Power Supplier Ancillary Service Settlements

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Power Supplier Ancillary Service Settlements

- **Settlement Name:**
  - MST/OATT Rate Schedule 1
  - Voltage Support Payments
  - Black Start Service Payment
  - NYPA Transmission Adjustment Charge
  - DAM Regulation Service Capacity
  - Balancing Supplier Regulation Service Capacity

Power Supplier Ancillary Service Settlements

- **Settlement Name:**
  - Real Time Regulation Movement
  - Regulation Revenue Adjustment
  - Regulation Performance Charge
  - Under Generation Penalty
  - Over Generation Penalty
  - Over Withdrawal Penalty

Power Supplier Ancillary Service Settlements

- **Settlement Name:**
  - DAM Spinning Reserve Availability
  - Balancing Spinning Reserve Availability
  - DAM 10 Minute Non-Synchronous Reserve Availability
  - Balancing 10 Minute Non-Synchronous Reserve Availability
  - DAM 30 Minute Operating Reserve Availability
  - Balancing 30 Minute Operating Reserve Availability

Power Supplier Ancillary Service Settlements

- **Objectives Per Settlement Name:**
  - Provide Settlement Description
  - Identify Settlement Eligibility
  - Name Settlement Determinants
  - Name Settlement Intermediates
  - Explain Settlement Algorithm
  - Step Through Settlement Scenario
  - Perform Settlement Example
  - Note Settlement Reference Material

Power Supplier Ancillary Service Settlements

- **MST/OATT Rate Schedule 1 (PS) Description**
  - Intended to recover a portion of NYISO's operating costs and FERC fees from Power Suppliers.

Scheduling, System Control, and Dispatch (S,SC & D)

+

FERC Fees

MST/OATT Rate Schedule 1 (PS)

- **Settlement Eligibility**
  - Power Suppliers will receive a charge for MST/OATT Schedule 1 if:
    - The supplier injected energy into the NYCA

MST/OATT Rate Schedule 1 (PS) S,SC, & D

- **Settlement Determinants Hr MST/OATT Sched 1 Rate: Inj ($/MW)**
  - Number of Injection Billing Units (MW)

MST/OATT Rate Schedule 1 (PS) S, SC, & D

- **Settlement Intermediates**
  - Not Applicable

- **Settlement Results**
  - Hr MST/OATT Sched 1 Inj Stlmnt: Gen ($)

MST/OATT Rate Schedule 1 (PS) S, SC, & D

- Settlement Algorithm

Hr MST/OATT Sched 1 Inj Stlmnt: Gen ($) =
{Hr MST/OATT Sched 1 Rate: Inj ($/MW) * Number of Injection Billing Units (MW)} * (-1)

Where:
Hr MST/OATT Sched 1 Rate: Inj ($/MW) =
.28 * {(NYISO Cost of Ops)/Forecasted MWh Volume}

MST/OATT Rate Schedule 1 (PS) S, SC, & D

- **Settlement Scenario**
  - ‘Generator A’ injects power into NYCA, due to NYISO issued Scheduled
    - 200 MWs in HB 3
  - ‘Gen A’ has signed both NYISO tariffs
  - Combined Rate Schedule 1 for Injections:
    - $0.33964 = (28% * $1.213) for 2023
  - ‘Generator A’ will be charged a RT Sched 1 Settlement for HB 3

MST/OATT Rate Schedule 1 (PS) S, SC, & D

- Settlement Example

Hr MST/OATT Sched 1 Inj Stlmnt: Gen ($) = - $67.93
{$0.33964 * 200} * (-1)

Where:
Hr MST/OATT Sched 1 Inj Stlmnt: Gen ($) = $0.33964
.28* {($190,000,000)/156,700,000}

MST/OATT Rate Schedule 1 (PS) FERC Fees

- **Settlement Determinants**
  - Hr Gen Avg Actual Energy (MWh)
  - Hr Gen Meter Energy (MWh)
  - Hr Proj FERC Fee NYISO Total ($)
  - Hr True-up FERC Fee NYISO Total ($)

MST/OATT Rate Schedule 1 (PS) FERC Fees

- **Settlement Intermediates**
  - Hr Sched 1 Inject (MWh)
  - Hr OATT Sched 1 FERC Fees Rate: Inj ($/MWh)

- **Settlement Results**
  - Hr OATT Sched 1 FERC Fees Inj StImnt: Gen ($)

MST/OATT Rate Schedule 1 (PS) FERC Fees

- **Settlement Algorithm - *FERC Fees***

Hr OATT Sched 1 FERC Fees Inj Stlmnt: Gen ($) =

Hr OATT Sched 1 FERC Fees Rate: Inj ($/MWh) Hr Sched 1 Inject (MWh) * (-1)*

Where:

Hr OATT Sched 1 FERC Fees Rate: Inj ($/MWh) =
actual billed fees – annual estimated fees + true up interest accrual

- Broken down to a monthly level and then an hourly level rate
- Demand Response Providers assessed 28% of the 94% Physical Allocation

Hr Sched 1 Inject (MWh) = Total Power Supplier injected MWh

MST/OATT Rate Schedule 1 (PS)

- **Summary**
  - Intended to recover a portion of NYISO's operating costs and FERC fees from Power Suppliers
    - Based on MWs Injected into the NYCA
    - Calculated on Hourly Level

MST/OATT Rate Schedule 1 (PS)

- **Settlement Reference Material**
  - MST Section 15.1 – Schedules
  - Accounting and Billing Manual Section 8

MST/OATT Rate Schedule 1 (PS)

- **Settlement Reference Material**
  - Advisory Billing File
    - Power Supplier
      - SSC&D OAT Inject Charge $
    - Hourly Bill Code 258
    - Daily Bill Code 322
      - FERC Fees OAT Inject Charge $
    - Hourly Bill Code 268
    - Daily Bill Code 331
  - DSS Corporate Report
    - Settlement Details - Power Supplier - Schedule 1 and Miscellaneous Expenses

Power Supplier Ancillary Service Settlements

- **Objectives Per Settlement Name:**
  - MST/OATT Rate Schedule 1
  - **Voltage Support Payments**
  - Black Start Service Payment
  - NYPA Transmission Adjustment Charge
  - DAM Regulation Service Capacity
  - Balancing Supplier Regulation Capacity

Power Supplier Ancillary Service Settlements

- **Objectives Per Settlement Name:**
  - Real Time Regulation Movement
  - Regulation Revenue Adjustment
  - Regulation Performance Charge
  - Under Generation Penalty
  - Over Generation Penalty
  - Over Withdrawal Penalty
  - DAM Reserve
  - Balancing Reserve

Power Supplier Ancillary Service Settlements

- **Voltage Support Rate Schedule 2 (PS) Description**
  - Intended to compensate Power Suppliers who offer their Generator's reactive capacity as Voltage Support Service to the NYISO.

Voltage Support Service (PS)

- **Settlement Eligibility**
  - Power Suppliers will receive a payment for Voltage Support Service if:
    - The Generator is capable of Providing Voltage Support Service
    - The Generator is Qualified by NYISO to Provide Voltage Support Service
      - Performs Reactive Power Capability Test
      - Has an Automatic Voltage Regulator
      - Maintains Voltage Levels as Directed by NYISO

Voltage Support Service (PS)

- **Settlement Determinants**
  - Mo UCAP Provider Ind
  - Gen VSS Compensation (MVAR)
  - Hr # Seconds in Service
  - Yr VSS Rate ($)
  - Mo VSS Rate ($)
  - # Hrs in Month

Voltage Support Service (PS)

- **Settlement Intermediates**
  - Hr VSS Rate ($)
  - Hr VSS in Service

- **Settlement Results**
  - Hr VSS StImnt ($)

Voltage Support Service (PS)

- ## Settlement Algorithm – ICAP

Hr VSS Stlmnt ($) =
{(Yr VSS Rate $ * Gen VSS Compensation MVAR / 12) / # Hrs in Month}

Voltage Support Service (PS)

- **Settlement Scenario**
  - ‘Generator A’ is a qualified Voltage Support Service Provider for the NYISO
    - MVar Capability = 60
  - Annual VSS Rate is $3128.96
  - Settlement Date is June 22, HB 7
  - Number of Hours in Month of June is 720
  - ‘Generator A’ is an ICAP Provider

