UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

Review of Generator Interconnection Agreements and Procedures	)	**Docket No. RM16-12-000**
American Wind Energy Association	)	**Docket No. RM15-21-000**

COMMENTS OF THE
NEW YORK INDEPENDENT SYSTEM OPERATOR, INC.

Pursuant to the Federal Energy Regulatory Commission's ("Commission") *Notice Inviting Post-Technical Conference Comments* ("Notice Inviting Comments") issued on June 3, 2016,[1] the New York Independent System Operator, Inc. ("NYISO") submits these comments in response to certain questions posed by the Commission. These comments supplement the comments that the NYISO submitted on September 8, 2015, individually,[2] and with other Independent System Operators ("ISOs") and Regional Transmission Organizations ("RTOs"),[3] in response to the June 19, 2015 petition by the American Wind Energy Association ("AWEA").[4]

[1] *Review of Generator Interconnection Agreements and Procedures* and *American Wind Energy Association*, Notice Inviting Post-Technical Conference Comments, Docket Nos. RM16-12-000 and RM15-21-000 (June 3, 2016); *Review of Generator Interconnection Agreements and Procedures* and *American Wind Energy Association*, Notice of Extension of Time, Docket Nos. RM16-12-000 and RM15-21-000 (June 16, 2016).

[2] *American Wind Energy Association*, Motion to Intervene and Comments of the New York Independent System Operator, Inc., Docket No. RM15-21-000 (September 8, 2015).

[3] *American Wind Energy Association*, Joint Comments of the California Independent System Operator Corporation, the Midcontinent Independent System Operator, Inc., the New York Independent System Operator, Inc., and PJM Interconnection, L.L.C. on Petition to Revise Generator Interconnection Rules and Procedures, Docket No. RM15-21-000 (September 8, 2015); *American Wind Energy Association*, Comments of the ISO/RTO Council on Petition to Revise Generator Interconnection Rules and Procedures, Docket No. RM15-21-000 (September 8, 2015).

The NYISO reiterates in these comments that it strongly urges the Commission to maintain the regional flexibility in interconnection processes provided for in Order No. 2003 and subsequent Commission orders that allows for regional variations from the Commission's *pro forma* Large Generator Interconnection Procedures and *pro forma* Large Generator Interconnection Agreement, which variations are carefully tailored to the unique circumstances and stakeholders in each region. The NYISO agrees with the goal of ensuring that interconnection processes are efficient, cost-effective, transparent, and provide for the provision of timely and accurate information and administers its interconnection process set forth in its Commission-approved tariff in a manner consistent with these goals. Rather than order specific "one-size-fits-all" process improvements via a national rulemaking, the NYISO requests that the Commission permit it to develop appropriate solutions and process improvements through a collaborative effort with its stakeholders.

The NYISO has not hesitated to propose revisions to its tariff where the NYISO and its stakeholders have identified areas of potential process improvements. Indeed, the NYISO has adopted a long line of improvements to its interconnection process, driven largely by stakeholder input, that are carefully tailored to circumstances unique to New York. Just this month, the Commission approved tariff revisions the NYISO developed with its stakeholders that were prompted by concerns expressed by AWEA and its members related to their desire for increased flexibility in the interconnection process.[5] In addition, the NYISO has committed to its

[4] *American Wind Energy Association*, Petition for Rulemaking of the American Wind Energy Association to Revise Generator Interconnection Rules and Procedures, Docket No. RM15-21-000 (June 19, 2015) ("AWEA Petition").

[5] *New York Independent System Operator, Inc.*, Tariff Revisions Regarding Interconnection Process Improvements, Docket No. ER16-1627-000 (June 6, 2016) (unpublished letter order) (approving tariff revisions intended to provide flexibility to interconnection customers by providing additional time to meet certain regulatory milestones and by permitting provisional entry into a Class Year Study pending satisfaction of the applicable regulatory milestone).

stakeholders to begin a comprehensive queue reform initiative in the third quarter of 2016 to examine further opportunities with its stakeholders for improving its interconnection process for the benefit of all interconnection customers and ultimately consumers, including considering certain process enhancements described in the below comments. As part of this previously-planned queue reform process, the NYISO will be giving full consideration as to whether any of the proposals raised by AWEA in its petition or discussed at the recent Commission technical conference may have merit for New York.

I. IDENTIFICATION OF FILING PARTY

The NYISO is the independent, not-for-profit corporation responsible for providing open access transmission service, maintaining reliability, and administering competitive wholesale markets for electricity, capacity, and ancillary services in New York State. The NYISO administers the interconnection process for the New York State Transmission System and Distribution System pursuant to its Commission-approved Open Access Transmission Tariff ("OATT").[6] This proceeding involves questions related to potential revisions to the interconnection procedures applicable across all regions, including those administered by the NYISO pursuant to its OATT.

[6] Terms with initial capitalization that are not otherwise defined herein shall have the meaning set forth in Attachments S and X of the NYISO's Open Access Transmission Tariff ("OATT"), or, if not defined therein, in Section 1 of the OATT or Section 2 of the NYISO's Market Administration and Control Area Services Tariff ("Services Tariff").

II. RESPONSES TO QUESTIONS POSED IN THE NOTICE INVITING COMMENTS

A. Questions on Coordination/Queue Management

Question 1.1. During the technical conference panel on coordination, there was discussion as to how the different RTOs/ISOs vary in design and operations that necessitate the need for regional flexibility (i.e., the independent entity variation standard or the regional differences standard) for generator interconnection procedures. Please explain in further detail how the varying market design and operations necessitate regional differences in the generator interconnection queue processes.

