

### **Rate Schedule 3**

#### **Payments for Regulation Service**

This Rate Schedule applies to Suppliers ~~who~~that provide Regulation Service to the ISO.

Transmission Customers will purchase Regulation Service from the ISO under the ISO OATT.

#### **1.0 Obligations of the ISO and Suppliers**

##### **1.1 The ISO shall:**

- (a) Establish ~~regulation and frequency response~~Regulation Service criteria and requirements in the ISO Procedures to ensure that Generators follow changes in Load consistent with the Reliability Rules;
- (b) Provide ~~SCDRTD~~SCDRTD Base Point Signals and AGC Base Point Signals to Generators providing ~~this~~Regulation Service to direct ~~the Generator's~~their output;
- (c) Establish criteria in the ISO Procedures that ~~Suppliers~~Generators must meet to qualify, or re-qualify, to supply ~~this~~Regulation Service;
- (d) Establish minimum metering requirements and telecommunication capability required for a Generator to be able to respond to AGC Base Point Signals and ~~SCDRTD~~SCDRTD Base Point Signals sent by the ISO;
- (e) Select ~~Suppliers~~Generators to provide ~~this~~Regulation Service in the Day-Ahead Market and ~~during the Dispatch Day ("Real-Time Market")~~, as described in Section 2.0 of this Rate Schedule;

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- (f) Pay Suppliers for providing ~~this~~Regulation Service as described in ~~Section 4.0~~Sections 4.0, 5.0, 6.0 and 7.0 of this Rate Schedule; and
- (g) Monitor ~~the Suppliers~~Generators' performance to ensure that they provide Regulation Service as required, as described in Section 3.0 of this Rate Schedule.

**1.2 Suppliers shall:**

- (a) Use~~Offer only~~ Generators that are: (i) ISO-Committed Flexible or Self-Committed Flexible; within the dispatchable portion of their operating range, and;(ii) able to respond to AGC Base Point Signals sent by/from the ISO pursuant to the ISO Procedures; to provide Regulation Service
- (b) Not use, contract to provide, or otherwise commit ~~the capability~~Capability that is ~~designated~~selected by the ISO to provide Regulation Service to provide Energy or ~~spinning~~Operating reserveReserves to any party other than the ISO; and
- (c) Pay ~~all~~any charges ~~due~~imposed under ~~Sections 2(f) and~~this Rate Schedule including, if ~~the relevant charges~~they are re-~~instituted by~~the ISO, charges described in Section 4.18.0 of this Rate Schedule.

- ~~1.3~~ (d) Ensure that all of its Generators shall: (a) ~~Comply~~that are selected to provide Regulation Service comply with ~~SCD~~ Base Point Signals issued by the ISO at all times pursuant to the ISO Procedures; and
- (b) ~~Comply with the~~ Ensure that all of its Generators that are selected to provide Regulation Service comply with all ISO Procedures that apply to providing Regulation

Service.

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**2.0 Selection of Suppliers in the Day-Ahead Market and the Real-Time Market (~~Dispatch~~  
~~Day~~)**

- (a) The ISO shall select Suppliers, in the Day-Ahead Market, to provide Regulation

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Service for each hour in the following Dispatch Day, from those that have Bid to provide Regulation Service from Generators that meet the qualification standards and criteria established in Section 1 of this Rate Schedule and in the ISO Procedures.

- (b) Real-Time Market: The ISO shall establish a Real-Time Market ~~to provide an alternate supply for Regulation Service during the Dispatch Day where (i) Suppliers scheduled in the Day Ahead Market are inadequate (e.g. and will establish a real-time Regulation Service Market-Clearing Price in each interval. During any period when the ISO suspends Generators' obligation to follow the AGC Base Point Signals sent to Regulation Service providers, insufficient Suppliers Bid in pursuant to Section 9.0 of this Rate Schedule, the Day Ahead real-time Market-Clearing Price for Regulation Service), (ii) a scheduled Supplier is unable to provide Regulation Service (e.g., the Generator tripped), or (iii) the demand for Regulation Service increases beyond the scheduled supply. The ISO shall select Suppliers in the Real-Time Market, during the Dispatch Day, to provide Regulation Service for each hour in automatically be set at zero, which an insufficient supply of Regulation Service exists, shall be the price used for real-time balancing and settlement purposes.~~ The ISO shall select Suppliers for Regulation Service from those that have Bid to provide Regulation Service from Generators that meet the qualification standards and criteria established in the ISO Procedures;
- (c) The ISO shall establish separate ~~Availability market clearing prices~~ Market Clearing

Prices for Regulation Service in the Day-Ahead Market and the Real-Time Market under Sections 4.0, 5.0 and 7.0 of this Rate Schedule. The ISO shall also compute Regulation Revenue Adjustment Payments and Regulation Revenue Adjustment Charges under Section 6.0 of this Rate Schedule.

