UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

Reliability Technical Conference **Docket No. AD18-11-000**

COMMENTS OF WESLEY J. YEOMANS ON BEHALF OF THE NEW YORK INDEPENDENT SYSTEM OPERATOR, INC.

My name is Wesley J. Yeomans. I serve as Vice President, Operations for the New York Independent System Operator, Inc. ("NYISO"). The NYISO appreciates the opportunity to participate on Panel II of this Reliability Technical Conference and offer comments related to maintaining and advancing the reliability and resilience of the bulk power system. My comments address the constructs of reliability and resilience based on the NYISO's experience in operating the bulk power system and wholesale electricity markets in New York.

The NYISO shares the interest in, and concern for, the reliability and resilience of the bulk power system expressed by the Federal Energy Regulatory Commission ("Commission"). As further described in the NYISO's recent comments in the ongoing resilience proceeding, the NYISO does not currently face imminent resilience concerns that require immediate action.[1] The NYISO, however, fully recognizes that technological developments, economic and environmental considerations, and public policies are transforming the electric grid. The ongoing transformation of the grid in New York presents new and changing variables that the NYISO must manage in its operation of, and planning for, the bulk power system.

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[1] Docket No. AD18-7-000, *Grid Resilience in Regional Transmission Organizations and Independent System Operators*, Response of the New York Independent System Operator, Inc. (March 9, 2018); and Docket No. AD18-7-000, *supra*, Reply Comments of the New York Independent System Operator, Inc. (May 9, 2018).

The NYISO embraces the challenges and opportunities presented by this transformation. The NYISO also remains confident in the ability to work collaboratively with its stakeholders, the Commission, the New York State Public Service Commission, the North American Electric Reliability Corporation, the Northeast Power Coordinating Council, Inc., the New York State Reliability Council, L.L.C. ("NYSRC"), elected officials, and other interested parties to develop and implement the market, operational, planning and other enhancements necessary to continue to efficiently and reliably serve New York's energy needs.

The NYISO has a history of success in evolving its markets in a responsive and complementary manner to changes in the electric industry. The NYISO has already taken steps to evolve its markets in response to the ongoing transformation of the grid in New York. The enhancements implemented to date have been successful and provide a solid foundation from which future market evolution can and should occur.

The wholesale markets administered by the NYISO, as well the established requirements for reliable operation of the bulk power system, already encompass and compensate for many aspects of resilience. Among other resilience measures, maintaining reliability requires: (1) designing the bulk power system to withstand multiple contingency events (*e.g.*, N-1-1 contingencies), thereby enabling the system to absorb the impact from the loss of multiple facilities; (2) operating the bulk power system to continually meet single contingency events (*i.e.*, N-1 contingencies), ensuring that the failure of a single system component will not disrupt continued operation of the system; (3) redundancy and rapid recovery capability in the form of procuring voltage support, frequency regulation service, and operating reserves to assist with responding to unanticipated disturbances that may arise; and (4) emergency preparedness and

system recovery capability and procedures, such as black start capability, coordination of system restoration, and procedures for addressing geomagnetic disturbances.

The NYISO's markets inherently value and support the elements of resilience embedded in maintaining reliability. All resources (without regard to fuel type) that have demonstrated the ability to meet the performance criteria for providing a service procured through the NYISO's markets are eligible to participate and compete with other resources to provide such services. Resources are paid for their reliability and resilience service based on competitive market outcomes. For example, the NYISO-administered markets recognize and compensate for resilience through: (1) clearing prices in the energy and ancillary services market that reflect the costs of securing the system to meet single contingency events as well as certain multiple contingency events, imposed by the NYSRC; (2) procurement of operating reserves to ensure that sufficient resource capability is available to meet certain multiple contingency events or other system disturbances; (3) establishment and procurement of locational operating reserve requirements to ensure that resource capability is available where needed and appropriately dispersed geographically to aid in response to, and expeditious recovery from, system disturbances; (4) establishment and use of "shortage" pricing to appropriately reflect the value of needed services where resource capability may be insufficient and provide appropriate price signals to incentivize improved resource performance and availability during critical operating periods; (5) operation of a capacity market to procure sufficient resource capability to meet expected peak customer demand, plus an installed reserve margin to address unplanned events that could affect system reliability; (6) establishment and procurement of locational capacity requirements to recognize transmission constraints that limit power flows and areas where local resources are needed to help ensure system reliability; (7) use of sloped capacity demand curves