NYISO Response to Question 1.1. The NYISO continues to believe that differences among the different regions' system characteristics, market design, planning requirements, and operations necessitate regional differences in their interconnection procedures. The Commission explicitly recognized, in Order No. 2003 and in numerous subsequent orders, the need for regional flexibility in interconnection procedures in light of the significant differences affecting the various regions.[7] In the NYISO, the regional variations approved by the Commission have been appropriate in light of, among other things, electrical characteristics, system topography and generation siting requirements uniquely affecting the NYISO.

The need for requirements unique to New York is due in large part to the fact that the NYISO has a load center in New York City that is one of the largest in the country. This creates

[7] *Standardization of Generator Interconnection Agreements and Procedures*, Order No. 2003, FERC Stats. & Regs. ¶ 31,146 (2003), *order on reh'g*, Order No. 2003-A, FERC Stats. & Regs. ¶ 31,160, *order on reh'g*, Order No. 2003-B, FERC Stats. & Regs. ¶ 31,171 (2004), *order on reh'g*, Order No. 2003-C, FERC Stats. & Regs. ¶ 31,190 (2005), *aff'd sub nom. Nat'l Ass'n of Regulatory Util. Comm'rs v. FERC*, 475 F.3d 1277 (D.C. Cir. 2007) ("Order No. 2003") at P 827 (acknowledging the differing characteristics of each region and providing ISO/RTOs with the flexibility to seek independent entity variations from the final rule "to customize its interconnection procedures and agreements to fit regional needs").

unique challenges with regard to the transmission of electricity from generation sources located in upstate New York (including the majority of New York's wind and large hydro-electric resources) to the load centers in downstate New York.

To address these unique challenges, the NYISO has Localities and Locational Minimum Installed Capacity Requirements. The NYISO's Deliverability Interconnection Standard was developed in light of such capacity requirements and has resulted in an analysis unique to the NYISO's interconnection process with unique implications to interconnection customers that seek to become Installed Capacity Suppliers in New York. The NYISO's deliverability analysis is performed as part of a grouped Class Year Study in which projects requesting Capacity Resource Interconnection Service are studied together to determine their collective impact on deliverability within their particular Capacity Region. The result of such analysis may result in deliverability constraints that, if not addressed through System Deliverability Upgrades for which the interconnection customer agrees to post Security, limit the interconnection customer's ability to participate in the NYISO's market as an Installed Capacity Supplier.

The NYISO's deliverability analysis is but one prong of its unique Class Year Study process. The hallmark of the NYISO's Class Year Study process is that it is performed for a group of projects that have achieved similar interconnection milestones to determine the cumulative impact of such projects. Through this unique clustered study, the NYISO is able to equitably allocate upgrade costs and generate detailed good faith cost estimates that provide reasonable closure on upgrade costs.

A fundamental element of the Class Year Study and other NYISO interconnection studies is the unique set of reliability requirements that must be examined under the NYISO's Minimum

Interconnection Standard. Because the NYISO's geographic footprint is limited to the State of New York, the NYISO is subject to requirements of the New York State Reliability Council – requirements not applicable to any other ISO or RTO. These requirements are among the Applicable Reliability Requirements that guide the evaluation of projects under the Minimum Interconnection Standard in the NYISO's interconnection procedures and may trigger upgrades that would not be triggered under standards applicable in other states or regions.

As a single-state ISO, the NYISO's interconnection procedures must also recognize New York State's permitting process with respect to generation and transmission. This permitting process and the regulatory milestones from such process that are referenced in the NYISO's interconnection procedures were the subject of the NYISO's most recent interconnection queue improvement.[8]

Each region contains a different mix of resources, resulting in different issues and attributes that each region must address in its interconnection procedures. While certain regions have experienced recent surges of solar interconnection requests, other have experiences surges in wind generator interconnection requests or energy storage interconnection requests. These factors are attributable in large part to state renewable portfolio requirements that differ in different parts of the country.

In addition, while certain regions receive a large number of interconnection requests from wind generators proposing to build their facilities in remote locations, requiring long generator lead lines to interconnect to the bulk transmission system, the NYISO, being a one-state ISO with a limited geographic footprint, has not. Unlike other regions, however, the NYISO is likely

[8] See note 5.

to see penetration of distributed energy resources ("DER") at a much more significant pace than other regions in light of the New York Public Service Commission's "Reforming the Energy Vision" plan[9] and recent revisions to the NYISO's interconnection procedures to include Behind-the-Meter Net Generation Resources.[10]

The NYISO and its stakeholders have spent significant time and resources over the last decade in refining and enhancing its interconnection procedures in light of circumstances and concerns specific to New York. As illustrated above, these procedures do not exist in a vacuum, but rather are intertwined with the NYISO's market and planning requirements and reflect unique market rules (*e.g.*, the absence of physical transmission rights), regional and state reliability requirements, state siting requirements, and a particular resource mix and transmission topography. In addition, the NYISO has continued to develop its market rules and planning requirements in line with the interconnection procedures accepted by the Commission. The interconnection procedures, therefore, should not be significantly revised without fully considering the impacts of such changes in diverse areas.

[9] *See, New York Public Service Commission*, Order Adopting Order Adopting a Ratemaking and Utility Revenue Model Policy Framework, Proceeding on Motion of the Commission in Regard to Reforming the Energy Vision, Case 14-M-0101 (May 19, 2016); *see also New York Public Service Commission*, Order Adopting Regulatory Policy Framework and Implementation Plan, Proceeding on Motion of the Commission in Regard to Reforming the Energy Vision, Case 14-M-0101 (February 26, 2015).