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~~(d)~~**2.1 Bidding Process:**

- (i) ~~Any qualified~~            A Supplier may submit a Bid in the Day- Ahead Market or the Real-  
Time Market to provide ~~this~~ Regulation Service from eligible Generators, provided,  
however, that Bids submitted by Suppliers that are attempting to re-qualify to provide  
Regulation Service, after being disqualified pursuant to Section 3.0 of this Rate  
Schedule 3, may be limited by the ISO pursuant to ISO ~~procedures~~; Procedures.
- (ii) Bids rejected by the ISO may be modified and

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resubmitted by the Supplier to the ISO in accordance with the terms of the ISO Tariff;  
~~and (iii) Bids in the Day Ahead Market that are not accepted by the ISO shall be automatically considered for the Real Time Market, unless withdrawn by the Supplier.~~

- (~~ec~~) Each Bid shall contain the following information: (i) the ~~Generator capability~~maximum amount of Capability (in MW) that the ~~Supplier will~~Generator is willing to provide for Regulation Service; (ii) the Generator's regulation response rate (in MW/Minute) which must be sufficient to permit that Generator to provide the offered amount of Regulation Service within an ~~SCD~~SCDRTD interval ~~of normal length (initially, SCD intervals will normally and which shall be five (5) minutes long)~~the same as the response rate specified in the Energy Bid for that Generator; (iii) the Supplier's Availability Bid Price (in \$/MW); and (iv) the physical location and name or designation of the Generator.
- (~~f~~) ~~The ISO shall, if a Generator providing Regulation Service trips off line, immediately attempt to re-establish a supply for the remainder of that Generator's commitment. Any additional cost incurred by the ISO as a result of covering the defaulting Generator's remaining commitment shall be reimbursed to the ISO by the defaulting Supplier. If the Availability payment for the replacement Regulation Service decreases, the ISO shall not pay the defaulting Supplier the difference in cost.~~

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~~(g) — If a Generator reduces its Capacity bid subsequent to being scheduled to provide Regulation or Operating Reserves (either Day Ahead or in a Supplemental Commitment), and if it, as a result, can no longer provide both the amount of Energy it was scheduled to provide Day Ahead and the amount of Regulation and Operating Reserves it was scheduled to provide, the ISO will first reduce the amount of Operating Reserves it is scheduled to provide, and then will reduce the amount of Regulation it is scheduled to provide, until the total amount of Energy, Regulation and Operating Reserves it is scheduled to provide is equal to its Capacity (or until it is no longer scheduled to provide Regulation or Operating Reserves).~~

### **3.0 Monitoring Suppliers and Generators Regulation Service Performance and Performance Related Payment Adjustments**

(a) The ISO shall establish (i) Generator performance measurement criteria; (ii) procedures to disqualify Suppliers ~~using whose~~ Generators that consistently fail to meet ~~such those~~ criteria; and (iii) procedures to re-qualify disqualified Suppliers, which may include a requirement to first demonstrate acceptable performance for a time.

- (b) The ISO shall establish and implement a Performance Tracking System to monitor the performance of Generators that provide Regulation Service. The ISO shall develop performance indices, which may vary with Control Performance, as part of the ISO Procedures. The Performance Tracking System shall compute the difference between the Energy

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actually supplied and the Energy scheduled by the ISO for all Generators serving Load within the NYCA as set forth in the ISO Procedures. The ISO shall use these values to compute Settlements reduce Regulation Service payments pursuant to Section 5.4 of this Rate Schedule.

