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December 9, 2016

SENT VIA ELECTRONIC FILING

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Room 1-A209
Washington, D.C. 20426

Re: Docket No. ER17-386-000 - New York Independent
System Operator, Inc.

Dear Secretary Bose:

For filing, please find the Notice of Intervention and Protest of the New York State Public Service Commission and the New York State Energy Research and Development Authority in the above-entitled proceeding. The parties have also been provided a copy of this filing, as indicated in the attached Certificate of Service. Should you have any questions, please feel free to contact me at (518) 402-1537.

Very truly yours,

S. Jay Goodman

S. Jay Goodman

Assistant Counsel

Attachment

cc: Service List

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**UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION**

New York Independent System Operator, Inc.) Docket No. ER17-386-000
)

**NOTICE OF INTERVENTION AND PROTEST
OF THE NEW YORK STATE PUBLIC SERVICE COMMISSION AND
NEW YORK STATE ENERGY RESEARCH AND DEVELOPMENT AUTHORITY**

INTRODUCTION AND EXECUTIVE SUMMARY

Pursuant to Rules 211 and 214 of the Federal Energy Regulatory Commission's (Commission) Rules of Practice and Procedure (18 C.F.R. §§385.211 and 385.214), and the Commission's Combined Notice of Filings #1, issued on November 18, 2016, the New York State Public Service Commission (NYPSC) and New York State Energy Research Authority (collectively, the State Entities) hereby submit this Notice of Intervention and Protest to the proposed tariff amendments filed by the New York Independent System Operator, Inc. (NYISO) on November 18, 2016 (Tariff Filing). The Tariff Filing describes new Installed Capacity (ICAP) Demand Curves for Capability Year (CY) 2017/2018, and the methodology and inputs for CYs 2018/2019, 2019/2020, and 2020/2021. The proposed amendments rely on recommendations advanced by NYISO Staff and its consultants,

Analysis Group, Inc. (AG) and Lummus Consultants International, Inc. (Lummus) (collectively, the Consultants).¹

The Tariff Filing represents the culmination of an extensive stakeholder process that commenced in August 2015. The State Entities participated actively in that process and took advantage of each opportunity to provide feedback through written or oral comments. As discussed below, the Tariff Filing proposes many Demand Curve design elements that are unjustified and would result in unjust and unreasonable prices. The State Entities respectfully urge the Commission to remedy each such deficiency.²

In particular, the NYISO has failed to adhere to its Market Administration and Control Area Services Tariff (Services Tariff), which requires the ICAP Demand Curve reset (DCR) parameters to be based on the "current localized levelized embedded cost of a peaking plant" with the "lowest fixed costs

¹ The final recommendations of NYISO Staff were appended to the Tariff Filing as Attachment V and will be referenced herein as the "NYISO Staff Recommendations." The Tariff Filing also includes a technical report prepared jointly by the Consultants that is appended to the filing as Attachment III, Exhibit A and is referenced herein as the "DCR Report." Affidavits sworn by AG and Lummus also are appended to the Tariff Filing as Attachment III (AG Aff.) and Attachment IV (Lummus Aff.), respectively.

² The views expressed herein are not intended to represent those of any individual member of the NYPSC. Pursuant to Section 12 of the New York Public Service Law, the Chair of the NYPSC is authorized to direct this filing on behalf of the NYPSC.

and highest variable costs among all" generation technologies examined that are "economically viable."³ In other words, the ICAP Demand Curves must reflect the actual cost to build a hypothetical proxy peaking plant today, based on current market conditions adjusted to reflect a tariff-defined level of excess capacity.⁴

The Demand Curves are not intended to anticipate and promote potential market or regulatory changes that might (or might not) happen in the future. The DCR process is not the appropriate vehicle to pursue market or regulatory changes, or for the NYISO to insert anticipate or predict future policy changes. The Demand Curves are updated periodically in part to ensure that capacity prices set by the Demand Curves reflect market and regulatory changes that occur between DCRs. The Commission has explicitly affirmed this point, stating that "[a] demand curve reset process takes place every three years so that changed circumstances, such as new regulations[,] can be taken into account."⁵

The State Entities' positions advanced herein adopt this Services Tariff-prescribed perspective, and advocate for

³ Services Tariff §§5.14.1.2.1-.2 (emphasis added).

⁴ Tariff Filing at 3.

⁵ Docket ER14-500-000, New York Independent System Operator, Inc., 146 FERC ¶61,043 (issued January 28, 2014) at ¶74 (2014 DCR Order).

Demand Curve parameters reflecting unit design decisions that a developer likely would make today, based on current market conditions. In the context of this reset cycle, the proposed Demand Curve design parameters that anticipate potential future market or regulatory rule changes would increase incumbent generator revenues, increase customer capacity costs, and present the peaking unit developer with an economic arbitrage opportunity to maximize revenues by avoiding optional investments reflected in the Demand Curves. Unfortunately, the Tariff Filing includes several proposals that are consistent with this approach and, therefore, violate the Services Tariff.

The Tariff Filing also advances certain recommendations that are based on analyses that are incomplete and/or have not been shared with stakeholders. The lack of transparency and access to relevant information handicaps the ability of the Commission and stakeholders to evaluate the NYISO's recommendations, or to develop alternative outcomes.

In light of the foregoing, the State Entities respectfully urge the Commission to:

1. direct the NYISO to eliminate the inclusion of dual fuel capability in the design of proxy peaking units located in Zones where such investment is optional;
2. direct the NYISO to eliminate the inclusion of selective catalytic reduction (SCR) technology to control emissions of nitrogen oxides (NO_x) in the design of proxy peaking units located in Zones where such investment is optional;

3. direct the NYISO to use alternative gas trading hubs for modeling purposes in Zones C and G (Rockland);
4. direct the NYISO to provide further information and analysis regarding certain financial parameters;
5. direct the NYISO to provide further information and analysis regarding a dramatic increase in certain peaking unit cost estimates; and,
6. direct the NYISO to explicitly reflect new shortage pricing rules in the updated Demand Curves.

NOTICE OF INTERVENTION

The State Entities submit their Notice of Intervention pursuant to Rule 214 of the Commission's Rules of Practice and Procedure (18 C.F.R. §385.214(a)(2)), and the Commission's Combined Notice of Filings #1, issued on November 18, 2016.⁶

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⁶ The NYPSC is a regulatory body established under the laws of the State of New York with jurisdiction to regulate rates and charges for the sale of electric energy to consumers within the State, and is therefore a State Commission as defined in section 3(15) of the Federal Power Act (FPA) (16 U.S.C. §796(15)).

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PROTEST

I. THE COMMISSION SHOULD DIRECT THE NYISO TO ELIMINATE THE INCLUSION OF DUAL FUEL CAPABILITY FOR PROXY PEAKING UNITS LOCATED IN ZONES WHERE SUCH CAPABILITY IS NOT REQUIRED AND THE ADDITIONAL COSTS ARE NOT JUSTIFIED

The NYISO recommends that proxy peaking units located in Zones C and F should be gas-only, but proxy peaking units located in New York City (NYC), Long Island, and the G-J Locality should include dual fuel capability.⁷ The NYISO explains that the “circumstances presented” in Zones C and F are distinguishable from NYC, Long Island, and the G-J Locality because local electric reliability rules applicable to NYC and Long Island require generators located in those Zones to include dual fuel capability.⁸ However, no such requirement applies to generators located in Zones C or F, or to generators in Zone G that interconnect with an interstate pipeline.

Absent a regulatory requirement for dual fuel capability, the NYISO examined other pertinent factors to

⁷ Tariff Filing at 16-18.

⁸ Id. at 16.

determine whether a peaking unit located in Zones C or F would include this optional investment. The NYISO explains that the availability of sites and utility infrastructure for facility interconnection are not constrained in Zones C and F.⁹ These Zones generally are located upstream of interstate pipeline constraints in New York, and multiple gas-only facilities are under development in Zones C and F, as indicated by the NYISO's interconnection queue.¹⁰ For these reasons, the NYISO appropriately concluded that it would be reasonable for a gas-only peaking unit to be selected as the appropriate configuration for the New York Control Area (NYCA) ICAP Demand Curve.¹¹ This recommendation is consistent with the unit approved by the Commission for NYCA during the 2014 DCR.¹²

As to the G-J Locality, however, the State Entities disagree with the NYISO that the Zone G peaking unit should include dual fuel capability. The NYISO attempts to distinguish Zone G from Zones C and F by arguing that, based on the consideration of certain factors, a peaking unit located in Zone G would be "economically viable" under the Services Tariff only

⁹ Tariff Filing at 18.

¹⁰ Id.

¹¹ Id.

¹² 2014 DCR Order at P83.

if it includes dual fuel capability.¹³ The NYISO's recommendation is based on its consideration of several factors. In particular, the NYISO assumes that a peaking unit located in Zone G would interconnect with the Local Distribution Company's (LDC) gas system and thus become subject to LDC tariff requirements for alternative fuels.¹⁴ This assumption rests on an evaluation of the "economic tradeoffs" between incremental net Energy and Ancillary Services (EAS) revenues potentially realized from operation on the alternate fuel and the incremental cost to install and maintain dual fuel capability, as well as the unquantified benefit of increased siting flexibility and potential reliability benefits.¹⁵

Significantly, however, the NYISO estimates that including dual fuel capability in a Zone G peaking unit would increase the facility's capital costs by approximately \$18.5 million in Zone G (8.0%).¹⁶ Notwithstanding the substantial

¹³ Tariff Filing at 16-18.

¹⁴ NYISO Staff Recommendations at 4-5.

¹⁵ Id. at 4; Tariff Filing at 16-18.

¹⁶ DCR Report at 112 and 126 (comparing the total capital costs for the F Frame unit with SCR and with or without dual fuel capability). Including dual fuel capability would increase the reference price by approximately 5.2% in Zones F and G, and by approximately 7.7% in Zone C. (Id. at Table 41A, p. 96 [comparing the reference prices for the F Frame unit with SCR and dual fuel capability and the gas-only F Frame unit with SCR]).

magnitude of this cost, the NYISO failed to present a quantitative economic analysis demonstrating that dual fuel capability would be cost-justified in Zone G, where it is not required. Information provided in the Tariff Filing indicates that the investment would be uneconomic, and that non-economic factors would be insufficient for a rational developer to assume the material, incremental capital costs to add such capability.

A. Dual Fuel Capability Is Optional and Not Cost-Justified In Zone G (Dutchess)

As noted above, dual fuel capability would increase the F Frame unit capital cost by approximately \$18.5 million in Zone G (8.0%). To date, however, the NYISO has not presented a quantitative economic analysis that justifies the incremental cost to include dual fuel capability in proxy peaking units located where such capability is not required. Similarly, the NYISO has failed to demonstrate that customers would realize a net benefit from such capability.¹⁷

Using data presented in the DCR Report, the State Entities compared revenues from the three-year historic period for a dual fuel and gas-only F Frame unit with SCR located in Zone G.¹⁸ Net energy revenues in CY 2013-2014 include historic

¹⁷ There has been no analysis evaluating the total costs and benefits of dual fuel capability from the customer perspective.