Voltage Support Service (PS)

- Settlement Example

Hr VSS Stlmnt ($) = $21.73
{($3128.96 * 60/12) / 720}

Voltage Support Service (PS)

- ## Settlement Algorithm – Non ICAP

Hr VSS Stlmnt ($) =
{[(Yr VSS Rate $ * Gen VSS Compensation MVAR / 12) / # Hrs in Month] * Hr VSS in Service}

Where:
Hr VSS in Service =
Hr # Seconds in Service / 3600

Voltage Support Service (PS)

- **Settlement Scenario Example**
  - 'Generator A' is a qualified Voltage Support Service Provider for the NYISO
    - MVar Capability = 150
  - Annual VSS Rate is $3128.96
  - Settlement Date is October 14, HB 3
  - Number of Hours in Month of October is 744
  - 'Generator A' is not an ICAP Provider
  - 'Generator A' was in Service for 3300 seconds in HB 3

Voltage Support Service (PS)

- ## Settlement Example

Hr VSS Stlmnt ($) = $48.36
{[($3128.96 * 150/12) / 744] * .92}

Where:
Hr VSS in Service = .92
3300/3600

Voltage Support Service (PS)

- **Summary**
  - Intended to compensate Power Suppliers who offer their Generator's capacity as Voltage Support Service to the NYISO
    - Based on Annual Compensation Rate
    - Proven MVar Capability
    - ICAP Participation vs. Time In Service

Voltage Support Service (PS)

- **Settlement Reference Material**
  - MST Section 15.2 – Schedules
  - Accounting and Billing Manual Section 5

Voltage Support Service (PS)

- **Settlement Reference Material**
  - Advisory Billing File
    - Power Supplier
      - Voltage Support $
    - Hourly Bill Code 214
    - Daily Bill Code 306
  - DSS Corporate Report
    - Settlement Details - Power Supplier - Voltage Support Service Credit

Power Supplier Ancillary Service Settlements

- **Objectives Per Settlement Name:**
  - MST/OATT Rate Schedule 1
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Power Supplier Ancillary Service Settlements

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  - DAM Reserve
  - Balancing Reserve

Power Supplier Ancillary Service Settlements

- **Black Start Service Payment Description**
  - Intended to compensate Power Suppliers who offer their Generator for Black Start Service as part of NYISO's and/or Transmission Owner's Black Start Restoration Plan.

Black Start Service Payment

- **Settlement Eligibility**
  - Generators will receive a payment for Black Start Service if:
    - The Yearly Black Start Service Rate is greater than zero (Yr Black Start Rate ($) > 0)
      - Generator is selected for NYISO or Transmission Owner Black Start Restoration Plan
      - Annual Embedded Cost information is Provided to NYISO
      - Generator achieves successful completion of periodic Black Start Test
      - Black Start Service is available upon NYISO/TO request

Black Start Service (NYISO Wide)

- **Settlement Determinants**
  - # Days in Previous Year (May 1st – April 30th)
  - Yr Black Start Rate ($)
    - Generator's Annual Capital Costs (for related Black Start Equipment)
    - Generator's Annual Operations & Maintenance Costs (for related Black Start Equipment)
    - Generator's Annual Restoration Plan Training Costs

Black Start Service

- **Settlement Intermediates**
  - N/A

- **Settlement Results**
  - Day Black Start Stlmnt ($)

Black Start Service

- Settlement Algorithm

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

Black Start Service

- **Settlement Scenario**
  - 'Generator A' is an approved Black Start Service Provider for the NYISO
  - Their annual Black Start Service Rate is $105,000

Black Start Service

- Settlement Example

Day Black Start Stlmnt ($) = $287.67
$105,000 / 365

Black Start Service (Local)

- **Settlement Determinants**
  - # Days in Previous Year (May 1st – April 30th)
  - Yr Local Black Start Rate ($)
    - Generator's Annual Capital Costs (for related Black Start Equipment)
    - Generator's Annual Operations & Maintenance Costs (for related Black Start Equipment)
    - Generator's Annual Restoration Plan Training Costs

Black Start Service (Local)

- **Settlement Intermediates**
  - N/A

- **Settlement Results**
  - Day Local Black Start StImnt ($)
  - Hr Local Black Start StImnt ($)

Black Start Service (Local)

- ## Settlement Algorithm

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

Hr Local Black Start Stlmnt ($) =
Day Local Black Start Stlmnt ($) / # Hr in Day

Black Start Service

- **Summary**
  - Intended to compensate Power Suppliers who offer their Generator for Black Start Service as part of NYISO's and/or Transmission Owner's Black Start Restoration Plan.
    - Based on Annual Costs Associated with the Provision of Black Start Services
    - # of Days in Previous Year May 1st to April 30th

Black Start Service

- **Settlement Reference Material**
  - MST Section 15.5 - Schedules
  - OATT Section 6 - Schedules
  - Accounting and Billing Manual Section 5

Black Start Services

- **Settlement Reference Material**
  - Advisory Billing File
    - Power Supplier
      - Daily Bill Code 311 & 312
        - » Black Start Daily Revenue Reqt
        - » Black Start Daily Revenue Payment $
    - Hourly Bill Code 1007
      - Local Black Start/Rest Payment $
    - Daily Bill Code 1017
      - Local Black Start/Rest Payment $
  - DSS Corporate Report
    - Settlement Details - Power Supplier – Black Start

Power Supplier Ancillary Service Settlements

- **Settlement Name:**
  - MST/OATT Rate Schedule 1
  - Voltage Support Payments
  - Black Start Service Payment
  - **NYPA Transmission Adjustment Charge**
  - DAM Regulation Service Capacity
  - Balancing Supplier Regulation Service Capacity

Power Supplier Ancillary Service Settlements

- **Settlement Name:**
  - Real Time Regulation Movement
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  - Regulation Performance Charge
  - Under Generation Penalty
  - Over Generation Penalty
  - Over Withdrawal Penalty

Power Supplier Ancillary Service Settlements

- **Settlement Name:**
  - DAM Spinning Reserve Availability
  - Balancing Spinning Reserve Availability
  - DAM 10 Minute Non-Synchronous Reserve Availability
  - Balancing 10 Minute Non-Synchronous Reserve Availability
  - DAM 30 Minute Operating Reserve Availability
  - Balancing 30 Minute Operating Reserve Availability

Power Supplier Ancillary Service Settlements

- **ESR NYPA Transmission Adjustment Charge (NTAC) Description**
  - A charge intended to cover NYPA's transmission revenue requirements

ESR NTAC Allocation

- **Settlement Eligibility**
  - Energy Storage Resources (ESRs) will receive a charge for NTAC ($) if:
    - Energy Storage Resource (ESR) makes actual energy withdrawals, in the real time market, when the resource is not providing a service
      - ESR is providing a service when:
        - 1) Following an energy schedule to inject ***or***
        - 2) Withdrawing energy and is a qualified voltage support service provider ***or***
        - 3) Withdrawing energy and is scheduled to provide operating reserve and/or regulation service ***or***
        - 4) committed or dispatched out of merit for NYCA or local reliability

ESR NTAC Allocation

- **Settlement Determinants**
  - RTD RT Gen TSC-Eligible Withdrawal Energy (MWh)
  - Hr NTAC Rate ($/MWh)

ESR NTAC Allocation

- **Settlement Intermediates**
  - Hr RT Gen TSC-Eligible Withdrawal Energy (MWh)
  - RTD RT NTAC Charge for Withdrawals Stlmnt: Gen ($)
- **Settlement Results**
  - Hr RT NTAC Charge for Withdrawals Stlmnt: Gen ($)

ESR NTAC Allocation

- Settlement Algorithm

Hr RT NTAC Charge for Withdrawals Stlmnt: Gen ($) =
{Hr NTAC Rate ($/MWh) * Hr RT Gen TSC-Eligible Withdrawal Energy (MWh)}
* (-1)

ESR NTAC

- **Settlement Reference Material**
  - OATT Attachment H Section 14
  - Accounting and Billing Manual
    - Section 7.6.3

ESR NTAC

- **Settlement Reference Material**
  - Advisory Billing File
    - Power Supplier
      - Daily Bill Code 272
        - » Storage Withdrawal NTAC Charge ($)
  - DSS Corporate Report
    - Settlement Details - Power Supplier Anc Srvc–Storage Withdrawal

Power Supplier Ancillary Service Settlements

- **Objectives Per Settlement Name:**
  - MST/OATT Rate Schedule 1
  - Voltage Support Payments
  - Black Start Service Payment
  - NYPA Transmission Adjustment Charge
  - DAM Regulation Service Capacity
  - Balancing Supplier Regulation Service Capacity

Power Supplier Ancillary Service Settlements

- **Objectives Per Settlement Name:**
  - Real Time Regulation Movement
  - Regulation Revenue Adjustment
  - Regulation Performance Charge
  - Under Generation Penalty
  - Over Generation Penalty
  - Over Withdrawal Penalty
  - DAM Reserve
  - Balancing Reserve

Power Supplier Ancillary Service Settlements

- **DAM Regulation Response Service Capacity Description**
  - Intended to compensate Power Suppliers who offer their Generator's capacity as Regulation Service to the NYISO in the DAM.

