Attachment V

UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

New York Independent System Operator, Inc. **Docket No. _____**

AFFIDAVIT OF DAVID B. PATTON, PH.D.

I. Qualifications and Purpose

1. My name is David B. Patton. I am an economist and President of Potomac Economics. Our offices are located at 9990 Fairfax Boulevard, Fairfax, Virginia 22030. Potomac Economics is a firm specializing in expert economic analysis and monitoring of wholesale electricity markets, and is the Market Monitoring Unit ("MMU") for the New York Independent System Operator, Inc. ("NYISO"). Potomac Economics serves in a substantially similar role for ISO New England, the Midwest Independent Transmission System Operator, Inc., and the Electric Reliability Council of Texas.

2. As the MMU for the NYISO, Potomac Economics is responsible for assessing the competitive performance of the markets that the NYISO administers and for assisting in the implementation of a monitoring plan to identify and remedy potential market design flaws and abuses of market power. This work has included preparing a number of reports that assess the performance of these markets and providing advice on numerous issues related to market design and

economic efficiency. Prior to Potomac Economics becoming the MMU, I served as the independent Market Advisor to the NYISO.

3. I have worked as an energy economist for twenty-one years, focusing primarily on the electric utility and natural gas industries. I have provided strategic advice, analysis, and expert testimony in the areas of electric power industry restructuring, pricing, mergers, and market power. I have also advised other existing and prospective RTOs on transmission pricing, market design, and congestion management issues. With regard to competitive analysis, I have provided expert testimony and analysis regarding market power issues in a number of mergers and market-based pricing cases before the Federal Energy Regulatory Commission ("FERC"), state regulatory commissions, and the U.S. Department of Justice.

4. Prior to my experience as a consultant, I served as a Senior Economist in the Office of Economic Policy at the Federal Energy Regulatory Commission, advising the Commission on a variety of policy issues including transmission pricing, open-access and electric utility mergers. As a member of the Commission's advisory staff, I worked on policies reflected in Order No. 888, particularly on issues related to power pool restructuring, independent system operators ("ISOs"), and functional unbundling. I also analyzed the competitive characteristics of alternative transmission pricing and electricity auctions proposed by ISOs.

5. Before joining the Commission, I worked as an economist for the U.S. Department of Energy. During this time, I helped develop and analyze policies related to investment in oil and gas exploration, electric utility demand side management, residential and commercial energy efficiency, and the deployment of new energy technologies. I have a Ph.D. and M.A. in Economics from George Mason University and a B.A. in Economics with a minor in Mathematics from New Mexico State University.

6. The purpose of this affidavit is to set forth my analysis of the need to apply the NYISO's Special Pricing Rules[1] at the Proxy Generator Bus that will be associated with the proposed Hudson Transmission Partners Scheduled Line (the "HTP Proxy Generator Bus"). Unless otherwise specified, capitalized terms used in my affidavit have the same meanings specified in the NYISO Services Tariff, as modified by the NYISO's current filing seeking authorization to make certain tariff revisions that are necessary to implement the HTP Scheduled Line.

7. Section II of this affidavit discusses the process proposed for scheduling across the HTP Scheduled Line and the resulting competitive concerns. Section III describes the pricing anomalies that may occur as a result. Section IV describes the Special Pricing Rules and how they would address the competitive concerns at the HTP Proxy Generator Bus.

II. Scheduling over HTP and the other interfaces between NYISO and PJM

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[1] The Special Pricing Rules are set forth in Market Services Tariff Section 17.1.6.4.

8. Currently, market participants schedule power between the NYISO and the PJM Interconnection, LLC ("PJM") across three interfaces. First, the primary NYISO – PJM interface is composed of multiple transmission facilities connecting the two systems. The interface is represented as a single Proxy Generator Bus in the NYISO market model for which Total Transfer Capability ("TTC") and Available Transfer Capability ("ATC") are posted and a Location Based Marginal Price ("LBMP") is calculated. This is known as the Keystone Proxy Generator Bus.

9. Second, the Neptune Scheduled Line allows scheduling between the NYISO and PJM that is separate from the lines that make up the primary interface. This results in separate LBMPs for transactions scheduled over the Neptune Scheduled Line. This is possible because the Neptune Scheduled Line is "controllable," *i.e.*, the flows can be independently increased and decreased because it is a Direct Current ("DC") facility.

