

New York Independent System Operator, Inc.
FERC Electric Tariff
Original Volume No. 2
Sched. 4

Original Sheet No. 286

Rate Schedule 4

Payments for Supplying Operating Reserves

This Rate Schedule applies to payments to Suppliers ~~who~~that provide Operating Reserves to the ISO. Transmission Customers will purchase Operating Reserves from the ISO under Rate Schedule 5 of the ISO OATT.

~~—The ISO shall provide procedures to establish adequate Operating Reserves that comply with the Reliability Rules. Operating Reserves are classified as follows:~~

- ~~(1) — Spinning Reserve: Operating Reserves provided by generation facilities and Interruptible Load Resources located within the NYCA that are already synchronized to the NYS Power System and can respond to instructions to change output level within ten (10) minutes;~~
- ~~(2) — 10 Minute Non Synchronized Reserve ("10 Minute NSR"): Operating Reserves provided by generation facilities that can be started, synchronized and loaded within ten (10) minutes; and~~
- ~~(3) — 30 Minute Reserve: Operating Reserves provided by generation facilities and Interruptible Load Resources that can respond to instructions to change output or consumption level within thirty (30) minutes.~~

~~—The ISO shall satisfy at least fifty (50) percent of the applicable 10 Minute Reserve~~

Issued by: ~~William J. Museler, President~~ Effective: ~~January 2, 2001~~
Issued on: ~~January 16, 2001~~
Filed to comply with order of the Federal Energy Regulatory Commission, Docket No. ER99-4235-002, issued
December 18, 2000.

requirements with Spinning Reserve. If the ISO satisfies all of the 10 Minute Reserve requirement through Spinning Reserve, it does not have to maintain 10 Minute NSR. The ISO shall establish additional categories of Operating Reserves if necessary to ensure reliability.

Procedure for Setting Prices for Reserves

The ISO's software design substitutes higher quality reserves in place of lower quality reserves, when doing so lowers the total bid cost, i.e., when the marginal bid for the higher quality reserve is lower than the marginal bid for the lower quality reserve. To the extent, however, that reliability standards require the use of higher quality reserves, substitution cannot be made in the opposite direction. In addition, if the total requirements for operating reserves are such that the marginal unit of operating reserves is a unit of higher priced lower quality reserves (e.g., 10 Minute NSR as compared to 10 Minute spinning reserves), then the market clearing price for operating reserves will be set by the higher priced lower quality reserves.

Accordingly, the price of higher quality reserves will not clear at a price below the price of lower quality reserves. For example, the clearing price of 10 Minute spinning reserves will not be below the clearing price for 10 Minute NSR and the clearing price for 10 Minute NSR will not be below the clearing price for 30 Minute Reserves.

1.0 General Responsibilities and Requirements

1.1 ISO Responsibilities

The ISO shall procure on behalf of its Customers a sufficient quantity of Operating Reserve products to comply with the Reliability Rules and with other applicable reliability standards. These

quantities shall be established under Section 7.0 of this Rate Schedule. To the extent that the ISO enters into Operating Reserve sharing agreements with neighboring Control Areas its Operating Reserves requirements shall be adjusted accordingly.

The ISO shall define requirements for Spinning Reserve, which may be met only by Suppliers that are eligible, under Section 1.2 of this Rate Schedule, to provide Spinning Reserve; 10-Minute Reserve, which may be met by Suppliers that are eligible to provide either Spinning Reserve or 10-Minute Non-Synchronized Reserve; and 30-Minute Reserve, which may be met by Suppliers that are eligible to provide any Operating Reserve product. The ISO shall also define locational requirements for Spinning Reserve, 10-Minute Reserve, and 30-Minute Reserve located East of Central East and on Long Island. In addition to being subject to the preceding limitations on Suppliers that can meet each of these requirements, the requirements for Operating Reserve located East of Central East may only be met by eligible Suppliers that are located East of Central East, and requirements for Operating Reserve located on Long Island may only be met by eligible Suppliers located on Long Island. Each of these Operating Reserve requirements shall be defined consistent with the Reliability Rules and other applicable reliability standards. The ISO shall select Suppliers of Operating Reserves products to meet these requirements, including the locational Operating Reserves requirements, as part of its overall co-optimization process.

The ISO shall ~~ensure that providers of~~select Operating Reserves Suppliers that are properly located electrically so that all locational Operating Reserves requirements determined consistently with the requirements of Section 7.0 of this Rate Schedule are satisfied, and so that transmission constraints resulting from either the commitment or dispatch of ~~units~~Generators do not limit the ISO's ability to deliver Energy to Loads in the case of a Contingency. The ISO will ensure that Suppliers that are

compensated for using Capacity counted toward meeting to provide one Operating Reserve requirements product is are not also counted toward meetings simultaneously compensated for providing another Operating Reserve product, or Regulation and Frequency Response Service requirements, using the same Capacity (consistent with the additive market clearing price calculation formulae in Sections 5.1 and 6.1 of this Rate Schedule.).

~~2.0 — Spinning Reserve Requirements and Responsibilities~~

~~2.1 — Day Ahead Market for Spinning Reserve~~

1.2 Supplier Eligibility Criteria

~~Suppliers offering Generator~~ The ISO shall enforce the following criteria, which define which types of Generators or Demand Side Resources are eligible to provide Spinning Reserve in the Day Ahead commitment shall submit Availability Bids for each hour of the upcoming day. For Spinning Reserves Suppliers located east of the Central East constraint not subject to a requirement to submit Availability Bids shall be limited to zero plus each Spinning Reserves Supplier's verifiable fuel commitment costs for providing Spinning Reserves for each hour. The ISO shall select Spinning supply particular Operating Reserve Suppliers for each hour of the upcoming day through its Day Ahead commitment, using Bids and/or schedules provided by the Suppliers, including products.

Issued by: William J. Museler, President Effective: January 2, 2001

Issued on: January 16, 2001

Filed to comply with order of the Federal

a. Spinning Reserve: Generators that are ISO Committed Flexible or Self-

Committed Flexible, are operating within the dispatchable portion of their operating range, are capable of responding to ISO instructions to change their output level within ten minutes, and are capable of producing Energy Regulatory Commission, Docket No. ER99-4235-002, issued December 18, 2000.

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Availability Bids by both Class A Unit and Class B Unit Suppliers, for at least thirty minutes shall be eligible to supply Spinning Reserve.

b. 10-Minute Non-Synchronized Reserve: Off-line Generators that are capable of

starting, synchronizing, and increasing their output level within ten (10) minutes and that meet the criteria set forth in the ISO Procedures, and, when the ISO has the capability to support their participation, Demand Side Resources that are capable of reducing their

~~Energy Bids by Class A Unit Suppliers. The ISO shall notify each Supplier of Spinning Reserve that has been selected usage within ten (10) minutes and that meet the criteria set forth in the Day Ahead Schedule of the amount ISO Procedures, shall be eligible, provided that they are capable of Spinning Reserve it has been scheduled providing Energy for at least thirty minutes, to provide. Suppliers of Spinning supply 10-Minute Non-Synchronized Reserve scheduled Day Ahead shall either provide Spinning Reserve or shall generate Energy when requested by.~~

c. **30-Minute Reserve:** (i) Generators that are ISO Committed Flexible or Self-Committed Flexible and operating within the ISO dispatchable portion of their operating range shall be eligible to do so, in all hours for which they have been selected to provide Spinning Reserve.

2.2 — Real-Time Market for Spinning Reserve

~~During each Dispatch Day, Suppliers whose Generators have not been scheduled to provide Spinning Reserve and which still have Capacity that has not been committed for use in any other way may submit Availability Bids to provide Spinning Reserve to supply synchronized 30-Minute Reserves;~~

~~(ii) Off-line Generators that are capable of starting, synchronizing, and increasing their output level within thirty (30) minutes and that meet the ISO.~~

~~These real-time Availability Bids may differ from Availability Bids that were made by those Suppliers in criteria set forth in the Day Ahead commitment, except that for Spinning Reserves Suppliers located east of ISO Procedures, and, when the Central East constraint not subject to a requirement to submit Availability Bids at a lower level, Availability Bids shall be limited to zero plus each Spinning Reserves Supplier's verifiable fuel commitment costs for providing Spinning Reserves for each hour. If ISO has~~

the ISO anticipates that it will require additional Spinning Reserves in an hour, it shall select additional Suppliers capable to support their participation, Demand Side Resources that are capable of Spinning Reserve from among those Suppliers that have submitted Real Time Availability Bids to it for that hour. It shall make this selection with reducing their Energy usage within thirty (30) minutes and that meet the objective of minimizing criteria set forth in the cost of meeting Load and providing all necessary Ancillary Services in that hour. The ISO shall notify

Issued by: _____ William J. Museler, President _____ Effective: _____ January 2, 2001

Issued on: _____ January 16, 2001

Filed to comply with order of the Federal Energy Regulatory Commission, Docket No. ER99-4235 ISO Procedures, shall be eligible to supply non-synchronized 30-002, issued December 18, 2000.