¹⁸ A summary of this analysis is appended as Attachment A.

prices affected by the "Polar Vortex," an extreme winter weather event. Incremental revenues attributable to oil-fired operation during this period were approximately \$6.47/kW-yr. Importantly, in subsequent years when the historic prices used to project net energy revenues do not include prices impacted by the Polar Vortex, incremental revenues earned from dual fuel capability were approximately \$0.52/kW-yr in CY 2014-2015, and were de minimis in CY 2015-2016. These paltry incremental revenues earned from dual fuel capability do not justify the material capital investment necessary to achieve such capability in Zone G, where it is not required by law or regulation.

Data provided by the NYISO and issued by the NYISO's Market Monitoring Unit (MMU) reinforces this conclusion. The NYISO completed a Consumer Impact Analysis of the ICAP Demand Curves that included a historic study of revenues earned by dual fuel peaking units over the last five years.¹⁹ The NYISO concluded that the incremental revenues associated with dual fuel capability only exceeded the incremental cost of same in Zones F and G during the year of August 2013-July 2014.²⁰ This period included the Polar Vortex, which, as noted above, was an

¹⁹ Consumer Impact Analysis: 2015/2016 ICAP Demand Curve Reset - Additional Analysis, Presentation to Installed Capacity Working Group (dated September 28, 2016) (Dual Fuel Impact Analysis).

²⁰ Id. at 15.

extreme weather event that caused extremely high gas prices.²¹

Aside from the impact of an extreme weather event that is unlikely to recur during the DCR period, the incremental cost of dual fuel capability exceeded the incremental revenues from that capability during all other historic periods examined.²²

The NYISO speculates that incremental revenues from oil-fired generation could be realized if certain events occur in the future.²³ There has been no discussion, however, of the likelihood of such events, or explanation of why a developer would assume the risk of material incremental costs to chase indeterminate and uncertain incremental profits in the future. Such events, if they occur in the future, may be considered in a future DCR process.²⁴

The information provided by the NYISO falls short of the data and analysis that a developer (and its financiers) would rely upon for investment decisions. Likewise, it is inadequate to justify inflating the reference price in Zone G by

²¹ Dual Fuel Impact Analysis at 15.

²² Id. at 16. NYISO Staff concluded that "there is no clear correlation between cold days and high gas prices." (Id. at 13.)

²³ Tariff Filing at 17; NYISO Staff Recommendations at 5; DCR Report at 32-33; AG Aff. at ¶30.

²⁴ 2014 DCR Order at ¶74 (explaining that "[a] demand curve reset process takes place every three years so that changed circumstances ... can be taken into account").

including incremental costs in the proxy peaking unit that are purely optional for the developer, and have not been demonstrated to be cost-justified. Accordingly, the proxy peaking unit in Zone G (Dutchess) should not include dual fuel capability.

B. Non-Economic Considerations Identified By The NYISO Do Not Overcome The Poor Economics Of Dual Fuel Capability

The NYISO asserts that including dual fuel capability would provide the developer with increased siting flexibility, and that dual fuel capability would provide "a form of fuel assurance."²⁵ Individually and collectively, these factors are unpersuasive and do not outweigh the dubious economics of including dual fuel capability where it is not required.

The claim that the optional, material cost of dual fuel capability is justified in part by increased siting flexibility is based on the assumption that a developer would interconnect its plant with the LDC system rather than an interstate pipeline. According to the NYISO, this decision could potentially minimize the costs to obtain natural gas and electrical interconnections.²⁶ Neither the NYISO, NYISO Staff, nor the Consultants, however, presented a detailed estimate of

²⁵ Tariff Filing at 17-18; Staff Recommendations at 4-5; AG Aff. at ¶30.

²⁶ Tariff Filing at 18.

the cost of electrical and gas interconnections for a proxy peaking plant interconnected with an interstate gas pipeline, or compared those costs to a proxy peaking unit that interconnects with an LDC system. More broadly, the NYISO failed to present a quantitative analysis that evaluates the potential costs and benefits of a proxy unit that interconnects with an LDC system rather than an interstate pipeline. Thus, this incomplete analysis fails to demonstrate that a developer would choose an LDC interconnection over an interstate pipeline interconnection.

The choice of interconnection is significant in regards to the optional dual fuel capability investment because a plant interconnected with the LDC system in Zone G would be subject to a utility tariff that would likely require the ability to run on an alternative fuel. An interstate gas pipeline interconnection would not require an alternative fuel and dual fuel capability. The NYISO acknowledges that a peaking unit connected to an interstate pipeline could be constructed in Zone G,²⁷ and the CPV Valley Energy Center (CPV Valley) generation project presents compelling evidence that an interstate pipeline interconnection may be preferred.

In a recent analysis of the CPV Valley generation project, the NYISO's MMU concluded, in relevant part, that CPV

²⁷ Id. at 16.

Valley "will be situated in a location where it will likely enjoy significant fuel cost advantages over other generators in the same wholesale electric market zone."²⁸ The MMU also concluded that "[p]rice spreads between natural gas trading hubs have increased considerably since 2010, and this is likely to drive future generation investment towards locations that are upstream of gas pipeline congestion while being downstream of electricity market congestion."²⁹ That is, the MMU anticipates that future generation developers would seek comparable fuel cost advantages by interconnecting with an interstate pipeline and exploiting price spreads between natural gas trading hubs to the extent practicable. This strategy would also avoid tariff-based costs that otherwise would be incurred to pay for LDC service. Thus, the recommendation to include dual fuel capability in Zone G, where it is optional, is based on incomplete data that fails to include a comprehensive analysis of whether the optional investment is cost-justified.

²⁸ Assessment of the Buyer-side Mitigation Exemption Test for the CPV Valley Energy Center Project, Potomac Economics, Ltd. (dated March 7, 2011) (CPV Assessment).

²⁹ Id. at 26-27.

C. The Reliability Benefits That Dual Fuel Capability Might Provide Are Not Sufficient To Justify The Optional, Material Cost Of Such Capability

The NYISO's recommendation is based, in part, on an argument that dual fuel capability could provide a reliability benefit.³⁰ Such reliability benefits, however, accrue to the system. A developer is not compensated for providing this benefit and, therefore, is unlikely to assume an optional, incremental investment to provide it. For this reason, the potential reliability benefits are not relevant to the design parameters for a hypothetical proxy peaking unit.

A recent analysis of preparedness for the 2015-2016 winter suggests that the potential reliability benefits associated with dual fuel capability may be speculative or illusory. In that analysis, the NYISO stated that NO_x emissions restrictions, decreased refinery capability in the Northeast, and upcoming carbon reduction targets under the Clean Power Plan are making it "more challenging for generation to burn oil."³¹ These considerations undermine the claim that the reliability benefits potentially associated with dual fuel capability would favor developing peaking units with that capability.

³⁰ Tariff Filing at 16-18; NYISO Staff Recommendations at 4.

³¹ Winter 2015-2016 Preparedness, FERC Commission Meeting (dated September 17, 2015) at 11.

For all the foregoing reasons, the State Entities respectfully urge the Commission to reject the NYISO's recommendation that the proxy peaking unit selected for Zone G include dual fuel capability. Such technology is not required for peaking units interconnected with an interstate pipeline, and the foregoing discussion explains why a developer would likely choose to build a gas-only plant on the interstate system.

II. THE COMMISSION SHOULD DIRECT THE NYISO TO ELIMINATE THE INCLUSION OF SCR FOR ZONES WHERE THE TECHNOLOGY IS NOT REQUIRED OR JUSTIFIED

The NYISO recommends that all proxy peaking units should include SCR technology to reduce NO_x emissions.³² This recommendation is based on a misleading characterization of current regulatory requirements and regulatory changes since the setting of the 2014 DCR, as well as the unjustified assumption that independent power producers would voluntarily assume incremental capital costs that are both optional and substantial. As detailed below, this recommendation should be rejected for the proxy peaking units located in Zones C, F, and G (Dutchess).

³² Tariff Filing at 15.

Initially, the NYISO states that the Consultants and NYISO Staff met with the New York State Department of Environmental Conservation (NYSDEC) "to review and discuss applicable environmental requirements for this DCR and developments since the last reset that impact such requirements."³³ The NYPSC also discussed these issues with the NYSDEC on multiple occasions during the stakeholder process. With respect to the NYISO's recommendation that all upstate peaking units should include SCR, the NYSDEC has authorized the NYPSC to explain that the NYISO Staff and the Consultants never discussed with NYSDEC whether a peaking unit without SCR may be permitted in Zones C, F, or G (Dutchess). This is the issue in dispute, not whether such unit may be permitted in New York City. Further, as detailed below, the NYISO ignored written comments provided by the NYSDEC that contradict the NYISO's characterization of, and conclusions regarding, relevant permitting requirements.

Further, it should be noted that electric generating plants have been permitted and constructed in New York without SCR to control NO_x emissions. These facilities include, for instance, the following:³⁴

³³ Tariff Filing at 4.

³⁴ The identified permits are available at http://www.dec.ny.gov/dardata/boss/afs/issued_atv.html.

Air Permit#	Facility Name	SCR?
3334600011	Danskammer Generating Station	No
6224000009	Reenergy Black River LLC	No
7351200005	Indeck-Oswego Energy Center	NO
9060800053	Samuel A Carlson Generating Station	No

This demonstrates that SCR technology to limit NO_x emissions is not an absolute requirement to satisfy applicable emissions rates and standards.

A. Optional Investment In SCR Technology Is Grossly Uneconomic

Generation plant owners incur costs to buy allowances and offsets for the NO_x emissions released by their facilities. The NYISO did not present a comparison of these costs for an F Frame unit with and without SCR technology.³⁵ The cost of allowances that must be purchased for each ton of NO_x actually emitted were not specified in the DCR Report or the NYISO Staff Recommendations. It is the State Entities' understanding that this data is embedded in the Consultants' model but includes proprietary data that cannot be included in public documents. As a result, the stakeholders were not presented with sufficient data as to the annual emissions costs savings that a developer

³⁵ Plants located in NO_x attainment zones (e.g., Zones C, F, and G [Dutchess]) do not incur the one-time cost to procure emission reduction credits (ERCs).

might realize by including optional SCR technology in its facility.

At a minimum, a benefit-cost analysis of the optional SCR investment is needed to support the recommendation that the proxy peaking plants located in Zones C, F, and G (Dutchess) should include this technology. The optional investment in SCR technology may increase project costs by approximately \$25 million (13.9%) in Zone F, approximately \$24.5 million (12.5%) in Zone C, and approximately \$26.4 million (12.6%) in Zone G (Dutchess).³⁶ The magnitude of this optional cost is large enough that the peaking plant developer (and, likely, its financiers) would require an economic analysis of the incremental investment, and would not rely solely on speculation as to future regulatory outcomes.

It appears that including optional SCR technology for proxy peaking units located in Zones C, F, and G (Dutchess) would not be cost-effective. A simple analysis illustrates this point. Based on data presented in the DCR Report for the period May 2015 through April 2016, the F Frame Unit with SCR located in Zone G (Dutchess) would emit approximately 8.1 tons of NO_x annually, whereas the same unit without SCR would emit

³⁶ DCR Report at 126.

approximately 34.5 tons of NO_x annually.³⁷ The NYPSC examined projected NO_x emission allowance prices embedded in the NYISO's Congestion Assessment and Resource Integration Study database, and inflated the highest price observed by a substantial margin to derive \$500/ton as a very conservative estimate of the proxy peaking unit developer's cost to procure allowances.