DAM Regulation Capacity

- **Settlement Eligibility**
  - Generators scheduled in the NYISO DAM are eligible to receive the DAM Regulation Response Service Capacity settlement if:
    - Hr DAM Sched Reg Capacity (MWh) > 0

DAM Regulation Capacity

- **Settlement Determinants**
  - Hr DAM Reg Capacity Price ($/MW)
  - Hr DAM Sched Reg Capacity (MWh)

DAM Regulation Capacity

- **Settlement Intermediates**
  - Not Applicable

- **Settlement Results**
  - Hr DAM Reg Capacity StImnt ($)

DAM Regulation Capacity

- Settlement Algorithm

Hr DAM Reg Capacity Stlmnt ($) =
Hr DAM Sched Reg Capacity (MWh) * Hr DAM Reg Capacity Price ($/MW)

Power Supplier Ancillary Service Settlements

- **Balancing Regulation Response Service Capacity Description**
  - Intended to compensate Power Suppliers who offer their Generator's capacity as Regulation Service to the NYISO in the RT Market.

Balancing Regulation Capacity

- **Settlement Eligibility**
  - Generators scheduled in the NYISO DAM or Real Time Regulation Response Service Market are eligible to receive the Balancing Regulation Service Capacity settlement.

Balancing Regulation Capacity

- **Settlement Determinants**
  - RTD Interval Seconds
  - RTD RT Reg Capacity Price ($/MW)
  - Hr DAM Sched Reg Capacity (MWh)
  - RTD RT Sched Reg Capacity (MW)

Balancing Regulation Capacity

- **Settlement Intermediates**
  - RTD BalMkt Reg Capacity (MW)

- **Settlement Results**
  - RTD BalMkt Reg Capacity StImnt ($)

Balancing Regulation Capacity

- ## Settlement Algorithm

RTD BalMkt Reg Capacity Stlmnt ($) =
RTD BalMkt Sched Reg Capacity (MW) * RTD RT Reg Capacity Price ($/MW) * RTD Interval Seconds/3600

Where:
RTD BalMkt Sched Reg Capacity (MW) =
RTD RT Sched Reg Capacity (MW) – Hr DAM Sched Reg Capacity (MWh)

Regulation Capacity

- **Settlement Scenario – Part 1**
  - ‘Generator A’ is scheduled to provide DAM Regulation Capacity
    - Operating Day 1/25/12
    - Operating HB 0
    - 10 MWhs
  - DAM Regulation Capacity Price = $7

Regulation Capacity

- **Settlement Scenario – Part 2**
  - Subsequently; ‘Generator A’ is eligible for a RT Regulation Capacity Settlement
    - Operating Day 1/25/12
    - Operating HB 0
    - RTD Interval 00:05
    - 12 MWhs
  - RT Regulation Capacity Price = $5

Regulation Capacity

- ## Settlement Example

Hr DAM Reg Capacity Stlmnt ($) = $70
10 * $7

RTD BalMkt Reg Capacity Stlmnt ($) = $0.83
2 * $5 * 300/3600

Where:
RTD BalMkt Sched Reg Capacity (MW) = 2
12 – 10

Power Supplier Ancillary Service Settlements

- **Real Time Regulation Movement Description**
  - Intended to compensate Regulation-Scheduled Resources responding to NYISO's six second dispatch, correcting for Area Control Error (ACE)

RT Regulation Movement

- **Settlement Eligibility**
  - Regulation-Scheduled Resources are eligible to receive the RT Regulation Movement Settlement if:
    - RTD RT Reg Movement (MW) > 0

RT Regulation Movement

- **Settlement Determinants**
  - RTD RT Reg Movement (MW)
  - RTD Perf Index: Non Time Weight
  - RTD Reg Movement Price ($/MW)

RT Regulation Movement

- **Settlement Intermediates**
  - Not Applicable

- **Settlement Results**
  - RTD RT Reg Movement StImnt ($)

RT Regulation Movement

- Settlement Algorithm

RTD RT Reg Movement Stlmnt ($) =
RTD RT Reg Movement (MW) * RTD Reg Movement Price ($/MW) * RTD Perf Index: Non-Time Weight

RT Regulation Movement

- **Settlement Scenario**
  - ‘Generator A’ is dispatched up 60 MWs to correct for ACE, by the NYISO
  - The Regulation Movement Price was calculated as $0.11
  - Their RT Performance Index is determined to be 1.0

RT Regulation Movement

- Settlement Example

RTD RT Reg Movement Stlmnt ($) = $6.60
60 * $0.11 * 1

RT Regulation Movement

- **Settlement Scenario**
  - 'Generator A' is dispatched down 15 MWs to correct for ACE, by the NYISO
  - The Regulation Movement Price was calculated as $1
  - Their RT Performance Index is determined to be 0.8610

RT Regulation Movement

- Settlement Example

RTD RT Reg Movement Stlmnt ($) = $12.92
15 * $1 * 0.8610

Power Supplier Ancillary Service Settlements

- **Regulation Revenue Adjustment Description**
  - Intended to properly compensate Power Suppliers for balancing energy if they are also providing Regulation Capacity Service in the Real Time Market.
  - RRA can be…
    - A payment

      or
    - A charge

Regulation Revenue Adjustment

- **Settlement Eligibility**
  - Power Suppliers will be eligible for the Regulation Revenue Adjustment if:
    - RTD RT Sched Reg Capacity (MW) > 0

      and
    - RTD AGC Basepoint (MW) ≠ RTD Basepoint (MW)

Regulation Revenue Adjustment

- **Settlement Determinants**
  - RTD AGC Basepoint (MW)
  - RTD Basepoint (MW)
  - RTD Gen Adjusted Energy (MW)
  - RTD Interval Seconds
  - RTD RT Sched Reg Capacity (MW)

  - RTD RT Energy Price: Gen ($/MW)
  - RTD RT Loss Price: Gen ($/MW)
  - RTD RT Cong Price: Gen ($/MW)

Regulation Revenue Adjustment

- **Settlement Intermediates**
  - RTD RT Total Price: Gen ($/MW)
  - RTD RRA Unweight: Gen ($)

- **Settlement Results**
  - RTD RRA: Gen ($)

Regulation Revenue Adjustment

- **Settlement Type 1: (Regulating Up)**
  - RTD AGC Basepoint (MW) > RTD Basepoint (MW)
  - RRA Payment if…
    - Energy Bid Price of Gen > Gen LBMP

      Bid = 10
      LBMP = 5
      ] Payment
  - RRA Charge if…
    - Energy Bid Price of Gen < Gen LBMP

      Bid = 5
      LBMP = 10
      ] Charge

Regulation Revenue Adjustment

- ## Settlement Algorithm – Type 1

RTD RRA: Gen ($) =
RTD RRA Unweight: Gen ($/Hr) * RTD Interval Seconds/3600

Where:
RTD RRA Unweight: Gen ($/Hr) =
[{Bid Cost from RTD Basepoint to Min(RTD Gen Adj Energy (MW), RTD AGC Basepoint (MW))}
- {Gen RTD RT Total Price: Gen ($/MWh) * Min(RTD Gen Adj Energy (MW), RTD AGC Basepoint (MW) – RTD Basepoint (MW))}]

