NEW YORK INDEPENDENT SYSTEM OPERATOR

10 Krey Boulevard ♦ Rensselaer, NY 12144

January 11, 2017

Honorable Kimberly D. Bose
Secretary
Federal Energy Regulatory Commission
888 First Street, N.E., Room 1A
Washington, D.C. 20426

Re: *New York Independent System Operator, Inc.*,
Settlement Intervals and Shortage Pricing in Markets Operated by Regional Transmission Organizations and Independent System Operators, Order No. 825, Compliance Filing;
Docket Nos. RM15-24-000, ER17-____-000

Dear Ms. Bose:

Pursuant to the *Order on Settlement Intervals and Shortage Pricing in Markets Operated by Regional Transmission Organizations and Independent System Operators* issued by the Federal Energy Regulatory Commission ("Commission") on June 16, 2016 ("Order No. 825" or "the Order"),[1] the New York Independent System Operator, Inc. ("NYISO") respectfully submits this compliance filing.

As demonstrated herein, the NYISO already complies with the requirements of Order No. 825 in that it: (i) settles and dispatches Energy and reserve transactions on a five minute basis in its real-time market; and (ii) triggers shortage pricing for Energy and/or reserve shortages through the co-optimization of Energy, reserves and regulation service products and use of reserve and regulation service demand curves.[2] As explained below, the NYISO's practice of settling intertie transactions on a five minute basis in real-time provides price signals that are consistent with purpose of the reforms required by Order No. 825 and ensures that intertie transactions are considered on the same basis as all other Energy transactions in real-time to meet system needs.[3] Requiring the NYISO to revert to less granular settlements of intertie transactions in real-time would be contrary to the objectives of Order No. 825's settlement interval reforms. Accordingly, the NYISO does not propose any revisions to its Tariffs in response to Order No. 825.

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[1] *Settlement Intervals and Shortage Pricing in Markets Operated by Regional Transmission Organizations and Independent System Operators*, Order No. 825, 155 FERC ¶ 61,276 (2016).

[2] Capitalized terms not otherwise defined herein shall have the meaning specified in Section 1 of the NYISO Open Access Transmission Tariff ("OATT") and Section 2 of the NYISO Market Administration and Control Area Services Tariff ("Services Tariff").

[3] Order No. 825 at P 90.

I. NYISO Compliance Obligations

A. Settlement and Dispatch Intervals

Order No. 825 requires that each regional transmission organization and independent system operator ("RTO/ISO") align settlement and dispatch intervals by: (1) settling energy transactions in its real-time markets at the same time interval it dispatches energy;[4] (2) settling operating reserves transactions in its real-time markets at the same time interval it prices operating reserves;[5] and (3) settling intertie transactions in the same time interval it schedules intertie transactions.[6]

B. Triggering Shortage Pricing

Order No. 825 also requires that each RTO/ISO trigger shortage pricing for any interval in which a shortage of energy or operating reserves is indicated during the pricing of resources for that interval.[7]

II. NYISO Already Complies With the Settlement and Dispatch Intervals Requirement

A. Settling Energy Transactions and Operating Reserves

As Order No. 825 acknowledges, the NYISO currently uses five-minute intervals to dispatch and settle its real-time markets for Energy, regulation service, and reserves.[8] The NYISO has used sub-hourly settlements in its real-time markets for Energy, Regulation Service, and Operating Reserves since its inception.

The NYISO dispatches and settles Energy, Operating Reserves,[9] and Regulation Service[10] on a five-minute basis through its Real-Time Dispatch ("RTD").[11] RTD is a security

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[4] *Id*. at P 53.

[5] *Id*. at P 69.

[6] *Id*. at P 88.

[7] *Id*. at P 162. The Commission expressly clarified that Order No. 825 does not address transmission constraint pricing or "transmission shortage pricing". (*Id*. at P 227.) Accordingly, the NYISO does not address its transmission constraint pricing rules in this filing.

[8] *Id*. at P 22 and 26.

[9] *See* Section 15.4.6.1 of the Services Tariff ("[t]he ISO shall calculate Real-Time Market clearing prices for each Operating Reserve product for each location in every interval and Scarcity Reserve Region in each interval for which a Scarcity Reserve Requirement is established by the ISO." "Real-time locational and Scarcity Reserve Requirement Shadow Prices will be calculated by the ISO's RTD.").

