

Section 7 – Interconnects and Distributed Generation

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7-1 Standby Generation

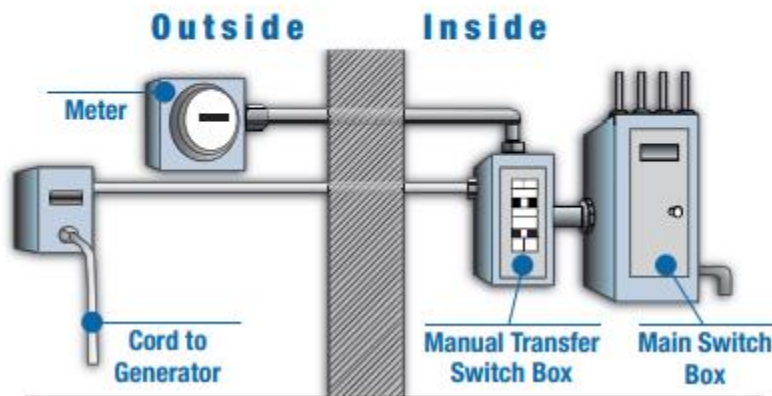
Permanent Generators:

The customer shall install an approved double-throw switch or throw over switches that are mechanically interlocked, are of adequate current and voltage rating and are so connected that the customer's generating equipment cannot energize the Company's supply lines. Refer to NEC articles 702 and 710. Must be rated as Service Entrance Equipment if ahead of the main and must be UL listed as a transfer switch under UL 1008.

- Before permanently installing a generator, contact your local electrical inspector and a qualified electrician to obtain the proper permits and connection criteria. Always read the Owner's Manual provided with your generator to obtain specific operating guidelines.

GENERATOR INSTALLATION

Below is an example of a properly installed generator.



- Permanent generators must meet local, state and national fire and electric codes and should only be installed by a licensed electrical contractor.
- There are several ways to connect your generator to your home's wiring circuit. However, the generator must be electrically isolated from the Company's distribution system.
 - A double-throw transfer switch, or similarly approved isolation switch, must be installed to isolate the generator from the Company's distribution system.
 - Be sure to obtain the proper electric permits and have your installations inspected.
 - The double-throw or throw over switch may be manually or automatically operated. Customer-owned generating equipment shall not operate in parallel with the Company's system except under specific contract with the Company covering the conditions of such operation.
 - Meter base mounted transfer systems are not allowed (GenerLink)
- Please notify the Company when installing a permanent generator for the safety of our utility personnel.

Portable Generators:

- Open the main breaker (or disconnect) on your panel when running a portable generator.
 - Never pull your electric meter to disconnect from the utility's distribution system.
 - A direct connection to the distribution system could result in great harm to utility personnel and cause damage to your home, neighboring homes and the generator, to which you will be liable.
- See Appendix B for general information on generator use.

7-2 Parallel Generation

Parallel Generation System:

A parallel generation system allows the transfer of electrical energy from the customer's generator into the Company's distribution system. Consult the Company for specific details. There are safety, liability, and contractual requirements.

Interconnection Process

Customer Project Planning Phase:

An applicant may contact the Company before or during the application process regarding the project. The Company can be reached by phone, e-mail, or by the external website to access information, forms, rates, and agreements.

Application

The Project Developer must first submit an Interconnection Application or a Combined Interconnection and Net Metering Application to the Company. A separate application is required for each Project, or Project site. The blank Interconnection Application or Combined Interconnection and Net Metering Application can be found on the Company website:

<https://www.uppco.com/residential/customer-generated-electricity/>

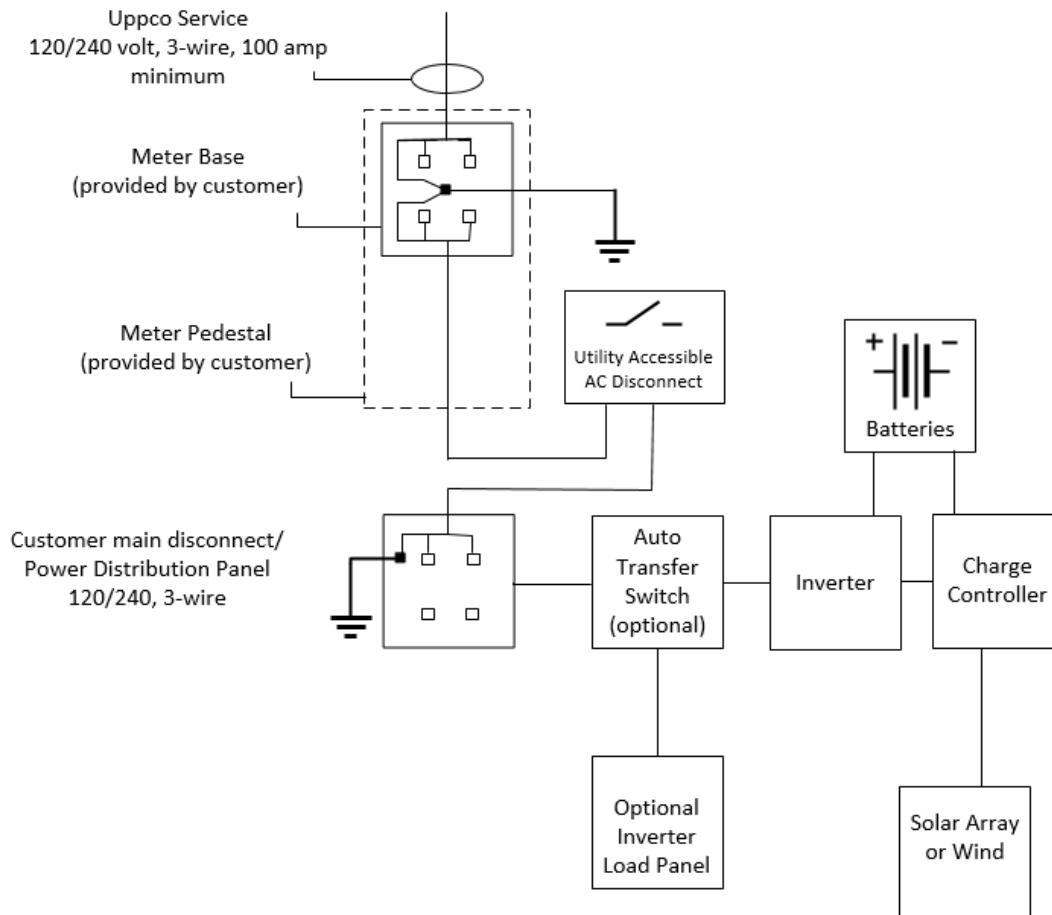
Design Example

Below is an example of a typical solar/wind parallel generation system. There are several notes about the system:

1. **Inverter:** Supply Make, Model and Power rating. Needs to be UL1741 and IEEE 1547 Compliant
2. **Utility Accessible AC Disconnect:** shall be lockable with visible open. Must also be clearly visible, labeled, accessible and within 10' of billing meter on the exterior of the building/home. The Company reserves the right to operate this switch if needed for circuit isolation.
 - a. The disconnect shown below can also be in between the inverter and customer power panel.
3. **Solar Panels:** Supply number of PV modules, make and model.
4. The output of the solar array (or wind generator) shall not be connected with any Company owned incoming service.
5. An auto transfer switch is required if the inverters are not automatically shut off in a power outage situation (loss of source power).
6. A state inspection will be required for any new solar/wind/generation installations.
7. This is only an example of a solar/wind connected system. Any design must be presented to the Company and approved by the Company distribution engineer.

7-2 Parallel Generation (Cont'd)

Example



Meter Install, Testing, & Inspection

Upon receipt of the local code inspection approval and Parallel Operating Agreement (POA) executed by the applicant, The Company will schedule the meter install, testing, and inspection. The Company shall have an opportunity to schedule a visit to witness commissioning tests required by IEEE 1547 and inspect the project. The Company may provide a waiver of its right to visit the site to inspect the project and witness the commissioning tests. The Company shall notify the applicant of its intent to visit the site, inspect the project, witness or perform the commissioning tests, or of its intent to waive inspection within 10 working days after notification that the installation and local code inspections have passed. Within 5 working days from receipt of the completed commissioning test report (if applicable), the Company will notify the applicant of its final approval or disapproval of the interconnection.

