

Union Power Cooperative

Application for Operation of Customer-Owned Generation

This application should be completed and returned to the _____ representative in order to begin processing the request.

INFORMATION: This application is used by Union Power Cooperative to determine the required equipment configuration for the Customer interface. Every effort should be made to supply as much information as possible.

PART 1 OWNER/APPLICANT INFORMATION

Legal Name of the Interconnection Customer (or, if an individual, individual's name)

Name: _____

Contact Person: _____

Mailing Address: _____

City: _____ County: _____ State: _____ Zip Code: _____

Facility Location (if different from above): _____

Phone Number: _____ Fax Number: _____

Email Address: _____

PROCESSING FEE OR DEPOSIT

Fast Track Process – Non-Refundable Processing Fees

If the interconnection Request is submitted under the Fast Track Process, the non-refundable processing fee is as follows:

If the Generating Facility is 20 kW or smaller, the fee is \$250.

If the Generating Facility is larger than 20 kW but not larger than 100 kW, the fee is \$250.

If the Generating Facility is larger than 100 kW but not larger than 2 MW, the fee is \$500.

Study Process Deposit

If the Interconnection Request is submitted under the Study Process, whether a new submission or an Interconnection Request that did not pass the Fast Track Process, the Interconnection Customer shall submit to the Cooperative an Interconnection Facilities Deposit Charge of \$20,000 plus \$1.00 per kW_{AC}.

GENERATING FACILITY INFORMATION

Energy Source:

Solar ___ Wind ___ Hydro ___ Hydro Type (e.g. Run-of-River) ___ Diesel ___ Natural Gas ___
Fuel Oil ___ Other (state type) _____

Prime Mover:

Fuel Cell ___ Recip Engine ___ Gas Turbine ___ Steam Turbine ___ Microturbine ___ PV ___
Other _____

Type of Generator: Synchronous ___ Induction ___ Inverter ___

Total Generator Nameplate Rating: _____ kW_{AC} (Typical) _____ kVAR

Interconnection Customer or Customer-Site Load: _____ kW (if none, so state)

Interconnection Customer Generator Auxiliary Load: _____ kW

Typical Reactive Load (if known): _____ kVAR

Maximum Physical Export Capability Requested: _____ kW_{AC}

List components of the Generating Facility equipment package that are currently certified:

	Number	Equipment Type	Certifying Entity
1.	_____	_____	_____
2.	_____	_____	_____
3.	_____	_____	_____
4.	_____	_____	_____
5.	_____	_____	_____

Generator (or solar panel information)

Manufacturer, Model Name, & Number of units: _____

Nameplate Output Power Rating in kW_{AC}: _____ Summer _____ Winter

Nameplate Output Power Rating in kVA: _____ Summer _____ Winter

Individual Generator Rated Power Factor: Leading _____ Lagging _____

Total Number of Generators in wind farm to be interconnected pursuant to this Interconnection

Request (if applicable): _____ Elevation: _____

Inverter Manufacturer, Model Name, & Number (if used): _____

Note: A completed Power Systems Load Flow data sheet must be supplied with the Interconnection Request.

For solar projects provide the following information:

Latitude: _____ Degrees _____ Minutes North

Longitude: _____ Degrees _____ Minutes West

Orientation: _____ Degrees (Due South=180°)

Fixed Tilt Array ____ Single Axis Tracking Array ____ Double Axis Tracking Array ____

Fixed Tilt Angle: _____ Degrees

GENERATING FACILITY CHARACTERISTICS DATA (for inverter-based machines)

Max design fault contribution current: _____ Instantaneous ____ or RMS? ____

Harmonics Characteristics: _____

Start-up requirements: _____

Inverter Short-Circuit Model Data

Model and parameter data required for short-circuit analysis is specific to each PV inverter make and model. All data to be provided in per-unit ohms, on the equivalent inverter MVA base.

Inverter Equivalent MVA Base: _____ MVA

Short-Circuit Equivalent Pos. Seq. Resistance (R1), valid for initial 2 to 6 cycles: _____ p.u.

Short-Circuit Equivalent Pos. Seq. Reactance (XL1), valid for initial 2 to 6 cycles: _____ p.u.

Short-Circuit Equivalent Neg. Seq. Resistance (R2), valid for initial 2 to 6 cycles: _____ p.u.

Short-Circuit Equivalent Neg. Seq. Reactance (XL2), valid for initial 2 to 6 cycles: _____ p.u.

Short-Circuit Equivalent Zero Seq. Resistance (R0), valid for initial 2 to 6 cycles: _____ p.u.

Short-Circuit Equivalent Zero Seq. Reactance (XL0), valid for initial 2 to 6 cycles: _____ p.u.

Special notes regarding short-circuit modeling assumptions:

GENERATING FACILITY CHARACTERISTICS DATA (for rotating machines)

RPM Frequency: _____

(*) Neutral Grounding Resistor (if applicable): _____

Synchronous Generators:

Direct Axis Synchronous Reactance, X_d : _____ P.U.

Direct Axis Transient Reactance, X'_d : _____ P.U.

Direct Axis Subtransient Reactance, X''_d : _____ P.U.

Negative Sequence Reactance, X_2 : _____ P.U.

Zero Sequence Reactance, X_0 : _____ P.U.

KVA Base: _____

Field Volts: _____

Field Amperes: _____

Induction Generators:

Motoring Power (kW): _____

I_2^2t or K (Heating Time Constant): _____

Rotor Resistance, R_r : _____

Stator Resistance, R_s : _____

Stator Reactance, X_s : _____

Rotor Reactance, X_r : _____

Magnetizing Reactance, X_m : _____

Short Circuit Reactance, X_d'' : _____

Exciting Current: _____

Temperature Rise: _____

Frame Size: _____

Design Letter: _____

Reactive Power Required In Vars (No Load): _____

Reactive Power Required In Vars (Full Load): _____

Total Rotating Inertia, H: _____ Per Unit on kVA Base

Note: Please contact the Cooperative prior to submitting the Interconnection Request to determine if the specified information above is required.