Regulation Revenue Adjustment

- **Settlement Type 2: (Regulating Down)**
  - RTD AGC Basepoint (MW) < RTD Basepoint (MW)
  - RRA Charge if…
    - Energy Bid Price of Gen > Gen LBMP

      Bid = 10
      LBMP = 5
      ⟩ Charge
  - RRA Payment if…
    - Energy Bid Price of Gen < Gen LBMP

      Bid = 5
      LBMP = 10
      ⟩ Payment

Regulation Revenue Adjustment

- Settlement Algorithm – Type 2

RTD RRA: Gen ($) =
RTD RRA Unweight: Gen ($/Hr) * RTD Interval Seconds/3600

Where:
RTD RRA Unweight: Gen ($/Hr) =
[{Bid Cost from Max(RTD Gen Adj Energy (MW), RTD AGC Basepoint (MW)) to RTD Basepoint (MW)} - {Gen RTD RT Total Price: Gen ($/MWh) * (RTD Basepoint (MW) – Max(RTD Gen Adj Energy (MW), RTD AGC Basepoint (MW))} * -1]

Regulation Revenue Adjustment

- **Settlement Scenario Type 2**
  - 'Generator A' provided RT Energy and Regulation Availability
    - RTD Gen Adj Energy = 82 MW
    - RTD AGC Basepoint = 85 MW
    - RTD Basepoint = 98 MW
  - RT LBMP $ = $112
  - Interval Length = 300
  - Bid Costs
    - 0-40 MW = $50
    - 41-80 MW = $75
    - 81-120 MW = $100

Remember:

- **RRA Payment if…Energy Bid Price of Gen < Gen LBMP**
- **RRA Charge if…Energy Bid Price of Gen > Gen LBMP**

Regulation Revenue Adjustment

- ## Settlement Algorithm – Type 2

RTD RRA: Gen($) = $13
$156 * 300/3600

Where:
RTD RRA Unweight: Gen ($/Hr) = $156
[{Bid Cost from Max(82, 85) to 98} - {$112 * (98 - Max(82, 85)} * -1]
[{13 * $100} – {$112 * (98-85)} * -1]
[{$1300} – {$1456} * -1]
[-$156 * -1]

Power Supplier Ancillary Service Settlements

- **Real Time Regulation Performance Charge Description**
  - Intended to charge Regulation Response Service Resources who are not responding or are responding poorly to NYISO's six second dispatch, correcting for Area Control Error (ACE)

Regulation Performance Charge

- **Settlement Eligibility**
  - Regulation Response Service Resources are eligible to be assessed the RT Regulation Performance Charge if:
    - RTD Perf Index: Non-Time Weight < 1

Regulation Performance Charge

- **Settlement Determinants**
  - RTD Perf Index: Non Time Weight
  - RTD RT Reg Capacity Price ($/MWh)
  - RTD RT Sched Reg Capacity (MW)
  - Hr DAM Sched Reg Capacity (MW)
  - Hr DAM Reg Capacity Price ($/MWh)
  - RTD Interval Seconds

Regulation Performance Charge

- **Settlement Intermediates**
  - RTD RT Increm Sched Reg Capacity (MW)

- **Settlement Results**
  - RTD RT Reg Performance Charge ($)

Regulation Performance Charge

- Settlement Algorithm

RTD RT Reg Performance Charge ($) =
[{(1-RTD Perf Index: Non-Time Weight) * RTD RT Increm Sched Reg Capacity (MW) * -1.1 * RTD RT Reg Capacity Price ($/MWh)} + {(1-RTD Perf Index: Non-Time Weight) * (RTD RT Sched Reg Capacity (MW) – RTD RT Increm Sched Reg Capacity (MW)) * -1.1 * Max(Hr DAM Reg Capacity Price ($/MWh), RTD RT Reg Capacity Price ($/MWh)}] * RTD Interval Seconds/3600

Where:
RTD RT Increm Sched Reg Capacity =
RTD RT Sched Reg Capacity (MW) – Hr DAM Sched Reg Capacity (MW)
If
RTD RT Sched Reg Capacity (MW) > Hr DAM Sched Reg Capacity (MW)

Or

RTD RT Increm Sched Reg Capacity = 0
If
RTD RT Sched Reg Capacity (MW) < Hr DAM Sched Reg Capacity (MW)

Regulation Performance Charge

- **Settlement Scenario**
  - 'Generator A' has a 45 MWh DAM Regulation Capacity Schedule for HB 0
  - 'Generator A' was subsequently issued a RT Regulation Capacity Schedule of 60 MWs for HB 0
  - Their Performance Index is determined to be 0.933
  - Regulation Capacity Prices for HB 0 are:
    - DAM = $8/MWh
    - RT = $5/MWh
  - The RTD Interval Seconds are 300 each interval across the hour

Regulation Performance Charge

- Settlement Example

RTD RT Reg Performance Charge ($) = -$2.67
[{(1- 0.933) * 15 * -1.1 * $5} + {(1- 0.933) * (60 – 15) * -1.1 * Max($8, $5)}] * 300/3600

[{0.067 * 15 * -1.1 * $5} + {0.067 * 45 * -1.1 * $8}] * 300/3600

-5.5275 + -26.532 * 300/3600

Where:
RTD RT Increm Sched Reg Capacity = 15
60 - 45

Regulation Service

- **Summary**
  - DAM Regulation Capacity
    - Compensating Suppliers offering capacity as Regulation to NYISO in DAM
  - Balancing Regulation Capacity
    - Compensating Suppliers offering capacity as Regulation to NYISO in RT Market
      - Factors in DAM Reg Capacity Schedule
  - Real Time Regulation Movement
    - Compensating Suppliers for responding to six second base points, as directed by NYISO
      - Factors in RT Supplier Performance

Regulation Service

- **Summary**
  - Regulation Revenue Adjustment
    - Properly compensating Suppliers for balancing energy when also providing Regulation Capacity in RT Market
  - Regulation Performance Charge
    - Charge assessed to Suppliers in the event they respond poorly or not at all to their six second dispatch
      - Factors in a 10% adder

Regulation Service

- **Settlement Reference Material**
  - MST Section 15.3 - Schedules
  - Accounting and Billing Manual Section 5.2 and Appendix I & G

DAM Regulation Capacity

- **Settlement Reference Material**
  - Advisory Billing File
    - Power Supplier
    - Hourly Bill Code 217
      - Hrly DAM Reg Capacity
    - Hourly Bill Code 218
      - Hrly DAM Reg MCP $
    - Daily Bill Code 308
      - Regulation Payment $
  - DSS Corporate Report
    - Settlement Details - Power Supplier – DAM Regulation Capacity

Balancing Regulation Capacity

- **Settlement Reference Material**
  - Advisory Billing File
    - Power Supplier
    - Hourly Bill Code 250
      - Hrly Bal Mkt Reg Capacity MWHr
    - Hourly Bill Code 251
      - Hrly Bal Mkt Avail $
    - Daily Bill Code 308
      - Regulation Payment $
  - DSS Corporate Report
    - Settlement Details - Power Supplier – RT Regulation Service

RT Regulation Movement

- **Settlement Reference Material**
  - Advisory Billing File
    - Power Supplier
    - Hourly Bill Code 265
      - Hrly Reg Movement MWHr
    - Hourly Bill Code 266
      - Hrly RT Reg Movement $
    - Daily Bill Code 329
      - Regulation Movement $
  - DSS Corporate Report
    - Settlement Details - Power Supplier – RT Regulation Service

Regulation Revenue Adjustment

- **Settlement Reference Material**
  - Advisory Billing File
    - Power Supplier
    - Hourly Bill Code 252
      - Hrly Reg Rev Adj $
    - Daily Bill Code 316
      - Regulation Rev Adj $
  - DSS Corporate Report
    - Settlement Details - Power Supplier – Regulation Revenue Adjustment

Regulation Performance Charge

- **Settlement Reference Material**
  - Advisory Billing File
    - Power Supplier
    - Hourly Bill Code 267
      - Hrly Reg Performance Charge $
    - Daily Bill Code 330
      - Regulation Performance Charge $
  - DSS Corporate Report
    - Settlement Details - Power Supplier – RT Regulation Service *(RT Regulation Movement Tab)*

Power Supplier Ancillary Service Settlements

- **Objectives Per Settlement Name:**
  - MST/OATT Rate Schedule 1
  - Voltage Support Payments
  - Black Start Service Payment
  - NYPA Transmission Adjustment Charge
  - DAM Regulation Service Capacity
  - Balancing Supplier Regulation Service Capacity

Power Supplier Ancillary Service Settlements

- **Objectives Per Settlement Name:**
  - Real Time Regulation Movement
  - Regulation Revenue Adjustment
  - Regulation Performance Charge
  - **Under Generation Penalty**
  - Over Generation Penalty
  - DAM Reserve
  - Balancing Reserve

Power Supplier Ancillary Service Settlements

- **Under Generation Penalty Description**
  - Intended to penalize Power Suppliers causing regulation burden due to under-generating below their RTD Basepoint (MW) outside of acceptable tolerance levels.

