Attachment VI

UNITED STATES OF AMERICA BEFORE THE FEDERAL ENERGY REGULATORY COMMISSION

New York Independent System Operator, Inc.

Docket No. ER25-___-000

AFFIDAVIT OF AARON D. MARKHAM

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Mr. Aaron D. Markham 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 Vice President of Operations for the New York Independent System Operator, Inc. ("NYISO"). In this position, I am directly responsible for overseeing the NYISO's grid reliability and operations teams. These teams are responsible for ensuring the bulk power grid and wholesale energy markets operate reliably and efficiently responding to the needs of New Yorkers, every minute of every day. I have held positions of increasing responsibility since joining the NYISO in 1999. Prior to my current role, I served as Director of Grid Operations, overseeing power system operations, operator training, and regulatory compliance with numerous reliability standards. I received a B.S. degree in Electrical Engineering Technology from The State University of New York ("SUNY") Polytechnic Institute at Utica-Rome and a M.B.A. from the College of Saint Rose.

II. Purpose of this Affidavit

3. I submit this affidavit in support of the NYISO's filing in this proceeding to establish: (a) the ICAP Demand Curves applicable for the 2025-2026 Capability Year; and (b) the methodologies and inputs for use in conducting annual updates to determine the ICAP Demand Curves for the 2026-2027, 2027-2028, and 2028-2029 Capability Years.¹ The

¹ Capitalized terms that are not specifically defined in this Affidavit shall have the meaning set forth in the filing letter to which this Affidavit is attached or, if not defined therein, the meaning set forth in the NYISO's Market Administration and Control Area Services Tariff ("Services Tariff").

NYISO's filing represent the NYISO Board of Directors approved results for the quadrennial ICAP Demand Curve reset ("DCR") for the 2025-2029 reset period. The NYISO proposes to use a 2-hour duration lithium-ion battery energy storage system ("2-hour BESS") as the technology for establishing the ICAP Demand Curves for the 2025-2029 reset period. This affidavit will address the operational capability of 2-hour BESS and how it provides reliability benefits to the New York electrical system. This affidavit also responds to concerns raised by certain parties regarding the capability of 2-hour BESS to help support maintaining system reliability.

III. Operational Capability of 2-hour BESS

- 4. The New York power system currently consists of a diverse set of resources that are called upon to reliably serve the electrical demand. The most recent NYISO Load & Capacity Data report attributes the total 2024 summer capacity of 37,375 MW comprised of up 4,662 MW of natural gas-only generation, 1,954 MW of oil-only generation, 18,683 MW of dual fuel (gas and oil) generation, 3,330 MW of nuclear generation, 4,274 MW of hydroelectric generation, 2,454 MW of wind generation (both land-based and offshore), 254 MW of utility-scale (or in-front-of-the-meter) solar generation, 1,429 MW of energy storage (including pumped storage and battery storage) and 334 MW of "other" generation types (*e.g.*, landfill gas, waste-to-energy, and biomass generation).² In addition, the NYISO procures capacity from external capacity suppliers and load reductions from demand response resources through its Special Case Resources program.
- The NYISO system is currently a summer peaking system. The 2024 summer forecasted peak baseline demand was 31,541 MW with the 2024-2025 winter forecast peak baseline demand of 23,800 MW.³
- 6. As part of New York state policy objectives and requirements established by New York's Climate Leadership and Community Protection Act ("CLCPA") approximately 6,000 MW of nameplate solar photovoltaic resources have been installed across the state that are not

² NYISO, 2024 Load & Capacity Data Report at 110 (April 2024), available at: <u>https://www.nyiso.com/documents/20142/2226333/2024-Gold-Book-Public.pdf</u> ("2024 Gold Book").

³ 2024 Gold Book at 21-22.

direct participants in the NYISO markets.⁴ These behind-the-meter ("BTM") solar resources are having the effect of changing the historical net load shape and driving the net peak load to hours later in the day when the sun starts to go down. Due to the impacts of the BTM solar resources, the duration of the highest net load hours on the system are one to two hours in duration.

