

Affected System Operator (ASO) Studies – May Update

2023 Level 3 Western MA, 2023 Greater Boston, 2024 SEMA/Cape Projects

This is Eversource's monthly report to customers who have ASO projects undergoing transmission studies. This month's update includes projects that are in the 2023 Level 3 ASO studies in the Western MA/Greater Boston area and projects that are in the 2024 Level 3 ASO Study in the SEMA/Cape Area. High level milestones for the Western MA, Greater Boston, SEMA/Cape projects have been included in section #4 below.

With the MA DPU approval of D.P.U. 19-55 and with issuance of the *DG Guidelines For Interconnection*, these monthly reports will be going out on the first business day of each month moving forward while the ASO remains underway. The *DG Guidelines For Interconnection* have been posted to Eversource's ASO website for quick reference.

These reports are emailed monthly and can be found on the ASO website:

<https://www.eversource.com/content/ema-c/about/about-us/doing-business-with-us/builders-contractors/interconnections/massachusetts/affected-system-operator-studies>

Throughout the remainder of the study process, please direct questions to your Account Executive so that they may be directed to the appropriate party for response and if applicable added to the ASO Website's FAQ section for others to review.

1. What is the scope and process for projects in the ASO study?

ASO transmission studies are required when a DG applicant's project has the potential to impact existing saturation levels at a substation in Eversource's territory that may have implications to Eversource's transmission system or to other transmission companies or bulk power operators. The primary affected parties in Eversource's Massachusetts territories are: ISO-New England, National Grid, Until and various municipal light departments.

Level 0 Studies

From a process perspective, for projects that are not automatically triggering a Level 3 transmission study (projects $\geq 5\text{MW}$), Eversource's Transmission Planning and Transmission Interconnections teams submit pre-screening forms to ISO-NE for concurrence. ISO-NE reviews the screening technical justification and typically will provide a response on concurrence within 2-3 weeks; Eversource's Transmission team checks in for updates on ISO-NE's decision on a weekly basis. When concurrence is received from ISO-NE, Eversource Transmission submits the Level 0 I.3.9 proposed plan application (PPA) package to the New England Power Pool (NEPOOL) Reliability Committee (RC) for inclusion on the upcoming agenda. Some of these projects may necessitate transfer limit analysis to ensure no degradation of interface limits. If adverse impacts are found, a Level 3 transmission study will be required.

Level 3 Studies

For projects that trigger a Level 3 analysis, a two-step process is implemented. When concurrence is received from ISO-NE on the study level, Eversource Transmission Planning prepares the study scope and assumptions which are also reviewed by ISO-NE. Generally, Level 3 transmission study scopes include thermal and voltage steady state analysis, as well as short circuit and stability analyses. Once the study scope is finalized, the study is performed and the Eversource Transmission Interconnections team attaches the study results to the I.3.9 PPA package to the NEPOOL RC for inclusion on the upcoming agenda.

Once Eversource's Transmission Interconnections team receives the approval letter from ISO-NE, which is usually sent out prior to the next month's RC meeting, Account Executives notify the customer of final project approval and the letter will be available in the PowerClerk system.

2. What are the roles and responsibilities of all parties involved in executing the Level 3 ASO study?

Eversource Transmission Planning and Transmission Interconnections teams work closely with ISO-NE to ensure ASO studies are performed consistently with ISO-NE tariffs and planning procedures and study parameters agreed upon by ISO-NE and Eversource. Eversource is the electric distribution and transmission company providing ISO-NE with the applicant's project information and transmission analysis results for review and approval. ISO-NE is the bulk power system operator for New England that reviews and concurs or rejects Eversource Transmission Planning teams' proposed transmission study level and results. The NEPOOL Reliability Committee reviews the PPAs at their monthly meetings and provides an advisory recommendation (approve or reject) to ISO-NE on each application. The interconnecting customer is required to provide inputs to Eversource, such as PSCAD models and project details like mechanical completion date, to complete the I.3.9 PPA package.

3. What are the standards and jurisdiction of this ASO study?

The ASO study is subject to tariffs and agreements under the jurisdiction of the Federal Energy Regulatory Commission. When required, transmission impact studies are governed primarily by ISO-NE tariff Section I.3.9 and ISO-NE Planning Procedures PP5-1 and PP5-3. Some of the reliability standards applicable to these studies, as referenced in PP5-3, are contained in ISO-NE Planning Procedure 3, but others exist as well. For example, elements of NERC's PRC-006-NPCC-1 underfrequency protection criteria and IEEE 1547 are often used to model resources in stability analyses.

