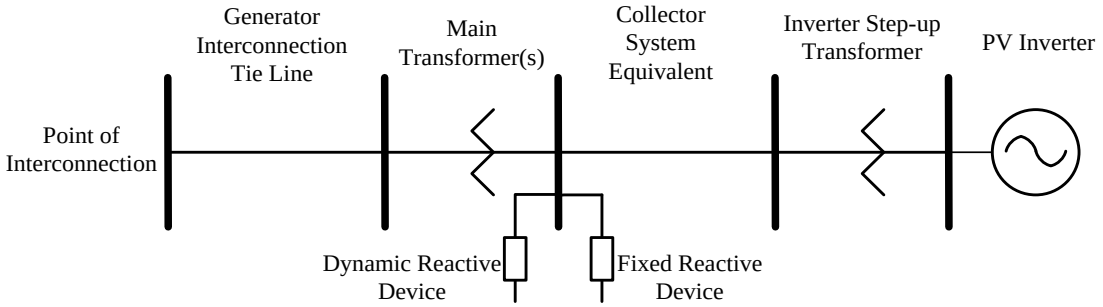
Generator Interconnection Request
Solar Generating Facility Data

Generating Facility Name: _____ Date: _____

Interconnection Service Capacity (Maximum Net Export Capability at POI): _____ MW

1. **Simplified One-Line Diagram.** This should be similar to Figure below. If it is different, please mark the difference on the diagram below.



2. **Generator Interconnection Tie Line.**
Provide either absolute or per unit impedance values.

   a) Point of Interconnection (utility substation/line name): _____

   b) Line voltage: _____ kV, line rating at 95°F ambient: _____ MVA, line length: _____ Miles / Feet

   c) R_1 = _____ ohm or _____ pu on 100 MVA and line kV base (positive sequence)

   d) X_1 = _____ ohm or _____ pu on 100 MVA and line kV base (positive sequence)

   e) B_1 = _____ μF or _____ pu on 100 MVA and line kV base (positive sequence)

   f) R_0 = _____ ohm or _____ pu on 100 MVA and line kV base (zero sequence)

   g) X_0 = _____ ohm or _____ pu on 100 MVA and line kV base (zero sequence)

   h) B_0 = _____ μF or _____ pu on 100 MVA and line kV base (zero sequence)

3. **Main Transformer.** Number of main transformers: _____
Provide data for either two-winding or three-winding transformer as appropriate.

   Two-Winding Main Transformer Data (as applicable)

   a) Rating at 95°F ambient (OA/FA/FA): _____ / _____ / _____ MVA

   b) Nominal Voltage for each winding (Low/High): _____ / _____ kV

   c) Winding Connections (Low/High): Delta or Wye / Delta or Wye

   d) Available tap positions: _____ / _____ / _____ / _____ / _____ kV **or** _____ % _____ # of taps.

   e) Positive sequence impedance Z_1: _____ %, _____ X/R on self-cooled (OA) MVA rating above.

f) Zero sequence impedance Z_0: _____ %, _____ X/R on self-cooled (OA) MVA rating above.

g) For pad mount transformer, construction: 3 / 4 / 5 -legged

Three-Winding Main Transformer Data (as applicable)

h) GSU connection and winding (attach diagram and mark to reference this form).

	H Winding Data	**X Winding Data**	**Y Winding Data**
Full load ratings at 95°F ambient (i.e. OA/FA/FA)	_____/_____/_____ MVA	_____/_____/_____ MVA	_____/_____/_____ MVA
Rated winding voltage base	_____ kV Delta or Wye connected	_____ kV Delta or Wye connected	_____ kV Delta or Wye connected
Tap positions available	_____/ _____/ _____/ _____/ _____ kV	_____/ _____/ _____/ _____/ _____ kV	_____/ _____/ _____/ _____/ _____ kV
Present Tap Setting (if applicable)	_____ kV	_____ kV	_____ kV
Neutral solidly grounded? (or) Neutral Grounding Resistor (if applicable)	_____ _____ Ohms	_____ _____ Ohms	_____ _____ Ohms
BIL rating	_____ kV	_____ kV	_____ kV

Three-Winding Main Transformer Impedance Data (as applicable)

	H-X Winding Data	**H-Y Winding Data**	**X-Y Winding Data**
Transformer base for impedances provided	_____ MVA	_____ MVA	_____ MVA
Positive sequence impedance Z_1	_____ % _____ X/R	_____ % _____ X/R	_____ % _____ X/R
Zero sequence impedance Z_0	_____ % _____ X/R	_____ % _____ X/R	_____ % _____ X/R

Additional Data for either Two-Winding or Three-Winding Main Transformer

i) Air core inductance: _____pu (From H winding side on _____MVA Base)

j) No load test results:

1) Rated Voltage of Winding at which current is determined: _____kV

2) Current at 90% / 100% / 110% of rated voltage: _____ / _____ / _____ A

3) Losses at 90% / 100% / 110% of rated voltage: _____ / _____ / _____ W

k) Provide Rapid Voltage Change (RVC) mitigation strategy on main transformer energization (**required** if valid air core inductance and no load test data cannot be provided, or if deficiency is identified):

☐ Main Transformer to be energized from the high side with a switching device that is equipped with pre-insertion resistors.