10. Third, the Linden VFT Scheduled Line allows scheduling between the NYISO and PJM that is separate from the lines that make up the primary interface and from the Neptune Scheduled Line. This results in separate LBMPs for transactions scheduled over the Linden VFT Scheduled Line. Like the Neptune Scheduled Line, the Linden VFT Scheduled Line is controllable.

11. In the filing that this affidavit supports, the NYISO is proposing to distinguish transactions scheduled across the new HTP Scheduled Line from the transactions scheduled at the other three interfaces between the NYISO and PJM.

Accordingly, the NYISO proposes to post a separate LBMP for the HTP Proxy Generator Bus.

12. The NYISO's proposed implementation of the HTP Scheduled Line as a distinct scheduling path will recognize that the HTP Scheduled Line is a transmission facility that relies in part on "physical rights" (in the form of Advance Reservations) to determine which transactions will be permitted to flow and the priority of each proposed transaction.

13. Successful implementation of the HTP Scheduled Line's Advance Reservations process is complicated by the fact the HTP Scheduled Line interconnects two transmission constrained areas in separate markets (New York City in the NYISO and Eastern New Jersey in PJM) that generally employ bid-based scheduling to allocate scarce transmission capacity.

14. Based on my review of topology of the NYISO system and the scheduling rules that will apply to HTP, I have determined that the price at the HTP Proxy Generator Bus may diverge substantially from competitive levels when it is congested (*i.e.*, when the constraint on imports and/or, in the future, exports over the line are binding). Congestion affecting the Proxy Generator Bus associated with the HTP Scheduled Line may occur when proposed transactions that are supported by Advance Reservations exceed the HTP Scheduled Line's TTC/ATC in real-time.

15. The first scenario in which the Special Pricing Rules may be necessary to prevent inefficient pricing anomalies is when the HTP Scheduled Line becomes severely congested in real time *after* the NYISO or PJM operators derate the capability of the HTP Scheduled Line to address problems with the line itself, or to maintain system reliability. Such derates can reduce the capability of the interface to a level lower than the net interface schedules from the NYISO's Day-Ahead Market ("DAM"). When this happens, the NYISO's Real Time Commitment software ("RTC") that schedules External Transactions must buy back some of the DAM transactions or purchase counter-flow transactions to resolve resulting congestion.

16. At most interfaces, this process will predictably result in a competitive price to resolve the real-time congestion because all market participants have the opportunity to submit offers to import or export power. However, the following two factors limit the set of potential competitors during periods of real-time congestion. First, only an entity holding Advance Reservations over the HTP Scheduled Line will be able to submit counterflow offers or offers to reduce its DAM transaction quantity in order to resolve the congestion. Hence, the advance reservation requirement prevents other entities from submitting counterflow offers to resolve the congestion.

17. Second, although the HTP Scheduled Line will be capable of bidirectional operation, the operator of the line has not yet applied to PJM for injection rights, so the line will not initially support exports from the NYISO to PJM. Thus, in the

event of a real-time import-constraint, competition to provide congestion relief will be limited to market participant(s) that scheduled DAM import transactions.

18. Both factors substantially limit the competitive options for resolving constraints on the HTP Scheduled Line. In fact, either factor alone would justify my conclusion that it is necessary to apply the Special Pricing Rules at the HTP Proxy Generator Bus. If the system of Advance Reservations were altered to allow many firms to schedule transactions across the HTP Scheduled Line (thereby addressing the first factor), the inability of entities to schedule exports from the NYISO to PJM (i.e., the second factor) would still limit competition to provide congestion relief. Likewise, if entities were allowed to schedule exports from the NYISO to PJM (thereby addressing the second concern), the system of Advance Reservations (i.e., the first factor) would still prevent other entities from competing to provide congestion relief.

19. If all potential suppliers were capable of simultaneously submitting offers to import or export over the HTP Scheduled Line, as is generally possible in the hourly external transaction scheduling process at the Keystone Proxy Generator Bus, the proposed Special Pricing Rules would not be necessary. However, Advance Reservation system and the other scheduling limitations raise competitive concerns that could lead to the sort of pricing anomalies that are discussed in Section III of this affidavit.