[10] *See* Section 15.3.5.1 of the Services Tariff ("[t]he ISO shall calculate a Real-Time Regulation Capacity Market Price and a Real-Time Regulation Movement Market Price for every RTD interval, except as noted in Section 15.3.8 of this Rate Schedule.").

constrained dispatch model that co-optimizes the procurement of these three products with the objective of minimizing total production cost. RTD makes dispatching decisions, provides Base Point Signals to the resources it dispatches, and establishes binding prices for the next five-minute interval.[12] Subsequent to the close of the Real-Time Scheduling Window, the NYISO posts the real-time schedule for each entity that submits a Bid or Bilateral Transaction schedule. The NYISO conducts Real-Time Market settlements based on the real-time schedules determined in accordance with Services Tariff Section 4.4.2.7.

The NYISO's use of tightly coupled dispatch and settlement intervals has provided critically important economic incentives for resources to follow NYISO dispatch instructions. It has also provided opportunities for supply resources to receive full compensation for their performance. The NYISO's rules thus accurately and transparently reflect the value of providing specific services needed to address actual system conditions.

There are limited cases in which the NYISO currently performs settlements on an hourly basis for certain resources. In these cases, the respective hourly settlements are unaffected by the reforms required in Order No. 825. Therefore, the NYISO does not propose any changes to these hourly settlement practices at this time.

For example, station power settlements are conducted hourly.[13] Station power settlements relate to power consumed by generation resources (*i.e.*, load) and not Energy produced by such resources. Order No. 825 expressly provides that the proposed settlement interval reforms do not apply to Real-Time Market load settlements.[14] As such, the NYISO's current settlement procedures for station power are unaffected by Order No. 825 and no changes are proposed herein.

Additionally, the NYISO conducts certain settlements related to Limited Energy Storage Resources ("LESRs") on an hourly basis that are unrelated to the provision of Energy or Operating Reserves by such resources in real-time. LESRs are a specific category of energy storage devices that only provide Regulation Service in the NYISO-administered markets. In real-time, these resources receive Regulation Capacity schedules in five-minute intervals and Regulation Movement schedules in six-second intervals. Five-minute prices are then used to

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[11] The NYISO's real-time dispatch and settlement intervals are normally five minutes long, although they can be shorter or longer at times when the NYISO's real-time dispatch software has entered "corrective action mode." The length of the dispatch and settlement intervals remain aligned in "corrective action mode." The Real-Time Dispatch - Corrective Action Mode ("RTD-CAM") is a specialized version of the RTD software that may be activated, as necessary, to address unanticipated real-time system conditions. *See* Sections 2.18 and 4.4.3 of the Services Tariff.

[12] *See* Section 17.1.2.1.1 of the Services Tariff ("[o]nly the prices and schedules determined for the first time point of the optimization period will be binding. Prices and schedules for the other four time points of the optimization period are advisory.").

[13] *See* Section 4.7 of the Services Tariff; Docket EL01-50-002, *KeySpan-Ravenswood, Inc. v. New York Independent System Operator, Inc.*, Compliance Filing and Request for Expedited Action (September 20, 2002); and *KeySpanRavenswood, Inc. v. New York Independent System Operator, Inc.*, 101 FERC ¶ 61,230 (2002).

[14] Order No. 825 at P 104.

settle Regulation Service. LESRs are also subject to net hourly settlements for Energy because deployment of Regulation Movement and the LESR Energy Management activities (undertaken by the NYISO on the resource's behalf) are not influenced by real-time five-minute Energy prices.[15]

These resources require Energy to charge and discharge in order to provide Regulation Service. However, the deployment of Regulation Movement does not consider the five-minute real-time Energy prices. As a result, LESRs providing Regulation Movement may inject or withdraw Energy that is not necessarily consistent with the economic signals from the five-minute real-time Energy prices. The NYISO provides LESR Energy Management service in order to maximize the resource's capability to provide Regulation Service. The hourly Energy settlement for LESRs accounts for the net injections and withdrawals that occur as a result of such Regulation Movement deployments and LESR Energy Management. Hourly settlements for the LESR Energy Management service that NYISO provides do not create a disincentive for the resources to follow NYISO Regulation Service dispatch instructions or to provide Regulation Service in real-time. Because the LESR Energy Management settlement is not directly related to an LESR's participation in the real-time Energy and Operating Reserves markets, the NYISO proposes to continue utilizing net-hourly settlements to account for the LESR Energy Management service it provides.