Under Generation Penalty

- **Settlement Eligibility**
  - Suppliers are subject to receive a charge for Under-Generation Penalty if:
    - Supplier is in Service and does not have a regulation schedule or Supplier is not in Service and does not have a regulation schedule, but producing > 5 MW
    - RTD Basepoint MW > 0
    - RTD Gen Adj Energy MW > 0
    - Generator is not Out of Merit during RTD Interval
    - Generator is outside of acceptable tolerance levels

Under Generation Penalty

- **Settlement Eligibility Exemptions**
  - Generators are not subject to receive a charge for Under-Generation Penalty under certain exemptions
    - Exemptions Identified in MST Rate Schedule 3-A
      - –Section 15.3A.3

Under Generation Penalty

- **Settlement Determinants**
  - Hr DAM Reg Capacity Price ($/MW)
  - RTD Reg Capacity Price ($/MW)
  - RTD Gen Avg Actual Energy (MW)

Under Generation Penalty

- **Settlement Determinants**
  - RTD Interval Seconds
  - RTD In Service Ind
  - RTD RT Sched Reg Capacity (MW)
  - RTD Out of Merit Flag
  - RTD PURPA Unit Class Type
  - RTD Gen Upper Op Limit (MW)

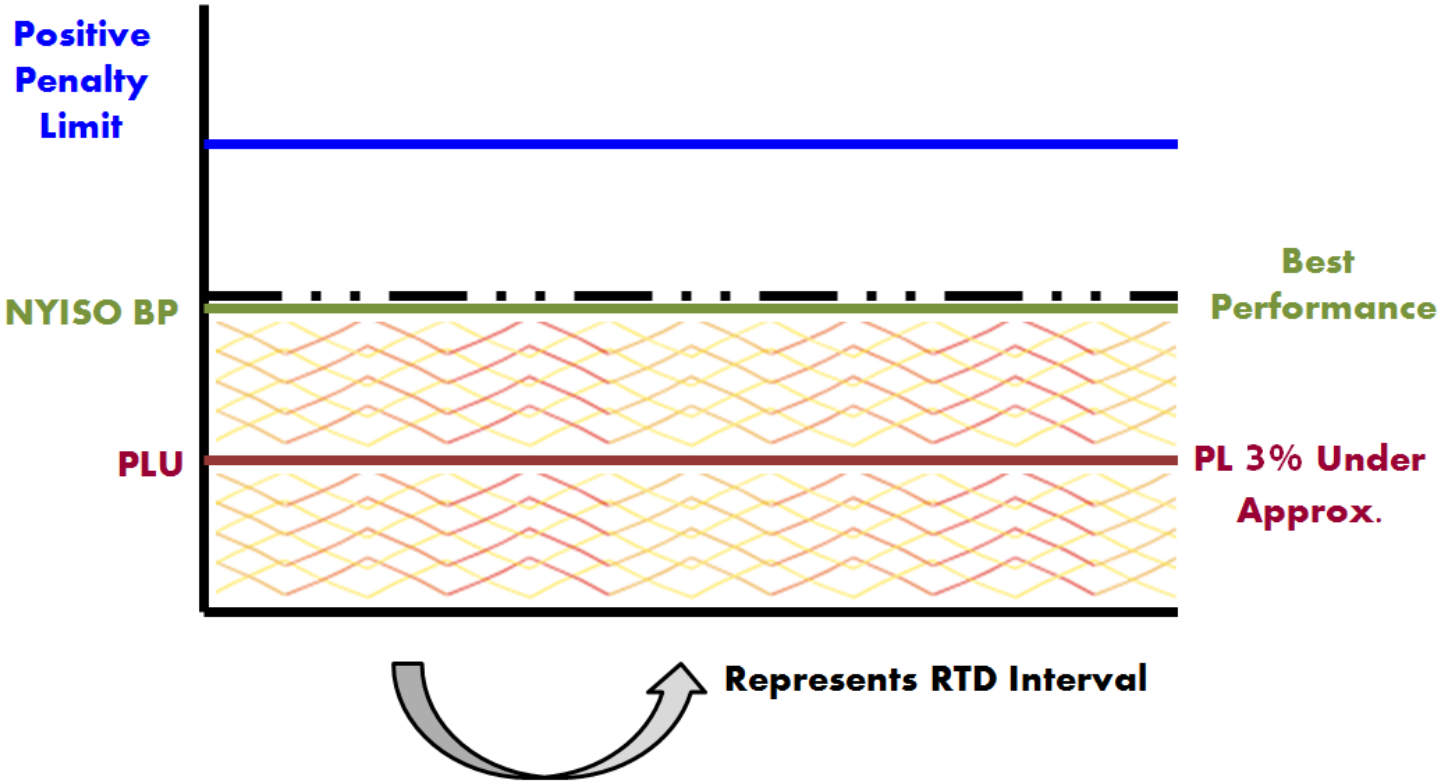
Under Generation Penalty

- **Settlement Intermediates**
  - RTD Reg Negative Injection Error (MW)

- **Settlement Results**
  - RTD Under-Gen Reg Penalty ($)

Under Generation Penalty

- Settlement Algorithm – RTD Neg Error



Under Generation Penalty

- Settlement Algorithm

RTD Under-Gen Reg Penalty ($) =
[Max{(RTD Reg Negative Injection Error (MW)* Max(Hr DAM Reg Capacity Price ($/MW), RTD RT Reg Capacity Price ($/MW)) * RTD Interval Seconds/3600), 0} * -1]

Where:
RTD Reg Negative Injection Error (MW) =
Max[RTD PLU (MW) – RTD Gen Avg Actual Energy (MW), 0 MW]

Under Generation Penalty

- **Settlement Scenario**
  - 'Generator A' is a Non-Regulating Unit
  - RTD Basepoint = 45 MW
  - RTD Gen Avg Actual Energy = 41 MW
  - Penalty Limit for Under Generation = 43.5 MW
  - Negative Injection Error = 2.5 MW
  - DAM Regulation Capacity Price = $2
  - RT Regulation Capacity Price = $3

Under Generation Penalty

- ## Settlement Example

RTD Under-Gen Reg Penalty ($) = -$0.63
[Max{(2.5 * Max($2, $3) * 300/3600), 0} * -1]

Where:
RTD Reg Negative Injection Error (MW) = 2.5
Max{(43.5 – 41), 0}
Max{(2.5), 0)}

Under Generation Penalty

- **Summary**
  - Intended to penalize Power Suppliers causing regulation burden due to under-generating below their RTD Basepoint (MW) outside of acceptable tolerance levels.

Under Generation Penalty

- **Settlement Reference Material**
  - MST Section 15.3A – Schedules
  - Accounting and Billing Manual Appendix I & G

Under Generation Penalty

- **Settlement Reference Material**
  - Advisory Billing File
    - Power Supplier
      - Regulation Charge ($)
    - Hourly Bill Code 222
    - Daily Bill Code 309
  - DSS Corporate Report
    - Settlement Details - Power Supplier – Regulation Penalty for Power Suppliers

Power Supplier Ancillary Service Settlements

- **Objectives Per Settlement Name:**
  - MST/OATT Rate Schedule 1
  - Voltage Support Payments
  - Black Start Service Payment
  - NYPA Transmission Adjustment Charge
  - DAM Regulation Service Capacity
  - Balancing Supplier Regulation Service Capacity

Power Supplier Ancillary Service Settlements

- **Objectives Per Settlement Name:**
  - Real Time Regulation Movement
  - Regulation Revenue Adjustment
  - Regulation Performance Charge
  - Under Generation Penalty
  - **Over Generation Penalty**
  - Over Withdrawal Penalty
  - DAM Reserve
  - Balancing Reserve

Power Supplier Ancillary Service Settlements

- **Over Generation Penalty Description**
  - Intended to penalize Power Suppliers causing regulation burden due to over-generating above their RTD Basepoint (MW) outside of acceptable tolerance levels.