Based on the foregoing estimates, SCR technology would enable a proxy peaking unit developer to avoid emitting approximately 27.3 tons of NO_x annually, for an annual allowance cost savings of approximately \$13,650. Over the course of 20 years (the proposed peaking unit amortization period), the developer's cumulative savings would be approximately \$273,000. This estimate ignores additional costs that would be avoided by not having to operate and maintain the SCR.³⁸ The State Entities maintain that a developer would not invest approximately \$26.4 million to save \$273,000 (\$13,650 annually) unless there is an

³⁷ The DCR Report states that the controlled F Frame Unit would run approximately 771 hours if located in Zone G (Dutchess), with a NO_x emissions rate of 20.9 lbs/hr. Annual emissions were estimated as follows: (1) 771 hrs/yr * 20.9 lbs/hr = 16,113.9 lbs/yr; (2) 16,113.9 lbs/yr ÷ 2,000 lbs/ton = 8.06 tons/yr. The same process was used to estimate NO_x emissions for the uncontrolled F Frame unit, based on an estimated emissions rate of 78 lbs/hr and 882 run-time hours.

³⁸ See, e.g., DCR Report at 133 (specifying the fixed and variable operation and maintenance costs for an F Frame unit with and without SCR).

affirmative regulatory or legal obligation to make that investment.

The NYISO estimated that including SCR technology in the proxy peaking unit would increase annual capacity costs throughout New York by approximately \$231 million when the reset Demand Curves are implemented (as compared to Demand Curves that reflect an uncontrolled proxy peaking unit).³⁹ The State Entities submit that customers should not be burdened with such a massive increase when there is no demonstrable requirement for the incremental cost of SCR in Zones C, F, and G (Dutchess), and no quantified customer benefit from its inclusion.

It is also false to assume that merely reflecting an optional capital investment in the ICAP Demand Curves would induce a developer to make the optional investment. To the contrary, it would be rational for an independent power producer operating in competitive markets to maximize future revenues by avoiding optional costs to the extent possible. As detailed below, there is no regulatory mandate for peaking units located in Zones C, F, and G (Dutchess) to include SCR, and the New York State Board on Electric Generation Siting (Siting Board) would

³⁹ Consumer Impact Analysis: 2015/2016 ICAP Demand Curve Reset, Tariq Niazi, ICAP Working Group (dated August 72, 2016) at 5.

not impose stricter emissions standards than those specified in an air permit issued by the NYSDEC.⁴⁰

Finally, the NYISO speculates, based on a conclusory and undocumented assertion by the Consultants, that the cost to retrofit a peaking unit with SCR technology would be cost-prohibitive if required in the future.⁴¹ NYISO Staff did not present any estimate of the retrofit costs - or any other proof - to corroborate this claim. NYISO Staff instead provided a footnote that the cost to retrofit a plant "that did not contemplate including an SCR at the time of construction" would increase the SCR cost by approximately 40%.⁴² The footnote acknowledged that the Consultants performed at least a rudimentary analysis of the cost to retrofit a peaking unit with SCR. The State Entities and other stakeholders requested the data underlying this estimate on numerous occasions throughout

⁴⁰ The Siting Board is tasked with implementing Article 10 of the New York Public Service Law, which is the State's siting statute for electric generation facilities. The Siting Board consists of the following individuals: the New York State Department of Public Service (DPS) Chair, who also serves as the NYPSC Chair; the Commissioner of NYSDEC; the Chair of the New York State Energy Research and Development Authority; the Commissioner, President & CEO of New York State Empire State Development; the Commissioner of the New York State Department of Health; and two ad hoc members of the public. The DPS/NYPSC Chair also serves as Chair of the Siting Board. (See <http://www3.dps.ny.gov/W/PSCWeb.nsf/All/12B735036AC1324A85257E200054A993?OpenDocument>.)

⁴¹ NYISO Staff Recommendations at 9-10, n.11.

⁴² Id. at 10, n.11.

the stakeholder process. Although NYISO Staff repeatedly assured stakeholders that this analysis would be reported, they instead provided only the conclusory footnote quoted above. Therefore, it is impossible to examine the assumptions underlying the Consultants' estimate. Regardless, any future change in regulations would require a lengthy process that includes a determination of how the new rules should apply to existing facilities.⁴³ It cannot be assumed that stricter NO_x emissions standards in the future, if promulgated, would necessarily require existing facilities to install SCR.

Importantly, a developer confronted with the choice of an optional and uneconomic up-front investment in SCR, or the potential risk of a higher capital cost in the future to retrofit SCR, could hedge its risk by designing the peaking unit with a footprint that "contemplates" the future addition of SCR.⁴⁴ This strategy would avoid the full, up-front optional cost of SCR technology while reducing the future cost of a potential retrofit that might never be required.

⁴³ NYSDEC Comments to NYISO Board of Directors (dated October 12, 2016) at 3 (NYSDEC Comments) (explaining that any future rulemaking process would be lengthy, and would include consideration of compliance options for existing facilities). The NYSDEC Comments were submitted to the NYISO Board, and are appended hereto as Attachment B. NYSDEC reviewed the NYISO Staff Recommendations and DCR Report commentary on air permitting issues prior to submitting its Comments.

⁴⁴ NYISO Staff Recommendations at 10, n.11.

B. Current Regulations Do Not Mandate The Use Of SCR To Control NO_x Emissions

In its Tariff Filing, the NYISO explains that a peaking plant developer must satisfy certain regulatory requirements promulgated by the United States Environmental Protection Agency (EPA). In New York, NYSDEC is the "exclusive agency authorized to implement the Title V air permitting program, as well as the federally-approved state Prevention of Significant Deterioration of Air Quality (PSD) and Nonattainment New Source Review (NNSR) programs" (collectively, the New Source Review (NSR) program).⁴⁵ In relevant part, this authority obligates the NYSDEC to "ensure the protection of human health and the environment and safeguard the air resources of the state by controlling and abating air pollution."⁴⁶

A new peaking unit must satisfy New Source Performance Standards (NSPS) promulgated by the EPA and administered by the NYSDEC.⁴⁷ The F Frame unit that the NYISO recommends for the proxy peaking unit in all locations is "the only peaking unit technology evaluated that can achieve this requirement without the installation of SCR emissions controls."⁴⁸

⁴⁵ NYSDEC Comments at 1.

⁴⁶ Id.

⁴⁷ Tariff Filing at 10. NYSDEC also oversees NSPS compliance.

⁴⁸ Id. at 10; NYISO Staff Recommendations at 7; DCR Report at 19-20; Lummus Aff. at ¶26.

The NSPS also establishes a capacity factor for base load and non-base load units to limit carbon dioxide emissions.⁴⁹ To avoid designation (and stricter regulation) as a base load unit, the F Frame peaker must operate under a 38.4% capacity factor limit that is measured on a 12-operating month or three-year rolling average basis.⁵⁰ This would limit operation of the F Frame peaking unit to approximately 3,300 hours per year,⁵¹ which is well below the maximum run time hours estimated for this unit over a three-year historic period.⁵²

The applicable review standard under the NSR program depends on whether a unit (i) is a "major source" for NO_x emissions (i.e., has the potential to emit (PTE) more than 100 tons of this pollutant annually),⁵³ and (ii) is located in an area designated as attainment or non-attainment for NO_x emissions. Units located in attainment areas are subject to PSD review and the Best Available Control Technology (BACT) standard, whereas units located in non-attainment areas are subject to NNSR review and the Lowest Achievable Emissions Rate

⁴⁹ Tariff Filing at 11.

⁵⁰ Id.; NYISO Staff Recommendations at 7; DCR Report at 20.

⁵¹ Tariff Filing at 11.

⁵² DCR Report at 162 (estimating that the gas-only F Frame unit without SCR would not run more than 2,496 hours per year if located in Zone C).

⁵³ NYISO Staff Recommendations at 8; Lummus Aff. at ¶27; NYSDEC Comments at 2.

(LAER) standard.⁵⁴ A unit that avoids "major source" designation also avoids NSR review under the PSD and NNSR programs.

A unit can avoid major source designation by adopting a federally-enforceable annual operating hour limit to ensure that the NO_x PTE remains below 100 tons per year; such units are referred to as "synthetic minor" sources.⁵⁵ The NYISO explains that a "synthetic minor" F Frame unit located in an attainment area for NO_x as a direct pollutant (e.g., Zones C, F, and G [Dutchess]) would be subject to a federally-enforceable annual operating hour limit of approximately 2,500 hours.⁵⁶

NYSDEC also regulates the emissions of NO_x as an ozone precursor. New York is part of the Ozone Transport Region (OTR) and has been designated as non-attainment statewide for ozone precursors.⁵⁷ Consequently, major sources of NO_x emissions are subject to the LAER standard.⁵⁸ As with the regulation of NO_x emissions as a direct pollutant, however, the strict LAER standard applies only to major sources. Synthetic minor sources of NO_x emissions are subject to a more lenient standard.

⁵⁴ NYISO Staff Recommendations at 8; Lummus Aff. at ¶27; NYSDEC Comments at 2.

⁵⁵ NYISO Staff Recommendations at 8; Lummus Aff. at ¶27; NYSDEC Comments at 2.

⁵⁶ NYISO Staff Recommendations at 8.

⁵⁷ NYSDEC Comments at 2.

⁵⁸ Id.

NYSDEC explained that its NSR evaluations are “fact specific and performed on a case-by-case basis” to “determine the appropriate air pollution control measures that are necessary to comply with the applicable requirements.”⁵⁹ For this reason, NYSDEC continued, “the use of SCR technology to control NO_x emissions may not be required or appropriate in every case, such as where other control measures are available or where the facility accepts federally-enforceable permit conditions to limit emissions below the applicable thresholds.”⁶⁰

In sum, there is no regulatory requirement which requires a peaking unit to control NO_x emissions with SCR. Instead, control measures are determined by the NYSDEC on a fact- and facility-specific basis, and no regulatory change since the last DCR increases the likelihood that SCR will be required.⁶¹

C. Other Factors Identified By The NYISO Are Irrelevant

There is currently no regulatory requirement for a peaking unit to satisfy applicable NO_x emissions rates and standards by installing SCR. To bolster its claim that a peaking unit would probably be required to install SCR, the NYISO identifies several regulatory developments that it claims

⁵⁹ Id.

⁶⁰ NYSDEC Comments at 2.

⁶¹ See generally NYSDEC Comments.

demonstrate a general trend toward stricter controls on NO_x emission controls.⁶² Each such factor, however, is irrelevant and lacks any probative value to the issue in dispute.

The NYISO first explains that the State recently adopted new regulations that reduce NO_x emissions from existing distributed generation facilities (the Part 222 Rules).⁶³ These rules apply to behind-the-meter generation sources that currently are not subject to certain regulations.⁶⁴ The Part 222 Rules thus address a gap in existing regulations and do not evidence a trend of tightening emissions standards on existing peaking units.

