Attachment I

UNITED STATES OF AMERICA BEFORE THE FEDERAL ENERGY REGULATORY COMMISSION

New York Independent System Operator, Inc.

Docket No. ER16-1751-000

AFFIDAVIT OF JOSHUA A. BOLES

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Mr. Joshua A. Boles declares:

1. I have personal knowledge of the facts and opinions herein and if called to testify could and would testify competently hereto.

I. Qualifications

2. I am the Manager of Installed Capacity Market Operations for the New York Independent System Operator, Inc. ("NYISO"). In this position, I am directly responsible for overseeing the administration of Installed Capacity ("ICAP") auctions conducted by the NYISO.¹ I will also be responsible for overseeing the administration, and execution, of the annual update process for the ICAP Demand Curves that the NYISO has proposed to implement in this proceeding. Prior to my current position, I served as the Manager of Monitoring, Analysis, and Reporting for the NYISO Market Mitigation and Analysis department. In this role, I was responsible for assisting in overseeing the administration of both the NYISO's capacity and energy market mitigation measures. I have worked for the NYISO in the administration of its capacity markets, including mitigation measures relating thereto, for over 10 years. I received a M.A. in Applied Economics and a B.A. in Economics from the State University of New York at Buffalo.

¹ Capitalized terms that are not specifically defined in this affidavit shall have the meaning set forth in the Request for Leave to Answer and Answer to which this affidavit is attached, or, if not defined therein, the meaning set forth in the NYISO Market Administration and Control Area Services Tariff ("Services Tariff").

II. Purpose of this Affidavit

- 3. I submit this affidavit in support of the NYISO's Request for Leave to Answer and Answer, which is being filed in response to the MI/NYC Protest and NYPSC Comments filed on June 10, 2016 in the above-captioned proceeding. These comments and protests raise concerns regarding the NYISO's proposed methodology for calculating winter-to-summer ratio ("WSR") values, as described in the NYISO's May 20, 2016 filing in this proceeding.² These comments and protests oppose the NYISO's proposal to include adjustments for certain qualifying capacity market entry and exit actions by resources when calculating WSR values.
- 4. The purpose of this affidavit is to describe certain analyses conducted by the NYISO in response to the concerns expressed in the MI/NYC Protest and the NYPSC Comments and present the results thereof. As further described in Section III below, the NYISO conducted a preliminary calculation of the WSR values that would be applicable for the 2017/2018 Capability Year pursuant to its proposed methodology, as well as a comparative analysis of the results that would be produced absent the NYISO's proposed adjustments for certain qualifying market entry and exit actions. Additionally, the NYISO conducted an analysis of the resulting WSR values that would be calculated both with and without the NYISO's proposed adjustments for qualifying market entry and exit actions for the following conditions: (i) a qualifying market exit of 1,000 MW in both New York City and Long Island in November 2014 ("Scenario 1"); and (ii) a qualifying market entry of 1,000 MW in both New York City and Long Island in May 2015 ("Scenario 2"). This additional assessment was conducted using the underlying data set developed for the preliminary calculation of WSR values that would be applicable for the 2017/2018 Capability Year. The results of the NYISO's analyses are set forth in the attached Exhibits A, B and C.

III. Description of the NYISO's Analysis and Results

5. As part of the enhancements to the ICAP Demand Curve reset process proposed in this proceeding, the NYISO proposed to revise its methodology for calculating WSR values.

² See Docket No. ER16-1751-000, New York Independent System Operator, Inc., Proposed Services Tariff Revisions to Implement Enhancements to the Periodic Reviews of the ICAP Demand Curves at 14-16 (May 20, 2016).

The NYISO's proposed WSR calculation methodology utilizes data regarding capacity available to be offered in the ICAP Spot Market Auctions for the same 36-month historical period that is used to estimated net Energy and Ancillary Services revenues for each peaking plant. This 36-month period is divided into three 12-month periods spanning from September through the following August. For purposes of its analyses, the NYISO refers to these 12-month periods as "year 3," "year 2," and "year 1" in Exhibits A, B and C. Year 3 represents the most current 12-month period in the historic data set. Year 2 represents the next most recent 12-month period and year1 represents the oldest 12-month period in the data set.³

6. The NYISO's proposal also requires adjustments to the historic capacity availability data for certain qualifying capacity market entry and exit actions by resources. These adjustments only apply in cases where a qualifying entry or exit action is not accounted for in all months of the 12-month period in which such qualifying event occurs. These adjustments are limited to instances in which a resource: (i) enters the capacity market for the first time (*i.e.*, new entry) or returns to the market after being retired, mothballed or from an ICAP Ineligible Forced Outage state; or (ii) exits the capacity market as a result of being retired, mothballed or entering an ICAP Ineligible Forced Outage state. If a qualifying event occurs with respect to a resource, the NYISO assesses whether the resulting impact of that event on total capacity availability is accounted for in all months of the relevant period, the NYISO adjusts the months that do not already account for the impact. In the case of a qualifying entry action, the NYISO would add the

³ For example, in calculating WSR values for the 2017/2018 Capability Year, the 36-month historic period encompasses September 2013 through August 2016. Year 3 encompasses September 2015 through August 2016. Year 2 encompasses September 2014 through August 2015. Year 1 encompasses September 2013 through August 2014.

