

Distributed Generation Interconnection

National Grid Reporting Requirements – Affected System Operator Studies

Paragraph 9 MONTHLY ASO STUDY UPDATE

March 15 ,2021

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9.d Estimated Timeline

The Western RI Area ASO Study #2 completed its Transmission System Impact Study (ASO Study) on January 30, 2021 and the associated Proposed Plan Applications (PPAs) were presented at the February 16th NEPOOL RC Meeting, and were officially approved by ISO-NE on March 4, 2021. As ISO-NE has approved the Western RI Area ASO Study #2 results, this is the final Paragraph 9 Monthly ASO Study Update.

ASO Study Name	No. of Applications	MW	Type of Study	Completion Date
Western RI Area ASO Study #2	34	165	Comprehensive	1/30/2021

9.e Estimated System Modifications & Costs

Western RI Area ASO Study #2

The (Level 3 Comprehensive) Transmission System Impact Study (ASO Study) identified adverse impacts triggering a need for a 25 MVA (+25/-12.5 size estimate) Synchronous Condenser to be installed at the Tower Hill Substation. The high-level cost-estimate of the Synchronous Condenser is in the tens of millions of dollars and construction will have a multi-year duration. This cost-estimate will be refined and is expected to be finalized in late March and notified to affected DG projects. Of the 165MW of DG projects studied, 95MW were found not to have an adverse impact on the transmission system and therefore can connect to the transmission system without triggering any transmission system modifications. The study results for the 70MW that would adversely impact the transmission system were officially approved by ISO-NE on March 4, 2021.

9.f Prioritization System

If it is possible to advance any projects ahead of completion of an ASO study, NECo will prioritize projects based on the following:

1. Has customer paid its full construction advance for system modifications?
2. When did the NECo receive customer payment?
3. What is the date of the customer's anticipated authority to interconnect?
4. What stage is the project within the NECo's construction process?
5. How far along is the customer's construction? (Developers may need to self-certify the responses to these questions)
 - a. Does customer have all necessary local permits to construct?
 - b. Does customer have site control?
6. Has the necessary generator notification form been approved by the RC?
7. Application deemed complete date.

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9.g Opportunities to Progress Applications

Western RI Area ASO Study #2:

The Company is progressing with the Distribution System Impact Studies associated with your individual projects, which began in parallel with the Area ASO Study #2.

9.h Study Results

Western RI Area ASO Study #2:

This Western RI Area ASO Study #2 concluded its ASO Study on January 30, 2021, and the associated PPAs were presented at the February 16, 2021 NEPOOL RC Meeting. ISO-NE approved the Study results and has delivered the PPA approval letters. The Company released the Area ASO Study #2 report in redacted form to all study participants.

10.a Contact Information

All Rhode Island

John C. Kennedy – 401-784-7221 email: John.Kennedy@Nationalgrid.com

Nick Neilsen – 401-784-4370 email: Nicholas.Neilsen@Nationalgrid.com

10.b Stakeholder Meetings

The last ASO Study Update meeting was held on October 6, 2020 by Webinar.

The next ASO Study Update meeting is scheduled to take place in later this month. This date is being refined, and invitations will be sent out accordingly. This will be held as a Webinar.

Due to the developing COVID-19 crisis, Narragansett Electric Company d/b/a National Grid (“the Company”) has determined the need to declare a Force Majeure Event pursuant to the “Standards for Connecting Distributed Generation”, RIPUC No. 2180 (“Tariff”) Section 3.0. The Force Majeure Event started on Friday March 27, 2020. At this time, the duration of this Force Majeure Event is unknown and will be closely monitored. The Company is taking steps to mitigate the Force Majeure Event by continuing to process distributed generation applications and projects. The Company, however, will be entitled to suspend or modify its performance of obligations pursuant to this notice and under the Tariff to the extent that the effect of the Force Majeure Event cannot be mitigated by the use of commercially reasonable efforts. The Company will notify customers whose DG project is directly impacted by the Event. All customers will be kept informed of the scope and duration (to extent known) of this Force Majeure Event and of the steps the Company is taking to mitigate the effects of the Event on its performance through periodic updates on the Company’s distributed generation website: <https://ngus.force.com/s/article/RI-Force-Majeure-Declarations>.

