



## CITY OF CENTRALIA

### INTERCONNECTION STANDARDS For Customer-Owned, Grid Connected Electric Generating Systems

(Appendix B to Interconnection & Net Metering Agreement)

#### A. General

This "Interconnection Standard for Customer-Owned, Grid Connected Electric Generating Systems" sets forth the requirements and conditions for interconnected non-utility-owned electric generation where such generation may be connected for parallel operation with the electrical system of the City of Centralia (City Light). Generating systems will be permitted to interconnect to the City Light's electric distribution system (15kV and below) only after a determination by the City Light that such interconnection will not interfere with the operation of the distribution circuit.

#### B. Interconnection Requirements

1. Customer shall comply with all the latest applicable National Electric Code (NEC) requirements [NEC Articles 690 and 705], NESC requirements, State of Washington requirements, building codes, and shall obtain electrical permit(s) for the equipment installation.
2. Any system over 25kW needs to have the customer on a dedicated transformer.
3. Customer shall provide space for metering equipment and meter base as per City requirements.
4. Customer's over-current device at the service panel shall be marked to indicate power source and connection to the City's distribution system.
5. The Customer shall assume the full responsibility for all maintenance of the generator and protective equipment and keeping of records for such maintenance. These records shall be available to the City for inspection at all times.
6. Customer's power production control system shall comply with NEC Articles 690 and 705; and applicable and current Institute of Electrical and Electronics Engineers (IEEE) Standards including Standard number 1547 "Interconnecting Distributed Resources with Electric Power Systems" for parallel operation with the City; in particular the:
  - a. Power output control system shall automatically disconnect from the City power source upon loss of City voltage and not reconnect until the City's voltage has been restored for at least five (5) minutes continuously.
  - b. Power output control system shall automatically initiate a disconnect from the City source within six (6) cycles if Customer's voltage falls below 60 Volts rms to ground (nominal 120 V rms base) on any phase.
  - c. Power output control system shall automatically initiate a disconnect from the City's system within two (2) seconds if the voltage rises above 132 Volts rms phase to ground or falls below 104 Volts rms phase to ground (nominal 120 V rms base) on any phase.
  - d. Power output control system shall automatically initiate a disconnect from the City's system within three (3) cycles for any reverse power flow condition.



7. Customer shall provide a written description of how the protection devices will achieve compliance with the requirements of this policy.
8. Customer shall furnish and install on customer's side of the meter, a UL-approved safety disconnect switch which shall be capable of fully disconnecting the Customer's generating facility from the City's electric system. The disconnect switch shall be located adjacent to the City's meters and shall be of the visible break type in a metal enclosure which can be secured by a padlock. The disconnect switch shall be accessible to City personnel at all times.
9. Meter Location: The CCL Production Meter must be located outdoors and adjacent (minimum of 10 inches and a maximum of 6 feet) to the existing CCL Service Meter. All other Location Requirements, Grounding Requirements, and Clearance requirements for the CCL Production Meter are identical to those for a CCL service Meter.
10. CCL will consider variance request for alternate Production Meter locations in the rare situations where locating adjacent to the existing service meter is truly impractical or cost prohibitive. A variance for an alternate Production Meter location must be obtained prior to construction.
11. **Solar Photovoltaic Equipment** shall be in compliance with Underwriters Laboratories (UL) 1741, *Standard for Static Inverters and Charge Controllers for Use in Photovoltaic Systems*; UL 1703, *Standard for Safety: Flat-Plate Photovoltaic Modules and Panels*; and IEEE 1262-1995, *Recommended Practice for Qualification of Photovoltaic (PV) Modules*; and the solar system shall be installed in compliance with IEEE Standard 929-2000, *Recommended Practice for Utility Interface of Photovoltaic Systems*.
12. Meter and transformer or transformer pole serving the Customer-Generator shall be labeled to indicate potential electric current back feed. The Utility will provide and install labels when Customer-Generator's electric system is approved for interconnection.

#### C. Safety

All Safety and operating procedures for joint use equipment shall be in compliance with the Occupational Safety and Health Administration (OSHA) standard 29 CFR 1910.269, the National Electrical Code (NEC), State of Washington rules, City standards, and equipment manufacturer's safety and operating manuals.

#### D. Guidelines For System Diagrams

The required System Diagram is one of the most important parts of the application for interconnection. The system diagram is used by CITY LIGHT Engineering during the review and approval process, and again during field testing and meter installation. The diagram is a permanent record copy of the system and is filed at CITY LIGHT for reference.

A good diagram can greatly shorten the CITY LIGHT engineering review period and helps ensure CITY LIGHT's field testing and meter installation are straightforward. Incomplete diagrams are one of the largest sources of delays during the application process. Discrepancies between the diagram and the actual installation as built are cause for rejection at the final testing and net meter installation, which in turn means rescheduling and a significant delay in activating the system.

The System Diagram can be anything from a One-Line, to a Schematic, to a complete Wiring Diagram that shows every wire and every connection throughout. Any of these are acceptable as long as the minimum key information is included. The diagram does not need to be overly complex, but accuracy and clarity are critical. The sample diagram on page 3 is for a typical PV System and is very simple, but it contains all the technical information for CITY LIGHT.



At a minimum, the System Diagram must show how the components of the customer generator system are connected electrically. Additional information, such as equipment part numbers and physical locations, should also be included on the diagram. Some of this additional information may be contained in the application forms as well, but documenting it on the System Diagram provides a single complete reference for the project and speeds the engineering reviews and field work.

*Note: These guidelines and the sample diagram are applicable for systems using a UL-1741 approved synchronous inverter. Systems not using a UL-1741 inverter have more complex requirements for interconnection and will require much more significant design drawings for review and approval.*

The System Diagram should provide the information as described below. Refer to the sample diagram on the following page for an example.

- Generator (PV Panels, Wind Turbine, Hydro Turbine, etc.)  
Include manufacturer, part number, nameplate maximum capacity (kW), and physical location. For modular systems (e.g. pv panels), also include: number of modules, configuration, nameplate maximum capacity of each module, and total nameplate maximum capacity.
- Inverter  
Include manufacturer, type or series, part number, serial number, nameplate maximum capacity (kW), output voltage, physical location.
- Production Meter Socket  
Diagram must show polarity (line/load), and identify the physical location relative to the City Light Service Meter.
- Disconnect Switch  
Include the physical location relative to the CITY LIGHT Service Meter.
- Electrical Service Panel  
Include the panel or main breaker size and the position at which the generation is connected. Show all panels (if there are multiple panels or subpanels) even if not directly connected into the generation system.
- CITY LIGHT Service Meter  
Include existing meter serial number, meter form, and class
- Other Related Equipment (battery banks, transfer or bypass switches, backup generators, etc.)  
These items are typically associated with more custom and complex systems.  
Providing accurate information and connection diagrams is especially important as these systems are not as "routine" and because Production Metering can become complex.

## Typical System Diagram

