February 9, 2022, TPAS Recommendation
February 17, 2022, OC Approval

Large Generating Facility - Interconnection System Reliability Impact Study Scope

Queue #1122: East Fishkill Project

1. Purpose

The purpose of this Interconnection System Reliability Impact Study ("SRIS" or "Study") is to evaluate the impact of the proposed interconnection of East Fishkill ("Project"), which is being developed by Microgrids Networks, LLC ("Developer"), to the New York State Transmission System ("NYSTS"). The Study will be performed in accordance with Attachment X of the NYISO Open Access Transmission Tariff ("OATT").

The Project will be located in Dutchess County, New York. The proposed Point of Interconnection ("POI") will be at the Shenandoah 115 kV Substation. The Connecting Transmission Owner ("CTO") is Central Hudson Gas and Electric Corporation ("CHG&E").

The Project is an energy storage plant. The Project, as proposed, will consist of one hundred sixty-seven (167) EPC Type CAB 1000 inverters. The Project is expected to have a maximum generating capacity of 205 MW and a maximum charging capacity 215 MW with four (4) hours discharging and four (4) hours charging duration during both summer and winter periods.[1]

The Project proposes an In-Service Date of May 2023, Initial Synchronization Date of March 2023, and Commercial Operation Date of June 2023.

The Study will assess the impact of the Project on the base case power system including potentially Affected Systems Con Edison and NYSEG. It will provide a list of the facilities (CTO Attachment Facilities and System Upgrade Facilities) required to reliably interconnect the Project, and non-binding good faith estimates of cost and time to construct those facilities.

The Study will be conducted in accordance with the Applicable Reliability Standards.

2. Interconnection Plan

The Study will include a description of the proposed facilities and the conceptual design of the interconnection to the system representation. The description will include a breaker one-line diagram depicting the proposed facilities and their integration with the existing facilities. The

[1] For temperature sensitive output projects, the MW values represent the Maximum Summer Peak Net Output that can be achieved between 85 and 95°F, and the Maximum Winter Peak Net Output that can be achieved between 10 and 35°F

Study will also identify potential issues with the feasibility/constructability of the conceptual design of the proposed interconnection to the extent known based on the Study assumptions.

3. Study Period

The Study will be based on the Class Year 2021 ATBA base cases ("Base Cases") that have the 2021 FERC 715 2026 system representation. The Study will be conducted using the steady state, stability, and short circuit Base Cases provided by the NYISO, and will include the representation of proposed projects that have already been cost allocated, up to and including Class Year 2019 (as listed in Appendix A of this scope).

4. Study Area

The Study will identify and evaluate the impact of the Project on the 115kV and above portions of the NYSTS in the following New York load zones: Zone **G** (**Hudson Valley**) and Zone **H (Millwood)** that are most likely to be affected by the Project. The Study will also evaluate the impact of the Project on the local system (below 115kV) in the electrical proximity to the POI.

5. Base Case Conditions

The impact of the proposed Project will be evaluated for **summer peak, winter peak,** and **light** load cases for the following base case conditions, and as specified under the subsequent sections of this Scope:

Case 1 - Base Case without the Project. The Base Cases will include the baseline system and the proposed projects listed in Appendix A of this scope. The short circuit Base Case will model all the projects as in-service. The steady state Base Case will normally model all projects in service and at full output but may model some projects as out-of-service or less than full output as necessary to establish a feasible base dispatch. Generation will be dispatched in accordance with the NYISO Minimum Interconnection Standard.[2]

Case 2 - Case 1 with the Project modeled as in-service in discharging mode and injecting full capacity at the POI. Unit and facility reactive resources for the Project will be represented. Generation will be re-dispatched in the steady state case, as needed, in accordance with the NYISO Minimum Interconnection Standard.

Case 3 - Case 1 with the Project modeled as in-service in charging mode and withdrawing full capacity at the POI. Unit and facility reactive resources for the Project will be represented. Generation will be re-dispatched in the steady state case, as needed, in accordance with the NYISO Minimum Interconnection Standard.

[2] As defined in the NYISO Transmission Expansion and Interconnection Manual (NYISO TEI Manual).

