



Connecticut Distributed Generated Interconnection Working Group Meeting Summary

State of Connecticut Public Utilities Regulatory Authority Office of Education, Outreach & Enforcement

Tuesday, February 6, 2024, 9:30 – 11:00AM EST

IX WG Subgroup Meeting Topics: Discussing how developers can optimize their interconnection materials (applications, models, etc.) such that communications between parties can run smoothly as the EDCs work to comply with FERC Order 2023, and timeline and communications regarding FERC 2023 compliance.

Meeting Context

In the IX WG Meeting held on January 9, 2024, participants discussed communication issues between parties that have occurred as EDCs and developers work to comply with FERC 2023. Within that discussion, the EDCs and developers discussed the most common issues EDCs face when reviewing models. Eversource shared the three main model issues to be discussed in further detail in this meeting. Additionally, developers are looking for clarity and transparency into the EDC processes for entering the queue and timelines related to FERC 2023 compliance.

This summary provides an overview of the discussion from that dedicated sub-group meeting.

Meeting Summary

Aileen Cole (GPI) and Val Stori (GPI) began the meeting with an introduction and agenda. Aileen Cole (GPI) then presented the following questions for Eversource, UI, and developers to discuss.

- *Are there any clarifications needed on how to address the top three issues EDCs face when reviewing models?*
- *Are these three issues addressable in a timely manner?*
- *What additional questions remain for the EDCs? What questions do the EDCs have for developers?*
- *Are there other transparency needs into DER studies in advance of the first transition cluster study?*

Discussion: Modeling

1. Jacob Lucas (Eversource): Improving the model submission process helps everyone, regardless of FERC order 2023. The three main points to improve the model process brought up last meeting were:
 - a. **1. Transmission study models need to be customized to the specific DER project.**
 - b. **2. Models need to be the most up to date from the inverter manufacturer.**
 - i. Eversource is working behind the scenes with inverter manufacturers to fix model bugs.
 - c. **3. Models need to adhere to performance requirements**, including voltage trip settings, frequency ride-through settings, IEEE 1547, etc. These are publicly available across the ISO-NE Source Requirement Document (SRD), ISO-NE 5-6 planning procedures, and Eversource-specific requirements.
2. Oliver Sandreuter: (Lodestar): These requirements are scattered, so it is hard to know when and where they're changing. Is there a potential to consolidate these into one best practice document that Eversource updates so all developers can keep up with the requirements?
 - a. Jacob Lucas (Eversource): One challenge is that the ISO-NE SDR documents are outside of Eversource's reach. These requirements don't change frequently and when they do, the document will have a revision noted. Eversource documents should reference all other requirements, but we can confirm they are listed and easy to find.
 - i. Jacob Lucas (Eversource): ISO-NE updates tend to only be updated by a new or updated industry standard (i.e., IEEE 1547), or if some of the transmission owner studies or ISO-NE system impact studies identified unique issues to New England.
 - ii. Brad Marszalkowski (ISO-NE): All of ISO-NE's Electromagnetic Transient (EMT) model requirements are located in Appendix C of [Planning Procedure 5-6](#). ISO-NE will release a new version of Planning Procedure 5-6 with updated EMT checklist requirements in the next few weeks.
 1. The 2018 ISO SRD is a set of performance requirements that states adopted. That document will be superseded by the new [Massachusetts \(Technical Standards Review Group \(TSRG\) document](#) (in effect in 2023). It is meant to take place of the current ISO-SRD and expand ride-through capabilities of DERs.
3. Kavita Ravi (BlueWave Energy): What can developers do to reduce the number of model iterations? What are examples of quick, easy checks?
 - a. Jacob Lucas (Eversource): There are a wide range of issues we encounter. For these issues, we provide information on the identified deficiencies. We don't just say "the model is wrong please fix."
 - b. Brad Marszalkowski (ISO-NE): ISO-NE is putting together "SMIB tests" (single machine infinite bus). The first step is to test the model to make sure it initializes correctly at its pmax, or maximum output, while also at its pmin reactive outputs.

Doing these basic initialization tests will reveal a lot. Another set of tests it rides through are angle jumps, high and low voltages, instantaneous low and high voltages for frequency spikes, etc. These tests won't be in the release in the next few weeks but will be added to the Procedure 5-6.

