISO reliability reasons).

This settlement is a payment (when related Balancing Market Cost > Bid Cost) to the Power Supplier. It is determined at the Security Constrained Dispatch (SCD) dispatch 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* ($) - The charges associated to the quantity (MW) a generator is required to purchase in the NYISO Balancing Market (at the real-time prices (LBMP) for energy, losses, and congestion) as a result of being dispatched below its DAM schedule.
- *DAM Margin Assurance Bid Cost* ($) - The generation production cost a Market Participant would save for not producing the energy equivalent to the quantity (MW) a generator is dispatched below its DAM schedule.

1.1.1.2 Required Data Elements

1.1.1.2.1 Determinants

Bill Code	Title	Business Description	DSS Value
	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)	Y
	Hr HAM Sched 10SyncRes Avail (MW)	Hourly Hour Ahead Market Scheduled 10-Minute Synchronous Operating Reserves Availability (MW) is a number representing the amount of Hour Ahead Market 10-Minute Synchronous Operating Reserves service the given generator is scheduled to provide for the given hour.	Y

Bill Code	Title	Business Description	DSS Value
	Hr HAM Sched 10NSync Avail (MW)	Hourly Hour Ahead Market Scheduled 10-Minute Non-Synchronous Operating Reserves Availability (MW) is a number representing the amount of Hour Ahead Market 10-Minute Non-Synchronous Operating Reserves Service the given generator is scheduled to provide for the given hour.	Y
	Hr HAM Sched 30Min Avail (MW)	Hourly Hour Ahead Market Scheduled 30-Minute Operating Reserves Availability (MW) is a number representing the amount of Hour Ahead Market 30-Minute Operating Reserves Service the given generator is scheduled to provide for the given hour.	Y
	Gen Upper Op Limit (MW)	Generator Uper Operating Limit (MW) is a number indicating the maximum operating capacity for a generator during the given period.	Y
	SCD 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).	Y
	SCD Basepoint (MW)	Security Constrained 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	Y
	SCD 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)	Y
	SCD 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)	Y
	SCD 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)	Y
	DAM Gen Bid Type Ind	Day Ahead Market Generation Bid Type Indicator is a character representing the type of DAM generation bid submitted by the generator (block or curve)	Y
	DAM Gen Bid Dispatch Seg - Curve	Day Ahead Market Generation Bid Dispatch Segments - Curve is a number representing the number of segments in the given DAM generation bid (curve generation bid type).	Y
	DAM Gen Bid Dispatch Seg - Block	Day Ahead Market Generation Bid Dispatch Segments - Block is a number representing the number of segments in the given DAM generation bid (block generation bid type).	Y

Bill Code	Title	Business Description	DSS Value
	Hr DAM Gen Bid -Price 1 ($/MW)	Day Ahead Market Generator Bid Price #1 is a number representing the bid price of generation ($/MW) bid in the first block during the interval, submitted by the Generator in a generation bid	Y
	Hr DAM Gen Bid -Price 2 ($/MW)	Day Ahead Market Generator Bid Price #2 is a number representing the bid price of generation ($/MW) bid in the second block during the interval, submitted by the Generator in a generation bid	Y
	Hr DAM Gen Bid -Price 3 ($/MW)	Day Ahead Market Generator Bid Price #3 is a number representing the bid price of generation ($/MW) bid in the third block during the interval, submitted by the Generator in a generation bid	Y
	Hr DAM Gen Bid -Price 4 ($/MW)	Day Ahead Market Generator Bid Price #4 is a number representing the bid price of generation ($/MW) bid in the fourth block during the interval, submitted by the Generator in a generation bid	Y
	Hr DAM Gen Bid -Price 5 ($/MW)	Day Ahead Market Generator Bid Price #5 is a number representing the bid price of generation ($/MW) bid in the fifth block during the interval, submitted by the Generator in a generation bid	Y
	Hr DAM Gen Bid -Price 6 ($/MW)	Day Ahead Market Generator Bid Price #6 is a number representing the bid price of generation ($/MW) bid in the sixth block during the interval, submitted by the Generator in a generation bid	Y
	Hr DAM Gen Bid -Gen 1 (MW)	Day Ahead Market Generator Bid Generation #1 is a number representing the amount of generation (MW) bid in the first block during the interval, submitted by the Generator in a generation bid	Y
	Hr DAM Gen Bid -Gen 2 (MW)	Day Ahead Market Generator Bid Generation #2 is a number representing the amount of generation (MW) bid in the second block during the interval, submitted by the Generator in a generation bid	Y
	Hr DAM Gen Bid -Gen 3 (MW)	Day Ahead Market Generator Bid Generation #3 is a number representing the amount of generation (MW) bid in the third block during the interval, submitted by the Generator in a generation bid	Y
	Hr DAM Gen Bid -Gen 4 (MW)	Day Ahead Market Generator Bid Generation #4 is a number representing the amount of generation (MW) bid in the fourth block during the interval, submitted by the Generator in a generation bid	Y
	Hr DAM Gen Bid -Gen 5 (MW)	Day Ahead Market Generator Bid Generation #5 is a number representing the amount of generation (MW) bid in the fifth block during the interval, submitted by the Generator in a generation bid	Y
	Hr DAM Gen Bid -Gen 6 (MW)	Day Ahead Market Generator Bid Generation #6 is a number representing the amount of generation (MW) bid in the sixth block during the interval, submitted by the Generator in a generation bid	Y

Bill Code	Title	Business Description	DSS Value
	SCD Out of Merit Type ID	SCD Out of Merit Type ID is a number representing the reason for an out of economic merit dispatch for the given generator and SCD-interval.	Y
5220	SCD Out of Merit Type Desc	SCD Out of Merit Type Description represents the reason for an out of economic merit dispatch for the given generator and SCD-interval.	Y
	SCD Interval Seconds	SCD Interval Seconds is a number representing the number of seconds in the SCD interval	Y
5270	Hr # Seconds On Dispatch	Hourly Number of Seconds On Dispatch is a number representing the amount of time in seconds a generator is actually on NYISO generation dispatch for the given hour.	Y
	Hr HAM Gen Bid On Dispatch Ind	Hourly Hour Ahead Market Generation Bid On Dispatch Indicator is a character representing whether or not the generator was bid into the NYISO Hour Ahead Market by the generator's organization as an on dispatch generator (values are Y or N).	Y
	SCD Reg Negative Error (MW)	SCD Regulation Negative Error (MW) is a number representing the amount of energy the given generator produced short of its AGC Basepoint for the given interval.	Y
	Eligible for Sync LOC Ind	Eligible for Synchronous Reserve Lost Opportunity Cost Indicator is a character representing whether or not the given generator is eligible for a Synchronous (10 or 30-Minute) Reserve LOC Payment in the given hour (values are Y or N).	N

1.1.1.2.2 Intermediates

Bill Code	Title	Business Description	DSS Value
	SCD RT Total Price - Gen ($/MW)	Real-Time Total Price ($/MW) is a number representing the total LBMP price of a generator bus	Y
	Hr Adj DAM Sched Gen (MW)	Day Ahead Adjusted 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), adjusted if the generator is derated such that it cannot fulfill its entire Operating Reserve Availability schedules (commitment).	N

	SCD DAM MarginAssrc BalMkt Cost ($)	SCD Day Ahead Market Margin Assurance Balancing Market Cost ($) is a number representing the amount of balancing market energy costs a generator incurred (due to NYISO dispatching the unit in real-time below their Day Ahead Market commitment) that is eligible for DAM Margin Assurance recovery.	N
	SCD DAM MarginAssrc Bid Cost ($)	SCD Day Ahead Market Margin Assurance Bid Cost ($) is a number representing the amount of determined bid cost (from a generator's HAM generation bid curve) that corresponds to the costs eligible for DAM Margin Assurance recovery.	N

1.1.1.2.3 Results

Bill Code	Title	Business Description	DSS Value
	SCD DAM Margin Assurance ($)	SCD Day Ahead Margin Assurance ($) is a number representing the DAM Margin Assurance settlement amount which is designed to ensure a generator dispatched in real-time by NYISO below the DAM commitment does not have its DAM margin eroded by additional balancing market energy charges; for the given generator for the given SCD-interval.	Y

1.1.1.3 Eligibility

Generators are eligible for DAM Margin Assurance ($) if:

- The generator is placed Out of Merit by NYISO for the following reasons: COMMITED FOR ISO RELIABILITY, OOM FOR TO LOCAL SECURITY, COMMITED FOR ISO RESERVES, or OOM FOR ISO SECURITY.
- The generator's:
  - SCD 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 HAM Gen Bid On Dispatch Ind = "Y").
- If the given interval < 08/29/2001 00:00 (Regulation Negative Control Error Date), the DAM Margin Assurance settlement is calculated as noted above. However, if the given interval is >= 08/29/2001 00:00, the generator's SCD Gen Adjusted Energy (MW) must be greater than its SCD Reg Negative Error (MW). Otherwise, SCD DAM Margin Assurance ($) = 0.

The following are scenarios for which DAM Margin Assurance ($) does not apply:

- When the generator is derated (following the Day-Ahead Market) by the Market Participant (Out of Merit Type description is "GENERTOR DERATE") such that:

Gen Upper Op Limit (MW) < {Hr HAM Sched 10SyncRes Avail (MW) + Hr HAM Sched 10NSyncRes Avail (MW) + Hr HAM Sched 30Min OpRes Avail (MW)}

- When the generator is eligible for a Synchronous Reserve Lost Opportunity Cost (LOC) payment:
  - Eligible for Sync LOC Ind = "Y", and
  - Out of Merit Type description is not equal to COMMITED FOR ISO RELIABILITY, OOM FOR TO LOCAL SECURITY, COMMITED FOR ISO RESERVES, or OOM FOR ISO SECURITY, and
  - DAM Margin Assurance payment is positive for the given SCD interval.
- DAM Margin Assurance ($) is not calculated for Grouped Generators (Generator Type = "GROUP UNIT").

1.1.1.4 Settlement Algorithm

SCD DAM Margin Assurance ($) is calculated as:

If the generator is not out of merit for local reliability (LRR):

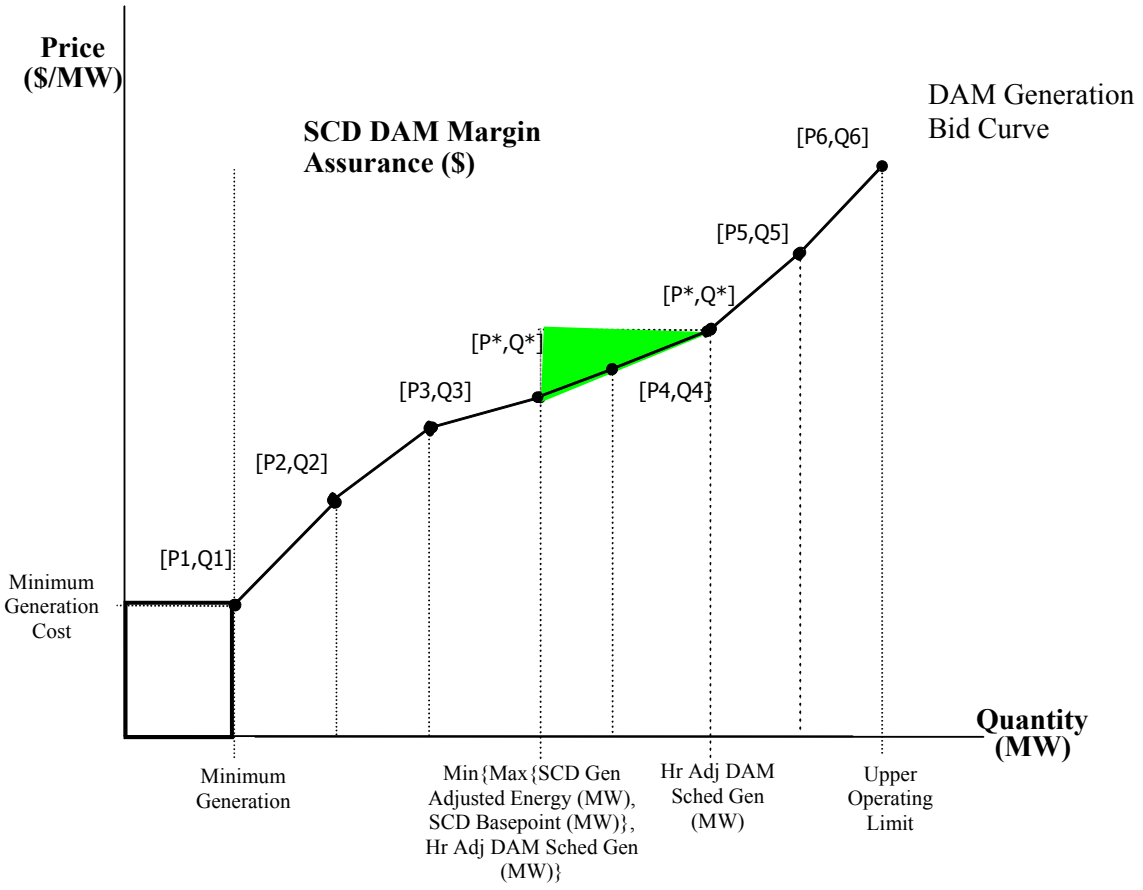
SCD DAM Margin Assurance ($) =

{SCD DAM MarginAssrc BalMkt Cost ($) (-) SCD DAM MarginAssrc Bid Cost ($)} * {SCD Interval Seconds ÷ 3,600 seconds}[1]

Else

SCD DAM Margin Assurance ($) = 0.

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



The triangular area noted in green (above the incremental bid curve) within the above graphical example represents the amount of DAM Margin Assurance ($) that a Market Participant would be paid corresponding to NYISO's out of merit dispatch of the given generator.

The area is calculated by subtracting SCD DAM MarginAssrc Bid Cost ($) from SCD DAM MarginAssrc BalMkt Cost ($). For further details, please see the following sections.

SCD DAM MarginAssrc BalMkt Cost ($) is calculated as:

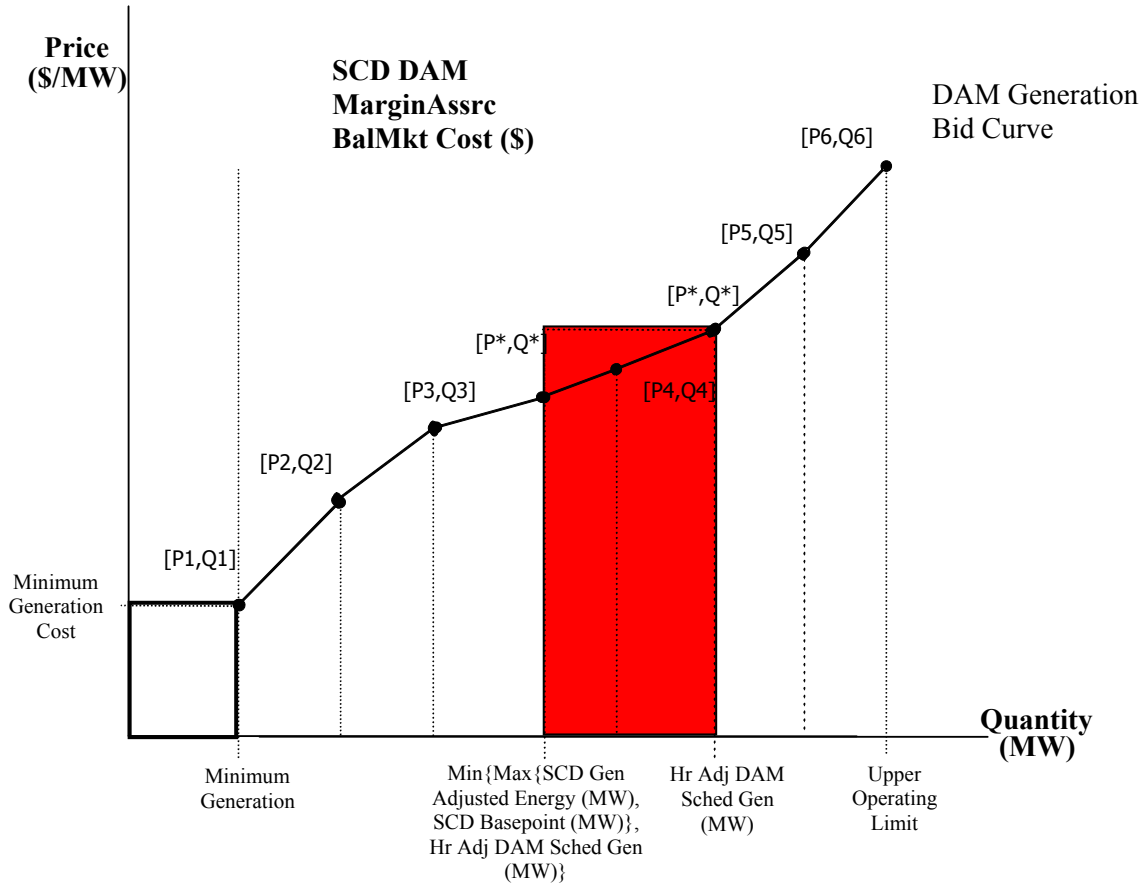
SCD DAM MarginAssrc BalMkt Cost ($) =

{Hr Adj DAM Sched Gen (MW) (-) Min{Max{SCD Gen Adjusted Energy (MW), SCD Basepoint (MW)}, Hr Adj DAM Sched Gen (MW)}} * SCD RT Total Price - Gen ($/MW)

SCD RT Total Price - Gen ($/MW) =

SCD RT Energy Price - Gen ($/MW) + SCD RT Loss Price - Gen ($/MW) + {-1 * SCD RT Cong Price - Gen ($/MW)}

See below section for more information on Hr Adj DAM Sched Gen (MW).



The rectangular area in red (above and below the incremental bid curve) within the above graphical example represents the amount of balancing market charges that a Market Participant would incur for energy purchased in the NYISO Balancing Market corresponding to NYISO's out of merit dispatch of the given generator.

The area is calculated as the difference between the generator's Hr Adj DAM Sched Gen (MW) and the Min{Max{SCD Gen Adjusted Energy (MW), SCD Basepoint (MW)}, Hr Adj DAM Sched Gen (MW)} multiplied by the SCD RT Total Price - Gen ($/MW) for energy purchased/sold in the NYISO Balancing Energy Market.

SCD DAM MarginAssrc Bid Cost ($) is calculated as:

SCD DAM MarginAssrc Bid Cost ($) is the sum of the Bid Production Cost under the DAM Generation Bid curve for each dispatch segment from Hr Adj DAM Sched Gen (MW) to the Min{Max{SCD Gen Adjusted Energy (MW), SCD Basepoint (MW)}, Hr Adj DAM Sched Gen (MW)}

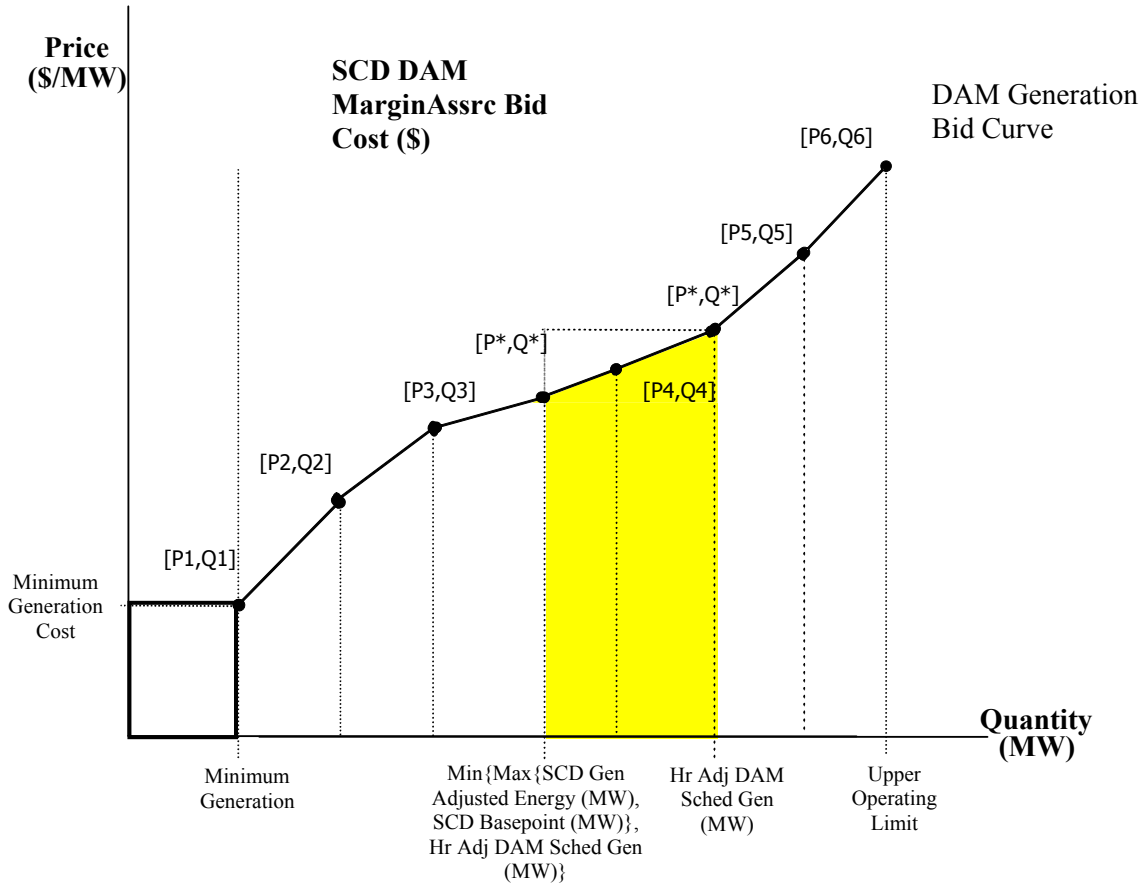
Please see Appendix A, Figure 1.3 for more information on how to determine the bid production cost ($) on a given Generation Bid curve corresponding to a specific upper and lower generation output level (MW).

*The corresponding Bid Prices (P*_upper & P*_lower) ($/MW) are calculated as:*

1. P*_upper ($/MW) is the price on the generator's DAM Generation Bid curve corresponding to their Hr Adj DAM Sched Gen (MW) for the given generator, for the given interval., and
2. P*_lower ($/MW) is the price on the generator's DAM Generation Bid curve corresponding to their Min{Max{SCD Gen Adjusted Energy (MW), SCD Basepoint (MW)}, Hr Adj DAM Sched Gen (MW)} for the given generator, for the given interval.

   Please see Appendix A, Figure 1.1 for more information on how to determine the price ($/MW) on a given Generation Bid curve corresponding to a specific generation output level (MW).

See below section for more information on Hr Adj DAM Sched Gen (MW).



The area in yellow (below the incremental cost curve) within the above graphical example represents the amount of generation bid production cost that a Market Participant would save for not having produced the energy corresponding to NYISO's out of merit dispatch of the given generator.

The area is calculated by summing each individual dispatch segment's the bid production cost ($) under the DAM Generation Bid curve between the two MW output levels, where the bid production cost under the DAM Generation Bid curve for a given dispatch segment can be calculated as discussed in Appendix A, Figure 1.3.

Hr Adj DAM Sched Gen (MW) is calculated as:

If the generator was derated during the hour,

Hr Adj DAM Sched Gen (MW) =

Min[Gen Upper Op Limit (MW) (-) {Hr HAM Sched 10SyncRes Avail (MW) + Hr HAM Sched 10NSyncRes Avail (MW) + Hr HAM Sched 30Min OpRes Avail (MW)}, Hr DAM Sched Gen (MW)]

Else

Hr Adj DAM Sched Gen (MW) = Hr DAM Sched Gen (MW)

NOTE: The adjustment to the Hr DAM Sched Gen (MW) is made in cases where a generator's Gen Upper Op Limit (MW) is reduced enough that the generator's Operating Reserve Availability commitments cannot be fulfilled.

1.1.1.5 Additional Information

When the generator is under/over-generating during the interval:

If the SCD Gen Adjusted Energy (MW) (adjusted metered generation) is below the SCD Basepoint (MW) (dispatch instruction) (under-generating), then the NYISO will only guarantee DAM margin (profit) up to the SCD Basepoint (MW) value (only the part the NYISO's scheduling is responsible for).

On the other hand, if a generator over-generates (i.e. above the SCD Basepoint (MW)), then the NYISO will only guarantee to the SCD Gen Adjusted Energy (MW) value since the difference between SCD Basepoint (MW) and SCD Gen Adjusted Energy (MW) would have already been accounted for in the real-time balancing market (again, only the part the NYISO's scheduling is responsible for).

1.1.1.6 References

The applicability of Day-Ahead Margin Assurance Payments is described within Attachment J of the MST (Market Administration and Control Area Services Tariff).

1.1.2 Day-Ahead Market (DAM) Margin Assurance - Local Reliability Rules (LRR)

1.1.2.1 Description

The Day-Ahead Market (DAM) Margin Assurance settlement ($) is a payment for Power Suppliers that are required to purchase energy in the NYISO Balancing Energy 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 energy settlements in Real-Time due to NYISO scheduling.

The DAM Margin Assurance ($) is calculated as the difference between balancing market charges and DAM bid production 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 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. However, if the generator is out of merit for NYISO reliability reasons, please refer to the section titled Day-Ahead Market (DAM) Margin Assurance. This section refers to only the second condition (for LRR reliability reasons).

NOTE: Please refer to the Day-Ahead Market (DAM) Margin Assurance settlement section for details regarding the Day-Ahead Market (DAM) Margin Assurance - Local Reliability Rules (LRR) settlement. The settlements are determined exactly the same, with the following notable exception:

SCD DAM Margin Assurance - LRR ($) is calculated as:

If the generator is out of merit for local reliability (LRR):

SCD DAM Margin Assurance - LRR ($) =

{SCD DAM MarginAssrc BalMkt Cost ($) (-) SCD DAM MarginAssrc Bid Cost ($)} * {SCD Interval Seconds ÷ 3,600 seconds}[2]

Else

SCD DAM Margin Assurance - LRR ($) = 0.

1.1.3 Ancillary Services

1.1.3.1 Regulation

1.1.3.1.1 DAM Regulation and Frequency Response Service Availability

1.1.3.1.1.1 Description

The Day Ahead Market (DAM) Regulation and Frequency Response Service Availability[3] settlement is intended to compensate Power Suppliers who offer their generator's capacity as Regulation and Frequency Response 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 and Frequency Response 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 and Frequency Response Service unless they have been offered to the market and scheduled by the NYISO to supply the service.

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

This DAM Regulation and Frequency Response Service Availability settlement is reduced under certain conditions, and the reduction is calculated as follows:

- Prior to August 01, 2001: Availability payments are reduced for intervals when the scheduled generators were not available for AGC dispatch (i.e. off control).
- Beginning August 01, 2001: Availability payments are not necessarily reduced, as long as regulation performance is within pre-determined limits.

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

[2] SCD Interval Seconds ÷ 3,600 seconds is used to settle by time weighting the calculation over the interval period.
[3] See the Ancillary Service Market Summary for more information.

1.1.3.1.1.2 Required Data Elements

1.1.3.1.1.2.1 Determinants

Bill Code	Title	Business Description	DSS Value
218	DAM Reg Price East ($/MW)	Day Ahead Market Regulation Price East - Generator ($/MW) is a number representing the east hourly market clearing price for the DAM regulation service based on the set of generators in the East Ancillary Service Pricing Region selected by SCUC.	Y
218	DAM Reg Price West ($/MW)	Day Ahead Market Regulation Price West - Generator ($/MW) is a number representing the west hourly market clearing price for the DAM regulation service based on the set of generators in the West Ancillary Service Pricing Region selected by SCUC.	Y
217	Hr DAM Sched Reg Avail (MW)	Hourly Day Ahead Market Scheduled Regulation Availability (MW) 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.	Y
	Hr # Seconds On Control	Hourly Number of Seconds On Control is a number representing the amount of time in seconds a generator providing regulation service is actually on regulation control for the given hour.	Y
	Hr # Seconds Operating Interval	Hourly Number of Seconds Operating Interval is a number representing the number of seconds in the given generator's operating interval for the given hour.	Y
	Market Participation Threshold	Market Participation Threshold is a number representing a Performance Index value that must be maintained on an hourly basis to avoid forfeiture of availability payments for regulation service for the given hour (values are between 0 and 1).	Y
	Payment Scaling Factor	Payment Scaling Factor is a number representing the value of service differences among regulation service providers with performance at or above the Market Participation Threshold (values are between 0 and the Market Participant Threshold).	Y
	Performance Index	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).	Y

1.1.3.1.1.2.2 Intermediates

Bill Code	Title	Business Description	DSS Value
216	Resource Availability Index	Resource Availability Index is a number representing a measurement of regulation performance as calculated by the NYISO using the number of seconds the generator was on control for the given hour (values are between 0 and 1).	Y

1.1.3.1.1.2.3 Results

Bill Code	Title		DSS Value
	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.	Y

1.1.3.1.1.3 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.