The NYISO next explains that the EPA lowered the national ambient air quality standard (NAAQS) for ozone from 75 ppb to 70 ppb.⁶⁵ The NYISO claims that this change may lead to additional emission control requirements for existing facilities, and/or revisions to the NSR requirements.⁶⁶ The NYISO, however, ignores that this change impacts "the New York

⁶² Tariff Filing at 14-15.

⁶³ Id. at 14 (citing the Rules for Distributed Generation Sources [6 N.Y.C.R.R. Part 222]).

⁶⁴ Parts 222, 200 and Subpart 227-2 Revised Regulatory Impact Statement Summary, NYSDEC, available at <http://www.dec.ny.gov/regulations/104383.html>. Notably, it took more than 10 years to promulgate and adopt the Part 222 Rules.

⁶⁵ Tariff Filing at 14.

⁶⁶ Id. at 14-15.

City Metropolitan Area, including Long Island and Westchester and Rockland Counties....”⁶⁷ The SCR dispute in this proceeding does not pertain to units located in the New York City Metropolitan Area. NYISO Staff did not assert that the revised ozone NAAQS might impact control requirements for peaking units located in Zones C, F, and G (Dutchess). The impact in these Zones, if any, is uncertain and speculative.

Finally, the NYISO explains that, on September 7, 2016, the EPA reduced New York’s seasonal NO_x emissions budget under the Cross State Air Pollution Rule (CSAPR).⁶⁸ However, in its comments to the NYISO Board, the NYSDEC explained that the modified CSAPR standard will not have “any noticeable impact on control requirements.”⁶⁹

The NYISO claims that the foregoing factors “undermine the continued viability” of limiting NO_x emissions via a federally-enforceable annual operating hour limit rather than SCR.⁷⁰ As detailed above, however, the factors are irrelevant to the control measures that might be required for a peaking unit located in Zones C, F, and G (Dutchess).

⁶⁷ NYISO Staff Recommendations at 9.

⁶⁸ Tariff Filing at 15. The reduced emissions budget is effective May 1, 2017. (Id.)

⁶⁹ NYSDEC Comments at 3.

⁷⁰ Tariff Filing at 15.

D. The Siting Board Defers To And Relies On NYSDEC

In the absence of a regulatory requirement for SCR, the NYISO argues that the Siting Board would refuse to issue a Certificate of Environmental Compatibility and Public Need (Certificate) for a peaking unit that does not include SCR. The NYISO explains that Article 10 of the New York State Public Service Law (PSL) establishes the rules and procedures for siting large generation facilities.⁷¹ Article 10 specifies that the Siting Board cannot issue a Certificate without making certain findings, including a determination that "the adverse environmental effects of the construction and operation of the facility will be minimized or avoided to the maximum extent practicable."⁷² The NYISO argues that the F Frame unit without SCR has a higher PTE for NOx emissions than the unit with SCR and, therefore, the Siting Board could not find that the unit without SCR minimizes or avoids an environmental impact to the maximum extent practicable.⁷³ The NYISO thus interprets the statute erroneously as requiring environmental impacts to be minimized to the maximum extent possible, rather than the maximum extent practicable. The NYISO provides no rationale or justification for its interpretation.

⁷¹ Tariff Filing at 12.

⁷² Id. at 12-13 (citing PSL § 168[3][c]).

⁷³ Id. at 12-13.

The NYISO's argument is based on an improper interpretation of the siting statute and ignores relevant Siting Board precedent that has explicitly rejected the statutory interpretation urged by the NYISO. In particular, the Siting Board in Case 99-F-1164 was presented with arguments that the Hearing Examiners had erred by finding that the siting statute required adverse environmental impacts to be reasonably minimized while taking costs into account, rather than minimizing such impacts to the maximum extent possible regardless of the costs.⁷⁴ The Siting Board unequivocally rejected this argument. In so ruling, the Siting Board explained that "reasonable minimization of adverse environmental impacts is what is required by [the siting statute] and that the costs of mitigation options in comparison with their benefits can be properly considered in evaluating what is reasonable."⁷⁵ Consideration of whether adverse environmental impacts have been addressed adequately "takes into account social, economic, and other essential considerations."⁷⁶ The Siting Board held that

⁷⁴ Case 99-F-1164, Mirant Bowline, L.L.C., Opinion and Order Granting a Certificate of Environmental Compatibility and Public Need Subject to Conditions (issued March 26, 2002) at 48-49 (Bowline Order). The subject facility received a Certificate and currently operates in Rockland County, New York.

⁷⁵ Id. at 51 (emphasis added).

⁷⁶ Id. at 52.

there is "nothing inconsistent between reasonable minimization and minimization that is practicable...."⁷⁷ In so ruling, the Siting Board explicitly rejected the argument that the word "minimize" as used in the siting statute "requires the best technology available be required to minimize in absolute terms all adverse environmental impacts" and stated that such interpretation would be "inconsistent with the balancing we must perform under" the siting statute.⁷⁸

The NYISO's claim that the Siting Board might require emissions controls stricter than those specified in a NYSDEC-approved air permit similarly ignore Siting Board precedent. NYSDEC explained in its Comments to the NYISO Board that the Siting Board "has historically relied upon the [NYSDEC's] expertise in assessing environmental impacts and determining the proper air pollution control technology required under the" Clean Air Act.⁷⁹ The State Entities reinforced this point in their arguments before the NYISO Board, explaining that the Siting Board has acknowledged its practice of relying on and deferring to the NYSDEC on air permitting issues, by noting that:

...a certificate cannot be issued unless the Board first finds that the proposed facility

⁷⁷ Bowline Order at 52.

⁷⁸ Id.

⁷⁹ NYSDEC Comments at 2-3.

will not violate applicable [NYSDEC] regulations and water quality standards. Therefore, the Board must give deference to the findings and conclusions of the DEC Commissioner regarding environmental permitting, and our consideration of various environmental issues must assume that the proposed facility conforms to DEC's permits and minimizes adverse environmental impacts.⁸⁰

The Siting Board thus has stated unequivocally that it will defer to the NYSDEC's permitting authority and accept a NYSDEC-issued air permit as evidence that the proposed facility will minimize adverse air impacts if it complies with the air permit.

Further refuting the argument that the Siting Board might require emissions controls stricter than those specified in the NYSDEC-issued air permit, the Siting Board in Case 99-F-1625 declined to order an additional review of potential air impacts incremental to the NYSDEC's analysis:

And most importantly, there exists the possibility that our requirement of compliance with a currently undefined local air permit condition would result in a facility design that differs from the one that had been reviewed by DEC. The Siting Board in the Ramapo Energy case concluded that not conducting an additional air quality impact review by the Board would be efficient and "also practical because it avoids altogether situations in which the Board might be called upon to impose conditions or restrictions that would conflict in any manner with those

⁸⁰ Case 97-F-1563, Athens Generating Company, L.P., Opinion and Order Granting Certificate of Environmental Compatibility and Public Need (issued June 15, 2000) at 13 (Athens Order).

established by the DEC Commission (another state agency).”⁸¹

The NYISO does not provide any basis to conclude that the Siting Board would break from its long-standing precedent by refusing to issue a Certificate for an F Frame unit that has received a NYSDEC-issued air permit to operate without SCR. Further, the NYISO has not provided any explanation as to how the Siting Board has the authority to impose stricter emissions requirements than those specified by NYSDEC pursuant to its federally-delegated permitting authority under the Clean Air Act.

The Commission should recognize that the Siting Board will defer to and rely on NYSDEC to ensure that the air permit for a peaking unit satisfies all applicable emissions rates and standards under the Clean Air Act. If NYSDEC issues an air permit that authorizes facility operation without SCR, the Siting Board will not challenge that decision by conditioning the Certificate on SCR installation. The NYISO has provided no rationale whatsoever in reaching a contrary conclusion.

⁸¹ Case 99-F-1625, KeySpan Energy, Opinion and Order Granting Certificate of Environmental Compatibility and Public Need (issued September 7, 2001) at 21 (KeySpan Order) (quotation marks in original).

E. The Commission Has Rejected The Inclusion of SCR In The ICAP Demand Curve

The Commission addressed the SCR requirement in the 2014 DCR Order. There, certain stakeholders opposed a NYISO recommendation that the F Frame unit without SCR be selected as the proxy peaking unit for the NYCA Demand Curves. The NYISO explained that such unit could avoid major source designation by adopting a federally-enforceable annual operating limit to avoid NSR review and the BACT/LAER standards.⁸² The NYISO also explained that the developer of an F Frame unit without SCR would have to identify specific measures that address adverse environmental impacts, and that the unit without SCR could comply with applicable regulations. The Commission agreed, and stated that "with the cap on operating hours, NYISO has reasonably chosen a proxy unit that best fits the requirements of a peaking unit while taking into account all current environmental regulations."⁸³ There has been no relevant change in those regulations that would compel a different outcome here. Significantly, the Commission's decision was not based on whether the F Frame unit without SCR would minimize environmental impacts, but whether the unit would comply with all applicable environmental regulations.

⁸² 2014 DCR Order at P75.

⁸³ Id. at P75.

F. The NYISO Incorrectly Interprets The Services Tariff To Require A Proxy Unit That Is Demonstrable And Repeatable

The NYISO rejects the use of a proxy peaking unit without SCR because it has not been proven to be permitted and constructed, or able to be constructed more than one time if it does obtain the requisite air permit.⁸⁴ This is conclusory and based on unsupported speculation. More fundamentally, however, it is premised on a false interpretation of the Services Tariff.

The Services Tariff provides that the DCR must assess the costs and revenues of a hypothetical proxy peaking plant, which is defined as a single facility that potentially includes multiple units.⁸⁵ The Services Tariff does not state that the periodic review process must evaluate whether the peaking unit design may be "repeated, if necessary," or how many times its construction may be repeated in the State during the reset period. The NYISO identifies the factors used to evaluate economic viability, but the list does not include the frequency with which a particular design may be constructed.⁸⁶

The NYISO's suggestion that the proxy peaking plant without SCR should not be selected because it might not be "repeatable" therefore is based on a false interpretation of the

⁸⁴ Tariff Filing at 15.

⁸⁵ Services Tariff § 5.14.1.2.2.

⁸⁶ Tariff Filing at 6.

Services Tariff. It also assumes, without any supporting rationale, that the NYSDEC would cap the number of generating plants that may be constructed without SCR. There is no such regulatory limitation and, in any event, several facilities have been built without SCR.⁸⁷

III. THE COMMISSION SHOULD DETERMINE THAT THE PROXY PEAKING UNITS LOCATED IN ZONES C AND G SHOULD BE MODELED USING DIFFERENT GAS TRADING HUBS THAN RECOMMENDED BY THE NYISO OR, ALTERNATIVELY, BLENDED GAS TRADING HUBS

A. The Proxy Peaking Unit Located in Zone C Should Be Indexed To The Dominion North Point Trading Hub

The NYISO recommends that the Zone C proxy peaking unit should be indexed to the Texas Eastern Zone M-3 (TETCO M3) gas trading hub, and the Zone F unit should be indexed to the Iroquois Zone 2 gas trading hub.⁸⁸ Responding to positions advanced by the State Entities and other stakeholders, the NYISO declined to replace the TETCO M3 gas trading hub with the Dominion North Point hub. The NYISO argued that the Dominion North Point gas trading hub (i) does not correlate well with Zonal LBMPs and, therefore, potentially may not reflect actual supply costs incurred by the peaking unit, and (ii) has less robust trading history.⁸⁹ Further, although the proxy peaking

⁸⁷ See pp. 17-18 and n.34, supra.