B. Settling Intertie Transactions

The NYISO's Real-Time Scheduling ("RTS") process, comprised of the Real-Time Commitment ("RTC") and RTD, performs a unique *ex ante*, co-optimized, multi-period commitment, scheduling and dispatch process that simultaneously evaluates bids and offers submitted by External Transactions (*i.e.*, intertie transactions) and internal resources to produce a least production cost solution to meet demand requirements, given current and projected transmission system capabilities.[16] RTS enables the NYISO to select, schedule and dispatch a portfolio of External Transactions and internal resources to serve real-time load on a least as-bid production cost basis. The forward looking solution ensures the most efficient set of resources are scheduled, recognizing both the current system conditions and expected future system demands.

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[15] *See* Section 15.3.6.1 of Rate Schedule 3 of the Services Tariff. The net Energy injection or withdrawal for an hour associated with LESR Energy Management service is multiplied by the time-weighted, integrated LBMP for the specific bus location of the LESR to calculate the payment or charge for such LESR Energy Management service.

[16] The NYISO's RTS is comprised of a RTC and a RTD. RTC schedules Imports, Exports and internal ("NYCA") resources every fifteen minutes over a forward-looking 2.5 hour commitment window. Each RTC run requires fifteen-minutes to execute. For example, the RTC that runs from 00:00 (top of the hour) to 00:15 commits and schedules resources, including Imports and Exports, for the period from 00:30 to 00:45. RTD dispatches NYCA Generators that were committed/scheduled by RTC. RTD optimizes the NYISO's dispatch every five minutes over a forward-looking dispatch window of approximately one hour. RTD can also identify the need to start 10 minute resources and NYISO Operators can use RTD to commit these resources. RTD is not able to schedule Imports or Exports, or to change Import or Export schedules. Together, RTC and RTD optimize the NYISO's resource commitment as frequently as every five minutes, looking ahead up to two and a half hours.

In RTS, External Transaction offers and bids (Imports, Exports and Wheels-Through) compete with internal NYCA resources, and with other External Transactions, including External Transactions offered at different interfaces, to be economically awarded an Energy, transmission and ramp schedule. RTS incorporates expected transmission congestion and permits the NYISO to meet its load obligations at the lowest production cost. Having RTS evaluate and schedule Import offers and Export bids at the same time it is committing internal NYCA resources ensures the least cost solution for New York loads.

The NYISO schedules Imports and Exports in fifteen-minute intervals at some or all of the interfaces that comprise its interconnections with PJM Interconnection, LLC, ISO New England, and Hydro-Quebec.[17] At these interfaces, the NYISO schedules Imports and Exports in fifteen-minute intervals and settles the scheduled transactions at the five-minute prices calculated by RTD. Wheels Through (the NYCA) receive hourly schedules and settle at the five-minute prices calculated by RTD. At the NYISO interface with the Ontario Independent Electricity System Operator ("IESO"),[18] one interface with Hydro-Quebec[19] and two interfaces with ISO New England,[20] the NYISO schedules Imports and Exports in hourly intervals and settles the scheduled transactions at the five-minute prices calculated by RTD. Settling External Transactions at more granular intervals than the scheduling and dispatching intervals is consistent with Order No. 825's goal "to provide correct incentives for market participants to follow commitment and dispatch instructions, make efficient investments in facilities and equipment, and maintain reliability."[21] The practice the Order is intended to reform is "when RTOs/ISOs schedule intertie transactions every fifteen minutes, but perform settlements on an hourly integrated price."[22] Order No. 825 specifically authorized RTOs/ISOs, like the NYISO, to propose continued use of settlement intervals for External Transactions that are more granular than scheduling intervals for such transactions.[23]

The NYISO's five-minute pricing for External Transactions, although more granular than the scheduling interval, aligns with the prices used for generation resources located in the NYCA. Providing consistent price signals for internal generation and External Transactions

[17] *See* Section 4.4.4 of the Services Tariff.

[18] NYISO has discussed implementation of fifteen-minute scheduling with representatives of IESO several times over the past year. IESO has indicated that it is not yet prepared to commit to implementation of fifteen-minute scheduling at the New York/Ontario border, or to a proposed implementation date for fifteen-minute scheduling. The NYISO is prepared to work with IESO to develop fifteen-minute scheduling capability at the New York/Ontario border in a timeframe that IESO can support.