Hr DAM Sched Reg Avail (MW) > 0

1.1.3.1.1.4 Settlement Algorithm

Prior to the date when changes were made to the determination of the performance adjustment (08/01/2001):

Hr DAM Reg Avail Stlmnt ($) =

DAM Reg Price ($/MW) * Hr DAM Sched Reg Avail (MW) * Resource Availability Index

Where:

Resource Availability Index = {3,600 Seconds - Hr # Seconds Operating Interval + Hr # Seconds On Control} ÷ 3,600 Seconds

After this date (08/01/2001):

If the generator's performance was within its acceptable performance threshold level (Performance Index > Market Participation Threshold), then:

Hr DAM Reg Avail Stlmnt ($) =

DAM Reg Price ($/MW) * Hr DAM Sched Reg Avail (MW) *

[Performance Index - {Payment Scaling Factor ÷ (1 - Payment Scaling Factor)}]

Else (generator was outside performance threshold level):

Hr DAM Reg Avail Stlmnt ($) = 0

NOTES:

- The generator's performance level cannot exceed 1.0. Therefore:

  If Performance Index > 1.0, then Performance Index = 1.0.

- The DAM Reg Price ($/MW) is based on the given generator's location within the NYISO AS pricing regions: East or West (DAM Reg Price East ($/MW), DAM Reg Price West ($/MW)).

- A Generator will still be paid for DAM Regulation and Frequency Control Service Availability, even if NYISO schedules the generator as off-control during the hour during the Hour Ahead Market (HAM).

  If Hr HAM Sched Reg Avail (MW) = 0, Resource Availability Index = 1.0

1.1.3.1.1.5 Additional Information

None

1.1.3.1.1.6 References

The scheduling and dispatch of Regulation Service are described in detail in the NYISO Ancillary Services Manual at Chapter 4: Regulation & Frequency Response Service.

The applicability of Day Ahead Regulation and Frequency Response Service Availability Payments is described within Schedule 3 of the MST (Market Administration and Control Area Services Tariff), and Schedule 3 of the OATT (Open Access Transmission Tariff).

1.1.3.1.2 Supplemental Regulation and Frequency Response Service Availability

1.1.3.1.2.1 Description

The Supplemental Regulation and Frequency Response Service Availability[4] settlement is intended to compensate Power Suppliers who offer their generator's capacity as Regulation and Frequency Response Service to the NYISO via the Hour Ahead Market (HAM).

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 and Frequency Response 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 and Frequency Response Service unless they have been offered to the market and scheduled by the NYISO to supply the service.

The Supplemental Regulation and Frequency Response Service Availability settlement is based upon the Regulation and Frequency Response Service capacity scheduled for the generator, the corresponding HAM Regulation and Frequency Response Service Market Clearing Price (MCP), and any required adjustment due to generator non-performance (see below). It is determined at the

[4] See the Ancillary Service Market Summary for more information.

hourly-level for each generator scheduled to provide this service in the supplemental regulation market.

This Supplemental Regulation and Frequency Response Service Availability settlement is reduced under certain conditions, and the reduction is calculated as follows:

- Prior to August 01, 2001: Availability payments are reduced for intervals when the scheduled generators were not available for AGC dispatch (i.e. off control).
- Beginning August 01, 2001: Availability payments are not necessarily reduced, as long as regulation performance is within pre-determined limits.

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

1.1.3.1.2.2 Required Data Elements

1.1.3.1.2.2.1 Determinants

Bill Code	Title	Business Description	DSS Value
220	HAM Reg Price East ($/MW)	Hour Ahead Market Regulation Price East - Generator ($/MW) is a number representing the east hourly market clearing price for the HAM regulation service based on the set of generators in the East Ancillary Service Pricing Region selected by BME.	Y
220	HAM Reg Price West ($/MW)	Hour Ahead Market Regulation Price West - Generator ($/MW) is a number representing the west hourly market clearing price for the HAM regulation service based on the set of generators in the West Ancillary Service Pricing Region selected by BME.	Y
217	Hr DAM Sched Reg Avail (MW)	Hourly Day Ahead Market Scheduled Regulation Availability (MW) 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.	Y
	Hr HAM Sched Reg Avail (MW)	Hourly Hour Ahead Scheduled Regulation Availability (MW) is a number representing the amount of regulation availability scheduled by the NYISO for the given generator in the Hour Ahead Market for the given hour.	Y
	Hr # Seconds On Control	Hourly Number of Seconds On Control is a number representing the amount of time in seconds a generator providing regulation service is actually on regulation control for the given hour.	Y

	Hr # Seconds Operating Interval	Hourly Number of Seconds Operating Interval is a number representing the number of seconds in the given generator's operating interval for the given hour.	Y
	Market Participation Threshold	Market Participation Threshold is a number representing a Performance Index value that must be maintained on an hourly basis to avoid forfeiture of availability payments for regulation service for the given hour (values are between 0 and 1).	Y
	Payment Scaling Factor	Payment Scaling Factor is a number representing the value of service differences among regulation service providers with performance at or above the Market Participation Threshold (values are between 0 and the Market Participant Threshold).	Y
	Performance Index	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).	Y

1.1.3.1.2.2.2 Intermediates

Bill Code	Title	Business Description	DSS Value
219	Hr Sup Sched Reg Avail (MW)	Hourly Supplemental Scheduled Regulation Availability (MW) is a number representing the amount of regulation availability scheduled by the NYISO for the given generator in the Hour Ahead Market net of the amount scheduled in the Day Ahead Market, or zero of DAM schedule > HAM schedule), for the given hour	Y
216	Resource Availability Index	Resource Availability Index is a number representing a measurement of regulation performance as calculated by the NYISO using the number of seconds the generator was on control for the given hour (values are between 0 and 1).	Y

1.1.3.1.2.2.3 Results

Bill Code	Title		DSS Value
	Hr Sup Reg Avail Stlmnt ($)	Hourly Supplemental Regulation Availability Settlement ($) is a number representing the BAS-determined supplemental regulation settlement for the generator for the hour.	Y

1.1.3.1.2.3 Eligibility

Generators scheduled in the NYISO Hour Ahead Market (HAM) Regulation and Frequency Response Service market in excess of their Day Ahead Market (DAM) Regulation and Frequency Response Service schedule are eligible to receive the Supplemental Regulation and Frequency Response Service Availability settlement.

Hr Sup Sched Reg Avail (MW) > 0

1.1.3.1.2.4 Settlement Algorithm

Prior to the date when changes were made to the determination of the performance adjustment (08/01/2001):

Hr Sup Reg Avail Stlmnt ($) =

HAM Reg Price ($/MW) * Hr Sup Sched Reg Avail (MW) * Resource Availability Index

Where:

Resource Availability Index = {3,600 Seconds - Hr # Seconds Operating Interval + Hr # Seconds On Control} ÷ 3,600 Seconds

After this date (08/01/2001):

If the generator's performance was within its acceptable performance threshold level (Performance Index > Market Participation Threshold), then:

Hr Sup Reg Avail Stlmnt ($) =

HAM Reg Price ($/MW) * Hr Sup Sched Reg Avail (MW) *

[Performance Index - {Payment Scaling Factor ÷ (1 - Payment Scaling Factor)}]

Else (generator was outside performance threshold level):

Hr Sup Reg Avail Stlmnt ($) = 0

Where Hr Sup Sched Reg Avail (MW) is calculated as:

Hr Sup Sched Reg Avail (MW) = Max{Hr HAM Sched Reg Avail (MW) - Hr DAM Sched Reg Avail (MW), 0}

NOTES:

- The generator's performance level cannot exceed 1.0. Therefore:

  If Performance Index > 1.0, then Performance Index = 1.0.

- The HAM Reg Price ($/MW) is based on the given generator's location within the NYISO AS pricing regions: East or West (HAM Reg Price East ($/MW), HAM Reg Price West ($/MW)).

1.1.3.1.2.5 Additional Information

None

1.1.3.1.2.6 References

The scheduling and dispatch of Regulation Service are described in detail in the NYISO Ancillary Services Manual at Chapter 4: Regulation & Frequency Response Service.

The applicability of Day Ahead Regulation and Frequency Response Service Availability Payments is described within Schedule 3 of the MST (Market Administration and Control Area Services Tariff), and Schedule 3 of the OATT (Open Access Transmission Tariff).

1.1.3.1.3 Regulation and Frequency Response Replacement Cost Settlement

1.1.3.1.3.1 Description

The Regulation and Frequency Response Service Replacement Cost settlement ($) is intended to recover NYISO's costs to replace DAM Regulation and Frequency Response Service Availability due to Power Suppliers who offer their generator's capacity as Regulation and Frequency Response Service to the NYISO in the DAM, but then are not able (un-available) to provide the service. The replacement capacity is purchased by NYISO in Hour Ahead Market (HAM) as Supplemental Reserve Service.

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 and Frequency Response 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 and Frequency Response Service unless they have been offered to the market and scheduled by the NYISO to supply the service.

The Regulation and Frequency Response Service Replacement Cost settlement is based upon NYISO's costs to procure the Supplemental Regulation and Frequency Response Service. It is allocated to generators based on the ratio of the generator's DAM Replacement (MW) to the total NYISO DAM Replacement (MW).

It is determined at the hourly-level for each generator scheduled to provide DAM Regulation and Frequency Response Service.

1.1.3.1.3.2 Required Data Elements

1.1.3.1.3.2.1 Determinants

Bil Code		Business Description	DSS
220	DAM Reg Price East ($/MW)	Hour Ahead Market Regulation Price East - Generator ($/MW) is a number representing the east hourly market clearing price for the HAM regulation service based on the set of generators in the East Ancillary Service Pricing Region selected by BME.	Y

218	HAM Reg Price East ($/MW)	Day Ahead Market Regulation Price East - Generator ($/MW) is a number representing the east hourly market clearing price for the DAM regulation service based on the set of generators in the East Ancillary Service Pricing Region selected by SCUC.	Y
217	Hr DAM Sched Reg Avail (MW)	Hourly Day Ahead Market Scheduled Regulation Availability (MW) 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.	Y
	Hr HAM Sched Reg Avail (MW)	Hourly Hour Ahead Market Scheduled Regulation Availability (MW) is a number representing the amount of regulation availability scheduled by the NYISO for the given generator in the Hour Ahead Market for the given hour.	Y
	Hr # Seconds On Control	Hourly Number of Seconds On Control is a number representing the amount of time in seconds a generator providing regulation service is actually on regulation control for the given hour.	Y
	Hr # Seconds Operating Interval	Hourly Number of Seconds Operating Interval is a number representing the number of seconds in the given generator's operating interval for the given hour.	Y

1.1.3.1.3.2.2 Intermediates

Bill Code	Title		DSS Value
219	Hr Sup Sched Reg Avail (MW)	Hourly Supplemental Scheduled Regulation Availability (MW) is a number representing the amount of regulation availability scheduled by the NYISO for the given generator in the Hour Ahead Market net of the amount scheduled in the Day Ahead Market, or zero of DAM schedule > HAM schedule), for the given hour	Y
	Hr DAM Reg Replacement (MW)	Hourly Day Ahead Market Regulation Replacement (MW) is a number representing the amount of regulation availability that had to be replaced by NYISO for the given generator in the Day Ahead Market for the given hour.	Y
	Hr Sup Reg Replacement (MW)	Hourly Supplemental Regulation Replacement (MW) is a number representing the amount of regulation availability that had to be replaced by NYISO for the given generator in the Hour Ahead Market for the given hour.	Y

	Hr Tot NYISO DAM Reg Repl (MW)	Hourly Total NYISO Day Ahead Market Regulation Replacement (MW) is a number representing the NYISO-wide total amount of regulation availability that had to be replaced by NYISO in the Day Ahead Market for the given hour.	Y
	Hr Tot NYISO SUP Reg Repl (MW)	Hourly Total NYISO Supplemental Regulation Replacement (MW) is a number representing the NYISO-wide total amount of regulation availability that had to be replaced by NYISO in the Hour Ahead Market for the given hour.	Y
216	Resource Availability Index	216 - Resource Availability Index is a number representing a measurement of regulation performance as calculated by the NYISO using the number of seconds the generator was on control for the given hour (values are between 0 and 1).	Y
	Resource Un-Available Index	Resource Un-Available Index is a number representing a measurement of regulation non-performance as calculated by the NYISO using the total number of seconds in the hour (3600) minus the number of seconds the generator was on control for the given hour (values are between 0 and 1).	Y
	NYISO Reg Replacement Cost Cap ($)	NYISO Regulation Replacement Cost Cap ($) is a number representing the maximum amount of regulation replacement costs that can be charged to all NYISO generators (in total) in the Regulation Replacement settlements for the given hour; based on the total amount of supplemental regulation procured by NYISO.	Y
	Tot NYISO Reg Replacement Cost ($)	Total NYISO Regulation Replacement Cost ($) is a number representing the total amount of NYISO regulation replacement costs to be allocated to generators for the given hour.	Y

1.1.3.1.3.2.3 Results

Bill Code	Title		DSS Value
221	Hr Reg Replacement Cost ($)	Hourly Regulation Replacement Cost ($) is a number representing the amount of NYISO total regulation replacement costs allocated to the given generator for the given hour.	Y

1.1.3.1.3.3 Eligibility

Generators scheduled in the NYISO Day Ahead Market (DAM) Regulation and Frequency Response Service market could be charged the DAM Regulation and Frequency Response Service Replacement Cost settlement if the generator was unavailable during the given interval.

- Hr DAM Sched Reg Avail (MW) > 0

- Resource Un-Available Index <> 0

1.1.3.1.3.4 Algorithm

Hr Reg Replacement Cost ($) can be calculated as follows:

Hr Reg Replacement Cost ($) =

Tot NYISO Reg Replacement Cost ($) * {Hr DAM Reg Replacement (MW) ÷ Hr Tot NYISO DAM Reg Repl (MW)}

Where Hr Tot NYISO DAM Reg Repl (MW) is the sum of all generator's Hr DAM Reg Replacement (MW) in the given hour.

NOTE:

If Tot NYISO Reg Replacement Cost ($) < 0, then

Tot NYISO Reg Replacement Cost ($) = 0

Tot NYISO Reg Replacement Cost ($) is calculated by:

Tot NYISO Reg Replacement Cost ($) =

Hr Tot NYISO DAM Reg Repl (MW) * {HAM Reg Price East ($/MW) - DAM Reg Price East ($/MW)}

The Total NYISO Regulation Replacement Cost is capped at NYISO's cost to procure Supplemental Regulation Service (MW) in the Hour Ahead Market, as follows:

If Tot NYISO Reg Replacement Cost ($) > NYISO Reg Replacement Cost Cap ($):

Tot NYISO Reg Replacement Cost ($) = NYISO Reg Replacement Cost Cap ($)

Where NYISO Reg Replacement Cost Cap ($) can be calculated as follows:

NYISO Reg Replacement Cost Cap ($) =

Hr Tot NYISO SUP Reg Repl (MW) * {HAM Reg Price East ($/MW) - DAM Reg Price East ($/MW)}

Where Hr Tot NYISO SUP Reg Repl (MW) is the sum of all generator's Hr Sup Reg Replacement (MW) in the given hour.

Hr DAM Reg Replacement (MW) is calculated by:

Hr DAM Reg Replacement (MW) =

Hr DAM Sched Reg Avail (MW) * Resource Un-Available Index

Where:

Resource Un-Available Index = {1 - Resource Availability Index}

And:

Resource Availability Index = {3,600 - Hr # Seconds Operating Interval + Hr # Seconds On Control} ÷ 3,600

NOTE:

- A Generator will not be considered off-control during the hour if NYISO schedules the generator as off-control during the hour during the Hour Ahead Market (HAM).

If Hr HAM Sched Reg Avail (MW) = 0,

Resource Availability Index = 1.0

Hr Sup Reg Replacement (MW) is calculated by:

Hr Sup Reg Replacement (MW) =

Hr Sup Sched Reg Avail (MW) * Resource Availability Index

Where:

Resource Availability Index = {3,600 - Hr # Seconds Operating Interval + Hr # Seconds On Control} ÷ 3,600

And Hr Sup Sched Reg Avail (MW) is calculated as:

Hr Sup Sched Reg Avail (MW) =

Max{Hr HAM Sched Reg Avail (MW) - Hr DAM Sched Reg Avail (MW), 0}

1.1.3.1.3.5 Additional Information

None

1.1.3.1.3.6 References

The applicability of Regulation and Frequency Response Replacement Costs is described within Schedule 3 of the MST (Market Administration and Control Area Services Tariff), and Schedule 3 of the OATT (Open Access Transmission Tariff).

1.1.3.1.4 Regulation and Frequency Response Service Penalty

1.1.3.1.4.1 Description

The Regulation and Frequency Response Service Penalty settlement ($) is intended to incent Power Suppliers who offer their generator's capacity as Day Ahead Market (DAM) and/or Supplemental Regulation and Frequency Response Service, and are scheduled and dispatched by NYISO, to follow their Automatic Generation Control (AGC) dispatch basepoints in real-time. If a generator does not follow its AGC basepoints within a tolerance level, a penalty is assessed to the generator.

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 and Frequency Response 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 and Frequency Response Service unless they have been offered to the market and scheduled by the NYISO to supply the service.

On-dispatch, non-regulating and off-dispatch, non-regulating generators that persistently under-generate shall be subject to the penalty. The limit below which the generator is subject to penalty shall include a tolerance and a time delay of approximately 3 SCD-intervals to give the generator a tolerance band to respond to changing prices. Generators providing Voltage Support Service, are Out of Merit, or are PURPA classified generators during the interval are not subject to the penalty. Generators that persistently over-generate may be subject to a regulation penalty in the future.

The Regulation and Frequency Response Service Penalty settlement is based upon the amount of energy the generator deviates from its AGC basepoints in real-time. The penalty amount is calculated as the generator's energy deviation (MW) multiplied against the corresponding Hour Ahead Market (HAM) price for regulation service (or against the DAM price if the HAM price does not exist) in the given hour.

The Regulation and Frequency Response Penalty settlement is determined at the SCD-level for each generator scheduled to provide regulation service (DAM and/or Supplemental).

1.1.3.1.4.2 Required Data Elements

1.1.3.1.4.2.1 Determinants

Bill Code	Title	Business Description	DSS Value
218	DAM Reg Price East ($/MW)	Day Ahead Market Regulation Price East - Generator ($/MW) is a number representing the east hourly market clearing price for the DAM regulation service based on the set of generators in the East Ancillary Service Pricing Region selected by SCUC.	Y
218	DAM Reg Price West ($/MW)	Day Ahead Market Regulation Price West - Generator ($/MW) is a number representing the west hourly market clearing price for the DAM regulation service based on the set of generators in the West Ancillary Service Pricing Region selected by SCUC.	Y

220	HAM Reg Price East ($/MW)	Hour Ahead Market Regulation Price East - Generator ($/MW) is a number representing the east hourly market clearing price for the HAM regulation service based on the set of generators in the East Ancillary Service Pricing Region selected by BME.	Y
220	HAM Reg Price West ($/MW)	Hour Ahead Market Regulation Price West - Generator ($/MW) is a number representing the west hourly market clearing price for the HAM regulation service based on the set of generators in the West Ancillary Service Pricing Region selected by BME.	Y
	SCD Basepoint (MW)	Security Constrained 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	Y
	SCD 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).	Y
	SCD Reg Negative Error (MW)	SCD Regulation Negative Error (MW) is a number representing the amount of energy the given generator produced short of its AGC Basepoint for the given interval.	Y
	SCD Reg Positive Error (MW)	SCD Regulation Positive Error (MW) is a number representing the amount of energy the given generator produced in excess of its AGC Basepoint for the given interval.	Y
	SCD Interval Seconds	SCD Interval Seconds is a number representing the number of seconds in the SCD interval	Y
	SCD 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)	Y
5260	SCD On Control Ind	On Control Indicator is a character representing whether or not the generator is on NYISO regulation control	Y
	SCD Out of Merit Flag	SCD Out of Merit Flag is a character representing whether or not the given generator was dispatched out of economic merit order during the SCD-interval	Y

	SCD PURPA Units Class Type	SCD PURPA Class Type is a character representing the class of the PURPA Generator (Class 1 or Class 2) during the given SCD-interval.	Y
	Reserve Pickup Ind	Reserve Pick Up Indicator is an character which indicates whether the SCD interval was initiated as a reserve pickup.	Y
	SCD VSS Flag	Voltage Support Service Flag is a character representing whether or not the unit is providing voltage support service during the interval (values are Y or N).	Y
	SCD Max Gen Flag	SCD Maximum Generation Flag is a character representing whether or not the given generator is operating at its maximum output level for the given interval (values are Y or N).	Y

1.1.3.1.4.2.2 Intermediates

Bill Code	Title	Business Description	DSS Value
	SCD Reg Energy Deviation (MW)	SCD Regulation Energy Deviation (MW) is a number representing the amount of energy the given generator deviated from its expected level of output when following AGC basepoints in real-time, for the given SCD-interval.	N

1.1.3.1.4.2.3 Results

Bill Code	Title	Business Description	DSS Value
	SCD Reg Penalty ($)	SCD Regulation Penalty ($) is a number representing the amount of the generator's Regulation Penalty settlement, charged due to a generator's regulation non-performance, for the given SCD-interval.	Y

1.1.3.1.4.3 Eligibility

Generators will receive a charge for Regulation and Frequency Response Penalty ($) if all of the following conditions exist:

- If the generator is in service but not on-control (SCD In Service Ind = Y/R & SCD On Control Ind = N), or the generator is not in service and not on control but is producing at least 5MW of output energy (SCD In Service Ind = N & SCD On Control Ind = N & SCD Gen Adjusted Energy (MW) > 5 MW).
- The generator is dispatched by NYISO in the SCD-interval (SCD Basepoint (MW) > 0).

- The generator is producing energy in the SCD-interval (SCD Gen Adjusted Energy (MW) > 0).
- The generator is not providing Voltage Support Service during the SCD-interval (SCD VSS Flag = N).
- The generator is not Out of Merit during the SCD-interval (SCD Out of Merit Flag = N).
- The generator is not a PURPA generator (SCD PURPA Units Class Type is not Class 1 or 2).
- If the generator is a Gilboa unit, and it is pumping during the SCD-interval (SCD Gen Adjusted Energy (MW) < 0).

1.1.3.1.4.4 Settlement Algorithm

SCD Reg Penalty ($) is calculated as follows:

If HAM Reg Price ($/MW) >0 (use HAM Regulation Prices):

SCD Reg Penalty ($) =

SCD Reg Energy Deviation (MW) * HAM Reg Price ($/MW) * {SCD Interval Seconds ÷3,600}

Else (HAM Regulation Prices do not exist, use DAM Regulation Prices):

SCD Reg Penalty ($) =

SCD Reg Energy Deviation (MW) * DAM Reg Price ($/MW) * {SCD Interval Seconds ÷3,600}

If SCD Reg Penalty ($) < 0, then

SCD Reg Penalty ($) = 0

Note: The DAM Reg Price ($/MW) and HAM Reg Price ($/MW) are based on the given generator's location within the NYISO AS pricing regions: East or West (DAM Reg Price East ($/MW), DAM Reg Price West ($/MW), HAM Reg Price East ($/MW), HAM Reg Price West ($/MW)).

Where SCD Energy Deviation (MW) is calculated as follows:

Effective 10/01/2001, NYISO changed how it determines the amount of energy deviation (MW). After this date, SCD Energy Deviation (MW) is calculated as:

SCD Energy Deviation (MW) = SCD Reg Negative Error (MW)

And prior to this date as follows:

If SCD Max Gen Flag = Y & Reserve Pickup Ind = Y

SCD Energy Deviation (MW) = Abs{SCD Reg Negative Error (MW)}

Else

SCD Energy Deviation (MW) = Abs{SCD Reg Negative Error (MW)} + Abs{SCD Reg Positive Error (MW)}

1.1.3.1.4.5 Additional Information

None

1.1.3.1.4.6 References:

The scheduling and dispatch of Regulation Service are described in detail in the NYISO Ancillary Services Manual at Chapter 4: Regulation & Frequency Response Service.

The applicability of Regulation and Frequency Response Penalty is described within Schedule 3 of the MST (Market Administration and Control Area Services Tariff), and Schedule 3 of the OATT (Open Access Transmission Tariff).

1.1.3.2 Voltage Support Services

1.1.3.2.1 Voltage Support Service Payment

1.1.3.2.1.1 Description

The Voltage Support Service (VSS) settlement ($) is intended to compensate Power Suppliers who offer their generator's capacity as Voltage Support Service to the NYISO.

The purpose for Voltage Support Service is to ensure sufficient capacity to maintain desired voltage levels on the New York Control Area (NYCA) transmission/distribution grid during real time operation. Voltage Support Service is accomplished through the use of on-line generators whose outputs are increased/ decreased to produce/absorb reactive energy, including the use of Automatic Voltage Response (AVR), as necessary to maintain desired voltage levels.

The Voltage Support Service Payment settlement is based upon the annually-determined Voltage Support Service Rate ($) for the generator, divided by the number of days in the year, multiplied times a ratio of the amount of time during the hour the generator was considered to be providing VSS. It is determined at the hourly-level for each generator selected to provide Voltage Support Service.

1.1.3.2.1.2 Required Data Elements

1.1.3.2.1.2.1 Determinants

Bill Code	Title	Business Description	DSS Value
	Capability Period	Capability Period represents the capability period that the day falls in (either Winter or Summer)	Y
	Gen Contr Ins Cap - Summer (MW)	Generator Contracted Summer Installed Capacity (MW) is a number representing the amount of installed capacity effective for the summer capacity period for the given generator.	Y

Bill Code	Title	Business Description	DSS Value
	Gen Contr Ins Cap - Winter (MW)	Generator Contracted Winter Installed Capacity (MW) is a number representing the amount of installed capacity effective for the winter capacity period for the given generator.	Y
	Gen Contract VSS (MVAR)	Generator Contract Voltage Support Service (MVAR) is the amount of voltage support service a generator has been contracted by NYISO to provide.	Y
	Gen Tested VSS (MVAR)	Generator Tested Voltage Support Service (MVAR) is the amount of voltage support service a generator has proven via required tests to be capable of providing to the NYISO.	Y
	Gen Type Desc	Generator Type Description represents the name of the type of Generator	Y
	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	Y
	Hr # Seconds In Service	Hourly Number of Seconds In Service is a number representing the amount of time in seconds a generator is actually in service for the given hour.	Y
	Hr # Seconds On AVR	Hourly Number of Seconds On Automatic Voltage Response is a number representing the amount of time in seconds a generator providing voltage support service is actually on automatic voltage response for the given hour.	Y
	Hr # Seconds Operating Interval	Hourly Number of Seconds Operating Interval is a number representing the number of seconds in the given generator's operating interval for the given hour.	Y
	Yr VSS Rate ($)	Annual Voltage Support Service Rate ($) is a number representing the amount determined by NYISO annually to be paid to generators providing voltage support services for a given year.	N
	# Hrs in Month	Number of Hours in Month is a number representing the number of hours in the given month (values are 672-744).	Y

1.1.3.2.1.2.2 Intermediates

Bill Code	Title	Business Description	DSS Value

	Hr VSS Rate ($)	Hourly Voltage Support Service Rate ($) is a number representing the amount determined by NYISO annually to be paid to generators providing voltage support services for a given hour.	Y
	Hr VSS In Service	Hourly Voltage Support Service In Service is a number representing a ratio of the amount of time during the hour a generator is considered to have provided voltage support service.	N

1.1.3.2.1.2.3 Results

Bill Code	Title	Business Description	DSS Value
214	Hr VSS Stlmnt ($)	214 - Hourly Voltage Support Service Settlement ($) is a number representing the payment to a generator providing voltage support services for the given hour.	Y

1.1.3.2.1.3 Eligibility

Generators will receive a payment for Voltage Support Service ($) if all of the following conditions exist:

- The generator is capable of providing Voltage Support Service.
- The generator is selected by NYISO to provide Voltage Support Service.