- i. Jacob Lucas (Eversource): SMIB tests will be helpful for DER developers because it offers a standard practice for model modification. A SMIB is a standard case that any consultant can build to test the model. Eversource uses software that not all DER developers have access to, so developers are dependent on consultants. Using consultants is difficult because developers can't confirm if the consultant is doing everything right. A SMIB case will be helpful in this.
 - c. Brad Marszalkowski (ISO-NE). ISO-NE's aim is to be transparent on what we expect in the models. Working to develop a suite of public tools to use and test models prior to submitting them. This will be developed for transmission resources but can also be used for DER resources.
- 4. Carl Nowiszewki (Eversource): Is there an opportunity for developers to limit selection or to standardize inverter manufacturers so they are not in need of new, updated models for each project? Can developers push the SMIB working model requirement on inverter manufacturers? Can developers push inverter manufacturers to commit to supply that inverter in 1-2 years when the project goes into construction to limit later changes in studies?
 - a. Brad Marszalkowski (ISO-NE): ISO-NE has seen several problematic inverter manufacturers. Haven't said developers can't use them, though some transmission owners have (e.g., Versant). ISO-NE simply takes the "if there's a problem with the study, we remove it" approach.
 - b. Jacob Lucas (Eversource): Eversource's inverter library is now in the thousands with likely 30+ different manufacturers. It's not our role to stipulate which manufacturers are permissible. There are a lot of manufacturers with different inverters that need to be studied, all of which update their models frequently. Don't see how SMIB model requirements could be pushed onto the manufacturers.
 - c. Brad Marszalkowski (ISO-NE): Manufacturers don't fall into any sort of regulatory framework over which ISOs have authority. ISO-NE can put out requirements for participants within the process and hope that sends a market signal to manufacturers to change.
 - d. Jacob Lucas (Eversource): There are a number of performance requirements; it would be difficult for manufacturers to know all of them.
 - e. Brad Marszalkowski (ISO-NE): Developers need to take a more active role in educating their perspective OEMs.
 - f. Jacob Lucas (Eversource): DER developers using consultants or engineering firms that are familiar with the ISO-NE requirements would be helpful.
 - g. Myra Sinnott (Delorean Power): Developers are always looking into new technology, new manufacturers, and better pricing. A lot can change in a couple of years, so developers try to keep their options open while sticking to

requirements. Developers try to maintain flexibility, but that creates the problem of needing to update models frequently.

- i. Brad Marszalkowski (ISO-NE): The least cost option is not always the best option. ISO-NE would like to see developers choosing well-vetted inverter manufacturers. ISO-NE is not averse to new technologies but needs to run a power system in which all technologies work.
5. Sam Grunow (Nexamp): Is there a way to determine if something falls under state or FERC jurisdiction? If a project falls under FERC jurisdiction, would the project interconnect under Eversource requirements or separate requirements?
 - a. Jacob Lucas (Eversource): This used to pertain to whether the DER would participate in wholesale market. Now, all DERs interconnecting through distribution system go through state interconnection process.
 - b. Sam Grunow (Nexamp): What about transmission-connected projects?
 - i. Jacob Lucas (Eversource): Almost all transmission-connected projects would go through ISO-NE, FERC-jurisdictional process.
6. Pete Falcier (Endurant Energy): Follow up to Jacob's comment on those veteran consultant/engineering firms with deep modeling experience in ISO-NE territory: is there a list from EDCs or ISO-NE or PURA for developers to refer to? Or a way for those firms to get on a list that developers can refer to in future?
 - a. *Please note the WG did not have time to answer this question.*

Discussion: FERC Order 2023 Timeline

1. Sam Valone (Lodestar): When does the FERC cluster study start? When do developers need to have all application materials submitted to ensure that they can all get reviewed and verified in time to make that first cluster study?
 - a. Jacob Lucas (Eversource): Please note this is subject to change. Our number one focus related to FERC Order 2023, is to increase the transparency of the transmission studies and timeline with developers. Eversource has increased the frequency of updates about the status of transmission studies for DER projects. We are trying to finish before ISO-NE's first transitional cluster study starts. If we are unable to finish a DER study by this deadline, we will be in a holding pattern. From that point, will need to know which FERC QP's will enter the ISO-NE transitional cluster study. We need to know which FERC QPs are electrically relevant to Eversource and what upgrades are coming out of their studies to include in our transmission studies. If there aren't relevant FERC QP's, we could likely continue our studies alongside ISO-NE's studies. We are losing visibility into ISO NE's transitional cluster study. Previously, ISO-NE had a serial study process so Eversource had visibility into the future studies getting performed at a later date.
 - i. The DER's will not be in the ISO-NE cluster study for potential system impact and system upgrades unless they have already been previously assumed to be in the study for potential system upgrades. The transmission owners are still performing the DER transmission studies. Eversource is working hard to finish all DER transmission studies by the

reliability committee approval in October. This hinges ISO-NE's tariff language that says plans must be approved within 90 days of the cluster study start. We are notifying developers which ones are in that batch and which ones are not.