- (c) ~~Payments by the ISO to each Supplier of Regulation Service will be based on the Generator's performance with respect to the performance indices. Suppliers that fail to perform at a level consistent with these indices may forfeit all or a substantial portion of their Availability payments, which would otherwise be payable for the subject hour. Suppliers that consistently fail to perform adequately may be disqualified by the ISO, pursuant to ISO Procedures.~~

#### **4.0 ~~Payments to Suppliers of Regulation Services~~**

##### **~~(a) Regulation Service Settlements – Day-Ahead Market~~**

##### **4.1 Calculation of Day-Ahead Market Clearing Prices**

The ISO shall ~~pay Suppliers of this~~ calculate a Day-Ahead Market Clearing Price for Regulation Service (i) ~~an Availability payment (for reserving capability to provide Regulation Service),~~ and (ii) ~~an Energy payment, as described below.~~

- (b) ~~The Availability payment,~~ each hour of the following day. The Day-Ahead Market-Clearing Price for each hour ~~or fraction thereof in which~~ shall equal the Day-Ahead Shadow Price of the ISO's Regulation Service constraint for that hour, which shall be



established under the ISO Procedures. Day-Ahead Shadow Prices will be calculated by the ISO's SCUC. Each hourly Day-Ahead Shadow Price shall include the Lost Opportunity Costs and Availability Bids of the marginal Generator selected during the fifth SCUC pass, described in Section of Attachment B to this ISO Services Tariff, and Section of Attachment J to the ISO OATT, that is selected to provide Regulation Service in that hour. Shadow Prices will also take account of the Regulation Service Demand Curves described in Section 7.0 of this Rate Schedule, which will ensure that Regulation Service is not scheduled by SCUC at a cost greater than the Demand Curve indicates should be paid.

Each Supplier that is scheduled Day-Ahead to provide Regulation Service shall be paid the Day-Ahead Market Clearing Price in each hour, multiplied by the amount of Regulation Service that it is scheduled to provide in that hour.

#### **4.2 Other Day-Ahead Payments**

As is provided, is equal in Article 4 and Attachment C of the Services Tariff, the ISO shall compensate each ISO-Committed Flexible Generator that provides Regulation Service if its Bid Production Cost to the following:

$$Availability\ Payment = MCP_{reg} \times R_{cap} \times K_{pi}$$

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Sched. 3 provide the Energy and Ancillary Services it is scheduled to supply in the Day-Ahead Market, including start-up costs, minimum Load costs, and Availability Bids, exceeds the revenues it receives from the sale of Energy and Ancillary Services.

No payments shall be made to any Supplier providing Regulation Service in excess of the amount of Regulation Service scheduled by the ISO in the Day-Ahead Market, except to the extent that a Supplier is directed to provide the excess amount by the ISO.

## **5.0 Regulation Service Settlements – Real-Time Market**

### **5.1 Calculation of Real-Time Market Clearing Prices**

The ISO shall calculate a Real-Time Market Clearing Price for Regulation Service for every RTD interval, except as noted in Section 9.0 of this Rate Schedule. The Real-Time Market-Clearing Price for each interval shall equal the real-time Shadow Price for the ISO’s Regulation Service constraint for that RTD interval, which shall be established under the ISO Procedures. Real-time Shadow Prices will be calculated by the ISO’s RTD. Each real-time Shadow Price shall include the Lost Opportunity Costs and Availability Bids of the marginal Generator, based on the third Real-Time Dispatch pass, described in Section of Attachment B to this ISO Services Tariff and Section of Attachment J to the ISO OATT, that is selected to provide Regulation Service in that interval. Shadow Prices will also take account of the Regulation Service Demand Curves described in Section 7.0 of this Rate Schedule, which will ensure that Regulation Service is not scheduled by RTC at a cost greater than the Demand Curve indicates should be paid.

### **5.2 Real-Time Regulation Service Balancing Payments**

Any deviation from a Generator’s Day-Ahead schedule to provide Regulation Service shall be settled pursuant to the following rules.

- (a) When the Generator’s real-time Regulation Service schedule is less than its Day-Ahead

Regulation Service schedule, the Generator shall pay a charge for the imbalance equal to the product of: (i) the Real-Time Market Clearing Price for Regulation Service; and (ii) the difference between the Generator's Day-Ahead Regulation Service schedule and its real-time Regulation Service schedule (subject to possible adjustments pursuant to Section 5.4 of this Rate Schedule.)

(b) When the Generator's real-time Regulation Service schedule is greater than its Day-Ahead Regulation Service schedule, the ISO shall pay the Generator an amount to compensate it for the imbalance equal to the product of: (i) the Real-Time Market Clearing Price for Regulation Service; and (ii) the difference between the Generator's Day-Ahead Regulation Service schedule and its real-time Regulation Service schedule (subject to possible adjustments pursuant to Section 5.4 of this Rate Schedule.)

### **5.3 Other Real-Time Regulation Service Payments**

As is provided in Article 4 and Attachment C of the Services Tariff, the ISO shall compensate each ISO-Committed Flexible Generator that provides Regulation Service if its Bid Production Cost to provide the Energy and Ancillary Services it is scheduled to supply in the Real-Time Market, including start-up costs, minimum Load costs, and Availability Bids, exceeds the revenues it receives from the sale of Energy and Ancillary Services.