~~each Supplier of Spinning Reserve that has been selected in the Real Time dispatch of the amount of Spinning Reserve it must provide. Any previously uncommitted Class A Unit whose Bid to provide Spinning Reserve is accepted by the ISO will be treated as a Generator on dispatch.~~

~~2.3~~ **Suppliers' Responsibilities** Minute Reserves.

- d. Self-Committed Fixed and ISO-Committed Fixed Generators: Shall not be eligible to provide any kind of Operating Reserve.

1.3 Other Supplier Requirements

~~All Generators selected by the ISO as Suppliers of Spinning~~ Operating Reserve must be located within the NYCA and must be under ISO Operational Control. ~~All Suppliers of Spinning Reserves selected by the ISO shall ensure that their Generators maintain and deliver the appropriate quantity of Energy when called upon by the ISO in all hours in which they have been selected to provide Spinning Reserve. Each Generator~~ Supplier bidding to supply Spinning Operating Reserve or reduce demand must be able to provide Energy or reduce demand consistent with the Reliability Rules and the ISO Procedures when called upon by the ISO ~~and shall specify in its Bid the amount of time for which it can supply such Energy. Class A Units may not contract to provide, or otherwise commit any Capacity that has been scheduled to operate or.~~ All Suppliers that are selected to provide Operating Reserves, in either shall ensure that their Resources maintain and deliver the appropriate quantity of Energy, or reduce the appropriate quantity of demand, when called upon by the ISO during any interval in which they have been selected.

Generators or Demand Side Resources that are selected to provide Operating Reserve in the

~~Day-Ahead commitment Market~~ or any supplemental commitment conducted by the ISO. They also may not increase ~~the~~their Energy Bids ~~made~~or Demand Reduction Bids for ~~the~~ portions of ~~those~~their ~~Generators~~Resources that have been scheduled ~~Day Ahead~~ through those processes, or reduce their commitments, in real-time except to the extent that they are directed to provide Spinning Reserve. They may do so by the ISO. Generators and Demand Side Resources may enter into alternate sales arrangements utilizing any Capacity that has not been scheduled to provide Operating Reserve.

Issued by: William J. Museler, President Effective: January 2, 2001
Issued on: January 16, 2001
~~Filed to comply with order of the Federal Energy Regulatory Commission, Docket No. ER99-4235-002, issued December 18, 2000.~~

~~utilizing any Capacity that has not been scheduled to operate or to provide Operating Reserves. Class B Units may not use, contract to provide or otherwise commit any Capacity that has been scheduled to provide Spinning~~

2.0 General Day-Ahead Market Rules

2.1 Bidding and Bid Selection

~~Resources capable of providing Spinning Reserve, in either the, 10-Minute Non-Synchronized Reserve and/or 30-Minute Reserve in the Day-Ahead commitment may submit Availability Bids for each hour of the upcoming day. If a Supplier offers Resources that are capable, based on their indicated commitment or in any subsequent commitment by the ISO. Subject to the limitations on Installed Capacity Suppliers, if applicable, they may enter into alternate sales arrangements utilizing any Capacity that has not been scheduled to provide Spinning Reserve.~~

2.4 Spinning Reserve Service in Real-Time Operation

~~The ISO shall, if necessary, reduce the output on Class A Units via SCD from otherwise economic loading to provide Spinning status, of providing Operating Reserves but does not submit an Availability Bid, it will be assigned a Day-Ahead Availability bid of \$0/MWh. The same rules shall apply to Demand Side Resources capable of proving 10-Minute Non-Synchronized Reserve and/or non-synchronized 30-Minute Reserve when the ISO has the capability. When reserve is activated, the ISO shall measure actual performance against expected performance and shall charge financial penalties, as detailed in Section 5 of this Rate Schedule to Suppliers of Spinning Reserve which fail to perform in accordance with their accepted bids.~~

~~Issued by: William J. Museler, President Effective: January 2, 2001~~
~~Issued on: January 16, 2001~~
~~Filed to comply with order of the Federal Energy Regulatory Commission, Docket No. ER99-4235-002, issued December 18, 2000.~~

~~3.0~~ **10 Minute NSR and 30 Minute Reserve Requirements and Responsibilities**

~~3.1~~ **Day Ahead Market for 10 Minute NSR and 30 Minute Reserve**

~~Suppliers offering Generators or Demand Side Resources to provide~~ to support their participation in Operating Reserves market.

The ISO may schedule Suppliers that make themselves available to provide Operating Reserves up to the following maximum Operating Reserve levels: (i) for Spinning Reserves, the Resource's emergency response rate multiplied by ten; (ii) for 10-Minute NSR and/or Non-Synchronized Reserves, or for non-synchronized 30-Minute Reserve in the Day Ahead commitment shall submit Availability Bids for each hour of the upcoming day. The ISO shall select Suppliers of 10-Reserves, the Resource's UOL_N or UOL_F, whichever is applicable at the relevant time (the Resource may offer one product or the other depending on the time required for it to start-up and synchronize to the grid); and (iii) for synchronized 30-Minute NSR and 30 Minute Reserve for each Reserves, the Resource's emergency response rate multiplied by twenty. However, the sum of the amount of Energy or Demand Reduction each Resource is scheduled to provide, the amount of Regulation Service it is scheduled to provide, and the amount of each Operating Reserves product it is scheduled to provide shall not exceed its UOL_N or UOL_F, whichever is applicable.

The ISO shall select Operating Reserve Suppliers for each hour of the upcoming day through the Day Ahead commitment, using Bids and/or schedules provided by the Suppliers. The ISO shall notify each Supplier of 10 Minute NSR and/or 30 Minute Reserve that has been selected in the Day Ahead schedule of the amount of 10 Minute NSR and/or 30 Minute Reserve it has been scheduled to provide.

Suppliers of 10 Minute NSR and/or 30 Minute Reserve scheduled Day Ahead shall provide 10 Minute NSR and/or 30 Minute Reserve for all hours in which they have been scheduled to provide

~~10 Minute and/or 30 Minute Reserve.~~

~~3.2 — Real-Time Markets for 10-Minute NSR and 30-Minute Reserve~~

~~During the day, Suppliers that have not been scheduled to provide 10 Minute NSR or 30-Minute Reserve and which still have Capacity through a co-optimized Day-Ahead commitment process that has not been committed for use in any other way may submit Availability Bids to provide 10 Minute NSR and/or 30 Minute Reserve to minimize the~~

Issued by: William J. Museler, President Effective: July 8, 2003
Issued on: May 9, 2003

New York Independent System Operator, Inc. Second Revised Sheet No. 292
FERC Electric Tariff Superseding First Revised Sheet No. 292
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~~ISO, provided however that Availability Bids from Class A Units to provide 30 Minute Reserves for each hour shall be limited to zero and Class A Units that have total cost of Energy, Operating Reserves and Regulation Service, using Bids submitted Real Time Energy Bids shall be deemed to have submitted a Real Time Availability Bid pursuant to Article 4.2 of, and Attachment D to, this ISO Services Tariff. As part of zero to provide 30 Minute Reserve to the ISO for their full capability. These Real Time Availability Bids may differ from Availability Bids that were made by those Suppliers in co-optimization process, the Day Ahead commitment. ISO shall determine how much of each Operating Reserves product particular Suppliers will be required to provide in light of the ISO anticipates that additional~~

~~Suppliers of 10 Minute NSR or 30 Minute Reserve are needed in an hour, it shall select additional Suppliers of 10 Minute NSR or 30 Minute Reserve from among those Suppliers that have supplied Real Time Availability Bids to it for that hour. It shall make this selection with Reliability Rules and other applicable reliability standards, including the objective of minimizing the cost of meeting Load and providing all necessary Ancillary Services in that hour.~~

~~The ISO may perform multiple selections of Suppliers of 10 Minute NSR or 30 Minute Reserve for any given hour. Suppliers bidding to supply 10 Minute NSR or 30 Minute Reserve that have not already been scheduled to provide 10 Minute NSR or 30 Minute Reserve, other than Class A Units that have submitted Real Time Energy Bids, may change their Real Time Availability Bids from one hour to the next.~~