⁸⁸ Tariff Filing at 29; Staff Recommendations at 23.

⁸⁹ Tariff Filing at 30.

units located in Zones C and F are estimated to have equal reference point prices, the NYISO chose the Zone F peaking unit as the location for the NYCA Demand Curve based on a lower annual net cost of new entry (CONE).⁹⁰

The State Entities understand that, in contemporaneous filings, the NY Transmission Owners (TOs) will advocate that the NYCA Demand Curve should be based on a proxy peaking unit located in Zone C that is indexed to the Dominion North Point natural gas trading hub. The State Entities concur with the TOs' recommendation that the proxy peaking unit underlying the NYCA Demand Curves should be located in Zone C and indexed to the Dominion North Point trading hub for the reasons detailed in the TOs' filings.

Although geography is not the sole factor that should drive selection of the gas trading hub for modeling purposes, it is sufficient to reject the NYISO's recommendation in this instance. The TOs demonstrated during the stakeholder process that TETCO M3 is located approximately 100 miles away from Zone C at its closest approach to that Zone. Proxy peaking unit supply costs should be modeled using a gas trading hub associated with a pipeline that can actually serve the unit. TETCO M3 is remote from Zone C and gas transported through the

⁹⁰ NYISO Staff Recommendations at 40-41.

pipeline cannot serve a unit located in Zone C. The associated pricing index, therefore, is not representative of actual supply costs for a unit located in Zone C.

Dominion North Point is a reasonable alternative to TETCO M3. The Dominion pipeline transits Zone C and gas transported through it can be used to fuel a generator located in that Zone. On this basis alone, Dominion North Point is a superior option to TETCO M3.

The economics of procuring supply from the Dominion pipeline are also better for a peaking unit in Zone C. At the request of the State Entities and other stakeholders, the NYISO prepared gas hub sensitivities that estimate the monthly reference price of a Zone C proxy peaking unit that is indexed to the Dominion North point gas trading hub rather than TETCO M3.⁹¹ The NYISO estimated that this change in fuel source would reduce the monthly reference price from \$10.72/kW-month (indexed to TETCO M3 in Zone C, or Iroquois Zone 2 in Zone F) to \$6.75/kW-month, a decrease of approximately 37%.⁹² The reduced reference price is driven by the fact that use of the alternative gas hub would increase annual net revenues for a Zone C peaking unit developer from \$41.41/kW-year or \$34.50/kW-

⁹¹ NYISO Staff Recommendations at 53-54.

⁹² Id. at 54.

year based on TETCO M3 and Iroquois Zone 2 supply prices, respectively, to \$80.46/kW-year based on Dominion North Point supply prices.⁹³ These data indicate that there would be a strong incentive for a peaking unit developer to build in Zone C based on supply procured from the Dominion pipeline. Therefore, the NYCA Demand Curves should be based on a peaking unit located in Zone C that is indexed to the Dominion North Point trading hub.

The NYISO's criticism of the Dominion North Point trading hub is misplaced.⁹⁴ This pipeline offers an arbitrage opportunity that will persist over time because prices on this pipeline and higher-cost alternatives likely will equilibrate over time at a price between the two indices. Historic pricing trends also suggest that the lower prices will persist over time.⁹⁵ A developer could reasonably determine that the arbitrage opportunity will persist, even if prices rise over time.

Contrary to the NYISO's concern, prices on the Dominion pipeline rise and fall with market conditions in a manner that is consistent with higher-priced trading hubs such

⁹³ NYISO Staff Recommendations at 24.

⁹⁴ Id. at 24, 53-68.

⁹⁵ Affidavit of John P. Sano on Behalf of the New York State Public Service Commission (Sano Aff.) at ¶18-20. The Sano Aff. is appended hereto as Attachment C.

as TETCO M3.⁹⁶ Prices on the Dominion pipeline, however, exhibit less volatility over time, which indicates a reduced level of price movement over time and undermines the NYISO's concern that the arbitrage opportunity is short-term only.⁹⁷

If, notwithstanding the foregoing, the Commission agrees with the NYISO's criticism of the Dominion North Point trading hub, it should consider the use of the Dominion South Point trading hub as an alternative. Dominion South Point has long been established as a primary liquid trading point for western and upstate New York since the beginning of the state's retail access programs in the late 1990s.⁹⁸ The index is regularly traded and reported.⁹⁹ The demarcation between the North and South Points on the Dominion pipeline arbitrarily has been set outside of Zone C.¹⁰⁰ Nevertheless, the North and South Points reference the same pipeline, transportation rates are the same regardless of which receipt area is utilized, and historic prices on both the Dominion North Point and Dominion South Point indices have correlated tightly with each other and typically vary by no more than \$0.02.¹⁰¹ For these reasons, Dominion South

⁹⁶ Sano Aff. at ¶18-19.

⁹⁷ Id.

⁹⁸ Id. at ¶12.

⁹⁹ Id.

¹⁰⁰ Id. at ¶13.

¹⁰¹ Id.

Point would be a reasonable substitute for Dominion North Point and TETCO M3. At a minimum, it could be used as a backup reference for days on which trades on Dominion North Point are not reported.

B. The Proxy Peaking Unit Located in Zone G (Rockland) Should Be Indexed To The Millennium East Trading Hub

The NYISO recommends that the Iroquois Zone 2 gas hub be selected for purposes of modeling EAS revenues for a proxy peaking unit located in Zone G.¹⁰² Significantly, the current Demand Curves use two gas hub pricing points for Zone G to reflect zonal differences in supply costs - the Dutchess County location is indexed to Iroquois Zone 2, and the Rockland County location is indexed to TETCO M3.¹⁰³ The NYISO now proposes to utilize only a single pricing hub - Iroquois Zone 2 - for the Zone G unit based on its perception that this hub better reflects "market dynamics" in Zone G.¹⁰⁴

The NYISO thus dismissed concerns advanced by the State Entities and other stakeholders that Iroquois Zone 2 should not be selected as the gas trading hub for a Zone G proxy peaking unit because a developer could obtain gas from a less expensive pipeline than Iroquois Zone 2, thereby realizing an

¹⁰² Tariff Filing at 29.

¹⁰³ Id. at 29 and n.126.

¹⁰⁴ Id. at 29.

arbitrage opportunity between gas and electricity markets. Specifically, the State Entities and other stakeholders recommended that the NYISO examine two potential proxy units located in Dutchess and Rockland Counties in Zone G in order to acknowledge the inherent differences between the two locations that impact generation costs, including the sources of gas for each unit.

Zone G contains a diversity of operators that receive gas from a variety of sources.¹⁰⁵ Some of these operators can procure supply only from "Millennium, East Deliveries" (Millennium East) or TETCO M3, while others rely on Iroquois Zone 2 during colder winter periods.¹⁰⁶ Relying solely on Iroquois Zone 2 for modeling purposes in Zone G thus fails to capture the actual dynamics of gas procurement that has been observed over a number of years.¹⁰⁷

The Commission should direct the NYISO to continue utilizing two Zone G proxy peaking units, and index the Rockland Count unit to the Millennium East trading hub. Given the NYISO's concern that its gas pricing database would include sufficient historic data for only two prior years on the Millennium East pipeline, it should continue reliance on the

¹⁰⁵ Sano Aff. at ¶14.

¹⁰⁶ Id.

¹⁰⁷ Id.

TETCO M3 gas index for the first historical year of September 2013 - August 2014 before shifting entirely to the Millennium East index for subsequent historical years. This approach would fully address the NYISO's concern that it lacks sufficient data regarding trades completed on the Millennium East pipeline while reflecting the fact that developers would take advantage of an arbitrage opportunity if it is economic to do so.

The State Entities disagree, however, that there is insufficient trading depth on the Millennium East index. The NYISO's conclusion is based on its review of data provided by SNL. Platt's Gas Daily, however, has reported Millennium East trading over the last four years on all but 27 days out of 1,460 calendar days (98.2%).¹⁰⁸ This coverage is consistent with Iroquois Zone 2, for which Platt's Gas Daily reported trading activity on 99.7% of days over the same four-year period.¹⁰⁹

Although it is reasonable to continue relying on TETCO M3 for one additional year as described above, it would not be reasonable to continue reliance on this index over the long-term. The receipt points for TETCO M3 better reflect supply costs in the New York City metropolitan area than they do in

¹⁰⁸ Sano Aff. ¶11.

¹⁰⁹ Id. Platt's Gas Daily reported Dominion South Point activity on 98% of days over the same four-year period, and TETCO M3 on 100% of those days. (Id.)

Zone G.¹¹⁰ Moreover, the TETCO M3 pipeline feeds gas into the Algonquin pipeline.¹¹¹ The TETCO M3 and Algonquin pipelines are owned and operated by the same corporate parent, which coordinates their operation to such an extent that shippers on TETCO upstream of M3 can be impacted by flow restrictions imposed on the downstream Algonquin pipeline.¹¹² TETCO M3 thus is not preferred for continued use except during a brief transition to reliance on the Millennium East gas trading hub. Nevertheless, if the Commission declines to adopt this approach, continuing to rely on TETCO M3 would be a better option than replacing it with a gas trading hub based on a pipeline (Iroquois Zone 2) that cannot serve the proxy unit.

The Tariff Filing also supports this change. A developer would increase annual average net EAS revenues from \$39.42/kW-year to \$114.51/kW-year by locating its facility in Rockland County and procuring gas from the Millennium East pipeline, and not siting in Dutchess County while procuring gas from Iroquois Zone 2.¹¹³ The State Entities submit that a

¹¹⁰ Sano Aff. at ¶8.

¹¹¹ Id.

¹¹² Id.

¹¹³ NYISO Staff Recommendations at 53. The NYISO did not provide sufficient data to compare these units on the basis of annual net CONE. Further, the NYISO estimated that substituting the Millennium East hub for Iroquois Zone 2 in Zone G (Rockland) would reduce the monthly reference price of a gas-only F

rational developer would take advantage of this opportunity if it would be economic to do so.

The NYISO dismissed this as a "short-run arbitrage opportunity" because it assumes that the opportunity will not persist over the proxy unit's economic life.¹¹⁴ The NYISO assumes that commodity costs will equilibrate as the cost of gas from the Millennium East pipeline increases to converge with supply costs from other pipelines. However, the converse also will happen - supply costs from other pipelines will decrease to converge with the Millennium East gas price. The NYISO did not justify its assumption that the Millennium East price will equilibrate at a price point sufficiently high to limit the arbitrage opportunity to a short period. A developer instead could determine that the arbitrage opportunity would justify an interconnection with Millennium East, even if gas prices gradually increase over time.