No payments shall be made to any Generator providing Regulation Service in excess of the amount of Regulation Service scheduled by the ISO in the Real-Time Market, except to the extent that a Generator is directed to provide the excess amount by the ISO.

Finally, whenever a Generator's real-time Regulation Service schedule is reduced by the ISO to a level lower than its Day-Ahead schedule for that product, the Generator's Day-Ahead Margin shall be protected after accounting for any margin associated with additional MWs of other products that the

Generator is scheduled to provide in real-time. The rules governing the calculation of these Day-Ahead Margin Assurance Payments are set forth in Attachment J to this ISO Services Tariff.

#### **5.4 Performance-Based Adjustments to Regulation Service Payments**

The total amount paid to Generators for providing Regulation Service shall be reduced to reflect the Generator's performance pursuant to the following formula:

$$\underline{\underline{Total\ Payment = (DAMCP_{reg} \times DAR_{cap}) + ((RTR_{cap} \times K_{pi}) - DAR_{cap}) \times RTMCP_{reg}}}$$

Where:

MCP<sub>reg</sub> DAMCP<sub>reg</sub> is the applicable ~~regulation market clearing price~~ Market Clearing Price for ~~regulation~~ Regulation Service (in MW), in either the Day-Ahead or Real Time Market, as appropriate, as established by the ISO pursuant to Section 4.1 of this Rate Schedule; and R<sub>cap</sub>

DAR<sub>cap</sub> is the ~~regulation capability~~ Regulation Service Capability (in MW) offered by the Supplier Generator and selected by the ISO for either in the Day-Ahead or Real Time Market Market;

RTMCP<sub>reg</sub> is the applicable Market Clearing Price for Regulation Service (in MW), in the Real-Time Market as established by the ISO under Section 5.1 of this Rate Schedule;

RTR<sub>cap</sub> is the Regulation Service Capability (in MW) offered by the Generator and selected by the ISO in the Real-Time Market; and

K<sub>pi</sub> is a factor, with a value between 0.0 and 1.0 inclusive, derived from each Supplier Generator's Regulation Service performance, as measured by the performance indices set forth in the ISO Procedures. K<sub>pi</sub> is defined using, and determined pursuant to the following equation:

$$K_{pi} = \frac{PI - PSF}{1 - PSF}$$

Where:

PI is the ~~unit~~Generator's performance index; and

PSF is the payment scaling factor, established pursuant to ISO ~~procedures~~Procedures.

The PSF shall be set between 0 and the minimum performance index required for payment of Availability payments. The PSF is established to reflect the extent of ISO compliance with the standards

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~~Sched. 3 established by NERC, NPCC or Good Utility Practice for Control Performance and System Security. The PSF is set initially at zero. Should the ISO's compliance with these measures deteriorate, in a manner that can be improved if regulation performance improves, the PSF will be increased.~~

~~Generators providing Regulation providers Service will be required to increase their performance index to obtain the same availability total Regulation Service payment as they received during periods of good ISO performance, as measured by these standards.~~

~~If Suppliers are scheduled in the Real Time Market to begin providing Regulation~~

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~~Service at some point within an hour, the market clearing price determined in the Real Time Market may change during the hour. All Suppliers scheduled in the Real Time Market to provide Regulation Service during the portion of any such hour preceding the price change will be paid the market clearing price determined in the Real Time Market for the portion of the hour preceding the price change. All Suppliers scheduled in the Real Time Market to provide Regulation Service during the portion of any such hour following the price change will be paid the market clearing price determined in the Real Time Market for the portion of the hour following the price change.~~

~~The Energy payment is equal to the following:~~

- ~~(i) — Each Supplier shall receive Day Ahead Market payments for Energy consistent with that Supplier's Day Ahead schedule.~~
- ~~(ii) — At times when the AGC Base Point Signals exceeds the SCD Base Point Signals sent to a Supplier's resource, that Supplier shall be paid the Real Time LBMP at that resource's bus for all Energy produced by that resource, up to the amount of Energy scheduled by the AGC Base Point Signals, minus the amount of Energy scheduled Day Ahead to be produced by that resource.~~
- ~~(iii) — At times when the SCD Base Point Signals exceeds the AGC Base Point~~