6. Analysis

Thermal, voltage, stability and short circuit analyses will be conducted to assess the performance of the base system conditions within the Study Area, with and without the Project, in accordance with Applicable Reliability Standards, guidelines and study practices. Modifications to Base Cases, during analyses, will be documented in the Study Report.

6.1 Steady State Analyses: N-0 and N-1

Thermal and voltage steady state analyses, using PSS/E or a comparable load flow program, will be conducted for **summer peak, winter peak and light** load cases, pre-contingency and for relevant Design Criteria Contingencies conditions, and will be limited to the Study Area.

Thermal limits will be assessed under both Normal Criteria and Emergency Criteria, using normal ratings pre-contingency and applicable post-contingency ratings *(e.g.*, Long-Term-Emergency, LTE, ratings or Short-Term-Emergency, STE, ratings).

Voltage limits will be assessed, pre- and post-contingency, using the applicable voltage limits.

6.2 Steady State Analyses: N-1-1

The Study will evaluate a limited selection of N-1-1 contingencies around the POI. Steady state analyses (**summer peak**) will be performed based on the N-1-1 contingency descriptions provided by the CTO(s) and/or the NYISO.

6.3 Transfer Assessments

The transfer assessment will determine the incremental impact of the project on the Normal and Emergency transfer limits of the UPNY-ConEd interface (opened and closed definitions, as applicable) in accordance with Applicable Reliability Standards, Guidelines and NYISO study practices. The transfer limits will be evaluated in the predominant north-to-south direction, unless otherwise specified. Sufficient analyses will be conducted to determine the most limiting of the thermal, voltage, or stability limits under **summer peak** load conditions.

6.4 NPCC A-10 Testing

The Study will review the NPCC Bulk Power System (BPS) classification of existing and proposed stations within the proximity of the Project to identify any existing or new stations that could be classified as BPS due to the addition of the Project. This testing will be performed for **summer peak** and **light load** cases, and in accordance with the latest NPCC A-10 criteria (npcc.org).

6.5 Short Circuit Analysis

Short circuit analysis will be performed, using ASPEN, to evaluate the impact of the Project on system protection and adequacy of existing circuit breakers, other fault current interrupting devices, and related equipment. All Project impacts of 100 A or more will be identified.

This analysis will be performed in accordance with the NYISO Guideline for Fault Current Assessment (Attachment I of the NYISO Transmission Expansion and Interconnection Manual), and in accordance with Connecting Transmission Owner and Affected System(s) criteria, to the extent such criteria are recognized as Applicable Reliability Standards.

6.6 Stability Analysis

Stability analysis, using PSS/E v34, will be performed for **summer peak** and **light** load conditions to determine the impact of the Project on system performance within the Study Area. This analysis will evaluate the performance of the system for Design Criteria Contingencies and will address issues including, but not limited to, transient stability, dynamic stability *(i.e.*, damping), critical clearing time, coordination of protection and control systems, and performance of any Special Protection Systems that may be affected. These analyses will explicitly consider the voltage and frequency ride-through capabilities of the facility.

6.7 Islanding Analysis

Analysis will be performed to determine the impacts on area voltage and frequency associated with the islanding of the Project with area distribution load during **light** load conditions. Upgrades shall be identified in the Study report to preclude excessive voltages (*i.e.*, voltages exceeding 1.05 pu) and abnormal frequencies during islanding conditions.

6.8 Local Distribution System Analysis

Steady State Voltage Fluctuations

The maximum and minimum voltage fluctuations on the distribution system in the vicinity of the POI will be evaluated when all area PV output changes and prior to any LTC action. Voltage fluctuations shall be below the IEEE 519 borderline of irritability curve (limit of 2% voltage change based on 1 fluctuation/minute). For this analysis, the Project is reduced from full discharge to full withdrawal for the area peak and light load conditions with LTC transformers modeled as regulating pre-change and non-regulating post-change. Analysis will be repeated with the Project changing from full withdrawal to full discharge.

LTC / Voltage Regulator Tap Movement

LTC / Voltage Regulator Tap position will be monitored with all area PV at full output and no output for the area peak and light load conditions. From full discharge to full withdrawal and from full withdrawal full discharge, LTC tap movement shall not exceed 1 tap position

The Local Distribution System Analysis will be performed by the CTO.