⁴ The applicable adjustment, if any, for a qualifying event is based on the resource's status in the last month of each 12-month period (*i.e.*, August). For example, if a resource returned to the capacity market from being in a mothball outage state in October of a 12-month period (*i.e.*, a qualifying entry action) and subsequently exited the capacity market in June of the same 12-month period as a result of entering an ICAP Ineligible Forced Outage state (*i.e.*, a qualifying exit action) and remains in this state for the remaining months of the period (*i.e.*, July and August), the adjustment, if any, that the NYISO would make to all months of the 12-month period would be to account for the impact of the affected resource's available capacity being removed from the market.

affected resource's applicable available capacity to each month in the 12-month period that did not already include such capacity. For a qualifying exit action, the NYISO would subtract the affected resource's applicable available capacity from each month in the 12-month period that did not otherwise already reflect removal of this capacity from the market.

- 7. The NYISO's proposed adjustments for certain qualifying entry and exit actions by resources are designed to minimize the potential for undue volatility that could otherwise occur as a result of capturing month-to-month variations in capacity availability due to certain market entry and exit by resources. Instead, as adjusted, the WSR values provide for a reflection of the year-to-year net changes in capacity availability after accounting for all resource entry and exit that occurs within each year. By reducing volatility, the adjustments provide for a more stable and predictable evolution of WSR values that reflects changes in the resource mix and the impact that such changes have on seasonal capacity availability. Inclusion of the proposed adjustments aligns the WSR calculation methodology with the overarching objectives of the NYISO's proposed annual update process for the ICAP Demand Curves (*i.e.*, providing for a stable and predictable evolutions).
- 8. The initial step in the NYISO's calculation of WSR values is to determine the base level of available ICAP for each relevant month (referred to as "ICAP Available Base" in Exhibits A, B and C). Capacity availability data used by the NYISO is sourced from the monthly ICAP Spot Market Auction reports published by the NYISO and posted on its website. The following data elements are used from these reports: (i) the locational equivalent demand forced outage rate ("EFORd") for each capacity region (referred to as the "Locational EFORd" in Exhibits A, B and C); (ii) the generation and UDR Unforced Capacity ("UCAP") availability values for each capacity region (referred to as the "Generation UCAP" in Exhibits A, B and C); (iii) the Special Case Resource ("SCR") UCAP available for each capacity region (referred to as "SCR UCAP" in Exhibits A, B and C); and (iv) for the NYCA, the UCAP available from imports (referred to as "Imports" in Exhibits A, B and C).

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- 9. To calculate the monthly ICAP Available Base value for each capacity region, the NYISO sums the relevant values for Generation UCAP, SCR UCAP and Imports to derive the total UCAP available (referred to as "Total UCAP Available" in Exhibits A, B and C). The ICAP Available Base is calculated by multiplying the Total UCAP Available by [1-Locational EFORd].
- 10. Following the calculation of the monthly ICAP Available Base values for each capacity region, the NYISO then identifies, within each 12-month period, whether a resource has experienced a qualifying entry or exit action. If a qualifying event is identified, the NYISO adjusts the ICAP Available Base value for each month that does not otherwise already reflect the impact of the qualifying event on the capacity available to the market. This adjustment is made using the applicable seasonal capacity availability values (*i.e.*, summer capability and winter capability) for the affected resource.⁵ The applicable summer and winter capability values for the affected resource are sourced from the most recent Load & Capacity Data report (commonly referred to as the "Gold Book") applicable for the 12-month period in which the qualifying event occurs that contains non-zero seasonal capability values for the affected resource. Exhibit A identifies each resource for which a qualifying event occurred, the applicable 12-month period in which adjustments were applied, the months in which the ICAP Available Base is adjusted, the seasonal capability values utilized for purposes of the adjustment and the source of these values.⁶
- 11. Once all qualifying events are identified for each month, along with the applicable capacity availability adjustments for each affected resource, the NYISO sums all applicable adjustments that apply for a given month to derive the total net capacity adjustment (referred to as the applicable capacity region "Modification" in Exhibits A, B and C). The ICAP Available Base value for each month is then adjusted by the Modification value to

⁵ For example, if a resource retired in June of year 3, then its applicable summer and winter capability values would be subtracted from the ICAP Available Base values for May through September (*i.e.*, all months prior to the qualifying exit action within the relevant 12-month period). No adjustments would be required for July or August of year 3 because the ICAP Available Base values for these months would already reflect the impact of the resource's retirement.