FERC certified The North American Electric Reliability Corporation (NERC) as the Electric Reliability Organization (ERO) in 2006. The ERO is responsible for developing and enforcing reliability standards within the United States. In executing part of its responsibilities, NERC delegates authority to Regional Entities to perform certain functions through delegation agreements. Ensuring the reliability of the bulk power system for New York and the six New England States was delegated from NERC to the Northeast Power Coordinating Council (NPCC). Using the reliability standards developed by these entities, the objective of the ASO studies is to demonstrate that the projects under study have no significant adverse effect on the transmission system.

Also, the New England Participating Transmission Owners (PTOs), including Eversource's operating companies, executed a Transmission Operating Agreement with ISO-NE in 2005. TOA Section 3.03(b) establishes the obligation for the PTOs to notify ISO-NE when multiple distributed generators may have cumulative impacts affecting the transmission system and consult with ISO-NE in its performance of impact studies.

4. What are the estimated timelines for completion of the ASO study?

Western MA:

- Level 3:
 - Customer Kickoff Call occurred 5/24/2023
- Eversource has finalized the Level 3 study assumptions and base cases with ISO-NE.
- Steady state analysis is complete and no adverse impact was identified.
- Short circuit analysis is complete and no adverse impact was identified.
- Stability analysis without one FERC QP model is complete and preliminary review of results by ISO-NE is completed. Potential sensitivity analysis may be required once the FERC QP stability model is available.

- PSCAD Study Case Building has begun.
- Additional QPs were requested to be included in the WMA ASO study. As a result, the completion date for the 2023 WMA ASO study is currently undetermined, and we anticipate needing an additional 2 months to finish once we receive the models. Our current goal is to finish the studies before August 2024.
- ISO-NE has provided models for the additional two FERC QP's on 3/20 and Eversource is performing the study with the additional FERC QP's included in the study cases.
- PSCAD Case Building has been completed and analysis has begun.
 - WMA PSCAD Analysis is expected to complete by June 30th.

Greater Boston:

- Level 3:
 - Customer Kickoff Call occurred 5/24/2023
- Eversource has finalized the Level 3 study assumptions and base cases with ISO-NE.
- Steady state analysis is complete and no adverse impact was identified.
- Short circuit analysis is complete pending result review by ISO-NE.
- Stability analysis is in progress.
- PSCAD Case Building has begun.
- Additional QPs were requested to be included in the GB ASO study. As a result, the completion date for the 2023 GB ASO study is currently undetermined, and we anticipate needing an additional 2 months to finish once we receive the models. Our current goal is to finish the studies before August 2024.
- PSCAD Case Building has been completed and analysis has begun.
 - PSSE-PSCAD benchmarking is in progress
 - PSCAD faults are being updated and rerun to better align with PSSE results

SEMA/Cape

- Level 3
 - Customer Kickoff Call occurred February 6, 2024
 - Opt In / Out Window closed February 14, 2024
 - Eversource Awaiting Payments for ASO Participants
 - Eversource Reviewing PSCAD Models Submitted by Participants
 - Customer Modeling Fixes are due March 29, 2024
 - Eversource reviewing PSCAD Models
 - Model Acceptance/Rejection to Level 3 Customers April 5, 2024
- Eversource sent the first request to ISO-NE for a list of FERC Queue Projects (QPs) models that are required to be modeled in the ASO study base cases in Feb 2024. Since then Eversource has been working with ISO-NE to get the steady state, short circuit, stability and PSCAD models
- PSCAD Study Case Building has begun
- Eversource is preparing the short circuit study scope
- Eversource has the pre-project steady state and stability cases ready, will submit to ISO-NE for review.
- Eversource has the pre-project steady state cases and study scope ready, submitted to ISO-NE for review on May 24, 2024

The following is a milestone schedule that Eversource will provide additional detail on in forthcoming reports and progress updates:

Milestone	Target Completio	Status	Lead
WMA/GB 2023 ASO Study Customer Kickoff Meeting	1/31/2023	Complete	Eversource