1.1.3.2.1.4 Settlement Algorithm

Hr VSS Stlmnt ($) is calculated as:

Hr VSS Stlmnt ($) = Hr VSS Rate ($) * Hr VSS In Service

NOTE: Non-Utility Generators and PURPA Classified Generators (Gen Type Desc = "NON-UTILTY GENERATOR" and "PURPA GENERATOR") are settled slightly differently than other generators, as follows:

If Gen Contract VSS (MVAR) < Gen Tested VSS (MVAR)

Hr VSS Stlmnt ($) = Gen Contract VSS (MVAR) * Hr VSS Rate ($) * Hr VSS In Service

Else

Hr VSS Stlmnt ($) = Gen Tested VSS (MVAR) * Hr VSS Rate ($) * Hr VSS In Service

Where Hr VSS Rate ($) is calculated as:

Hr VSS Rate ($) = Yr VSS Rate ($) ÷ {12 * # Hrs in Month}

And Hr VSS In Service is calculated as:

If {Capability Period = "SUMMER" and Gen Contr Ins Cap - Summer (MW) > 0}

OR {Capability Period = "WINTER" and Gen Contr Ins Cap - Winter (MW) > 0}

OR Hr Out of Merit Flag = 'Y"

Hr VSS In Service = 1.0

Else

If Hr # Seconds In Service <= Hr # Seconds On AVR[5]

Hr VSS In Service = {3,600 - Hr # Seconds Operating Interval + Hr # Seconds In Service} ÷ 3,600

Else

Hr VSS In Service = {3,600 - Hr # Seconds Operating Interval + Hr # Seconds On AVR} ÷ 3,600

1.1.3.2.1.5 Additional Information

Hr VSS In Service (%) can be calculated as follows:

Hr VSS In Service (%) = Hr VSS In Service * 100

1.1.3.2.1.6 References:

The applicability of Voltage Support Service Payments is described within Schedule 2 of the MST (Market Administration and Control Area Services Tariff), and Schedule 2 of the OATT (Open Access Transmission Tariff).

1.1.3.2.2 Voltage Support Service Lost Opportunity Cost Payment

1.1.3.2.2.1 Description

The Voltage Support Service (VSS) Lost Opportunity Cost (LOC) settlement ($) is intended to provide generators with a payment to offset any lost revenue in the energy markets as a result of being dispatched out of merit in real-time to provide Voltage Support Service.

The purpose for Voltage Support Service is to ensure sufficient capacity to maintain desired voltage levels on the New York Control Area (NYCA) transmission/distribution grid during real time operation. Voltage Support Service is accomplished through the use of on-line generators whose outputs are increased / decreased to produce/absorb reactive energy, including the use of Automatic Voltage Response (AVR), as necessary to maintain desired voltage levels.

The VSS LOC Payment settlement is based upon the generator's lost revenue from the real-time energy markets due to being dispatched out of merit by NYISO for VSS, minus the bid production costs of that energy determined from the generator's Hour Ahead Market (HAM) Generation Bid.

It is determined at the SCD-interval level for each generator dispatched out of merit in real-time by NYISO to provide voltage support service.

[5] Generators are not considered to be on voltage response if it is not in service.

1.1.3.2.2.2 Required Data Elements

1.1.3.2.2.2.1 Determinants

Bill Code	Title	Business Description	DSS Value
	Gen Upper Op Limit (MW)	Generator Upper Operating Limit (MW) is a number indicating the maximum operating capacity for a generator during the given period.	Y
	SCD 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).	Y
	SCD Interval Seconds	SCD Interval Seconds is a number representing the number of seconds in the SCD interval	Y
	SCD 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)	Y
	SCD 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)	Y
	SCD 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)	Y
	SCD VSS Flag	Voltage Support Service Flag is a character representing whether or not the unit is providing voltage support service during the interval (values are Y or N).	Y
	Hr HAM Gen Bid Type Ind	Hour Ahead Market Generation Bid Type Indicator is a character representing the type of HAM generation bid submitted by the generator (block or curve)	Y
	HAM Gen Bid Dispatch Seg – Block	Hour Ahead Market Generation Bid Dispatch Segments - Block is a number representing the number of segments in the given HAM generation bid (block generation bid type).	Y
	HAM Gen Bid Dispatch Seg – Curve	Hour Ahead Market Generation Bid Dispatch Segments - Curve is a number representing the number of segments in the given HAM generation bid (curve generation bid type).	Y
	Hr HAM Gen Bid -Gen 1 (MW)	Hour Ahead Market Generator Bid Generation #1 is a number representing the amount of generation (MW) bid in the first block during the interval, submitted by the Generator in a generation bid	Y
	Hr HAM Gen Bid -Gen 2 (MW)	Hour Ahead Market Generator Bid Generation #2 is a number representing the amount of generation (MW) bid in the second block during the interval, submitted by the Generator in a generation bid	Y

Bill Code	Title	Business Description	DSS Value
	Hr HAM Gen Bid -Gen 3 (MW)	Hour Ahead Market Generator Bid Generation #3 is a number representing the amount of generation (MW) bid in the third block during the interval, submitted by the Generator in a generation bid	Y
	Hr HAM Gen Bid -Gen 4 (MW)	Hour Ahead Market Generator Bid Generation #4 is a number representing the amount of generation (MW) bid in the fourth block during the interval, submitted by the Generator in a generation bid	Y
	Hr HAM Gen Bid -Gen 5 (MW)	Hour Ahead Market Generator Bid Generation #5 is a number representing the amount of generation (MW) bid in the fifth block during the interval, submitted by the Generator in a generation bid	Y
	Hr HAM Gen Bid -Gen 6 (MW)	Hour Ahead Market Generator Bid Generation #6 is a number representing the amount of generation (MW) bid in the sixth block during the interval, submitted by the Generator in a generation bid	Y
	Hr HAM Gen Bid -Price 1 ($/MW)	Hour Ahead Market Generator Bid Price #1 is a number representing the bid price of generation ($/MW) bid in the first block during the interval, submitted by the Generator in a generation bid	Y
	Hr HAM Gen Bid -Price 2 ($/MW)	Hour Ahead Market Generator Bid Price #2 is a number representing the bid price of generation ($/MW) bid in the second block during the interval, submitted by the Generator in a generation bid	Y
	Hr HAM Gen Bid -Price 3 ($/MW)	Hour Ahead Market Generator Bid Price #3 is a number representing the bid price of generation ($/MW) bid in the third block during the interval, submitted by the Generator in a generation bid	Y
	Hr HAM Gen Bid -Price 4 ($/MW)	Hour Ahead Market Generator Bid Price #4 is a number representing the bid price of generation ($/MW) bid in the fourth block during the interval, submitted by the Generator in a generation bid	Y
	Hr HAM Gen Bid -Price 5 ($/MW)	Hour Ahead Market Generator Bid Price #5 is a number representing the bid price of generation ($/MW) bid in the fifth block during the interval, submitted by the Generator in a generation bid	Y
	Hr HAM Gen Bid -Price 6 ($/MW)	Hour Ahead Market Generator Bid Price #6 is a number representing the bid price of generation ($/MW) bid in the sixth block during the interval, submitted by the Generator in a generation bid	Y

1.1.3.2.2.2.2 Intermediates

Bill Code	Title	Business Description	DSS Value
	SCD RT Total Price - Gen ($/MW)	Real-Time Total Price ($/MW) is a number representing the total LBMP price of a generator bus	Y

	SCD VSS LOC -Revenue ($)	SCD Voltage Support Service Lost Opportunity Cost -Revenue ($) is a number representing the amount of potential revenue lost related to a generator's dispatch to provide voltage support service in the given interval.	Y
	SCD VSS LOC -Cost ($)	SCD Voltage Support Service Lost Opportunity Cost -Cost ($) is a number representing the amount of cost determined from a Hour Ahead Market Generation Bid curve related to a generator's dispatch to provide voltage support service in the given interval.	Y

1.1.3.2.2.2.3 Results

Bill Code	Title	Business Description	DSS Value
	SCD VSS LOC Stlmnt ($)	SCD Voltage Support Service Lost Opportunity Cost Settlement ($) is a number representing the payment made to generators providing voltage support service designed to cover any lost revenue due to being dispatched off of their economic basepoint to provide VSS for the given interval.	Y

1.1.3.2.2.3 Eligibility

Generators will receive a payment for Voltage Support Service ($) if all of the following conditions exist:

- The generator is capable of providing Voltage Support Service.
- The generator is selected by NYISO to provide Voltage Support Service.
- The generator was Out of Merit in order to provide Voltage Support Service during the SCD-interval (SCD VSS Flag = "Y").

1.1.3.2.2.4 Settlement Algorithm

SCD VSS LOC Stlmnt ($) is calculated as:

SCD VSS LOC Stlmnt ($) =

{SCD VSS LOC -Revenue ($) (-) SCD VSS LOC -Cost ($)} * {SCD Interval Seconds ÷ 3,600}

SCD VSS LOC -Revenue ($) is calculated as:

SCD VSS LOC -Revenue ($) =

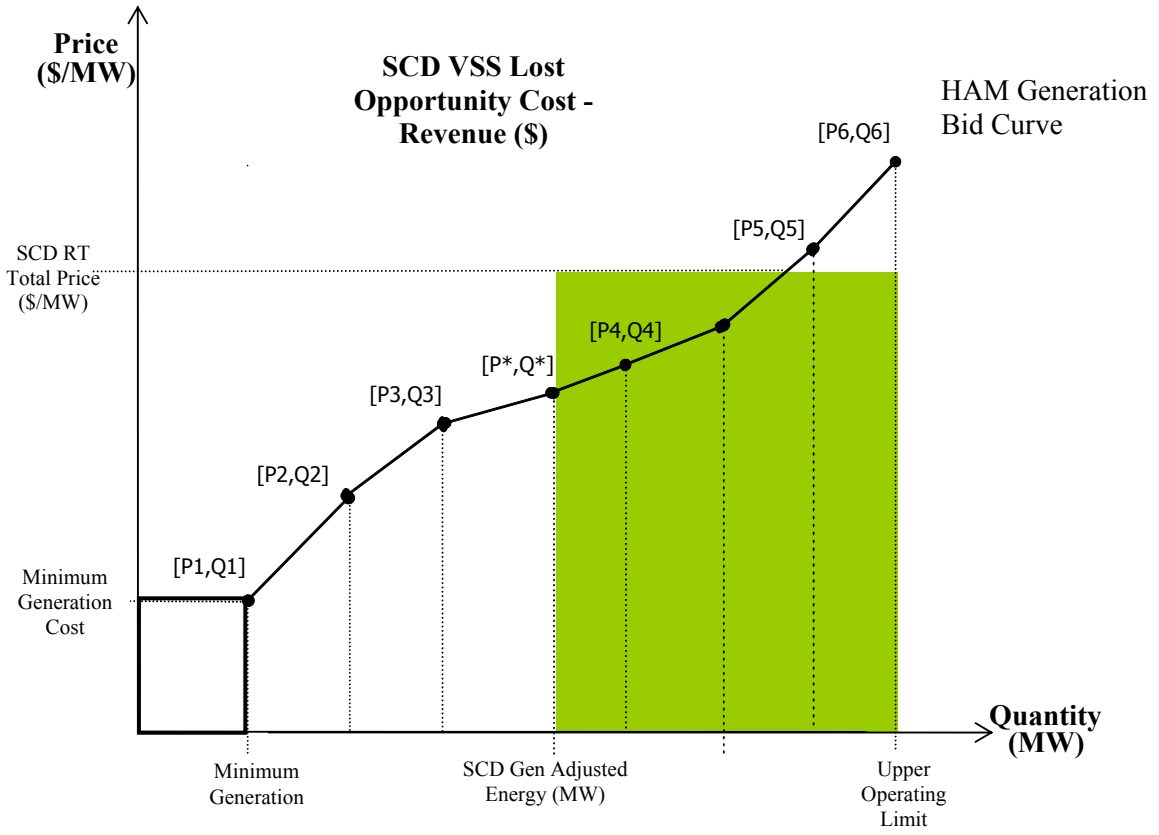
{Gen Upper Op Limit (MW) - SCD Gen Adjusted Energy (MW)} * SCD RT Total Price - Gen ($/MW)

Where SCD RT Total Price - Gen ($/MW) can be determined as:

SCD RT Total Price - Gen ($/MW) =

SCD RT Energy Price - Gen ($/MW) + SCD RT Loss Price - Gen ($/MW)
(-) SCD RT Cong Price - Gen ($/MW)

NOTE: The below graphic represents the SCD VSS LOC -Revenue ($):

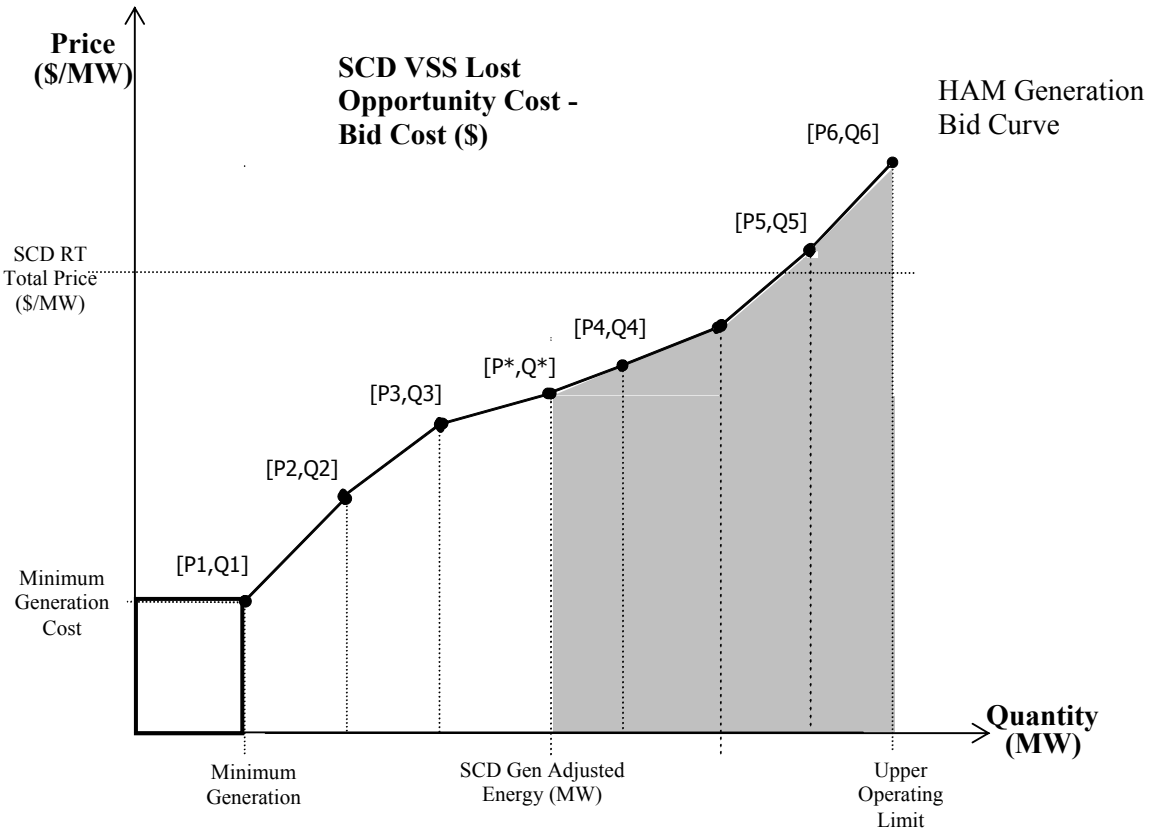


SCD VSS LOC -Cost ($) can be calculated as:

SCD VSS LOC -Cost ($) is the bid production cost ($) under the generator's Hour Ahead Market (HAM) Generation Bid up to its Upper Operating Limit (MW), minus the bid production cost ($) under the generator's HAM Generation Bid up to its Generator Adjusted Energy (MW).

Please see Appendix A, Figure 1.3 for more information on how to determine the bid production cost ($) on a given Generation Bid curve corresponding to a specific upper and lower generation output level (MW).

NOTE: The below graphic represents the SCD VSS LOC -Cost ($):



1.1.3.2.2.5 Additional Information

None

1.1.3.2.2.6 References:

The applicability of Voltage Support Lost Opportunity Cost Payments is described within Schedule 2 of the MST (Market Administration and Control Area Services Tariff), and Schedule 2 of the OATT (Open Access Transmission Tariff).

1.1.3.3 Black Start

1.1.3.3.1 Black Start Service Payment

1.1.3.3.1.1 Description

The Black Start Service Payment settlement ($) is intended to compensate Power Suppliers who offer their generator for Black Start Service as part of NYISO's Black Start Restoration Plan.

Black Start Service represents those generators that, following a system-wide blackout, can start without the availability of outside electric supply and are available to participate in restoration activities. The NYISO maintains the Black Start Restoration Plan for the New York State Power System, and identifies the generators that are needed due to their location in critical areas of the NYCA.

Generators capable of providing Black Start Service that are selected by NYISO as part of the NYISO's Black Start Recovery Plan are eligible to receive this settlement. Generators which are

obligated to supply Black Start Service as a result of divestiture agreements are not eligible for this service.

The Black Start Service Payment settlement is based upon the annually-determined Black Start Rate ($) for the generator, divided by the number of days in the year. It is determined at the daily-level for each generator selected to provide Black Start Service.

1.1.3.3.1.2 Required Data Elements

1.1.3.3.1.2.1 Determinants

Bill Code	Title	Business Description	DSS Value
	# Days in Year	Number of Days in Year is a number representing the number of days in the given year (values are 365-366).	Y
	Yr Black Start Rate ($)	Monthly Black Start Rate ($) is a number representing the monthly amount determined for black start payments to capable generators for providing black start service to the NYISO; annual amount is divided by 12 to determine monthly value.	Y

1.1.3.3.1.2.2 Intermediates

None

1.1.3.3.1.2.3 Results

Bill Code	Title	Business Description	DSS Value
312	Day Black Start Stlmnt ($)	Daily Black Start Settlement ($) is a number representing the amount of the black start payment to a generator capable of providing black start service to NYISO for the given day.	Y

1.1.3.3.1.3 Eligibility

Generators will receive a payment for Black Start Service ($) if all of the following conditions exist:

- The generator is capable of providing Black Start Service.
- The generator is selected by NYISO as part of the NYISO Black Start Restoration Planning process.

The following are conditions for which Black Start Service ($) does not apply:

- Generators which are obligated to supply Black Start Service as a result of divestiture agreements.

1.1.3.3.1.4 Settlement Algorithm

Day Black Start Stlmnt ($) is calculated as:

Day Black Start Stlmnt ($) = Yr Black Start Rate ($) ÷ # Days in Year

1.1.3.3.1.5 Additional Information

- The Yearly Black Start Rate ($) is the summation of a generator's annual capital costs and annual operations & maintenance costs for black start related equipment, and the Annual Restoration Plan training costs.

1.1.3.3.1.6 References

The applicability of Black Start Service Payments is described within Schedule 5 of the MST (Market Administration and Control Area Services Tariff), and Schedule 6 of the OATT (Open Access Transmission Tariff).

1.1.3.4 Operating Reserve

1.1.3.4.1 DAM 10-Minute Synchronous Reserve Availability

1.1.3.4.1.1 Description

The Day-Ahead Market (DAM) 10-Minute Synchronous Availability[6] settlement is intended to compensate Power Suppliers who offer their generator's capacity as 10-Minute Synchronous Reserve Service to the NYISO in the DAM.

The DAM 10-Minute Synchronous Availability settlement is based upon the 10-Minute Synchronous Reserve Service capacity scheduled for the generator, the corresponding DAM 10-Minute Synchronous Reserve Market Clearing Price (MCP), and any required adjustment due to generator non-performance. 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 10-Minute Synchronous 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.

1.1.3.4.1.2 Required Data Elements

1.1.3.4.1.2.1 Determinants

Bill Code	Title	Business Description	DSS Value
	DAM 10Sync Price East ($/MW)	Hour Ahead Market 10-Minute Synchronous Operating Reserves Price East ($/MW) is a number representing the east hourly market clearing price for HAM 10-Minute Synchronous Operating Reserves service based on the set of generators in the East Ancillary Service Pricing Region selected	Y

[6] See the Ancillary Service Market Summary for more information.

Bill Code	Title	Business Description	DSS Value
		by BME.	
	DAM 10Sync Price West ($/MW)	Hour Ahead Market 10-Minute Synchronous Operating Reserves Price West ($/MW) is a number representing the west hourly market clearing price for HAM 10-Minute Synchronous Operating Reserves service based on the set of generators in the West Ancillary Service Pricing Region selected by BME.	Y
	Hr DAM Sched 10NSync Avail (MW)	Hourly Day Ahead Market Scheduled 10-Minute Synchronous Operating Reserves Availability (MW) is a number representing the amount of Day Ahead Market 10-Minute Synchronous Operating Reserves service the given generator is scheduled to provide for the given hour.	Y
	Hr Op Res Avg Supply Perf Ratio	Hourly Operating Reserves Average Supply Performance Ratio is a number representing the average hourly operating reserves supply ratio for the given generator, for the given hour. It is a measure of how closely the generator followed Operating Reserve dispatch instructions.	Y

1.1.3.4.1.2.2 Intermediates

Bill Code	Title	Business Description	DSS Value
	Hr DAM 10Sync Unadj Avail ($)	Hourly Day Ahead Market 10-Minute Synchronous Operating Reserves Unadjusted Availability ($) is a number representing the unadjusted settlement amount for Day Ahead Market 10-Minute Synchronous Operating Reserves service, unadjusted for supply performance, for the given generator, for the given hour.	Y

1.1.3.4.1.2.3 Results

Bill Code	Title	Business Description	DSS Value
	Hr DAM 10Sync Avail Stlmnt ($)	Hourly Day Ahead Market 10-Minute Synchronous Operating Reserves Availability Settlement ($) is a number representing the settlement amount for the availability of Day Ahead Market 10-Minute Synchronous Operating Reserves service, adjusted for supply performance,	Y

Bill Code	Title	Business Description	DSS Value
		for the given generator, for the given hour.	

1.1.3.4.1.3 Eligibility

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

- The generator is scheduled to provide such service in the DAM, and

  Hr DAM Sched 10NSync Avail (MW) > 0.

The following are conditions for when DAM 10-Minute 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.

1.1.3.4.1.4 Settlement Algorithm

DAM 10Sync Avail Stlmnt ($) is calculated as:

Hr DAM 10Sync Avail Stlmnt ($) =

Hr DAM 10Sync Unadj Avail ($) * Hr Op Res Avg Supply Perf Ratio

Where:

Hr DAM 10Sync Unadj Avail ($) =

Hr DAM Sched 10Sync Avail (MW) * DAM 10Sync Price ($/MW)

NOTE: The DAM 10Sync Price ($/MW) is based on the given generator's location within the NYISO AS pricing regions: East or West (DAM 10Sync Price East ($/MW), DAM 10Sync Price West ($/MW)).

1.1.3.4.1.5 Additional Information

Hourly Operating Reserve Average Supply Ratio:

The Hourly Operating Reserve Average Supply Ratio (Hr Op Res Avg Supply Perf Ratio) is an hourly performance ratio representing the amount of time that a generator was accurately providing Operating Reserve Service in the given hour. The ratio is computed by dividing the SCD Gen Avg Actual Energy (MW) (average actual generation output in real-time) by the generator's SCD Basepoint (MW) (dispatch instruction) at the Security Constrained Dispatch (SCD) level, and then averaging those values across the hour. Operating Reserve Availability payments are adjusted by this ratio to reflect the generator's failure to fulfill their commitments to provide Operating Reserve Service.

1.1.3.4.1.6 References

The applicability of Day Ahead 10-Minute Synchronous Reserve Availability Payments is described within Schedule 4 of the MST (Market Administration and Control Area Services Tariff), and Schedule 5 of the OATT (Open Access Transmission Tariff).

1.1.3.4.2 Supplemental 10-Minute Synchronous Reserve Availability

1.1.3.4.2.1 Description

The Supplemental 10-Minute Synchronous Availability[7] settlement is intended to compensate Power Suppliers who offer their generator's capacity as 10-Minute Synchronous Reserve Service to the NYISO in the Hour Ahead Market (HAM).

The Supplemental 10-Minute Synchronous Availability settlement is based upon the Supplemental 10-Minute Synchronous Reserve Service capacity scheduled for the generator, the corresponding HAM 10-Minute Synchronous Reserve Market Clearing Price (MCP), and any required adjustment due to generator non-performance. The Supplemental 10-Minute Synchronous Reserve Service capacity scheduled is the net of the generator's HAM and DAM 10-Minute Synchronous Reserve Service schedules, or zero (whichever is greater). It is determined at the hourly-level for each generator scheduled to provide this service in the HAM above their DAM 10-Minute Synchronous Reserve Service schedule.

Power Suppliers offering their generators into NYISO's HAM 10-Minute Synchronous 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.

1.1.3.4.2.2 Required Data Elements

1.1.3.4.2.2.1 Determinants

Bill Code	Title	Business Description	DSS Value
	HAM 10Sync Price East ($/MW)	Hour Ahead Market 10-Minute Synchronous Operating Reserves Price East ($/MW) is a number representing the east hourly market clearing price for HAM 10-Minute Synchronous Operating Reserves service based on the set of generators in the East Ancillary Service Pricing Region selected by BME.	Y
	HAM 10Sync Price West ($/MW)	Hour Ahead Market 10-Minute Synchronous Operating Reserves Price West ($/MW) is a number representing the west hourly market clearing price for HAM 10-Minute Synchronous Operating Reserves service based on the set of generators in the West Ancillary Service Pricing Region selected by BME.	Y
	Hr DAM Sched 10Sync Avail (MW)	Hourly Day Ahead Market Scheduled 10-Minute Synchronous Operating Reserves Availability (MW) is a number representing the amount of Day Ahead Market 10-Minute Synchronous Operating	Y

[7] See the Ancillary Service Market Summary for more information.

Bill Code	Title	Business Description	DSS Value
		Reserves service the given generator is scheduled to provide for the given hour.	
	Hr HAM Sched 10SyncRes Avail (MW)	Hourly Hour Ahead Market Scheduled 10-Minute Synchronous Operating Reserves Availability (MW) is a number representing the amount of Hour Ahead Market 10-Minute Synchronous Operating Reserves service the given generator is scheduled to provide for the given hour.	Y
	Hr Op Res Avg Supply Perf Ratio	Hourly Operating Reserves Average Supply Performance Ratio is a number representing the average hourly operating reserves supply ratio for the given generator, for the given hour. It is a measure of how closely the generator followed Operating Reserve dispatch instructions.	Y

1.1.3.4.2.2.2 Intermediates

Bill Code	Title	Business Description	DSS Value
	Hr Sup 10Sync Unadj Avail ($)	Hourly Supplemental 10-Minute Synchronous Operating Reserves Unadjusted Availability Credit ($) is a number representing the unadjusted settlement amount for Supplemental 10-Minute Synchronous Operating Reserves Service, unadjusted for supply performance, for the given generator, for the given hour.	Y
	Hr Sup Sched 10Sync Avail (MW)	Hourly Supplemental Scheduled 10-Minute Synchronous Operating Reserves Availability (MW) is a number representing the amount of Supplemental 10-Minute Synchronous Operating Reserves Service the given generator is scheduled to provide for the given hour. This is the net difference between HAM and DAM 10-Minute Synchronous Operating Reserves Availability (MW) values.	Y

1.1.3.4.2.2.3 Results

Bill Code	Title	Business Description	DSS Value
	Hr Sup 10Sync Avail Stlmnt ($)	Hourly Supplemental 10-Minute Synchronous Operating Reserves Availability Settlement ($) is a number representing the settlement amount for availability of Supplemental 10-Minute Synchronous Operating Reserves Service, adjusted	Y

Bill Code	Title	Business Description	DSS Value
		for supply performance, for the given generator, for the given hour.	