The MMU affirmed this possibility in its mitigation analysis of the CPV Project. The MMU explained there may be opportunities for a developer to secure a competitive advantage by exploiting price spreads between natural gas trading hubs by siting at locations that are upstream of gas pipeline congestion

Frame Unit with SCR from \$14.30/kW-month to \$5.60/kW-month.
(Id. at 54.)

¹¹⁴ Tariff Filing at 26; Staff Recommendations at 77-78.

and downstream of electricity market congestion.¹¹⁵ The MMU explained that the price spreads have increased considerably since 2010, and it expects that this price spread “is likely to drive future generation investment towards” similar locations.¹¹⁶ This indicates that CPV Valley entering the market will not eliminate the price spread. The conclusion that the arbitrage opportunity will persist is supported further by a review of historic pricing on the relevant trading hubs.¹¹⁷

C. If The Commission Declines To Adopt The Alternative Gas Pipelines, It Should Direct The Use Of A Blended Supply Price For Modeling Purposes

If, arguendo, the Commission declines to adopt the alternative gas trading indices recommended above, it should instead direct the NYISO to utilize a blend of gas hub indices. This would be consistent with the MMU’s recommendation that the NYISO utilize a blend of gas hubs for modeling purposes in Zone G because the Iroquois Zone 2 index “will tend to cause under-estimates of net revenues.”¹¹⁸ The use of a blended gas hub also would be consistent with the MMU’s methodology to estimate net

¹¹⁵ CPV Assessment at 26-27.

¹¹⁶ Id.

¹¹⁷ Sano Aff. at ¶18-19.

¹¹⁸ NYISO Staff Recommendations at 75-76.

EAS revenues for the Zone G (Rockland) proxy peaking unit.¹¹⁹ For that analysis, the MMU blends the cost of gas on the east (Iroquois Zone 2) and west (TETCO M3) sides of the Hudson River in equal proportions.¹²⁰

The State Entities agree with the MMU that, if a blend of gas hubs is utilized, the hubs should be blended in equal proportions. For Zone C, the NYISO should utilize a 50%/50% blend of Dominion (North or South Point) and Millennium East.¹²¹ For Zone G (Rockland), the NYISO should utilize a 50%/50% blend of Millennium and Iroquois Zone 2.¹²² These blends incorporate the preferred pricing hubs for each zone, as detailed above, combined using the ratio adopted by the MMU for certain analyses. It is not necessary under this approach to identify a publication source of blended prices, as the NYISO claims. The necessary information is easily determined when the gas trading hubs and blending proportions have been specified (as recommended herein).

¹¹⁹ David B. Patton et al., 2015 State of the Market Report for the New York ISO Markets (2015) SOM Report) dated May 2016) at A-23, A-2.

¹²⁰ Id.

¹²¹ Sano Aff. at ¶22.

¹²² Id.

IV. THE COMMISSION SHOULD DIRECT THE NYISO TO JUSTIFY CERTAIN FINANCIAL PARAMETERS THAT LACK SUFFICIENT SUPPORT

During the stakeholder process, the State Entities and other stakeholders argued that the Consultants had failed to justify the use of the following financial parameters: (a) a proxy peaking unit Return on Equity (ROE) of 13.4%; (b) a Debt/Equity ratio of 55%/45%; and (c) a 7.75% cost of debt. The State Entities and other stakeholders requested additional information to clarify the basis for these recommendations, and explained why the Consultants' recommendations should be modified. NYISO Staff, however, summarily adopted the Consultants' recommendations without addressing the issues identified by the stakeholders. The NYISO similarly adopted those recommendations without adequately addressing the stakeholders' concerns.

A. ROE

The NYISO recommends the use of a 13.4% ROE for the proxy peaking unit. Although broadly consistent with the ROE derived using the methodology approved by the Commission in the last reset process, this recommendation is based on the DCR Report, which did not provide sufficient explanation of how the proposed ROE was derived to enable evaluation of the recommendation.

The DCR Report explained that the ROE recommendation was based on data from three sources: (a) the estimated ROE for a proxy group of publicly-traded Independent Power Producers (IPP) based on the Capital Asset Pricing Model (CAPM); (b) independent estimates of ROE for new power plants; and, (c) ROE estimates for project finance. The IPP proxy group consists of only four companies and yields a range of ROEs from 9.22% to 12.45%, depending on the source of certain data inputs. Significantly, whereas the proxy group betas range from 0.89 to 1.35, the recommended 13.4% ROE implies a beta of 1.49. This is considerably higher than the betas of individual proxy group members and suggests the inclusion of a much higher risk expectation. The DCR Report does not explain why the proxy peaking unit warrants such increased risk expectation, and provides little rationale for recommending a return that exceeds the proxy peaking unit ROE by more than 230 basis points.

The DCR Report next cited studies conducted by the California Energy Commission (CEC) and the National Energy Technology Laboratory (NETL). According to the DCR Report, the CEC and NETL studies present IPP ROEs of 15.5% and 14.47%, respectively. The CEC report was published in January 2010 but the data underlying its conclusions were based on facilities located in California and 2008 data that was updated to reflect 2009 circumstances. The ROEs presented in the NETL report

appear to reflect an average of capital structure data from 2006, 2007, and 2008 for a diverse group of technologies that include nuclear and renewables. The CEC and NETL studies, therefore, are outdated and based on economic and regulatory circumstances that likely have changed significantly during the many years since their publication.

Finally, the DCR Report explained that the ROE recommendation also reflects information gleaned from "independent sources" that estimated "the ROE for project finance." Similar to the CEC and NETL studies, the referenced sources of project finance data were issued in 2003 and 2008. These sources, therefore, are also outdated and reflect economic and regulatory circumstances that likely have changed significantly during the intervening years.

In light of the foregoing deficiencies, the recommended ROE should be lowered to reflect a beta and return that aligns with other IPPs.

B. D/E Ratio

The NYISO recommends that the proxy peaking unit reflect a D/E ratio of 55%/45%. According to the DCR Report, the recommended D/E ratio balances current IPP leverage that is higher than previous years, and the "limited fixed revenues streams for a merchant peaking plant in NYISO would limit debt

level.” The DCR Report also cited the CEC and NETL studies for support of the proposed D/E ratio.

The justification provided for the recommended D/E ratio is inadequate. Companies in the IPP proxy group presented in the DCR Report have a much higher debt share that ranges from 68.8% to 75.6%. Although IPP D/E ratios currently may be higher than in previous years, as the Consultants note, the data identifies a trend that started approximately one year ago and appears to be continuing. The NYISO does not claim that the trend is likely to moderate or reverse before the ICAP Demand Curves are reset. As to the sources supporting a lower D/E ratio, the CEC and NETL reports are outdated and reflect economic and regulatory circumstances that likely have changed significantly since they were published. For the foregoing reasons, the recommended D/E ratio should be increased (i.e., debt increased relative to equity) to reflect current market conditions and recent data relative to IPP capital structure.

C. Cost of Debt

The NYISO recommends imputing a 7.75% cost of debt to the proxy peaking unit. This recommendation apparently was based on data from issuances by Calpine, NRG Energy, and Dynegy. During the stakeholder process, however, the Consultants presented information showing that the average of all securities with a given investment grade rating of “B” as of June 7, 2016

was 7.42%. The recommended cost of debt should be reduced to align with recent data on investment-grade, B-rated securities. The cost of debt should also be adjusted to account for the likelihood that a project would be more likely to utilize secured debt than unsecured debt, as assumed in the DCR Report.

V. **THE COMMISSION SHOULD DIRECT THE NYISO TO INVESTIGATE THE DRAMATIC INCREASE IN ENGINEERING, PROCUREMENT, AND CONSTRUCTION COST ESTIMATES SINCE THE LAST DEMAND CURVE RESET**

The State Entities and other stakeholders repeatedly expressed concern that engineering, procurement, and construction (EPC) cost estimates for the F Frame unit had increased dramatically since the last reset process. Previously, the NYISO's consultant estimated that total capital costs for the gas-only, simple cycle F Frame unit without SCR would be approximately \$148 million and \$146 million in Zone C and Zone F, respectively. Accounting for an estimated 2.2% annual escalation across three years, or a total escalation of 6.6% between Demand Curve resets from 2013 to 2016, capital costs for an F Frame unit located in Zone C would be expected to increase from \$148 million to approximately \$158 million, and Zone F capital costs to increase from \$146 million to \$156 million.

The Consultants' capital cost estimates for the F Frame unit wildly exceed these estimates. According to the DCR

Report, an F Frame unit without SCR constructed in Zone C is now estimated to cost approximately \$195.9 million, which is \$47.9 million, or 32.3%, more than prior estimates. The DCR Report estimates that it would cost approximately \$183.5 million to construct the same unit in Zone F, which exceeds earlier projections by \$37.5 million, or 25.7%. It appears that dramatic increases in EPC costs account for much of this difference:

Capital Cost Components (\$M)	Zone C			Zone F		
	2013	2016	Increase	2013	2016	Increase
Equipment	\$55.4	\$62.8	13%	\$55.4	\$62.8	13%
Construction Labor/Materials	\$34.0	\$41.6	22%	\$35.4	\$43.5	23%
Electrical Interconn't & Deliverability	\$9.5	\$21.7	128%	\$9.5	\$10.9	15%
Gas Interconn't & Reinforcement	\$5.3	\$15.6	194%	\$5.3	\$15.6	194%
Startup/Training	\$0.85	\$2.0	135%	\$0.85	\$2.0	133%

Although the State Entities acknowledge that cost estimates are inherently uncertain, the dramatic increase in capital cost estimates from 2013 to 2016 is shocking, to say the least, and far exceeds the level of variation that would reasonably be expected to arise in cost estimates separated by only three years. The NYISO fails to adequately explain this dramatic increase in capital cost estimates. A full explanation is imperative to justify the cost estimates, and for stakeholders and the Commission to understand the data presented. The State Entities thus request that the Commission

direct the NYISO to reflect more reasonable estimates or explain fully the dramatic increases in estimated F Frame unit capital costs.

VI. THE COMMISSION SHOULD DIRECT THE NYISO TO MODIFY THE DATA UNDERLYING THE RECOMMENDED DEMAND CURVE PARAMETERS TO ACCOUNT FOR INCREASED ENERGY REVENUES FROM SHORTAGE PRICING

In 2014, the NYISO and stakeholders developed a comprehensive shortage pricing mechanism as part of the NYISO's Fuel Assurance Initiative. Cost impacts were examined during this stakeholder process. The NYISO estimated that the shortage pricing proposal, if implemented, would increase annual energy costs by approximately \$221 million, but reduce capacity costs by an equivalent amount.¹²³ In its filing with FERC on the shortage pricing proposal, the NYISO stated that one benefit of the proposal would be to reduce the "missing money" covered by capacity payments.¹²⁴ Significantly, however, this offset would be realized only if 56% of additional energy revenues are reflected explicitly in the Net Cost-Of-New-Entry (CONE) calculation.¹²⁵ The shortage pricing rules were implemented on November 1, 2015.

¹²³ See, e.g., Market Issues Working Group, Consumer Impact Analysis: Comprehensive Shortage Pricing (October 30, 2014) at 5, 10-11 (MIWG Presentation).