⁶ On a going forward basis, the NYISO anticipates that it would post to its website a document similar to Exhibit A as part of each annual update of the ICAP Demand Curves to provide transparency as to its calculation of updated WSR values.

derive the total adjusted level of ICAP available for the month (referred to as the applicable capacity region "ICAP Total (Adjusted)" in Exhibits A, B and C).

- 12. The WSR for each 12-month period of the historic data set is then calculated as the ratio of: (1) the average of the ICAP Total (Adjusted) values for the six winter months included in the period (*i.e.*, November through April of the following year); and (2) the average of the ICAP Total (Adjusted) values for the six summer months included in the period (*i.e.*, September and October and May through August of the following year). The WSR for each 12-month period is referred to as the "1 Year WSR" in Exhibits A, B and C.
- 13. The WSR value for the historic 36-month period is calculated as the average of the three 1 Year WSRs. The resulting value is rounded to three decimal places to derive the final WSR value that applies for each capacity region (referred to as the applicable capacity region "WSR" in Exhibits A, B and C).
- 14. The NYISO executed the procedures described above to calculate preliminary WSR values that would apply to the ICAP Demand Curves for the 2017/2018 Capability Year.⁷ The historic data period for these calculations encompasses September 2013 through August 2016. Notably, because the G-J Locality did not exist prior to May 1, 2014, the WSR value for this Locality for the 2017/2018 Capability Year would be calculated based on two years of data from September 2014 through August 2016.⁸ All results that are derived based on the NYISO's proposed WSR calculation methodology are labeled in Exhibits A, B and C as "NYISO Proposal" results.
- 15. In addition to calculating the preliminary WSR values for the 2017/2018 Capability Year consistent with its proposed methodology, the NYISO also calculated preliminary values that would result from excluding the proposed adjustments for qualifying entry and exit actions (referred in Exhibit A, B and C as the "Unadjusted" methodology). The 1 Year

⁷ The WSR values calculated by the NYISO are preliminary because at the time the analysis was undertaken capacity availability data for the July 2016 and August 2016 ICAP Spot Market Auctions was not yet available. For purposes of its analysis, the NYISO utilized the data from June 2016 (*i.e.*, the most current month for which data was available) as a proxy for July 2016 and August 2016 data.

⁸ Beginning with the 2018/2019 Capability Year, the WSR value for the G-J Locality will, consistent with all other capacity regions, be based on three years of historic data.

WSRs for the Unadjusted methodology were calculated in the same manner as the NYISO Proposal methodology, except that the NYISO used the ICAP Available Base values instead of the ICAP Total (Adjusted) values to derive the alternative 1 Year WSRs. Consistent with the NYISO Proposal methodology, the final WSR values for the Unadjusted methodology are the average of the 1 Year WSRs, rounded to three decimal places. All results that are derived based on the Unadjusted methodology are labeled in Exhibits A, B and C as "Unadjusted" results.

- 16. The NYISO also utilized the calculated WSR values (both from the NYISO Proposal methodology and the Unadjusted methodology) to assess the impacts thereof on ICAP Demand Curve reference point values. This assessment was conducted using the Commission-approved parameters for the currently-effective ICAP Demand Curves (*i.e.*, the ICAP Demand Curves for the 2016/2017 Capability Year) and the reference point calculation formula set forth in Section 5.5 of the NYISO ICAP Manual. The only parameter that was altered was the WSR values. Instead of the Commission-approved WSR values for the currently-effective ICAP Demand Curves the WSR values resulting from its analysis.
- 17. The results of the NYISO's analysis are provided in Exhibit A and summarized in the table below.⁹

⁹ The differences between the results for the NYISO Proposal methodology and the Unadjusted methodology depicted in all the tables in this affidavit are calculated by subtracting the applicable NYISO Proposal value from the Unadjusted value. Therefore, as it relates to WSR values, a positive value represents a circumstance where, in comparison to the results of the Unadjusted methodology, the NYISO Proposal methodology results in a lower WSR value. Conversely, a negative value indicates that the NYISO Proposal methodology results in a higher WSR value than the Unadjusted methodology. With respect to reference point values, a positive difference indicates that using the Unadjusted methodology results in a higher reference point value compared the NYISO Proposal methodology. A negative value indicates that the Unadjusted methodology would result in a lower reference point value compared to the NYISO Proposal methodology.