1.1.3.4.2.3 Eligibility

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

- The generator is scheduled to provide such service in the HAM, and

  Hr Sup Sched 10Sync Avail (MW) > 0.

The following are conditions for when Supplemental 10-Minute 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.

1.1.3.4.2.4 Settlement Algorithm

Hr Sup 10Sync Avail Stlmnt ($) is calculated as:

Hr Sup 10Sync Avail Stlmnt ($) =

Hr Sup 10Sync Unadj Avail ($) * Hr Op Res Avg Supply Perf Ratio

Where:

Hr Sup 10Sync Unadj Avail ($) =

Hr Sup Sched 10Sync Avail (MW) * HAM 10Sync Price ($/MW)

Hr Sup Sched 10Sync Avail (MW) =

Max{Hr HAM Sched 10SyncRes Avail (MW) (-) Hr DAM Sched 10Sync Avail (MW), 0}

NOTE: The HAM 10Sync Price ($/MW) is based on the given generator's location within the NYISO AS pricing regions: East or West (HAM 10Sync Price East ($/MW), HAM 10Sync Price West ($/MW)).

1.1.3.4.2.5 Additional Information

Hourly Operating Reserve Average Supply Ratio:

The Hourly Operating Reserve Average Supply Ratio (Hr Op Res Avg Supply Perf Ratio) is an hourly performance ratio representing the amount of time that a generator was accurately providing Operating Reserve Service in the given hour. The ratio is computed by dividing the SCD Gen Avg Actual Energy (MW) (average actual generation output in real-time) by the generator's SCD Basepoint (MW) (dispatch instruction) at the Security Constrained Dispatch (SCD) level, and then

averaging those values across the hour. Operating Reserve Availability payments are adjusted by this ratio to reflect the generator's failure to fulfill their commitments to provide Operating Reserve Service.

1.1.3.4.2.6 References

The applicability of Supplemental 10-Minute Synchronous Reserve Availability Payments is described within Schedule 4 of the MST (Market Administration and Control Area Services Tariff), and Schedule 5 of the OATT (Open Access Transmission Tariff).

1.1.3.4.3 DAM 10-Minute Non-Synchronous Reserve Availability

1.1.3.4.3.1 Description

The Day-Ahead Market (DAM) 10-Minute Non-Synchronous Availability[8] 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 Availability settlement is based upon the 10-Minute Non-Synchronous Reserve Service capacity scheduled for the generator, the corresponding DAM 10-Minute Non-Synchronous Reserve Market Clearing Price (MCP), and any required adjustment due to generator non-performance. 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 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.

1.1.3.4.3.2 Required Data Elements

1.1.3.4.3.2.1 Determinants

Bill Code	Title	Business Description	DSS Value
	DAM 10NSync Price East ($/MW)	Day Ahead Market 10-Minute Non-Synchronous Operating Reserves Price East ($/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.	Y
	DAM 10NSync Price West ($/MW)	Day Ahead Market 10-Minute Non-Synchronous Operating Reserves Price West ($/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.	Y

[8] See the Ancillary Service Market Summary for more information.

Bill Code	Title	Business Description	DSS Value
	Hr DAM Sched 10NSync Avail (MW)	Hourly Day Ahead Market Scheduled 10-Minute Non-Synchronous Operating Reserves Availability (MW) 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.	Y
	Hr Op Res Avg Supply Perf Ratio	Hourly Operating Reserves Average Supply Performance Ratio is a number representing the average hourly operating reserves supply ratio for the given generator, for the given hour. It is a measure of how closely the generator followed Operating Reserve dispatch instructions.	Y

1.1.3.4.3.2.2 Intermediates

Bill Code	Title	Business Description	DSS Value
	Hr DAM 10NSync Unadj Avail ($)	Hourly Day Ahead Market 10-Minute Non-Synchronous Operating Reserves Unadjusted Availability ($) is a number representing the unadjusted settlement amount for Day Ahead Market 10-Minute Non-Synchronous Operating Reserves service, unadjusted for supply performance, for the given generator, for the given hour.	Y

1.1.3.4.3.2.3 Results

Bill Code	Title	Business Description	DSS Value
	Hr DAM 10NSync Avail Stlmnt ($)	Hourly Day Ahead Market 10-Minute Non-Synchronous Operating Reserves Availability ($) is a number representing the availability settlement for Day Ahead Market 10-Minute Non-Synchronous Operating Reserves Service, adjusted for supply performance, for the given generator, for the given hour.	Y

1.1.3.4.3.3 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

  Hr DAM Sched 10NSync Avail (MW) > 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.

1.1.3.4.3.4 Settlement Algorithm

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

Hr DAM 10NSync Avail Stlmnt ($) =

Hr DAM 10NSync Unadj Avail ($) * Hr Op Res Avg Supply Perf Ratio

Where:

Hr DAM 10NSync Unadj Avail ($) =

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

NOTE: The DAM 10NSync Price ($/MW) is based on the given generator's location within the NYISO AS pricing regions: East or West (DAM 10NSync Price East ($/MW), DAM 10NSync Price West ($/MW)).

1.1.3.4.3.5 Additional Information

Hourly Operating Reserve Average Supply Ratio:

The Hourly Operating Reserve Average Supply Ratio (Hr Op Res Avg Supply Perf Ratio) is an hourly performance ratio representing the amount of time that a generator was accurately providing Operating Reserve Service in the given hour. The ratio is computed by dividing the SCD Gen Avg Actual Energy (MW) (average actual generation output in real-time) by the generator's SCD Basepoint (MW) (dispatch instruction) at the Security Constrained Dispatch (SCD) level, and then averaging those values across the hour. Operating Reserve Availability payments are adjusted by this ratio to reflect the generator's failure to fulfill their commitments to provide Operating Reserve Service.

1.1.3.4.3.6 References

The applicability of Day Ahead 10-Minute Non-Synchronous Reserve Availability Payments is described within Schedule 4 of the MST (Market Administration and Control Area Services Tariff), and Schedule 5 of the OATT (Open Access Transmission Tariff).

1.1.3.4.4 Supplemental 10-Minute Non-Synchronous Reserve Availability

1.1.3.4.4.1 Description

The Supplemental 10-Minute Non-Synchronous Availability[9] 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 Hour Ahead Market (HAM).

The Supplemental 10-Minute Non-Synchronous Availability settlement is based upon the Supplemental 10-Minute Non-Synchronous Reserve Service capacity scheduled for the generator, the corresponding HAM 10-Minute Non-Synchronous Reserve Market Clearing Price (MCP), and any required adjustment due to generator non-performance. The Supplemental 10-Minute Non-Synchronous Reserve Service capacity scheduled is the net of the generator's HAM and DAM 10-Minute Non-Synchronous Reserve Service schedules, or zero (whichever is greater). It is determined at the hourly-level for each generator scheduled to provide this service in the HAM above their DAM 10-Minute Non-Synchronous Reserve Service schedule.

Power Suppliers offering their generators into NYISO's HAM 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.

1.1.3.4.4.2 Required Data Elements

1.1.3.4.4.2.1 Determinants

Bill Code	Title	Business Description	DSS Value
	HAM 10NSync Price East ($/MW)	Hour Ahead Market 10-Minute Non-Synchronous Operating Reserves Price East ($/MW) is a number representing the east hourly market clearing price for HAM 10-Minute Non-Synchronous Operating Reserves Service based on the set of generators in the East Ancillary Service Pricing Region selected by BME.	Y
	HAM 10NSync Price West ($/MW)	Hour Ahead Market 10-Minute Non-Synchronous Operating Reserves Price West ($/MW) is a number representing the west hourly market clearing price for HAM 10-Minute Non-Synchronous Operating Reserves Service based on the set of generators in the West Ancillary Service Pricing Region selected by BME.	Y
	Hr DAM Sched 10NSync Avail (MW)	Hourly Day Ahead Market Scheduled 10-Minute Non-Synchronous Operating Reserves Availability (MW) 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.	Y
	Hr HAM Sched 10NSync Avail (MW)	Hourly Hour Ahead Market Scheduled 10-Minute Non-Synchronous Operating Reserves Availability (MW) is a number representing the amount of Hour Ahead Market 10-Minute Non-Synchronous Operating Reserves Service the given generator is	Y

[9] See the Ancillary Service Market Summary for more information.

Bill Code	Title	Business Description	DSS Value
		scheduled to provide for the given hour.	
	Hr Op Res Avg Supply Perf Ratio	Hourly Operating Reserves Average Supply Performance Ratio is a number representing the average hourly operating reserves supply ratio for the given generator, for the given hour. It is a measure of how closely the generator followed Operating Reserve dispatch instructions.	Y

1.1.3.4.4.2.2 Intermediates

Bill Code	Title	Business Description	DSS Value
	Hr Sup 10NSync Unadj Avail ($)	Hourly Supplemental 10-Minute Non-Synchronous Operating Reserves Unadjusted Availability ($) is a number representing the unadjusted settlement amount for Supplemental 10-Minute Non-Synchronous Operating Reserves Service, unadjusted for supply performance, for the given generator, for the given hour.	Y
	Hr Sup Sched 10NSync Avail (MW)	Hourly Supplemental Scheduled 10-Minute Non-Synchronous Operating Reserves Availability (MW) is a number representing the amount of Supplemental 10-Minute Non-Synchronous Operating Reserves Service the given generator is scheduled to provide for the given hour. This is the net difference between HAM and DAM 10-Minute Non-Synchronous Operating Reserves Availability (MW) values.	Y

1.1.3.4.4.2.3 Results

Bill Code	Title	Business Description	DSS Value
	Hr Sup 10NSync Avail Stlmnt ($)	Hourly Supplemental 10-Minute Non-Synchronous Operating Reserves Availability Settlement ($) is a number representing the settlement amount for the availability of Supplemental 10-Minute Non-Synchronous Operating Reserves Service, adjusted for supply performance, for the given generator, for the given hour.	Y

1.1.3.4.4.3 Eligibility

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

- The generator is scheduled to provide such service in the HAM, and

  Hr Sup Sched 10NSync Avail (MW) > 0.

The following are conditions for when Supplemental 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.

1.1.3.4.4.4 Settlement Algorithm

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

Hr Sup 10NSync Avail Stlmnt ($) =

Hr Sup 10NSync Unadj Avail ($) * Hr Op Res Avg Supply Perf Ratio

Where:

Hr Sup 10NSync Unadj Avail ($) =

Hr Sup Sched 10NSync Avail (MW) * HAM 10NSync Price ($/MW)

Hr Sup Sched 10NSync Avail (MW) =

Max{Hr HAM Sched 10NSync Avail (MW) - Hr DAM Sched 10NSync Avail (MW), 0}

NOTE: The HAM 10NSync Price ($/MW) is based on the given generator's location within the NYISO AS pricing regions: East or West (HAM 10NSync Price East ($/MW), HAM 10NSync Price West ($/MW)).

1.1.3.4.4.5 Additional Information

Hourly Operating Reserve Average Supply Ratio:

The Hourly Operating Reserve Average Supply Ratio (Hr Op Res Avg Supply Perf Ratio) is an hourly performance ratio representing the amount of time that a generator was accurately providing Operating Reserve Service in the given hour. The ratio is computed by dividing the SCD Gen Avg Actual Energy (MW) (average actual generation output in real-time) by the generator's SCD Basepoint (MW) (dispatch instruction) at the Security Constrained Dispatch (SCD) level, and then averaging those values across the hour. Operating Reserve Availability payments are adjusted by this ratio to reflect the generator's failure to fulfill their commitments to provide Operating Reserve Service.

1.1.3.4.4.6 References

The applicability of Supplemental 10-Minute Non-Synchronous Reserve Availability Payments is described within Schedule 4 of the MST (Market Administration and Control Area Services Tariff), and Schedule 5 of the OATT (Open Access Transmission Tariff).

1.1.3.4.5 DAM 30-Minute Operating Reserve Availability

1.1.3.4.5.1 Description

The Day-Ahead Market (DAM) 30-Minute Operating Reserve Availability[10] settlement is intended to compensate Power Suppliers who offer their generator's capacity as 30-Minute Operating Reserve Service to the NYISO in the DAM.

The DAM 30-Minute Operating Availability settlement is based upon the 30-Minute Operating Reserve Service capacity scheduled for the generator, the corresponding DAM 30-Minute Operating Reserve Market Clearing Price (MCP), and any required adjustment due to generator non-performance. 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 30-Minute Operating Reserve Service market must be synchronous to the NYCA transmission grid in real-time, and capable of providing that reserve energy within 30-minutes of a reserve pickup.

1.1.3.4.5.2 Required Data Elements

1.1.3.4.5.2.1 Determinants

Bill Code	Title	Business Description	DSS Value
	DAM 30Min Price East ($/MW)	Day Ahead Market 30-Minute Operating Reserves Price East ($/MW) is a number representing the east hourly market 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.	Y
	DAM 30Min Price West ($/MW)	Day Ahead Market 30-Minute Operating Reserves Price West ($/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.	Y
	Hr DAM Sched 30Min Avail (MW)	Hourly Day Ahead Market Scheduled 30-Minute Operating Reserves Availability (MW) 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.	Y
	Hr Op Res Avg Supply Perf Ratio	Hourly Operating Reserves Average Supply Performance Ratio is a number representing the average hourly operating reserves supply ratio for	Y

[10] See the Ancillary Service Market Summary for more information.

Bill Code	Title	Business Description	DSS Value
		the given generator, for the given hour. It is a measure of how closely the generator followed Operating Reserve dispatch instructions.	

1.1.3.4.5.2.2 Intermediates

Bill Code	Title	Business Description	DSS Value
	Hr DAM 30Min Unadj Avail ($)	Hourly Day Ahead Market 30-Minute Operating Reserves Unadjusted Availability ($) is a number representing the unadjusted settlement amount for Day Ahead Market 30-Minute Operating Reserves Service, unadjusted for supply performance, for the given generator, for the given hour.	Y

1.1.3.4.5.2.3 Results

Bill Code	Title	Business Description	DSS Value
	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, adjusted for supply performance, for the given generator, for the given hour.	Y

1.1.3.4.5.3 Eligibility

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

- The generator is scheduled to provide such service in the DAM, and

  Hr DAM Sched 30Min Avail (MW) > 0.

The following are conditions for when DAM 30-Minute Operating 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.

1.1.3.4.5.4 Settlement Algorithm

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

Hr DAM 30Min Avail Stlmnt ($) =

Hr DAM 30Min Unadj Avail ($) * Hr Op Res Avg Supply Perf Ratio

Where:

Hr DAM 30Min Unadj Avail ($) =

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

NOTE: The DAM 30Min Price ($/MW) is based on the given generator's location within the NYISO AS pricing regions: East or West (DAM 30Min Price East ($/MW), DAM 30Min Price West ($/MW)).

1.1.3.4.5.5 Additional Information

Hourly Operating Reserve Average Supply Ratio:

The Hourly Operating Reserve Average Supply Ratio (Hr Op Res Avg Supply Perf Ratio) is an hourly performance ratio representing the amount of time that a generator was accurately providing Operating Reserve Service in the given hour. The ratio is computed by dividing the SCD Gen Avg Actual Energy (MW) (average actual generation output in real-time) by the generator's SCD Basepoint (MW) (dispatch instruction) at the Security Constrained Dispatch (SCD) level, and then averaging those values across the hour. Operating Reserve Availability payments are adjusted by this ratio to reflect the generator's failure to fulfill their commitments to provide Operating Reserve Service.

1.1.3.4.5.6 References

The applicability of Day Ahead 30-Minute Operating Reserve Availability Payments is described within Schedule 4 of the MST (Market Administration and Control Area Services Tariff), and Schedule 5 of the OATT (Open Access Transmission Tariff).

1.1.3.4.6 Supplemental 30-Minute Operating Reserve Availability

1.1.3.4.6.1 Description

The Supplemental 30-Minute Operating Availability[11] settlement is intended to compensate Power Suppliers who offer their generator's capacity as 30-Minute Operating Reserve Service to the NYISO in the Hour Ahead Market (HAM).

The Supplemental 30-Minute Operating Reserve Availability settlement is based upon the Supplemental 30-Minute Operating Reserve Service capacity scheduled for the generator, the corresponding HAM 30-Minute Operating Reserve Market Clearing Price (MCP), and any required adjustment due to generator non-performance. The Supplemental 30-Minute Operating Reserve Service capacity scheduled is the net of the generator's HAM and DAM 30-Minute Operating Reserve Service schedules, or zero (whichever is greater). It is determined at the hourly-level for each generator scheduled to provide this service in the HAM above their DAM 30-Minute Operating Reserve Service schedule.

Power Suppliers offering their generators into NYISO's HAM 30-Minute Operating Reserve Service market must be synchronous to the NYCA transmission grid in real-time, and capable of providing that reserve energy within 30-minutes of a reserve pickup.

[11] See the Ancillary Service Market Summary for more information.

1.1.3.4.6.2 Required Data Elements

1.1.3.4.6.2.1 Determinants

Bill Code	Title	Business Description	DSS Value
	HAM 30Min Price East ($/MW)	Hour Ahead Market 30-Minute Operating Reserves Price East ($/MW) is a number representing the east hourly market clearing price for HAM 30-Minute Operating Reserves Service based on the set of generators in the East Ancillary Service Pricing Region selected by BME.	Y
	HAM 30Min Price West ($/MW)	Hour Ahead Market 30-Minute Operating Reserves Price West ($/MW) is a number representing the west hourly market clearing price for HAM 30-Minute Operating Reserves Service based on the set of generators in the West Ancillary Service Pricing Region selected by BME.	Y
	Hr DAM Sched 30Min Avail (MW)	Hourly Day Ahead Market Scheduled 30-Minute Operating Reserves Availability (MW) 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.	Y
	Hr HAM Sched 30Min Avail (MW)	Hourly Hour Ahead Market Scheduled 30-Minute Operating Reserves Availability (MW) is a number representing the amount of Hour Ahead Market 30-Minute Operating Reserves Service the given generator is scheduled to provide for the given hour.	Y
	Hr Op Res Avg Supply Perf Ratio	Hourly Operating Reserves Average Supply Performance Ratio is a number representing the average hourly operating reserves supply ratio for the given generator, for the given hour. It is a measure of how closely the generator followed Operating Reserve dispatch instructions.	Y

1.1.3.4.6.2.2 Intermediates

Bill Code	Title	Business Description	DSS Value
	Hr Sup 30Min Unadj Avail ($)	Hourly Supplemental 30-Minute Operating Reserves Unadjusted Availability ($) is a number representing the unadjusted settlement amount for Supplemental 30-Minute Operating Reserves Service, unadjusted for supply performance, for	Y

Bill Code	Title	Business Description	DSS Value
		the given generator, for the given hour.	
	Hr Sup Sched 30Min Avail (MW)	Hourly Supplemental Scheduled 30-Minute Operating Reserves Availability (MW) is a number representing the amount of Supplemental 30-Minute Operating Reserves Service the given generator is scheduled to provide for the given hour. This is the net difference between HAM and DAM 30-Minute Operating Reserves Availability (MW) values.	Y

1.1.3.4.6.2.3 Results

Bill Code	Title	Business Description	DSS Value
	Hr Sup 30Min Avail Stlmnt ($)	Hourly Supplemental 30-Minute Operating Reserves Availability Settlement ($) is a number representing the settlement amount for the availability of Supplemental 30-Minute Operating Reserves Service, adjusted for supply performance, for the given generator, for the given hour.	Y

1.1.3.4.6.3 Eligibility

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

- The generator is scheduled to provide such service in the HAM, and

  Hr Sup Sched 30Min Avail (MW) > 0.

The following are conditions for when Supplemental 30-Minute Operating 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.

1.1.3.4.6.4 Settlement Algorithm

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

Hr Sup 30Min Avail Stlmnt ($) =

Hr Sup 30Min Unadj Avail ($) * Hr Op Res Avg Supply Perf Ratio

Where:

Hr Sup 30Min Unadj Avail ($) =

Hr Sup Sched 30Min Avail (MW) * HAM 30Min Price ($/MW)

Hr Sup Sched 30Min Avail (MW) =

Max{Hr HAM Sched 30Min Avail (MW) - Hr DAM Sched 30Min Avail (MW), 0}

NOTE: The HAM 30Min Price ($/MW) is based on the given generator's location within the NYISO AS pricing regions: East or West (HAM 30Min Price East ($/MW), HAM 30Min Price West ($/MW)).

1.1.3.4.6.5 Additional Information

Hourly Operating Reserve Average Supply Ratio:

The Hourly Operating Reserve Average Supply Ratio (Hr Op Res Avg Supply Perf Ratio) is an hourly performance ratio representing the amount of time that a generator was accurately providing Operating Reserve Service in the given hour. The ratio is computed by dividing the SCD Gen Avg Actual Energy (MW) (average actual generation output in real-time) by the generator's SCD Basepoint (MW) (dispatch instruction) at the Security Constrained Dispatch (SCD) level, and then averaging those values across the hour. Operating Reserve Availability payments are adjusted by this ratio to reflect the generator's failure to fulfill their commitments to provide Operating Reserve Service.

1.1.3.4.6.6 References

The applicability of Supplemental 30-Minute Operating Reserve Availability Payments is described within Schedule 4 of the MST (Market Administration and Control Area Services Tariff), and Schedule 5 of the OATT (Open Access Transmission Tariff).

1.1.3.4.7 10-Minute Synchronous Reserve Reduction

1.1.3.4.7.1 Description

The 10-Minute Synchronous Reserve Reduction settlement ($) is intended to reduce the Day Ahead Market (DAM) and Supplemental 10-Minute Synchronous Reserve Availability settlements when the given generator is unable at a later time (still prior to or during real-time) to actually provide the scheduled reserve capacity (availability). 10-Minute Synchronous Reserve Reduction ($) is charged to Power Suppliers who were selected to provide DAM and/or Supplemental 10-Minute Synchronous Operating Reserve Service in the DAM or Hour Ahead Markets (HAM) respectively, when appropriate.

The 10-Minute Synchronous Reserve Reduction settlement is a charge to the Market Participant when the scenarios below are true. This settlement occurs at the hourly-level for each generator scheduled in the DAM and/or Supplemental 10-Minute Synchronous Reserve markets.

There are two main scenarios which cause 10-Minute Synchronous Reserve Reduction:

1. A result of the generator being off-service for a period of time during the given hour.
2. When the generator's Upper Operating Limit (MW) (UOL) is decreased by the Market Participant below its total obligation (MW) for the given derate-period(s) during the given hour.

1.1.3.4.7.2 Required Data Elements

1.1.3.4.7.2.1 Determinants

Bill Code	Title	Business Description	DSS Value
	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.	N
	DAM 10Sync Price East ($/MW)	Day Ahead Market 10-Minute Synchronous Operating Reserves Price East ($/MW) is a number representing the east hourly market clearing price for DAM 10-Minute Synchronous Operating Reserves Service based on the set of generators in the East Ancillary Services Pricing Region selected by SCUC.	Y
	DAM 10Sync Price West ($/MW)	Day Ahead Market 10-Minute Synchronous Operating Reserves Price West ($/MW) is a number representing the west hourly market clearing price for DAM 10-Minute Synchronous Operating Reserves Service based on the set of generators in the West Ancillary Services Pricing Region selected by SCUC.	Y
	HAM 10Sync Price East ($/MW)	Hour Ahead Market 10-Minute Synchronous Operating Reserves Price East ($/MW) is a number representing the east hourly market clearing price for HAM 10-Minute Synchronous Operating Reserves service based on the set of generators in the East Ancillary Service Pricing Region selected by BME.	Y
	HAM 10Sync Price West ($/MW)	Hour Ahead Market 10-Minute Synchronous Operating Reserves Price West ($/MW) is a number representing the west hourly market clearing price for HAM 10-Minute Synchronous Operating Reserves service based on the set of generators in the West Ancillary Service Pricing Region selected by BME.	Y
	Hr DAM Sched 10Sync Avail (MW)	Hourly Day Ahead Market Scheduled 10-Minute Synchronous Operating Reserves Availability (MW) is a number representing the amount of Day Ahead Market 10-Minute Synchronous Operating Reserves service the given generator is scheduled to provide for the given hour.	Y
	Hr HAM Sched 10SyncRes Avail (MW)	Hourly Hour Ahead Market Scheduled 10-Minute Synchronous Operating Reserves Availability (MW) is a number representing the amount of Hour Ahead Market 10-Minute Synchronous Operating Reserves service the given generator is	Y

Bill Code	Title	Business Description	DSS Value
		scheduled to provide for the given hour.	
	Hr DAM Sched 10NSync Avail (MW)	Hourly Day Ahead Market Scheduled 10-Minute Non-Synchronous Operating Reserves Availability (MW) 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.	Y
	Hr HAM Sched 10NSync Avail (MW)	Hourly Hour Ahead Market Scheduled 10-Minute Non-Synchronous Operating Reserves Availability (MW) is a number representing the amount of Hour Ahead Market 10-Minute Non-Synchronous Operating Reserves Service the given generator is scheduled to provide for the given hour.	Y
	Hr DAM Sched 30Min Avail (MW)	Hourly Day Ahead Market Scheduled 30-Minute Operating Reserves Availability (MW) 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.	Y
	Hr HAM Sched 30Min Avail (MW)	Hourly Hour Ahead Market Scheduled 30-Minute Operating Reserves Availability (MW) is a number representing the amount of Hour Ahead Market 30-Minute Operating Reserves Service the given generator is scheduled to provide for the given hour.	Y
202	Hr NYISO DAM Energy (MW)	NYISO Day-Ahead Market Energy (MW) is a number representing the amount of generation settled in the NYISO Day-Ahead Market	Y
	Hr RT Max Sched Trans - Gen (MW)	Hourly Real-Time Maximum Scheduled Transactions - Generator (MW) is a number representing the maximum amount of transaction energy for all transactions injected at a given generator across all SCD-intervals in the given hour.	N
	Hr DAM 30Min Reduct - Op Limit (MW)	Hourly Day Ahead Market 30-Minute Operating Reserves Reduction - Operating Limit (MW) is a number representing the amount of DAM 30-Minute Operating Reserves service reduced for the given interval, for the given generator due to its operating limit being less than its operating reserves obligation.	N
	Hr Sup 30Min Reduct - Op Limit (MW)	Hourly Supplemental 30-Minute Operating Reserves Reduction - Operating Limit (MW) is a number representing the amount of Supplemental	N

Bill Code	Title	Business Description	DSS Value
		30-Minute Operating Reserves service reduced for the given interval, for the given generator due to its operating limit being less than its operating reserves obligation.	
	SCD Out of Merit Flag	SCD Out of Merit Flag is a character representing whether or not the given generator was dispatched out of economic merit order during the SCD-interval.	Y
	Gen Upper Op Limit (MW)	Generator Upper Operating Limit (MW) is a number indicating the maximum operating capacity for a generator during the given operating status interval.	N
	Hr # Seconds In Service	Hourly Number of Seconds In Service is a number representing the amount of time in seconds a generator is actually in service for the given hour.	Y
	Hr PURPA Unit Ind	Hourly PURPA Unit Indicator is a character indicating whether or not the given unit is a PURPA unit during the given hour.	N
	Hr # Seconds Operating Interval	Hourly Number of Seconds Operating Interval is a number representing the number of seconds in the given generator's operating status intervals for the given hour.	Y
	# Seconds Derate Interval	# of Seconds Derate Interval is a number representing the number of seconds that a generator was derated by the Market Participant for the given operating status interval, within a given hour.	N
	Gen Status In Service Ind	Generator Status In Service Indicator is a character that represents whether the given generator was in service for the given operating status interval. (values are Y or N).	N

1.1.3.4.7.2.2 Intermediates

Bill Code	Title	Business Description	DSS Value
	Hr # Seconds Off Service	Hourly Number of Seconds Off Service is a number representing the number of seconds that the given generator was not in service for the given hour.	N
	Hr Sup Sched 10Sync Avail (MW)	Hourly Supplemental Scheduled 10-Minute Synchronous Operating Reserves Availability (MW) is a number representing the amount of Supplemental 10-Minute Synchronous Operating	Y