WMA/GB Customer Schedule Update + Technical Discussion Meeting Held	2/15/2023	Complete	Eversource
WMA/GB PowerClerk Opt In/Opt Out Notices Issued to Customers	2/3/2023	Complete	Eversource
WMA/GB Customers Opt In/Opt Out	2/24/2023	Complete	Customer
WMA/GB Eversource provides WMA/GB Level 3 Study Costs to Opt Ins	3/3/2023	Complete	Eversource
WMA/GB Level 0 Customers Make Payment and Submit Models	3/10/2023	Complete	Customer
WMA/GB Eversource Provides Model Feedback to Level 0 Customers	3/17/2023	Complete	Eversource
WMA/GB Level 3 Customers Make Payment and Submit Models	3/1720/23	Complete	Eversource
WMA/GB Eversource Provides Model Feedback to Level 3 Customers	3/24/2023	Complete	Eversource
WMA/GB Level 0 Cure Period Ends	3/31/2023	Complete	Customer
WMA/GB Level 3 Cure Period Ends	4/7/2023	Complete	Customer
WMA/GB Level 0 Customer Modeling Fixes are Due	4/28/2023	Complete	Customer
WMA/GB Level 3 Customer Modeling Fixes are Due	4/28/2023	Complete	Customer
WMA/GB Eversource provides Model Acceptance/Rejection to Level 0 Customers	5/19/2023	Complete	Eversource
WMA/GB Eversource Provides Model Acceptance/Rejection to Level 3 Customers*	9/8/2023	Complete	Eversource
WMA/GB Customer Update Meeting	5/24/2023	Complete	Eversource
WMA ISO-NE Scope Approval	7/31/2023	Complete	Eversource
SEMA/Cape Level 3 ASO Study Customer Kickoff Meeting	2/6/2024	Complete	Eversource
SEMA/Cape Customers Opt In/Opt Out	2/15/2024	Complete	Customer
SEMA/Cape Eversource provides Level 3 Study Costs to Opt Ins	2/7/2024	Complete	Eversource
SEMA/Cape Level 3 Customers Make Payment and Submit Models	3/1/2024	In Process	Customer
SEMA/Cape Eversource Provides Model Feedback to Level 3 Customers	3/11/2024	Complete	Eversource
SEMA/Cape Level 3 Cure Period Ends	3/29/2024	Complete	Customer
SEMA/Cape Level 3 Customer Modeling Fixes are Due	3/29/2024	Complete	Customer
SEMA/Cape Eversource Provides Model Acceptance/Rejection to Level 3 Customers*	4/5/2024	Complete	Eversource
SEMA/Cape Customer Update Meeting			Eversource
SEMA/Cape ISO-NE Scope Approval			Eversource

* Awaiting receipt of QP models from ISO-NE

Any progress updates to ASO stakeholders will be in addition to the *DG Guidelines For Interconnection* reporting required by the Department of Public Utilities and the Company will continue to share ad-hoc updates as they become available. Factors that could impact the schedule and associated study activities are: base case modeling issues, DER stability model issues, solution development for potential adverse system impacts and/or significant project inverter model changes by customers.

5. What are the estimated necessary system modifications and associated costs?

The 2023 Level 0 studies in Greater Boston and Western MA had no necessary system modifications. The 2021 Level 0 and Level 3 SEMA/Cape study had shown no significant impacts and thus no necessary system modifications are needed. The required system modifications for the 2023 Greater Boston and Western MA ASO will be determined upon completion of the studies.

6. What prioritization system has the EDC developed to determine which of the affected DG applications would be eligible to interconnect first if capacity became available?

The EDC would prioritize applications to interconnect if the capacity became available in the order of the dates the applications were deemed complete e.g. first come, first served. It is unlikely that Eversource would allow applications to “jump” the queue in front of other projects, simply based on capacity differences, to ensure a fair methodical approach to all projects in the queue.

Separately, Eversource is continuing to proceed with distribution-level studies, including Group Studies authorized by D.P.U. 17-164, while the ASO transmission-level studies are being conducted. This is being done to reduce the distribution-level study wait time and increase value to customers. The Group Study order in D.P.U. 17-164 will allow Eversource to process distribution studies in groupings that will include different customers bundled together. More information can be found on this Order here:

<https://eeaonline.eea.state.ma.us/DPU/Fileroom/dockets/bynumber/17-164>

7. Are there any proposed resolutions that the EDC is exploring to enable some affected DG applicants to proceed with the interconnection process prior to completion of the ASO study?

Eversource is continuing to proceed with distribution level studies, including group studies, while ASO transmission studies are being conducted. This is being done to reduce the distribution-level study wait time and increase value to customers. Eversource is implementing group studies based on the Group Studies order in D.P.U. 17-164.

8. Are the study results available at this time for ASO projects?

There were no adverse impacts found in the 2023 Level 0 ASO studies in Greater Boston and Western MA as well as Level 0 and Level 3 SEMA/Cape projects. The Greater Boston and Western MA Level 3 results will be made available upon the completion of all study analyses.

Regarding *DG Guidelines For Interconnection* item E (10), applicants should direct any questions and correspondence to their Account Executive so that inquiries can be directed in a timely manner to the appropriate party for a response. The Company also utilizes the questions that come in to update its FAQs list on the ASO website.