Signals sent to a Supplier's Generator, each Supplier shall be paid the Real-Time LBMP at the Generator's bus for X MW minus the amount of Energy scheduled Day Ahead to be produced by that Generator, where X is defined as:

$$\begin{aligned} X &= ACT, \text{ if } ACT < AGC \text{ (SCD-AGC);} \\ &AGC \text{ (SCD-AGC)} + 2(ACT - AGC \text{ (SCD-AGC)}), \\ &\text{if } ACT \geq AGC \text{ (SCD-AGC) and } ACT \leq AGC; \\ &SCD, \text{ if } ACT > AGC; \end{aligned}$$

where ACT is the amount of Energy actually produced by the Generator; AGC is the AGC Base Point Signal sent to the Generator; and SCD is the SCD Base Point Signal sent to the Generator.

- (iv) Notwithstanding the preceding clauses, whenever the ISO announces a reserve pick-up, each Supplier located in the area affected by that reserve pick-up shall be paid the Real-Time LBMP for all Energy it produces, minus the amount of Energy scheduled to be produced Day Ahead by that Generator, if that Supplier was either scheduled to operate in BME or subsequently has been directed to operate by the ISO.



~~December 18, 2000.~~

### ~~Regulation Market Clearing Price~~

~~The ISO shall determine a regulation market clearing price to be paid to Suppliers for resource Availability (in MW) reserved to provide Regulation Service in the Day Ahead or Real Time Markets. The ISO shall stack Bids submitted by qualified Suppliers from lowest Bid (\$/MW) to highest Bid. The ISO shall select Bids to provide Regulation Service starting with the lowest Bids. The Bid associated with the last Supplier selected to supply Regulation Service shall set the  $MCP_{reg}$ . All Suppliers selected in the same market (i.e., Day Ahead or Real Time) will receive an Availability payment calculated with the corresponding  $MCP_{reg}$ .~~

## 6.0 ~~4.0a Persistent Undergeneration by Suppliers Not~~ Energy Settlement Rules for Generators Providing Regulation Service

### 6.1 Energy Settlements

~~An Off Dispatch Supplier~~ For any interval in which a Generator that is not providing Regulation Service and that persistently operates at a level below receives an AGC Base Point Signal that is different than its RTD Base Point Signal the Generator shall receive a settlement payment for Energy consistent with a real-time Energy injection equal to the lower of its Hour Ahead schedule actual generation or its Economic Operating Point, shall pay a persistent undergeneration charge to the ISO, unless its operation is within a tolerance described below AGC Base Point Signal. ~~Persistent undergeneration charges for Off Dispatch Suppliers shall be calculated as follows:~~

~~Persistent undergeneration charge = Energy Difference x  $MCP_{reg}$  x Length of SCD Interval/60 Minutes~~

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where: Energy Difference in (MW) is determined by subtracting the the actual Energy provided by the Supplier from the lower of the Energy required by its Hour Ahead schedule or its Economic Operating Point; averaged over each SCD interval; and  $MCP_{reg}$  is the Market Clearing Price (\$/MW) which applies to the SCD interval for which Regulation Service in the Real Time Market, or the Day Ahead Market if no Real Time Market applies, the calculation for which is specified in the ISO Procedures. The Energy Difference shall be set at zero for any Energy Difference that is otherwise negative or that falls within a tolerance, set pursuant to ISO Procedures, and which shall contain a steady state and a dynamic component. The steady state component shall initially be 3% of the Supplier's upper operating limit, and the dynamic component shall be a time constant that shall initially be set at fifteen minutes. The ISO may modify the steady state and dynamic components as necessary to maintain good Control Performance.

—— An On Dispatch Supplier that is not providing Regulation Service and that persistently operates at level below its SCD Base Point Signal shall pay a persistent undergeneration charge

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to the ISO, unless its operation is within a tolerance described below. Persistent undergeneration charges for On-Dispatch Suppliers shall be calculated as follows:

$$\text{Persistent undergeneration charge} = \frac{\text{Energy Difference} \times \text{MCP}_{\text{reg}} \times \text{Length of SCD Interval}}{60 \text{ Minutes}}$$

where: Energy Difference in (MW) is determined by subtracting the actual Energy provided by the Supplier from the energy signaled to be supplied by the Supplier's SCD Base Point Signal, averaged over each SCD interval; and  $\text{MCP}_{\text{reg}}$  is the Market Clearing Price (\$/MW) which applies to the SCD interval for which Regulation Service in the Real Time Market, or the Day Ahead Market if no Real Time Market applies, the calculation for which is specified in the ISO Procedures. The Energy Difference shall be set at zero for any Energy Difference that is otherwise negative or that falls within a tolerance, set pursuant to ISO Procedures, and which shall contain a steady state and a dynamic component. The steady state component shall initially be 3% of the Supplier's upper operating limit, and the dynamic component shall be a time constant that shall initially be set at fifteen minutes. The ISO may modify the steady state and dynamic components as necessary to maintain good Control Performance.