Bill Code	Title	Business Description	DSS Value
		Reserves Service the given generator is scheduled to provide for the given hour. This is the net difference between HAM and DAM 10-Minute Synchronous Operating Reserves Availability (MW) values.	
	Hr Sup Sched 10NSync Avail (MW)	Hourly Supplemental Scheduled 10-Minute Non-Synchronous Operating Reserves Availability (MW) is a number representing the amount of Supplemental 10-Minute Non-Synchronous Operating Reserves Service the given generator is scheduled to provide for the given hour. This is the net difference between HAM and DAM 10-Minute Non-Synchronous Operating Reserves Availability (MW) values.	Y
	Hr Sup Sched 30Min Avail (MW)	Hourly Supplemental Scheduled 30-Minute Operating Reserves Availability (MW) is a number representing the amount of Supplemental 30-Minute Operating Reserves Service the given generator is scheduled to provide for the given hour. This is the net difference between HAM and DAM 30-Minute Operating Reserves Availability (MW) values.	Y
	Hr Sup 10Sync Reduct - Obligation (MW)	Hourly Supplemental 10-Minute Synchronous Operating Reserves Reduction Obligation (MW) is a number representing the obligation used in the Supplemental 10-Minute Synchronous Operating Reserves reduction calculation due to the generator's obligation exceeding its upper operating limit.	N
	Hr DAM 10Sync Reduct - Obligation (MW)	Hourly Day Ahead Market 10-Minute Synchronous Operating Reserves Reduction Obligation (MW) is a number representing the obligation used in the DAM 10-Minute Synchronous Operating Reserves reduction calculation due to the generator's obligation exceeding its upper operating limit.	N
	Hr 10Sync Reduct - Off Service (MW)	Hourly 10-Minute Synchronous Reserves Reduction - Off Service (MW) is a number representing the amount of 10-Minute Synchronous Operating Reserves service reduce for the given interval, for the given generator due to it being off service.	N
	Hr DAM 10Sync Reduct - Op Limit (MW)	Hourly Day Ahead Market 10-Minute Synchronous Operating Reserves Reduction - Operating Limit (MW) is a number representing the amount of Day Ahead Market 10-Minute	N

Bill Code	Title	Business Description	DSS Value
		Synchronous Operating Reserves service reduced for the given interval, for the given generator due to its operating limit being less than its operating reserves obligation.	
	Hr Sup 10Sync Reduct - Op Limit (MW)	Hourly Supplemental 10-Minute Synchronous Operating Reserves Reduction - Operating Limit (MW) is a number representing the amount of Supplement 10-Minute Synchronous Operating Reserves service reduced for the given interval, for the given generator due to its operating limit being less than its operating reserves obligation.	N
	Hr 10Sync Reduct - Total (MW)	Hourly 10-Minute Synchronous Operating Reserves Reduction - Total (MW) is a number representing the total amount of reduction due to off service and due to the operating limit being less than the generator's obligation over the given hour.	Y

1.1.3.4.7.2.3 Results

Bill Code	Title	Business Description	DSS Value
	Hr 10Sync Reduct Stlmnt ($)	Hourly 10-Minute Synchronous Operating Reserves Reduction Settlement ($) is a number representing the amount for 10-Minute Synchronous Operating Reserves reduction settlement, adjusted for supply performance, for the given generator, for the given hour.	Y

1.1.3.4.7.3 Eligibility

Generators will be charged 10-Minute Synchronous Reserve Reduction ($) if any of the following conditions exist:

- Generator is Off-Service.
- Generator's Upper Operating Limit (UOL) is derated by the Market Participant below its total obligation. A generator's obligation from operating reserve schedules will be reduced in the following order until its total obligation <= UOL:
    - Supplemental 30-Minute Operating Reserve
    - DAM 30-Minute Operating Reserve
    - Supplemental 10-Minute Synchronous Reserve
    - DAM 10-Minute Synchronous Reserve

The following are scenarios for which 10-Minute Synchronous Reserve Reduction ($) does not apply:

- When the generator is placed Out of Merit by NYISO (SCD Out of Merit Flag = "Y"), the Market Participant will not receive a reduction for being off-service (Hr # Seconds In Service = 3,600 seconds) in a given hour.
    - **NOTE:** The generator is still subject to receive DAM and Supplemental 10-Minute Synchronous Reserve Reduction when the generator is placed Out of Merit by NYISO.
- The GILBOA generators are not subject to 10-Minute Synchronous Reserve Reduction.
- PURPA generators (Hr PURPA Unit Ind = "Y) are not subject to 10-Minute Synchronous Reserve Reduction.
- 10-Minute Synchronous Reserve Reduction ($) is not calculated for Grouped Generators (Generator Type = "GROUP UNIT").

1.1.3.4.7.4 Settlement Algorithm

Hr 10Sync Reduct Stlmnt ($) is calculated as:

Hr 10Sync Reduct Stlmnt ($) =

Hr 10Sync Reduct - Total (MW) * 10Sync Price ($/MW)

Where 10Sync Price ($/MW) is defined as:

If HAM 10Sync Price ($/MW) > 0:

10Sync Price ($/MW) = HAM 10Sync Price ($/MW)

Else

10Sync Price ($/MW) = DAM 10Sync Price ($/MW)

NOTE: The HAM 10Sync Price ($/MW) and DAM 10Sync Price ($/MW) data elements are based on the given generator's location within the NYISO AS pricing regions (Gen AS Pricing Region Ind): East or West (HAM 10Sync Price East ($/MW), HAM 10Sync Price West ($/MW) and DAM 10Sync Price East ($/MW), DAM 10Sync Price West ($/MW)).

Hr 10Sync Reduct - Total (MW) is calculated as:

Hr 10Sync Reduct - Total (MW) =

Hr 10Sync Reduct - Off Service (MW) + Hr Sup 10Sync Reduct - Op Limit (MW) + Hr DAM 10Sync Reduct - Op Limit (MW)

NOTES:

- Hr Sup 10Sync Reduct - Op Limit (MW) & Hr DAM 10Sync Reduct - Op Limit (MW) are calculated for each unique operating status interval for the given hour, and then all unique interval's totals are summed together to determine the hourly values.
- See the following sections for detailed calculations of 10-Minute Synchronous Reserve Reduction - Off-Service (MW), and DAM and

Supplemental 10-Minute Synchronous Reduction - Operating Limit (MW).

Hr 10Sync Reduct - Off Service (MW) is calculated as:

Hr 10Sync Reduct - Off Service (MW) =

{Hr DAM Sched 10Sync Avail (MW) + Hr Sup Sched 10Sync Avail (MW)} * (Hr # Seconds Off Service ÷ 3,600 Seconds)

Where Hr # Seconds Off Service is:

Hr # Seconds Off Service =

[3,600 Seconds - {3,600 Seconds - Hr # Seconds Operating Interval + Hr # Seconds In Service}]

NOTES:

- The 10-Minute Synchronous Reserve Reduction - Off-Service (MW) portion (above) of the overall 10-Minute Synchronous Reduction calculation is performed first, and is calculated only once for the given hour.
- See below for information regarding the calculation of Hr Sup Sched 10Sync Avail (MW).

Hr Sup 10Sync Reduct - Op Limit (MW) is calculated as:

If Gen Status In Service Ind = "Y" and Gen Upper Op Limit (MW) < Hr Sup 10Sync Reduct - Obligation (MW), then:

Hr Sup 10Sync Reduct - Op Limit (MW) =

[Hr Sup Sched 10Sync Avail (MW) (-) {Gen Upper Op Limit (MW) (-) (Hr Sup 10Sync Reduct - Obligation (MW) (-) Hr Sup Sched 10Sync Avail (MW)}] * {# Seconds Derate Interval ÷ 3,600 seconds}

If Hr Sup 10Sync Reduct - Op Limit (MW) > Hr Sup Sched 10Sync Avail (MW):

Hr Sup 10Sync Reduct - Op Limit (MW) = Hr Sup Sched 10Sync Avail (MW)

Where Hr Sup 10Sync Reduct - Obligation (MW) is calculated as:

Hr Sup 10Sync Reduct - Obligation (MW) =

Hr DAM Sched 10Sync Avail (MW) + Hr Sup Sched 10Sync Avail (MW) +

Hr DAM Sched 10NSync Avail (MW) + Hr Sup Sched 10NSync Avail (MW) +

Hr DAM Sched 30Min Avail (MW) + Hr Sup Sched 30Min Avail (MW) +

Hr NYISO DAM Energy (MW) + Hr RT Max Sched Trans - Gen (MW) (-)

Hr Sup 30Min Reduct - Op Limit (MW) (-) Hr DAM 30Min Reduct - Op Limit (MW)

NOTES:

- The Supplemental 10-Minute Synchronous Reserve Reduction portion (above) of the overall 10-Minute Synchronous Reserve Reduction calculation is performed second, and is calculated for each time period in which the generator is derated by the Market Participant within a given hour.
- See below for information regarding the calculation of:
  - Hr Sup Sched 10Sync Avail (MW)
  - Hr Sup Sched 10NSync Avail (MW)
  - Hr Sup Sched 30Min Avail (MW)

Hr DAM 10Sync Reduct - Op Limit (MW) is calculated as:

If Gen Status In Service Ind = "Y" and Gen Upper Op Limit (MW) < Hr DAM 10Sync Reduct - Obligation (MW), then:

Hr DAM 10Sync Reduct - Op Limit (MW) =

[Hr DAM Sched 10Sync Avail (MW) (-) {Gen Upper Op Limit (MW) (-) (Hr DAM 10Sync Reduct - Obligation (MW) (-) Hr DAM Sched 10Sync Avail (MW)}] * {# Seconds Derate Interval ÷ 3,600 seconds}

If Hr DAM 10Sync Reduct - Op Limit (MW) > Hr DAM Sched 10Sync Avail (MW):

Hr DAM 10Sync Reduct - Op Limit (MW) = Hr DAM Sched 10Sync Avail (MW)

Where Hr DAM 10Sync Reduct - Obligation (MW) is calculated as:

Hr DAM 10Sync Reduct - Obligation (MW) =

Hr DAM Sched 10Sync Avail (MW) + Hr Sup Sched 10Sync Avail (MW) +

Hr DAM Sched 10NSync Avail (MW) + Hr Sup Sched 10NSync Avail (MW) +

Hr DAM Sched 30Min Avail (MW) + Hr Sup Sched 30Min Avail (MW) +

Hr NYISO DAM Energy (MW) + Hr RT Max Sched Trans (MW) - Gen (-)

Hr Sup 30Min Reduct - Op Limit (MW) (-) Hr DAM 30Min Reduct - Op Limit (MW) (-) Hr Sup 10Sync Reduct - Op Limit (MW)

NOTES:

- The DAM 10-Minute Synchronous Reserve Reduction portion (above) of the overall 10-Minute Synchronous Reduction calculation is performed last, and is calculated for each time period in which the Upper Operating Limit (UOL) is less than the obligation level for DAM 10-Minute Synchronous Reserves.
- See below for information regarding the calculation of:
  - Hr Sup Sched 10Sync Avail (MW)
  - Hr Sup Sched 10NSync Avail (MW)

- Hr Sup Sched 30Min Avail (MW)

The various Supplemental Reserve Availability (MW) data elements are calculated as:

Hr Sup Sched 10Sync Avail (MW) =

Max{Hr HAM Sched 10SyncRes Avail (MW) - Hr DAM Sched 10Sync Avail (MW), 0}

Hr Sup Sched 10NSync Avail (MW) =

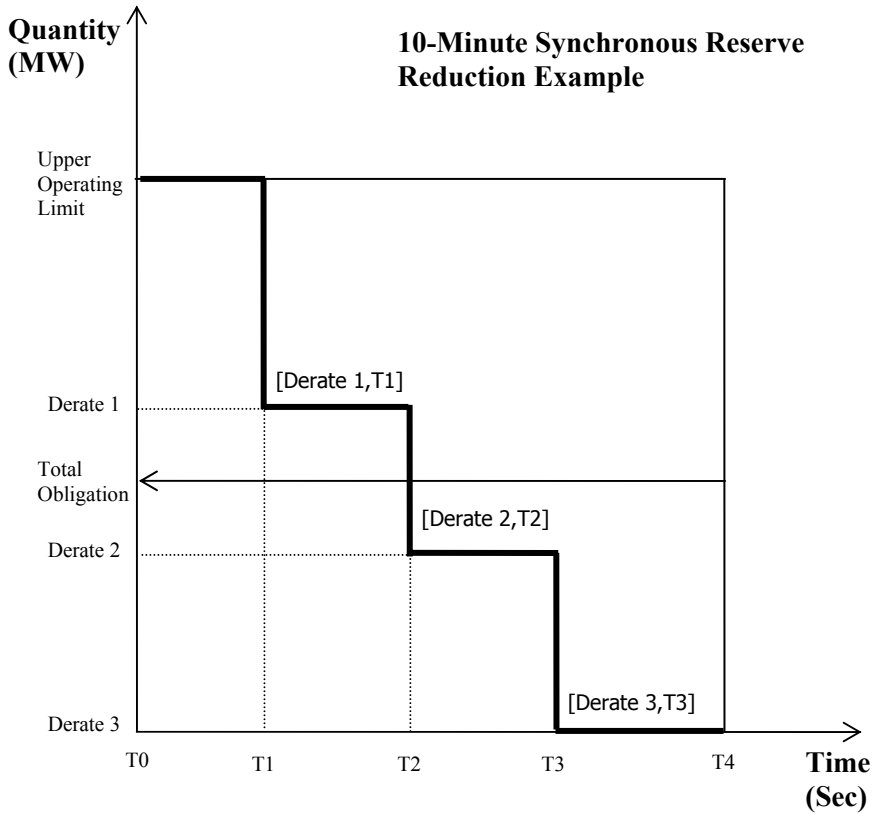
Max{Hr HAM Sched 10NSync Avail (MW) - Hr DAM Sched 10NSync Avail (MW), 0}

Hr Sup Sched 30Min Avail (MW) =

Max{Hr HAM Sched 30Min Avail (MW) - Hr DAM Sched 30Min Avail (MW), 0}

1.1.3.4.7.5 Additional Information

10-Minute Synchronous Reserve Reduction Graphical Example:



NOTE: The above is a graphical representation of how a Market Participant's generator would be charged for 10-Minute Synchronous Reserve Reduction over an hour of time (from T0 - T4). Also, it is important to note that time between x-axis data points (i.e. between T1/T2, or T2/T3,

etc.) are not at the ~5-min Security Constrained Dispatch (SCD) level, since these intervals can be any length of time.

[Upper Operating Limit (MW), Time T0]

- Generator is capable of producing above its total obligation (MW). Therefore 10-Minute Synchronous Reserve Reduction is not applicable, and Hr 10Sync Reduct Stlmnt ($) = 0.

[Derate 1 (MW), Time T1]

- Generator's Upper Operating Limit (MW) has been derated to quantity Derate 1 (MW) at time T1. Since the generator is still in-service, and rated above its total obligation (MW), 10-Minute Synchronous Reduction is not applicable, and Hr 10Sync Reduct Stlmnt ($) = 0.

[Derate 2 (MW), Time T2]

- Generator's is still in-service, but its Upper Operating Limit (MW) has been derated to quantity Derate 2 (MW) at time T2. Generator is now derated below its total obligation (MW).
    - Hr Sup 10Sync Reduct - Op Limit (MW) would be calculated from T2 to T3.
    - Hr DAM 10Sync Reduct - Op Limit (MW) would be calculated from T2 to T3 if Gen Upper Op Limit (MW) < Hr DAM 10Sync Reduct - Obligation (MW).

[Derate 3 (MW), Time T3]

- Generator is now off service at quantity Derate 3 (MW) and Time T3. Therefore, Hr 10Sync Reduct - Off Service (MW) would be calculated from T3 to T4.

1.1.3.4.7.6 References

The applicability of 10-Minute Synchronous Reserve Reduction Charges is described within Schedule 4 of the MST (Market Administration and Control Area Services Tariff).

1.1.3.4.8 10-Minute Non-Synchronous Reserve Reduction

1.1.3.4.8.1 Description

The 10-Minute Non-Synchronous Reserve Reduction settlement ($) is intended to reduce the Day Ahead Market (DAM) and Supplemental 10-Minute Non-Synchronous Reserve Availability settlements when the given generator is unable at a later time (still prior to or during real-time) to actually provide the reserve capacity (availability). 10-Minute Non-Synchronous Reserve Reduction ($) is charged to Power Suppliers who were selected to provide DAM and/or Supplemental 10-Minute Non-Synchronous Operating Reserve Service in the DAM or Hour Ahead Markets (HAM) respectively, when appropriate.

The 10-Minute Non-Synchronous Reserve Reduction settlement is a charge to the Market Participant when the scenario below above is true. This settlement occurs at the hourly-level for each generator scheduled in the DAM and/or Supplemental 10-Minute Non-Synchronous Reserve markets.

10-Minute Synchronous Reserve Reduction is caused as a result of the generator being unavailable for a period of time during the given hour.

1.1.3.4.8.2 Required Data Elements

1.1.3.4.8.2.1 Determinants

Bill Code	Title	Business Description	DSS Value
	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.	N
	DAM 10NSync Price East ($/MW)	Day Ahead Market 10-Minute Non-Synchronous Operating Reserves Price East ($/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.	Y
	DAM 10NSync Price West ($/MW)	Day Ahead Market 10-Minute Non-Synchronous Operating Reserves Price West ($/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.	Y
	HAM 10NSync Price East ($/MW)	Hour Ahead Market 10-Minute Non-Synchronous Operating Reserves Price East ($/MW) is a number representing the east hourly market clearing price for HAM 10-Minute Non-Synchronous Operating Reserves Service based on the set of generators in the East Ancillary Service Pricing Region selected by BME.	Y
	HAM 10NSync Price West ($/MW)	Hour Ahead Market 10-Minute Non-Synchronous Operating Reserves Price West ($/MW) is a number representing the west hourly market clearing price for HAM 10-Minute Non-Synchronous Operating Reserves Service based on the set of generators in the West Ancillary Service Pricing Region selected by BME.	Y
	Hr DAM Sched 10NSync Avail (MW)	Hourly Day Ahead Market Scheduled 10-Minute Non-Synchronous Operating Reserves Availability (MW) 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.	Y
	Hr HAM Sched 10NSync Avail (MW)	Hourly Hour Ahead Market Scheduled 10-Minute Non-Synchronous Operating Reserves Availability (MW) is a number representing the amount of Hour Ahead Market 10-Minute Non-Synchronous Operating Reserves Service the given generator is scheduled to provide for the given hour.	Y

Bill Code	Title	Business Description	DSS Value
	Hr # Seconds Available	Hourly Number of Seconds Available is a number representing the amount of time in seconds that the given generator was available for the given hour.	Y
	Hr # Seconds Operating Interval	Hourly Number of Seconds Operating Interval is a number representing the number of seconds in the given generator's operating interval for the given hour.	Y
5200	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.	Y
	Hr PURPA Unit Ind	Hourly PURPA Unit Indicator is a character indicating whether or not the given unit is a PURPA unit during the given hour.	N

1.1.3.4.8.2.2 Intermediates

Bill Code	Title	Business Description	DSS Value
	Hr # Seconds Unavailable	Hourly Number of Seconds Unavailable is a number representing amount of time in seconds the given generator was unavailable, for the given hour.	Y
	Hr Sup Sched 10NSync Avail (MW)	Hourly Supplemental Scheduled 10-Minute Non-Synchronous Operating Reserves Availability (MW) is a number representing the amount of Supplemental 10-Minute Non-Synchronous Operating Reserves Service the given generator is scheduled to provide for the given hour. This is the net difference between HAM and DAM 10-Minute Non-Synchronous Operating Reserves Availability (MW) values.	Y
	Hr 10NSync Reduct - Unavail (MW)	Hourly 10-Minute Non-Synchronous Operating Reserves Reduction Unavailable (MW) is a number representing the amount of 10-Minute Non-Synchronous Operating Reserves Service reduced for the given generator due to it being unavailable, for the given hour.	Y

1.1.3.4.8.2.3 Results

Bill Code	Title	Business Description	DSS Value

Bill Code	Title	Business Description	DSS Value
	Hr 10NSync Reduct Stlmnt ($)	Hourly 10-Minute Non-Synchronous Operating Reserves Reduction Settlement ($) is a number representing the settlement amount for 10-Minute Non-Synchronous Operating Reserves Reduction, adjusted for supply performance, for the given generator, for the given hour.	Y

1.1.3.4.8.3 Eligibility

Generators will be charged 10-Minute Non-Synchronous Reserve Reduction ($) if any of the following conditions exist:

- Generator is Unavailable.

The following are scenarios for which 10-Minute Non-Synchronous Reserve Reduction ($) does not apply:

- When the generator is placed Out of Merit by NYISO (Hr Out of Merit Flag = "Y"), the Market Participant will not receive a reduction for being unavailable (Hr # Seconds Available = 3,600 seconds) in a given hour.
- The GILBOA generators are not subject to 10-Minute Non-Synchronous Reserve Reduction.
- PURPA generators (Hr PURPA Unit Ind = "Y) are not subject to 10-Minute Non-Synchronous Reserve Reduction.
- 10-Minute Non-Synchronous Reserve Reduction ($) is not calculated for Grouped Generators (Generator Type = "GROUP UNIT").

1.1.3.4.8.4 Settlement Algorithm

Hr 10NSync Reduct Stlmnt ($) is calculated as:

Hr 10NSync Reduct Stlmnt ($) =

Hr 10NSync Reduct - Unavail (MW) * 10NSync Price ($/MW)

Where 10NSync Price ($/MW) is defined as:

If HAM 10NSync Price ($/MW) > 0:

10NSync Price ($/MW) = HAM 10NSync Price ($/MW)

Else

10NSync Price ($/MW) = DAM 10NSync Price ($/MW)

NOTE: The HAM 10NSync Price ($/MW) and DAM 10NSync Price ($/MW) data elements are based on the given generator's location within the NYISO AS pricing regions (Gen AS Pricing Region Ind): East or West (HAM 10NSync Price East ($/MW),

HAM 10NSync Price West ($/MW) and DAM 10NSync Price East ($/MW), DAM 10NSync Price West ($/MW)).

Hr 10NSync Reduct - Unavail (MW) is calculated as:

Hr 10NSync Reduct - Unavail (MW) =

{Hr DAM Sched 10NSync Avail (MW) + Hr Sup Sched 10NSync Avail (MW)} * (Hr # Seconds Unavailable ÷ 3,600 Seconds)

Where Hr # Seconds Unavailable is:

Hr # Seconds Unavailable =

[3,600 Seconds - {3,600 Seconds - Hr # Seconds Operating Interval + Hr # Seconds Available}]

Hr Sup Sched 10NSync Avail (MW) is calculated as:

Hr Sup Sched 10NSync Avail (MW)} =

Max{Hr HAM Sched 10NSync Avail (MW) - Hr DAM Sched 10NSync Avail (MW), 0}

1.1.3.4.8.5 Additional Information

None

1.1.3.4.8.6 References

The applicability of 10-Minute Non-Synchronous Reserve Reduction Charges is described within Schedule 4 of the MST (Market Administration and Control Area Services Tariff).

1.1.3.4.9 30-Minute Operating Reserve Reduction

1.1.3.4.9.1 Description

The 30-Minute Operating Reserve Reduction settlement ($) is intended to reduce the Day Ahead Market (DAM) and Supplemental 30-Minute Operating Reserve Availability settlements when the given generator is unable at a later time (still prior to or during real-time) to actually provide the scheduled reserve capacity (availability). 30-Minute Operating Reserve Reduction ($) is charged to Power Suppliers who were selected to provide DAM and/or Supplemental 30-Minute Operating Reserve Service in the DAM or Hour Ahead Markets (HAM) respectively, when appropriate.

The 30-Minute Operating Reserve Reduction settlement is a charge to the Market Participant when the scenarios below are true. This settlement occurs at the hourly-level level for each generator scheduled in the DAM and/or Supplemental 30-Minute Operating Reserve markets.

There are two main scenarios which cause 30-Minute Operating Reserve Reduction:

1. A result of the generator being unavailable for a period of time during the given hour.
2. When the generator's Upper Operating Limit (UOL) is derated by the Market Participant below its total obligation for the given derate-period(s) during the given hour.