	WSR Impact			Reference Point Impact		
	(2017/2018 Capability Year)			(2016/2017 ICAP Demand Curve Parameters)		
	WSR Value WSR Value Impact		NYISO Proposal	Unadjusted	Impact	
	(NYISO	(Unadjusted)		(\$/kW-month)	(\$/kW-month)	
	Proposal)					
NYCA	1.038	1.038	0.000	\$8.82	\$8.82	\$0.00
G-J Locality	1.054	1.056	0.002	\$11.91	\$12.02	\$0.11
NYC	1.077	1.076	-0.001	\$18.64	\$18.57	-\$0.07
LI	1.075	1.075	0.000	\$8.46	\$8.46	\$0.00

- 18. As depicted in the table above, the impacts of the NYISO's proposed adjustments for qualifying entry and exit actions are anticipated to be minimal for the 2017/2018 Capability Year, both in terms of impact on the WSR values and the resulting impact such values would have on ICAP Demand Curve reference point values. Notably, as demonstrated by the results for the G-J Locality, the proposed adjustments can result in either increasing or decreasing WSR values depending on the timing and magnitude of the qualifying entry and exit actions. Thus, the adjustments can result in WSR values that place either upward or downward pressure on ICAP Demand Curve reference point values.
- 19. To further assess the potential impacts of failing to include the NYISO's proposed adjustments for qualifying entry and exit actions, the NYISO analyzed two alternative scenarios. Scenario 1 assesses the impacts of a 1,000 MW qualifying exit in both New York City and Long Island in November 2014. Scenario 2 assesses the impacts of a 1,000 MW qualifying entry in both New York City and Long Island in May 2015.¹⁰
- 20. The assessments for Scenarios 1 and 2 were conducted utilizing the data set developed for calculating the preliminary WSR values that would be applicable for the 2017/2018 Capability Year. For purposes of assessing the impacts for these scenarios, however, the NYISO sought to isolate the impact of the posited qualifying entry or exit at issue. Accordingly, for both the NYISO Proposal results and the Unadjusted results, the NYISO began by adjusting the historic data set for the actual qualifying entry and exit actions that occurred during this period, as reflected in Exhibit A. This adjustment is identified in Exhibits B and C as the "Adjustment for Entry/Exit (ICAP MW)." The NYISO then

¹⁰ The NYISO elected to assess entry and exit in New York City and Long Island for this additional analysis because the impact of resource entry and exit on WSR values is expected to be greatest in Localities.

conducted the same analysis described above with respect to the preliminary calculations for the 2017/2018 Capability Year in order to derive results for both the NYISO Proposal methodology and the Unadjusted methodology in terms of WSR values and the impact of such values on ICAP Demand Curve reference point values.

	Scenario 1: 1,000 MW Hypothetical Qualifying Exit in NYC and LI in November 2014						
	WSR Impact			Reference Point Impact			
	(2017/2018 Capability Year)			(2016/2017 ICAP Demand Curve Parameters)			
	WSR Value	WSR Value	Impact	NYISO Proposal	Unadjusted	Impact	
	Proposal)	(Onacjusted)		(\$/K vv - month)	(\$/K W -month)		
NYCA	1.039	1.034	-0.005	\$8.87	\$8.64	-\$0.23	
G-J Locality	1.058	1.046	-0.012	\$12.12	\$11.52	-\$0.60	
NYC	1.083	1.070	-0.013	\$19.06	\$18.17	-\$0.89	
LI	1.085	1.063	-0.022	\$8.78	\$8.10	-\$0.68	

21. The results for Scenario 1 are provided in Exhibit B and summarized in the table below.

22. The results for Scenario 2 are provided in Exhibit C and summarized in the table below.

	Scenario 2: 1,000 MW Hypothetical Qualifying Entry in NYC and LI in May 2015						
	WSR Impact			Reference Point Impact			
	(2017/2018 Capability Year)			(2016/2017 ICAP Demand Curve Parameters)			
	WSR Value	WSR Value	Impact	NYISO Proposal	Unadjusted	Impact	
	(NYISO	(Unadjusted)		(\$/kW-month)	(\$/kW-month)		
	Proposal)						
NYCA	1.037	1.027	-0.010	\$8.78	\$8.35	-\$0.43	
G-J Locality	1.051	1.030	-0.021	\$11.76	\$10.81	-\$0.95	
NYC	1.072	1.052	-0.020	\$18.30	\$17.07	-\$1.23	
LI	1.068	1.036	-0.032	\$8.24	\$7.40	-\$0.84	