Issued by: William J. Museler, President Effective: July 8, 2003
Issued on: May 9, 2003

~~New York Independent System Operator, Inc. First Revised Sheet No. 292A
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~~The ISO shall notify each Supplier of 10 Minute NSR or 30 Minute Reserve that has been scheduled in the Real Time dispatch of the amount of 10 Minute NSR or 30 Minute Reserve it must provide. Any~~

Supplier whose Bid to provide 10-

Issued by: ~~William J. Museler, President~~ Effective: ~~July 8, 2003~~
Issued on: ~~May 9, 2003~~

~~Minute NSR or 30 Minute Reserve is accepted by the ISO in the Real Time dispatch must make its Generators or Demand Side Resources available for dispatch by the ISO.~~

3.3 — Suppliers' Responsibilities

~~Subject to the ISO's locational requirements, Suppliers of 10 Minute NSR or 30 Minute Reserve may use Generators located within the NYCA or outside the NYCA. In order for a Supplier to provide 10 Minute NSR or 30 Minute Reserve using a Generator located outside the NYCA, the operator of that Generator's Control Area must have agreed to modify the DNI between the NYCA and that Control Area instantaneously upon notification by the ISO that the ISO is initiating a reserve pick up for the area including that Generator. The locational Operating Reserves requirements specified above.~~

2.2 ISO Notice Requirement

~~The ISO shall notify each Operating Reserve Supplier that has been selected in the Day-Ahead Market of the amount of a 10 Minute NSR provided by Generators within any given External Control Area cannot exceed the maximum amount by which the operator of that Control Area will change the DNI from that Control Area into the NYCA within ten (10) minutes of the initiation of a reserve pick up by the ISO. Likewise, the amount of 30 Minute Reserve provided by Generators within any given external Control Area cannot exceed the maximum amount by which the operator of that Control Area will change the DNI from that Control Area into the NYCA within thirty (30) minutes of the initiation of a reserve pick up by the ISO. All Generators selected by the ISO as Suppliers of 10 Minute NSR or 30 Minute~~

~~Reserve shall ensure that their Generators maintain and deliver the appropriate quantity of Energy when called upon by the ISO in all hours in which they have~~ of each Operating Reserve product that it has been scheduled to provide.

2.3 Real-Time Market Responsibilities of Suppliers Scheduled to Provide Operating Reserves in the Day-Ahead Market

Issued by:

William J. Museler, President Effective: January 2, 2001

Issued on: January 16, 2001

~~Filed to comply with order of the Federal~~ Suppliers that are scheduled Day-Ahead to provide Operating Reserves shall either provide Operating Reserve, or Energy Regulatory Commission, Docket No. ER99-4235-002, issued December 18, 2000.

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3.0 General Real-Time Market Rules

3.1 Bid Selection

The ISO will automatically select Operating Reserves Suppliers in real-time from eligible Resources, and when the ISO has the capability to support their participation, Demand Side Resources, that submit Real-Time Bids pursuant to Section 4.4 of, and Attachment D to, this ISO Services Tariff. All Suppliers will automatically be assigned a real-time Operating Reserves Availability bid of \$0/MW. The ISO may schedule Suppliers that make themselves available to provide Operating Reserves up to the following maximum Operating Reserve levels: (i) for Spinning Reserves, the Resource's emergency response rate multiplied by ten; (ii) for 10-Minute Non-Synchronized Reserves, or for non-synchronized 30-Minute Reserves, the Resource's UOL_N or UOL_E, whichever is applicable at the relevant time (the Resource may offer one product or the other depending on the time required for it to start-up and synchronize to the grid); and (iii) for synchronized 30-Minute Reserves, the Resource's emergency response rate multiplied by twenty. However, the sum of the amount of Energy, or, when the ISO has the capability to support demand side participation, Demand Reduction, that each Resource is scheduled to provide, the amount of Regulation Service it is scheduled to provide, and the amount of each Operating Reserves product it is scheduled to provide shall not exceed its UOL_N or

UOL_E, whichever is applicable.

Suppliers will thus be selected on the basis of their response rates, their applicable upper operating limit, and their Energy Bid (which will reflect their opportunity costs) through a co-optimized real-time commitment process that minimizes the total cost of Energy, Regulation Service and Operating Reserves. As part of the process, the ISO shall determine how much of each Operating Reserves product particular Suppliers will be required to provide in light of the Reliability Rules and other applicable reliability standards, including the locational Operating Reserves requirements specified above.

3.2 ISO Notice Requirement

The ISO shall notify each Supplier of Operating Reserve that has been scheduled by RTD of the amount of Operating Reserve that it must provide.

3.3 Obligation to Make Resources Available to Provide Operating Reserves

~~been scheduled to provide 10 Minute NSR or 30 Minute Reserve.~~

~~Suppliers may not use, contract~~

Any Resource that is eligible to supply Operating Reserves and that is made available to provide
~~or otherwise commit any Capacity on any Generator that has been scheduled to provide 10 Minute NSR or 30 Minute Reserve in the Day Ahead commitment or in the Real Time dispatch. Subject to the limitations on Installed Capacity Suppliers, if applicable, they may enter into alternate sales arrangements utilizing any Capacity that has not been scheduled to provide 10 Minute NSR or 30 Minute Reserve in either the Day Ahead commitment or in the Real Time dispatch.~~

ISO for dispatch in Real-Time must also make itself available to provide Operating Reserves.

3.4 10-Minute NSR and 30-Minute Reserve Service in Real-Time Operation

Suppliers of 10 Minute NSR and 30 Minute Reserve **Activation of Operating Reserves**

All Resources that are selected by the ISO to provide Operating Reserves shall respond to the ISO's directions to direction by the ISO to activate. When reserve is activated, the ISO activate in real-time.

3.5 Performance Tracking and Supplier Disqualifications

When a Generator selected to supply Operating Reserves is activated, the ISO shall measure actual and track its actual Energy production against its expected performance-against expected performance and in real-time. The ISO may disqualify Generators that consistently fail to provide Energy when called upon to do so in real-time from providing Operating Reserves in the future. If a Resource has been disqualified, the ISO shall charge financial penalties as detailed require it to pass a re-qualification test before accepting any additional Bids to supply Operating Reserves from it. Disqualification and re-qualification criteria shall be set forth in Section 5 of this Rate Schedule, to Suppliers of 10 Minute NSR or 30 Minute Reserve, other than Class A Units supplying 30 Minute Reserves, which fail to perform in accordance with their accepted Bids.the ISO Procedures.

4.0 Payments to Suppliers of Spinning Reserve Operating Reserves Settlements –

General Rules

4.1 Establishing Locational Day-Ahead Availability Payments

Each Supplier which the ISO has scheduled Day Ahead to provide Spinning Reserve shall be paid **Reserve Prices**

Except as noted below, the ISO shall calculate separate Day-Ahead Market and Real-Time Market prices for each of the Day Ahead Availability price for Spinning three Operating Reserve in

each hour, multiplied by the amount of Spinning Reserve that Supplier is scheduled to provide in each hour. ~~The Day~~

Issued by: William J. Museler, President Effective: May 30, 2002
Issued on: May 8, 2002

New York Independent System Operator, Inc. Fourth Revised Sheet No. 295
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~~Ahead Availability price products~~ for Spinning Reserve for each hour shall be equal to the highest Availability Bid of any resource scheduled in the Day Ahead Market to meet any of the reserve requirements satisfied by reserves meeting the requirements applicable to Spinning Reserve at that location. ~~Day Ahead Availability prices will be calculated for Spinning Reserve located:~~of three locations: (i) east~~West~~ of central-east, excluding~~Central-East~~ ("West" or "Western"); (ii) East of Central-East Excluding Long Island; (ii) Long Island ("East" or "Eastern"); and (iii) west of central-east. ~~When there are no binding~~Long Island ("L.I."). ~~The ISO will thus calculate nine different~~ localional Operating Reserve prices in both the Day-Ahead Market and the Real-Time Market. Day-Ahead localional reserve prices shall be calculated pursuant to Section 5.0 of this Rate Schedule. Real-Time localional ~~reserve constraints between these three locations, the Day Ahead Availability price for Spinning Reserve shall be the same in each of the three locations. When there are binding location reserve constraints, separate Day Ahead Availability prices may be paid to Spinning Reserve Suppliers in each of the three locations. Examples of the manner in which these separate payments shall be~~ prices

shall be calculated are set forth in Technical Bulletin No. 80, Locational Reserve Availability Clearing Prices, found at http://www.nyiso.com/services/documents/techbulletins/pdf/tb_80.pdf. Whenever a pursuant to Section 6.0 of this Rate Schedule.