¹²⁴ Docket ER15-1641, New York Independent System Operator, Inc., Tariff Filing (dated February 18, 2015) at 6.

¹²⁵ Id. at 13.

The NYISO did not act on this proposal by explicitly accounting for additional revenue increases attributable to increased revenue requirements and shortage pricing in the Net CONE calculation. Instead, the NYISO asserts that the impacts of new shortage pricing rules are captured by the net EAS revenues model, and will be recognized over time through the annual update process.¹²⁶

Tweaking the model is inadequate to address the deficiency. The intent of the proposal underlying adoption of the shortage pricing mechanism was to explicitly account for the cost impact of the new rule. Aligning the model with the shortage pricing mechanism is appropriate, but it is not sufficient to account for the increased generator revenues. If this omission is not corrected, customers would bear the full cost impact of shortage pricing, which was not intended, and the resulting capacity prices would be unjust and unreasonable. The NYISO should address this deficiency by explicitly accounting for additional revenue increases attributable to increased reserve requirements and shortage pricing in the Net CONE calculation.

¹²⁶ Tariff Filing at 35.

CONCLUSION

For all the foregoing reasons, the Commission should direct the NYISO to address the errors and deficiencies in the proposed ICAP Demand Curves for CY 2017/2018, and inputs for CY 2018/2019, 2019/2020, 2020/2021.

Respectfully submitted,

/s/ Paul Agresta

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Dated: December 9, 2016
Albany, New York



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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.

Dated: Albany, New York
December 9, 2016

S. Jay Goodman

S. Jay Goodman
Assistant Counsel
3 Empire State Plaza
Albany, NY 12223-1305
(518) 402-1537

ATTACHMENT A

	Gas Only w/ SCR				\$/kW-year
	2013-14	2014-15	2015-16	3 year average	
Dutchess	\$ 30.22	\$ 17.06	\$ 14.41	\$ 20.56	
Rockland	\$ 30.17	\$ 17.01	\$ 14.29	\$ 20.49	

	Dual Fuel w/ SCR				\$/kW-year
	2013-14	2014-15	2015-16	3 year average	
	\$ 36.69	\$ 17.58	\$ 14.41	\$ 22.89	
	\$ 36.64	\$ 17.53	\$ 14.29	\$ 22.82	

ATTACHMENT B

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Office of Air Resources, Climate Change & Energy, Deputy Commissioner
625 Broadway, 14th Floor, Albany, New York 12233-1010
P: (518) 402-2794 | F: (518) 402-9016
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October 12, 2016

Ms. Diane L. Egan
Corporate Secretary &
Secretary to the Board
New York Independent System Operator, Inc.
10 Krey Boulevard
Rensselaer, NY 12144

Dear Ms. Egan:

Re: DEC Comments on NYISO Staff Recommendations for ICAP Demand Curves

The New York State Department of Environmental Conservation ("DEC" or the "Department") is providing the below comments in response to the September 15, 2016 final recommendations of the New York Independent System Operator, Inc. ("NYISO") Staff on the Proposed NYISO Installed Capacity ("ICAP") Demand Curves¹ ("Proposed ICAP DC"), to clarify and provide background information regarding the Department's statutory and regulatory authority as it relates to air permitting and the state's air pollution control program.

Pursuant to the federal Clean Air Act ("CAA" or "Act") and Article 19 of the New York State Environmental Conservation Law ("ECL"), the Department is the primary air pollution control permitting authority in New York, with federal oversight by the United States Environmental Protection Agency ("EPA") and the exclusive agency authorized to implement the federally-approved Title V air permitting program, as well as the federally-approved state Prevention of Significant Deterioration of Air Quality ("PSD") and Nonattainment New Source Review ("NNSR") programs, collectively the New Source Review ("NSR") program. This authority requires, among other things, that the Department ensure the protection of human health and the environment and safeguard the air resources of the state by controlling and abating air pollution.

As part of the Department's duties to implement the Title V and NSR permitting programs, the Department reviews and evaluates air permit applications to ensure that proposed permits comply with all applicable state and federal requirements, including requirements to install air pollution controls that limit emissions to thresholds set pursuant to the CAA. Based on our reading of the NYISO Staff's statements, the

¹ Proposed NYISO Installed Capacity Demand Curves For Capability Year 2017/2018 and Annual Update Methodology and Inputs For Capability Years 2018/2019, 2019/2020, and 2020/2021

Department would like to clarify that there are no air pollution control regulations that mandate that generating units install selective catalytic reduction ("SCR") to address NO_x emissions beyond the requirements set forth in the above-cited rules and regulations. Rather, the regulations require that the Department review permit applications on a fact specific, case-by-case basis to determine the appropriate air pollution control measures that are necessary to comply with the applicable requirements.

The Department's NSR regulations, in conformity with federal NSR regulations, prescribe emission thresholds for various pollutants, including NO_x, and set forth the criteria and procedures for determining the appropriate air pollution control measures for each emissions source in the state. For purposes of NSR, this determination involves either the evaluation of Best Available Control Technology ("BACT") in areas that have been designated as in attainment of the National Ambient Air Quality Standards ("NAAQS"), or Lowest Achievable Emission Rate ("LAER") in areas that have been designated as non-attainment of the NAAQS.

For purposes of PSD, BACT is an emissions limitation based on the maximum degree of control that can be achieved, determined on a case-by-case basis, and considers energy, environmental, and cost impacts. BACT can be add-on control equipment or modification of the production processes or methods, such as fuel cleaning or treatment and innovative fuel combustion techniques. BACT can also be a design, equipment, work practice, or operational standard if the emissions standard is infeasible. The regulations set forth the criteria and procedures for determining BACT.

For purposes of NNSR, LAER is the most stringent emission limitation derived from either the most stringent emission limitation contained in the State Implementation Plan ("SIP") for such class or category of source, or the most stringent emission limitation achieved in practice by such class or category of source. The emissions limitation may result from a combination of reduction measures, such as changes in raw material, process modifications, and add-on controls. Unlike BACT, however, LAER does not consider cost. LAER is also applicable to sources in the ozone transport region ("OTR"), which includes New York. Since VOC and NO_x are ozone precursors, they are treated as nonattainment pollutants for purposes of NSR.

Because the Department's NSR determinations are fact specific and performed on case-by-case basis, the use of SCR technology to control NO_x emissions may not be required or appropriate in every case, such as where other control measures are available or where the facility accepts federally-enforceable permit conditions to limit emissions below the applicable thresholds. Hence, sources may choose to limit emissions below the applicable NSR thresholds, thereby avoiding classification as a major stationary source (i.e., a synthetic minor source) and the applicability of the NSR requirements, as provided for under the Act. The Board on Electric Generation Siting and the Environment ("Siting Board") has historically relied upon the Department's

expertise in assessing environmental impacts and determining the appropriate air pollution control technology required under the Act.

If rulemaking is proposed in New York that would have the effect of tightening NOx emissions standards, the New York State Administrative Procedures Act ("SAPA") and Department regulations establish a robust and lengthy public comment and hearing process by which affected parties, stakeholders and the public can participate in the regulatory review process. As part of that process, the Department is required pursuant to SAPA to prepare a Regulatory Impact Statement which, among other things, estimates the cost of complying with Departmental rules and regulations and sets forth any compliance options for affected parties.² Therefore, any regulatory changes that would occur are subject to requirements that ensure that the public and affected parties have sufficient opportunity to comment on the rulemaking. Additionally, the 2015 revision to the ozone NAAQS does not change the fact-specific, case-by-case determination required under the NSR program.

For purposes of the federal Cross-State Air Pollution Rule ("CSAPR"), the NOx annual trading budget for 2017 was revised by EPA in its final rulemaking to 5,135 tons. Based on that, the Department does not anticipate that CSAPR will have any noticeable impact on control requirements.

Sincerely,



J. Jafed Snyder

cc: Mark Seibert
Jay Goodman

² SAPA 202-a

ATTACHMENT C

UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

New York Independent System)
Operator, Inc.) Docket No. ER17-386-000
)

AFFIDAVIT OF JOHN P. SANO ON
BEHALF OF THE NEW YORK STATE
PUBLIC SERVICE COMMISSION

I, John P. Sano, being duly sworn, depose and say:

1. My name is John P. Sano and I am employed by the New York State Department of Public Service (“Department”) as a Utility Supervisor in the Gas Policy and Supply Section of the Office of Electric, Gas and Water. My business address is Three Empire State Plaza, Albany, New York, 12223-1350.

2. I hold a Bachelor of Science Degree in Chemical Engineering from Clarkson University. I also hold a Masters in Business Administration from the State University of New York at Albany. Prior to joining the Department in 1990, I held several engineering and management positions with the Union Carbide Corporation at its Bound Brook, New Jersey Phenolic Plastics Division from 1974 through 1976. I worked with the General Electric Corporation at its Silicone Products Division in Waterford, New York from 1976 through 1990. My responsibilities over this period included new process development, process engineering, production engineering, production management, customer technical support, project management, and maintenance management. I was awarded a Bronze Medallion Award during my tenure at General Electric in recognition of my individual contribution as an author of company patents and trade secrets.

3. Since joining the Department in 1990, I have held various engineering and supervisory positions in the former Gas Division, as well as the former Energy & Water Division. The majority of my responsibilities include analysis of natural gas utility policy matters, including distribution system design and planning, capacity asset management, gas purchasing practices, and gas system reliability, as well as analysis of issues related to the restructuring of the natural gas industry and use of natural gas in New York. I have testified in various proceedings before the New York State Public Service Commission, including gas rate cases for all major investor-owned gas utilities in New York State.

4. I have acquired through this work deep knowledge of the gas supply and procurement issues presented by the Demand Curve Reset (“DCR”) process. Pursuant to the Market Administration and Control Area Services Tariff (“Services Tariff”), the New York State Independent System Operator, Inc. (“NYISO”) oversees a DCR process that engages in the detailed analysis of a hypothetical electric generation peaking plant. This affidavit is based on my review of the NYISO’s transmittal letter accompanying the NYISO’s proposed Services Tariff amendments that describe new Installed Capacity (“ICAP”) Demand Curves for Capability Years 2017/2018 through 2020/2021, and associated documents (“Tariff Filing”).

5. The DCR process employs a hypothetical analysis that includes numerous assumptions and forecasts, as well as conjecture as to how complex business decisions might be made in the future. Such analysis lies at the core of my work with the Department. Significantly, however, the detailed analysis of a hypothetical peaking plant required by the Services Tariff imposed certain methodological elements that I disagree with, at least as administered by the NYISO in this DCR process. For purposes of this affidavit, I reviewed the Tariff Filing from the perspective of the Services Tariff and the evaluative framework developed by the NYISO. This

does not necessarily reflect the analysis that I would use or conclusions that I would reach relative to similar issues reviewed in a different context, such as a gas utility rate case or regulation of a retail access program. The opinions expressed in this affidavit, therefore, should not be interpreted as having generalw applicability outside of the DCR process.

