EXHIBIT B

Community Power Group
195 Pinney Street, Ellington, CT

Distribution System Impact Study
CD01716

Patel, Marmik Y

<u>History of Revisions</u>
Rev 0: 07/19/2021 MYP

Rev 1: 07/21/2021 DRM

Rev 2: 07/21/2021 RPA

Table of Contents

Abstract

This system impact study is to examine the 4 MW photovoltaic generator proposed on 14W7 Pinney Street, Ellington, CT. A full circuit impact study is needed for this installation due to it failing the fast track screen. The study will cover impacts related to voltage, equipment, and protection.

The study found there to be no voltage issues during minimum and maximum loading at the full 4 MW output of the PV system operating at 100% power factor. The customer will need a new three phase service consisting of a new primary meter and recloser. The DG customer did not cause excess capacitor bank operations. The power quality was determined to be acceptable. The generator did not cause any of the LTC's at the Rockville or Scitico substations to operate on either the primary or alternate configurations. Reverse power flow at the Rockville 14W7-2 breaker was substantial during minimum load but did not back feed onto transmission. Fluctuations between states of the generator will be controlled by implementing a standard ramp rate. This will reduce the frequency of large swings in operation and prevent excess operation of voltage regulating equipment on the circuit. The Sandia Risk on Islanding Screen was performed and passed, therefore, this project does not create an islanding risk. The risk of islanding specification sheet indicates that the proposed inverters belong to Group 1 or 2A. A dynamic study in PSCAD was also performed to check Transient Over Voltage (TOV) and Ground Fault over Voltage (GFOV) and no concerns were found in the dynamic study.

Introduction

The purpose of this study is to determine the electrical system impacts of a 4 MW PV proposed on the Rockville 14W7 feeder. The electrical system impacts considered in this study are voltage, equipment, and protection concerns. Recommendations will be based on assurance that all the customers fed from this circuit, and adjacent alternate circuits, are within the established ratings for voltage and that fault protection is enough. The Rockville 14W7 was chosen for ease of interconnection at Pinney Street, Ellington, CT.

Project Location

Community Power Group is proposing the installation of a 4 MW PV generator at their site in Ellington, CT. This project will be located on the low side of the Rockville 14W substation, on the 14W7 circuit at Pinney Street, Ellington, CT. The PV project site is approximately 10.69 circuit miles away from the Rockville 14W substation. The site plan for the project shown below in Figure 1 illustrates the location of the PV system and how it will connect to the 14W7 circuit. The customer proposed two separate POIs and requested that Eversource explore the best option. Based on the impact study; option two was determined to be the best option as it does not require reconductoring Pinney Street. A picture illustrating the distance of the project site to the Rockville 14W7 substation can be found in Appendix A.