- 7. 2-hour BESS are flexible assets and can be used in many different ways to meet system needs and support reliability. For example, 2-hour BESS could be operated to discharge continuously for two consecutive hours to meet a two-hour peak demand need or assist in meeting longer duration peak demand needs. 2-hour BESS could also be operated to discharge in non-consecutive hours. In this case the 2-hour BESS could discharge for one hour and then stop discharging for one or more hours before being operated to discharge its remaining stored energy in a second hour to help meet system needs. Alternatively, 2-hour BESS could also be operated to discharge at reduced output over a longer duration to assist in meeting a system need. For example, 2-hour BESS could be operated to discharge at 50% output for four hours to meet a system need. In combination with the existing fleet of resources, which have a diverse set of operating attributes, the flexibility provided by 2-hour BESS will enhance reliability of the grid.
- 8. The NYISO has also implemented a capacity accreditation framework that seeks to properly value the contribution of each resource type to meeting New York's resource adequacy needs.⁵ The capacity accreditation framework assigns Capacity Accreditation Factors ("CAFs") to capacity supply resources to reflect their marginal contribution to meeting the resource adequacy needs of the system. CAFs represent the incremental amount of load that can be supplied by an individual resource (expressed as a percentage of each resource's ICAP). These values impact the capacity market compensation provided to resources. As a result, the CAFs assigned to each resource type represent its reliability

⁴ See, e.g., New York State Energy Research and Development Authority, *Statewide Distributed Solar Projects* available at: <u>https://www.nyserda.ny.gov/All-Programs/NY-Sun/Solar-Data-Maps/Statewide-Distributed-Solar-Projects</u>.

⁵ Docket No. ER22-772-000, *New York Independent System Operator, Inc.*, Excluding Certain Resources from the "Buyer-Side" Capacity Market Power Mitigation Measures, Adopting a Marginal Capacity Accreditation Market Design, and Enhancing Capacity Reference Point Price Translation (January 5, 2022); and *New York Independent System Operator, Inc.*, 179 FERC ¶ 61,102 (2022).

contribution to the system and adjust its capacity market compensation to reflect such reliability value. Currently, CAFs are determined annually. The annual determination of CAFs helps to ensure that each resource's contribution to meeting system reliability evolves over time to reflect changes in the system.

- 9. In 2020, the NYISO implemented market rules for BESS resources to fully participate in the NYISO-administered wholesale markets. These participation rules incentivize storage resources to be available in times of system needs by measuring availability of the BESS during a Peak Load Window,⁶ consider the state of charge of the resource when awarding real-time market schedules to ensure the awards are feasible, and provide the NYISO operators the authority to direct operation of battery resources outside of the market, if necessary, in order to preserve reliability. The NYISO is also developing additional operational tools to better manage reliability with the increase in the number of smaller resources, including BESS.
- 10. New reliability rules have been implemented by the NYSRC for New York and are currently being considered by the North American Electric Reliability Corporation for implementation nationwide to ensure inverter-based resources, such as BESS, are able to ride through electrical disturbances that occur on the system beyond the protection zone for such resource. This capability helps ensure BESS will be available to operate as needed in support of a reliable system after a contingency.
- 11. The electrical power system is a complex machine requiring a number of attributes to be satisfied to operate to the level of reliability required by applicable reliability standards. The NYISO's current capacity market is designed to facilitate procuring resources that provide value in satisfying the probabilistic loss of load expectation criteria (*i.e.*, resource adequacy). As reflected in the CAF values for a 2-hour BESS, it can contribute to meeting this need. A 2-hour BESS also has value in satisfying other reliability criteria including

⁶ The Peak Load Window is designed to align with the hours exhibiting the greatest risk for loss of load events, as determined using the models resulting from the annual study by the New York State Reliability Council, L.L.C. ("NYSRC") to establish the statewide installed reserve margin ("IRM"). The IRM establishes an additional quantity of capacity above forecasted peak needs that is required to ensure maintenance of the resource adequacy reliability criteria to not exceed a loss of load expectation of greater than 0.1 loss of load event days per year.

transmission security, albeit at a different level than the resource adequacy requirements that serve as the foundation of the current capacity market design. No single resource can, alone, meet all system reliability needs. The NYISO leverages the collective capabilities of the entire resource fleet to meet system needs reliably and efficiently. As an additional asset to the resource fleet, the capability provided by 2-hour BESS helps to maintain system reliability and provides benefits that enhance reliability of the grid.

12. 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.

Ann Meell Aaron D. Markham November <u>26</u>, 2024

Subscribed and sworn to before me this $\mathcal{A}_{\ell}^{\prime\prime}$ day of November, 2024

Notary Public

My commission expires: March 21, 2026

DIANE L. EGAN Notary Public, State of New York **Qualified in Schenectady County** No. 4924890 Commission Expires March 21, 20 26