to properly value capacity in relation to the established minimum requirements as well as recognize the value of capacity procured in excess of such minimum requirements; and (8) including the costs of certain resilience measures within the sloped capacity demand curves of the downstate population centers of New York such as dual fuel capability, the cost to procure an alternative fuel reserve sufficient to accommodate operation on such alternative fuel for 96 hours before needing to be replenished, and certain storm hardening costs for new resources located in New York City related to raising site elevations of power plants in response to the flooding experienced during Superstorm Sandy.

The NYISO markets recognize the critical importance of maintaining and enhancing grid interconnections through encouraging economic interchange with neighboring markets. Interregional operational processes that allow for requests of emergency energy assistance, if necessary, to support reliability have also been established with neighboring markets. Maintaining and protecting existing interconnections between neighboring systems and continually assessing opportunities to improve interregional transaction coordination serves to bolster resiliency throughout an interconnected region. These interconnections foster the opportunity to rely on a broader, more diverse set of resources to meet the overall needs of an interconnected region. The more diverse resource pool available through interregional interconnections provides both economic and resiliency benefits, especially during stressed operating conditions such as sustained heat waves or cold snaps.

Consistent with reliability requirements established by the NYSRC, the NYISO has implemented operating practices that bolster the resiliency of the system during stressed conditions. For example, Storm Watch events bolster resilience of the system to serve the needs of the downstate population centers, including New York City, during certain actual or

anticipated severe weather conditions (*e.g.*, thunderstorms, hurricanes, tornados and major snowstorms). During these events, the NYISO operates portions of the transmission system serving the downstate load centers in a more conservative fashion by reducing transfer capability into Southeastern New York. This requires the commitment of, and greater reliance on, local supply resources to meet system needs in this region to safeguard against the loss of multiple transmission system facilities that could occur as a result of severe weather conditions.

Situational awareness of conditions and events that may affect the bulk power system is also key to maintaining and advancing reliability and resiliency. The NYISO enables and enhances situational awareness through technological advancements together with operational practices. Examples of technological advancements include the installation of new phasor measurement units ("PMUs") throughout the State and the opening of the NYISO's new state-of-the-art primary power control center in 2014. Combining cutting-edge technology and innovative system visualization capabilities, the NYISO's new control center provides system operators with improved situational awareness of real-time system conditions.

Operational practices that enhance situational awareness include coordinated communications with neighboring systems during stressed system conditions. The NYISO also engages in regular communications with natural gas pipelines and local distribution companies to facilitate effective electric-gas coordination and awareness of potential impacts of conditions and situations of each system on the other. The NYISO regularly conducts fuel inventory surveys of New York resources to provide better general awareness of fuel access and advance knowledge of potential fuel availability issues that could arise, especially during period of expected system stress, such as cold snaps. The NYISO also performs periodic audits of resources. These audits provide the NYISO with important information regarding the operational status of facilities,

including the state of equipment necessary for dual-fuel units to access and operate on alternative fuel sources.

The NYISO continually assesses New York's bulk power system to ensure the ongoing reliability and resiliency thereof. This includes near-term assessments of resource adequacy, longer duration assessments of anticipated system and resource fleet changes, and reviews following significant operational events. For example, the NYISO conducts seasonal assessments to evaluate resource capability to meet near-term, expected peak load and operating reserve requirements as well as projected needs under extreme operating conditions such as heat waves and cold snaps. These assessments include evaluations of resource sufficiency under certain extreme conditions such as the unavailability of all natural gas-fired generation in New York that does not have dual-fuel capability.