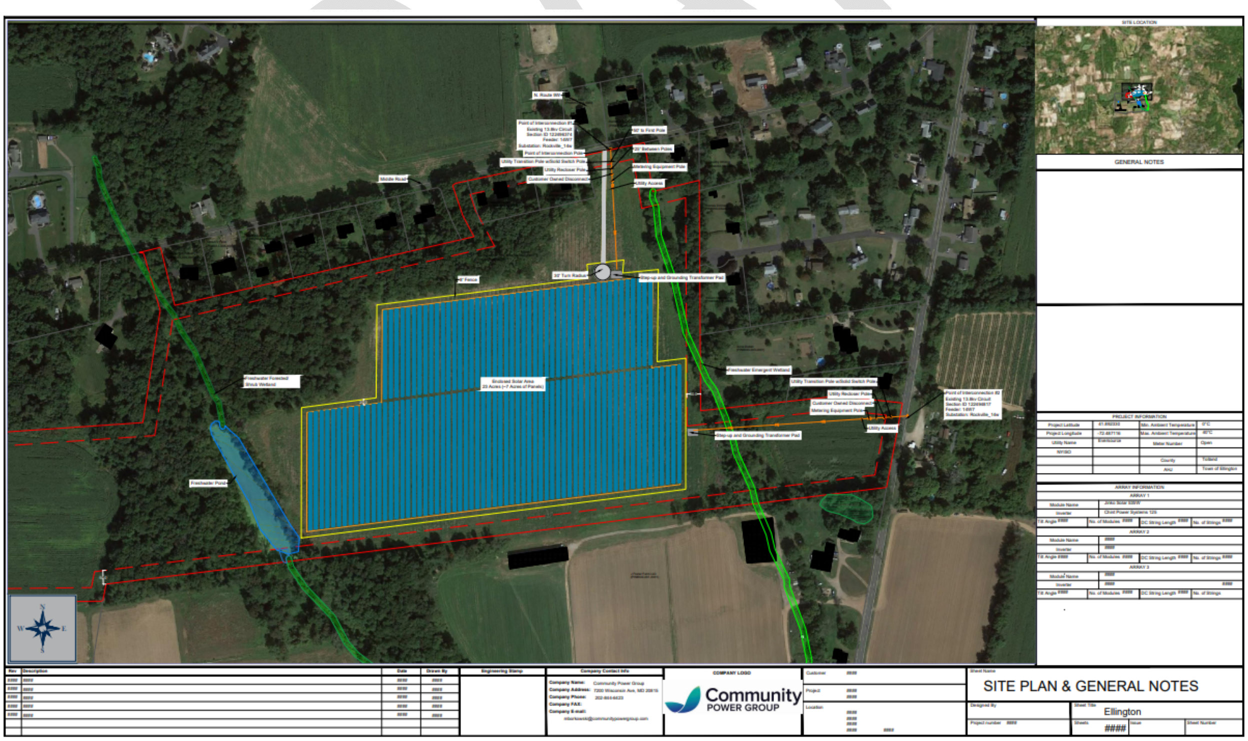

Figure 1: Site plan for Community Power Group Ellington

System Configuration

The primary distribution voltage of the customer is 13.8 kV. The customer will fully export onto the Eversource distribution system. The Rockville 14W7 feeder has 260 kW of generation existing and queued ahead on the circuit with the majority of it comes from residential PV systems. The system was modeled using Synergi™ Electric, with a 98% power factor during maximum and minimum load for the 14W source circuits. The loads were allocated per circuit feeder head prior to analysis. The proposed system was modeled with a unity power factor. Simulations during minimum and maximum loading periods were studied, with the proposed system on and off. The existing generation always remained on due to no generation falling within one quarter of a mile from the proposed DG project at Pinney Street, Ellington, CT. Day time peak and daytime minimum peak were the studied scenarios for this DG application. During each loading scenario, voltage flicker and rapid voltage change were analyzed in addition to steady state voltages because of this distribution system impact study. During those simulations, voltage and power factor were verified to ensure the circuit still meets regulatory standards after the proposed system is interconnected. A dynamic analysis was also completed due to greater than 100% of the minimum load being carried by the generator (i.e., back feed at the substation).

System Loading and Assumptions

The Rockville 14W substation is fed from two 115kV transmission lines and consists of two transformers, the 14W-1X and the 14W-3X that steps the voltage down to two 13.8kV buses that feeds eight circuits and one transformer 14W-6X that steps the voltage down to 27.6kV bus that feeds one circuit.

The loading information for the primary configuration is as follows. The Rockville 14W-3X transformer, has a peak load of 24 MVA and a daytime minimum load of 8.75 MVA.

Table 1: Generation and Load Data

Source	Maximum Load (MVA)	Minimum Load (MVA)	Existing Generation (MW)	Proposed Generation (MW)
14W-3X	24	8.75	2.783	0.280*

*Does not include the Community Power Group 4 MW project

Generation Characteristics:

Table 2: PV Generator Characteristics	
Generator Manufacturer:	Chint Power Systems America
Generator Model:	CPS SCH125KTL-DO/US-600
Phase:	Three
Max AC Power Output Total:	4 MW
Nominal AC Output Voltage:	600V
Max Continuous Output Current:	167.5A @13.8kV
Power Factor:	1.0
Frequency:	60Hz

Voltage Impact During Normal Operation | Rockville 14W7

CT regulatory requirements require adherence to voltages at -5% to +5% PU. The modeling software uses a nominal voltage of 120 as the output, so the voltages from the model will need to stay between 114 and 126 V. This portion of the study determines if the interconnection can maintain these requirements at peak and minimum loading conditions. The study looks at both peak and minimum loading during time in which the generator is in parallel with the Eversource system. All circuits fed from the Rockville 14W-3X substation transformer were modeled for this analysis.