[19] The Dennison Scheduled Line, at the Hydro-Quebec Cedars Proxy Bus, is scheduled hourly.

[20] The Cross Sound Scheduled Line and Northport Norwalk Scheduled Line are the two interfaces between the NYISO and ISO New England scheduled hourly.

[21] Order No. 825 at P 5.

[22] *Id*. at P 2.

[23] *Id*. at P 90.

promotes competition and allows for the most economic supply option to be identified. Internal resources and External Transactions should have equal incentives to respond to price signals reflecting real-time system conditions. Increasing the settlement interval for External Transactions to fifteen-minutes or hourly would introduce a misalignment with generation resources in the NYCA and result in a price that reflects the anticipated value of the External Transaction rather than the value that is used to determine most real-time schedules, prices and settlements in New York.

The NYISO's current pricing method for External Transactions correctly places the risk of changing prices on Market Participants, rather than consumers.[24] Market Participants bear the risk that an External Transaction scheduled as economic for a fifteen-minute interval may become uneconomic if the five-minute interval prices change due to unforeseen system conditions. If the NYISO were to change its rules to align the scheduling and pricing of intertie transactions at the fifteen-minute level, then consumers would instead bear the risk that transactions, which were scheduled based on economics at the fifteen-minute level, become uneconomic if the five-minute interval prices change due to unforeseen system conditions.

Accordingly, the NYISO proposes to maintain its current practice of settling External Transactions on a five-minute basis. Continued reliance on more granular settlement intervals for External Transactions is consistent with the objectives of Order No. 825. Requiring the NYISO to revert to less granular settlements for such transactions would undermine the benefits of aligning the real-time settlement intervals for all supply resources.

III. NYISO Already Complies With the Shortage Pricing Trigger Requirement

Order No. 825 acknowledges that the NYISO currently implements shortage pricing in both its Day-Ahead and Real-Time Markets[25] utilizing various demand curves for Operating Reserves (*i.e.*, Operating Reserve Demand Curves)[26] and Regulation Service (*i.e.*, Regulation Service Demand Curve)[27]. These demand curves represent the escalating value of each product

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[24] The Commission has previously held that it is appropriate to assign risk to Market Participants, or Transmission Customers. *See New York State Independent System Operator, Inc.*, Order Conditionally Accepting Tariff Revision 146 FERC ¶ 61,097 (2014) at P 37 ("We [the Commission] continue to find it reasonable to incorporate both import and curtailment risk in the importer's offer rather than assigning these costs to statewide load."). *See also New York State Independent System Operator, Inc.*, Order Conditionally Accepting Tariff Revision 146 FERC ¶ 61,155 (2014) at P 40 ("assigning latency risk to transmission customers that schedule External Transactions is consistent with the treatment of transactions between NYISO and PJM as well as with the treatment of exports from NYISO.").

[25] Order No. 825 at P 112 and 172.

[26] *See* Section 2.15 and Section 15.4 of the Services Tariff ("Operating Reserve Demand Curve: A series of quantity/price points that defines the maximum Shadow Price for Operating Reserves meeting a particular Operating Reserve requirement corresponding to each possible quantity of Resources that the ISO's software may schedule to meet that requirement. A single Operating Reserve Demand Curve will apply to both the Day-Ahead Market and the Real-Time Market for each of the ISO's twelve Operating Reserve requirements.").

[27] *See* Section 2.18 and Section 15.3 of the Services Tariff ("Regulation Service Demand Curve: A series of quantity/price points that defines the maximum Shadow Price for Regulation Service corresponding to each possible quantity of Resources that the ISO's software may schedule to satisfy the ISO's Regulation Service constraint. A

as the level of any shortage thereof increases. The NYISO has utilized demand curves for shortage pricing since 2005.[28]

The NYISO dispatches and prices Operating Reserves on a five-minute basis. This practice is necessary to support the NYISO's use of a least-cost economic dispatch market model that simultaneously co-optimizes Energy, Regulation Service and Operating Reserves nominally every five minutes in real-time. Co-optimization ensures that the system commits and dispatches adequate resources to meet the flexibility requirements of the system. It also allows prices to reflect shortage conditions that are brief in duration.