23. Notably, as shown in the results for Scenario 1 and Scenario 2, failure to include the NYISO's proposed adjustments for qualifying entry and exit produces anomalous results for the WSR applicable to year 2 in each scenario. These anomalous results are inconsistent with the general trend in WSR values for the NYCA over the three year historic period and result in interjecting unnecessary volatility into the resulting WSR values.¹¹ This unnecessary volatility undermines stability and the objective of providing for a methodology that appropriately reflects how changes in the resource mix over time impact seasonal capacity availability. This unnecessary volatility is depicted in the figures

¹¹ The general trend in NYCA WSR values over the three-year historic period is a gradual increase from year 1 (*i.e.*, the oldest 12-month period) to year 3 (*i.e.*, the most recent 12-month period).

and tables below.¹² It is important to note that the degree of volatility in WSRs that results from month-to-month changes in the resource mix related to entry and exit is dependent on both the magnitude of the change in capacity availability and the timing of entry and exit actions by resources. Qualifying entry or exit actions that exactly align with the 12-month periods used in calculating the WSR values (*i.e.*, those qualifying events that occur in September of a 12-month period and persist for the remaining months of the period) would not introduce additional volatility. The potential randomness of this volatility as a result of the timing of the qualifying events underscores the benefits of the NYISO's proposal.¹³

	Scenario 1: 1,000 MW Hypothetical Qualifying Exit in NYC and LI in November 2014						
	Year 3 WSR (9/15-8/16)		Year 2 WSR (9	0/14-8/15)	Year 1 WSR (9/13-8/14)		
	NYISO Proposal	Unadjusted	NYISO Proposal	Unadjusted	NYISO Proposal	Unadjusted	
NYCA	1.047	1.047	1.039	1.023	1.032	1.032	
G-J Locality	1.066	1.066	1.050	1.026	N/A	N/A	
NYC	1.098	1.098	1.086	1.049	1.064	1.064	
LI	1.091	1.091	1.094	1.027	1.071	1.071	

¹² Although the NYISO's analyses assume that entry perfectly aligns with the beginning of the Summer Capability Period (*i.e.*, May) and exit perfectly aligns with the beginning of the Winter Capability Period (*i.e.*, November), if the opposite were assumed to occur (*i.e.*, market entry in November and market exit in May), the resulting depictions of the trend lines shown in the figures below would exhibit the mirror image of the volatility shown in the results for the Unadjusted case.

¹³ There are a variety of factors that can affect the timing of entry and exit decisions, including factors that may be beyond the reasonable control of the asset owner/developer. For example, market exits may be driven by unanticipated mechanical failures, damage to equipment or financial hardship of the asset owner. The timing of market entry may be materially affected by the multi-year construction schedules for new resources and/or the process of securing the necessary permits and approvals for facility construction and operation.





	Scenario 2: 1,000 MW Hypothetical Qualifying Entry in NYC and LI in May 2015						
	Year 3 WSR (9/15-8/16)		Year 2 WSR (9/14-8/15)		Year 1 WSR (9/13-8/14)		
	NYISO Proposal	Unadjusted	NYISO Proposal	Unadjusted	NYISO Proposal	Unadjusted	
NYCA	1.043	1.043	1.036	1.006	1.032	1.032	
G-J Locality	1.058	1.058	1.044	1.003	N/A	N/A	
NYC	1.081	1.081	1.071	1.012	1.064	1.064	
LI	1.066	1.066	1.067	0.972	1.071	1.071	

Scenario 2: Trend Line of Changes in WSR for NYCA



24. Based on the foregoing, the NYISO's proposed methodology, including the adjustments for qualifying entry and exit actions, is formulaic, transparent and provides for the calculation

of WSR values that are reflective of changes in the resource mix over time and the resulting impact that such changes have on seasonal capacity availability. The proposed adjustments for qualifying entry and exit are intended to result in WSR values that reflect year-to-year changes in seasonal capacity availability driven by the net effect of all resource changes that occur within each year, while minimizing the potential for unnecessary volatility that could result from measuring the impacts of month-to-month variations in the resource mix.

25. 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 therein are true to the best of my knowledge, information, and belief.

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oshua A. Boles June 27, 2016

Subscribed and sworn to before me this 27th day of June, 2016

Notary Public Comm My commission expires: <u>March 21, 201</u>8

DIANE L. EGAN Notary Public, State of New York Qualified in Schenectady County No. 4924890 Commission Expires March 21, 20