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VIA E-MAIL

Mr. Robert A. Hiney Chairman of the NYISO Board of Directors c/o Mr. Stephen G. Whitley President and CEO New York Independent System Operator, Inc. 10 Krey Boulevard Rensselaer, New York 12144

Re: Supplemental Comments Regarding the 2014-2017 Demand Curve Reset Process

Dear Chairman Hiney:

Pursuant to the request of the New York Independent System Operator, Inc. ("NYISO") Board of Directors ("Board"), Multiple Intervenors and the City of New York ("City") hereby jointly submit these supplemental comments regarding the 2014-2017 demand curve reset process. As further described herein, Multiple Intervenors and the City strongly support the conclusions of the supplemental analysis undertaken with respect to the viability of the frame turbine equipped with a selective catalytic reduction ("SCR") system to serve as a proxy unit technology for both the G-J and New York City demand curves. Accordingly, consistent with prior recommendations submitted to the NYISO Board by Multiple Intervenors and the City urge the NYISO Board to adopt use of this technology as a viable proxy unit and revise the proxy unit technology selections for the G-J and New York City demand curves that were set forth in NYISO staff's final recommendations dated September 6, 2013 ("Final Recommendations").¹

The Final Recommendations proposed selection of an LMS100 aeroderivative turbine equipped with an SCR system as the appropriate proxy unit technology for both the G-J and New York City demand curves.² With respect to the G-J locality, adoption of NYISO staff's recommendations would result in an increase to the current monthly demand curve reference value applicable to the Lower Hudson Valley (<u>i.e.</u>, NYISO Load Zones G-I) of nearly 100 percent. The proxy unit technology recommended for the New York City demand curve would

¹ As stated in Initial Joint Comments, Multiple Intervenors and the City strongly support NYISO staff's recommendation to utilize the frame turbine without an SCR system as the appropriate proxy unit technology for the New York Control Area ("NYCA") demand curve.

² Final Recommendations at 28.

artificially inflate the current monthly reference value for such demand curve by nearly 30 percent.

Among other matters, the Initial Joint Comments urged the NYISO Board to revise the recommended proxy unit technology selections for both the G-J and New York City demand curves. As demonstrated in the Initial Joint Comments, NYISO staff's recommended use of the LMS100 turbine with an SCR in the face of significantly lower-cost, viable alternative technologies would constitute a clear violation of Section 5.14.1.2 of the NYISO Market Administration and Control Area Services Tariff ("Services Tariff").³ Section 5.14.1.2 of the Services Tariff requires that the technology selected as the proxy unit for each capacity region represent the "technology that results in the lowest fixed costs and highest variable costs among all other units' technology that are economically viable."

As it relates to the G-J locality, two alternative viable technologies are available for selection by the NYISO Board – the frame turbine without SCR and the frame turbine with SCR. The Initial Joint Comments demonstrated that NYISO staff's recommendation to require dualfuel capability for the proxy unit located in the Lower Hudson Valley was unnecessary and unjustified.⁴ Absent such dual-fuel requirement, the frame unit without SCR is viable and has fixed costs that are significantly lower than the LMS100 technology recommended by NYISO staff.⁵ Additionally, use of the frame unit without SCR would likely produce a resulting reference value for the G-J demand curve that is more than 30 percent lower than the value recommended by NYISO staff.⁶ Alternatively, if the NYISO Board determines that use of a frame unit without SCR is not warranted, the frame unit with SCR is also available to serve as the proxy unit for the G-J demand curve. The Initial Joint Comments clearly demonstrated the viability of this technology, noting that such technology's fixed costs are approximately half the costs of the LMS100 technology and would result in a reference value more than 30 percent less than the value recommended by NYISO staff.⁷ Accordingly, to ensure compliance with Section 5.14.1.2 of the Services Tariff, Multiple Intervenors and the City urged the NYISO Board to vacate NYISO staff's recommended proxy unit technology for the G-J demand curve and provide for the selection of either of the lower-cost, viable alternative frame technology configurations.

³ Initial Joint Comments at 5-13.