6.9 Preliminary Non-Binding Deliverability Analysis

The Study will include a preliminary non-binding deliverability analysis performed under the NYISO Deliverability Interconnection Standard.

7. Modeling Assumptions

7.1 Phase angle regulators ("PARs"), switched shunts, and LTC transformers will be modeled as regulating pre-contingency and non-regulating post-contingency. The Study will use PAR schedules established by the NYISO in coordination with the neighboring ISOs through the NERC and NPCC base case development processes. PARs may be adjusted as necessary to relieve pre-contingency overloads.

7.2 SVC and FACTS devices will be set to zero pre-contingency and allowed to operate to full range post-contingency.

8. Evaluation and Identification of Upgrades

If the Study results indicate that the Project, as proposed, would result in violations of Applicable Reliability Standards, analyses will be performed to identify any System Upgrade Facilities or

Distribution Upgrades (if applicable) that would be required to meet the NYISO Minimum Interconnection Standard. When such upgrades are identified, sufficient re-assessments (among those identified in this scope) should be performed to assure that the upgrades do not cause any adverse reliability impact on the Study Area.

9. Cost Estimates of Facilities and Time to Construct

A description of facilities *(i.e.*, CTO Attachment Facilities and System Upgrade Facilities, if any) required to interconnect the Project to the NYSTS, or the Distribution System (if applicable), and non-binding good faith estimates of cost and time to construct those facilities, will be provided.

10. Report

The Study Report will document the summary of the results relevant to the project impacts, project description, project modeling, study assumptions, criteria and methodology, mitigation solutions and their impact assessment, and conclusions, for each of the analyses identified in this scope.

Appendix A

List of Other Proposed Projects to be Modeled in the Base Case

Queue#1122: East Fishkill Project

Queue Pos.	Owner / Project Name	MW (S|W)
276	EDF Renewables Development, Inc./Homer Solar Energy Center	90.0| 90.0
495	Mohawk Solar LLC / Mohawk Solar	90.5 | 90.5
519	Canisteo Wind Energy LLC/Canisteo Wind	290.7 | 290.7
531	Invenergy Wind Development LLC / Number 3 Wind Energy	105.8 |105.8
535	sPower Development Company, LLC / Riverhead Expansion	36.0 | 36.0
546	Atlantic Wind, LLC / Roaring Brook Wind	79.7 | 79.7
579	Bluestone Wind, LLC / Bluestone Wind	124.2 | 124.2
596	Invenergy Wind Development LLC / Alle Catt II Wind	339.1 | 339.1
612	Deepwater Wind South Fork, LLC / South Fork Wind Farm	96.0 | 96.0
617	North Park Energy, LLC / Watkins Glen Solar	50.0 | 50.0
618	North Park Energy, LLC / High River Solar	90 | 90
619	North Park Energy, LLC / East Point Solar	50 | 50
620	North Park Energy, LLC / North Side Solar	180.0 | 180.0
637	Flint Mine Solar LLC / Flint Mine Solar	100.0 | 100.0
644	Hecate Energy Columbia County 1, LLC / Columbia County 1	60.0 | 60.0
678	LI Solar Generation, LLC / Calverton Solar Energy Center	22.9 | 22.9
683	KCE NY 2, LLC / KCE NY 2	200.0 | 200.0
695	Deepwater Wind, LLC / South Fork Wind Farm II	40.0 | 40.0
704	Bear Ridge Solar, LLC / Bear Ridge Solar	100.0 | 100.0
706	High Bridge Wind, LLC / High Bridge Wind	100.8 | 100.8
720	North Light Energy Center, LLC / North Light Energy Center	80.0 | 80.0
721	Excelsior Energy Center, LLC / Excelsior Energy Center	280.0 | 280.0
737	Empire Offshore Wind LLC / EI Sunset Park	816.0 | 816.1
746	Energy Storage Resources, LLC / Peconic River Energy Storage	150.0 | 150.0
791	Danskammer Energy LLC / Danskammer Energy Center	595.5 | 600.0