4.2 Settlements Involving Suppliers of Operating Reserves Located on Long Island
locational reserve constraint is binding in the Day Ahead Market, the amount paid to resources

Suppliers of Operating Reserves located on Long Island shall receive settlement payments as if they were providing Spinning Reserve, per MW of Spinning Operating Reserves located in the East.
The ISO will calculate separate locational Long Island Operating Reserves prices but will not post them or use them for settlement purposes.

4.3 “Cascading” of Operating Reserves

The ISO will deem Spinning Reserve to be the “highest quality” Operating Reserve, followed by 10-Minute Non-Synchronized Reserve and by 30-Minute Reserve. The ISO shall substitute higher quality Operating Reserves in place of lower quality Operating Reserves, when doing so lowers the total as-bid cost, i.e., when the marginal cost for the higher quality Operating Reserve product is lower than the marginal cost for the lower quality Operating Reserve scheduled applicable to the Long Island Spinning Reserve requirement, will not exceed the east of central east excluding Long Island Day-Ahead Spinning Reserve Availability price.

Issued by: _____ William J. Museler, President _____ Effective: _____ September 30, 2001
Issued on: _____ September 11, 2002
Filed to comply with order of the Federal Energy Regulatory Commission, Docket Nos. ER00-3591-000 *et al.*, issued August 27, 2002, 100 FERC ¶ 61,213 (2002).

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Locational Real-Time Availability Payments

~~Subject to the limitation in Section 4.3 below, each Supplier selected to provide more Spinning Reserve in an hour than it was scheduled Day Ahead to provide in that hour shall be paid the~~

~~Issued by: William J. Museler, President Effective: September 30, 2001
Issued on: July 30, 2001~~

Availability price for Spinning Reserve at its location, multiplied by the amount of Spinning product, and the substitution of a higher quality for the lower quality product does not cause locational Operating Reserve requirements to be violated. To the extent, however, that reliability standards require the use of higher quality Operating Reserves, substitution cannot be made in the opposite direction.

The price of higher quality Operating Reserves will not be set at a price below the price of lower quality Operating Reserves in the same location. Thus, the price of Spinning Reserves will not be below the price for 10-Minute Non-Synchronized Reserves or 30-Minute Reserves and the clearing price for 10-Minute Non-Synchronized Reserves will not be below the clearing price for 30-Minute Reserves.

5.0 Operating Reserve Settlements – Day-Ahead Market

5.1 Calculation of Day-Ahead Market Clearing Prices

The ISO shall calculate hourly Day-Ahead Market clearing prices for each Operating Reserve product at each location. Each Day-Ahead Market clearing price shall equal the sum of the relevant Day-Ahead locational Shadow Prices for that product in that hour, subject to the restriction described in Section 4.3 of this Rate Schedule.

The Day-Ahead Market clearing price for a particular Operating Reserve product in a particular location shall reflect the Shadow Prices associated with all of the Operating Reserve that Supplier provided that was in excess of the amount scheduled to be provided Day Ahead, if any. The ISO shall

calculate separate real time Availability prices for Spinning requirements, including locational requirements, that a particular Operating Reserves product from a particular location may be used to satisfy in a given hour. The ISO shall calculate Day-Ahead Market clearing prices using the following formulae:

$$\text{Market clearing price for Western 30-Minute Reserves} = \text{SP1}$$

$$\text{Market clearing price for Western 10-Minute-Non-Synchronized Reserves} = \text{SP1} + \text{SP2}$$

$$\text{Market clearing price for Western Spinning Reserves} = \text{SP1} + \text{SP2} + \text{SP3}$$

$$\text{Market clearing price for Eastern 30-Minute Reserves} = \text{SP1} + \text{SP4}$$

$$\text{Market clearing price for Eastern 10-Minute Non-Synchronized Reserves} = \text{SP1} + \text{SP2} + \text{SP4} + \text{SP5}$$

$$\text{Market clearing price for Eastern Spinning Reserves} = \text{SP1} + \text{SP2} + \text{SP3} + \text{SP4} + \text{SP5} + \text{SP6}$$

$$\text{Market clearing price for L.I. 30-Minute Reserves} = \text{SP1} + \text{SP4} + \text{SP7}$$

$$\text{Market clearing price for L.I. 10-Minute Non-Synchronized Reserves} = \text{SP1} + \text{SP2} + \text{SP4} + \text{SP5} + \text{SP7} + \text{SP8}$$

$$\text{Market clearing price for L.I. Spinning Reserves} = \text{SP1} + \text{SP2} + \text{SP3} + \text{SP4} + \text{SP5} + \text{SP6} + \text{SP7} + \text{SP8} + \text{SP9}$$

Where:

SP1 = Shadow Price for total 30-Minute Reserve for each requirement constraint for the hour

SP2 = Shadow Price for total 10-Minute Reserve requirement constraint for the hour

SP3 = Shadow Price for total Spinning Reserve requirement constraint for the hour. The real-time Availability price for Spinning

SP4 = Shadow Price for Eastern or L.I. 30-Minute Reserve for each requirement constraint for the hour shall be equal to the highest Availability Bid of any resource scheduled in the hour ahead

market to meet any of the reserve requirements applicable to Spinning Reserve at that location that is providing more Spinning Reserve in that hour than it had been scheduled to provide in that hour in the Day Ahead schedule. Real time Availability prices will be calculated for Spinning Reserve located: (i) east of central east but not on

SP5 = Shadow Price for Eastern or L.I. 10-Minute Reserve requirement constraint for the hour

SP6 = Shadow Price for Eastern or L.I. Spinning Reserve requirement constraint for the hour

SP7 = Shadow Price for Long Island; (ii) 30-Minute Reserve requirement constraint for the hour

SP8 = Shadow Price for Long Island; and (iii) west of central east. When there are no binding locational reserve constraints between these three locations, the real time Availability price for Spinning Reserve shall be the same in each of the three locations. When there are binding locational reserve constraints, separate Availability prices may be paid to Spinning Reserve Suppliers in each of the three locations. Examples of the manner in which these separate payments shall be 10-Minute Reserve requirement constraint for the hour

SP9 = Shadow Price for Long Island Spinning Reserve requirement constraint for the hour

Day-Ahead locational Shadow Prices will be calculated by the SCUC. Each hourly Day-Ahead Shadow Price shall equal the marginal cost of scheduling a Resource to provide the relevant Operating Reserves product in that hour. It will include the Availability Bid and lost opportunity cost of the marginal Resource, and any impact on the Bid Production Cost of procuring Energy or Regulation Service that would result from procuring an increment of Operating Reserve in that hour, as calculated are set forth in Technical Bulletin No. 80, Locational 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.

Shadow Prices will also be consistent with the Operating Reserve Demand Curves described in Section 7.0 of this Rate Schedule, which will ensure that Operating Reserves are not scheduled by SCUC at a

~~cost greater than the relevant Operating Reserve Availability Clearing Prices, found at http://www.nyiso.com/services/documents/techbulletins/pdf/tb_80.pdf. Whenever a Long Island locational reserve constraint is binding in the hour-ahead market, the amount paid to resources providing Spinning Demand Curve indicates should be paid. If more Operating Reserve;~~

~~Issued by: William J. Museler, President Effective: September 30, 2001
Issued on: September 11, 2002
Filed to comply with order of the Federal Energy Regulatory Commission, Docket Nos. ER00-3591-000 *et al.*, issued August 27, 2002, 100 FERC ¶ 61, 213 (2002). New York Independent System Operator, Inc.
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~~per MW of Spinning of a particular quality than is needed is scheduled to meet a particular locational Operating Reserve scheduled applicable to the Long Island Spinning Reserve requirement, will not exceed the east of central east excluding Long Island real-time Spinning requirement, the Shadow Price for that Operating Reserve Availability price.~~

~~Acceptance of any Spinning Reserve Bid in the real-time Market shall not affect the availability price for Spinning Reserve that was determined requirement constraint shall be set at zero.~~

~~Each Supplier that is scheduled Day-Ahead to provide Operating Reserve shall be paid the applicable Day-Ahead.~~

~~Locational Lost Opportunity Cost Payments~~

~~A Class A Supplier of Spinning Market clearing price, based on its location and the quality of Operating Reserve scheduled, multiplied by the amount of Operating Reserve that produces less Energy in the real-time dispatch than it would have been economic for it to produce because of its selection to provide 10 Minute Spinning Reserve will be paid for Lost Opportunity Costs ("LOC"). The Lost Opportunity Cost Payment ("LOCP") that each such Supplier receives in each SCD interval shall be~~

computed by multiplying the following: (i) the LOC of that Supplier at that location in that interval, in \$/MW; (ii) the number of MW of Spinning Reserve supplied by that Supplier in that interval; and (iii) the length of the SCD interval, in hours. LOC in each SCD interval shall be calculated as follows:

$$LOC = \max.(P_i - B_i, 0)$$

Issued by: William J. Museler, President Effective: September 30, 2001
Issued on: July 30, 2001

where:

B_i = ~~Energy Bid by Generator i at the level at which it is dispatched. For units scheduled to provide Spinning Reserve both that the Supplier is scheduled to provide in each hour.~~

5.2. Other Day-Ahead and hour ahead, the Bid is the higher of the Day Ahead or real time bid. For units scheduled only hour ahead, it is the real time Energy Bid. If Bids lower than zero are submitted, B_i shall equal zero.

