



Step-By-Step Guide for Applying for GEUS's Distributed Generation Program

1. Customer/Contractor submits the following documents to GEUS at 2810 Wesley St., Greenville, TX 75401 or by email to kwilliams@geus.org
 - a. Signed and completed "Technical Requirements for Distributed Generation Agreement".
 - b. Signed and completed "Application for Interconnection and Parallel Operation of Distributed Generation".
 - c. Copy of site electrical one-line diagram of the generating equipment and interconnection to GEUS. (see detail requirements in Application)
 - d. Copy of site documentation that indicates the precise physical location of the proposed distributed generation facility, proposed meter locations, and proposed manual disconnects.
 - e. Copy of any site documentation that describes and details the operation of the protection and control schemes with schematic drawings for all protection and control circuits, relay current circuits, relay potential circuits, and alarm/monitoring circuits (if applicable).
 - f. Copy of purchase agreement between customer and contractor that shows proof of ownership of installed equipment.
2. Customer/Contractor is responsible for obtaining Electrical Permit from the City of Greenville, Community Development Department, located at 2315 Johnson St, Greenville, TX 75401 or by phone 903-457-3160. Locations outside city limits may not be required to obtain permits. The GEUS DG application may be submitted before a permit is issued.
3. GEUS will
 - a. Review the application and documents received.
 - b. Approve and sign the Application for installation or reject the application.
 - i. If GEUS approves the application, Customer may begin the installation of the system.
 - ii. If GEUS rejects the application, GEUS will provide the Customer with written justification of why the application was rejected.
4. Once the Application is approved, Contractor installs the system.
5. Customer/Contractor will notify GEUS when installation is complete to schedule a final inspection.
6. GEUS will conduct an Inspection within two (2) weeks of notice
 - a. Contractors Electrician must be on site for inspection and ready to correct any issues identified.
 - b. If the system passes the Inspection, GEUS will provide the Customer with signed authorization to interconnect (Application for Interconnection and Parallel Operation of Distributed Generation).
 - c. If the system does not pass the Inspection, GEUS will require the Customer/Contractor to make any corrections necessary for the system to meet all requirements outlined in the Technical Requirements for Distributed Generation Agreement.
7. Once the Customer receives written authorization from GEUS to interconnect with the utility system, the Customer may commence with parallel operations.



TECHNICAL REQUIREMENTS FOR DISTRIBUTED GENERATION AGREEMENT

A. General

1. This document describes requirements for interconnecting Distributed Generation (DG), rated up to 25kW and operating at 600V or less. For DG larger than 25kW, or DG operating at greater than 600V, please contact GEUS Engineering Department for requirements.
2. GEUS may determine that certain specific interconnection locations and conditions require the installation of more sophisticated protective devices and operating schemes. If GEUS determines an application for parallel operation describes facilities that require additional devices and operating schemes, GEUS shall make those additional requirements known to the Customer after the interconnection studies are completed.
3. Point of Interconnection shall be defined by the GEUS Service Policy.
4. Customer shall own, operate, maintain, design and install the DG Facility, as necessary, to allow the flow of energy from/to the DG Facility, to the customer's load, and to the GEUS electric distribution system. Customer will be responsible for GEUS's cost to place into service, operate and maintain Interconnection Facilities, and for the costs of any protective and/or metering facilities which, in GEUS's sole opinion, are required and/or prudent in order to protect GEUS's System from disruption or damage caused by the DG Facility, and/or are required and/or prudent to meter parameters associated with the DG Facility. At a minimum, the metering facilities shall measure the energy delivered by the DG Facility, the energy fed back into the GEUS system, and the energy provided by GEUS to the Customer.

B. Design Considerations

1. The DG Facility equipment shall be designed in accordance with, but not limited to, UL Standards, IEEE Standards, the National Electrical Code, the National Electrical Safety Code, ERCOT requirements, GEUS Electric Service Policy, Public Utility Commission of Texas, and any other applicable local, state or federal codes or standards.
2. The DG Facility generator shall be equipped with protective hardware and software designed to prevent the generator from being connected to a de-energized GEUS circuit, and in the event of de-energization of GEUS facilities, the DG facility generator shall cease to energize GEUS facilities, within the timeframes dictated by IEEE 1547-2018.
3. The DG Facility generator shall be equipped with the necessary protective hardware and software designed to prevent connection or parallel operation of the generating equipment with GEUS's distribution system unless the GEUS voltage and frequency are of normal magnitude, and the DG voltage is synchronized with the GEUS voltage.