Peak Loading

At peak loading steady state conditions, with generation at unity power factor and the customer generation connected, the system can sustain voltage within the PURA limitations. The system does not cause any voltage or thermal issues throughout the model.

Table 3: Peak Load									
Circuit Point	Generation Off			95% Generation- Hold Taps			Generation 100% - Steady State		
PCC (V) 14W7	120.8	120.2	119.3	124.9	123.8	122.4	124.9	123.8	122.4
14W7 Feeder Head (V)	123.3	122	122	--	--	--	123.6	122.3	122.3
14W7 Feeder Head (kW)	1545	1514	1726	--	--	--	228	207	412
14W7 Feeder Head (kVAR)	322	323	366	--	--	--	321	331	361
Power Factor (Feeder Head)	97.9	97.8	97.8	--	--	--	58	53.1	75.2
14W-3X (kW)	7915	8039	8215	--	--	--	6618	6751	6922

Generation Off

During this simulation, the proposed PV was turned off while all existing PV remained at full output. As shown in Table 3, above, all voltages readings were within the PURA limitations.

Generation On

Under this simulation, all generators, including the proposed generator, were turned on. As shown in Table 3, all voltages were within the PURA limitations. Power factor does deteriorate as the generation serves local load and increases the VAR flow on the system. The need for an additional capacitor bank to correct to power factor will be at the discretion of the circuit owner.

Generation at 95% - Flicker

Under this simulation, steady state system was locked into place with the proposed PV off. The capacitor banks and regulators in the model were then locked into place. The DG was then turned on to 95%, per Eversource standards. The voltage values were recorded, and the flicker was calculated. The flicker and voltages were acceptable remaining within the ANSI limits for voltage and within the 2% limit spelled out in the Eversource standards as shown in Table 4. It should be noted that the fluctuation in output only occurred with the proposed DG. Eversource typically considers DGs within 0.25 aerial miles of the project. The nearest projects were greater than this distance and did not play a role in the system flicker calculation. Under normal circuit configurations and having all capacitor banks in service, the maximum flicker occurred at 3.39%. A ramp rate will be implemented to reduce the voltage flicker below 2%. Table 4 below illustrates the flicker on all three phases during peak load.

Table 4: Peak Load Flicker			
Phase	A	B	C
PCC	3.39%	3.00%	2.60%

Rapid Voltage Change

For flicker issues, Eversource can mitigate the issue by requiring the DG to install a ramp rate for the introduction of generation after the loss of generation due to a cloud or transient. However, this does not resolve the issue of the impacts to the Eversource distribution system when the DG is taken offline. IEEE 1547-2018 spells out that the rapid voltage change from a DER should not exceed 3%. As shown in Table 5, all rapid voltage change values are within the IEEE 1547-2018 limit of 3%., the maximum RVC occurred at 2.98%. Table 5 below illustrates the RVC on all three phases during peak load.

Table 5: Peak Load Rapid Voltage Change			
Phase	A	B	C
PCC	2.98%	2.91%	2.60%

<ins>Minimum Loading</ins>

At daytime minimum loading steady state conditions, with generation at unity power factor and the customer generation connected, the system can sustain voltage within PURA limitations on all circuits associated with the Rockville 14W-3X configuration. For the minimum load simulation all the voltage control cap banks were turned off. The system does not cause high voltage at the PCC; or elsewhere along the 14W7 circuit.

Table 6: Min Load 36%									
Circuit Point	Generation Off			95% Generation- Hold Taps			Generation 100% - Steady State		
PCC (V) 14W7	121.8	121.5	121.3	125.6	124.9	124.2	125.6	124.9	124.2
14W7 Feeder Head (V)	122.7	122.3	122.3	--	--	--	122.8	122.4	122.4
14W7 Feeder Head (kW)	531	513	596	--	--	--	-771	-788	-708
14W7 Feeder Head (kVAR)	239	249	251	--	--	--	276	288	289
Power Factor (Feeder Head)	91.2	89.9	92.2	--	--	--	-94.1	-93.9	-92.6
14W-3X (kW)	2665	2620	2896	--	--	--	1365	1322	1595

Generation Off

During this simulation, the proposed PV was turned off while all existing PV remained at full output. As shown in Table 6, above, all voltages readings were within the PURA limitations.