☐ Other mitigation: _____

4. Collector System Equivalent Model.
Provide either absolute or per unit impedance values.

a) Collector system voltage = _____ kV

b) Collector system equivalent model rating at 95°F ambient = _____ MVA

c) R_1 = _____ ohm or _____ pu on 100 MVA and line kV base (positive sequence)

d) X_1 = _____ ohm or _____ pu on 100 MVA and line kV base (positive sequence)

e) B_1 = _____ μF or _____ pu on 100 MVA and line kV base (positive sequence)

f) R_0 = _____ ohm or _____ pu on 100 MVA and line kV base (zero sequence)

g) X_0 = _____ ohm or _____ pu on 100 MVA and line kV base (zero sequence)

h) B_0 = _____ μF or _____ pu on 100 MVA and line kV base (zero sequence)

5. **Inverter Step-Up Transformers.** Number of inverter transformers: _____
Provide data for either two-winding or three-winding transformer as appropriate

Two-Winding Inverter Step-Up Transformer Data (as applicable):

a) Nameplate Rating (at 95°F ambient): _____ MVA

b) Maximum Rating (if applicable): _____ MVA

c) Nominal Voltage for each winding (Low/High): _____ / _____ kV

d) Winding Connections (Low/High): Delta or Wye / Delta or Wye

e) Available taps: _____ / _____ / _____ / _____ / _____ kV **or** _____ % _____ # of taps.

f) Positive sequence impedance (Z_1) _____ %, _____ X/R on MVA rating above.

g) Zero sequence impedance (Z_0) _____ %, _____ X/R on MVA rating above.

Three-Winding Inverter Step-Up Transformer Data (as applicable)

h) GSU connection and winding (attach diagram and mark to reference this form).

	H Winding Data	**X Winding Data**	**Y Winding Data**
Full load ratings at 95°F ambient (i.e. OA/FA/FA)	_____/_____/_____ MVA	_____/_____/_____ MVA	_____/_____/_____ MVA
Rated winding voltage base	_____ kV Delta or Wye connected	_____ kV Delta or Wye connected	_____ kV Delta or Wye connected
Tap positions available	_____/ _____/ _____/ _____/ _____ kV	_____/ _____/ _____/ _____/ _____ kV	_____/ _____/ _____/ _____/ _____ kV
Present Tap Setting (if applicable)	_____ kV	_____ kV	_____ kV
Neutral solidly grounded? (or) Neutral Grounding Resistor (if applicable)	_____ _____ Ohms	_____ _____ Ohms	_____ _____ Ohms
BIL rating	_____ kV	_____ kV	_____ kV

Three-Winding Inverter Step-Up Transformer Impedance Data (as applicable)

	H-X Winding Data	**H-Y Winding Data**	**X-Y Winding Data**
Transformer base for impedances provided	_____ MVA	_____ MVA	_____ MVA
Positive sequence impedance Z_1	_____ % _____ X/R	_____ % _____ X/R	_____ % _____ X/R
Zero sequence impedance Z_0	_____ % _____ X/R	_____ % _____ X/R	_____ % _____ X/R

6. Inverter Data.

a) Number of Inverters: _____

b) Inverter maximum capability at 95°F/35°C or higher: _____ kW/ _____ kVA

c) Describe inverter reactive capability: _____

d) Inverter short circuit ratio limit: _____

e) Inverter Manufacturer and Model #: _____

f) Provide with this form the inverter specification sheet with reactive capability curve. ☐ **Attached**

g) Type of photovoltaic system: Fixed or Tracked

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7. Plant Reactive Power Compensation (beyond the inverters built-in reactive capability)**.**

a) Type of reactive compensation device(s): Fixed or Dynamic

b) Individual fixed shunt reactive device type: _____

- Number and size of each: _____×_____ MVA

c) Dynamic reactive control device (e.g., SVC, STATCOM): _____

d) Control range at rated MW output: _____ Mvar (lead and lag)

e) Control mode (e.g., voltage, power factor, reactive power): _____

f) Regulation point: _____

g) Describe the overall reactive power control strategy: _____

8. Dynamic Modeling Data.

a) Provide with this form 2nd generation standard/generic dynamic models for the inverter, and any additional dynamic reactive control devices. **Standard/Generic Models Attached** ☐

- Include plant volt/var control function model and active power/frequency control function model.
- All the associated files, including source code for user-written models, for dynamic modeling should be in PSS/E version 33, and must be shareable on an interconnection-wide basis to support use in the interconnection-wide cases.
- Model parameters must be set for the inverter to operate according to PowerSouth's requirements for Inverter-Based Generation, including:

(1) Voltage response and ride-thru settings.
(2) Frequency response and ride thru settings.
(3) Control mode (as determined by PowerSouth)
(4) Q-Priority (as determined by PowerSouth)
(5) Any plant-level real power limits.

b) In addition, if the standard model does not accurately represent the equipment's dynamic response, user-written models should be submitted along with the standard model. The user-written models must include the model characteristics, including block diagrams, values and names for all model parameters and a list of all state variables.

User-Written Models Attached ☐

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9. Three-Phase Modeling Data.

a) Provide with this form a three-phase model for the for the inverter, and any additional dynamic reactive control devices. **Attached** ☐

10. Short Circuit Contribution of the Generating Facility at the Point of Interconnection.

a) Maximum Three Phase Fault Current: _____ Amps and Duration: _____

b) Maximum Single Line to Ground Fault* Current: _____ Amps and Duration: _____
* Single Line to Ground Fault at the Point of Interconnection with ties to utility at the POI open.

11. Harmonic Distortion of the plant at Point of Interconnection.

a) Total Harmonic Current Distortion: _____ %

b) Provide with this data form the individual harmonic currents through 49th harmonic, in % of fundamental current rating. **Attached** ☐