Over Generation Penalty

- **Settlement Eligibility**
  - Generators are subject to receive a charge for Over-Generation Penalty if:
    - Generator Type = Wind or Solar and is ≥ 13 MW
    - RTD RT Generator Limit Output Flag = Y
    - Outside 3% Tolerance Level

Over Generation Penalty

- **Settlement Determinants**
  - Generation Type ID
  - RTD RT Generator Output Limit Flag
  - Hr DAM Reg Capacity Price ($/MW)
  - RTD Reg Capacity Price ($/MW)
  - RTD Basepoint (MW)
  - RTD Gen Avg Actual Energy (MW)
  - RTD Gen Upper Op Limit (MW)
  - RTD Interval Seconds

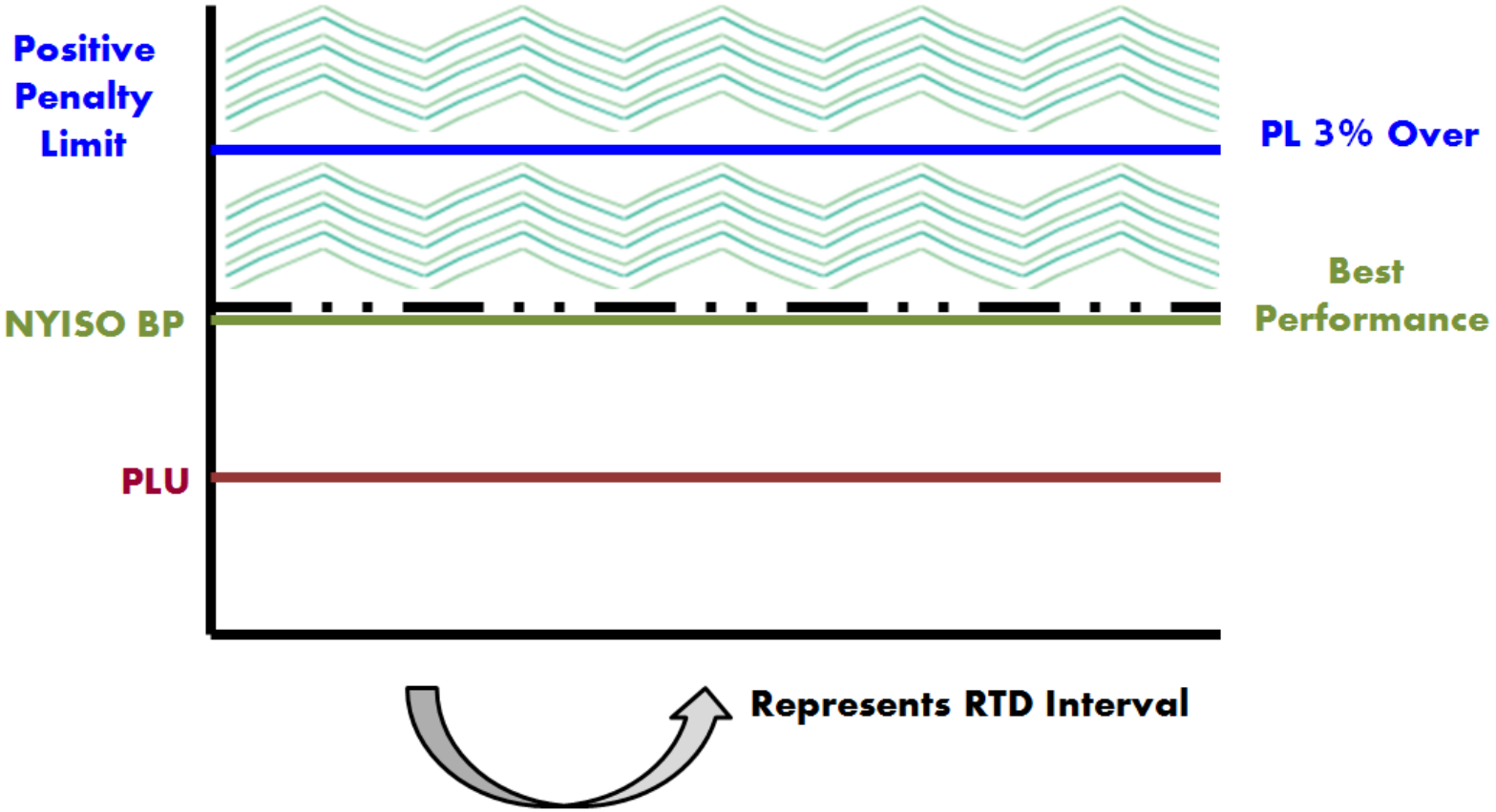
Over Generation Penalty

- **Settlement Intermediates**
  - RTD Reg Positive Error (MW)

- **Settlement Results**
  - RTD Output-Limited Over-Generation Reg Penalty ($)

Over Generation Penalty

- Settlement Algorithm – RTD Pos Error



Over Generation Penalty

- ## Settlement Algorithm

RTD Output-Limited Over-Generation Reg Penalty ($) =
[Max{(RTD Reg Positive Error (MW) * Max(Hr DAM Reg Capacity Price ($/MW),
RTD RT Reg Price ($/MW)) * RTD Interval Seconds
/3600), 0} * -1]

Where:
RTD Reg Positive Error (MW) =
Max{RTD Gen Avg Actual Energy (MW) – (RTD Basepoint (MW) + (UOL * 0.03)), 0 MW}

Over Generation Penalty

- **Settlement Scenario**
  - ‘Generator A’ is a Wind unit capable of producing up to 15 MWs
    - Output Limit Flag = Y
  - RTD Basepoint = 15 MW
  - RTD Gen Avg Actual Energy = 20 MW
  - Gen UOL = 25 MW
  - Positive Penalty Limit = 15.75 MW
  - RTD Reg Positive Error = 4.25 MW
  - DAM Regulation Capacity Price = $2
  - RT Regulation Capacity Price = $1

Over Generation Penalty

- ## Settlement Example

RTD Output-Limited Over-Generation Reg Penalty ($) = -$0.71
[Max{(4.25 * Max($2, $1) * 300/3600), 0} * -1]

Where:
RTD Reg Positive Error (MW) = 4.25
{20 - (15 + (25 * 0.03))}
{20 - (15 + 0.75)}
{20 – 15.75}

Over Generation Penalty

- **Summary**
  - Intended to penalize Power Suppliers causing regulation burden due to over-generating above their RTD Basepoint (MW) outside of acceptable tolerance levels.