Generation On

Under this simulation, all generators, including the proposed generator, were turned on. As shown in Table 6, all voltages were within the PURA limitations.

Generation at 95% - Flicker

The same analysis for voltage flicker was studied during light load conditions. Table 7 below illustrates the voltage flicker. The voltage flicker does not stay within the 2% threshold with the worst-case scenario at 3.12%. A ramp rate will be implemented to reduce the voltage flicker below 2%.

Table 7: Min Load Flicker			
Phase	A	B	C
PCC	3.12%	2.80%	2.39%

Rapid Voltage Change

The same analysis for rapid voltage change was studied during light load conditions. Table 8 below illustrates the rapid voltage change. The rapid voltage change stays within the 3% threshold with the worst-case scenario at 2.96%.

Table 8: Min Load Rapid Voltage Change			
Phase	A	B	C
PCC	2.96%	2.80%	2.39%

Voltage Impact During Unplanned Alternate Operation | Scitico 27H9

This configuration simulates a power outage or fault that occurred upstream from the PV system location. Eversource has a scheme in place so that in this scenario the 14W7-71S will open and the 14W7-92T will close and the 27H9 will pick up the islanded zone of the 27H9 circuit. The alternate configuration load flow analysis on Scitico 27H9 feeder also includes 6 MW Thompson Family Land Trust project.

<u>Peak Loading</u>

At peak loading steady state conditions, with generation at unity power factor and the customer generation connected, the system can sustain voltage within the PURA limitations. The system does not cause any voltage problems throughout the model as seen Table 9. The project did not cause a large amount of voltage flicker which will be mitigated with a ramp rate.

Table 9: Peak Load									
Circuit Point	Generation Off			95% Generation- Hold Taps			Generation 100% - Steady		
PCC (V) 14W7	117.9	119.3	118.8	122	123.3	122.7	122	123.3	122.7
27H9 Feeder Head (V)	122.9	123.3	123.3	--	--	--	123.1	123.4	123.5
27H9 Feeder Head (kW)	1688	1055	707	--	--	--	421	-224	-572
27H9 Feeder Head (kVAR)	577	526	457	--	--	--	553	490	412
Power Factor	94.6	89.5	84	--	--	--	60.6	-41.6	-81.2
27H-2X (kW)	4920	4920	4920	--	--	--	3750	3750	3750

Generation Off

During this simulation, the proposed PV was turned off while all existing PV remained at full output. As shown in Table 9, above, all voltages readings were within the PURA limitations.

Generation On

Under this simulation, all generators, including the proposed generator, were turned on. As shown in Table 9, all voltages were within the PURA limitations.

Generation at 95% - Flicker

The same analysis for voltage flicker was studied during light load conditions. Table 10 below illustrates the voltage flicker. The voltage flicker did not stay within the 2% threshold with the worst-case scenario at 3.48%. This issue will be eliminated with a ramp rate.

Table 10: Peak Load Flicker			
Phase	A	B	C
PCC	3.48%	3.35%	3.28%

Rapid Voltage Change

The same analysis for rapid voltage change was studied during light load conditions. Table 11 below illustrates the rapid voltage change. The rapid voltage change stays within the 3% threshold with the worst-case scenario at 2.98%.

Table 11: Peak Load Rapid Voltage Change			
Phase	A	B	C
PCC	2.98%	2.97%	2.98%

<u>Minimum Loading</u>

At daytime minimum loading steady state conditions, with generation at unity power factor and the customer generation connected, the system can sustain voltage within PURA limitations on all circuits associated with the Scitico 27H9. The system does not cause high voltage at the PCC; or elsewhere on the 27H9 feeder.