4. Prior to energization of the DG facility, the customer shall submit design documentation to the GEUS Engineering Department for review. Design documentation shall include, but not be limited to, electrical one line diagram, schematic drawings showing configuration of all DG equipment, current and potential circuits, control schemes, metering schemes, and protection schemes. Approval of the design must be obtained from the GEUS Engineering Department, prior to starting construction of the DG facility.

5. Prior to connection of the DG Facility to GEUS, a GEUS representative will inspect the DG Site. In addition, a commissioning test may be required, which must be witnessed by a GEUS representative. The commissioning test will be used to determine if the DG Facility complies with Technical Requirements and that all metering, telemetry, communications equipment, etc., associated with the Point of Interconnection are functioning properly, and receiving and transmitting accurate information. Customer shall not commence parallel operation of the DG Facility with GEUS facilities until written approval has been provided to customer, by GEUS. GEUS shall notify Customer as to whether or not approval is granted, within ten (10) working days from GEUS's inspection of the DG Facility. In the event the DG Facility does not comply with Requirements, GEUS shall notify Customer in writing and shall provide Customer a reasonable period of time to bring the DG Facility into compliance. GEUS shall have reasonable access to the DG Site at all times and shall provide advance notice to Customer of the need for GEUS presence at the DG Site, except that no advance notice is necessary in the case of an emergency, or in connection with the performance of GEUS obligations imposed on it by this Agreement, or if necessary to meet GEUS's legal obligation to provide service to GEUS retail customers.

C. Protective function requirements.

The DG Facility must have an over-voltage trip function, an under-voltage trip function, an over/under frequency trip function, and an automatic synchronizing check function.

D. Operational requirements

GEUS recognizes the importance of having operational and maintenance procedures for the purpose of coordinating the operation of DG and Interconnection Facilities with GEUS's Electric Operation system. Failure to install, operate and maintain all wiring and apparatus in such condition and/or manner, as to not endanger persons or property, as to not cause impairment of Interconnection facilities, as to not cause impairment of GEUS facilities, as to not cause impairment of the DG facility, and as to not cause impairment of any of GEUS's distribution customers, may result in GEUS disconnecting the DG Facility from the GEUS distribution system. The Customer's contractors, agents, and operating/maintenance personnel must be informed (by Customer) of these procedures, and must follow these procedures. Copies of this document and any attachments shall be posted at the DG Facility. Accordingly, to help ensure the protection and safety of the DG Facility and GEUS personnel and property, the continued provision of electric service to the DG Facility, the continued maintenance of an interconnection between the DG Facility and Interconnection Facilities, and the reliable functioning of GEUS's overall system operations, the following operational and maintenance procedures shall be observed.

1. The DG Facility shall be responsible for protecting its generating equipment in such a manner that GEUS system outages, short circuits or other disturbances, including zero sequence currents, negative sequence currents, and ferroresonant over-voltages, do not damage the DG Facility's generating equipment. The DG Facility's protective equipment shall also prevent unnecessary operation of GEUS interrupting devices, which might affect GEUS's capability to provide reliable service to other customers.
2. Circuit breakers or other interrupting devices at the Point of Interconnection must be capable of interrupting maximum available fault current from either direction.

3. The Customer shall furnish and install a manual disconnect switch on the load side of the DG meter. The manual disconnect switch shall be accessible to GEUS personnel and capable of being locked in the open position.
4. GEUS shall have the right to suspend service by disconnection, in cases (i) where continuance of service to Customer will, in GEUS's reasonable determination, endanger persons or property of GEUS or if there is evidence that the DG Facility operation causes disruption or deterioration of service to other customers served from the same grid; (ii) where GEUS reasonably determines that Customer is failing to meet its obligations as provided for under this Agreement; (iii) where GEUS has reasonable cause to believe that the requirements of this Agreement are not being complied with by Customer.

E. Prevention of interference.

1. Voltage. The Customer will operate its generating equipment in such a manner that the voltage levels on GEUS facilities are in the same range that would exist if the DG equipment were not connected to GEUS's system. Unless directed by GEUS Engineering in writing, the DG facility must trip according to Table 1. Volt-Var and Volt-Watt ramping is permitted and may be required by GEUS on an as needed basis. GEUS shall not be responsible for damage due to voltage rise from customers DG equipment. The DG Facility may be reconnected when the DG facility voltage and frequency are within normal range, GEUS voltage and frequency are within normal range, and the DG facility is synchronized with the GEUS system.