⁴ *Id*. at 5-9.

- ⁵ *Id*.
- ⁶ *Id*. at 9.
- ⁷ *Id*. at 9-12.

Similar to the G-J demand curve, the Initial Joint Comments also demonstrated that NYISO staff's proposal to utilize the LMS100 as the proxy unit for the New York City demand curve would result in a violation of Section 5.14.1.2 of the Services Tariff due to the availability of the lower-cost, viable frame unit with SCR technology.⁸ Notably, the fixed costs of the frame unit with SCR are approximately 40 percent lower than the LMS100, and would reduce the reference value of the New York City demand curve by nearly 30 percent.⁹ As such, the City contended that the Services Tariff required selection of the frame unit with SCR as the appropriate proxy unit technology for the New York City demand curve.

On October 14, 2013, the NYISO Board conducted oral argument regarding the 2014-2017 demand curve reset process. During oral argument, Multiple Intervenors and the City reiterated their position regarding the impropriety of NYISO staff's proxy unit technology recommendations for the G-J and New York City demand curves. Notably, Multiple Intervenors and the City cited the Marsh Landing Generating Station in California ("Marsh Landing Facility") as evidence of the commercially viability and suitability of the frame unit with SCR.¹⁰ Additionally, Multiple Intervenors and the City noted that use of such technology as a demand curve proxy unit has already been reviewed and approved by the Federal Energy Regulatory Commission ("FERC"). In fact, since 2007, the PJM Interconnection, L.L.C. ("PJM") Open Access Transmission Tariff has expressly required that the proxy unit for its demand curves be a simple-cycle frame unit with SCR. After demonstrating the clear viability of lower-cost alternatives, including the frame unit with SCR, Multiple Intervenors and the City reaffirmed their request for the NYISO Board to reject the unwarranted recommendations of NYISO staff and instead provide for the selection of a lower-cost, viable proxy unit technology for both the G-J and New York City demand curves.

In response to the comments of Multiple Intervenors and the City, as well as other parties making similar claims, the NYISO Board directed NYISO staff to conduct additional analysis regarding the viability of the frame unit with SCR technology. Subsequently, NYISO staff engaged the services of The Brattle Group, Inc. ("Brattle") to assist in conducting such additional analysis.

⁸ *Id*. at 13.

⁹ *Id*.

¹⁰ The Marsh Landing Facility is a 720 MW, approximately \$700 million facility owned by NRG Energy, Inc. that commenced commercial operation earlier this year. The facility consists of four Siemens frame turbines operating in a simple-cycle configuration. Each turbine is equipped with SCR technology to control nitrogen oxide ("NOx") emissions. The Marsh Landing Facility was permitted and has demonstrated the ability to achieve compliance with California's stringent NOx emissions requirements, which are equivalent to the requirements applicable to certain portions of the Lower Hudson Valley and New York City.

On November 1, 2013, NYISO staff distributed a report from Brattle entitled "Independent Evaluation of SCR Systems for Frame-Type Combustion Turbines – Report for ICAP Demand Curve Reset" ("Brattle Study"). The Brattle Study summarizes the additional analysis undertaken with respect to the frame unit with SCR and concludes that such technology is viable. Therefore, Brattle recommends that the frame unit with SCR be utilized as the appropriate proxy unit technology for both the G-J and New York City demand curves. In so doing, the Brattle Study affirms the positions advocated by Multiple Intervenors and the City.

The Brattle Study expressly states that

we find the F class turbine to be economically viable and recommend that S&L and NERA [NYISO staff's demand curve consultants] estimate new demand curves for Zones J, K and G-J locality using the S&L estimated costs and performance parameters for SCR on F-Class frame units given in Appendix B of the September 6, 2013 NYISO report.¹¹

