



City of Oak Ridge Electric Department
Interconnection Procedures
For Renewable Distributed Generation
Under
The TVA/Local Power Company
Green Power Providers Program

(For Generating Facilities Less Than 50 kW)

1. GENERAL PROCEDURES & STANDARDS

1.1. Scope

These procedures describe the steps interconnection customers (herein after called customer) participating in the TVA Green Power Providers Program must follow in order for their renewable distributed generation equipment (DG equipment) to be evaluated and approved for interconnection to the City of Oak Ridge Electric Department (herein after called CORED) distribution system for parallel operation. The Green Power Providers Program is currently the only arrangement for net metering services from the Local Power Company. Requirements for interconnection will be based on the size of the system and will be broken into the following categories:

Tier 1 – 10 kW or less;

Tier 2 – Greater than 10 kW and less than or equal to 50 kW; or

1.2. Application for Interconnection

Each customer must submit a completed application to CORED prior to purchasing any DG equipment. If the equipment meets the criteria for Tier 1, complete application. If the system meets the criteria of Tier 2, complete application. Please provide the supporting documents identified with each application.

1.3. Application Processing (See Figure 1)

1.3.1. The CORED will review the application for sufficiency and completeness and notify the customer within **10** business days of receipt of application that it has received all documents required or indicate how the application is deficient.

1.3.2. Within **10** calendar days the CORED will evaluate the system using the criteria of Section 2 Fast Track Screening Process to determine if an interconnection study is necessary. If the project does not pass the Fast Track Screening Process, the requirements outlined in Section 3 Study Process will be followed. Otherwise, the CORED will notify the customer that they may proceed with purchase and installation of the project and will send a completed interconnection agreement to the customer for execution. The customer will also be notified of any additional requirements. **Customer will not be allowed to proceed with parallel operation until all provisions of these procedures have been met and the City of Oak Ridge Electric Department has given written notification to proceed with parallel operation.**

1.3.3. The customer must execute the interconnection agreement and return it to the CORED at least **180** calendar days prior to the desired date of parallel operation.

- 1.3.4. After installation, the customer returns the Certificate of Completion to the CORED. **Prior to parallel operation, the Local Power Company may inspect the DG equipment for compliance with the proposed design and may require a commissioning test in accordance with the procedures defined by the latest version of IEEE 1547.2.** The Local Power Company will have the option of witnessing the commissioning test or may require documentation from the equipment owner describing which tests were performed and their results. The Local Power Company will offer to complete any required commissioning tests as soon as possible.
- 1.3.5. If the inspection of the completed system and any required commissioning test are satisfactory, the CORED will notify the customer in writing that interconnection of the DG equipment is authorized for parallel operation. If the system does not pass the inspection and/or commissioning test, the CORED has the right to lock out the facility. **The customer shall not under any circumstance take any action to operate the system in parallel until the problems have been corrected and a new inspection and commissioning test are performed, or waived by the CORED.**

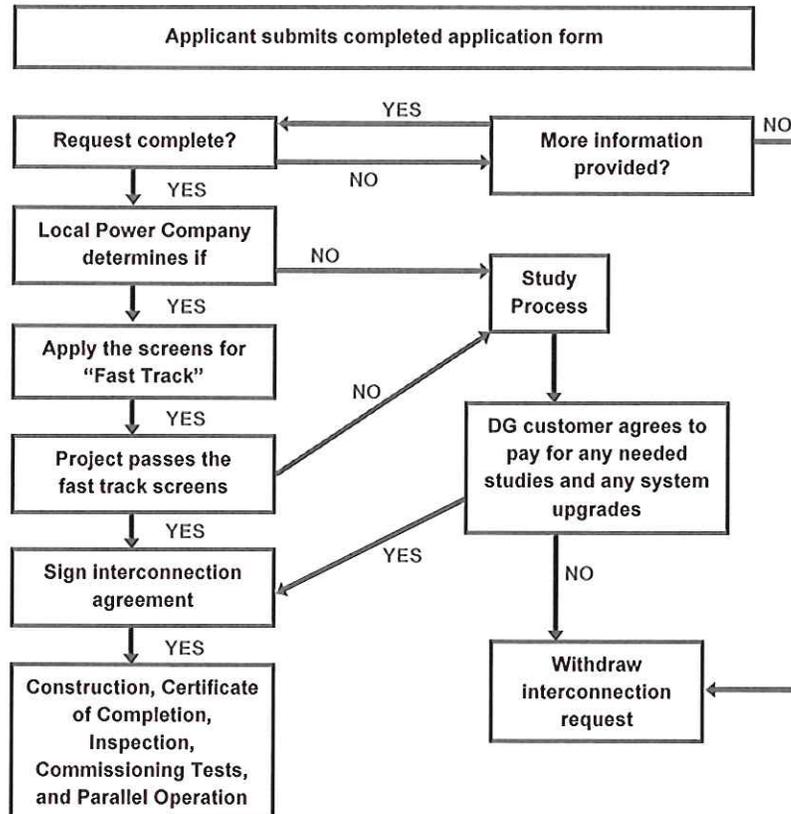


FIGURE 1. THE APPLICATION PROCESS

1.4. Standards and Certification Criteria

The DG equipment must comply with the latest revision of the following standards and the customer must provide evidence of certification with the DG equipment application or with the Certificate of Completion:

- 1.4.1. IEEE1547 Standard for Interconnecting Distributed Resources With Electric Power Systems (including use of IEEE 1547.2 testing protocols to establish conformity)
- 1.4.2. IEEE1547.2 Standard Conformance Test Procedures for Equipment Interconnecting Distributed Resources With Electric Power Systems
- 1.4.3. UL 1741 Inverters, Converters, and Controllers for Use in Independent Power Systems
- 1.4.4. NFPA 70 National Electrical Code
- 1.4.5. The DG equipment shall be considered certified for interconnected operation if the generation equipment and all related interconnection components have been tested and listed by a Nationally Recognized Testing Laboratory (NRTL certification by Department of Labor) for continuous interactive operation with an electric distribution system in compliance with the codes and standards outlined in 1.4.1 – 1.4.4 above.
- 1.4.6. The customer must provide evidence that the installation has been inspected and approved by state or local code officials, as applicable, prior to its operation in parallel. This information will be submitted with the Certificate of Completion.

2. FAST TRACK SCREENING PROCESS

2.1. Applicability

The CORED will determine if the proposed system can follow the Fast Track process or if the design of the system would require evaluation under the Study Process of Section 3. Generally this process is available to a customer whose proposed DG equipment is no larger than 50 kW and meets the codes, standards, and certification requirements of 1.4 above.

2.2. Fast Track Review Screens

Within 10 calendar days after CORED has received a sufficient and complete Interconnection Application, the CORED shall perform an initial review using the screens set forth below and shall notify the interconnection customer of the results.

2.2.1. Generation on Circuit as a Percent of Annual Peak Load

For interconnection of proposed DG equipment to a radial distribution circuit, the aggregated generation, including the proposed DG equipment, on the circuit shall not exceed 15 percent of the line section annual peak load as most recently measured at the substation. A line section is that portion of a CORED's electric system connected to a customer bounded by automatic sectionalizing devices or the end of the distribution line.

2.2.2. Maximum Fault Current

The proposed DG equipment, in aggregation with other generation on the distribution circuit, shall not contribute more than 10 percent to the distribution circuit's maximum fault current at the point on the high voltage (primary) level nearest the proposed point of interconnection.

2.2.3. Short Circuit Interrupting Capability

The proposed DG equipment, in aggregate with other generation on the distribution circuit, shall not cause any distribution protective devices and equipment (including, but not limited to, substation breakers, fuse cutouts, and line reclosers), or customer equipment on the system to exceed 87.5 percent of the short circuit interrupting capability; nor shall the interconnection be proposed for a circuit that already exceeds 87.5 percent of the short circuit interrupting capability.

2.2.4. Type of Interconnection

Using the table below, determine the type of transformer connection allowable to interconnect a DG with a primary distribution line through a transformer. This screen includes a review of the type of electrical service provided to the customer, including line configuration and the transformer connection to limit the potential for creating over-voltages on the CORED's electric power system due to a loss of ground during the operating time of any anti-islanding function.

Primary Distribution Line Type	Type of Interconnection to Primary Distribution Line	Result/Criteria
3-phase, 3 wire	3-phase or single-phase, phase-to-phase	Pass screen
3-phase, 3 wire	Effectively grounded 3-phase or single-phase, line-to-neutral	Pass screen

2.2.5. Maximum Size for Single Phase

If the proposed DG equipment is to be interconnected on single-phase secondary, shared secondary, or individual service, the aggregate generation capacity on the single-phase secondary, shared secondary, or individual service shall not exceed 15 kW.

2.2.6. Load Balance

If the proposed DG equipment is single-phase and is to be interconnected on a center tap neutral of a 240-volt service, its addition shall not create an imbalance between the two sides of the 240-volt service of more than 20 percent of the nameplate rating of the service transformer. If the proposed DG equipment is single-phase and is to be interconnected to a three-phase service secondary or service, its addition shall not cause the load on any of the individual phases to exceed twice the load on any of the other two phases.

2.2.7. Transient Stability Problems

The DG equipment, in aggregate with other generation interconnected to the distribution side of a substation transformer feeding the circuit where the DG equipment proposes to interconnect, shall not exceed 10 MW in an area where there are known, or posted, transient stability limitations to generating units located in the general electrical vicinity (e.g., three or four distribution busses from the point of interconnection).

2.2.8. No Upgrades Required

No construction of facilities by the CORED on its own system shall be required to accommodate the DG equipment.

2.3 Fast Track Screening Results

If the proposed DG equipment passes the screens, the customer's application will be approved and Local Power Company will provide the customer an executable interconnection agreement. If the proposed project does not pass the screens, the customer will be notified and offered the opportunity to attend a meeting where the processes outlined in 3.0 Study Process will be explained and a course of action determined.

3. STUDY PROCESS

The study process (see Figure 3) consists of the minimum engineering review, the system impact study, and the facilities study. At an initial meeting, the parties shall determine whether a minimum engineering review is sufficient, or the parties shall proceed directly to a system impact study, or a system upgrade study.