1.1.3.4.9.2 Required Data Elements

1.1.3.4.9.2.1 Determinants

Bill Code	Title	Business Description	DSS Value
	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.	N
	DAM 30Min Price East ($/MW)	Day Ahead Market 30-Minute Operating Reserves Price East ($/MW) is a number representing the east hourly market 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.	Y
	DAM 30Min Price West ($/MW)	Day Ahead Market 30-Minute Operating Reserves Price West ($/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.	Y
	HAM 30Min Price East ($/MW)	Hour Ahead Market 30-Minute Operating Reserves Price East ($/MW) is a number representing the east hourly market clearing price for HAM 30-Minute Operating Reserves Service based on the set of generators in the East Ancillary Service Pricing Region selected by BME.	Y
	HAM 30Min Price West ($/MW)	Hour Ahead Market 30-Minute Operating Reserves Price West ($/MW) is a number representing the west hourly market clearing price for HAM 30-Minute Operating Reserves Service based on the set of generators in the West Ancillary Service Pricing Region selected by BME.	Y
	Hr DAM Sched 10Sync Avail (MW)	Hourly Day Ahead Market Scheduled 10-Minute Synchronous Operating Reserves Availability (MW) is a number representing the amount of Day Ahead Market 10-Minute Synchronous Operating Reserves service the given generator is scheduled to provide for the given hour.	Y
	Hr HAM Sched 10SyncRes Avail (MW)	Hourly Hour Ahead Market Scheduled 10-Minute Synchronous Operating Reserves Availability (MW) is a number representing the amount of Hour Ahead Market 10-Minute Synchronous Operating Reserves service the given generator is	Y

Bill Code	Title	Business Description	DSS Value
		scheduled to provide for the given hour.	
	Hr DAM Sched 10NSync Avail (MW)	Hourly Day Ahead Market Scheduled 10-Minute Non-Synchronous Operating Reserves Availability (MW) 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.	Y
	Hr HAM Sched 10NSync Avail (MW)	Hourly Hour Ahead Market Scheduled 10-Minute Non-Synchronous Operating Reserves Availability (MW) is a number representing the amount of Hour Ahead Market 10-Minute Non-Synchronous Operating Reserves Service the given generator is scheduled to provide for the given hour.	Y
	Hr DAM Sched 30Min Avail (MW)	Hourly Day Ahead Market Scheduled 30-Minute Operating Reserves Availability (MW) 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.	Y
	Hr HAM Sched 30Min Avail (MW)	Hourly Hour Ahead Market Scheduled 30-Minute Operating Reserves Availability (MW) is a number representing the amount of Hour Ahead Market 30-Minute Operating Reserves Service the given generator is scheduled to provide for the given hour.	Y
202	Hr NYISO DAM Energy (MW)	NYISO Day-Ahead Market Energy (MW) is a number representing the amount of generation settled in the NYISO Day-Ahead Market	Y
	Hr RT Max Sched Trans (MW) - Gen	Hourly Real-Time Maximum Scheduled Transactions - Generator (MW) is a number representing the maximum amount of transaction energy for all transactions injected at a given generator, for all SCD-intervals in the given hour.	N
	SCD Out of Merit Flag	SCD Out of Merit Flag is a character representing whether or not the given generator was dispatched out of economic merit order during the SCD-interval.	Y
	Gen Upper Op Limit (MW)	Generator Uper Operating Limit (MW) is a number indicating the maximum operating capacity for a generator during the given period.	Y
	Hr # Seconds Available	Hourly Number of Seconds Available is a number representing the amount of time in seconds that the given generator was available for the given hour.	Y

Bill Code	Title	Business Description	DSS Value
	Hr PURPA Unit Ind	Hourly PURPA Unit Indicator is a character indicating whether or not the given unit is a PURPA unit during the given hour.	N
	Hr # Seconds Operating Interval	Hourly Number of Seconds Operating Interval is a number representing the number of seconds in the given generator's operating interval for the given hour.	Y
	# Seconds Derate Interval	# of Seconds Derate Interval is a number representing the number of seconds that a generator was derated by the Market Participant for the given operating status interval, within a given hour.	N
	Gen Status In Service Ind	Hourly Generator In Service Indicator is a character that represents whether the given generator was in service for the given interval (values Y or N).	N

1.1.3.4.9.2.2 Intermediates

Bill Code	Title	Business Description	DSS Value
	Hr # Seconds Unavailable	Hourly Number of Seconds Unavailable is a number representing amount of time in seconds the given generator was unavailable, for the given hour.	Y
	Hr DAM 30Min Reduct - Op Limit (MW)	Hourly Day Ahead Market 30-Minute Operating Reserves Reduction - Operating Limit (MW) is a number representing the amount of DAM 30-Minute Operating Reserves service reduced for the given interval, for the given generator due to its operating limit being less than its operating reserves obligation.	N
	Hr Sup 30Min Reduct - Op Limit (MW)	Hourly Supplemental 30-Minute Operating Reserves Reduction - Operating Limit (MW) is a number representing the amount of Supplemental 30-Minute Operating Reserves service reduced for the given interval, for the given generator due to its operating limit being less than its operating reserves obligation.	N
	Hr Sup Sched 10Sync Avail (MW)	Hourly Supplemental Scheduled 10-Minute Synchronous Operating Reserves Availability (MW) is a number representing the amount of Supplemental 10-Minute Synchronous Operating Reserves Service the given generator is scheduled to provide for the given hour. This is the net	Y

Bill Code	Title	Business Description	DSS Value
		difference between HAM and DAM 10-Minute Synchronous Operating Reserves Availability (MW) values.	
	Hr Sup Sched 10NSync Avail (MW)	Hourly Supplemental Scheduled 10-Minute Non-Synchronous Operating Reserves Availability (MW) is a number representing the amount of Supplemental 10-Minute Non-Synchronous Operating Reserves Service the given generator is scheduled to provide for the given hour. This is the net difference between HAM and DAM 10-Minute Non-Synchronous Operating Reserves Availability (MW) values.	Y
	Hr Sup Sched 30Min Avail (MW)	Hourly Supplemental Scheduled 30-Minute Operating Reserves Availability (MW) is a number representing the amount of Supplemental 30-Minute Operating Reserves Service the given generator is scheduled to provide for the given hour. This is the net difference between HAM and DAM 30-Minute Operating Reserves Availability (MW) values.	Y
	Hr 30Min Reduct - Unavail (MW)	Hourly 30-Minute Operating Reserves Reduction - Unavailable (MW) is a number representing the amount of 30-Minute Operating Reserves service reduced for the given interval, for the given generator due to it being unavailable.	N
	Hr Sup 30Min Reduct - Obligation (MW)	Hourly Supplemental 30-Minute Operating Reserves Reduction Obligation (MW) is a number representing the obligation used in the Supplemental 30-Minute Operating Reserves reduction calculation due to the generator's obligation exceeding its upper operating limit.	N
	Hr DAM 30Min Reduct - Obligation (MW)	Hourly Day Ahead Market 30-Minute Operating Reserves Reduction Obligation (MW) is a number representing the obligation used in the Day Ahead Market 30-Minute Operating Reserves reduction calculation due to the generator's obligation exceeding its upper operating limit.	N
	Hr 30Min Reduct - Total (MW)	Hourly 30-Minute Operating Reserves Reduction Total (MW) is a number representing the total amount of reduction due to the generator being unavailable and due to the operating limit being less than the generator's obligation over the given hour.	Y

1.1.3.4.9.2.3 Results

Bill Code	Title	Business Description	DSS Value
	Hr 30Min Reduct Stlmnt ($)	Hourly 30-Minute Operating Reserves Reduction Settlement ($) is a number representing the settlement amount for 30-Minute Operating Reserves Reduction, for the given generator, for the given hour.	Y

1.1.3.4.9.3 Eligibility

Generators will be charged 30-Minute Operating Reserve Reduction ($) if any of the following conditions exist:

- Generator is Unavailable.
- Generator's Upper Operating Limit (UOL) is derated by the Market Participant below its total obligation. A generator's obligation from operating reserve schedules will be reduced in the following order until its total obligation <= UOL:
    - Supplemental 30-Minute Operating Reserve
    - DAM 30-Minute Operating Reserve
    - Supplemental 10-Minute Synchronous Reserve
    - DAM 10-Minute Synchronous Reserve

The following are scenarios for which 30-Minute Operating Reserve Reduction ($) does not apply:

- When the generator is placed Out of Merit by NYISO (SCD Out of Merit Flag = "Y") the Market Participant will not receive a reduction for being Unavailable (Hr # Seconds Available = 3,600 seconds) in a given hour.
    - **NOTE:** The generator is still subject to receive DAM and Supplemental 30-Minute Operating Reserve Reduction when the generator is placed Out of Merit by NYISO.
- The GILBOA generators are not subject to 30-Minute Operating Reserve Reduction.
- PURPA generators (Hr PURPA Unit Ind = "Y) are not subject to 30-Minute Operating Reserve Reduction.
- 30-Minute Operating Reserve Reduction ($) is not calculated for Grouped Generators (Generator Type = "GROUP UNIT").

1.1.3.4.9.4 Settlement Algorithm

Hr 30Min Reduct Stlmnt ($) is calculated as:

Hr 30Min Reduct Stlmnt ($) =

Hr 30Min Reduct - Total (MW) * 30Min Price ($/MW)

Where 30Min Price ($/MW) is defined as:

If HAM 30Min Price ($/MW) > 0:

30Min Price ($/MW) = HAM 30Min Price ($/MW)

Else

30Min Price ($/MW) = DAM 30Min Price ($/MW)

NOTE: The HAM 30Min Price ($/MW) and DAM 30Min Price ($/MW) data elements are based on the given generator's location within the NYISO AS pricing regions (Gen AS Pricing Region Ind): East or West (HAM 30Min Price East ($/MW), HAM 30Min Price West ($/MW) and DAM 30Min Price East ($/MW), DAM 30Min Price West ($/MW)).

Hr 30Min Reduct - Total (MW) is calculated as:

Hr 30Min Reduct - Total (MW) =

Hr 30Min Reduct - Unavail (MW) + Hr Sup 30Min Reduct - Op Limit (MW) + Hr DAM 30Min Reduct - Op Limit (MW)

NOTES:

- Hr Sup 30Min Reduct - Op Limit (MW) & Hr DAM 30Min Reduct - Op Limit (MW) are calculated for each unique operating status interval for the given hour, and then all unique interval's totals are summed together to determine the hourly values.
- See the following sections for detailed calculations of 30-Minute Operating Reserve Reduction - Unavailable (MW), and DAM and Supplemental 30-Minute Operating Reserve Reduction - Operating Limit (MW).

Hr 30Min Reduct - Unavail (MW) is calculated as:

Hr 30Min Reduct - Unavail (MW) =

{Hr DAM Sched 30Min Avail (MW) + Hr Sup Sched 30Min Avail (MW)} * (Hr # Seconds Unavailable ÷ 3,600 Seconds)

Where Hr # Seconds Unavailable is:

Hr # Seconds Unavailable =

[3,600 Seconds - {3,600 Seconds - Hr # Seconds Operating Interval + Hr # Seconds Available}]

NOTES:

- The 30-Minute Operating Reserve Reduction - Unavailable (MW) portion (above) of the overall 30-Minute Operating Reserve Reduction calculation is performed first, and is calculated only once for the given hour.
- See below for information regarding the calculation of Hr Sup Sched 30Min Avail (MW).

Hr Sup 30Min Reduct - Op Limit (MW) is calculated as:

If Gen Status In Service Ind = "Y" and Gen Upper Op Limit (MW) < Hr Sup 30 Min Reduct - Obligation (MW), then

Hr Sup 30Min Reduct - Op Limit (MW) =

[Hr Sup Sched 30Min Avail (MW) (-) {Gen Upper Op Limit (MW) (-) (Hr Sup 30Min Reduct - Obligation (MW) (-) Hr Sup Sched 30Min Avail (MW)}] * {# Seconds Derate Interval ÷ 3,600 seconds}

If Hr Sup 30Min Reduct - Op Limit (MW) > Hr Sup Sched 30Min Avail (MW)

Hr Sup 30Min Reduct - Op Limit (MW) = Hr Sup Sched 30Min Avail (MW)

Where Hr Sup 30Min Reduct - Obligation (MW) is calculated as:

Hr Sup 30Min Reduct - Obligation (MW) =

Hr DAM Sched 10Sync Avail (MW) + Hr Sup Sched 10Sync Avail (MW) +

Hr DAM Sched 10NSync Avail (MW) + Hr Sup Sched 10NSync Avail (MW) +

Hr DAM Sched 30Min Avail (MW) + Hr Sup Sched 30Min Avail (MW) +

Hr NYISO DAM Energy (MW) + Hr RT Max Sched Trans (MW)

NOTES:

- The Supplemental 30-Minute Operating Reserve Reduction portion (above) of the overall 30-Minute Operating Reserve Reduction calculation is performed second, and is calculated for each time period in which the generator is derated by the Market Participant within a given hour.
- See below for information regarding the calculation of:
  - Hr Sup Sched 10Sync Avail (MW)
  - Hr Sup Sched 10NSync Avail (MW)
  - Hr Sup Sched 30Min Avail (MW)

Hr DAM 30Min Reduct - Op Limit (MW) is calculated as:

If Gen Status In Service Ind = "Y" and Gen Upper Op Limit (MW) < Hr DAM 30Min Reduct - Obligation (MW), then

Hr DAM 30Min Reduct - Op Limit (MW) =

[Hr DAM Sched 30Min Avail (MW) (-) {Gen Upper Op Limit (MW) (-) (Hr DAM 30 Min Reduct - Obligation (MW) (-) Hr DAM Sched 30Min Avail (MW)}] * {# Seconds Derate Interval ÷ 3,600 seconds}

If Hr DAM 30Min Reduct - Op Limit (MW) > Hr DAM Sched 30Min Avail (MW)

Hr DAM 30Min Reduct - Op Limit (MW) = Hr DAM Sched 30Min Avail (MW)

Where Hr DAM 30Min Reduct - Obligation (MW) is calculated as:

Hr DAM 30Min Reduct - Obligation (MW) =

Hr DAM Sched 10Sync Avail (MW) + Hr Sup Sched 10Sync Avail (MW) +

Hr DAM Sched 10NSync Avail (MW) + Hr Sup Sched 10NSync Avail (MW) +

Hr DAM Sched 30Min Avail (MW) + Hr Sup Sched 30Min Avail (MW) +

Hr NYISO DAM Energy (MW) + Hr RT Max Sched Trans (MW) - Gen (-)

Hr Sup 30Min Reduct - Op Limit (MW)

NOTES:

- The Day Ahead Market 30-Minute Operating Reserve Reduction portion (above) of the overall 30-Minute Operating Reserve Reduction calculation is performed last, and is calculated for each time period in which the Upper Operating Limit (UOL) is less than the obligation level for DAM 30-Minute Operating Reserves.
- See below for information regarding the calculation of:
  - Hr Sup Sched 10Sync Avail (MW)
  - Hr Sup Sched 10NSync Avail (MW)
  - Hr Sup Sched 30Min Avail (MW)

The various Supplemental Reserve Availability (MW) data elements are calculated as:

Hr Sup Sched 10Sync Avail (MW) =

Max{Hr HAM Sched 10SyncRes Avail (MW) - Hr DAM Sched 10Sync Avail (MW), 0}

Hr Sup Sched 10NSync Avail (MW) =

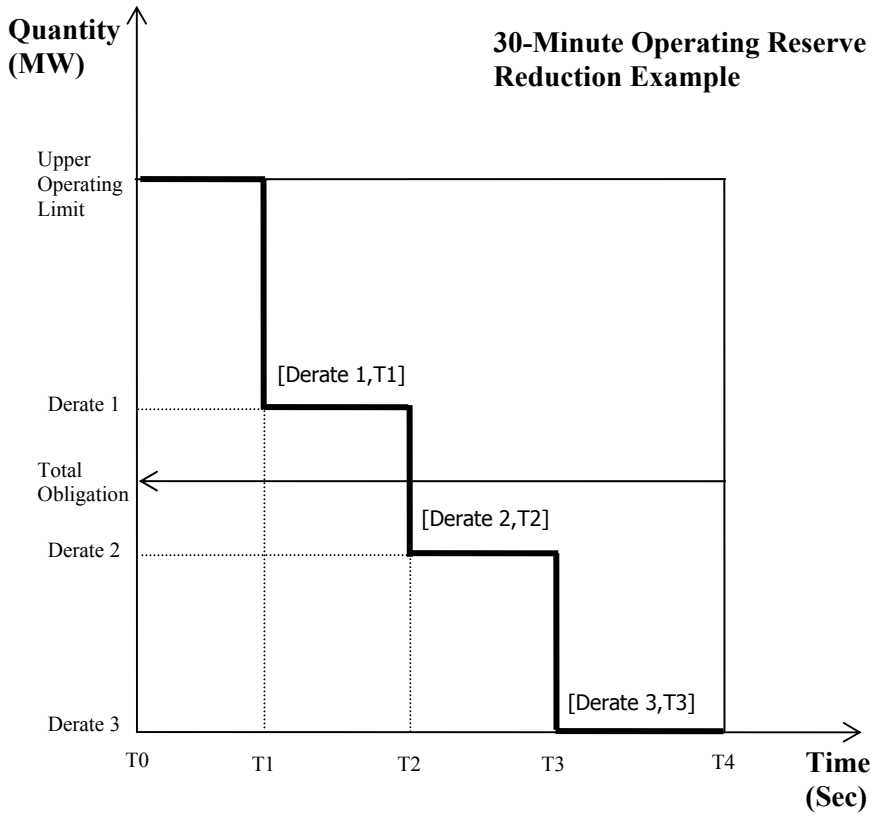
Max{Hr HAM Sched 10NSync Avail (MW) - Hr DAM Sched 10NSync Avail (MW), 0}

Hr Sup Sched 30Min Avail (MW) =

Max{Hr HAM Sched 30Min Avail (MW) - Hr DAM Sched 30Min Avail (MW), 0}

1.1.3.4.9.5 Additional Information

30-Minute Operating Reserve Reduction Graphical Example:



NOTE: The above is a graphical representation of how a Market Participant's generator would be charged for 30-Minute Operating Reserve Reduction over an hour of time (from T0 - T4). Also, it is important to note that time between x-axis data points (i.e. between T1/T2, or T2/T3, etc.) are not at the ~5-min Security Constrained Dispatch (SCD) level, since these intervals can be any length of time.

[Upper Operating Limit (MW), Time T0]

- Generator is capable of producing above its total obligation. Therefore, 30-Minute Operating Reserve Reduction is not applicable, and Hr 30Min Reduct Stlmnt ($) = 0.

[Derate 1 (MW), Time T1]

- Generator's Upper Operating Limit (MW) has been derated to quantity Derate 1 (MW) at time T1. Since the generator is still available, and rated above its total obligation (MW), 30-Minute Operating Reserve Reduction is not applicable, and Hr 30Min Reduct Stlmnt ($) = 0.

[Derate 2 (MW), Time T2]

- Generator's Upper Operating Limit (MW) has been derated to quantity Derate 2 (MW) at time T2. Generator is now derated below its total obligation (MW).
    - Hr Sup 30 Mn Reduct - Op Limit (MW) would be calculated from T2 to T3.
    - Hr DAM 30 Mn Reduct - Op Limit (MW) would be calculated from T2 to T3 if Gen Upper Op Limit (MW) < Hr DAM 30 Min Reduct - Obligation (MW)

[Derate 3 (MW), Time T3]

- Generator is now unavailable at quantity Derate 3 (MW) and Time T3. Therefore, Hr 30 Mn Reduct - Unavail (MW) would be calculated from T3 to T4.

1.1.3.4.9.6 References

The applicability of 30-Minute Operating Reserve Reduction Charges is described within Schedule 4 of the MST (Market Administration and Control Area Services Tariff).

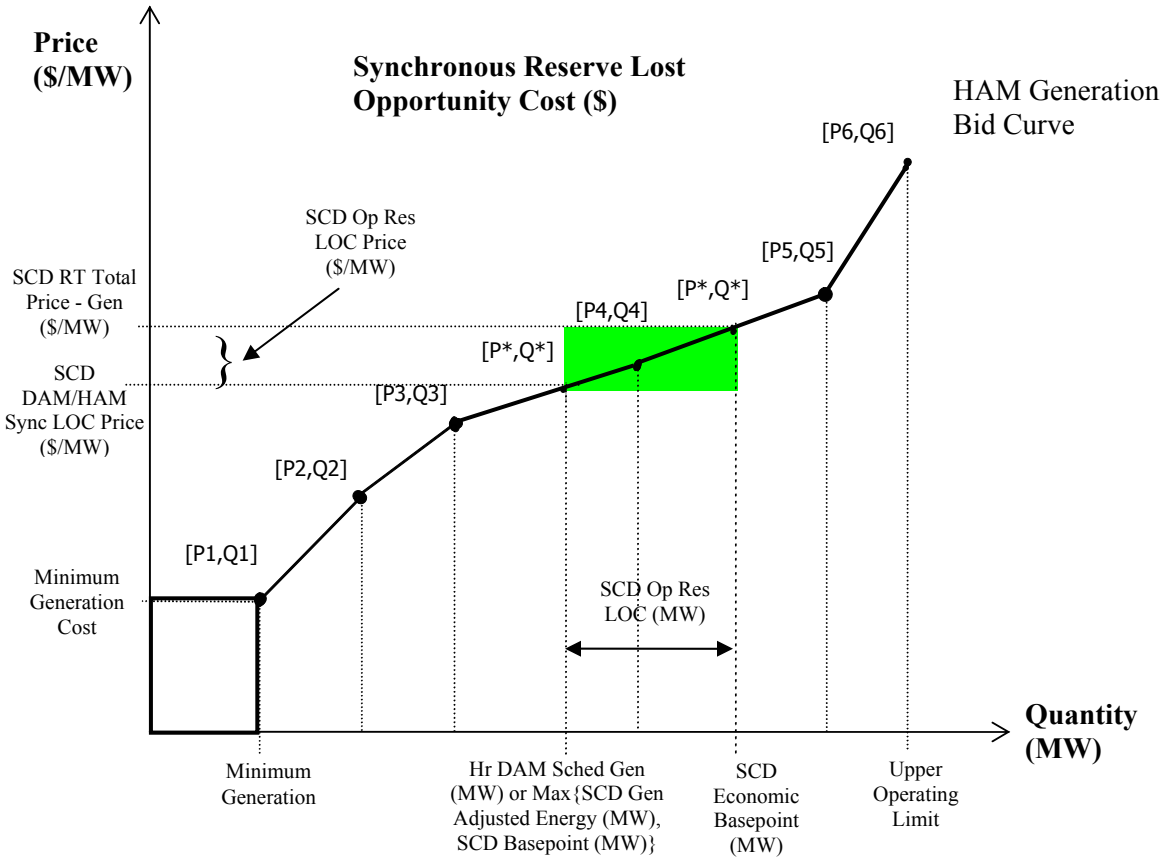
1.1.3.4.10 Synchronous Reserve Lost Opportunity Cost (Blocked Generators)

1.1.3.4.10.1 Description

The Synchronous Reserve Lost Opportunity Cost (LOC) for Blocked Generators settlement ($) is designed to provide generators with a payment (minus any required adjustment due to non-performance) to offset any lost revenue in the energy markets as a result of being blocked during the scheduling process. The settlement is intended for Power Suppliers who offer to provide Day Ahead Market (DAM) and/or Supplemental Synchronous (10 or 30-Minute) Reserve Service, and a portion of their economic energy schedule is reduced in order to provide such reserve service. In this scenario, the generator may be eligible for a lost opportunity cost payment.

This specific scenario occurs when NYISO dispatches a generator below its economic basepoint according to the Market Participant's Generation Bid curve. This settlement occurs at the Security Constrained Dispatch (SCD) dispatch interval (~5-minute) for each generator, blocked during scheduling, synchronous to the NYCA grid in order to provide Synchronous Reserve Service.

See the below graphical example:



The area highlighted in green represents the generator's SCD Op Res LOC Stlmnt ($). It represents the area between the generator's economic basepoint and its actual basepoint (or corresponding output level), and the difference in prices corresponding to the non-economic dispatch level.

1.1.3.4.10.2 Required Data Elements

1.1.3.4.10.2.1 Determinants

Bill Code	Title	Business Description	DSS Value
	Hr DAM Sched 10Sync Avail (MW)	Hourly Day Ahead Market Scheduled 10-Minute Synchronous Operating Reserves Availability (MW) is a number representing the amount of Day Ahead Market 10-Minute Synchronous Operating Reserves service the given generator is scheduled to provide for the given hour.	Y
	Hr HAM Sched 10SyncRes Avail (MW)	Hourly Hour Ahead Market Scheduled 10-Minute Synchronous Operating Reserves Availability (MW) is a number representing the amount of Hour Ahead Market 10-Minute Synchronous Operating Reserves service the given generator is scheduled to provide for the given hour.	Y
	Hr DAM Sched 30Min Avail (MW)	Hourly Day Ahead Market Scheduled 30-Minute Operating Reserves Availability (MW) 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.	Y
	Hr HAM Sched 30Min Avail (MW)	Hourly Hour Ahead Market Scheduled 30-Minute Operating Reserves Availability (MW) is a number representing the amount of Hour Ahead Market 30-Minute Operating Reserves Service the given generator is scheduled to provide for the given hour.	Y
	Gen Upper Op Limit (MW)	Generator Uper Operating Limit (MW) is a number indicating the maximum operating capacity for a generator during the given period.	Y
	SCD Op Res Avg Supply Perf Ratio	SCD Operating Reserves Average Supply Performance Ratio is a number representing the SCD-level operating reserves supply ratio for the given generator, for the given SCD-interval. It is a measure of how closely the generator followed Operating Reserve dispatch instructions.	Y
5220	Out of Merit Type Desc	Out of Merit Type Description represents the reason for an out of economic merit dispatch for the given generator and SCD interval	Y

Bill Code	Title	Business Description	DSS Value
	Out of Merit Type ID	SCD Out of Merit Type ID is a character that represents whether a given generator was dispatched out of merit.	Y
	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).	Y
	SCD Basepoint (MW)	Security Constrained 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.	Y
	SCD 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).	Y
	SCD Interval Seconds	SCD Interval Seconds is a number representing the number of seconds in the SCD interval.	Y
	SCD 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).	Y
	SCD 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).	Y
	SCD 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).	Y
	DAM Gen Bid Dispatch Seg - Block	Day Ahead Market Generation Bid Dispatch Segments - Block is a number representing the number of segments in the given DAM generation bid (block generation bid type).	Y
	DAM Gen Bid Dispatch Seg - Curve	Day Ahead Market Generation Bid Dispatch Segments - Curve is a number representing the number of segments in the given DAM generation bid (curve generation bid type).	Y

Bill Code	Title	Business Description	DSS Value
	Hr DAM Gen Bid -Gen 1 (MW)	Day Ahead Market Generator Bid Generation #1 is a number representing the amount of generation (MW) bid in the first block during the interval, submitted by the Generator in a generation bid.	Y
	Hr DAM Gen Bid -Gen 2 (MW)	Day Ahead Market Generator Bid Generation #2 is a number representing the amount of generation (MW) bid in the second block during the interval, submitted by the Generator in a generation bid.	Y
	Hr DAM Gen Bid -Gen 3 (MW)	Day Ahead Market Generator Bid Generation #3 is a number representing the amount of generation (MW) bid in the third block during the interval, submitted by the Generator in a generation bid.	Y
	Hr DAM Gen Bid -Gen 4 (MW)	Day Ahead Market Generator Bid Generation #4 is a number representing the amount of generation (MW) bid in the fourth block during the interval, submitted by the Generator in a generation bid.	Y
	Hr DAM Gen Bid -Gen 5 (MW)	Day Ahead Market Generator Bid Generation #5 is a number representing the amount of generation (MW) bid in the fifth block during the interval, submitted by the Generator in a generation bid.	Y
	Hr DAM Gen Bid -Gen 6 (MW)	Day Ahead Market Generator Bid Generation #6 is a number representing the amount of generation (MW) bid in the sixth block during the interval, submitted by the Generator in a generation bid.	Y
	Hr DAM Gen Bid -Price 1 ($/MW)	Day Ahead Market Generator Bid Price #1 is a number representing the bid price of generation ($/MW) bid in the first block during the interval, submitted by the Generator in a generation bid.	Y
	Hr DAM Gen Bid -Price 2 ($/MW)	Day Ahead Market Generator Bid Price #2 is a number representing the bid price of generation ($/MW) bid in the second block during the interval, submitted by the Generator in a generation bid.	Y
	Hr DAM Gen Bid -Price 3 ($/MW)	Day Ahead Market Generator Bid Price #3 is a number representing the bid price of generation ($/MW) bid in the third block during the interval, submitted by the Generator in a generation bid.	Y
	Hr DAM Gen Bid -Price 4 ($/MW)	Day Ahead Market Generator Bid Price #4 is a number representing the bid price of generation ($/MW) bid in the fourth block during the interval, submitted by the Generator in a generation bid.	Y
	Hr DAM Gen Bid -Price 5 ($/MW)	Day Ahead Market Generator Bid Price #5 is a number representing the bid price of generation ($/MW) bid in the fifth block during the interval,	Y

Bill Code	Title	Business Description	DSS Value
		submitted by the Generator in a generation bid.	
	Hr DAM Gen Bid -Price 6 ($/MW)	Day Ahead Market Generator Bid Price #6 is a number representing the bid price of generation ($/MW) bid in the sixth block during the interval, submitted by the Generator in a generation bid.	Y
	HAM Gen Bid Dispatch Seg - Block	Hour Ahead Market Generation Bid Dispatch Segments - Block is a number representing the number of segments in the given HAM generation bid (block generation bid type).	Y
	HAM Gen Bid Dispatch Seg - Curve	Hour Ahead Market Generation Bid Dispatch Segments - Curve is a number representing the number of segments in the given HAM generation bid (curve generation bid type).	Y
	Hr HAM Gen Bid -Gen 1 (MW)	Hour Ahead Market Generator Bid Generation #1 is a number representing the amount of generation (MW) bid in the first block during the interval, submitted by the Generator in a generation bid.	Y
	Hr HAM Gen Bid -Gen 2 (MW)	Hour Ahead Market Generator Bid Generation #2 is a number representing the amount of generation (MW) bid in the second block during the interval, submitted by the Generator in a generation bid.	Y
	Hr HAM Gen Bid -Gen 3 (MW)	Hour Ahead Market Generator Bid Generation #3 is a number representing the amount of generation (MW) bid in the third block during the interval, submitted by the Generator in a generation bid.	Y
	Hr HAM Gen Bid -Gen 4 (MW)	Hour Ahead Market Generator Bid Generation #4 is a number representing the amount of generation (MW) bid in the fourth block during the interval, submitted by the Generator in a generation bid.	Y
	Hr HAM Gen Bid -Gen 5 (MW)	Hour Ahead Market Generator Bid Generation #5 is a number representing the amount of generation (MW) bid in the fifth block during the interval, submitted by the Generator in a generation bid.	Y
	Hr HAM Gen Bid -Gen 6 (MW)	Hour Ahead Market Generator Bid Generation #6 is a number representing the amount of generation (MW) bid in the sixth block during the interval, submitted by the Generator in a generation bid.	Y
	Hr HAM Gen Bid -Price 1 ($/MW)	Hour Ahead Market Generator Bid Price #1 is a number representing the bid price of generation ($/MW) bid in the first block during the interval, submitted by the Generator in a generation bid.	Y