In reaching its conclusion, Brattle strongly disagrees with the recommendation of NYISO staff's consultants "that [the] proxy unit not be based on a simple cycle F-class CT with SCR because of technical challenges, unsuccessful projects, and lack of market acceptance."¹² In addition to the Marsh Landing Facility cited by Multiple Intervenors and the City, Brattle notes that SCR technology has been successfully deployed at other frame unit projects, including the Sacramento Municipal Utility District's McClellan generation facility ("McClellan Facility") and the Modesto Irrigation District's McClure generation facility ("McClure Facility").¹³ Although the Marsh Landing Facility commenced commercial operation earlier this year, the combination of frame turbine technology with SCR has been in operation at the McClellan Facility and McClure Facility since 2004 and 2005, respectively, representing over 4,000 hours of operational experience.¹⁴

Comparatively, when the NYISO Board elected to proceed with the LMS100 as the proxy unit for the New York City demand curve as part of the 2008-2011 demand curve reset process instead of, at that time, the more conventional LM6000 technology, only a single LMS100 unit was in commercial operation in the United States and had operated for only 587

 14 Id. Over the seven-month period from March 2013 through September 2013, the Marsh Landing Facility amassed over 500 hours of operation. (Id. at 13.)

¹¹ Brattle Study at v.

¹² Final Recommendations at 14.

¹³ Brattle Study at 11-12.

hours over approximately nine months of operation.¹⁵ In just seven months of operation through September 2013, the Marsh Landing Facility nearly equaled the operation of the only LMS100 unit that provided an adequate basis upon which the NYISO Board concluded such technology was viable to serve as a proxy unit technology in New York. When combined with the operating history of the McClellan Facility and McClure Facility, the NYISO Board is presented with three times as many units in operation and nearly eight times more operating hours demonstrating the viability of the frame turbine with SCR technology.¹⁶ Given this vastly greater volume of operating experience, Multiple Intervenors and the City fail to understand how the NYISO Board could reach any conclusion other than finding that the frame unit with SCR is viable and should be utilized as the proxy unit, where appropriate, in New York.

Furthermore, as Brattle notes, "[b]oth F-Class turbines and SCR systems are mature, commercially available technologies."¹⁷ Thus, similar to the LMS100 technology, the frame unit with SCR merely represents the combination of two very mature, and proven technologies. In justifying use the LMS100 during the 2008-2011 demand curve reset, the NYISO noted that despite its relatively limited operating history "[t]he major components of the LMS-100 technology ... are based on both GE Frame 6 and LM6000 designs. The gas turbine in the LMS-100 has over 100 million hours of operating experience in aircraft engines and industrial applications."¹⁸ As it relates to the frame unit with SCR, the Siemens frame turbine being considered has more than 5.3 million hours of fleet operation.¹⁹ Moreover, SCR technology was first patented by a U.S. company in 1959 and is a post-combustion emissions control technology

¹⁶ Given that the Marsh Landing Facility consists of four individual frame turbines each equipped with an SCR system, one could legitimately argue that the number of units with this technology in operation in the United States is six – six times more than the number of LMS100 units that were in operation at the time the NYISO Board determined that sufficient operating history was available to deem such technology as viable.

¹⁷ Brattle Study at iii.

¹⁸ FERC Docket No. ER08-283-000, *New York Independent System Operator, Inc.*, Tariff Revisions to Implement Revised ICAP Demand Curves for Capability Years 2008/2009, 2009/2010 and 2010/2011 (November 30, 2007) at 5-6.

¹⁹ NERA, Independent Study to Establish Parameters of the ICAP Demand Curve for the New York Independent System Operator (August 2, 2013) at 20.

¹⁵ National Economic Research Associates, Inc. ("NERA"), Independent Study to Establish Parameters of the ICAP Demand Curve for the New York Independent System Operator (August 15, 2007) at 25-26.

that is used extensively in electric generation applications.²⁰ Thus, the extensive history of these two mature and proven technologies further demonstrate the viability of the frame unit with SCR.