—————The following types of Generators shall not be subject to persistent undergeneration charges:

**6.2 Additional Payments/Charges When AGC Base Point Signals Exceed RTD Base Point Signals**

(i)

Generators providing Energy under contracts (including PURPA contracts), executed and effective on or before November 18, 1999, in which the power purchaser does not control the operation of the supply source but would be responsible for payment of the persistent undergeneration charge;

(ii) Existing topping turbine Generators and extraction turbine Generators producing electric

Energy resulting from the supply of steam to the district steam system in operation on or

before November 18, 1999 and/or topping or extraction turbine Generators utilized in

replacing or repowering existing steam supplies from such units (in accordance with

good engineering and economic design) For any interval in which a Generator that

cannot follow schedules, up to a maximum total of 365 MW of such units;

(iii) Existing intermittent (*i.e.*, non-schedulable) renewable resource Generators within the

NYCA in operation on or before November 18, 1999, plus up to an additional 500

MW of such Generators; and

(iv) Capacity Limited Resources and Energy Limited Resources to the extent that their real-

time Energy injections are equal to or greater than their bid in upper operating limits but

are less than their Real Time Scheduled Energy Injections.

None of these exemptions shall be available to a Supplier during an SCD interval when it is scheduled to provide providing Regulation Service or receives an AGC Base Point Signal that is On-

Dispatch.

~~\_\_\_\_\_ All persistent undergeneration charges shall be suspended in the event that the ISO re-institutes higher than its RTD Base Point Signal it shall receive or pay a Regulation performance charges pursuant to Section 4.1, below. Revenue Adjustment Payment (“RRAP”) or Regulation Revenue Adjustment Charge (“RRAC”) calculated under the terms of this subsection. If the Energy Bid Price of such a Generator is higher than the LBMP the Generator shall receive a RRAP. Conversely, for any interval in which such a Generator’s Energy Bid Price is lower than the LBMP the Generator shall be assessed a RRAC. RRAPs and RRACs shall be calculated using the following~~

formula: 
$$Payment / Charge = \frac{\int_{RTD \text{ Base Point Signal}}^{\max(RTD \text{ Base Point Signal}, \min(AGC \text{ Base Point Signal}, Actual))} [Bid - LBMP]}{RTD \text{ Base Point Signal}}$$

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Issued on: June 29, 2001 For purposes of this formula, whenever the Generator’s actual Bid exceeds the applicable LBMP the “Bid” term shall be set at a level equal to the minimum of (Bid or Reference Bid +\$100).

### **6.3 Additional Charges/Payments When RTD Base Point Signals Are Lower than AGC Base Point Signals**

For any interval in which a Generator that is providing Regulation Service receives an AGC Base Point Signal that is lower than its RTD Base Point Signal it shall receive or pay a RRAP or RRAC calculated under the terms of this subsection. If the Energy Bid Price of such a Generator is higher than the LBMP the Generator shall be assessed a RRAC. Conversely, for any interval in which such a Generator’s Energy Bid Price is lower than the LBMP the Generator shall receive a RRAP. RRAPs and RRACs shall be calculated using the following formula:

$$Payment / Charge = \frac{\int_{\min(RTD \text{ Base Point Signal}, \max(AGC \text{ Base Point Signal}, Actual))}^{RTD \text{ Base Point Signal}} - [Bid - LBMP]}{\min(RTD \text{ Base Point Signal}, \max(AGC \text{ Base Point Signal}, Actual))}$$

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Sched. 3 For purposes of this formula, whenever the Generator's actual Bid is lower than the applicable LBMP the "Bid" term shall be set at a level equal to the minimum of (Bid or Reference Bid - \$100).

## **7.0 Regulation Service Demand Curve**

The ISO shall establish a Regulation Service Demand Curve that will apply to both the Day-Ahead and real-time Regulation Service markets. The Market Clearing Prices for Regulation Service calculated pursuant to Sections 4.1 and 5.1 of this Rate Schedule shall take account of the demand curve established in this Section so that Regulation Service is not purchased at a cost higher than the demand curve indicates should be paid in the relevant market.