[10] *New York Independent System Operators, Inc.*, Order Accepting Proposed Tariff Revisions Subject to Condition, Docket No. ER16-1213-000 (May 17, 2016) (accepting proposed revisions to the NYISO's tariff, including the NYISO's interconnection procedures, to allow for the participation of Behind-the-Meter Net Generator Resources in NYISO's energy, ancillary services, and capacity markets.)

Question 1.2. Should the interconnection process and the regional transmission planning process be coordinated to improve the efficiency of both? If so, how? Should the transmission planning process be used to identify transmission upgrades that would facilitate the interconnection process? How can this be accomplished?

NYISO Response to Question 1.2. The NYISO understands this question to be asking whether it would be appropriate or desirable to conflate the interconnection and regional transmission planning processes. The NYISO's interconnection process and regional transmission planning process are distinct in light of their different purposes; however, while distinct, the processes are complementary. In response to the Order No. 1000 regional transmission planning and cost allocation directives[11] the NYISO has proposed tariff revisions to provide for greater coordination between its interconnection process and its Comprehensive System Planning Process ("CSPP"), which is composed of the NYISO's Reliability Planning Process, Economic Planning Process, and Public Policy Transmission Planning Process.

The NYISO submitted tariff revisions in response to the directives in the Commission's December 23, 2015 Order[12] in the NYISO's Order No. 1000 regional proceeding that create new Transmission Interconnection Procedures ("TIP"), revise the NYISO's existing interconnection

[11] *Transmission Planning and Cost Allocation by Transmission Owning and Operating Public Utilities*, Order No. 1000, 136 FERC ¶ 61,051 (2011) ("Order No. 1000"), *order on reh'g and clarification*, Order No. 1000-A, 139 FERC ¶ 61,132 (2012) ("Order No. 1000-A"), *order on reh'g and clarification*, 141 FERC ¶ 61,044 (2012) ("Order No. 1000-B"). For convenience, unless otherwise specified, references in this filing to "Order No. 1000" should be understood to encompass Order Nos. 1000, 1000-A, and 1000-B.

[12] *New York Independent System Operator, Inc.*, Order Conditionally Accepting Tariff Revisions and Requiring Further Compliance, 153 FERC ¶ 61,341 (2015) ("December Order"); The Commission has granted the NYISO a partial extension of 180 days to address certain tariff implementation issues associated with the *pro forma* operating agreement proposed in the March 2016 Compliance Filing. *See New York Independent System Operator, Inc.*, Notice of Extension of Time, Docket No. ER13-102-007 (March 23, 2016).

and transmission expansion requirements, and reflect such new requirements in the CSPP.[13] These tariff revisions, developed with stakeholder input, created the proposed TIP—a hybrid interconnection process melding the existing Large Facility Interconnection Procedures with the existing transmission expansion procedures. As proposed, the TIP provides transmission-specific interconnection procedures that apply equally to incumbent and non-incumbent interconnection customers' transmission projects. The TIP also offers customers an opportunity to propose and develop transmission upgrades that may be related to an interconnection project or other goal – *e.g.*, relieving increased congestion that a proposed generation project may create.

The TIP and CSPP are, in fact, distinct and necessarily so due to their specific aims. The interconnection process is intended to ensure that a project being proposed, including under the CSPP, can connect to the system without adversely impacting system reliability. This evaluation looks at all of the detailed mechanics specific to the proposed connection to the existing system and determines, for example, how the local system will accommodate the project (e.g., through a new substation connection or tap into an existing line). These evaluations are quite different than those involved in the CSPP, which are focused on the evaluation of the proposed project to determine whether it would satisfy the identified need and then select the project that is the more efficient or cost effective solution.

While the Transmission Interconnection Procedures and CSPP are distinct by design, they complement each other to the benefit of the NYISO's planning process as a whole. Evaluation of the more efficient or cost effective solution, by necessity, requires the NYISO to

[13] *New York Independent System Operator, Inc.*, Compliance Filing, Docket No. ER13-102-009 (March 22, 2016) ("Compliance Filing").

account for the system impacts of the proposed solutions.[14] This is precisely what NYISO proposes to do by acknowledging that it "shall give due consideration to the results of any completed System Impact Study or System Reliability Impact Study, as applicable."[15] The NYISO proposes to include within the CSPP certain interconnection milestones to ensure that projects are timely progressing through the TIP, which develops information that is important for the NYISO's determination of the more efficient or cost-effective transmission solution.

The NYISO does not believe that a new mechanism in its regional planning process is required to identify transmission upgrades to facilitate the interconnection process. Existing mechanisms in the interconnection process, Transmission Expansion Process, and proposed mechanisms in the TIP identify upgrades necessary to interconnect a proposed project. Interconnection customers also have the opportunity, under OATT Sections 3.7 and 4.5, to propose additional upgrades – transmission expansion projects beyond those required for their interconnection projects – that they wish to have evaluated to facilitate their interconnection goals (*e.g.*, transmission upgrades increasing transfer capability to increase the facility's ability to inject more into the grid). Further, the NYISO's Public Policy Transmission Planning Process component of its CSPP also provides a means by which interested parties can propose transmission upgrades that could facilitate interconnection.

[14] The NYISO conducts a system impact study of proposed regulated transmission solutions under its Reliability Planning Process, giving due consideration to the results of any completed System Impact Study or System Reliability Impact Study, and then affords an interconnection customer the ability to adjust its submission to address the impact and "remain eligible for selection." Proposed revisions to OATT Section 31.2.6.3.

[15] *See* Proposed revisions to OATT Sections 31.2.6.3, 31.2.6.5, 31.4.8 pending in .