3.1. Minimum Engineering Review

The Minimum Engineering Review, also known as the Feasibility Study in FERC Order 2006, is designed to identify any adverse system impacts that would result from interconnection of the DG equipment. Examples of such negative impacts would include ***exceeding the short circuit capability rating of any breakers, violations of thermal overload or voltage limits, and a review of grounding requirements and electric system protection***. If CORED determines that the Minimum Engineering Review will require substantial time, CORED will ask customer to reimburse CORED for the costs associated with this review.

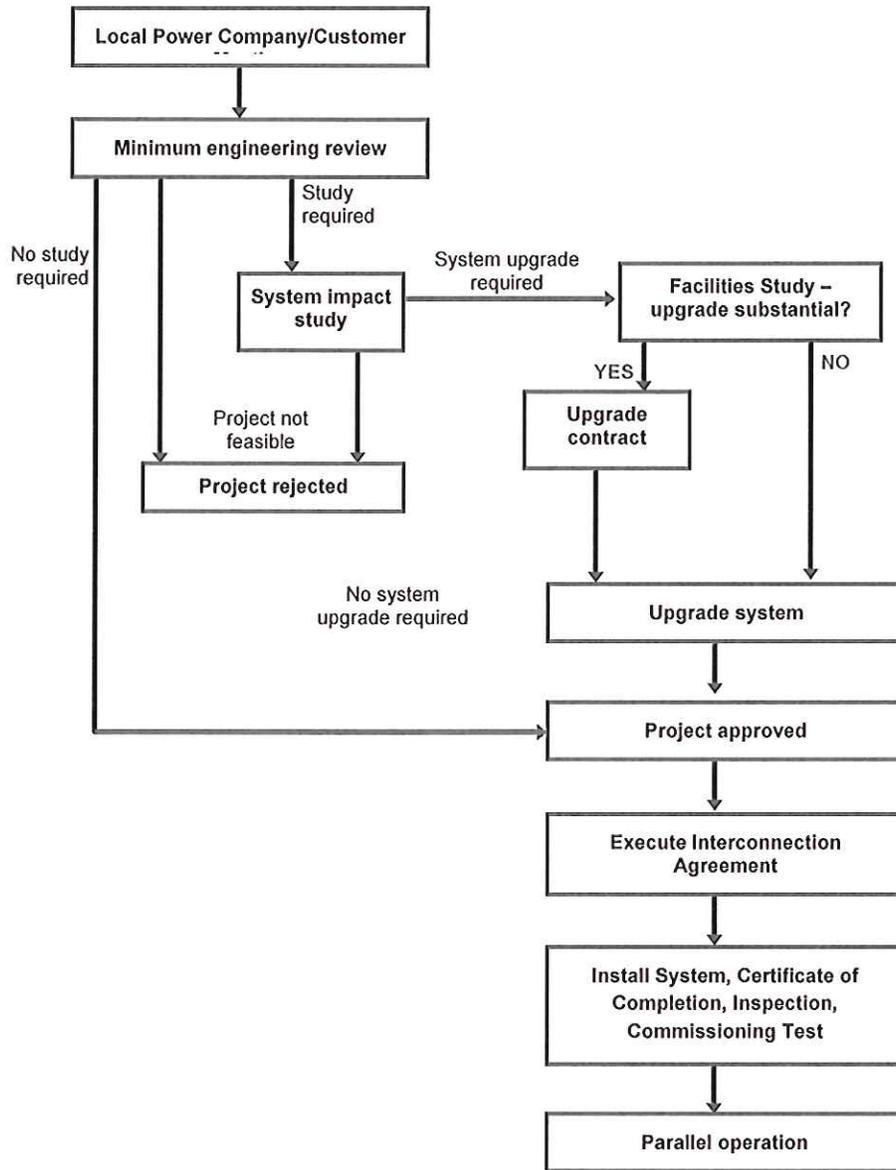


FIGURE 2. THE STUDY PROCESS

3.2. System Impact and Facilities Studies

Beyond the minimum engineering review (or feasibility review), the study process includes the system impact study and the facilities study. A system impact study is designed to identify and detail the electric system impacts that would result if the proposed project were interconnected without project modifications or electric system modifications, focusing on the adverse system impacts identified in the feasibility study. A system impact study shall evaluate the impact of the proposed interconnection on the reliability of the electric system.

In instances where the system impact study shows potential for distribution system adverse impacts, the CORED shall send the customer a distribution system impact study agreement, including an outline of the scope of the study and a nonbinding good faith estimate of the cost to perform the study, if such a study is required. Once the customer agrees to pay the cost of the study, the process continues.

Once the required system impact study is complete, a facilities study agreement if needed, including an outline of the scope of the study and a nonbinding good faith estimate of the cost to perform the facilities study, shall be sent to the customer. Design for any required interconnection facilities and/or upgrades shall be performed under the facilities study agreement. Upon completion of the facilities study, and with the agreement of the customer to pay for interconnection facilities and upgrades identified in the facilities study, the CORED shall provide the customer an executable interconnection agreement.