Over Generation Penalty

- **Settlement Reference Material**
  - MST Section 15.3A – Schedules
  - Accounting and Billing Manual Appendix I & G

Over Generation Penalty

- **Settlement Reference Material**
  - Advisory Billing File
    - Power Supplier
      - Regulation Charge ($)
    - Hourly Bill Code 222
    - Daily Bill Code 309
  - DSS Corporate Report
    - Settlement Details - Power Supplier – Regulation Penalty for Power Suppliers

Power Supplier Ancillary Service Settlements

- **Objectives Per Settlement Name:**
  - MST/OATT Rate Schedule 1
  - Voltage Support Payments
  - Black Start Service Payment
  - NYPA Transmission Adjustment Charge
  - DAM Regulation Service Capacity
  - Balancing Supplier Regulation Service Capacity

Power Supplier Ancillary Service Settlements

- **Objectives Per Settlement Name:**
  - Real Time Regulation Movement
  - Regulation Revenue Adjustment
  - Regulation Performance Charge
  - Under Generation Penalty
  - Over Generation Penalty
  - **Over Withdrawal Penalty**
  - DAM Reserve
  - Balancing Reserve

Power Supplier Ancillary Service Settlements

- **Over Withdrawal Penalty Description**
  - Intended to charge Energy Storage Resources, that are not providing Regulation Service, causing regulation burden due to over-withdrawal above their RTD Basepoint (MW) outside of acceptable tolerance levels

Over Withdrawal Penalty

- **Settlement Eligibility**
  - Energy Storage Resources are subject to receive a charge for Over-Withdrawal Penalty if:
    - Outside 3% Tolerance Level

Over Withdrawal Penalty

- **Settlement Determinants**
  - Generation Type ID
  - Hr DAM Reg Capacity Price ($/MW)
  - RTD Reg Capacity Price ($/MW)
  - RTD Basepoint (MW)
  - RTD Gen Avg Actual Energy (MW)
  - RTD Gen Upper Op Limit (MW)
  - RTD PLO (MW)
  - RTD Interval Seconds

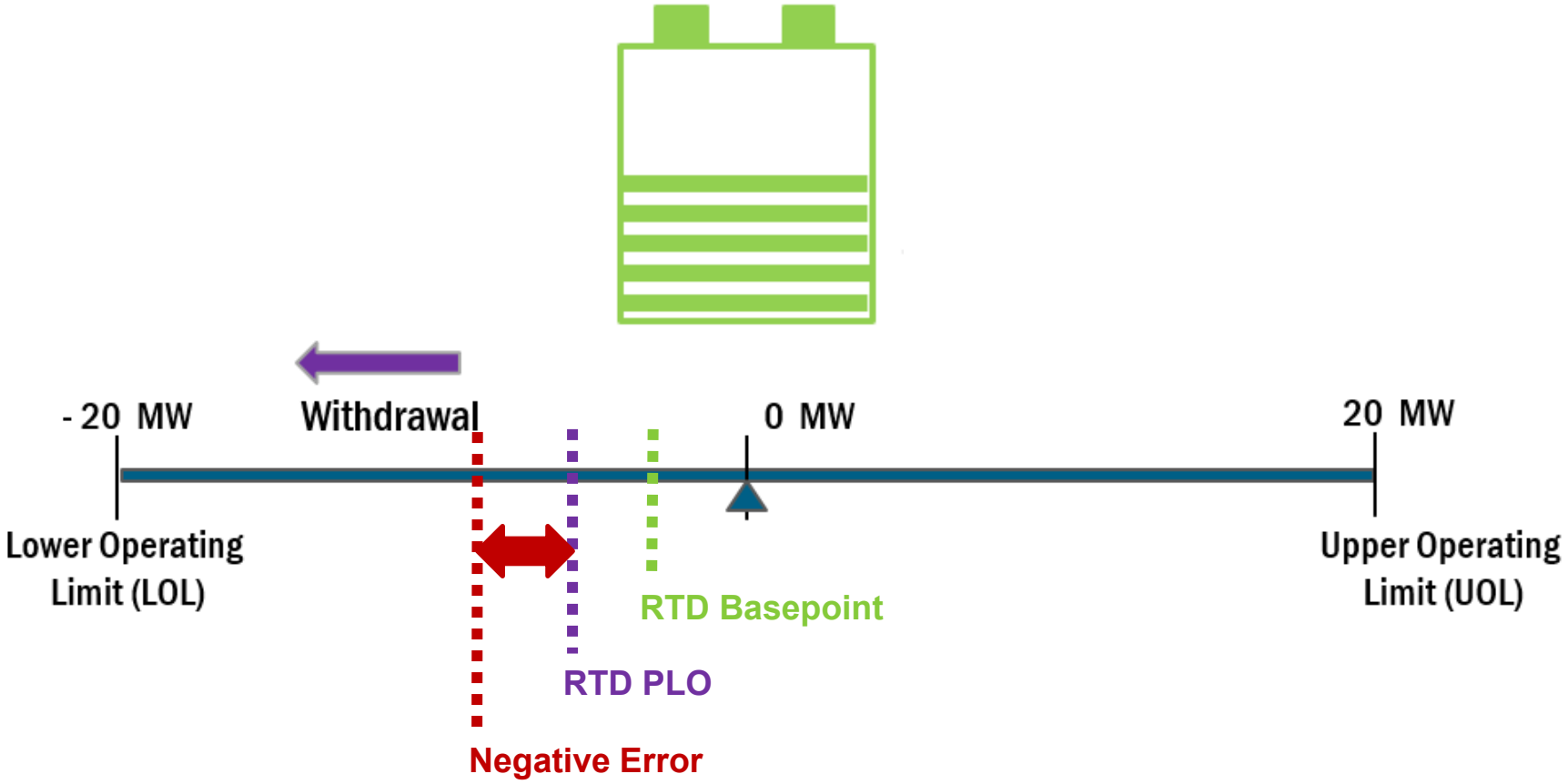
Over Withdrawal Penalty

- **Settlement Intermediates**
  - RTD Reg Negative Withdrawal Error (MW)

- **Settlement Results**
  - RTD Over-Withdrawal Reg Penalty ($)

Over Withdrawal Penalty

- Settlement Algorithm – RTD Negative Withdrawal Error



Over Withdrawal Penalty

- Settlement Algorithm

RTD Over-Withdrawal Reg Penalty ($) =
[Max{(RTD Reg Negative Withdawal Error(MW)* Max(Hr DAM Reg Capacity Price($/MW), RTD RT Reg Capacity Price ($/MW)) * RTD Interval Seconds/3600), 0} * -1]

Where:
RTD Reg Negative Withdrawal Error (MW) =
Max[RTD PLO (MW) – RTD Gen Avg Actual Withdrawal Energy (MW), 0 MW]

Over Withdrawal Penalty

- **Summary**
  - Intended to charge Energy Storage Resources, that are not providing Regulation Service, causing regulation burden due to over-withdrawal above their RTD Basepoint (MW) outside of acceptable tolerance levels

Over Withdrawal Penalty

- **Settlement Reference Material**
  - MST Section 15.3A – Schedules
  - Accounting and Billing Manual Appendix I & G

Over Withdrawal Penalty

- **Settlement Reference Material**
  - Advisory Billing File
    - Power Supplier
      - Regulation Charge ($)
    - Hourly Bill Code 222
    - Daily Bill Code 309
  - DSS Corporate Report
    - Settlement Details - Power Supplier – Regulation Penalty for Power Suppliers

Power Supplier Ancillary Service Settlements

- **Objectives Per Settlement Name:**
  - MST/OATT Rate Schedule 1
  - Voltage Support Payments
  - Black Start Service Payment
  - NYPA Transmission Adjustment Charge
  - DAM Regulation Service Capacity
  - Balancing Supplier Regulation Service Capacity

Power Supplier Ancillary Service Settlements

- **Objectives Per Settlement Name:**
  - Real Time Regulation Movement
  - Regulation Revenue Adjustment
  - Regulation Performance Charge
  - Under Generation Penalty
  - Over Generation Penalty
  - Over Withdrawal Penalty
  - DAM Reserve
  - Balancing Reserve

Power Supplier Ancillary Service Settlements

- **DAM Reserve Availability Description**
  - Intended to compensate Power Suppliers who offer their Generator's capacity as Reserve Service to the NYISO in the DAM.

DAM Reserve Availability

- **Settlement Eligibility**
  - Power Suppliers will receive a payment for DAM Reserve Availability if:
    - Hr DAM Sched Res Avail (MWh) > 0
      - 10 Minute Spinning Reserves
      - 10 Minute Non-Synchronous Reserves
      - 30 Minute Spinning & Non-Synchronous Reserves

DAM Reserve Availability

- **Settlement Determinants**
  - Gen AS Pricing Region Ind
  - Hr DAM ‘Reserve Type’ Price ($/MW)
  - Hr DAM Sched ‘Reserve Type’ Avail (MWh)

DAM Reserve Availability

- **Settlement Intermediates**
  - N/A

- **Settlement Results**
  - Hr DAM 'Reserve Type' Avail StImnt ($)

DAM Reserve Availability

- Settlement Algorithm

Hr DAM ‘Reserve Type’ Avail Stlmnt ($) =
Hr DAM Sched ‘Reserve Type’ Avail (MWh) * Hr DAM ‘Reserve Type’ Price ($/MW)

Power Supplier Ancillary Service Settlements

- **Balancing Reserve Availability Description**
  - Intended to compensate Power Suppliers who offer their Generator's capacity as Reserve Service to the NYISO in the RT Market.