Operation in Parallel

Upon Company approval of the interconnection, the Company shall install required metering, provide to the applicant a written statement of final approval, and a fully executed POA authorizing parallel operation.

Operational Provisions

Disconnection

The Company may refuse to connect, or may disconnect, a project from the distribution system if any of the following conditions apply:

7-2 Parallel Generation (Cont'd)

1. Applicant has not complied with any one of the technical requirements contained in the applicable Interconnection Procedures,
2. The electrical characteristics of the Applicant Facility are not compatible with the electrical characteristics of the Company distribution system,
3. An emergency condition exists on the Company distribution system,
4. Applicant's protective relay equipment fails,
5. The Company determines that the Applicant Facility is disrupting service to any Company customer,
6. Disconnection is required to allow for construction, installation, maintenance, repair, replacement, removal, investigation, inspection or testing of any of Company's facilities,
7. If a required installation fails, or becomes incapacitated, and is not repaired in a timely manner, as determined by the Company,
8. Applicant commits a material breach of the POA.

Maintenance and Testing

The Company reserves the right to test the relaying and control equipment that involves protection of the Company electric system whenever the Company determines a reasonable need for such testing exists. The Project Developer is solely responsible for conducting and documenting proper periodic maintenance on the generating equipment and its associated control, protective equipment, interrupting devices, and main Isolation Device, per manufacturer recommendations. The Project Developer is solely responsible for routine and maintenance checks of the relaying and control equipment that must be conducted in accordance with provided written test procedures which are required by IEEE Std. 1547 and test reports of such testing shall be maintained by the Project Developer and made available for Company inspection upon request. [NOTE – IEEE 1547 requires that testing be conducted in accordance with written test procedures, and the nationally recognized testing laboratory providing certification will require that such test procedures be available before certification of the equipment.]

Periodic test reports or a log for inspection shall be maintained and provided to the Company upon written request.

Operating in Parallel

The Project Developer will be solely responsible for the required synchronizing equipment and for properly synchronizing the Project with the Company electric system.

Voltage fluctuation at the Point of Common Coupling (PCC) during synchronization is limited per IEEE std. 1547.

These requirements are directly concerned with the actual operation of the Project with the Company:

- The Project may not commence parallel operation until final approval has been given by the Company. The completed installation is subject to inspection by the Company prior to approval. Preceding this inspection, all contractual agreements must be executed by the Project Developer.

- The Project must be designed to prevent the Project from energizing into a de-energized the Company line. The Project's circuit breaker or contactor must be blocked from closing in on a de-energized Company distribution system.
- The Project shall discontinue parallel operation with a particular service and perform necessary switching when requested by the Company for any of the following reasons:
 1. When public safety is being jeopardized.

7-2 Parallel Generation (Cont'd)

2. During voltage or loading problems, system emergencies, or when abnormal sectionalizing or circuit configuration occurs on the Company system.
3. During scheduled shutdowns of the Company equipment that are necessary to facilitate maintenance or repairs.
4. In the event there is demonstrated electrical interference (i.e. Voltage Flicker, Harmonic Distortion, etc.) to the Company customers, suspected to be caused by the Project, and such interference exceeds then current system standards, the Company reserves the right to install special test equipment as may be required to perform a disturbance analysis and monitor the operation and control of the Project to evaluate the quality of power produced by the Project. In the event that no standards exist, then the applicable tariffs and rules governing electric service shall apply. If the Project is the source of the interference, and that interference exceeds Company standards or generally accepted industry standards, then it shall be the responsibility of the Project Developer to eliminate the interference problem.
5. When either the Project or its associated synchronizing and protective equipment is demonstrated by Company to be improperly maintained, so as to present a hazard to the Company system or its customers.
6. Whenever the Project is operating isolated with other Company customers, for whatever reason.
7. Whenever the Company notifies the Project Developer in writing of a non-safety related violation of the Interconnection Agreement and the Project Developer fails to remedy the violation within 10 working days of notification.

If the Project has shown an unsatisfactory response to requests to separate the generation from the Company system, the Company reserves the right to disconnect the Project from parallel operation with the Company electric system until all operational issues are satisfactorily resolved.