P_i = ~~Real Time LBMP at Generator i 's location in that interval.~~

LOC will be calculated on a locational basis. Suppliers with Class B Units scheduled for Spinning Reserve shall not receive LOC payments for Capacity that was not available to be scheduled to generate Energy.

~~Other Payments~~

~~The ISO shall pay the Real Time LBMP for all Energy generated in accordance with the ISO's instructions. (Suppliers of Spinning Reserve shall be paid for Energy produced during reserve pick-ups in accordance with the provisions of Article 4 of the Tariff relative to real time Settlements.) Real Time LBMPs shall be computed under the assumption that all Energy generated by Class B Units supplying Spinning Reserve are fixed injections. Payments~~

As ~~provided in Article 4 in Section 4.10 and Attachment C of this ISO Services Tariff~~, the Tariff, ISO shall compensate each Generator/ISO-Committed Flexible Resource providing Spinning/Operating Reserves shall also be compensated by the ISO if its Bid Production Cost to provide

the Energy and Ancillary Services ~~the ISO has it~~ is scheduled ~~it~~ 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.

Issued by: William J. Museler, President Effective: September 30, 2001
Issued on: July 30, 2001

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Energy at LBMP prices, and ancillary services, including real-time opportunity costs for ancillary services scheduled Day Ahead.

4.1 ~~Payments to Suppliers of 10 Minute Non-Synchronized Reserve~~

~~Locational Day Ahead Availability Payments~~

~~Each Supplier which the ISO has scheduled Day Ahead to provide 10 Minute NSR shall be paid the Day Ahead Availability price~~

6.0 Operating Reserve Settlements – Real-Time Market

6.1 Calculation of Real-Time Market Clearing Prices

The ISO shall calculate Real-Time Market clearing prices for each Operating Reserve product for 10 Minute NSR at its~~each~~ location in each hour, multiplied by the amount of 10 Minute NSR at each location that Generator is scheduled to provide in in every interval. Except when the circumstances described below in Section 6.1A apply, each hour. ~~The Day Ahead Availability price for 10 Minute NSR for each hour~~ real-time market-clearing price shall be equal to the highest Availability Bid of any resource scheduled in the Day Ahead Market to meet any of the reserve the sum

of the relevant real-time locational Shadow Prices for a given product, subject to the restriction described in Section 4.3 of this Rate Schedule.

The Real-Time Market clearing price for a particular Operating Reserve product for a particular location shall reflect the Shadow Prices associated with all of the Operating Reserve requirements satisfied by reserves meeting the, including locational requirements applicable to 10 Minute NSR at, that a particular Operating Reserves product from that location. Day Ahead Availability prices will be calculated for 10 Minute NSR located: (i) east of central east excluding Long Island; (ii) Long Island; and (iii) west of

Issued by: William J. Museler, President Effective: September 30, 2001 May 24, 2003
Issued on: May August 23rd, 2003
Filed to comply with order of the Federal Energy Regulatory Commission, Docket No. ER03-873-000, issued July 22, 2003, 104 FERC ¶ 61,094 (2003).

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~~central east. When there are no binding locational reserve constraints between these three locations, the Day Ahead Availability price for 10 Minute NSR shall be the same in each of the three locations.~~

~~When there are binding locational reserve constraints, separate Day Ahead Availability prices may be~~

~~paid to 10 Minute NSR Suppliers in each of the three locations. Examples of the manner in which these separate payments shall be calculated are set forth in Technical Bulletin No. 80, Locational Reserve Availability Clearing Prices, found at http://www.nyiso.com/services/documents/techbulletins/pdf/tb_80.pdf. Whenever the Long Island locational ten minute total or 30 minute total reserve constraints are binding in the Day Ahead Market, the amount paid to 10 Minute NSR Suppliers, per MW of 10 Minute NSR scheduled applicable to the Long Island ten minute total reserve requirement, will not exceed the east of central east excluding Long Island Day Ahead 10 Minute NSR Availability price.~~

~~Locational Real Time Availability Payments~~

~~Each Supplier that provides more 10 Minute NSR than it was scheduled Day Ahead to provide in that hour shall be paid the real time Availability price for 10 Minute NSR at its location, multiplied by the amount of 10 Minute NSR that Supplier provided that was in excess of the amount scheduled to be provided Day~~

~~Issued by: William J. Museler, President Effective: September 30, 2001
Issued on: September 11, 2002
Filed to comply with order of the Federal Energy Regulatory Commission, Docket Nos. ER00-3591-000 *et al.*, issued August 27, 2002, 100 FERC ¶ 61,213 (2002).~~

~~Ahead, if any. The ISO shall calculate separate real-time Availability prices for 10 Minute NSR for each hour. The real-time Availability price for 10 Minute NSR for each hour shall be equal to the highest Availability Bid of any resource scheduled in the real-time Market to meet any of the reserve requirement satisfied by reserves requirements applicable to 10 Minute NSR at that location that is providing more 10 Minute NSR in that hour than it had been scheduled to provide in that hour in the Day Ahead schedule.~~

~~Real-time Availability prices will be calculated for 10 Minute NSR located: (i) east of central-east excluding Long Island; (ii) Long Island; and (iii) west of central-east. When there are no binding locational reserve constraints between these three locations, the real-time Availability price for Spinning Reserve shall be the same in each of the three locations. When there are binding locational reserve constraints, separate real-time Availability prices may be paid to 10 Minute NSR Suppliers in each of the three locations. Examples of the manner in which these separate payments shall be calculated are set forth in Technical Bulletin No. 80, Locational Reserve Availability Clearing Prices, found at http://www.nyiso.com/services/documents/techbulletins/pdf/tb_80.pdf. Whenever the Long Island locational ten-minute total or 30-minute total reserve constraints are binding in the hour-ahead market, the amount paid to 10 Minute NSR Suppliers, per MW of 10 Minute NSR scheduled applicable to the Long Island ten~~

Issued by: ~~William J. Museler, President~~ Effective: ~~September 30, 2001~~
Issued on: ~~September 11, 2002~~
Filed to comply with order of the Federal Energy Regulatory Commission, Docket Nos. ER00-3591-000 *et al.*, issued August 27, 2002, 100 FERC ¶ 61,213 (2002).