The ISO shall establish a target level of Regulation Service for each hour, which will be the number of MW of Regulation Service that the ISO would seek to maintain in that hour if cost were not a consideration. The ISO will then define a Regulation Service demand curve for that hour as follows:

For quantities of Regulation Services that are less than or equal to the target level of Regulation Services minus 25 MW, the price on the Regulation Service demand curve shall be \$300/MW.

For quantities of Regulation Service that are less than or equal to the target level of Regulation Service but that exceed the target level of Regulation Service minus 25 MW, the price on the Regulation Service demand curve shall be \$250/MW.

For all other quantities, the price on the Regulation Service demand curve shall be \$0/MW. However, the ISO shall not schedule more Regulation Service than the level defined by the requirement for that hour.

In order to respond to operational or reliability problems that arise in real-time, the ISO may procure Regulation Service at a quantity and/or price point different than those specified above. The ISO shall post a notice of any such purchase as soon as reasonably possible and shall report on the reasons for such purchases at the next meeting of its Business Issues Committee. The ISO shall also



investigate whether it is necessary to modify the quantity and price points specified above to avoid future operational or reliability problems. The ISO will consult with its independent market advisor when it conducts this investigation.

If the ISO determines that it is necessary to modify the quantity and/or price points specified above in order to avoid future operational or reliability problems it may temporarily modify them for a period of up to one hundred and twenty days. If circumstances reasonably allow, the ISO will consult with its independent market advisor, the Business Issues Committee, the Commission, and the PSC before implementing any such modification. In all circumstances, the ISO will consult with those entities as soon as reasonably possible after implementing a temporary modification.

A periodic independent review of the Regulation Service Demand Curve will be performed in accordance with the ISO Procedures to determine whether its parameters should be adjusted.

#### **4.18.0 Reinstating Performance Charges**

The ISO will monitor, on a real-time hourly or daily basis, as appropriate, its compliance with the standards established by NERC and NPCC and with the standards of Good Utility Practice for Control Performance, Area Control Area, Disturbance Control Standards, Reserve Pickup Performance and System Security. Should it appear to the ISO that degradation in performance threatens compliance with one or more of the established standards for these criteria or compromises reliability, and that reinstating the performance charges that were originally part of the ISO's market design, would assist in improving compliance with established standards for these criteria, or would assist in re-establishing reliability, the ISO may require Suppliers of Regulation Service, as well as Suppliers not providing Regulation Service, to pay a performance charge. Any reinstatement of Regulation penalties pursuant to this Section shall not override previous Commission-approved settlement agreements that exempt a particular unit from such penalties. The ISO shall provide notice of

its decision to reinstate performance charges to the Commission, to each Customer and to the Operating Committee and the Business Issues Committee no less than seven days before it re-institutes the performance charges.

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If the ISO determines that performance charges are necessary, Suppliers of Regulation Service shall pay a performance charge to the ISO as follows:

$$\text{Performance Charge} = \text{Energy Deviation} \times \text{MCP}_{\text{reg}} \times (\text{Length of SCD-Interval}/60$$

minutes)

Where:

~~where:~~ Energy Deviation (in MW) is the absolute difference between the actual Energy supplied by the Supplier and the Energy required by the AGC Base Point Signals, whether positive or negative, averaged over each SCDRTD interval; and

MCP<sub>reg</sub> is the Market Clearing Price (\$/MW) which applies to the SCDRTD interval for this Service in the Real-Time Market or the Day-Ahead Market, ~~if no Real-Time Market~~ applies appropriate.

The method used by the ISO to calculate the Energy Deviation will permit Suppliers a

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certain period of time to respond to AGC Base Point Signals. Initially this time period will be thirty (30) seconds, although the ISO will have the authority to change its length. If the Supplier's output at any point in time is between the largest and the smallest of the AGC Base Points sent to that Supplier within the preceding thirty (30) seconds (or such other time period length as the ISO may define), the Supplier's Energy Deviation at that point in time will be zero. Otherwise, the Supplier may have a positive Energy Deviation. However, in cases in which responding to the AGC Base Point within that time period would require a Supplier to change output at a rate exceeding the amount of Regulation it has been scheduled to provide, the Supplier will have a zero Energy Deviation if it changes output at the rate equal to the amount of Regulation it is scheduled to provide.