Appendix

9.a Scope & Process

At an overall level, when the interconnection of distributed generation (DG) to The Narragansett Electric Company's (NECo) electric power system (EPS) has the potential to impact a neighboring EPS (distribution or transmission), further analysis and/or study will be required. Examples of potential impacts on a neighboring EPS include reverse power flow onto the bulk transmission system and the establishment of new retail delivery points (for example, new/upgraded substations, transformers) to provide the distribution capacity necessary to accommodate greater amounts of large-scale DG projects interconnecting to NECo's EPS. The purpose of this Paragraph 9 Monthly Report (Paragraph 9 Report) is to provide updates for ongoing affected system operator (ASO) studies that implicate three or more DG applications or more than 15MW of DG capacity in accordance with the Reporting Requirements.

The Western RI Area ASO Study #2 was a study of a group of proposed DG interconnections to NECo's distribution system in Rhode Island performed by NECo's transmission provider, New England Power company (NEP), with inputs from two other Affected System Operators, ISO-NE and Eversource, to determine the impacts of these interconnections on the transmission system in accordance with ISO-NE rules and planning procedures. Area ASO Study #2 was a transmission study and was separate from and in addition NECo's own distribution system impact study.

The Area ASO Study #2 consisted of a Level 3 Comprehensive Transmission System Impact Study. This was a full study and was completed as per PP5-3 and PP5-6.

Process

ISO New England (ISO-NE) Tariff Process Applicable to DG Interconnections

There are two primary ISO-NE tariff processes that are potentially applicable to the interconnection review of new DG resources:

1. ISO-NE's interconnection processes, pursuant to Schedules 22 and 23 of the ISO New England Open Access Transmission Tariff (OATT)¹, and
2. ISO-NE's Proposed Plan Application (PPA) process, pursuant to Section I.3.9 of the ISO New England Transmission, Markets, and Services Tariff.²

Jurisdiction for Interconnection

DG projects fall under one of two jurisdictions for interconnection: state or federal. A customer proposing to interconnect a DG resource to a state-jurisdictional distribution facility must follow the associated state interconnection process. A customer proposing to interconnect a DG resource to a Federal Energy Regulatory Commission (FERC)-jurisdictional distribution facility must follow the ISO-NE's

1 https://www.iso-ne.com/static-assets/documents/regulatory/tariff/sect_2/oatt/sect_ii.pdf

2 https://www.iso-ne.com/static-assets/documents/regulatory/tariff/sect_1/sect_i.pdf

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interconnection process under Schedule 22 or 23 of the Open Access Transmission Tariff (OATT) (unless it falls under one of the exemptions identified in Schedule 23).³

Most of the DG being installed in New England is interconnecting to the lower-voltage distribution system through state interconnection processes, which are administered by the states' electric distribution companies. In these cases, the customer is an interconnection customer of the electric distribution company, not of ISO-NE. A customer should contact NECo and/or ISO-NE to determine whether the specific distribution feeder to which the DG facility plans to interconnect is subject to the OATT.

Overview of Section I.3.9 Proposed Plan Application Process

Regardless of the jurisdiction for interconnection, DG resources greater than 1 MW will require review by ISO-NE pursuant to Section I.3.9 of the ISO Tariff to ensure the proposed system change does not have a significant adverse impact on the regional power system. This is true even in cases where the project is interconnecting under the state process.

The Section I.3.9 PPA process has been part of the region's planning processes for decades. ISO-NE, as the Regional Transmission Organization for New England, is responsible for reviewing and approving proposed system changes because these changes may impact the stability, reliability, or operating characteristics of the New England power system.

Commencement of the Transmission Study of PPA (ISO-NE Planning Procedures)

NEP commences a transmission study when it has sufficient information about firm MW values for the proposed generator(s) and has determined how and where the generator(s) will interconnect to NECo's EPS (e.g., NECo distribution system modifications and transmission system injection points). NECo gathers this information from Interconnecting Customers and coordinates with NEP to facilitate a transmission study.