Gas Hub Pricing Selection Criteria and Zone C

6. Selecting an appropriate gas hub pricing point for each proxy peaking unit to model net energy and ancillary services (“EAS”) revenues is critical for the model to provide reasonably accurate results and inputs for calculating the reference point prices that will determine the ICAP Demand Curves. As the NYISO explains, the selection process is not straightforward because there are multiple supply options for virtually all potential proxy peaking unit locations. The NYISO created a list of criteria that it used to evaluate potential gas trading hubs for each proxy peaking unit location. The criteria selected by the NYISO were: (1) correlation of gas hub prices with locational based marginal prices (“LBMPs”) for the relevant location and the extent to which the gas hub prices reflect New York electricity market dynamics; (2) the liquidity and depth of trading activity at the gas hub; (3) geographic proximity of the gas hub to the location at issue; and (4) precedent for the gas hub prices being used in prior DCRs and other NYISO studies and evaluations (including NYISO planning studies and evaluations conducted by the NYISO’s Market Monitoring Unit [“MMU”]).

7. The NYISO recommends that the Zone C peaking unit be indexed to the Texas Eastern Zone M-3 (“TETCO M3”) gas trading hub. However, this index is not the best fit for the proposed criteria. The NYISO explains that natural gas prices on the TETCO M3 gas trading hub appear to correlate with Load Zone LBMPs. Based on this correlation, the NYISO concludes that the trading hub reflects Zonal market dynamics. However, the TETCO M3 pipeline is located

outside of Zone C and cannot supply fuel to a peaking unit located in Zone C. A mere correlation between two phenomena does not necessarily indicate a real relationship unless the correlation is supported by other data.

8. The TETCO M3 receipt point closest to Zone C is located in Zone G, where the pipeline feeds directly into the Algonquin pipeline that serves New England. Based on geography and gas flows, TETCO M3 prices are more reflective of demand in New York City and New England. Supply from TETCO M3 could be delivered to Zone C only via transport over the “Millennium, East Deliveries” (“Millennium East”) pipeline. Notably, the TETCO and Algonquin pipelines are owned and operated by the same corporate parent, which manages them in concert with each other. Pipeline operation is coordinated to such an extent that shippers on TETCO upstream of M3 can be impacted by operational flow constraints on the Algonquin pipeline. For these reasons, it is not clear that the correlation identified by the NYISO truly reflects the supply costs incurred by marginal units in Zone C.

9. It is more likely that generation operators in Zone C would obtain their gas supply from the Dominion pipeline, which has two relevant trading hubs (the “North Point” and the “South Point”), or the Millennium East pipeline. Both pipelines transit Zone C and currently serve generation units operating in the Zone.

10. The NYISO criticized the Dominion North Point and Millennium gas trading hubs based on its perception that the indices do not correlate well with Zonal LBMPs. As noted above, however, an evaluation of the relationship between prices on a gas trading hub and Zonal market dynamics requires a more in-depth analysis than that provided by the graphs presented in the Tariff Filing.

11. The NYISO also asserted that these gas trading hubs are sub-optimal for Zone C because they have a lower level of trading history and activity as compared to TETCO M3. I disagree. Based on data from the last four years of Platt's Gas Daily, trading history has been reported for Millennium East on 98.2% of 1,460 trading days. This trading history is robust, although the NYISO is technically correct that the trading history is "lower" – by a modest amount – than the 100% of calendar days reported for TETCO M3 over the same period.

12. If the Dominion North Point gas trading hub is disfavored for the reasons stated by the NYISO, then the Dominion South Point gas trading hub should be considered as an alternative. Dominion South Point is a well-established, liquid trading point for western and upstate New York. It is regularly traded, and Platt's Gas Daily reported trading activity for this index on 99.8% of the calendar days noted above.

13. The Dominion North and South Points both utilize the same Dominion pipeline. These trading hubs are distinguished at an arbitrary point that is outside of Zone C. Geography in this instance is not an issue, however, because Dominion South Point is utilized regularly for retail access programs in areas of New York that are served by the Dominion pipeline. Historically, prices on the Dominion North and South Points correlate tightly and typically vary by no more than \$0.02. Prices on the Dominion South Point gas trading hub tend to be lower than prices on the TETCO M3 gas trading hub. I discuss this point later in my affidavit, and explain why this arbitrage opportunity is likely to persist over time.

Gas Hub Pricing Selection Criteria and Zone G

14. The Demand Curves currently model peaking units at two locations in Zone G to reflect geographical differences across the Zone that impact the availability and price of natural gas. Currently, the proxy peaking unit located in Dutchess County is indexed to the Iroquois Zone

2 pricing hub, whereas the proxy peaking unit located in Rockland County is indexed to the TETCO M3 hub. Modeling two peaking units in Zone G is appropriate based on the diversity of operators in this region that obtain gas supply from a variety of sources. Also, although multiple pipelines transit Zone G, access to supply from those pipelines can be dependent on where the generator is located relative to the receipt points. For instance, the Iroquois Zone 2 pipeline serves Dutchess and Ulster Counties in Zone G, but not Rockland County, which may be served by either the Millennium or Algonquin pipelines. Relying solely on the Iroquois Zone 2 gas trading hub to model market dynamics for the entire Zone G thus fails to fully represent actual market activity in the Zone.

15. As noted, there are multiple alternatives that also may be included in the modeling of multiple peaking units in Zone G. Of these alternatives, the Algonquin gas trading hub and TETCO M3 trading hub are sub-optimal. The former presents the price of gas delivered in ISO-NE, not New York, whereas prices on the latter option better reflect demand in New England than demand in New York. Millennium East, the remaining alternative, serves Zone G, and exhibits some correlation with Zonal LBMPs.

16. Importantly, the Millennium East gas trading hub is a lower-cost source of commodity than the Iroquois Zone 2 gas trading hub that the NYISO recommends. A rational developer is likely to procure supply from the lowest-cost source that can serve its unit reliably. The Millennium East gas trading hub likely would be more attractive to new peaking units built in Zone G and, therefore, it should be selected as the pricing point for the proxy peaking unit located in Zone G whether or not two peaking units are modeled for the Demand Curves in this reset process.

17. If this hub is deemed to have an insufficient trading history because data is not available during the oldest historic year analyzed, then the TETCO M3 gas trading hub should be used to model supply costs during the first Capability Year (CY 2018/2018), but replaced with the Millennium East gas trading hub during each subsequent Capability Year.

Arbitrage Opportunities

18. Recent prices indicate that the NYISO selected the highest-cost gas trading hubs to model the supply costs of peaking units located in Zones C and G. This is demonstrated on the following Table, which depicts the average annual spot price for natural gas from multiple trading hubs during the period 2013 through 2016:

Average Annual Spot Price Level (\$ per MMBTU)*					
Historic Year	Dominion South	Millennium	TETCO M3	Iroquois Zone 2	Tennessee Zone 6
2016	1.37	1.34	1.58	2.66	2.77
2015	1.49	1.28	2.57	4.25	4.58
2014	3.33	3.20	5.44	7.65	8.15
2013	3.53	3.49	3.97	5.62	6.67

* Prices from Platt’s Gas Daily

19. The NYISO dismisses the opportunities for low-cost supply on the Millennium and Dominion North as short-term arbitrage opportunities that will disappear over time. According to the NYISO, prices on the lower-cost trading hubs will equilibrate at a higher point that approximates prices on the trading hubs preferred by the NYISO. Millennium East and Dominion (North Point and South Point) historically have had lower price levels than TETCO M3 over time, as demonstrated on the Price Level Table. Prices on the pipelines rise and fall with market conditions similar to the higher-priced gas hubs, but with less volatility over time. This is presented on the following Price Volatility Table:

Annual Price Volatility (Std. Dev. of the natural log price differential)*					
Historic Year	Dominion South	Millennium	TETCO M3	Iroquois Zone 2	Tennessee Zone 6
2016	0.12	0.13	0.17	0.19	0.25
2015	0.13	0.12	0.27	0.23	0.28
2014	0.12	0.14	0.31	0.27	0.31
2013	0.03	0.07	0.10	0.24	0.24

* Standard Deviation of (Ln price B – Ln price A) over the calendar year
 Lower volatility also indicates less price movement over time.

20. The Millennium East and Dominion South Point trading hubs present arbitrage opportunities that are long-term, and not short-run as claimed by the NYISO. This is demonstrated by the fact that average annual spot prices on the Millennium East and Dominion South Point trading hubs historically are lower than comparable prices on the TETCO M3, Iroquois Zone 2, and Tennessee Zone 6 gas trading hubs. The reduced volatility over time also indicates that the arbitrage opportunities presented by the Millennium East and Dominion South Point trading hubs will persist over time.

Blended Gas Trading Hubs

21. If the alternative gas trading hubs recommended above are not selected, consideration should be given to reliance on a blended gas trading hub price. This approach reflects how many generators and gas utilities actually procure their fuel supply. It also is consistent with the methodology utilized by the MMU to estimate net EAS revenues for the Zone G (Rockland) proxy peaking unit. Notably, the Tariff Filing includes commentary from the MMU which advocates that the Zone G proxy peaking unit should be indexed to a 50%/50% blend of Iroquois Zone 2 and TETCO M3.

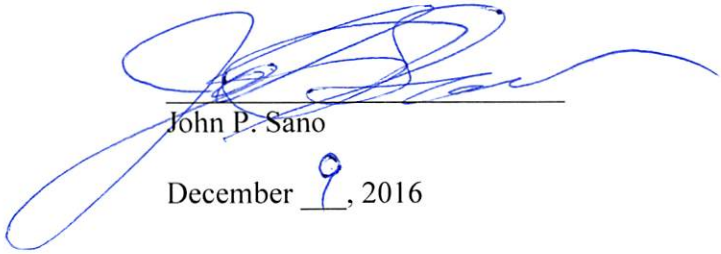
22. My affidavit explains why multiple trading hubs appropriately may reflect dynamic market activities across a geographic region (Zone). This presents an alternative approach to modeling net EAS revenues if the preferred alternative pipelines are not selected for this purpose. The MMU's method of blending multiple gas trading hubs in equal proportions is reasonable. If a blend of gas trading hubs is to be utilized for modeling purposes, the Zone C peaking unit should be indexed to a 50%/50% blend of the Dominion (North Point or South Point) and Millennium East gas trading hubs. The Zone G (Rockland) proxy peaking unit should be indexed to a 50%/50% blend of Millennium East and Iroquois Zone 2.

23. The NYISO asserts that a trading hub blend cannot be utilized because no publication reports a blended price, and the NYISO states that it does not have a basis to derive such proportion. If the proportions and pipelines are specified, however, the blended price would be easy to determine.

24. This concludes my affidavit.

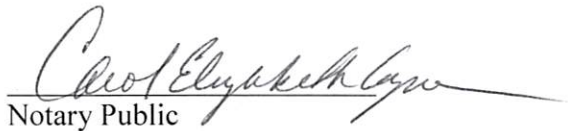
ATTESTATION

I am the witness identified in the foregoing affidavit. I have read the affidavit and am familiar with its contents. The facts set forth herein are true to the best of my knowledge, information, and belief.



John P. Sano
December 9, 2016

Subscribed and sworn to before me
this 9th day of December, 2016



Notary Public

My Commission expires:

CAROL ELIZABETH COYNE
Notary Public, State of New York
Qual. in Rensselaer Co. No. 02CO4940511
Commission Expires July 18, 20 18