Table 12: Min Load 32%									
Circuit Point	Generation Off			95% Generation- Hold Taps			Generation 100% - Steady		
PCC (V) 14W7	118.9	118.8	123.1	122	121.7	125.8	122	121.7	125.8
27H9 Feeder Head (V)	122.9	122.9	123.3	--	--	--	122.7	122.7	123
27H9 Feeder Head (kW)	-1103	-1251	-1542	--	--	--	-2361	-2509	-2827
27H9 Feeder Head (kVAR)	666	658	318	--	--	--	829	812	483
Power Factor	-85.6	-88.5	-97.9	--	--	--	-94.4	-95.1	-98.6
27H-2X (kW)	3770	3770	3770	--	--	--	5020	5020	5020

Generation Off

During this simulation, the proposed PV was turned off while all existing PV remained at full output. As shown in Table 12 above, all voltages readings were within the PURA limitations.

Generation On

Under this simulation, all generators, including the proposed generator, were turned on. As shown in Table 12, all voltages were within the PURA limitations.

Generation at 95% - Flicker

The same analysis for voltage flicker was studied during light load conditions. Table 13 below illustrates the voltage flicker. The voltage flicker does not stay within the 2% Eversource threshold with the worst-case scenario at 2.61%. Voltage flicker will be eliminated using a ramp rate. Implementing a ramp rate will further limit the impacts of this fluctuating resource.

Table 13: Min Load Flicker			
Phase	A	B	C
PCC	2.61%	2.44%	2.19%

Rapid Voltage Change

The same analysis for rapid voltage change was studied during light load conditions. Table 14 below illustrates the rapid voltage change. The rapid voltage change stays within the 3% PURA threshold with the worst-case scenario at 2.61%.

Table 14: Min Load Rapid Voltage Change			
Phase	A	B	C
PCC	2.61%	2.44%	2.19%

Voltage Impact During Planned Alternate Operation | Rockville 14W-1X

Under this configuration, Eversource would plan maintenance on the Rockville 14W-3X transformer. The 14W-3X transformer would be disconnected via the 14W-3X3-A-2 and 14W-3X3-B-2 breaker. The 14W-1X transformer would pick up the A2 and B2 bus via the 14W-91T-2 and 14W-92T-2 breaker. There is currently 3.07 MWs of queued and installation generation ahead of this project in the queue position on the 14W-3X transformer and 3.59 MW's of queued and installed generation ahead of this project in the queue position on the 14W-1X transformer. Under the N-1 contingency, the 14W-1X transformer would be able to handle this configuration as the aggregate DG contribution (3.07 MW+ 3.59 MW) of 6.66 MW is only 14.3% of the station transformer nameplate capacity of 46.7 MVA.

Peak Loading

At peak loading steady state conditions, with generation at unity power factor and the customer generation connected, the system can sustain voltage within the PURA limitations. The system does not cause any voltage problems throughout the model from the two buses being fed from the 14W-1X transformer. Power factor does deteriorate as the generation serves local load and increases the VAR flow on the system. The need for an additional capacitor bank to correct to power factor will be at the discretion of the circuit owner.

Table 15: Peak Load									
Circuit Point	Generation Off			95% Generation- Hold Taps			Generation 100% - Steady		
PCC (V) 14W7	120.3	120.7	118.6	124.5	124.5	121.9	124.5	124.6	122.1
14W7 Feeder Head (V)	122.7	122.4	121.3	--	--	--	123.2	123	121.9
14W7 Feeder Head (kW)	1534	1518	1703	--	--	--	240	223	416
14W7 Feeder Head (kVAR)	321	321	359	--	--	--	332	328	367
Power Factor	97.9	97.8	97.9	--	--	--	58.7	56.3	75
14W-1X (kW)	17137	16400	17282	--	--	--	15913	15123	15986

Generation Off

During this simulation, the proposed PV was turned off while all existing PV remained at full output. As shown in Table 15 above, all voltages readings were within the PURA limitations.

Generation On

Under this simulation, all generators, including the proposed generator, were turned on. As shown in Table 15, all voltages were within the PURA limitations.