Question 1.3. Are more stringent requirements for interconnection customers to enter and progress through the generator interconnection queue an effective but nondiscriminatory way to deal with "unready" projects entering the queue? What are the advantages and disadvantages to setting more stringent requirements for progressing through the interconnection queue? If more stringent requirements are appropriate, what should these requirements be, and should they include non-financial requirements (site control, etc.)?

NYISO Response to Question 1.3. Interconnection procedures should strike an appropriate balance of the – at times conflicting – goals of flexibility, finality and speed. More stringent requirements for interconnection customers[16] to enter and progress through the interconnection queue would come at the expense of the flexibility that most interconnection customers in New York appreciate and need in the interconnection process. The NYISO does not believe that more stringent requirements are necessary in its process at this time. The NYISO, in consultation with its stakeholders and interconnection customers has already adopted a number of process revisions to address this balance:

- Modifications to Class Year Study entry and re-entry rules to provide flexibility to interconnection customers while at the same time tightening the overall process to address "queue squatting" by projects not proceeding through the interconnection process; specifically:
    - providing flexible Class Year start dates, avoiding overlapping Class Years, and setting a schedule for completing major Class Year milestones;
    - providing the option of a Deliverability evaluation early in the NYISO interconnection process prior to the Class Year study;

[16] NYISO's interconnection procedures refer to "Developers" (in the Large Facility Interconnection Procedures), "Interconnection Customers" in the Small Generator Interconnection Procedures, "Transmission Developers" in the proposed Transmission Interconnection Procedures, and "Eligible Customers" in the existing transmission expansion procedures. Since the Commission refers to "interconnection customer" throughout, the NYISO uses that term in its responses to refer to any of the above project developers.

- streamlining the cost allocation decision process;
- permitting Headroom obligations for certain System Upgrade Facilities to be satisfied by security; and
- permitting security posting reductions for completed System Upgrade Facilities.[17]

- Modifications to limit extensions of Commercial Operation Date beyond a certain date[18] – unless the interconnection customer can demonstrate that it has made reasonable progress toward commercial operation.[19]

- NYISO's unique queue administration (not using a "hard" serial queue process) enables the NYISO to provide greater flexibility to interconnection customers because projects advance through the interconnection queue based on their own progress and the NYISO is not required to re-study projects if a project with a higher queue number withdraws. A project may only enter a clustered Class Year Study when it has satisfied certain milestones demonstrating its progress.

The above-referenced tariff revisions strived to balance the need to encourage projects to proceed through the interconnection process while at the same time recognizing the need to provide flexibility for interconnection customers. Under certain circumstances, this approach may lengthen the total time a project takes to go from its Interconnection Request to Commercial Operation, but this is the balance carefully struck by the NYISO and its stakeholders that actively participate in the NYISO's interconnection process and is to the benefit of interconnection customers that would otherwise have to withdraw their projects.

[17] *See New York Independent System Operator, Inc.*, Letter Order on Tariff Revisions, Docket No. ER10-290-000 (Jan. 6, 2010); *New York Independent System Operator, Inc.*, Letter Order on Compliance Filing, Docket No. ER10-290-000 (Feb. 22, 2010).

[18] Under these provisions, the Commercial Operation Date may be extended, as of right, without being a Material Modification, only up to the following date: four (4) years from either the date the project completes a Class Year Study or, for Small Generating Facilities not subject to a Class Year Study, the date the NYISO tenders the Small Generator Interconnection Agreement to the interconnection customer. *See* OATT Attachment X, Section 30.4.4.5.

[19] *See New York Independent System Operator, Inc.*, 142 FERC ¶ 61,113 (2013); *see also, New York Independent System Operator, Inc.*, Letter Order on Compliance Filing, Docket Nos. ER13-588-001 and ER13-588-002 (April 1, 2013).

Question 1.7. *Pro forma* Large Generator Interconnection Procedures section 13.4 and similar sections in regional tariffs allow for an interconnection customer to require a transmission provider to use third party consultants in place of transmission provider staff if a transmission provider cannot complete a study within an agreed upon timeframe or the applicable time set for such a study. How frequently do interconnection customers call upon this provision and to what effect?

NYISO Response to Question 1.7. The use of third party consultants, when requested by the interconnection customer, can prove effective and efficient if the contractual agreements regarding such work are managed appropriately. It is imperative that when third party consultants are used in connection with interconnection study work, they be subject to a contract between the consultant and the NYISO. Where consultants have been subject only to bilateral contracts with the interconnection customer, the NYISO has at times experienced difficulty in obtaining objective and accurate study results. There can be a tendency for consultants to offer result-oriented study results if their obligation is to the interconnection customer and not to perform tariff-defined studies under the direction of the NYISO. The NYISO has found that this can best be addressed by managing the consultant's deliverables through direct contract between the consultant and the NYISO. While a useful tool, this approach continues to require the time of NYISO staff to ensure a tariff-compliant study is performed.

Question 1.8. What are the challenges associated with affected system coordination? How can coordination of interconnection requests among affected systems be improved? Are there specific changes needed to the *pro forma* interconnection procedures, *pro forma* interconnection agreement, and/or other tariffs to help improve affected system coordination? Would common standards for modeling and assessing reliability across affected systems improve

such coordination? Would more specific guidance in the *pro forma* interconnection procedures, *pro forma* interconnection agreement, and/or other tariffs on how and when affected systems should be involved in the interconnection process improve such coordination?

NYISO Response to Question 1.8. For the NYISO, the challenges associated with affected systems are somewhat different between affected systems within the NYISO (*e.g.,* New York Transmission Owners within the NYISO's footprint) in comparison with neighboring ISOs/RTOs and other systems. The roles and requirements of the Transmission Owners within the NYISO as Connecting Transmission Owners and as Affected Transmission Owners are fairly well defined in the NYISO's interconnection procedures. As a result, those procedures have been working reasonably well.