The Brattle Study also fully distinguishes the prior examples of SCR deployments with frame turbines that were relied upon by NYISO staff's consultants in rejecting use of the technology.²¹ Specifically, NYISO staff's consultants noted that prior unsuccessful deployments of the technology at the Puerto Rico Electric Power Authority's Central Cambalache facility in Puerto Rico ("Cambalache Facility") and the Riverside Generating Company facility in Kentucky ("Riverside Facility") demonstrate its technical challenges.²² Notably, both of these installations were undertaken in the late 1990s and early 2000s and, thus, are not representative of technological advancements that have occurred over the intervening period, which are reflected in newer installations such as the Marsh Landing Facility. In addition, Brattle found that the unsuccessful deployments at the Cambalache Facility and Riverside Facility were the result of improper design and/or improper use and, therefore, do not undermine the viability of technology.²³

With respect to the Cambalache Facility, Brattle noted that the failure of the equipment at the facility was due to the use of an improper grade of fuel oil by the facility operator that resulted in catalyst poisoning.²⁴ Thus, Brattle concluded that the Cambalache Facility "does not inform an assessment of SCR applicability to frame combustion turbines."²⁵ Brattle further found that the issues at the Riverside Facility were the result of utilizing improperly sized cooling air fans, thereby compromising the ability of the dilution air system to achieve proper cooling of exhaust gas temperatures.²⁶ Additionally, reports were provided to Brattle regarding

²³ Brattle Study at 15-16.

²⁴ *Id.* at 15.

 25 *Id*.

²⁶ Id.

²⁰ Institute of Clean Air Companies, Inc., *White Paper: Selective Catalytic Reduction* (SCR) Control of NOx Emissions (November 1997) at 1, available at: <u>http://www.ammoniapro.com/Ammonia%20Library/NOx%20Reduction/Institute%20of%20Clean%20Air%20Co_SCR.pdf</u>; and Brattle Study at 4-8.

²¹ Brattle Study at 15-16.

²² Final Recommendations at 13.

the potential for faulty and/or damaged equipment being utilized at the Riverside Facility.²⁷ Consistent with the conclusion for the Cambalache Facility, such factors discredit the reasonableness of relying on the experience at the Riverside Facility in assessing the viability of using SCR technology with frame turbines.

Having demonstrated the viability of the technology through citing multiple examples of successful deployments over the past decade and discrediting the unsuccessful deployments relied upon by NYISO staff's consultants, Brattle correctly concluded that the frame unit with SCR is an appropriate technology to consider for use as a proxy unit in New York.²⁸ Noting the requirements of Section 5.14.1.2 of the Services Tariff, Brattle further concluded that selection of the frame unit with SCR is mandated by the tariff due to the significantly lower capital costs associated with the frame technology.²⁹ In fact, the fixed costs of the LMS100 are more than 70 percent higher than the fixed costs of the frame unit with SCR in the Lower Hudson Valley, and more than 60 percent higher than a frame unit with SCR located in New York City.³⁰

Based on the foregoing, the Brattle Study affirms the positions advocated by Multiple Intervenors and the City by confirming the viability of the frame unit with SCR to serve as a proxy unit in New York. Due to its significantly lower capital costs, Section 5.14.1.2 of the Services Tariff dictates selection of this technology instead of the LMS100 technology, where appropriate. Continued reliance on the LMS100 technology would result in artificially inflated demand curves for the G-J and New York City localities and significantly impair the ability of such demand curves to provide appropriate price signals regarding the need for, and value of, additional capacity within such capacity regions. Such artificially inflated demand curves would also result in substantial, unnecessary increases to consumer capacity costs. Accordingly, the NYISO Board should reject NYISO staff's proposal to utilize the LMS100 as the proxy unit technology for the G-J and New York City demand curves, and, instead, provide for the selection of: (a) the frame unit with SCR for the G-J demand curve if it does not select use of a frame unit without SCR located in Dutchess County; and (b) the frame unit with SCR as the appropriate proxy unit technology for the New York City demand curve.

- ²⁷ *Id.* 15-16.
- ²⁸ *Id.* at 17.
- ²⁹ *Id.* at 2.
- ³⁰ *Id*.

If you have any questions regarding these comments or would like to discuss them further, please do not hesitate to contact Garrett Bissell at (518) 320-3437, or via e-mail at gbissell@couchwhite.com.

Respectfully submitted,

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GEB/glm

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