Generation at 95% - Flicker

The same analysis for voltage flicker was studied during light load conditions. Table 16 below illustrates the voltage flicker. The voltage flicker does not stay within the 2% threshold with the worst-case scenario at 3.49%. Voltage flicker will be eliminated using a ramp rate. Implementing a ramp rate will further limit the impacts of this fluctuating resource.

Table 16: Max Load Flicker (N-1)			
Phase	A	B	C
PCC	3.49%	3.15%	2.78%

<u>Minimum Loading</u>

At daytime minimum loading steady state conditions, with generation at unity power factor and the customer generation connected, the system can sustain voltage within PURA limitations on all circuits associated with the Rockville N-1 scheme. The system does not cause high voltage at the PCC; or elsewhere on the Rockville feeders.

Table 17: Min Load 37%									
Circuit Point	Generation Off			95% Generation- Hold Taps			Generation 100% - Steady		
PCC (V) 14W7	121.8	121.8	121.3	125.6	125.2	124.2	125.6	125.2	124.2
14W7 Feeder Head (V)	122.7	122.6	122.3	--	--	--	122.8	122.7	122.4
14W7 Feeder Head (kW)	546	530	615	--	--	--	-755	-772	-683
14W7 Feeder Head (kVAR)	246	257	259	--	--	--	285	293	300
Power Factor	91.2	90	92.1	--	--	--	-93.5	-93.5	-91.5
14W-1X (kW)	5933	5530	6143	--	--	--	4640	4236	4854

Generation Off

During this simulation, the proposed PV was turned off while all existing PV remained at full output. As shown in Table 17, above, all voltages readings were within the PURA limitations.

Generation On
Under this simulation, all generators, including the proposed generator, were turned on. As shown in Table 17, all voltages were within the PURA limitations.

Generation at 95% - Flicker
The same analysis for voltage flicker was studied during light load conditions. Table 18 below illustrates the voltage flicker. The voltage flicker does not stay within the 2% threshold with the worst-case scenario at 3.12%. Voltage flicker will be eliminated using a ramp rate. Implementing a ramp rate will further limit the impacts of this fluctuating resource.

Table 18: Min Load Flicker (N-1)			
Phase	A	B	C
PCC	3.12%	2.79%	2.39%

Regulators and Capacitors
The 14W7 circuit has one 1200KVAR and one 600kVAR capacitor bank and three set of 150A voltage line regulators. The below tables illustrate the regulator and LTC operations that were experienced under the above load flow scenarios. During the minimum load when there was a reverse power flow through the feeder head all the voltage-controlled capacitors were turned off in the Synergi model. There were no capacitor bank operations as a result of the DG ramping on or ramping off due to fluctuation in output.

<u>Primary Configuration: 14W-3X Transformer</u>
Table 19, below, illustrates the regulator tap positions and substation LTC positions before and after the PV system was put into the model. As you can see, there is no tap changes to the substation LTC with the addition of this project.

Table 19: Regulator/LTC Tap Changes Peak Load									
Circuit Point	Generation Off			Generation 100% - Steady State			Tap Changes		
Rockville 14W-3X	-7	-7	-7	-7	-7	-7	0	0	0

As seen below, in Table 20, the regulator and LTC both stayed at their same tap positions with the addition to this project under minimum load.

Table 20: Regulator/LTC Tap Changes Min Load 36%									
Circuit Point	Generation Off			Generation 100% - Steady State			Tap Change		
Rockville 14W-3X	-8	-8	-8	-8	-8	-8	0	0	0

Unplanned Alternate Configuration (27H9): 27H-2X

Table 21, below, illustrates the regulator tap positions and substation LTC positions before and after the PV system was put into the model. As you can see, there is no tap change to the substation LTC with the addition of this project.

Table 21: Regulator/LTC Tap Changes Peak Load									
Circuit Point	Generation Off			Generation 100% - Steady State			Tap Changes		
Rockville 27H-2X	1	1	1	1	1	1	0	0	0

As seen below, in Table 22, the regulator and LTC both stayed at their same tap positions with the addition to this project under minimum load.