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~~minute total reserve requirement, will not exceed the east of central east excluding Long Island real time
10 Minute NSR Availability price.~~

~~Acceptance of any Supplier's Bid to supply 10 Minute NSR in the real time Market
shall not affect the Availability price for 10 Minute NSR that was determined Day head.~~

Issued by: ~~William J. Museler, President~~ Effective: ~~September 30, 2001~~

Issued on: ~~July 30, 2001~~

~~Locational Lost Opportunity Cost Payments~~

~~A Supplier of 10 Minute NSR which produces less Energy in the real time Dispatch than it would have been economic for it to produce because it has been selected (in the Day Ahead or Real Time Markets) to provide 10 Minute NSR will be paid for LOC. The LOC payment that each such Supplier receives in each SCD interval shall be computed by multiplying the following: (i) the LOC of that Supplier at that location in that may be used to satisfy in a given interval, in \$/MW; (ii) the amount of generation that would have been scheduled had the Supplier not provided reserve; and (iii) the length of the SCD interval, in hours. LOC in each SCD interval shall be calculated as follows:~~

$$LOC_i = \max.(P_i - B_i, 0)$$

~~where:~~

~~I = the interval duration;~~

~~B_i = Energy Bid by Generator *i* at the level at which it is dispatched. For units scheduled to provide 10 Minute NSR Day Ahead and hour ahead, the Bid is the higher of the Day Ahead or real time Bid. For units scheduled only hour ahead, it is the real time Energy Bid. If Bids less than zero are submitted, B_i shall be equal to zero.~~

~~P_i = For the interval and for units scheduled to provide reserve both Day Ahead and hour ahead, this shall be the Day Ahead LBMP at Generator's location unless the resultant LOC is less than or equal to zero, in which case it shall be the Real Time LBMP at the Generator location. For the interval and for units scheduled to provide reserve hour ahead, this shall be The ISO shall calculate the Real Time LBMP at Generator's location.~~

Other Payments

~~The ISO shall pay the Real-Time LBMP for all Energy generated by Suppliers of 10 Minute NSR in accordance with the ISO's instructions. (Suppliers of 10 Minute NSR shall be paid for Energy produced during reserve pick-ups in accordance with the provisions of Article 4 related to Real Time Market Settlement.)~~

~~As provided in Article 4 of the Tariff, each 10 Minute NSR Supplier shall also be compensated by the ISO if its Bid Production Cost to produce the Energy the ISO has requested it to generate, including start-up costs, exceeds the revenues it receives from ancillary service Availability payments and the sale of Energy at LBMP prices.~~

4.2 Payments to Suppliers of 30 Minute Reserve

Locational Day Ahead Availability Payments

~~Each Supplier scheduled Day Ahead to provide 30 Minute Reserve shall be paid the Day Ahead Availability price for 30 Minute Reserve at its location in each hour, multiplied by the amount of 30 Minute Reserve that the Supplier is scheduled to provide in each hour. The Day Ahead Availability price for 30 Minute Reserve for each hour shall be equal to the highest Availability Bid of any resource scheduled in the Day Ahead Market to meet any of the reserve requirements satisfied by reserves meeting the requirements applicable to 30 Minute Reserve at that location. Day Ahead Availability prices will be calculated for~~

Issued by: ~~William J. Museler, President~~ Effective: ~~September 30, 2001~~
Issued on: ~~July 30, 2001~~

~~30 Minute Reserves located: (i) east of central east excluding Long Island; (ii) Long Island; and (iii) west of central east. When there are no binding locational reserve constraints between these three locations, the Day Ahead Availability price for 30 Minute Reserves shall be the same in each of the three locations. When there are binding locational reserve constraints, separate Day Ahead Availability prices may be paid to 30 Minute Reserve Suppliers in each of the three locations. Examples of the manner in which these separate payments shall be calculated are set forth in Technical Bulletin No. 80, Locational Reserve Availability Clearing Prices, found at http://www.nyiso.com/services/documents/techbulletins/pdf/tb_80.pdf. Whenever the Long Island locational 30 minute total reserve constraint is binding in the Day Ahead Market, the amount paid to resources providing 30 Minute Reserve, per MW of 30 Minute Reserve scheduled applicable to the Long Island 30 minute total reserve requirement, will not exceed the east of central east excluding Long Island Day Ahead 30 Minute Reserve Availability price.~~

~~Locational Real-Time Availability Payments~~

~~Each Supplier selected to provide more 30 Minute Reserve than it was scheduled Day Ahead to provide in each hour shall be paid the real time Availability price for 30 Minute Reserve at its location, multiplied by the amount of 30 Minute Reserve that the Supplier~~

~~provided that was in excess of the amount scheduled to be provided Day Ahead, if any. The ISO shall calculate separate real time Availability prices for 30 Minute Reserve for each hour. The real time Availability price for 30 Minute Reserve~~

Issued on: ~~July 30, 2001~~

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~~for each hour shall be equal to the highest Availability Bid of any resource scheduled in the Real Time Market to meet any of the reserve requirement satisfied by reserves meeting the requirements applicable to 30 Minute Reserves at that location that is providing more 30 Minute Reserve in that hour than it had been scheduled to provide in that hour in the Day Ahead schedule. Real time Availability prices will be calculated for 30 Minute Reserves located: (i) east of central east excluding Long Island; (ii) Long Island; and (iii) west of central east. When there are no binding locational reserve constraints between these three locations, the real time Availability price for 30 Minute Reserve shall be the same in each of the three locations. When there are binding locational reserve constraints, separate real time Availability prices may be paid to 30 Minute Reserve Suppliers in each of the three locations. Examples of the manner in which these separate payments shall be calculated are set forth in Technical Bulletin No. 80, Locational Reserve Availability Clearing Prices, found at http://www.nyiso.com/services/documents/techbulletins/pdf/tb_80.pdf. Whenever the Long Island locational 30 minute total reserve constraint is binding in the Day Ahead Market, the amount paid to resources providing 30 Minute Reserve, per MW of 30 Minute Reserve scheduled applicable to the Long Island 30 minute total reserve requirement, will not exceed the east of central east excluding Long Island Day Ahead 30 Minute Reserve Availability price. Acceptance of any Bid to supply 30 Minute~~

Issued by: ~~William J. Museler, President~~ Effective: ~~September 30, 2001~~

Issued on: ~~September 11, 2002~~

Filed to comply with order of the Federal Energy Regulatory Commission, Docket Nos. ER00-3591-000 *et al.*, issued August 27, 2002, 100 FERC ¶ 61, 213 (2002).

~~Reserve in the Real Time Market shall not affect the Availability price for 30 Minute Reserve that was determined Day Ahead.~~

Other Payments

~~— The ISO shall pay the Real Time LBMP for all Energy generated in accordance with the ISO's instructions. (Suppliers of 30 Minute Reserve shall be paid for Energy produced during reserve pick ups in accordance with the provisions of Article 4 related to real time Settlement.) As provided in Article 4 of the Tariff, each 30 Minute Reserve Supplier shall also be compensated by the ISO if its Bid Production Cost to produce the Energy the ISO has requested it to generate, including start-up costs, exceeds the revenues it receives from ancillary service Availability payments and the sale of Energy at LBMP prices. On any day that Long Island reserve constraints are binding, the ISO shall allocate to Long Island customers the net incremental bid production cost guarantee charges for Long Island units that have committed for either Energy or Operating Reserves if it is determined that a Long Island reserve constraint caused those units to be committed and the commitment of those units resulted in an increase in bid production cost guarantee payments by an amount equal to or greater than the threshold for market power mitigation of guarantee payments specified in Section 3.2.1 (2) of Attachment H to this Services Tariff.~~

4.3 — Exceptions

~~— Notwithstanding anything to the contrary in this Rate Schedule, no payments shall be made to any Supplier providing Operating Reserves for reserves provided by that Supplier in~~

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~~excess of the amount of Operating Reserves scheduled by the ISO either Day Ahead or in any subsequent schedule. The market clearing price paid to Suppliers of any category of Operating Reserve shall not be determined by any Bid to supply Operating Reserve that has not been accepted by the ISO.~~

5.0 — Failure to Provide Operating Reserves

~~If a Supplier reduces its Capacity Bid subsequent to being scheduled to provide Regulation Service or Operating Reserves (either Day Ahead or in a supplemental commitment), and if the ISO must, as a result, reduce the amount of Operating Reserves that Supplier is scheduled to provide in accordance with Rate Schedule 3 of this Tariff, the ISO will first reduce the amount of 30 Minute Reserve that Generator is scheduled to provide. If it is still necessary to reduce the amount of Operating Reserves that Supplier is scheduled to provide, the ISO will reduce the amount of 10 Minute NSR that Generator is scheduled to provide. Finally, if it is still necessary to reduce the amount of Operating Reserves that Supplier is scheduled to provide, the ISO will reduce the amount of Spinning Reserve that Generator is scheduled to provide.~~

~~If a Supplier scheduled Day Ahead to provide Operating Reserves trips off line and consequently is unable to provide Spinning Reserve, or if the amount of Operating Reserves a Supplier is scheduled to provide is decreased due to a reduction in that Supplier's Capacity, it~~

Issued by: William J. Museler, President

Effective: January 2, 2001

Issued on: January 16, 2001

~~Filed to comply with order of the Federal Energy Regulatory Commission, Docket No. ER99-4235-002, issued December 18, 2000.~~

~~shall be charged the Real Time Availability price at its location (or the Day Ahead Availability price, if there is no Real Time Availability price) in each hour for the relevant category of Operating Reserves applied to the reduction in the amount of Operating Reserves it was scheduled Day Ahead to provide at that location.~~