EXCITATION AND GOVERNOR SYSTEM DATA FOR SYNCHRONOUS GENERATORS ONLY

Provide appropriate IEEE model block diagram of excitation system, governor system and power system stabilizer (PSS) in accordance with the regional reliability council criteria. A PSS may be

determined to be required by applicable studies. A copy of the manufacturer's block diagram may not be substituted.

INTERCONNECTION FACILITIES INFORMATION

Will more than one transformer be used between the generator and the point of common coupling?

Yes ___ No ___ (If yes, copy this section and provide the information for each transformer used. This information must match the single-line drawing and transformer specification sheets.)

Will the transformer be provided by the Interconnection Customer? Yes ___ No ___

Transformer Data (if applicable, for Interconnection Customer-owned transformer):

Is the transformer: Single phase ___ Three phase ___ Size: _____ kVA

Transformer Impedance: _____ % on _____ kVA Base

If Three Phase:

Transformer Primary _____ Volts, Delta ___ Wye , floating neutral ___
Wye Grounded neutral ___

Transformer Secondary _____ Volts, Delta ___ Wye , floating neutral ___
Wye Grounded neutral ___

Transformer Tertiary: _____ Volts, Delta ___ Wye , floating neutral ___
Wye Grounded neutral ___

Transformer Fuse Data (if applicable, for Interconnection Customer-owned fuse):

(Attach copy of fuse manufacturer's Minimum Melt and Total Clearing Time-Current Curves)

Manufacturer: _____ Type: _____ Size: _____ Speed: _____

Interconnecting Circuit Breaker (if applicable):

Manufacturer: _____ Type: _____
Load Rating (Amps): _____ Interrupting Rating (Amps): _____ Trip Speed (Cycles): _____

Interconnection Protective Relays (if applicable):

If Microprocessor-Controlled:

List of Functions and Adjustable Setpoints for the protective equipment or software:

	Setpoint Function	Minimum	Maximum
1.	_____	_____	_____
2.	_____	_____	_____

3.	_____	_____	_____
4.	_____	_____	_____
5.	_____	_____	_____
6.	_____	_____	_____

If Discrete Components:

(Enclose Copy of any Proposed Time-Overcurrent Coordination Curves)

Manufacturer: __ Type: _____ Style/Catalog No.: ____ Proposed Setting: _____
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Manufacturer: __ Type: _____ Style/Catalog No.: ____ Proposed Setting: _____
Manufacturer: __ Type: _____ Style/Catalog No.: ____ Proposed Setting: _____

Current Transformer Data (if applicable):

(Enclose Copy of Manufacturer’s Excitation and Ratio Correction Curves)

Manufacturer: _____
Type: _____ Accuracy Class: _____ Proposed Ratio Connection: _____

Manufacturer: _____
Type: _____ Accuracy Class: _____ Proposed Ratio Connection: _____

Potential Transformer Data (if applicable):

Manufacturer: _____
Type: _____ Accuracy Class: _____ Proposed Ratio Connection: _____
Manufacturer: _____
Type: _____ Accuracy Class: _____ Proposed Ratio Connection: _____

General Information

1. One-line diagram

Enclose site electrical one-line diagram showing the configuration of all Generating Facility equipment, current and potential circuits, and protection and control schemes.

- The one-line diagram should include the project owner’s name, project name, project address, model numbers and nameplate sizes of equipment, including number and nameplate electrical size information for solar panels, inverters, wind turbines, disconnect switches, latitude and longitude of the project location, and tilt angle and orientation of the photovoltaic array for solar projects.
- The diagram should also depict the metering arrangement required whether installed on the customer side of an existing meter (“net metering/billing”) or directly connected to the grid through a new or separate delivery point requiring a separate meter.
- List of adjustable set points for the protective equipment or software should be included on the electrical one-line drawing.
- This one-line diagram must be signed and stamped by a licensed Professional Engineer if the Generating Facility is larger than 50 kW.

- Is One-Line Diagram Enclosed? Yes ___ No ___

2. Site Plan

- Enclose copy of any site documentation that indicates the precise physical location of the proposed Generating Facility (e.g., USGS topographic map, or other diagram or documentation) and the proposed Point of Interconnection.
- Proposed location of protective interface equipment on property (include address if different from the Interconnection Customer's address)_____
- _____
- Is Site Plan Enclosed? Yes ___ No ___
- Is Site Control Verification Form Enclosed? Yes ___ No ___

3. Equipment Specifications

Include equipment specification information (product literature) for the solar panels and inverter(s) that provides technical information and certification information for the equipment to be installed with the application.

- Are Equipment Specifications Enclosed? Yes ___ No ___

4. Protection and Control Schemes

- Enclose copy of any site documentation that describes and details the operation of the protection and control schemes.
- Is Available Documentation Enclosed? Yes ___ No ___
- Enclose copies of schematic drawings for all protection and control circuits, relay current circuits, relay potential circuits, and alarm/monitoring circuits (if applicable)
- Are Schematic Drawings Enclosed? Yes ___ No ___

SIGN OFF AREA

The customer agrees to provide [the Cooperative] with any additional information required to complete the interconnection. The customer shall operate his equipment within the guidelines set forth by the cooperative.

Applicant

Date

UNION POWER COOPERATIVE CONTACT FOR APPLICATION SUBMISSION AND FOR MORE INFORMATION:

Cooperative contact:

Title: _____

Address: _____

Phone: _____

Fax: _____

E-mail: _____