Consistent with Order No. 825, the NYISO uses demand curves to price all reserve shortages, regardless of their duration.[29] Each five-minute LBMP calculated during the RTD process may incorporate shortage costs associated with the inability to meet a Regulation Service or Operating Reserves requirement under the Regulation Service Demand Curve and the Operating Reserve Demand Curves and/or Scarcity Reserve Demand Curve.[30] The NYISO's use of demand curves allows for prices to increase as shortages worsen. Escalating prices allows the commitment and dispatch software to determine the most economic solution to resolve different levels of shortage. Escalating prices also incentivize greater resource flexibility by rewarding resources that are capable of responding to real-time system conditions.

The NYISO already complies with the shortage pricing requirements established by Order No. 825. Accordingly, no revisions to its Tariffs are necessary.

IV. Offline Resource Pricing

Order No. 825 does not require any changes to existing practices that allow offline resources to set prices, however, the Order states that "RTOs/ISOs choosing to use offline resources to count towards energy and operating reserve requirements may not allow infeasible or uneconomic offline units to set prices … or to be counted as providing reserves."[31] The NYISO's offline gas turbine ("GT") pricing rules provide a transparent price signal when unforeseen changes arise between the RTC process and RTD process.[32] This pricing method

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single Regulation Service Demand Curve will apply to both the Day-Ahead Market and the Real-Time Market for Regulation Service. The Shadow Price for Regulation Service shall be used to calculate Regulation Service payments under Rate Schedule 3 of this ISO Services Tariff.").

[28] *See* Docket No. ER04-230-000, *New York Independent System Operator, Inc.*, Tariff Revisions Reflecting Implementation of Enhanced Real-Time Scheduling Software (November 26, 2003); and *New York State Independent System Operator, Inc.*, 106 FERC ¶ 61,111 (2004).

[29] *See* Order No. 825 at PP 112 and 121 ("Potomac Economics explains that all the markets that it monitors (ISONE, NYISO, and MISO) are designed to price all shortages, regardless of duration.").

[30] *See* Section 17.1 of the Services Tariff.

[31] Order No. 825 at P 168.

[32] *See* Section 4.4.2.4 of the Services Tariff; Docket No. ER05-1123-000, *New York Independent System Operator, Inc.*, Proposed Tariff Revisions to Remedy Real-Time Market Price Volatility Attributable to Forecasting

uses adjusted GT bids to establish a realistic price signal that includes commitment costs when an offline GT sets price in real-time. The NYISO's offline GT pricing logic only utilizes offers from feasible and economic offline units to set prices. The NYISO's RTD process allows an offline 10-minute GT to set price because it is capable of starting within ten minutes, prior to the next RTC process execution. Allowing offline GTs to set price in the Real-Time Market, through the RTD process, helps ensure the most efficient set of resources are scheduled, recognizing both the current system conditions and expected future system demands. As such, the NYISO does not propose any changes to its offline GT pricing logic at this time.

V. Correspondence

Copies of correspondence concerning this filing should be served on:

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VI. Service

The NYISO will send an electronic link to this filing to the official representative of each party to this proceeding, to each of its customers, to each participant on its stakeholder committees, to the New York State Public Service Commission, and to the New Jersey Board of Public Utilities. In addition, the complete filing will be posted on the NYISO's website at www.nyiso.com.

Uncertainties and Request for Expedited Treatment (June 17, 2005); and *New York Independent System Operator, Inc.*, 112 FERC ¶ 61,075 (2005). Resources eligible for consideration under such rules are offline generators that: (i) are capable of starting with ten minutes; (ii) have satisfied any applicable minimum downtime requirements; and (iii) have not otherwise been committed by RTC or RTD-CAM.

VII. Conclusion

The NYISO respectfully requests that the Commission accept this compliance filing and determine that NYISO's existing processes and procedures comply with the requirements of Order No. 825.

Respectfully submitted,

/s/ James H. Sweeney
Robert E. Fernandez, General Counsel
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CERTIFICATE OF SERVICE

I hereby certify that I have this day served the foregoing document upon each person designated on the official service list compiled by the Secretary in this proceeding in accordance with the requirements of Rule 2010 of the Rules of Practice and Procedure, 18 C.F.R. §385.2010.

Dated at Rensselaer, NY this 11th day of January 2017.

/s/ Joy A. Zimberlin

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