Table 22: Regulator/LTC Tap Changes Min Load 32%									
Circuit Point	Generation Off			Generation 100% - Steady State			Tap Change		
Rockville 27H-2X	0	0	0	0	0	0	0	0	0

Risk of Islanding (ROI) Screening

The project underwent the new Sandia screening process to determine the risk of islanding. The first screen asks if there are VAR sources. The system has capacitor banks on the system; this answer is yes. The next question asks if there are rotating machines. The 14W7 feeder does not have any rotating machines. This answer is 'no'. The next question asks if all the other inverters are using the same detection method; this will be answered 'no'. The follow up question is if 33% or higher of the installed inverter capacity on the feeder has Group 1 or Group 2A generic islanding detection methods. The Chint Power Systems America inverters that the developer proposed uses the Group 2B detection methods. This question gets answered no. Lastly, do 50% or higher of the installed inverters capacity on the feeder have group 2B? This project accounts for 76% of the generation on the circuit and uses a 2B detection method which results in a passing screen. Due to this screening process, the project does *not* intend to have a risk of islanding and the detection methods should suffice for detecting an island. These results can be seen in figure 4 below. This methodology is consistent with leading practices from other utilities who rely on the inverter islanding detection methods.

Condition	Answer
VAR source in the zone? (Rotating Machine, capacitor, underground cable, STATCOM, etc)	Yes
Rotating Machines in the zone?	No
Inverters with the same UIDM as the proposed project?	No
Do 33% or higher of the installed inverter capacity on the feeder have Group 1 or 2A IDM?	No
Do 50% or higher of the installed inverter capacity on the feeder have Group 2B IDM?	Yes
All inverters are Group 5 IDM?	No
All inverters are Group 2c IDM?	No
Is the zone net-capacitive?	No
All inverters are Group 3,4, or 6?	No
Are there more than 5 inverters connected to the feeder with a Y-grounded transformer?	Yes
RESULT	Pass, no further reviews necessary

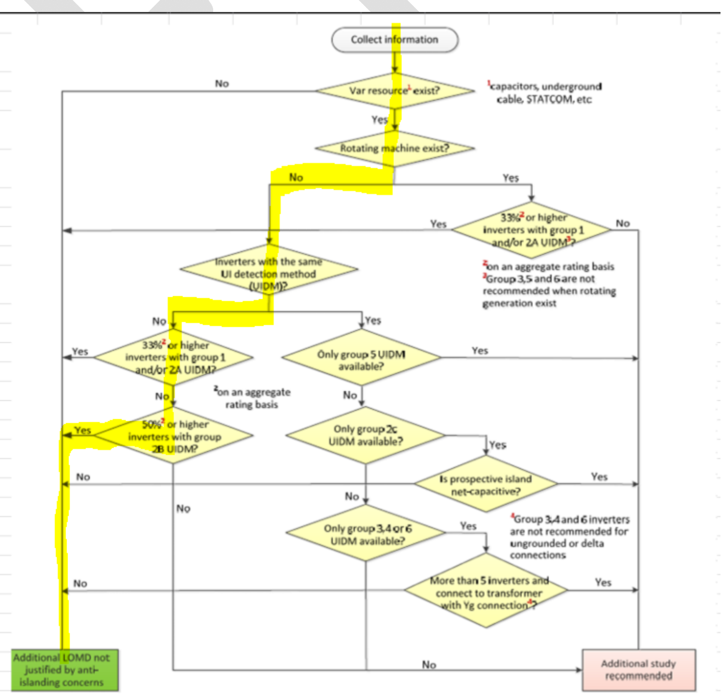

Figure 4: New Sandia screening

System Upgrades and Service

Primary Feed 14W7
The customer will also need a new three phase service consisting of a recloser and one primary meters.

It was determined that system upgrades are necessary for the installation of this DG. The project will need the following:

- Site dedicated recloser
- Primary Meter (1)
- Reconductoring #2 cable type to 556 TW between pole 1193 and 1192 upstream of the project site.
- Install a capacitor bank at the 14W7 feeder head (at the discretion of the circuit owner).

Protection Study
P&C concluded that the system needs additional effective grounding measures. When the project goes to construction a coordination study will be conducted. The customer is expected to follow the Eversource inverter and relay settings. The typical settings mandated by ISO-NE are shown below in Figure 5.