While coordination of interconnection studies and system upgrades with affected systems outside NYISO's footprint is somewhat more challenging due to regional differences, NYISO has been working with our neighboring regions – ISO New England and PJM – under the Northeastern ISO/RTO Planning Coordination Protocol to address these issues.

The primary challenges that NYISO has experienced associated with affected system coordination relate to interconnection projects proposing to connect on a tie line between two regions. Improvements in this area should be made; one possibility is that an Interconnection Request be submitted in both regions. This would provide for more efficient coordination with affected Transmission Owners within each region, more formal development and review of study results, and more complete identification of required upgrades and related cost estimates.

Question 1.9. At the technical conference, there was a discussion about whether all the right stakeholders (e.g., transmission owners, transmission providers, interconnection customers,

etc.) to the interconnection process were involved in the appropriate manner and at the right times throughout the interconnection process. What challenges and barriers, if any, are there to including the right stakeholders at the appropriate times in the interconnection process? What mechanisms would help ensure that entities are involved at the appropriate times in the interconnection process?

NYISO Response to Question 1.9. NYISO's interconnection procedures involve numerous stakeholders throughout the process. First, the Connecting Transmission Owner is identified and is involved in the scoping meeting and each interconnection study. Before the System Impact Study or System Reliability Impact Study, Affected Transmission Owners and Affected Systems are identified. All of these parties, as well as any other interested party, may participate in discussions of the System Impact Study or System Reliability Impact Study scope in NYISO stakeholder meetings, specifically, the NYISO's Transmission Planning Advisory Subcommittee and the NYISO's Operating Committee meetings. Parties most directly impacted by a project – the interconnection customer, Connecting Transmission Owner(s), Affected Transmission Owner(s) and Affected System Operator(s) – all have ongoing opportunity for review and comment throughout the interconnection study process.

Question 1.10. Should interconnection procedures be more specific about what constitutes a material modification to a generator interconnection request? Is it clear to interconnection customers what types of modifications to their interconnection requests would and would not affect their place in the queue? Do transmission owners and RTO/ISOs exercise any level of discretion in determining whether a customer has made a material modification? What is the range and nature of that discretion? Please reference provisions in interconnection procedures, as applicable, in your answer.

NYISO Response to Question 1.10. The *pro forma* tariff provisions that state what modifications are automatically permitted (without a materiality determination) are helpful. However, the *pro forma* provisions concerning the definition of a Material Modifications could be improved for regions such as New York that do not apply a "hard" queue approach.

In accordance with the *pro forma* interconnection procedures, a Material Modification "shall mean those modifications that have a material impact on the cost or timing of any Interconnection Request with a later queue priority date."[20] Because the NYISO does not employ the "hard" serial interconnection queue approach used in other regions, as described in response to question 1.12, the *pro forma* definition of Material Modification is not well suited for identifying what constitutes a material modification to an Interconnection Request in New York. The definition does not provide much guidance in New York where the concept of priority associated with higher Queue Positions has little if any meaning. It is, therefore, possible for a contemplated modification to be deemed non-material under the *pro forma* definition of "Material Modification," while also being so extreme that the modified project should be subject to a new Interconnection Request to fully evaluate whether it can reliably interconnect to the transmission system.

The NYISO has developed and issued implementing guidelines and procedures regarding materiality determinations in its Transmission Expansion and Interconnection Manual that supplement the tariff to address this concern. Moreover, the NYISO has identified this as an area for consideration for potential improvement. Since the tariff does not provide bright-line criteria for what constitutes a Material Modification, materiality determinations are ultimately a judgment call. Also, the consequence of a modification determined to be material (loss of queue

[20] *See* OATT Attachment X, Section 30.1 (Definition of "Material Modification").

position) is rather dire, not only to the Interconnection Request itself, but also to other interconnection projects that can be adversely impacted in some cases. For this reason, the NYISO plans to address this issue as part of comprehensive queue reforms to be discussed in its stakeholder process later this year.

Question 1.12. Are there specific technologies, tools, or administrative processes that could improve the accuracy of cost and time estimates, reduce the processing time, or increase the efficiency of the interconnection queue process?

NYISO Response to Question 1.12. The NYISO employs a unique approach in administering its interconnection queue that it believes results in efficiencies and eliminates the "restudy" problem that is prevalent in other regions. The NYISO's approach differs significantly from the "hard" interconnection queue approach used in other regions. Once an interconnection customer has submitted a valid Interconnection Request for its project and the project has been included in the NYISO's interconnection queue, the interconnection customer's advancement through the NYISO's interconnection process, including the identification of required facilities and related costs to reliably interconnect its project, is largely driven by its own project development and not the progress, or lack thereof, of other projects with higher Queue Positions. While the NYISO takes Queue Position into account in determining the order of performing interconnection studies,[21] it is only one of the factors taken into account. To the extent practicable, the NYISO evaluates Interconnection Requests in parallel, not sequentially.

The NYISO does not include proposed projects in the base case of its interconnection studies simply because the project has a higher Queue Position than the studied project. Rather, a project is only included in the base case when it has satisfied certain requirements, including

[21] *See* OATT, Attachment X Section 30.4.1.

acceptance of the cost of, and provision of security for, any upgrades identified in the Class Year Interconnection Facilities Study ("Class Year Study") to interconnect its project. Therefore, unlike in other ISO/RTOs, the NYISO does not require a process to continuously re-study the facilities, and related costs, required to interconnect a project if projects with higher Queue Positions withdraw or fail to progress.