- b. Sam Valone (Lodestar): If I submit a new DER application today, could it be included in ISO-NE's base case cluster study or would it need to be in the 2nd cluster study?
 - i. Jacob Lucas (Eversource): That decision will be made on a case-by-case basis. It is worth having Eversource evaluate for potential completion before the ISO-NE transitional study; however, this will be more difficult as time goes on. We will continue to try to advance DER transmission studies in parallel with ISO-NE's study process, to the extent possible.
 1. Eversource is going one by one through DER studies to identify which they think they'll be able to advance (e.g., they're in an area where they know there won't be another electrically relevant project). But there could be scenarios in which we must wait for specific projects, since they don't know whether a specific FERC QP project will opt in/out, etc.
 - c. Brad Marszalkowski (ISO-NE): Confirming October is correct. It has to be 90 days after the transmission cluster starts, which is planned for August.
2. Mrinmayee "MK" Kale (New Leaf Energy): In Maine, CMP was asked to host monthly check-in meetings with developers to update on the study process status and study results. A regular check-in with developers would be appreciated so we know if we should continue to invest in our projects.
 - a. Jacob Lucas (Eversource): In Massachusetts, Eversource does biweekly and monthly updates. There are significant study milestones and gateways that should trigger communication. We could do a better job with that as the firm transitional cluster deadline approaches in October.
 - b. Joe Marranca (UI): UI is striving to make communication improvements and to clean up the internal processes so information can be released faster. However, the UI team is unable to share information on certain timelines, such as the ISO-NE transmission studies.
 - c. MK (New Leaf Energy): Two important factors: 1) the frequency of communication; 2) what is being communicated. Suggest that EDCs speak to CMP to see their approach to sharing information with developers.
3. Pete Falcier (Endurant Energy): Can you speak to the settlement-only option? Trying to figure out the settlement-only DER aggregation option, which ISO-NE views as a non-model approach, vs. the benefits of doing a full model approach. If the project has a nameplate over 5 MW, can you use 4.99 MW in your interconnection agreement via limiting with controls, or is there a physical limitation?
 - a. Brad Marszalkowski (ISO- NE): Settlement-only generators have to be less than 5 MW, but have the choice to become a modeled asset. ISO-NE does accept software limitations. Project >5 MW projects can "software down" to 4.99 MW, as long as the net output is <5 MW.

- b. Pete Falcier (Endurant Energy): Do settlement-only assets still need to go through the reliability committee if they're between 1-5 MW?
 - i. Brad Marszalkowski (ISO-NE): If the project is >1 MW and in a saturated area, it will require a system impact study and proposed plan application. If it does not need a system impact study, it would go through as a notification form. Both projects go before the reliability committee. Proposed plan applications are voted on at the reliability committee. The notification form is a "consent agenda" which is non-voting in the committee.
 - ii. Pete Falcier (Endurant Energy): What drives time differential between >5MW vs <5MW projects?
 - 1. Brad Marszalkowski (ISO-NE): Projects >5 MW automatically require a system impact study, which adds two months. For 1-5 MW projects that are also lumped into a study, the same timeline applies. 1-5 MW projects not lumped into a study can go through the ISO-NE process quickly. The Eversource timeline is different.
 - 2. Jacob Lucas (Eversource): The two months mentioned refer only to approval. Reliability committee meetings occur once a month. After the items are voted on, ISO-NE takes that input and issues approval on the proposed plan application via a letter sent to the transmission owner. The letters are issued 1-2 weeks after the reliability committee meeting, which contributes to this process taking 2 months.
 - 3. Peter Falcier (Endurant Energy): These two months are after all the modeling. If the project is >5 MW, is the reliability committee process the same?
 - 4. Brad Marszalkowski (ISO-NE): If >5 MW, the project will be in a system impact study and need to provide planning models, which will take a longer time. Developers will be working with the asset registration team to get registered in the markets as a modeled asset.
 - 5. Peter Falcier (Endurant Energy): Is there a Gantt chart or illustration of these processes (e.g., for modeled assets, 1-5MW, >5MW, etc.)?
 - a. Brad Marszalkowski (ISO-NE): See diagram in Generator Data Submittal Requirements training.
 - iii. Pete Falcier (Endurant Energy): Is there a way to use hosting capacity maps or ISO-NE maps to determine whether certain studies will be needed based on anticipated point of Interconnection?
 - 1. Brad Marszalkowski (ISO-NE): Hosting capacity maps will be helpful, but they won't give a yes/no determination. Which studies will be performed is not only dependent on what's currently installed, but also on what's approved to be installed (but not yet

installed), which is constantly changing. ISO-NE only provides determinations directly with transmission owners, not developers.

Next Steps

1. Upcoming recurring IX WG meeting: EDC progress updates on trough-type connection plans & EDC presentations on MSA proposals (originally scheduled for February 13, 2023—rescheduled to later in February due to severe winter storm event).
2. Upcoming PURA deadlines:
 - a. 3/15/24: EDCs to file trough-type connection plans with PURA for review & approval.
 - b. 4/1/24: Deadline to implement \$25 cost adder.
 - c. 4/10/24: EDCs' MSA compliance filings due.