One major aspect related to protecting the proposed system and electric grid, is whether the system is effectively grounded. Below describes the four (4) main criteria looked at to ensure the system is effectively grounded. All four (4) criteria must pass to be deemed effectively grounded.

1. Is the DG less than one (1) megawatt (MW)? *FAIL
2. Does the proposed system pass the anti-islanding concern or in other words, does it pass the generation to load ratio requirement? *YES
3. Does the fault current at the point of common coupling (PCC) stay below a value that's greater than 10% of the existing value? *YES
4. Is the proposed area unknown to excessive fault currents? *YES

Since the system failed One (1) of the four (4) effective grounding conditions, the customer will be responsible for providing additional effective grounding on the 4 MW PV installation.

Appendix C

C.1. Inverter voltage trip settings

Shall Trip Function	Required Settings	
	Voltage (p.u. of nominal voltage)	Clearing Time(s)
OV2	1.20	0.16
OV1	1.10	2.0
UV1	0.88	2.0
UV2	0.50	1.1

C.2. Inverter frequency trip settings

Shall Trip Function	Required Settings	
	Frequency (Hz)	Clearing Time(s)
OF2	62.0	0.16
OF1	61.2	300.0
UF1	58.5	300.0
UF2	56.5	0.16

C.3. Inverter Voltage Ride-through Capability and Operational Requirements

Voltage Range (p.u.)	Operating Mode/ Response	Minimum Ride-through Time(s) (design criteria)	Maximum Response Time(s) (design criteria)
V > 1.20	Cease to Energize	N/A	0.16
1.175<V≤1.20	Permissive Operation	0.2	N/A
1.15<V≤1.175	Permissive Operation	0.5	N/A
1.10<V≤1.15	Permissive Operation	1	N/A
0.88≤V≤1.10	Continuous Operation	infinite	N/A
0.65≤V<0.88	Mandatory Operation	Linear slope of 8.7 s/1 p.u. voltage starting at 3 s @ 0.65 p.u.: $T_{VRT} = 3\,s + \frac{8.7}{1\,p.u.}(V - 0.65\,p.u.)$	N/A
0.45≤V<0.65	Permissive Operation[12]	0.32	N/A
0.30≤V<0.45	Permissive Operation	0.16	N/A
V<0.30	Cease to Energize	N/A	0.16

C.4. Inverter frequency ride-thru capability

Frequency Range (Hz)	Operating Mode	Minimum Time(s) (Design Criteria)
f > 62.0	No ride-through requirements apply to this range	
61.2<f≤61.8	Mandatory Operation	299
58.8≤f≤61.2	Continuous Operation	Infinite
57.0≤f≤58.8	Mandatory Operation	299
f<57.0	No ride-through requirements apply to this range	

C.5. Grid support utility interactive inverter function status

Function	Default Activation State
SPF, Specified Power Factor	Off
Q(V), Volt-Var Function with Watt or Var Priority	Off Default value: 2% of maximum current output per second
SS, Soft-Start Ramp Rate	On
FW, Freq-Watt Function OFF	Off

Figure 5 Smart inverter settings excerpt from Appendix C of Exhibit B – Generator Interconnection Technical Requirements (April 30th, 2018)

Conclusion

Community Power Group has requested to interconnect an aggregate of 4 MW of inverter-based PV generation to the low side of the Rockville 14W substation on the 14W7 feeder at 13.8 kV. The system will be located approximately at Pinney Street, Ellington, CT which is located approximately 3.07 circuit miles from the Rockville 14W substation. The project did not cause any adverse impacts to customer voltages or power quality. The DG did not cause excess capacitor bank operations. The project did not cause any LTC operations. Their operation will be managed by implementing a ramp rate on the project, standard practice for Eversource to eliminate any voltage flicker. This project will be able to connect to the Eversource EPS with the installation of the required upgrades listed in the system upgrades and service section above. A dynamic study in PSCAD was also performed to check Transient Over Voltage (TOV) and Ground Fault over Voltage (GFOV) and no concerns were found in the dynamic study.

Appendices

Appendix A: Distance from the Rockville 14W Substation to the project site.