20. NYISO proposes to apply the Special Pricing Rules when the HTP Scheduled Line becomes severely congested in the rolling 15-minute evaluation of external

transactions by RTC when a ramp constraint is imposed to limit the change in schedules between NYCA and adjacent control areas to prevent inefficient pricing anomalies. Although it is less clear that the Special Pricing Rules are needed in this case, it is possible that the number of firms competing to relieve congestion may not be sufficient to prevent inefficient pricing anomalies. This is because the NYISO is planning to implement the rolling 15-minute evaluation on a limited basis for only the following interfaces: the Hydro Quebec Proxy Generator Bus, the Keystone Proxy Generator Bus, the Linden VFT Scheduled Line, the Neptune Scheduled Line, and the HTP Scheduled Line. Hence, the number of firms competing to relieve the congestion will be reduced due to the limited number of interfaces. [2]

III. Potential Price Anomalies at the HTP Proxy Generator Bus without the Special Pricing Rules

21. The Special Pricing Rules proposed in this filing were implemented for the Neptune Scheduled Line and the Linden VFT Scheduled Line to address similar competitive and pricing concerns as described above. However the first use of a substantially similar pricing rule was the "Non-Competitive Proxy Bus rule" that was approved by the Commission and implemented for the HQ Proxy Generator

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[2] For this reason, there is some potential for inefficient pricing anomalies to occur at the PJM Keystone Proxy Generator Bus as well. Although the PJM Keystone Proxy Generator Bus does not have the characteristics of a Non-Competitive Proxy Generator Bus or a designated Scheduled Line, and thus, is not eligible for treatment under the Special Pricing Rules, we will monitor 15-minute pricing and scheduling outcomes on an on-going basis. If we identify anomalous pricing outcomes, we will promptly notify the NYISO and the Commission and recommend appropriate modifications to the pricing rules.

Bus.[2] Market outcomes at the HQ Proxy Generator Bus illustrate the types of concerns that arise for the HTP Scheduled line.

22. When the HQ interface had been constrained prior to implementing the Non-Competitive Proxy Bus rule, prices for counter-flow transactions into Quebec have dropped as low as negative $999.99 per MWh, forcing the NYISO to *pay* parties $999.99 per MWh to receive power in Quebec from the New York system. Such costs are collected from the loads in New York in the form of uplift charges. This occurred on July 5, 2002 when operators derated the import capability from 1,500 megawatts to 500 megawatts for one hour. Since 1,350 megawatts had been sold into New York Day-Ahead Market at $34.68 per MWh, the NYISO's Balancing Market Evaluator was required to schedule 700 megawatts of uneconomic export counter-flow and to curtail 150 megawatts of day-ahead market import transactions at $999.99 per MWh.

23. Thus, the NYISO effectively paid day-ahead importers $999.99 per MWh for curtailing transactions that were originally accepted at $34.68 per MWh. Since HQ's bids were needed to resolve the interface congestion, HQ had no incentive to bid at more economic prices. Had other market participants with the ability to receive power in Quebec been bidding to purchase power from New York at more economic price levels, their bids would have been accepted and set prices at more efficient levels. Hence, greater liquidity provided by competing suppliers at the

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[2] *See New York Independent Transmission System Operator, Inc*., 104 FERC ¶ 61,220 (2003)~~;~~ *on reh'g*, 105 FERC ¶ 61,347 (2003).

HQ Proxy Generator Bus would likely have prevented or, at least, significantly mitigated pricing inefficiencies on July 5, 2002. It is my opinion that the limitation on competition to resolve congestion over the HTP Scheduled Line presents competitive conditions that could produce results similar to those experienced at the HQ Proxy Generator Bus if the Special Pricing Rules are not applied.

24. Even though pricing anomalies similar to those that could occur at the HTP Proxy Generator Bus have generally occurred for relatively brief periods, the economic costs have been substantial. For example, the pricing event at the HQ Bus on July 5, 2002 resulted in uplift costs to loads in New York of approximately $850,000 in a single hour. When these price anomalies are sustained, the costs are much higher. Costs of greater than $6,500,000 were generated on April 17, 2002 when real-time prices paid by the NYISO at the HQ Proxy Generator Bus ranged from $750/MWh to $903.69/MWh in eleven consecutive hours.

25. The NYISO proposes not to apply the Special Pricing Rules at times when congestion is caused by ramp constraints on the flows across the HTP Scheduled Line in the hourly evaluation of external transactions. The NYISO applies ramp limits at the New York Control Area ("NYCA")-wide level and at the primary interface with PJM, but does not presently propose to apply a specific ramp limit to the HTP Scheduled Line. The NYISO has the ability to accept bids at any of its Proxy Generator Buses to resolve NYCA ramp constraints. Because offers at

multiple interfaces can resolve the ramp constraint, competition should be sufficient establish reasonable prices at the Proxy Generator Buses.