In addition to existing NYISO efforts to gain administrative efficiencies, such as its queue administration explained above, the NYISO also recently implemented changes to simplify the Interconnection Request form and to lower the study deposit for the Class Year Study for projects entering a Class Year for a "CRIS-only" request.[22]

The NYISO is reviewing additional process improvements, including improvements that might be made to the Class Year process and other steps within the interconnection process. The NYISO is also evaluating potential administrative improvements that could increase the efficiency of queue administration. The NYISO intends to discuss potential process and administrative improvements in the stakeholder process beginning in the third quarter of this year. To the degree that these or other potential process improvements require tariff modifications, the NYISO would pursue such changes in our stakeholder process and, if approved by our stakeholders and Board, would timely file them with the Commission pursuant to Section 205 of the Federal Power Act.

Question 1.13. Can technological advancements be incorporated into a project as it proceeds through the interconnection process (e.g., an inverter technology improvement that provides efficiency in cost and performance, more efficient battery storage) without presenting

[22] These improvements were among the tariff revisions approved by the Commission in Docket No. ER16-1213-000 on May 17, 2016, described in note 8, *supra.*

system reliability concerns and causing delays to the interconnection study process? If so, what changes to the interconnection procedures would allow the incorporation of technological advancements after the submission of an interconnection request?

NYISO Response to Question 1.13. Technological advances and other project modifications can be incorporated into a project if proposed at appropriate stages of the interconnection study process. Section 30.4.4 of the NYISO's Large Facility Interconnection Procedures specify what modifications may be made at various stages of the process, permitting more significant modifications prior to execution of the Interconnection System Reliability Impact Study Agreement.[23] The NYISO recently made improvements to its processes to accommodate additional project modifications that result in only a *de minimis* increase in the energy capability of existing facilities.[24] This revision was in response to stakeholder concerns that any increase in output triggered the requirement that an existing facility submit a new Interconnection Request, regardless of how minimal the increase might be. By revising the tariff to permit limited increases in energy capability of existing facilities without requiring a new Interconnection Request, this enhancement eliminated unnecessary interconnection studies and their related costs. It thereby added efficiencies to the NYISO's interconnection process and provided added flexibility to existing facilities interconnected to the New York State Transmission System. Among the interconnection customers who benefit from this added flexibility are wind generators who often change their turbine design or manufacturer and, as a result, may end up increasing their facility's overall size by a small amount.

[23] *See* NYISO OATT Attachment X, Section 30.4.4.1.

[24] *See New York Independent System Operator, Inc.*, Letter Order on Compliance Filing, Docket No. ER14-627-000 (Jan. 23, 2014).

Question 1.14. There was discussion during the technical conference about the challenges of getting technical and modeling information from turbine and equipment manufacturers due to concerns about sharing proprietary business information on the technologies. What have been the challenges with getting turbine and other manufacturers to provide necessary technical information and models to transmission providers for interconnection studies? How does this information disclosure challenge affect the study of interconnection requests and what should be done to facilitate a better information exchange between manufacturers and those performing interconnection studies?

NYISO Response to Question 1.14. In the NYISO's experience, obtaining essential technical information is not a problem for most Interconnection Requests. Issues do arise, however, where the NYISO raises specific questions about characteristics and performance of a device – both steady-state and dynamic – that often need to be addressed by the manufacturer. Obtaining such information is often a challenge.

Most challenges related to modeling information concern vendor-specific models of new power system components. It is usually a challenge to obtain representative examples of dynamic simulations performed by the manufacturer in the process of the model development and to obtain validation materials justifying the use of a model in interconnection studies. For a vendor-specific model, simulation examples and validation materials are usually considered to be confidential and/or proprietary manufacturer information that vendors will not consent to sharing with the NYISO for use in its interconnection process.

The primary impact of this information disclosure challenge is that it makes it more difficult to interpret simulation results. In the absence of representative examples of dynamic simulations with a device and, especially, of model validation materials, it is often not clear if study results are a solid basis for conclusions on the project's performance and impact on the power system. Consequently, additional evaluations, including sensitivity analyses, are needed, which delays interconnection studies.

As part of the queue reform initiatives the NYISO intends to discuss later this year, the NYISO intends to consider tariff or manual language to clarify what modeling information is required[25] and the consequences for failure to provide such information on a timely basis. Among such proposals may be language providing for withdrawal from the Interconnection Queue if the interconnection customer fails to provide modeling information necessary and sufficient for proceeding with an interconnection study in a timely manner. Additionally, NYISO intends to clarify that an interconnection customer is responsible for providing, in a timely manner, modeling information necessary and sufficient for proceeding with an interconnection study for another project if its performance may be affected by the interconnection customer's project. Failure to comply with such information requirements may result in withdrawal.

[25] With respect to user-written dynamic models, which are the most common causes for concern, "sufficient information" will likely be specified to include, but not be limited to, model documentation (user manuals/guides), model files and libraries, data files and spreadsheets, etc. sufficient for the use of the model and also representative simulation examples and validation materials. The nomenclature of "sufficient information" should be subject to determination by the Transmission Provider on a case-by-case basis.

B. Transparency and Timing in the Generator Interconnection Study Process

Question 2.1. Are interconnection study delays and their causes communicated to interconnection customers with an appropriate amount of detail and within appropriate timeframes? Should standardized content and communication procedures be established to provide interconnection customers information and status updates on their requests?

NYISO Response to Question 2.1. The NYISO staff involved with interconnection studies maintain an ongoing dialogue, by phone, by electronic mail and in-person, to keep interconnection customers updated regarding the status of their study. To formalize these communications would likely lead to inefficiencies in these communications by reducing the existing flexibility both the NYISO and its interconnection customers currently have in initiating and maintaining such informal forms of communication.