If the ISO calls for a Supplier of any category of Operating Reserves (other than a Supplier that has previously tripped off line) to generate Energy with part or all of the Capacity that the ISO has scheduled to provide any category of Operating Reserves, and that Supplier fails to provide the amount of Energy requested by the ISO within the time applicable for the scheduled Operating Reserves (ten (10) or thirty (30) minutes), the ISO shall:

- (1) ~~not pay the non-performing Supplier for any shortfall in the amount of Energy provided;~~
- (2) ~~charge the Supplier for any shortfall in the amount of Energy provided, at the Real Time LBMP for Energy at that Supplier's location; and~~
- (3) ~~reduce any Availability payments for the scheduled Operating Reserves, and any Lost Opportunity Cost payments, if applicable, that the Supplier would otherwise have received for the 24-hour billing period in which that Supplier failed to clearing prices using the following formulae:~~

Market clearing price for Western 30-Minute Reserves = SP1

Market clearing price for Western 10-Minute-Non-Synchronized Reserves = SP1 + SP2

Market clearing price for Western Spinning Reserves = SP1 + SP2 + SP3

Market clearing price for Eastern 30-Minute Reserves = SP1 + SP4

Market clearing price for Eastern 10-Minute Non-Synchronized Reserves = SP1 + SP2 + SP4 + SP5

Market clearing price for Eastern Spinning Reserves = SP1 + SP2 + SP3 + SP4 + SP5
+ SP6

Issued by: William J. Museler, President Effective: May 30, 2002

Issued on: May 8, 2002

Market clearing price for L.I. 30-Minute Reserves = SP1 + SP4 + SP7

Market clearing price for L.I. 10-Minute Non-Synchronized Reserves = SP1 + SP2 + SP4 + SP5 + SP7 +

SP8

Market clearing price for L.I. Spinning Reserves = SP1 + SP2 + SP3 + SP4 + SP5 + SP6 +
SP7 + SP8 + SP9

Where:

SP1 = Shadow Price for total 30-Minute Reserve requirement constraint for the interval

SP2 = Shadow Price for total 10-Minute Reserve requirement constraint for the interval

SP3 = Shadow Price for total Spinning Reserve requirement constraint for the interval

SP4 = Shadow Price for Eastern or L.I. 30-Minute Reserve requirement constraint for the interval

SP5 = Shadow Price for Eastern or L.I. 10-Minute Reserve requirement constraint for the interval

SP6 = Shadow Price for Eastern or L.I. Spinning Reserve requirement constraint for the interval

SP7 = Shadow Price for Long Island 30-Minute Reserve requirement constraint for the interval

SP8 = Shadow Price for Long Island 10-Minute Reserve requirement constraint for the interval

SP9 = Shadow Price for Long Island Spinning Reserve requirement constraint for the interval

Real-time locational Shadow Prices will be calculated by the ISO's RTD. Each real-time Shadow Price shall equal the marginal cost of scheduling a Resource to provide the relevant Operating Reserve product in that interval. It will include the lost opportunity cost of the marginal Generator, and any impact on the Bid Production Cost of procuring Energy or Operating Reserves that would result from procuring an increment of Regulation Service, in the relevant interval as calculated during 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. (Real-time Availability Bid Prices will also be taken into account but they will always equal zero pursuant to Section 3.1 of this Rate Schedule.) Shadow Prices will also be consistent with the Operating Reserve Demand Curves described in Section 7.0 of this Rate Schedule, which will ensure that Operating Reserves are not scheduled by RTC at a cost greater than the relevant Operating Reserve Demand Curve indicates should be paid. If there is more Operating Reserve of the required quality than is needed to meet a particular locational Operating Reserve requirement then the Shadow Price for that Operating Reserve requirement constraint shall be zero.

Each Supplier that is scheduled in real-time to provide Operating Reserve shall be paid the applicable Real-Time Market clearing price, based on its location and the quality of Operating Reserve scheduled, multiplied by the amount of Operating Reserve that the Supplier is scheduled to provide in each interval.

6.1A Calculation of Real-Time Market Clearing Prices for Operating Reserves During EDRP/SCR Activations

A. During Intervals When Scarcity Pricing Rule “A” Applies

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Sched. 4 During any interval in which the ISO is using scarcity pricing rule “A” to calculate LBMPs under Section I.A.2.a of Attachment B to this ISO Services Tariff, and Section of Attachment J to the ISO OATT, the real-time market clearing prices for Operating Reserves shall be recalculated by considering the lost opportunity costs of Resources that are scheduled to provide Spinning Reserves and synchronized 30-Minute Reserves in the manner described below. The ISO shall also consider the lost opportunity costs of Resources providing lower quality Operating Reserves to ensure that the requirements of Section 4.3 of this Rate Schedule are not violated. Specifically:

The Eastern Spinning Reserve market clearing price shall be the higher of: (i) the highest lost opportunity cost of any provider of Spinning Reserve or synchronized 30-Minute Reserve that is

scheduled by RTD and is not located on Long Island; (ii) the original market clearing price calculated under Section 6.1 above.

The Eastern 10-Minute Non-Synchronized Reserve market clearing price shall be the higher of: (i) the highest lost opportunity cost of any provider of synchronized 30-Minute Reserve that is scheduled by RTD and is not located on Long Island; and (ii) the original market clearing price calculated under Section 6.1 above.

The Eastern 30-Minute Reserve market clearing price shall be the higher of: (i) the highest lost opportunity cost of any provider of synchronized 30-Minute Reserve that is scheduled by RTD and is not located on Long Island; and (ii) the original market clearing price calculated under Section 6.1 above.

The Western Spinning Reserve market clearing price shall be the higher of: (i) the highest lost opportunity cost of any provider of Western Spinning Reserve or synchronized 30- Minute Reserves that is scheduled by RTD; and (ii) the original market clearing price calculated under Section 6.1 above.

The Western 10-Minute Non-Synchronized Reserve market clearing price shall be the higher of: (i) the highest lost opportunity cost of any provider of Western synchronized 30 Minute-Reserve that is scheduled by RTD; and (ii) the original market clearing price calculated under Section 6.1 above.

The Western 30-Minute Reserve market clearing price shall be the higher of: i) the highest lost opportunity cost of any provider of Western synchronized 30-Minute Reserve that is scheduled by RTD; and (ii) the original market clearing price calculated under Section 6.1 above.

B. During Intervals When Scarcity Pricing Rule “B” Applies

perform as scheduled. The Availability payments and the Lost Opportunity Cost payments, if applicable, that the Supplier would have received will be calculated by

~~multiplying the average ratio of~~

~~During any interval in which the ISO is using scarcity pricing rule “B” to calculate LBMPs under Section I.A.2.b of Attachment B to this ISO Services Tariff, and Section of Attachment J to the ISO OATT, the amount of Energy supplied to the amount of Energy scheduled, during any activation of that Supplier during that 24-hour~~

~~billing period by the applicable Availability payments and Lost Opportunity Cost payments, if applicable, that the Supplier would otherwise have received.~~

~~If a Generator providing real-time market clearing prices for Operating Reserves has repeatedly failed shall be recalculated by considering the lost opportunity costs of Resources scheduled to provide Energy when called upon by the ISO, the ISO may preclude that Generator from providing Spinning Reserve and synchronized 30-Minute Reserve in order to satisfy Eastern Operating Reserves in the future. If a specific Generator has been precluded from supplying Reserve requirements in the manner described below. The ISO shall also consider the lost opportunity costs of Resources providing lower quality Operating Reserves, the ISO shall require that Generator to pass a re-qualification test before accepting any additional Bids to supply Operating Reserves from that Generator, to ensure that the requirements of Section 4.3 of this Rate Schedule are not violated. Specifically:~~

~~The Eastern Spinning Reserve market clearing price shall be the higher of: (i) the highest lost opportunity cost of any provider of Eastern Spinning Reserve or synchronized 30-Minute Reserve that is scheduled by RTD and is not located on Long Island; and (ii) the original market clearing price calculated under Section 6.1 above.~~

~~The Eastern 10-Minute Non-Synchronized Reserve market clearing price shall be the higher of: (i) the highest lost opportunity cost of any provider of Eastern synchronized 30-Minute Reserve that is~~

scheduled by RTD and is not located on Long Island; and (ii) the original market clearing price calculated under Section 6.1 above.

The Eastern 30-Minute Reserve market clearing price shall be the higher of: (i) the highest lost opportunity cost of any provider of Eastern synchronized 30-Minute Reserve that is scheduled by RTD and is not located on Long Island; and (ii) the original market clearing price calculated under Section 6.1 above.

