

Affected System Operator (ASO) Studies – January Update

2021 Level 3 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 2021 Level 0 ASO studies in SEMA/Cape area that officially commenced as of April 2022. Results were approved at the May RC meeting. The 2021 Level 3 ASO studies in SEMA/Cape have officially commenced as of June 2022. High level milestones for 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.

The 2021 Level 0 and Level 3 ASO studies in Greater Boston and Western MA have officially completed. The Level 3 studies received approval at the December 2022 RC meeting. Eversource has circulated the PPA approval letters with customers. No major upgrades were identified as a result of the Greater Boston and Western MA level studies.

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?

The 2021 Greater Boston and western MA Level 0 ASO studies commenced in early October and have since completed with the December 2021 RC approval. The Greater Boston and western MA Level 0 transfer limit analysis (TLA) studies showed no adverse impacts. The Level 3 studies in these two regions started in January 2022 and received PPA approval at the December 2022 RC meeting with no significant impacts. The 2023 round of ASO in Greater Boston and Western MA are commencing with customer opt-ins being finalized.

The 2021 SEMA/Cape ASO Level 0 study commenced in April 2022 and has shown no significant impacts. ISO-NE has also reviewed these results and concurred with Eversource's results. These projects received verbal approval at the May RC meeting and PPA approval letters have been circulated to customers. The 2021 SEMA/Cape ASO Level 3 study commenced in June 2022 and is currently in progress. Eversource will be issuing study-specific biweekly updates to the in-

study SEMA/Cape customers via Powerclerk. These updates will report status regarding the phases of each study analysis and next steps to study completion.

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

Milestone	Target Completion	Status	Lead
SEMA/Cape Level 0 Study Scope Submission	4/7/2022	Complete	Eversource
SEMA/Cape ISO-NE Review Level 0 Study Scope	4/14/2022	Complete	ISO-NE
SEMA/Cape Level 0 Analysis	4/20/2022	Complete	Eversource
SEMA/Cape Level 0 Study Results Discussion with ISO-NE	4/21/2022	Complete	Eversource, ISO-NE
SEMA/Cape Request FERC QP models from ISO-NE	5/17/2022	Complete	Eversource
SEMA/Cape Level 3 Study Commencement	6/10/2022	Complete	Eversource
SEMA/Cape Study Scope Discussion with ISO-NE	6/17/2022	Complete	Eversource, ISO-NE
SEMA/Cape Level 3 Customer Kickoff Meeting	6/23/2022	Complete	Eversource
SEMA/Cape Level 3 Obtain ISO-NE Steady-State Library Cases	7/7/2022	Complete	Eversource
SEMA/Cape Level 3 Obtain ISO-NE Stability Library Cases	7/7/2022	Complete	Eversource
SEMA/Cape Level 3 Steady-State Library Cases Review	7/15/2022	Complete	Eversource
SEMA/Cape Level 3 Stability Library Cases Review	7/15/2022	Complete	Eversource
SEMA/Cape Level 3 Request ISO-NE short circuit base case from ISO-NE	7/20/2022	Complete	Eversource
SEMA/Cape Level 3 Discuss with ISO-NE on the discrepancies of the PV modeling in peak load case	8/5/2022	Complete	Eversource
SEMA/Cape Level 3 Correct PV Modeling in peak load case	8/18/2022	Complete	Eversource
SEMA/Cape Level 3 Discuss Steady State Scope with ISO-NE	8/26/2022	Complete	Eversource
SEMA/Cape Level 3 Send Steady State Scope to ISO-NE for Review	9/2/2022	Complete	Eversource
SEMA/Cape Level 3 Steady-state Library Cases Development	11/18/2022	Complete	ISO-NE

SEMA/Cape Level 3 Steady-state Library Cases Finalization	2/14/2023	Complete	ISO-NE*
SEMA/Cape Level 3 ISO-NE Steady State Scope Review Completion	11/10/2022	Complete	Eversource
SEMA/Cape Level 3 Stability Library Cases Development	2/14/2023	Complete	ISO-NE*
SEMA/Cape Level 3 Stability Library Cases Finalization	2/28/2023	Complete	ISO-NE*
SEMA/Cape Level 3 Short Circuit Study Scope	10/28/2022	Complete	Eversource
SEMA/Cape Level 3 Short Circuit Library Cases Development*	3/8/2023	In progress	Eversource
SEMA/Cape Level 3 Short Circuit Library Cases Analysis Completion*	3/31/2023	Not Started	Eversource
SEMA/Cape Level 3 Stability Cases Dispatch	3/3/2023	In progress	Eversource
SEMA/Cape Level 3 Stability Modeling Files for Stability Analysis	3/7/2023	Not Started	Eversource
SEMA/Cape Level 3 Stability Fault Files Creation for Stability Analysis	3/15/2023	Not Started	Eversource
SEMA/Cape Level 3 Stability Fault Simulation and Review	3/22/2023	Not Started	Eversource
SEMA/Cape Level 3 Stability ISO-NE Review	3/30/2023	Not Started	Eversource
SEMA/Cape Level 3 PSCAD Case Creation	3/3/2023	Not Started	Eversource
SEMA/Cape Level 3 PSCAD Fault Files for PSCAD Analysis	3/10/2023	Not Started	Eversource
SEMA/Cape Level 3 PSCAD Substitution Library Modeling and FERC Queue Project Modeling	4/12/2023	Not Started	Eversource
SEMA/Cape Level 3 PSCAD Simulation	5/13/2023	Not Started	Eversource
SEMA/Cape Level 3 PSSE and PSCAD Case Benchmarking	5/15/2023	Not Started	Eversource
SEMA/Cape Level 3 PSCAD Result Review	5/22/2023	Not Started	Eversource

**Awaiting ISO-NE to provide required modeling of the relevant FERC queued projects to Eversource. This is required in order for Eversource to finalize the steady-state library cases development.*

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 2021 Level 0 and Level 3 studies in Greater Boston and western MA had no necessary system modifications. The 2021 Level 0 SEMA/Cape study had shown no significant impacts and thus no necessary system modifications are needed. The Level 3 study in SEMA/Cape has not been completed at this time.

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 2021 Level 0 ASO studies in Greater Boston and western MA as well as SEMA/Cape. The Level 3 studies are in progress and final results are not available at this time.

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.