Question 2.2. Are interconnection procedures sufficiently clear with regard to the "triggers" that could necessitate restudy? Should interconnection procedures include a comprehensive list of triggers for restudy?

NYISO Response to Question 2.2. Please see the NYISO's response to Question 1.12 in which the NYISO explains why re-studies are not an issue under the NYISO's interconnection process.

Question 2.3. Are the triggers that cause restudies appropriate to the risk of reliability concerns or reflective of likely cost allocation shifts due to changes in circumstances? Are there triggers that should be included and, conversely, are there existing triggers that should be removed? What specific changes, if any, should be made to restudy provisions or practices?

NYISO Response to Question 2.3. Please see the NYISO's response to Question 1.12 in which the NYISO explains why re-studies are not an issue under the NYISO's interconnection process.

Question 2.4. For interconnection requests that require restudy, would studying this group of requests together on a specified schedule (e.g., an annual restudy group) create efficiencies in the interconnection process? If yes, please explain why. If not, please explain why not.

NYISO Response to Question 2.4. Please see the NYISO's response to Question 1.12 in which the NYISO explains why re-studies are not an issue under the NYISO's interconnection process.

Question 2.5. What specific historical information, not currently provided by transmission providers, would assist interconnection customers early in the interconnection process in making siting decisions?

NYISO Response to Question 2.5. The NYISO believes that it may be beneficial to allow interconnection customers in the Large Facility Interconnection Procedures to request a pre-application report similar to the process the Commission added to the Small Generator Interconnection Procedures. Information provided on that form, as well as a one-line diagram of contemplated Points of Interconnection, could assist interconnection customers early in the interconnection process in making siting decisions. This is an issue that the NYISO plans to explore with stakeholders in the comprehensive queue reforms it plans to discuss later this year.

Question 2.7. How can the use of non-disclosure agreements help reduce delays in the interconnection study process? Would the utilization of generic models by transmission providers and transmission owners reduce delays in interconnection study processes? Are specific changes to interconnection processes needed to better address challenges related to data acquisition?

NYISO Response to Question 2.7. With regard to obtaining technical and modeling information from equipment manufacturers, these entities are not NYISO interconnection customers and are typically not formally involved in interconnection studies. All technical and modeling information is to be provided by/via the interconnection customer; however, the ability to engage in 3-part communications among the NYISO, the interconnection customer and the manufacturer may help reduce delays related to obtaining data and further clarifications of the data. While a non-disclosure agreement signed directly with a manufacturer might be a option to consider, such an agreement cannot address delays triggered by modeling and simulation issues that need to be discussed with various parties involved in a specific interconnection study and, more generally, in the NYISO interconnection process. It would not be feasible for all such parties to be signatories to a non-disclosure agreement. Further, any such non-disclosure agreement may conflict with tariff language requiring the protection of information designated as "Confidential." Therefore, to accommodate such non-disclosure agreements, revisions to the application of confidentiality provisions in the tariff may be necessary.

The use of generic models by transmission providers and transmission owners could reduce delays in interconnection study processes. However, generic models should only be used if there is convincing evidence that their use has been justified by both representative testing and interconnection study practices. That is, instances in which it is not expected that the use of the model will adversely affect the quality and accuracy of simulations in comparison to what more accurate vendor-specific models would produce.

C. Certainty in Cost Estimates and Construction Time

Question 3.2. In situations where transmission providers use per unit cost guides to develop cost estimates, should additional information and benchmarking of these cost guides be required? What would the process, timing and study cost effects be of developing detailed project specific estimates rather than estimates based on per unit costs?

NYISO Response to Question 3.2. The NYISO's Class Year Interconnection Facilities Study already provides detailed project-specific cost estimates. Indeed, it is such detail that can lead to delays in the interconnection process. In discussions with its stakeholders, however, stakeholders have made clear to the NYISO that they prefer a more detailed and lengthy process that produces more detailed cost estimates than a shorter, more abbreviated process with less detailed estimates. The NYISO nonetheless recognizes the potential for additional process improvements that might be able to address certain timing issues related to the Class Year Study. This is among the discussion topics for the comprehensive queue reform effort the NYISO intends to address later this year.

Question 3.6. Does the current process to resolve disputes between interconnection customers, transmission providers, and transmission owners work effectively? Are changes needed to the process to effectively resolve most disputes in a timely manner? Should transmission providers play a role in mediating such disputes between interconnection customers and transmission owners?

NYISO Response to Question 3.6. The NYISO has repeatedly used its existing dispute resolution process to vet concerns from interconnection customers and to mitigate disputes. The NYISO believes that it can play a unique role in mediating disputes that arise in the interconnection process and strives to utilize dispute resolution to address interconnection customer concerns and to avoid disputes rising to litigation before the Commission.

D. Interconnection of Electric Storage Resources

Question 4.1. Are changes to the *pro forma* Small Generator Interconnection Procedures or *pro forma* Large Generator Interconnection Procedures necessary to facilitate the interconnection of electric storage resources? Similarly, are changes to the *pro forma* Small Generator Interconnection Agreement or *pro forma* Large Generator Interconnection Agreement necessary? If so, please describe those changes and explain how the changes should be prioritized.