For generation resources 5 MW and above, NECo works with NEP on the PPA requirement during NECo's detailed study phase of the interconnection process. For generation resources between 1 MW and 5 MW, NECo had been working with NEP to issue the Generator Notification Forms (GNFs) to ISO-NE during NECo's detailed design phase as well; ISO-NE was not requiring transmission impact analyses for these applications. Because of the significant number of proposed DG project interconnection applications between 1 MW and 5 MW received through the first half of 2018, ISO-NE is exercising its discretion to request impact analyses from NEP for applications between 1 MW and 5 MW. As a result, NECo has been submitting GNFs for applications between 1 MW and 5 MW to ISO-NE for review at or around 20 business days after the commencement of a distribution system impact study.

³ Exemptions: The state interconnection process will apply if a DG resource is interconnecting to a FERC-jurisdictional distribution facility and the project will:

- a. Produce energy to be consumed only on the retail customer's site,
- b. Not sell its output into the ISO markets, or
- c. Sell 100% of its output as a Qualifying Facility (QF) to the interconnecting utility under a Public Utility Regulatory Policies Act (PURPA) contract.

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9.b Roles and Responsibilities

Below is a list of the various roles and responsibilities associated with transmission studies:

NECo – Interconnecting Company & Coordinator, includes the following functions:

- Customer Energy Integration (CEI) – Coordinate with developers from application to interconnection
- Distribution Planning – Analyze and develop interconnection solutions at distribution level; assist in coordination across NECo in development of most viable solution; coordinate engineering studies with ASOs (such as NEP and ISO-NE)
- Substation Engineering – Develop protection strategies to preserve safety and reliability given complex effects of high DG volume
- Design, Resource Planning, Operations – All downstream departments that implement the engineered solution required for safe and reliable interconnections

NEP – a National Grid affiliate and also an ASO, includes the Transmission Planning and Asset Management (TPAM) function that is responsible to complete transmission-related analyses. NEP is the transmission provider in the area, including transfer analyses and transmission system impact studies.

ISO-NE – the Independent System Operator established in accordance with the NEPOOL Agreement and applicable FERC approvals, responsible for managing the bulk power generation and transmission systems in New England. Provides guidance and oversight to NEP analyses and responsible for ensuring compliance with ISO-NE Tariffs Schedule 22 and Schedule 23 as well as Section I.3.9. The ISO-NE will determine whether such interconnections will have a cumulative impact on facilities used for the provision of regional transmission service.

New England Power Pool (“NEPOOL”) Reliability Committee (“RC”) – The RC is a standing technical committee of NEPOOL, which is made up of Market Participants from across the region and serves as the ISO’s principal advisory body. The RC provides advisory input to ISO-NE on the design and oversight of reliability standards for the New England power system. RC meetings are held monthly and consider matters such as PPAs for generation and transmission projects. After an advisory vote by the RC, the ISO will issue a determination approving or denying a PPA.

ASO - Any neighboring Electric Power System (EPS) not under control of NECo (i.e. municipal light company or other regulated utility).

Governance Participant – a signatory to the NEPOOL agreement.

9.c Standards and Jurisdiction

In most cases, as is the case for the DG seeking to interconnect to NECo’s EPS in Rhode Island, the need for a transmission impact study is defined by ISO-NE Planning Procedures. Specifically, pursuant to ISO-NE’s tariff, Section I.3.9.1, and ISO-NE Planning Procedures PP5-1⁴ and PP5-3⁵ (collectively "ISO-NE

⁴ Entitled, “*Procedure for Review of Governance Participant’s Proposed Plans (Section I.3.9 Applications: Requirements, Procedures, and Forms).*”

⁵ Entitled, “*Guidelines for Conducting and Evaluating Proposed Plan Application Analyses.*”

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Planning Procedures”), any proposed generation resource above 1 MW must be reviewed by ISO-NE and brought before the NEPOOL RC for approval. ISO-NE Planning Procedures PP5-1 and PP5-3 provide guidelines for the PPA application and review process.

Under the ISO-NE Planning Procedures, for each proposed generation resource 5 MW or greater, ISO-NE requires a formal transmission system impact study. Although proposed generation resources between 1 MW and 5 MW generally do not automatically trigger a transmission system impact study, ISO-NE has the discretion to request further analysis of the impact consistent with ISO-NE Planning Procedures, on an as-needed basis. Commencing around September 2018, ISO-NE started to exercise that discretion and has been requesting additional impact analyses from NEP on generation resources between 1 MW and 5 MW.