Balancing Reserve Availability

- **Settlement Eligibility**
  - Power Suppliers will receive a payment for Balancing Reserve Availability if:
    - Hr DAM Sched Res Avail (MWh) > 0

    Or

    - RTD BalMkt Sched Res Avail (MWh) > 0
      - 10 Minute Spinning Reserves
      - 10 Minute Non-Synchronous Reserves
      - 30 Minute Spinning & Non-Synchronous Reserves

Balancing Reserve Availability

- **Settlement Determinants**
  - Gen AS Pricing Region Ind
  - RTD Interval Seconds
  - Hr DAM Sched ‘Reserve Type’ Avail (MWh)
  - RTD RT Sched ‘Reserve Type’ Avail (MW)
  - RTD RT ‘Reserve Type’ Price ($/MW)

Balancing Reserve Availability

- **Settlement Intermediates**
  - RTD BalMkt Sched 'Reserve Type' Avail (MW)

- **Settlement Results**
  - RTD BalMkt 'Reserve Type' Avail Stlmnt ($)

Balancing Reserve Availability

- ## Settlement Algorithm

RTD BalMkt *Reserve Type* Avail Stlmnt ($) =
RTD BalMkt Sched 'Reserve Type' Avail (MW) * RTD RT 'Reserve Type' Price ($/MW) * RTD Interval Seconds/3600

Where:
RTD BalMkt Sched 'Reserve Type' Avail (MW) =
RTD RT Sched 'Reserve Type' Avail (MW) – Hr DAM Sched 'Reserve Type' Avail (MWh)

Reserve Availability

- **Settlement Scenario – Part 1**
  - ‘Generator A’ is scheduled to provide DAM Reserves
    - Operating Day 10/18/11
    - Operating HB 11
    - 20 MWhs
  - DAM ‘Reserve Type’ MCP = $15

Reserve Availability

- **Settlement Scenario – Part 2**
  - Subsequently; ‘Generator A’ is eligible for a RT Reserve Settlement
    - Operating Day 10/18/11
    - Operating HB 11
    - RTD Interval 11:05
    - 17 MWhs
  - RT ‘Reserve Type’ MCP = $1.20

Reserve Availability

- ## Settlement Example

Hr DAM ‘Reserve Type’ Avail Stlmnt ($) = $300
20* $15

RTD BalMkt *Reserve Type* Avail Stlmnt ($) = -$0.30
-3 * $1.20 * 300/3600

Where:
RTD BalMkt Sched ‘Reserve Type’ Avail (MW) = -3
17 - 20

Reserve Availability

- **Summary**
  - DAM Reserve
    - Compensating PS offering capacity as Reserve Service to NYISO in DAM
      - Based on…
        - » Reserve Product Type
        - » Reserve Product Location
  - Balancing Reserve
    - Compensating PS offering capacity as Reserve Service to NYISO in RT Market
      - Based on…
        - » Reserve Product Type
        - » Reserve Product Location

Reserve Availability

- **Settlement Reference Material**
  - MST Section 15.4 – Schedules
  - Accounting and Billing Manual Section 5.3

DAM Reserve Availability

- **Settlement Reference Material**
  - Advisory Billing File
    - Power Supplier
      - Reserve Availability $
      - Reserve MCP $
      - Reserve MWHr
    - Hourly Bill Code 223 - 246
    - Daily Bill Code 310
      - Operating Reserve Payment $
  - DSS Corporate Report
    - Settlement Details - Power Supplier – DAM 'Reserve Type' Availability

Balancing Reserve Availability

- **Settlement Reference Material**
  - Advisory Billing File
    - Power Supplier
      - Reserve Availability $
      - Reserve MCP $
      - Reserve MWHr
    - Hourly Bill Code 223 - 246
    - Daily Bill Code 310
      - Operating Reserve Payment $
  - DSS Corporate Report
    - Settlement Details - Power Supplier – Balancing Market 'Reserve Type' Availability

Appendix

Power Supplier Ancillary Service Settlements

- **Voltage Support Lost Opportunity Cost (LOC) Description**
  - 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.

Voltage Support (LOC)

- **Settlement Eligibility**
  - Power Suppliers will receive a payment for Voltage Support LOC if:
    - The Generator is capable of Providing Voltage Support Service
    - The Generator is Qualified by NYISO to Provide Voltage Support Service
    - The Generator was Out of Merit to provide Voltage Support Service during the hour

Voltage Support (LOC)

- **Settlement Determinants**
  - RTD Economic Operating Point (MW)
  - RTD Gen Adjusted Energy (MW)
  - RTD Basepoint (MW)
  - Hr DAM Sched Gen (MW)
  - RTD VSS Flag
  - RTD Interval Seconds
  - Hr RT Gen Bid: Gen n (MW)
  - Hr RT Gen Bid: Price n ($/MW)

Voltage Support (LOC)

- **Settlement Intermediates**
  - RTD RT Total Price: Gen ($/MW)
  - RTD VSS LOC: Revenue ($)
  - RTD VSS LOC: Cost ($)

- **Settlement Results**
  - RTD VSS LOC StImnt ($)

Voltage Support (LOC)

- ## Settlement Algorithm

RTD VSS LOC Stlmnt ($) =
RTD VSS LOC-Revenue ($) – RTD VSS LOC-Cost ($)

Where:
RTD VSS LOC-Revenue ($) =
[{EOP – Max(RTD Gen Adj Energy (MW), RTD Basepoint (MW), Hr DAM Sched Gen (MW))} * RTD RT Total Price: Gen ($/MW) * RTD Interval Seconds/3600]

RTD VSS LOC-Cost ($) =
Area Under Bid Curve from Max(RTD Gen Adj Energy (MW), RTD Basepoint (MW), Hr DAM Sched Gen (MW)) to EOP * RTD Interval Seconds/3600

Voltage Support (LOC)

- ## Settlement Algorithm with Example

RTD VSS LOC-Revenue ($) =
[{EOP – Max(RTD Gen Adj Energy (MW), RTD Basepoint (MW), Hr DAM Sched Gen (MW))} * RTD RT Total Price: Gen ($/MW) * RTD Interval Seconds/3600]

EOP	270
RTD Gen Adj Energy (MW)	210
RTD Basepoint (MW)	220
DAM Sched Gen (MW)	218
RTD RT Total Price Gen	$75
RTD VSS LOC- Revenue	(270 – 220) * $75 * 300/3600 = $312.50

Voltage Support (LOC)

- ## Settlement Algorithm with Example

RTD VSS LOC-Cost ($) =
Area Under Bid Curve from Max(RTD Gen Adj Energy (MW), RTD Basepoint (MW), Hr DAM Sched Gen (MW)) to EOP * RTD Interval Seconds/3600

	Bid MW 1	Bid MW 2	Bid MW 3
Bid MW	200	240	300
Bid $	$32	$36	$44

Max (210, 220, 218)	220
EOP	270
Cost Components	(240 – 220) * $36 = $720 (270 – 240) * $44 = $1,320
Area Under Curve/Bid Cost	($720 + $1,320) * 300/3600 = $170

Voltage Support (LOC)

- ## Settlement Algorithm with Example

RTD VSS LOC Stlmnt ($) =
RTD VSS LOC-Revenue ($) – RTD VSS LOC-Cost ($)

RTD VSS LOC Stlmnt ($) = $142.50
$312.50 – $170

Voltage Support (LOC)

- **Summary**
  - 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.
    - Based on…
      - Revenue Lost & Cost Saved
    - Calculated at the RTD Settlement Level

Voltage Support (LOC)

- **Settlement Reference Material**
  - MST Section 15.2 – Schedules
  - Accounting and Billing Manual Section 5

Voltage Support (LOC)

- **Settlement Reference Material**
  - Advisory Billing File
    - Power Supplier
      - Voltage Support LOC $
    - Hourly Bill Code 215
    - Daily Bill Code 307
  - DSS Corporate Report
    - Settlement Details - Power Supplier - Voltage Support Service LOC