NYISO Response to Question 4.1. The NYISO has evaluated three energy storage facilities, each of which reached Commercial Operation – one (1) 120 MW uprate of an existing hydroelectric pump storage facility, (1) 20 MW flywheel energy storage facility; and (1) 20 MW battery facility. The NYISO's interconnection procedures were, and continue to be, flexible enough to accommodate the evaluation of these energy storage projects. The NYISO does not

recommend a *pro forma* Interconnection Agreement be developed for such projects. Just as the NYISO has done for Merchant Transmission Facilities under the Large Facility Interconnection Procedures, unique technologies can be accommodated through non-conforming revisions to the *pro forma* Interconnection Agreements as long as the Transmission Providers adequately justify to the Commission the reasons for revising *pro forma* provisions.

Question 4.2. What is the appropriate process to interconnect an electric storage resource as transmission equipment: the generator interconnection process, the transmission planning process, or some other process? Why? If some other process is appropriate, please describe how that process would interact with existing processes.

NYISO Response to Question 4.2. Please see the NYISO's response to Question 4.1.

Question 4.3. Do current interconnection studies adequately account for the operational characteristics of electric storage resources? If not, what could the Commission do to improve interconnection studies for electric storage resources?

NYISO Response to Question 4.3. Yes, NYISO's interconnection studies currently account for the operating characteristics of electric storage resources, to the extent necessary under the Minimum Interconnection Standard. Interconnection studies for individual energy storage projects typically evaluate the impact of the project on the system at the proposed design maximum power injection and maximum charging load, which is consistent with how other generation resources are evaluated. Integration of individual energy storage devices into the NYISO-administered wholesale markets is also dependent on design and testing of the operational controls of the resource, which is not appropriately addressed by interconnection studies.

The NYISO has experienced challenges, however, with the accuracy of modeling information used to evaluate energy storage resources in the interconnection process. The challenge varies depending on the nature of the energy storage resource. For example, pump storage facilities with conventional generators face few modeling challenges because the interconnection studies account for the facility's characteristics with greater accuracy. Energy storage facilities using more newly developed technologies (*e.g.*, flywheel storage systems and battery storage systems) face greater challenges. The dynamic models used for them in recent interconnection studies are, in their nature, close to generic simulation tools and may turn out to be too simple for project-specific assessments. At this time, little to no validation data has been presented to the NYISO to justify the use of such dynamic models of storage systems in interconnection studies.

Question 4.4. Should an interconnection customer be allowed to limit the requested level of interconnection service at a point of interconnection that includes multiple energy production devices, which may include electric storage resources, to a level that is lower than the cumulative rated capacity of all the resources at that point of interconnection? What is the best way for an interconnection customer and a transmission provider and/or owner to establish the operational limit? What safeguards, if any, are needed to ensure that the interconnection customer does not exceed the level of interconnection service in its interconnection agreement?

NYISO Response to Question 4.4. Limiting the maximum power injection of multiple sources through a single point of interconnection to a value less than the cumulative rated capability of the individual resources should not be allowed without adequate provisions for enforcement of the maximum limit. However, an interconnection customer should be allowed to submit proposals for review to the NYISO and Connecting Transmission Owner describing its

proposed maximum injection limit and the enforcement thereof to ensure it does not impact the resource's ability to reliably interconnect to the transmission or distribution system. Enforcement of the maximum limit should include adequate provision for monitoring and corrective action by the transmission provider/operator as necessary to maintain reliability in the event that the maximum power limit is exceeded.

Question 4.5. Are there potential ways to streamline the interconnection process for the addition of electric storage resources to existing facilities when (a) the electric storage resource will be using existing interconnection service; and (b) the electric storage resource will be requesting new interconnection service?

NYISO Response to Question 4.5. Any effort to revise the interconnection processes to better accommodate the addition of electric storage resources to existing facilities should be done in tandem with and in the context of existing market rules. Adding a battery to an existing wind facility, for example, may be something that can be accommodated in the existing interconnection procedures. However, under current market rules and operating requirements, the battery may not be able to participate as part of the existing facility.[26]

Question 4.6. What are the primary obstacles for interconnecting standalone or aggregated distribution-level electric storage resources that want to participate in the RTO and ISO markets, and what are some potential solutions that address these obstacles?

[26] For example, the NYISO has certain scheduling and settlement rules that are unique to intermittent resources (e.g., wind and solar) that allow them to maximize their output and minimize their exposure to over-generation / under-generation penalties. The addition of electric storage resources to the existing resources would prohibit the resource from participating as an intermittent resource and remove the benefits of these rules. Some interconnection customers that are looking to connect new electric storage resources share some of the existing infrastructure with existing facilities, but bid and are scheduled independently of other resources at the facility. Please see the NYISO's response to Question 4.6 for information regarding NYISO's efforts to address these and other related concerns.

NYISO Response to Question 4.6. For standalone distribution-level electric storage resources, the primary challenges for the facility owner are ensuring that it can meet the various requirements to participate in the market. A proposed interconnection for an aggregation of multiple energy production devices, including energy storage resources, can be challenging to integrate into the NYISO's markets (for example, it may require development of appropriate metering configurations to accommodate the additions of different technologies).

The more significant challenges are presented when trying to incorporate energy storage resources into the NYISO-administered wholesale markets under existing market rules. The NYISO is currently working with stakeholders to develop a DER Roadmap that will include the concepts and general structure for interconnection customer connected distributed energy resources, including energy storage resources, participating in the wholesale market. Following the issuance of the Roadmap, the NYISO will continue working with stakeholders to develop market rules that will move the concepts into application.

V. COMMUNICATIONS

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VI. CONCLUSION

WHEREFORE, the NYISO respectfully requests that the Commission consider these comments, refrain from initiating a proposed rulemaking, and allow the NYISO and other ISOs/RTOs to address the above-referenced issues through their individual stakeholder processes in order that the solutions to each issue can be tailored as necessary to reflect regional differences.

Respectfully submitted,

/s/ Sara B. Keegan
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