26. If, for market, operational or reliability reasons, at some future time the NYISO determines that it is necessary to implement a Scheduled Line specific ramp limit for the HTP Scheduled Line, then it will be necessary to modify the Special Pricing Rules to address situations when the ramp constraint for the HTP Scheduled Line is binding.

IV. Special Pricing Rules Recommendation

27. The NYISO proposes to apply the Special Pricing Rules for Variably Scheduled Proxy Generator Busses to the HTP Scheduled Line. These rules should effectively address the competitive and pricing concerns described in the prior two sections of this affidavit. As described in Section 17.1.6.4 of the NYISO Market Services Tariff, The Special Pricing Rules for Variably Scheduled Proxy Generator Busses currently operate as follows:

Rule No.	Proxy Generator Bus Constraint affecting External Schedules at location a	Direction of Proxy Generator Bus Constraint	Real-Time Pricing Rule (for location a)
40	The Rolling RTC used to schedule External Transactions in a given 15-minute interval is subject to an Interface ATC Constraint, and RTC_{15} was not subject to that Interface ATC Constraint	Into NYCA (Import)	Real-Time $LBMP_a$ = Max(Rolling RTC $LBMP_a$, Min(RTD $LBMP_a$, 0))
41	The Rolling RTC used to schedule External Transactions in a given 15-minute interval is subject to an Interface ATC Constraint, and RTC_{15} was not subject to that Interface ATC Constraint	Out of NYCA (Export)	Real-Time $LBMP_a$ = Min(Rolling RTC $LBMP_a$, Max(RTD $LBMP_a$, SCUC $LBMP_a$))
42	The Rolling RTC used to schedule External Transactions in a given 15-minute interval is subject to a NYCA Ramp Constraint, and RTC_{15} was not subject to that NYCA Ramp Constraint	Into NYCA (Import)	Real-Time $LBMP_a$ = Max(Rolling RTC $LBMP_a$, Min(RTD $LBMP_a$, 0))
43	The Rolling RTC used to schedule External Transactions in a given 15-minute interval is subject to a NYCA Ramp Constraint, and RTC_{15} was not subject to that NYCA Ramp Constraint	Out of NYCA (Export)	Real-Time $LBMP_a$ = Min(Rolling RTC $LBMP_a$, Max(RTD $LBMP_a$, SCUC $LBMP_a$))
44	RTC_{15} and the Rolling RTC are subject to the same Interface ATC Constraint	Into NYCA (Import)	Real-Time $LBMP_a$ = Max(RTC_{15} $LBMP_a$, Rolling RTC $LBMP_a$, Min(RTD $LBMP_a$, 0))
45	RTC_{15} and the Rolling RTC are subject to the same Interface ATC Constraint	Out of NYCA (Export)	Real-Time $LBMP_a$ = Min(RTC_{15} $LBMP_a$, Rolling RTC $LBMP_a$, Max(RTD $LBMP_a$, SCUC $LBMP_a$))
46	RTC_{15} and the Rolling RTC are subject to the same NYCA Ramp Constraint	Into NYCA (Import)	Real-Time $LBMP_a$ = Max(RTC_{15} $LBMP_a$, Rolling RTC $LBMP_a$, Min(RTD $LBMP_a$, 0))
47	RTC_{15} and the Rolling RTC are subject to the same NYCA Ramp Constraint	Out of NYCA (Export)	Real-Time $LBMP_a$ = Min(RTC_{15} $LBMP_a$, Rolling RTC $LBMP_a$, Max(RTD $LBMP_a$, SCUC $LBMP_a$))

28. Section 18.6.1.2 of the NYISO's Market Services Tariff includes related provisions that affect the settlement of external transactions that settle at Proxy Generator Busses where the Special Pricing Rules are applied. Specifically:

- The NYISO will not make Real-Time Bid Production Cost Guarantee payments to External Generators or other Suppliers for imports scheduled at a

Proxy Generator Bus that is associated with a Scheduled Line if the Proxy Generator Bus is export constrained.

29. I was consulted by the NYISO in connection with the formulation of the Special Pricing Rules, and I previously filed affidavits in support of the application of these rules to the Cross Sound Scheduled Line, the Neptune Scheduled Line, and the Linden VFT Scheduled Line. All three of the identified Scheduled Lines require Advance Reservations comparable to the reservations proposed for the HTP Scheduled Line. I support the application of these rules to the HTP Scheduled Line because these rules will appropriately limit Market Participants' ability to exercise market power in relieving real-time congestion at the HTP Proxy Generator Bus. Left unaddressed, the potential for Market Participants to exercise market power could result in inefficient pricing and substantial costs to New York loads.