## **9.0 Temporary Suspension of Regulation Service Markets During Reserve Pick-Ups**

During any period in which the ISO has activated RTD-CAM software and has called for a “large event” or “small event” reserve or maximum generation pickup, as described in Article 4.4.4(A) of this ISO Services Tariff, the ISO will suspend Generators’ obligation to follow the AGC Base Point Signals sent to Regulation Service providers and will suspend the real-time Regulation Service market. The ISO will not procure any Regulation Service and will establish a real-time Regulation Service Market-Clearing Price of zero for settlement and balancing purposes. The ISO will resume sending

AGC Base Point Signals and restore the real-time Regulation Service market as soon as possible after the end of the reserve or maximum generation pickup.

## Rate Schedule “3-A”

### Charges Applicable to Suppliers That Are Not Providing Regulation Service

#### 1.0 Persistent Undergeneration Charges

A Supplier that is not providing Regulation Service and that persistently operates at a level below its schedule shall pay a persistent undergeneration charge to the ISO, unless its operation is within a tolerance described below. Persistent undergeneration charges shall be calculated as follows:

$$\text{Persistent undergeneration charge} = \frac{\text{Energy Difference} \times \text{MCP}_{\text{reg}} \times \text{Length of Interval}}{60}$$

Minutes

Where:

Energy Difference in (MW) is determined by subtracting the actual Energy provided by the Supplier from its RTD Base Point Signal for the dispatch interval. The Energy Difference shall be set at zero for any Energy Difference that is otherwise negative or that falls within a tolerance, set pursuant to ISO Procedures, and which shall contain a steady-state and a dynamic component. The steady-state component shall initially be 3% of the Supplier’s Normal Upper Operating Limit or Emergency Upper Operating Limit, as applicable, and the dynamic component shall be a time constant that shall initially be set at fifteen minutes; and

MCP<sub>reg</sub> is the Market-Clearing Price (\$/MW) which applies to the dispatch interval for which Regulation Service in the Real-Time Market, or, if applicable, the Day-Ahead Market.

#### 2.0 Restoration of Performance Charges

In addition, if the ISO determines that The persistent undergeneration charges described in Section 1.0 above shall be suspended in the event that the ISO re-institutes Regulation performance charges are

~~necessary, charges pursuant to Section 8.0 of Rate Schedule 3 of this Services Tariff. If the ISO re-~~  
~~institutes performance charges then~~ Suppliers that sell Energy through the LBMP Markets or ~~that~~ supply  
Bilateral Transactions that serve Load in the NYCA, but ~~that~~ do not provide Regulation Service, shall  
pay a performance charge to the ISO as

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Sched. 3 follows:

Performance Charge = Energy Difference x  $MCP_{reg}$  x Length of ~~SCD~~ Interval/60 minutes

Where:

~~where:~~ Energy Difference (in MW) is the absolute difference between the actual Energy supplied by the Supplier and the Energy ~~required~~ it is directed to produce by the SCDRTD Base Point Signals, whether positive or negative, averaged over each SCDRTD interval; and

$MCP_{reg}$  is the Market Clearing Price (\$/MW) which

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~~Sched. 3~~ applies to the ~~SCD~~-interval for which Regulation Service was provided in the Real-Time Market, or, if appropriate, the Day-Ahead Market ~~if no Real Time Market applies~~.

In cases in which the Energy Difference that would be calculated using the procedure described above is less than the tolerance set forth in the ISO Procedures, the ISO shall set the Energy Difference for that ~~SCD~~-interval equal to zero.

### **3.0 Exemptions**

The following types of Generator shall not be subject to persistent undergeneration charges, or, if they are restored by the ISO, to performance charges:

- (i) Generators providing Energy under contracts (including PURPA contracts), executed and effective on or before November 18, 1999, in which the power purchaser does not control the operation of the supply source but would be responsible for payment of the persistent undergeneration or performance charge;
- (ii) Existing topping turbine Generators and extraction turbine Generators producing electric Energy resulting from the supply of steam to the district steam system in operation on or before November 18, 1999 and/or topping or extraction turbine Generators utilized in replacing or repowering existing steam supplies from such units (in accordance with good engineering and economic design) that cannot follow schedules, up to a maximum total of 365 MW of such units;
- (iii) Existing intermittent (*i.e.*, non-schedulable) renewable resource Generators within the NYCA in operation on or before November 18, 1999, plus up to an additional 500 MW of such Generators; and

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- (iv) Capacity Limited Resources and Energy Limited Resources to the extent that their real-time Energy injections are equal to or greater than their bid-in upper operating limits but are less than their Real-Time Scheduled Energy Injections.

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Sheet Nos. 282 through 285 are reserved for future use.

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