Bill Code	Title	Business Description	DSS Value
	Hr HAM Gen Bid -Price 2 ($/MW)	Hour Ahead Market Generator Bid Price #2 is a number representing the bid price of generation ($/MW) bid in the second block during the interval, submitted by the Generator in a generation bid.	Y
	Hr HAM Gen Bid -Price 3 ($/MW)	Hour Ahead Market Generator Bid Price #3 is a number representing the bid price of generation ($/MW) bid in the third block during the interval, submitted by the Generator in a generation bid.	Y
	Hr HAM Gen Bid -Price 4 ($/MW)	Hour Ahead Market Generator Bid Price #4 is a number representing the bid price of generation ($/MW) bid in the fourth block during the interval, submitted by the Generator in a generation bid.	Y
	Hr HAM Gen Bid -Price 5 ($/MW)	Hour Ahead Market Generator Bid Price #5 is a number representing the bid price of generation ($/MW) bid in the fifth block during the interval, submitted by the Generator in a generation bid.	Y
	Hr HAM Gen Bid -Price 6 ($/MW)	Hour Ahead Market Generator Bid Price #6 is a number representing the bid price of generation ($/MW) bid in the sixth block during the interval, submitted by the Generator in a generation bid.	Y

1.1.3.4.10.2.2 Intermediates

Bill Code	Title	Business Description	DSS Value
	Hr Sup Sched 10Sync Avail (MW)	Hourly Supplemental Scheduled 10-Minute Synchronous Operating Reserves Availability (MW) is a number representing the amount of Supplemental 10-Minute Synchronous Operating Reserves Service the given generator is scheduled to provide for the given hour. This is the net difference between HAM and DAM 10-Minute Synchronous Operating Reserves Availability (MW) values.	Y
	Hr Sup Sched 30Min Avail (MW)	Hourly Supplemental Scheduled 30-Minute Operating Reserves Availability (MW) is a number representing the amount of Supplemental 30-Minute Operating Reserves Service the given generator is scheduled to provide for the given hour. This is the net difference between HAM and DAM 30-Minute Operating Reserves Availability (MW) values.	Y

Bill Code	Title	Business Description	DSS Value
	SCD DAM Sync LOC Price ($/MW)	SCD DAM Sync LOC Price ($/MW) is a number representing the average cost of energy for the given generator using the Day-Ahead bid curve and the SCD Basepoint.	N
	SCD HAM Sync LOC Price ($/MW)	SCD HAM Sync LOC Price ($/MW) is a number representing the average cost of energy for the given generator using the Hour-Ahead bid curve and the SCD Basepoint.	N
	SCD RT Total Price - Gen ($/MW)	Real-Time Total Price ($/MW) is a number representing the total LBMP price of a generator bus.	Y
	SCD Op Res LOC Price ($/MW)	SCD Operating Reserves Lost Opportunity Costs Price ($/MW) is a number representing the price for Operating Reserves Lost Opportunity Costs per megawatt for the given generator, for the given SCD-interval.	Y
	SCD Economic Basepoint (MW)	SCD Economic Basepoint (MW) is a number representing the dispatch basepoint at which a generator would be economically dispatched. This dispatch value does not include any adjustments due to system reliability and/or constraints (out of merit).	Y
	SCD Op Res LOC (MW)	SCD Operating Reserves Lost Opportunity Costs (MW) is a number representing the quantity (in MW) of Operating Reserves Lost Opportunity the given generator had due to being backed down off of its economic dispatch point or blocked from being scheduled to provide market energy in order to provide operating reserves for the given SCD-interval.	Y
	SCD Op Res LOC Credit ($)	SCD Operating Reserves Lost Opportunity Costs Credit ($) is a number representing the credit amount for Operating Reserves Lost Opportunity Costs, unadjusted for supply performance, for the given generator, for the given SCD-interval; due to being backed down off of its economic dispatch point or blocked from being scheduled to provide market energy in order to provide operating reserves service.	Y

1.1.3.4.10.2.3 Results

Bill Code	Title	Business Description	DSS Value

Bill Code	Title	Business Description	DSS Value
	SCD Op Res LOC Stlmnt ($)	SCD Operating Reserves Lost Opportunity Costs Settlement ($) is a number representing the settlement amount for Operating Reserves Lost Opportunity Costs, adjusted for supply performance, for the given generator, for the given SCD-interval; due to either being backed down off of its economic dispatch point or blocked from being scheduled to provide market energy in order to provide operating reserves service.	Y

1.1.3.4.10.3 Eligibility

Generators will receive a payment for Synchronous Reserve Lost Opportunity Cost ($) if all of the following conditions exist:

- The generator is not under-generating in the given interval:

  SCD Gen Adjusted Energy (MW) >= SCD Basepoint (MW)

- The generator is scheduled in the DAM and/or Supplemental Synchronous (10 or 30-Minute) Reserve Market in the given interval:

  (Hr DAM Sched 10Sync Avail (MW) + Hr Sup Sched 10Sync Avail (MW) + Hr DAM Sched 30Min Avail (MW) + Hr Sup Sched 30Min Avail (MW)) > 0

- The generator is dispatched in the energy markets at its highest possible output level, defined as its upper operating limit minus its total Synchronous (10 or 30-Minute) Reserve schedule:

  SCD Basepoint (MW) = Gen Upper Op Limit (MW) - {Hr DAM Sched 10Sync Avail (MW) + Hr Sup Sched 10Sync Avail (MW) + Hr DAM Sched 30Min Avail (MW) + Hr Sup Sched 30Min Avail (MW)}

- The quantity of Synchronous Reserve Lost Opportunity Cost (MW) blocked in the scheduling process is greater than zero.

  SCD Op Res LOC (MW) > 0

1.1.3.4.10.4 Algorithm

SCD Op Res LOC Stlmnt ($) is calculated as:

SCD Op Res LOC Stlmnt ($) = SCD Op Res LOC Credit ($) * SCD Op Res Avg Supply Perf Ratio

SCD Op Res LOC Credit ($) = SCD Op Res LOC (MW) * SCD Op Res LOC Price ($/MW) * {SCD Interval Seconds ÷ 3,600 Seconds}

Where SCD Op Res LOC (MW) is calculated as:

If generator is Out of Merit for the following reasons: COMMITED FOR ISO RELIABILITY, OOM FOR TO LOCAL SECURITY, COMMITED FOR ISO RESERVES, or OOM FOR ISO SECURITY.

SCD Op Res LOC (MW) = SCD Economic Basepoint (MW) - Hr DAM Sched Gen (MW)

Else:

SCD Op Res LOC (MW) = SCD Economic Basepoint (MW) - Max{SCD Gen Adjusted Energy (MW), SCD Basepoint (MW)}

Where SCD Economic Basepoint (MW) is calculated as:

SCD Economic Basepoint (MW) is the projected economic energy output level (MW) on the generator's HAM Generation Bid corresponding to the SCD RT Total Price - Gen ($/MW) for the given generator, for the given interval.

Please see Appendix A, Figure 1.2 for more information on how to determine the generation output level (MW) on a given Generation Bid curve corresponding to a specific price ($/MW).

And SCD Op Res LOC Price ($/MW) is calculated as:

SCD Op Res LOC Price ($/MW) = SCD RT Total Price - Gen ($/MW) - Max{SCD DAM Sync LOC Price ($/MW), SCD HAM Sync LOC Price ($/MW)}

Where SCD DAM Sync LOC Price ($/MW) and SCD HAM Sync LOC Price ($/MW) are calculated as:

3. SCD DAM Sync LOC Price ($/MW) is the price on the generator's DAM Generation Bid curve corresponding to their SCD Basepoint (MW) for the given generator, for the given interval., and
4. SCD HAM Sync LOC Price ($/MW) is the price on the generator's HAM Generation Bid curve corresponding to their SCD Basepoint (MW) for the given generator, for the given interval.

Please see Appendix A, Figure 1.1 for more information on how to determine the price ($/MW) on a given Generation Bid curve corresponding to a specific generation output level (MW).

1.1.3.4.10.5 Additional Information

SCD Op Res LOC (MWh) can also be calculated as:

SCD Op Res LOC (MWh) =

SCD Op Res LOC (MW) * {SCD Interval Seconds ÷ 3,600 seconds}

1.1.3.4.10.6 References

The applicability of Synchronous Reserve Lost Opportunity Cost Payments is described within Schedule 4 of the MST (Market Administration and Control Area Services Tariff).

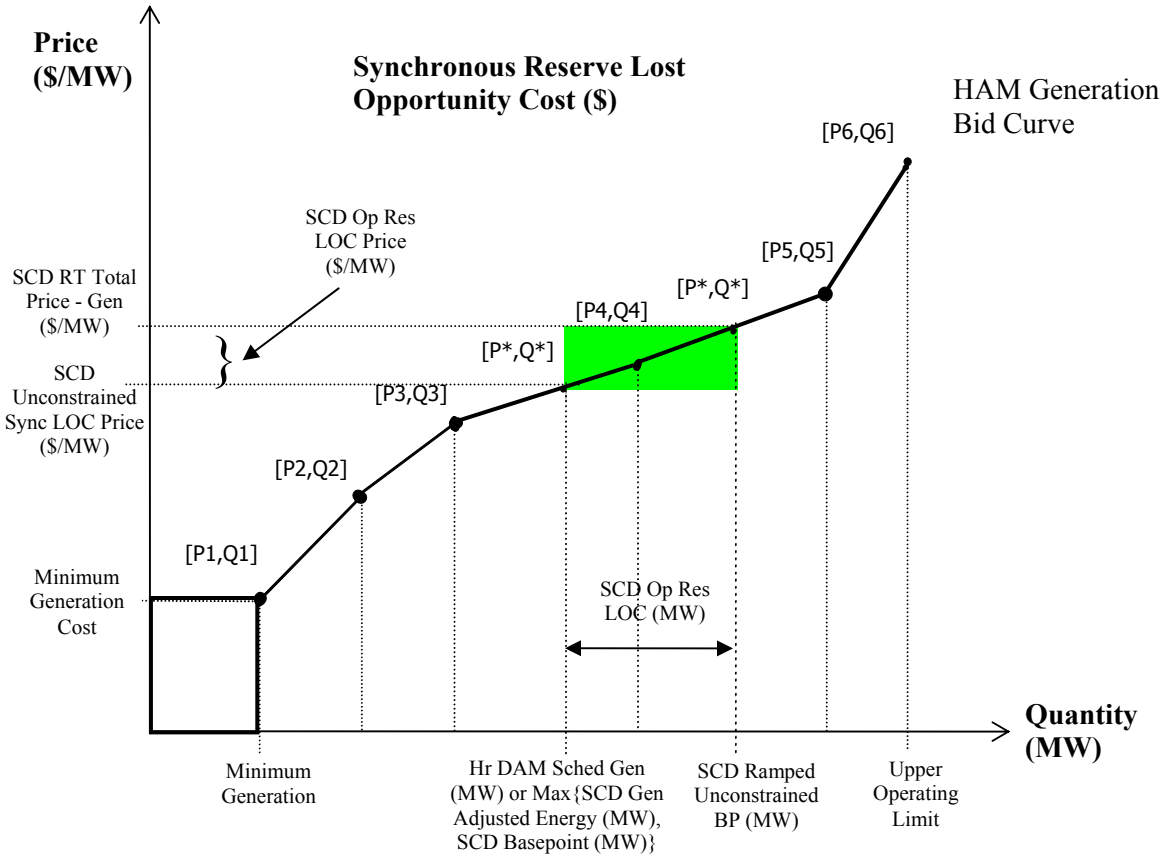
1.1.3.4.11 Synchronous Reserve Lost Opportunity Cost (Backed-Down Generators)

1.1.3.4.11.1 Description

The Synchronous Reserve Lost Opportunity Cost (LOC) for Backed-Down Generators settlement ($) is designed to provide generators with a payment (minus any required adjustment due to non-performance) to offset any lost revenue in the energy markets as a result of being backed down in real-time. The settlement is intended for Power Suppliers who offer to provide Day Ahead Market (DAM) and/or Supplemental Synchronous (10 or 30-Minute) Reserve Service, but then in real-time, NYISO reduced a portion of their economic energy schedule in order to provide un-scheduled reserve service. In this scenario, the generator may be eligible for a lost opportunity cost payment.

This settlement occurs at the Security Constrained Dispatch (SCD) dispatch interval (~5-minute) for each generator, running in real-time on the NYCA grid, but backed down in order to provide Synchronous Reserve Service.

See the below graphical example:



The area highlighted in green represents the generator's SCD Op Res LOC Stlmnt ($). It represents the area between the generator's economic basepoint and its actual basepoint (or corresponding output level), and the difference in prices corresponding to the non-economic dispatch level.

1.1.3.4.11.2 Required Data Elements

1.1.3.4.11.2.1 Determinants

Bill Code		Business Description	DSS Value
5220	Out of Merit Type Desc	Out of Merit Type Description represents the reason for an out of economic merit dispatch for the given generator and SCD interval	Y
	Out of Merit Type ID	SCD Out of Merit Type ID is a character that represents whether a given generator was dispatched out of merit.	Y
	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).	Y
	SCD Basepoint (MW)	Security Constrained 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.	Y
	SCD 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).	Y
	SCD Last SCD Basepoint (MW)	SCD Last SCD Basepoint (MW) is a number representing the SCD basepoint for the SCD-interval that is previous to the given SCD-interval, for the given generator.	Y
	SCD Unconstrained BP (MW)	SCD Unconstrained Basepoint (MW) is a number representing the unconstrained basepoint for the given SCD-interval, for the given generator.	Y
	SCD Interval Seconds	SCD Interval Seconds is a number representing the number of seconds in the SCD interval.	Y
	SCD 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).	Y
	SCD 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).	Y
	SCD RT Cong Price - Gen ($/MW)	Real-Time Congestion Price ($/MW) is a number representing the price of congestion at a generator	Y

Bill Code	Title	Business Description	DSS Value
		bus (LBMP congestion component).	
	SCD Op Res Avg Supply Perf Ratio	SCD Operating Reserves Average Supply Performance Ratio is a number representing the SCD-level operating reserves supply ratio for the given generator, for the given SCD-interval. It is a measure of how closely the generator followed Operating Reserve dispatch instructions.	Y
	HAM Gen Bid Dispatch Seg - Block	Hour Ahead Market Generation Bid Dispatch Segments - Block is a number representing the number of segments in the given HAM generation bid (block generation bid type).	Y
	HAM Gen Bid Dispatch Seg - Curve	Hour Ahead Market Generation Bid Dispatch Segments - Curve is a number representing the number of segments in the given HAM generation bid (curve generation bid type).	Y
	Hr HAM Gen Bid -Gen 1 (MW)	Hour Ahead Market Generator Bid Generation #1 is a number representing the amount of generation (MW) bid in the first block during the interval, submitted by the Generator in a generation bid.	Y
	Hr HAM Gen Bid -Gen 2 (MW)	Hour Ahead Market Generator Bid Generation #2 is a number representing the amount of generation (MW) bid in the second block during the interval, submitted by the Generator in a generation bid.	Y
	Hr HAM Gen Bid -Gen 3 (MW)	Hour Ahead Market Generator Bid Generation #3 is a number representing the amount of generation (MW) bid in the third block during the interval, submitted by the Generator in a generation bid.	Y
	Hr HAM Gen Bid -Gen 4 (MW)	Hour Ahead Market Generator Bid Generation #4 is a number representing the amount of generation (MW) bid in the fourth block during the interval, submitted by the Generator in a generation bid.	Y
	Hr HAM Gen Bid -Gen 5 (MW)	Hour Ahead Market Generator Bid Generation #5 is a number representing the amount of generation (MW) bid in the fifth block during the interval, submitted by the Generator in a generation bid.	Y
	Hr HAM Gen Bid -Gen 6 (MW)	Hour Ahead Market Generator Bid Generation #6 is a number representing the amount of generation (MW) bid in the sixth block during the interval, submitted by the Generator in a generation bid.	Y
	Hr HAM Gen Bid -Price 1 ($/MW)	Hour Ahead Market Generator Bid Price #1 is a number representing the bid price of generation ($/MW) bid in the first block during the interval,	Y

Bill Code	Title	Business Description	DSS Value
		submitted by the Generator in a generation bid.	
	Hr HAM Gen Bid -Price 2 ($/MW)	Hour Ahead Market Generator Bid Price #2 is a number representing the bid price of generation ($/MW) bid in the second block during the interval, submitted by the Generator in a generation bid.	Y
	Hr HAM Gen Bid -Price 3 ($/MW)	Hour Ahead Market Generator Bid Price #3 is a number representing the bid price of generation ($/MW) bid in the third block during the interval, submitted by the Generator in a generation bid.	Y
	Hr HAM Gen Bid -Price 4 ($/MW)	Hour Ahead Market Generator Bid Price #4 is a number representing the bid price of generation ($/MW) bid in the fourth block during the interval, submitted by the Generator in a generation bid.	Y
	Hr HAM Gen Bid -Price 5 ($/MW)	Hour Ahead Market Generator Bid Price #5 is a number representing the bid price of generation ($/MW) bid in the fifth block during the interval, submitted by the Generator in a generation bid.	Y
	Hr HAM Gen Bid -Price 6 ($/MW)	Hour Ahead Market Generator Bid Price #6 is a number representing the bid price of generation ($/MW) bid in the sixth block during the interval, submitted by the Generator in a generation bid.	Y

1.1.3.4.11.2.2 Intermediates

Bill Code	Title	Business Description	DSS Value
	SCD Op Res LOC (MW)	SCD Operating Reserves Lost Opportunity Costs (MW) is a number representing the quantity (in MW) of Operating Reserves Lost Opportunity the given generator had due to being backed down off of its economic dispatch point or blocked from being scheduled to provide market energy in order to provide operating reserves for the given SCD-interval.	Y
	SCD Ramped Unconstrained BP (MW)	SCD Ramped Unconstrained Basepoint (MW) is a number representing the ramped unconstrained basepoint for the given generator, for the given SCD-interval.	Y
	SCD Op Res LOC Price ($/MW)	SCD Operating Reserves Lost Opportunity Costs Price ($/MW) is a number representing the price for Operating Reserves Lost Opportunity Costs per megawatt for the given generator, for the given	Y

Bill Code	Title	Business Description	DSS Value
		SCD-interval.	
	SCD RT Total Price - Gen ($/MW)	Real-Time Total Price ($/MW) is a number representing the total LBMP price of a generator bus.	Y
	SCD Unconstrained Sync LOC Price ($/MW)	SCD Unconstrained Sync LOC Price ($/MW) is the price on the generator's HAM bid curve corresponding to their SCD Ramped Unconstrained BP (MW).	Y
	SCD Marg Op Res LOC Price ($/MW)	SCD Marginal Operating Reserves Lost Opportunity Costs Price ($/MW) is a number representing the maximum price for Operating Reserves Lost Opportunity Costs per megawatt across all generators in the given SCD-interval.	N
	SCD Op Res LOC Credit ($)	SCD Operating Reserves Lost Opportunity Costs Credit ($) is a number representing the credit amount for Operating Reserves Lost Opportunity Costs, unadjusted for supply performance, for the given generator, for the given SCD-interval; due to being backed down off of its economic dispatch point or blocked from being scheduled to provide market energy in order to provide operating reserves service.	Y

1.1.3.4.11.2.3 Results

Bill Code	Title	Business Description	DSS Value
	SCD Op Res LOC Stlmnt ($)	SCD Operating Reserves Lost Opportunity Costs Settlement ($) is a number representing the settlement amount for Operating Reserves Lost Opportunity Costs, adjusted for supply performance, for the given generator, for the given SCD-interval; due to either being backed down off of its economic dispatch point or blocked from being scheduled to provide market energy in order to provide operating reserves service.	Y

1.1.3.4.11.3 Eligibility

Generators will receive a payment for Synchronous Reserve Lost Opportunity Cost for Backed Down Generators ($) if all of the following conditions exist:

- The actual adjusted generator energy output is less than the unconstrained basepoint for the given SCD-interval, for the given generator.

SCD Gen Adjusted Energy (MW) < SCD Unconstrained BP (MW)

- The quantity of 10-Minute Synchronous Reserve Lost Opportunity Cost (MW) backed down in real-time is greater than zero.

  SCD Op Res LOC (MW) > 0

1.1.3.4.11.4 Algorithm

SCD Op Res LOC Stlmnt ($) is calculated as:

SCD Op Res LOC Stlmnt ($) = SCD Op Res LOC Credit ($) * SCD Op Res Avg Supply Perf Ratio

SCD Op Res LOC Credit ($) = SCD Op Res LOC (MW) * SCD Op Res LOC Price ($/MW) * {SCD Interval Seconds ÷ 3,600 Seconds}

NOTE: Prior to 11/08/2000, this settlement was determined using the marginal (maximum across all generators in the interval) SCD Op Res LOC Price ($/MW), vs. using each individual generator's SCD Op Res LOC Price ($/MW). Therefore:

SCD Op Res LOC Credit ($) = SCD Op Res LOC (MW) * SCD Marg Op Res LOC Price ($/MW) * {SCD Interval Seconds ÷ 3,600 Seconds}

Where SCD Marg Op Res LOC Price ($/MW) is calculated as:

SCD Marg Op Res LOC Price ($/MW) is the maximum SCD Op Res LOC Price ($/MW) across all generators in the interval.

Where SCD Op Res LOC (MW) is calculated as:

If generator is Out of Merit for the following reasons: COMMITED FOR ISO RELIABILITY, OOM FOR TO LOCAL SECURITY, COMMITED FOR ISO RESERVES, or OOM FOR ISO SECURITY.

SCD Op Res LOC (MW) =

SCD Ramped Unconstrained BP (MW) - Hr DAM Sched Gen (MW)

Else:

SCD Op Res LOC (MW) =

SCD Ramped Unconstrained BP (MW) - Max{SCD Gen Adjusted Energy (MW), SCD Basepoint (MW)}

SCD Ramped Unconstrained BP (MW) is calculated as:

If the current SCD dispatch interval is > 5 minutes in length (SCD Interval Seconds > 300 Seconds):

SCD Ramped Unconstrained BP (MW) =

{SCD Unconstrained BP (MW) + SCD Last SCD Basepoint (MW)} ÷ 2} * {300 Seconds ÷ SCD Interval Seconds} +

{SCD Unconstrained BP (MW) * {{SCD Interval Seconds - 300 Seconds} ÷ SCD Interval Seconds}

Else:

SCD Ramped Unconstrained BP (MW) =

SCD Last SCD Basepoint (MW) +

{{SCD Unconstrained BP (MW) - SCD Last SCD Basepoint (MW)} ÷ 2} * {SCD Interval Seconds ÷ 300 Seconds}

And SCD Op Res LOC Price ($/MW) is calculated as:

SCD Op Res LOC Price ($/MW) =

SCD RT Total Price - Gen ($/MW) - SCD Unconstrained Sync LOC Price ($/MW)

Where SCD Unconstrained Sync LOC Price ($/MW) is calculated as:

SCD Unconstrained Sync LOC Price ($/MW) is the price ($/MW) on the generator's HAM Generation Bid curve corresponding to their SCD Ramped Unconstrained BP (MW) for the given generator, for the given interval.

Please see Appendix A, Figure 1.1 for more information on how to determine the price ($/MW) on a given Generation Bid curve corresponding to a specific generation output level (MW).

1.1.3.4.11.5 Additional Information

SCD Op Res LOC (MWh) can also be calculated as:

SCD Op Res LOC (MWh) =

SCD Op Res LOC (MW) * {SCD Interval Seconds ÷ 3,600 seconds}

1.1.3.4.11.6 References

The applicability of Synchronous Reserve Lost Opportunity Cost Payments is described within Schedule 4 of the MST (Market Administration and Control Area Services Tariff).

1.1.3.4.12 10-Minute Non-Synchronous Reserve Lost Opportunity Cost (LOC)

1.1.3.4.12.1 Description

The 10-Minute Non-Synchronous Lost Opportunity Cost (LOC) settlement is a LOC payment to a Power Supplier to help recover the revenue lost due to not selling energy into the Day-Ahead or Balancing Energy Markets. The 10-Minute Non-Synchronous Lost Opportunity Cost (LOC) settlement ($) is intended for Power Suppliers who's generators are prevented (by NYISO) from participating in the NYISO energy markets (Day-Ahead or Balancing Energy Markets) in order to be held for participation in NYISO's 10-Minute Non-Synchronous Operating Reserve Market.

The LOC payment is the amount of energy bid production cost bid by the generator for the given interval, including minimum generation costs and the incremental costs up to the expected basepoint

where the generator would have been economically dispatched. This settlement occurs hourly (Day-Ahead Market only) or at the Security Constrained Dispatch (SCD) dispatch interval (~5-minute) for each generator held non-synchronous to the power grid in order to participate in the NYISO 10-Minute Non-Synchronous Operating Reserve Market.

There is one main scenario which causes 10-Minute Non-Synchronous Lost Opportunity Cost:

1. A result of the generator not being dispatched in the energy markets (SCD Basepoint <=0) and the generator is scheduled for 10-Minute Non-Synchronous Reserve (MW) (DAM and Supplemental 10-Minute Non-Synchronous Reserve Availability (MW) total to be > 0).