Real-Time Market clearing prices for Western Reserve shall not be affected under scarcity pricing rule “B”.

6.2 Operating Reserve Balancing Payments

Any deviation in performance from a Supplier’s Day-Ahead schedule to provide Operating Reserves, including deviations that result from schedule modifications made by the ISO, shall be settled pursuant to the following rules.

- (a) When the Supplier’s real-time Operating Reserves schedule is less than its assigned Day-Ahead Operating Reserves schedule, the Supplier shall pay a charge for the imbalance equal to the product of: (i) the Real-Time Market clearing price for the relevant Operating Reserves Product in the relevant location; and (ii) the difference between the Supplier’s Day-Ahead and real-time Operating Reserves schedules.
- (b) When the Supplier’s real-time Operating Reserves schedule is greater than its assigned Day-Ahead Operating Reserves schedule, the ISO shall pay the Supplier an amount to compensate it for the imbalance equal to the product of: (i) the Real-Time Market clearing price for the relevant Operating Reserve product in the relevant location; and (ii) the difference between the Supplier’s Day-Ahead and real-time Operating Reserves

schedules.

6.3. Other Real-Time Payments

The ISO shall pay Generators that are selected to provide Operating Reserves, but are directed to convert to Energy production in real-time, the applicable Real-Time LBMP for all Energy they are directed to produce in excess of their Day-Ahead schedule.

As is provided in Section 4.10 and Attachment C of this ISO Services Tariff, the ISO shall compensate each eligible Supplier providing Operating Reserves if its Bid Production Cost to provide the Energy and Ancillary Services it is scheduled to supply in the Real-Time Market, including Minimum Generation Bid and Start-Up Bid costs (?) the revenues it receives from the sale of Energy and Ancillary Services. Any Supplier that provides Energy during a large event reserve pickup or a maximum generation event, as described in Sections 4.4.4(A) (1) and (2) of this ISO Services Tariff shall be eligible for a Bid Production Cost guarantee payment calculated, under Attachment C, solely for the duration of the large event reserve pickup or maximum generation pickup.

Finally, whenever a Resource's real-time Operating Reserves schedule is reduced by the ISO to a level lower than its Day-Ahead schedule for that product, the Resource's Day-Ahead Margin shall be protected after accounting for any margin associated with other products that the Resource 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.

7.0 Operating Reserve Demand Curves

The ISO shall establish nine Operating Reserve Demand Curves, one for each Operating Reserves requirement. Specifically, there shall be a demand curve for: (i) Total Spinning Reserves; (ii) Eastern or Long Island Spinning Reserves, (iii) Long Island Spinning Reserves; (iv) Total 10-Minute

Non-Synchronized Reserves; (v) Eastern or Long Island 10-Minute Non-Synchronized Reserves; (vi) Long Island 10-Minute Non-Synchronized Reserves; (vii) Total 30-Minute Reserves; (viii) Eastern or Long Island 30-Minute Reserves; and (ix) Long Island 30-Minute Reserves. Each Operating Reserve Demand Curve will apply to both the Day-Ahead Market and the Real-Time Market for the relevant product and location.

The market clearing prices for Operating Reserves shall be calculated pursuant to Sections 5.1 and 6.1 of this Rate Schedule and in a manner consistent with the demand curves established in this Section so that Operating Reserves are not purchased at a cost higher than the relevant demand curve indicates should be paid.

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

(a) Total Spinning Reserves: For quantities of Operating Reserves meeting the total Spinning Reserves requirement that are less than or equal to the target level for that requirement, the price on the total Spinning Reserves demand curve shall be \$500/MW. For all other quantities, the price on the total Spinning Reserves demand curve shall be \$0/MW.

(b) Eastern or Long Island Spinning Reserves: For quantities of Operating Reserves meeting the Eastern or Long Island Spinning Reserves requirement that are less than or equal to the target level for that requirement, the price on the Eastern or Long Island

Spinning Reserves demand curve shall be \$25/MW. For all other quantities, the price on the Eastern or Long Island Spinning Reserves demand curve shall be \$0/MW.

(c) Long Island Spinning Reserves. For quantities of Operating Reserves meeting the Long Island Spinning Reserves requirement that are less than or equal to the target level for that requirement, the price on the Long Island Spinning Reserves demand curve shall be \$25/MW. For all other quantities, the price on the Long Island Spinning Reserves demand curve shall be \$0/MW.

(d) Total 10-Minute Reserves. For quantities of Operating Reserves meeting the total 10-minute reserves requirement that are less than or equal to the target level for that requirement, the price on the total 10-minute reserves demand curve shall be \$150/MW. For all other quantities, the price on the total 10-minute reserves demand curve shall be \$0/MW.

(e) Eastern or Long Island 10-Minute Reserves. For quantities of Operating Reserves meeting the Eastern or Long Island 10-minute reserves requirement that are less than or equal to the target level for that requirement, the price on the Eastern or Long Island 10-minute reserves demand curve shall be \$500/MW. For all other quantities, the price on the Eastern or Long Island 10-Minute Reserves demand curve shall be \$0/MW.

(f) Long Island 10-Minute Reserves. For quantities of Operating Reserves meeting the Long Island 10-minute reserves requirement that are less than or equal to the target level for that requirement, the price on the Long Island 10-minute reserves demand curve shall be \$25/MW. For all other quantities, the price on the Long Island 10-minute reserves demand curve shall be \$0/MW.

- (g) Total 30-Minute Reserves. For quantities of Operating Reserves meeting the total 30-Minute Reserves requirement that are less than or equal to the target level for that requirement minus 400 MW, the price on the total 30-Minute Reserves demand curve shall be \$200/MW. For quantities of Operating Reserves meeting the total 30-Minute Reserves requirement that are less than or equal to the target level for that requirement minus 200 MW but that exceed the target level for that requirement minus 400 MW, the price on the total 30-Minute Reserves demand curve shall be \$100/MW. For quantities of Operating Reserves meeting the total 30-Minute Reserves requirement that are less than or equal to the target level for that requirement but that exceed the target level for that requirement minus 200 MW, the price on the total 30-Minute Reserves demand curve shall be \$50/MW. For all other quantities, the price on the total 30-Minute Reserves demand curve shall be \$0/MW. However, the ISO will not schedule more total 30-Minute Reserves than the level defined by the requirement for that hour.
- (h) Eastern or Long Island 30-Minute Reserves. For quantities of Operating Reserves meeting the Eastern or Long Island 30-Minute Reserves requirement that are less than or equal to the target level for that requirement, the price on the Eastern or Long Island 30-Minute Reserves demand curve shall be \$25/MW. For all other quantities, the price on the Eastern or Long Island 30-Minute Reserves demand curve shall be \$0/MW.
- (i) Long Island 30-Minute Reserves. For quantities of Operating Reserves meeting the Long Island 30-Minute Reserves requirement that are less than or equal to the target level for that requirement, the price on the Long Island 30-Minute Reserves demand

curve shall be \$300/MW. For all other quantities, the price on the Long Island 30-Minute Reserves demand curve shall be \$0/MW.

In order to respond to operational or reliability problems that arise in real-time, the ISO may procure any Operating Reserve product 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 ninety 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 Operating Reserve Demand Curves will be performed in accordance with the ISO Procedures to determine whether the parameters of any Operating Reserve Demand Curve should be adjusted.

6.08.0 Self-Supply

Transactions may be entered into to provide for Self-Supply of Operating Reserves. Except as noted in the next paragraph, Customers seeking to Self-Supply Operating Reserves must place the Generator(s) supplying any one of the Operating Reserves under ISO control. The Generator(s) must

meet ISO rules for acceptability. The amount that any such Customer will be

Issued by: ~~William J. Museler, President~~ Effective: ~~January 2, 2001~~

Issued on: ~~January 16, 2001~~

~~Filed to comply with order of the Federal Energy Regulatory Commission, Docket No. ER99-4235-002, issued December 18, 2000. New York Independent System Operator, Inc.~~

~~FERC Electric Tariff~~ Original Sheet No. 307

~~Original Volume No. 2~~

~~Sched. 4~~ charged for Operating Reserves will be reduced by the market value of the services provided by the specified Generator(s) as determined in the ISO Services Tariff.

Alternatively, Customers, including LSEs, may enter into Day-Ahead Bilateral financial

Transactions, *e.g.*, contracts-for-differences, in order to hedge against price volatility in the Operating

Reserves markets.

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