30. The rules for import constrained situations (Rule Nos. 40, 42, 44, & 46 in the table above) prevent the NYISO from being subjected to paying uneconomic prices to reduce imports from New England and PJM. Under the Special Pricing Rules, at times when the Cross-Sound Scheduled Line, the Neptune Scheduled Line, the Linden VFT Scheduled Line, or the HTP Scheduled Line are constrained and Market Participants may be able to exercise market power, competitive market-derived prices may be substituted for real-time prices that result from the exercise of market power.

31. This is consistent with the results at other interfaces that are subject to greater competition. In theory, a participant should be willing to export (or reduce its

imports) as long as the cost paid for the export is less than the cost of generating power in the adjacent area. Under most conditions, this value should correspond to the most expensive internal generator whose output can be reduced. A negative price (*i.e.*, a participant being paid to accept export energy from New York) should only occur if no internal generator can be reduced to accommodate the export from New York without incurring significant expected costs. This is unlikely to be the case except in a minimum generation condition where the only option is to shut down an operating generating unit. The pricing rules are designed to preclude pricing at the HTP Proxy Generator Bus that is not consistent with competitive expectations (*i.e.*, the outcomes that would be expected were there many participants transacting over the interface).

32. Similarly, the rules for export constraints (Rule Nos. 41, 43, 45, & 47 in the table above) will prevent Market Participants from extracting substantial market power rents when their imports must be accepted in real-time as counter-flow to relieve the export constraint, by limiting prices to the lower of: (a) the LBMP determined by the rolling 15-minute evaluation of RTC; (b) the LBMP determined by the hourly evaluation of RTC, which is known as "RTC_{15}"; or (c) the higher of the LBMP determined by RTD and the DAM LBMP determined by SCUC. Even though exports will not be allowed across the HTP Scheduled Line, the Special Pricing Rules will still be needed, because export constraints can arise when the prevailing direction of flows are in the import direction (*i.e.*, when import flows are not allowed to fall below a particular level).

33. Under the pricing alternatives established in the proposed Special Pricing Rules applicable to both import and export constrained situations, the real-time prices at the HTP Proxy Generator Bus will be allowed to rise to levels associated with competitive market conditions in New York but not to arbitrarily high levels reflecting a lack of competition at the interface. A competitive RTD or Day-Ahead Market (SCUC) price can be a reasonable competitive proxy for a Real-Time Proxy Generator Bus LBMP (determined by RTC) that has been inflated to arbitrarily high (or arbitrarily low negative) levels as a result of a lack of competition. Such prices will thus be used to set the price at the HTP Proxy Generator Bus when appropriate.

34. The Special Pricing Rules may, under certain conditions, cause the real-time LBMP at the HTP Proxy Generator Bus to be set to a significantly lower level than would otherwise apply, and indeed may cause LBMPs to be set to zero. This remedy for the lack of competition could be undermined by elevated guarantee payments brought about by the very noncompetitive conditions this filing seeks to address. Thus, it is appropriate to apply the rules regarding guarantee payments described in Paragraph 28 of my Affidavit.

35. In its role as the Market Monitoring Unit for the NYISO, Potomac Economics will closely monitor the performance of prices at the HTP Proxy Generator Bus to ensure that the Special Pricing Rules achieve their intended purpose and do not result in any significant inefficiencies.

36. For the reasons set forth above, I recommend that the Commission approve the proposed application of the Special Pricing Rules at the Proxy Generator Bus that is associated with the HTP Scheduled Line.

37. This concludes my affidavit.

ATTESTATION

I am the witness identified in the foregoing Affidavit of David B. Patton, Ph.D. dated December [13]th, 2012 (the "Affidavit"). I have read the Affidavit and am familiar with its contents. The facts set forth therein are true to the best of my knowledge, information, and belief.

David B. Patton

December [13]th, 2012

Subscribed and sworn to before me

this [13]th day of December, 2012

MATTHEW JAMES CARRIER
Notary Public
City/County of Fairfax
Commonwealth of Virginia
Notary registration number - 7233763
My commission expires - Nov. 30, 2013

Notary Public

My commission expires: Nov. 30 2013