1.1.3.4.12.2 Required Data Elements

1.1.3.4.12.2.1 Determinants

Bill Code	Title	Business Description	DSS Value
	DAM Energy Price - Gen ($/MW)	Day Ahead Market Energy Price - Generator ($/MW) is a number representing the price of energy at a generator bus (LBMP energy component)	Y
	DAM Loss Price - Gen ($/MW)	Day Ahead Market Loss Price - Generator ($/MW) is a number representing the price of losses at a generator bus (LBMP loss component)	Y
	DAM Cong Price - Gen ($/MW)	Day Ahead Market Congestion Price - Generator ($/MW) is a number representing the price of congestion at a generator bus (LBMP congestion component)	Y
	SCD 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)	Y
	SCD 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)	Y
	SCD 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)	Y
	Gen Upper Op Limit (MW)	Generator Uper Operating Limit (MW) is a number indicating the maximum operating capacity for a generator during the given period.	Y
	SCD Basepoint (MW)	Security Constrained 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	Y
	Hr DAM Sched 10NSync Avail (MW)	Hourly Day Ahead Market Scheduled 10-Minute Non-Synchronous Operating Reserves Availability	Y

Bill Code	Title	Business Description	DSS Value
		(MW) 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 HAM Sched 10NSync Avail (MW)	Hourly Hour Ahead Market Scheduled 10-Minute Non-Synchronous Operating Reserves Availability (MW) is a number representing the amount of Hour Ahead Market 10-Minute Non-Synchronous Operating Reserves Service the given generator is scheduled to provide for the given hour.	Y
	Hr Max Unused 10NSync Avail (MW)	Hourly Maximum Unused 10-Minute Non-Synchronous Operating Reserves Availability (MW) is a number representing the maximum unused 10-Minute Non-Synchronous Operating Reserves Availability (MW) for the given hour.	Y
	SCD Op Res Avg Supply Perf Ratio	SCD Operating Reserves Average Supply Performance Ratio is a number representing the SCD-level operating reserves supply ratio for the given generator, for the given SCD-interval. It is a measure of how closely the generator followed Operating Reserve dispatch instructions.	Y
	SCD Interval Seconds	SCD Interval Seconds is a number representing the number of seconds in the SCD interval	Y
	DAM Gen Bid Dispatch Seg - Curve	Day Ahead Market Generation Bid Dispatch Segments - Curve is a number representing the number of segments in the given DAM generation bid (curve generation bid type).	Y
	DAM Gen Bid Dispatch Seg - Block	Day Ahead Market Generation Bid Dispatch Segments - Block is a number representing the number of segments in the given DAM generation bid (block generation bid type).	Y
	Hr DAM Gen Bid -Price 1 ($/MW)	Day Ahead Market Generator Bid Price #1 is a number representing the bid price of generation ($/MW) bid in the first block during the interval, submitted by the Generator in a generation bid.	Y
	Hr DAM Gen Bid -Price 2 ($/MW)	Day Ahead Market Generator Bid Price #2 is a number representing the bid price of generation ($/MW) bid in the second block during the interval, submitted by the Generator in a generation bid.	Y
	Hr DAM Gen Bid -Price 3 ($/MW)	Day Ahead Market Generator Bid Price #3 is a number representing the bid price of generation ($/MW) bid in the third block during the interval, submitted by the Generator in a generation bid.	Y

Bill Code	Title	Business Description	DSS Value
	Hr DAM Gen Bid -Price 4 ($/MW)	Day Ahead Market Generator Bid Price #4 is a number representing the bid price of generation ($/MW) bid in the fourth block during the interval, submitted by the Generator in a generation bid.	Y
	Hr DAM Gen Bid -Price 5 ($/MW)	Day Ahead Market Generator Bid Price #5 is a number representing the bid price of generation ($/MW) bid in the fifth block during the interval, submitted by the Generator in a generation bid.	Y
	Hr DAM Gen Bid -Price 6 ($/MW)	Day Ahead Market Generator Bid Price #6 is a number representing the bid price of generation ($/MW) bid in the sixth block during the interval, submitted by the Generator in a generation bid.	Y
	Hr DAM Gen Bid -Gen 1 (MW)	Day Ahead Market Generator Bid Generation #1 is a number representing the amount of generation (MW) bid in the first block during the interval, submitted by the Generator in a generation bid.	Y
	Hr DAM Gen Bid -Gen 2 (MW)	Day Ahead Market Generator Bid Generation #2 is a number representing the amount of generation (MW) bid in the second block during the interval, submitted by the Generator in a generation bid.	Y
	Hr DAM Gen Bid -Gen 3 (MW)	Day Ahead Market Generator Bid Generation #3 is a number representing the amount of generation (MW) bid in the third block during the interval, submitted by the Generator in a generation bid.	Y
	Hr DAM Gen Bid -Gen 4 (MW)	Day Ahead Market Generator Bid Generation #4 is a number representing the amount of generation (MW) bid in the fourth block during the interval, submitted by the Generator in a generation bid.	Y
	Hr DAM Gen Bid -Gen 5 (MW)	Day Ahead Market Generator Bid Generation #5 is a number representing the amount of generation (MW) bid in the fifth block during the interval, submitted by the Generator in a generation bid.	Y
	Hr DAM Gen Bid -Gen 6 (MW)	Day Ahead Market Generator Bid Generation #6 is a number representing the amount of generation (MW) bid in the sixth block during the interval, submitted by the Generator in a generation bid.	Y
	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.	Y
	HAM Gen Bid Dispatch Seg - Curve	Hour Ahead Market Generation Bid Dispatch Segments - Curve is a number representing the number of segments in the given HAM generation	Y

Bill Code	Title	Business Description	DSS Value
		bid (curve generation bid type).	
	HAM Gen Bid Dispatch Seg - Block	Hour Ahead Market Generation Bid Dispatch Segments - Block is a number representing the number of segments in the given HAM generation bid (block generation bid type).	Y
	Hr HAM Gen Bid -Price 1 ($/MW)	Hour Ahead Market Generator Bid Price #1 is a number representing the bid price of generation ($/MW) bid in the first block during the interval, submitted by the Generator in a generation bid.	Y
	Hr HAM Gen Bid -Price 2 ($/MW)	Hour Ahead Market Generator Bid Price #2 is a number representing the bid price of generation ($/MW) bid in the second block during the interval, submitted by the Generator in a generation bid.	Y
	Hr HAM Gen Bid -Price 3 ($/MW)	Hour Ahead Market Generator Bid Price #3 is a number representing the bid price of generation ($/MW) bid in the third block during the interval, submitted by the Generator in a generation bid.	Y
	Hr HAM Gen Bid -Price 4 ($/MW)	Hour Ahead Market Generator Bid Price #4 is a number representing the bid price of generation ($/MW) bid in the fourth block during the interval, submitted by the Generator in a generation bid.	Y
	Hr HAM Gen Bid -Price 5 ($/MW)	Hour Ahead Market Generator Bid Price #5 is a number representing the bid price of generation ($/MW) bid in the fifth block during the interval, submitted by the Generator in a generation bid.	Y
	Hr HAM Gen Bid -Price 6 ($/MW)	Hour Ahead Market Generator Bid Price #6 is a number representing the bid price of generation ($/MW) bid in the sixth block during the interval, submitted by the Generator in a generation bid.	Y
	Hr HAM Gen Bid -Gen 1 (MW)	Hour Ahead Market Generator Bid Generation #1 is a number representing the amount of generation (MW) bid in the first block during the interval, submitted by the Generator in a generation bid.	Y
	Hr HAM Gen Bid -Gen 2 (MW)	Hour Ahead Market Generator Bid Generation #2 is a number representing the amount of generation (MW) bid in the second block during the interval, submitted by the Generator in a generation bid.	Y
	Hr HAM Gen Bid -Gen 3 (MW)	Hour Ahead Market Generator Bid Generation #3 is a number representing the amount of generation (MW) bid in the third block during the interval, submitted by the Generator in a generation bid.	Y

Bill Code	Title	Business Description	DSS Value
	Hr HAM Gen Bid -Gen 4 (MW)	Hour Ahead Market Generator Bid Generation #4 is a number representing the amount of generation (MW) bid in the fourth block during the interval, submitted by the Generator in a generation bid.	Y
	Hr HAM Gen Bid -Gen 5 (MW)	Hour Ahead Market Generator Bid Generation #5 is a number representing the amount of generation (MW) bid in the fifth block during the interval, submitted by the Generator in a generation bid.	Y
	Hr HAM Gen Bid -Gen 6 (MW)	Hour Ahead Market Generator Bid Generation #6 is a number representing the amount of generation (MW) bid in the sixth block during the interval, submitted by the Generator in a generation bid.	Y
	Hr HAM Gen Bid -Min Gen (MW)	Hour 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.	Y

1.1.3.4.12.2.2 Intermediates

Bill Code	Title	Business Description	DSS Value
	Hr Sup Sched 10NSync Avail (MW)	Hourly Supplemental Scheduled 10-Minute Non-Synchronous Operating Reserves Availability (MW) is a number representing the amount of Supplemental 10-Minute Non-Synchronous Operating Reserves Service the given generator is scheduled to provide for the given hour. This is the net difference between HAM and DAM 10-Minute Non-Synchronous Operating Reserves Availability (MW) values.	Y
203	DAM Total Price - Gen ($/MW)	Day Ahead Market Total Price - Generator ($/MW) is a number that represents the total DAM LBMP price at a generator bus.	Y
	SCD RT Total Price - Gen ($/MW)	Real-Time Total Price ($/MW) is a number representing the total LBMP price of a generator bus	Y
	Hr DAM 10NSync LOC Cred ($)	Hourly Day Ahead Market 10-Minute Non-Synchronous Reserves Lost Opportunity Cost Credit ($) is a number representing the Day Ahead Market 10-Minute Non-Synchronous Lost Opportunity Cost Service Credit, unadjusted for supply performance, for the given generator, for the given SCD-interval.	Y

Bill Code	Title	Business Description	DSS Value
	Hr DAM 10NSync LOC (MW)	Hourly Day Ahead Market 10-Minute Non-Synchronous Reserves Lost Opportunity Cost (MW) is a number representing the amount of Day Ahead Market 10-Minute Non-Synchronous Lost Opportunity Cost MWs the given generator had for the given SCD-interval.	Y
	Hr DAM 10NSync LOC Price ($/MW)	Hourly Day Ahead Market 10-Minute Non-Synchronous Reserves Lost Opportunity Cost Price ($/MW) is a number representing the price of Day Ahead Market 10-Minute Non-Synchronous Lost Opportunity Cost service for the given SCD-interval.	Y
	SCD BalMkt 10NSync LOC Cred ($)	SCD Balancing Market 10-Minute Non-Synchronous Reserves Lost Opportunity Cost Credit ($) is a number representing the Balancing Market 10-Minute Non-Synchronous Lost Opportunity Cost Service Credit, unadjusted for supply performance, for the given generator, for the given SCD-interval.	Y
	SCD BalMkt 10NSync LOC (MW)	SCD Balancing Market 10-Minute Non-Synchronous Reserves Lost Opportunity Cost (MW) is a number representing the amount of Balancing Market 10-Minute Non-Synchronous Lost Opportunity Cost MWs the given generator had for the given SCD-interval.	Y
	SCD RT 10NSync LOC Price ($/MW)	SCD Real-Time 10-Minute Non-Synchronous Reserves Lost Opportunity Cost Market Clearing Price ($/MW) is a number representing the price of Real-Time 10-Minute Non-Synchronous Lost Opportunity Cost Service for the given generator, for the given SCD-interval.	Y
	SCD Adj 10NSync LOC Cred ($)	SCD Adjusted 10-Minute Non-Synchronous Operating Reserves Lost Opportunity Cost Credit ($) is a number representing the 10-Minute Non-Synchronous Operating Reserves Lost Opportunity Cost Credit, adjusted for usage, but unadjusted for supply performance, for the given generator, for the given SCD-interval.	Y
	SCD Unadj 10NSync LOC Cred ($)	SCD Unadjusted 10-Minute Non-Synchronous Reserves Lost Opportunity Cost Credit ($) is a number representing the 10-Minute Non-Synchronous Lost Opportunity Cost Service Credit, unadjusted for supply performance, for the given generator, for the given SCD-interval.	Y

Bill Code	Title	Business Description	DSS Value
	SCD 10NSync LOC (MW)	SCD 10 Minute Non-Synchronous Reserves Lost Opportunity Cost (MW) is a number representing the amount of 10-Minute Non-Synchronous Lost Opportunity Cost MWs the given generator had for the given SCD-interval.	Y
	SCD 10NonSync LOC Scale Factor	SCD 10 Minute Non-Synchronous Operating Reserves Lost Opportunity Cost Scale Factor is a number representing the scale factor used to determine 10 Minute Non-Synchronous Lost Opportunity Cost credits.	N
	SCD Unused 10NonSync (MW)	SCD Unused 10 Minute Non-Synchronous Operating Reserves is a number representing the amount of 10 Minute Non-Synchronous Operating Reserves that was not used during the interval, for the given generator.	N

1.1.3.4.12.2.3 Results

Bill Code	Title	Business Description	DSS Value
	SCD Adj 10NSync LOC Stlmnt ($)	SCD Adjusted 10-Minute Non-Synchronous Operating Reserves Lost Opportunity Cost Settlement ($) is a number representing the 10-Minute Non-Synchronous Operating Reserves Lost Opportunity Cost, adjusted for usage and supply performance, for the given generator, for the given SCD-interval.	Y

1.1.3.4.12.3 Eligibility

Generators will receive a payment for 10-Minute Non-Synchronous Reserve Lost Opportunity Cost ($) if all of the following conditions exist:

- The generator is non-synchronous to the grid (SCD Basepoint (MW) <= 0).
- The generator has been scheduled in either the DAM or HAM 10-Minute Synchronous Reserve Markets (Hr DAM Sched 10NSync Avail (MW) and/or Hr HAM Sched 10NSync Avail (MW) > 0).

The following are scenarios for which 10-Minute Non-Synchronous Lost Opportunity Cost ($) does not apply:

- The 10-Minute Non-Synchronous Reserve LOC ($) settlement does no apply prior to May 30, 2000.
- The GILBOA generators are not qualified to receive a 10-Minute Non-Synchronous Lost Opportunity Cost (LOC) adjustment.

1.1.3.4.12.4 Settlement Algorithm

SCD Adj 10NSync LOC Stlmnt ($) is calculated as:

SCD Adj 10NSync LOC Stlmnt ($) = SCD Adj 10NSync LOC Cred ($) * SCD Op Res Avg Supply Perf Ratio

An adjustment is made to the 10-Minute Non-Synchronous Reserve LOC Credit ($) if the determined amount of 10-Minute Non-Synchronous Reserve LOC (MW) exceeds the generator's total 10-Minute Non-Synchronous Reserve Availability (MW) schedules (SCD 10NSync LOC (MW) - {Hr DAM Sched 10NSync Avail (MW) + Hr Sup Sched 10NSync Avail (MW)} > 0), as follows:

SCD Adj 10NSync LOC Cred ($) =

SCD Unadj 10NSync LOC Cred ($) *

[[{Hr DAM Sched 10NSync Avail (MW) + Hr Sup Sched 10NSync Avail (MW)} + [{SCD 10NSync LOC (MW) - {Hr DAM Sched 10NSync Avail (MW) + Hr Sup Sched 10NSync Avail (MW)}} * SCD 10NonSync LOC Scale Factor]] ÷ SCD 10NSync LOC (MW)]

Otherwise, no adjustment is made, and:

SCD Adj 10NSync LOC Cred ($) = SCD Unadj 10NSync LOC Cred ($)

NOTE: The above adjustment in not applicable to the Gilboa generators, so:

SCD Adj 10NSync LOC Cred ($) = SCD Unadj 10NSync LOC Cred ($)

Where the SCD 10NonSync LOC Scale Factor is calculated as:

If SCD Unused 10NonSync (MW) > Hr Max Unused 10NSync Avail (MW) and SCD Unused 10NonSync (MW) <> 0, then:

SCD 10NonSync LOC Scale Factor =

Hr Max Unused 10NSync Avail (MW) ÷ SCD Unused 10NonSync (MW)

Otherwise:

SCD 10NonSync LOC Scale Factor = 1.

SCD Unused 10NonSync (MW) is calculated as:

SCD Unused 10NonSync (MW) =

SCD 10NSync LOC (MW) - {Hr DAM Sched 10NSync Avail (MW) + Hr Sup Sched 10NSync Avail (MW)}

SCD Unadj 10NSync LOC Cred ($) is calculated as:

If the generator was scheduled only in the DAM, the 10-Minute Non-Synchronous Reserve LOC settlement will use the values calculated from the DAM {Hr DAM Sched 10NSync Avail (MW) > 0 & Hr Sup Sched 10NSync Avail (MW) = 0}:

SCD Unadj 10NSync LOC Cred ($) = Hr DAM 10NSync LOC Cred ($) * {SCD Interval Seconds ÷ 3,600}

SCD 10NSync LOC (MW) = Hr DAM 10NSync LOC (MW)

Otherwise, if the generator was scheduled only in the HAM as supplemental reserve, the 10-Minute Non-Synchronous Reserve LOC settlement will use the values calculated from real-time/balancing market {Hr DAM Sched 10NSync Avail (MW) = 0 & Hr Sup Sched 10NSync Avail (MW) > 0}:

SCD Unadj 10NSync LOC Cred ($) = SCD BalMkt 10NSync LOC Cred ($) * {SCD Interval Seconds ÷ 3,600}

SCD 10NSync LOC (MW) = SCD BalMkt 10NSync LOC (MW)

And lastly, if the generator is scheduled in both the DAM and in the HAM as supplemental reserve, the 10-Minute Non-Synchronous Reserve LOC settlement will use the greater of the values calculated from the DAM and the real-time/balancing market {Hr DAM Sched 10NSync Avail (MW) > 0 & Hr Sup Sched 10NSync Avail (MW) > 0}:

SCD Unadj 10NSync LOC Cred ($) = Max{SCD BalMkt 10NSync LOC Cred ($), Hr DAM 10NSync LOC Cred ($)} * {SCD Interval Seconds ÷ 3,600}

SCD 10NSync LOC (MW) = SCD BalMkt 10NSync LOC (MW) or Hr DAM 10NSync LOC (MW) corresponding to the above SCD Unadj 10NSync LOC Cred ($)

Hr DAM 10NSync LOC Cred ($) is calculated as:

If the generator was scheduled in the DAM (Hr DAM Sched 10NSync Avail (MW) > 0), then:

NOTE: Effective November 8, 2000, NYISO changed the method used to calculate the DAM 10NSync LOC Cred ($). After this date, it is calculated as follows (see below for the method prior to this date):

Hr DAM 10NSync LOC Cred ($) =

{DAM Total Price - Gen ($/MW) - Hr DAM 10NSync LOC Price ($/MW)} * Hr DAM 10NSync LOC (MW)

Hr DAM 10NSync LOC Price ($/MW) is the determination of the cost under the DAM Generation Bid, including minimum generation costs and the incremental costs from minimum generation up to Hr DAM 10NSync LOC (MW), divided by Hr DAM 10NSync LOC (MW).

Hr DAM 10NSync LOC (MW) is the expected output level (MW) for the generator at the DAM Total Price - Gen ($/MW) using the DAM Generation Bid.

However, if Hr DAM 10NSync LOC Cred ($) <= 0 (from above), then it will be determined using the SCD RT Total Price - Gen ($/MW) against both the DAM and HAM Generation Bids. Hr DAM 10NSync LOC Cred ($) will be calculated as the lesser value determined from either the DAM or HAM Generation Bids, as follows:

Calculate using the DAM Generation Bid:

Hr DAM 10NSync LOC Cred ($) =

{SCD RT Total Price - Gen ($/MW) - Hr DAM 10NSync LOC Price ($/MW)} * Hr DAM 10NSync LOC (MW)

Hr DAM 10NSync LOC Price ($/MW) is the determination of the cost under the DAM Generation Bid, including minimum generation costs and the incremental costs from minimum generation up to Hr DAM 10NSync LOC (MW), divided by Hr DAM 10NSync LOC (MW).

Hr DAM 10NSync LOC (MW) is the expected output level (MW) for the generator at the SCD RT Total Price - Gen ($/MW) using the DAM Generation Bid.

Calculate using the HAM Generation Bid:

Hr DAM 10NSync LOC Cred ($) =

{SCD RT Total Price - Gen ($/MW) - Hr DAM 10NSync LOC Price ($/MW)} * Hr DAM 10NSync LOC (MW)

Hr DAM 10NSync LOC Price ($/MW) is the determination of the cost under the HAM Generation Bid, including minimum generation costs and the incremental costs from minimum generation up to Hr DAM 10NSync LOC (MW), divided by Hr DAM 10NSync LOC (MW).

Hr DAM 10NSync LOC (MW) is the expected output level (MW) for the generator at the SCD RT Total Price - Gen ($/MW) using the HAM Generation Bid.

Prior to November 8, 2000, the Hr DAM 10NSync LOC Cred ($) is calculated as follows:

Hr DAM 10NSync LOC Cred ($) =

{SCD RT Total Price - Gen ($/MW) - Hr DAM 10NSync LOC Price ($/MW)} * Hr DAM 10NSync LOC (MW)

Hr DAM 10NSync LOC Price ($/MW) is the determination of the cost under the DAM Generation Bid, including minimum generation costs and the incremental costs from minimum generation up to Hr DAM 10NSync LOC (MW), divided by Hr DAM 10NSync LOC (MW).

Hr DAM 10NSync LOC (MW) is the expected output level (MW) for the generator at the SCD RT Total Price - Gen ($/MW) using the DAM Generation Bid.

However:

If Hr DAM 10NSync LOC Cred ($) < 0, then:

Hr DAM 10NSync LOC Cred ($) = 0.

If Hr DAM 10NSync LOC Cred ($) > {DAM Total Price - Gen ($/MW) or SCD RT Total Price - Gen ($/MW)} * Hr DAM 10NSync LOC (MW), then:

Hr DAM 10NSync LOC Cred ($) =

{DAM Total Price - Gen ($/MW) or SCD RT Total Price - Gen ($/MW)} * Hr DAM 10NSync LOC (MW)

NOTES:

- Please see Appendix A, Figure 1.4 for more information on how to determine the cost ($) under a given Generation Bid curve, including minimum generation costs and the incremental costs from minimum generation up to a specific generation output level (MW), divided by the output level (MW).
- Please see Appendix A, Figure 1.2 for more information on how to determine the generation output level (MW) on a given Generation Bid curve corresponding to a specific price ($/MW).

SCD BalMkt 10NSync LOC Cred ($) is calculated as:

If the generator was scheduled in the HAM as supplemental reserve (Hr Sup Sched 10NSync Avail (MW) > 0), then:

SCD BalMkt 10NSync LOC Cred ($) =

{SCD RT Total Price - Gen ($/MW) – SCD RT 10NSync LOC Price ($/MW)} * SCD BalMkt 10NSync LOC (MW)

SCD RT 10NSync LOC Price ($/MW) is the determination of the cost under the HAM Generation Bid, including minimum generation costs and the incremental costs from minimum generation up to SCD BalMkt 10NSync LOC (MW), divided by SCD BalMkt 10NSync LOC (MW).

SCD BalMkt 10NSync LOC (MW) is the expected output level (MW) for the generator at the SCD RT Total Price - Gen ($/MW) using the HAM Generation Bid.

However:

If SCD BalMkt 10NSync LOC Cred ($) < 0, then:

SCD BalMkt 10NSync LOC Cred ($) = 0.

If SCD BalMkt 10NSync LOC Cred ($) > {SCD RT Total Price - Gen ($/MW) * SCD BalMkt 10NSync LOC (MW)}, then:

SCD BalMkt 10NSync LOC Cred ($) =

SCD RT Total Price - Gen ($/MW) * SCD BalMkt 10NSync LOC (MW)

NOTES:

- Please see Appendix A, Figure 1.4 for more information on how to determine the cost ($) under a given Generation Bid curve, including minimum generation costs and the incremental costs from minimum generation up to a specific generation output level (MW), divided by the output level (MW).

- Please see Appendix A, Figure 1.2 for more information on how to determine the generation output level (MW) on a given Generation Bid curve corresponding to a specific price ($/MW).

Other Supporting Calculations:

Hr Sup Sched 10NSync Avail (MW) = max{Hr HAM Sched 10NSync Avail (MW) - Hr DAM Sched 10NSync Avail (MW), 0}

DAM Total Price - Gen ($/MW) = DAM Energy Price - Gen ($/MW) + DAM Loss Price - Gen ($/MW) (-)DAM Cong Price - Gen ($/MW)

SCD RT Total Price - Gen ($/MW) = SCD RT Energy Price - Gen ($/MW) + SCD RT Loss Price - Gen ($/MW) (-)SCD RT Cong Price - Gen ($/MW)

1.1.3.4.12.5 Additional Information

None

1.1.3.4.12.6 References

The applicability of Non-Synchronous Reserve Lost Opportunity Cost Payments is described within Schedule 4 of the MST (Market Administration and Control Area Services Tariff).

1.1.3.4.13 10-Minute Reserve Shortfall Charge

1.1.3.4.13.1 Description

The 10-Minute Reserve Shortfall Charge ($) is a charge to Market Participants who are penalized when a given generator fails to meet their basepoint instructions during reserve pickup intervals. The settlement is charged to Power Suppliers who have been selected to provide DAM and/or Supplemental 10-Minute Operating Reserve Service (Synchronous or Non-Synchronous) in the NYISO Day Ahead (DAM) or Hour Ahead (HAM) Operating Reserve Markets, respectively.

This settlement is determined using data from the next SCD-interval (SCD Next Basepoint (MW) & SCD Next Gen Avg Actual Energy (MW) specifically), and then the resulting charge is applied against the current interval SCD RT Total Price - Gen ($/MW). This is designed so that the SCD RT Total Price ($/MW) for the given generator at the beginning of the reserve pickup interval is used during the settlement.

It is determined at the Security Constrained Dispatch (SCD) dispatch interval (~5-minute) for each generator scheduled in the NYISO Operating Reserve Markets.

1.1.3.4.13.2 Required Data Elements

1.1.3.4.13.2.1 Determinants

Bill Code	Title	Business Description	DSS Value

Bill Code	Title	Business Description	DSS Value
	SCD Next Basepoint (MW)	Next Security Constrained Dispatch Basepoint (MW) is a number representing the average amount of energy scheduled by the NYISO during the real-time dispatch for the generator for the next SCD-interval; calculated over approximately 5 minute time intervals communicated to support generation dispatch	N
	SCD Next Gen Avg Actual Energy (MW)	SCD Next Generator Average Actual Energy (MW) is a number representing average actual output of a generator over the next SCD interval. It is the average of the 6-second-level data coming from the NYISO SCADA system.	N
	SCD Interval Seconds	SCD Interval Seconds is a number representing the number of seconds in the SCD interval	Y
	SCD 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)	Y
	SCD 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)	Y
	SCD 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)	Y
	SCD Next VSS Flag	SCD Next Voltage Support Service Flag is a character representing whether or not the unit is providing voltage support service in the next SCD-interval (values are Y or N).	N
	SCD Reserve Pickup Flag	SCD Reserve Pickup Flag is a character representing whether or not the given SCD-interval is a reserve pickup interval (values are Y or N).	N
	Hr DAM Sched 10Sync Avail (MW)	Hourly Day Ahead Market Scheduled 10-Minute Synchronous Operating Reserves Availability (MW) is a number representing the amount of Day Ahead Market 10-Minute Synchronous Operating Reserves service the given generator is scheduled to provide for the given hour.	Y
	Hr HAM Sched 10SyncRes Avail (MW)	Hourly Hour Ahead Market Scheduled 10-Minute Synchronous Operating Reserves Availability (MW) is a number representing the amount of Hour Ahead Market 10-Minute Synchronous Operating Reserves service the given generator is scheduled to provide for the given hour.	Y

Bill Code	Title	Business Description	DSS Value
	Hr DAM Sched 10NSync Avail (MW)	Hourly Day Ahead Market Scheduled 10-Minute Non-Synchronous Operating Reserves Availability (MW) 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.	Y
	Hr HAM Sched 10NSync Avail (MW)	Hourly Hour Ahead Market Scheduled 10-Minute Non-Synchronous Operating Reserves Availability (MW) is a number representing the amount of Hour Ahead Market 10-Minute Non-Synchronous Operating Reserves Service the given generator is scheduled to provide for the given hour.	Y
	Hr DAM Sched 30Min Avail (MW)	Hourly Day Ahead Market Scheduled 30-Minute Operating Reserves Availability (MW) 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.	Y
	Hr HAM Sched 30Min Avail (MW)	Hourly Hour Ahead Market Scheduled 30-Minute Operating Reserves Availability (MW) is a number representing the amount of Hour Ahead Market 30-Minute Operating Reserves Service the given generator is scheduled to provide for the given hour.	Y

1.1.3.4.13.2.2 Intermediates

Bill Code	Title	Business Description	DSS Value
	SCD RT Total Price - Gen ($/MW)	Real-Time Total Price ($/MW) is a number representing the total LBMP price of a generator bus	Y

1.1.3.4.13.2.3 Results

Bill Code	Title	Business Description	DSS Value
	SCD 10Min Shortfall Stlmnt ($)	SCD 10-Minute Operating Reserves Shortfall Settlement ($) is a number representing the settlement amount for charges incurred by the given generator due to underperformance during Operating Reserves pickup periods, for the given SCD-interval.	Y

1.1.3.4.13.3 Eligibility

Generators will be charged 10-Minute Reserve Shortfall ($) when:

- The given SCD-interval is a reserve pickup interval (SCD Reserve Pickup Flag = 'Y), and
- The generator is scheduled in the DAM and/or Supplement Reserve Markets:
  - Hr DAM Sched 10Sync Avail (MW) > 0 OR Hr DAM Sched 10NSync Avail (MW) > 0 OR Hr DAM Sched 30Min Avail (MW) > 0

    OR
  - Hr HAM Sched 10Sync Avail (MW) > 0 OR Hr HAM Sched 10NSync Avail (MW) > 0 OR Hr HAM Sched 30Min Avail (MW) > 0
- And, the generator fails to meet dispatch instructions when called to provide reserve pickup in the real-time balancing energy market [SCD Next Basepoint (MW) > SCD Next Gen Avg Actual Energy (MW)].

10-Minute Reserve Shortfall ($) does not apply when:

- The generator will not be charged the 10-Minute Reserve Shortfall Charge ($) if it is providing Voltage Support Service (SCD Next VSS Flag = "Y") in the next SCD-interval.

1.1.3.4.13.4 Settlement Algorithm

SCD 10Min Shortfall Stlmnt ($) is calculated as:

SCD 10Min Shortfall Stlmnt ($) =

{SCD Next Basepoint (MW) (-) SCD Next Gen Avg Actual Energy (MW)} * SCD RT Total Price - Gen ($/MW) * {SCD Interval Seconds ÷ 3,600 seconds}

If SCD 10Min Shortfall Stlmnt ($) < 0

SCD 10Min Shortfall Stlmnt ($) = 0

Where:

SCD RT Total Price - Gen ($/MW) =

SCD RT Energy Price - Gen ($/MW) + SCD RT Loss Price - Gen ($/MW) + {-1 * SCD RT Cong Price - Gen ($/MW)}

NOTE: The above settlement is determined using data from the next SCD-interval (SCD Next Basepoint (MW) & SCD Next Gen Avg Actual Energy (MW) specifically), and then the resulting charge is applied against the current interval SCD RT Total Price - Gen ($/MW).

1.1.3.4.13.5 Additional Information

None

1.1.3.4.13.6 References

The applicability of 10-Minute Reserve Shortfall Charges is described within Schedule 4 of the MST (Market Administration and Control Area Services Tariff).