The NYISO also conducts market and operational studies to evaluate the potential impacts of significant changes in system conditions over time. For example, the NYISO recently conducted studies to assess the potential operational impacts of the continued growth of distributed solar resources in New York, as well as the potential impacts related to the State's Clean Energy Standard ("CES"). The CES seeks to achieve a future system where 50% of New York's electricity requirements are served by renewable generation. These studies highlight the challenges and opportunities presented by the ongoing transformation of the grid in New York. The CES assessment also identified a multitude of potential market enhancements to consider with stakeholders over the coming years to help ensure the continued reliability and resilience of New York's electric system.

The NYISO and its stakeholders are actively engaged in a multi-faceted effort to identify, review, and develop the enhancements necessary to address the evolving nature of New York's

electric system. This effort involves an assessment of multiple initiatives, including: (1) a comprehensive review to identify and implement efficiency improvements and other enhancements to the NYISO's current system planning processes and procedures; (2) assessing potential changes to the amount of operating reserves procured and the potential implementation of additional locational reserve regions and associated requirements; (3) re-evaluating the current shortage pricing levels; (4) evaluating the potential need for additional products and services, such as a flexible ramping product; (5) integration of distributed resources and energy storage resources; (6) re-evaluating performance requirements and resource availability measurements for capacity resources including external capacity suppliers; and (7) assessing opportunities for further enhancements to interregional transaction scheduling and coordination.

As part of this effort, the NYISO, in collaboration with its stakeholders, has developed a "master plan" to provide a strategic vision for market design enhancements over the next five years.[2] The NYISO intends to develop similar master plans annually on a going forward basis to provide a continually updated vision of a cohesive, forward-looking market design strategy for the evolution of the NYISO's markets. The NYISO's holistic approach reflects its view that no single market enhancement or reform that will comprehensively address the continued changes occurring in the electric industry.

The NYISO's path forward also reflects the unique considerations and needs within New York. Regional differences exist with respect to the types and pace of change in the electric sector. These differences affect resilience considerations and needs within each region. The

[2] NYISO, *2018 Master Plan: Wholesale Market for the Grid of the Future* (June 2018), available at: http://www.nyiso.com/public/webdocs/markets_operations/committees/bic_miwg/meeting_materials/2018-06-13/2018%20Master%20Plan.pdf.

timeframe for required action and the actions required within each region are driven by the circumstances present, the pace and nature of the changes occurring, the steps already undertaken in preparation for and in response to such changes, and the imminence of any potential resilience and/or reliability concerns. The NYISO's approach, priorities, and timelines for pursing enhancements reflect the need for the wholesale markets to continuously evolve as the ongoing transformation of New York's electric system unfolds.

The NYISO takes no position, at this time, regarding whether incremental resilience-specific standards should be developed and implemented. The NYISO, however, believes that consideration of measures to advance bulk power system resilience could be furthered by conducting certain system evaluations in the near term. For example, the NYISO recently commenced discussions with its stakeholders regarding a proposal to conduct a comprehensive fuel and energy security assessment in 2019. The proposed evaluation would assess the ability to meet electric system needs over a forward-looking ten-year study period during certain stressed system conditions such as prolonged cold weather events and disruptions in natural gas availability to generation resources. The assessment recently proposed by the NYISO, and other similar studies to evaluate system performance during more extreme conditions, can provide key information regarding the types and magnitude of risks that may be faced by the bulk power system. This information can help to facilitate informed discussions and collaboration among system operators, stakeholders, policymakers, and regulators as to the options that may be available to best prepare for, and respond to, the risks faced within a particular region. The data and information provided by such evaluations can also help identify enhancements that should be pursued to advance desired improvements in grid resilience.

This concludes my prepared comments. I look forward to the opportunity to participate in this important discussion and addressing any questions that you may have.

Dated: July 31, 2018