Prior to this, for the most part, for a project that was sized between 1 MW and 5 MW, a GNF would have been required, which did not include any study or analysis. This requested evaluation by ISO-NE for generation resources between 1 MW and 5 MW required a change in process for NECo with respect to the processing of NECo’s interconnection applications, coordination with NEP, and the timing of these notifications to ISO-NE. The change in process also contributed to the inclusion of between 1 MW and 5 MW projects in the ASO studies.

The attached link offers additional information relative to the ISO-NE Planning Procedures I.3.9.:

<https://ngus.force.com/servlet/servlet.FileDownload?file=0150W00000FEqTu>

Typically, for NECo interconnected generation resources, NEP submits the PPA on the generator’s behalf and performs the required transmission analysis and studies in coordination with the ISO-NE and any other ASO. While ISO-NE’s Planning Procedures allow generators that are a Governance Participant under the ISO-NE Tariff to submit their own PPAs for their projects, if the project results in the need for transmission system upgrades, an affected transmission owner is required to submit its own PPA for the proposed transmission system upgrades. Importantly, regardless of whether the generating facility PPA is submitted by a Governance Participant or NEP, the same aforementioned transmission system impact studies and NEPOOL RC approval are required. The ISO-NE Planning Procedures do not specify the manner in which NEP should perform a transmission study where there is a high volume of proposed NECo interconnected generator resource applications and capacity coming into an area in a short time frame, as is the case in the first two RI ASO study areas, with a third ASO Study pending. Therefore, NEP considered the ongoing challenges in these areas, including the saturation and system constraints and best practices for system planning, to assure the safety and reliability of the transmission system. In the context of these considerations, NEP developed its study methodology with the following goals in mind:

- **Speed:** Facilitate developer interconnection as quickly as possible.
- **Reliability:** Ensure that the interconnections do not compromise the reliability of the transmission system.
- **Coordination:** Ensure the distribution upgrades are appropriately represented in the study assumptions.
- **Process:** Abide by ISO-NE Planning Procedures and Tariff requirements.
- **Solutions:** Develop the appropriate set of upgrades for each of Area ASO Study #1 and Area ASO Study #2, as opposed to determining individual case-by-case upgrades, which

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more efficiently uses time, material and human resources, and avoids duplicative, out-of-date and/or unnecessary infrastructure (at the customer's cost).

- **Efficiency:** The study of individual projects in the same area would be performed sequentially, or, subject to ISO-NE's approval, in a group approach. By way of comparison, a single typical 5 MW transmission system impact study would take approximately 3 months. The goal of grouping the projects in Area ASO Study #2, or in discrete substation analyses, is to gain significant efficiency over individual sequential project analysis by evaluating many hundreds of MWs at one time.

With these goals considered, and consistent with NEP's obligation in Section 3.03(b) of the Transmission Operating Agreement ("TOA")⁶ to notify ISO-NE of situations where the interconnection of multiple DG resources may have cumulative impacts on the facilities used for the provision of regional transmission service⁷, NEP began communicating with ISO-NE to assess the preferred way to evaluate the impact of this volume of generation proposing to interconnect in the same area. ISO-NE elected to exercise its discretion under the Planning Procedures and requested that the studies include generation projects between 1 MW and 5 MW given the saturation in the area and the potential aggregate impacts to the transmission system. For Western RI Area ASO Study #2, NEP and ISO-NE determined that it would be more efficient to group the PPAs and the associated transmission system study, rather than submit individual applications and studies for each project. In addition, in the Western RI Area ASO Study #2, NEP and ISO-NE determined that discrete analyses at multiple substations would be more efficient.

⁶ The Transmission Operating Agreement was executed by ISO-NE and the region's Participating Transmission Owners (PTO) when ISO-NE became the Regional Transmission Organization for New England in 2005, and sets forth the roles and responsibilities of the PTOs and ISO-NE as it pertains to the operation and planning of the regional transmission system.

⁷ The failure of a PTO to appropriately implement the requirements of the TOA, Section I.3.9 of the ISO-NE Tariff, or ISO-NE's Planning Procedures, could subject a PTO to liability for breach of the TOA, ISO-NE's Tariff, and RC reliability requirements. In this event, FERC has the authority to pursue criminal liability and/or levy fines up to \$1 million per day for violations of the Federal Power Act, FERC regulations, orders or tariffs.