Table 1 Voltage trip setpoints

	Percent of Nominal Voltage	Clearing time (Sec)
Over Voltage Trip 2	120%	.16
Over Voltage Trip 1	110%	2
Under Voltage Trip 2	70%	2
Under Voltage Trip 1	45%	.16

2. Flicker. The DG Facility shall not cause excessive voltage flicker on GEUS's distribution system. This flicker shall not exceed 3.0% voltage dip, in accordance with Institute of Electrical and Electronics Engineers (IEEE) 519 as measured at the Point of Interconnection.

3. Frequency. Unless directed by GEUS Engineering in writing, the DG facility must trip for frequency according to Table 2. Frequency-Watt ramping (Frequency Droop) is permitted. The DG Facility may be reconnected when the DG facility voltage and frequency are within normal range, GEUS voltage and frequency are within normal range, and the DG facility is synchronized with the GEUS system.

Table 2 Frequency Trip Setpoints

	Frequency (Hz)	Clearing time (Sec)
Over Frequency Trip 2	62.0	.16
Over Frequency Trip 1	61.2	300
Under Frequency Trip 2	58.5	300
Under Frequency Trip 1	56.5	.16

4. Harmonics. In accordance with IEEE 519, the total harmonic distortion (THD) voltage (measured at the Point of Interconnection) shall not exceed 5.0% of the fundamental (60 Hz). Any individual harmonic frequency shall not exceed 3.0% of the fundamental, when measured at the Point of Interconnection.

5. Fault and line clearing. The DG Facility shall automatically disconnect from GEUS within ten cycles if the voltage on one or more phases falls below 45% of nominal voltage. This disconnect timing also ensures that

the DG Facility is disconnected from GEUS prior to automatic re-close of breakers. The DG Facility may be reconnected only after GEUS voltage and frequency return to normal range, the GEUS system is stabilized, and the DG facility voltage and frequency are within normal range

6. Inspection and start-up testing. With at least two weeks advance notice, the Customer shall request from GEUS a date and time for initial energization and start-up testing of the DG Facility. GEUS may witness the testing of any equipment and protective systems associated with the interconnection. The Customer shall revise and re-submit the application with information reflecting any proposed modification that may affect the safe and reliable operation of the GEUS distribution system.

7. Site testing. Testing of protection systems shall include procedures to functionally test all protective elements of the system up to and including tripping of the DG Facility. Testing will verify all protective set points and relay/breaker trip timing. GEUS may witness the testing of installed switchgear, protection systems, and DG. The Customer is responsible for routine maintenance of the DG, control equipment, and protective equipment. The Customer will maintain records of such maintenance activities, which GEUS may review at reasonable times.

8. Metering. At a minimum, two meters shall be required (one to monitor the output of the DG facility, and the other meter to monitor the net flow between GEUS and the Customer). GEUS shall supply, own, and maintain all necessary meters and associated equipment to record energy flow, and demand (if applicable). The Customer shall supply at no cost to GEUS suitable locations on its premises for the installation of GEUS's meters and any other required equipment. Meter locations shall be within ten feet of each other unless approved by GEUS Engineering. Procurement and installation of meter bases are the responsibility of the customer.

By signature below, customer agrees to the terms and conditions stated within this document.

Printed Name of Customer

Signature of Customer

Date

NOTICE:

INSTALLATION MUST BE COMPLETED WITHIN ONE YEAR FROM THE DATE SHOWN ABOVE, OR AGREEMENT IS SUBJECT TO CANCELLATION. THE TERM OF THIS AGREEMENT IS ONE YEAR, EXTENDED AUTOMATICALLY UNLESS TERMINATED BY EITHER PARTY WITH SIXTY DAYS WRITTEN NOTICE.

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Below are excerpts from the GEUS' rate tariffs Appendix "D" concerning DG rates as well Appendix "A" concerning Fuel Charges.

APPENDIX "D"

DISTRIBUTED GENERATION (DG): All charges, character of service, and terms and conditions of the GEUS Rates for Electric Service under which the consumer receives service apply except as expressly altered by this Appendix.

In a billing month after a customer receives approval from GEUS to interconnect the customer's on-site generating facility, the energy delivered by the customer's approved system to GEUS' electric system shall be credited to the customer's account as described below.

The monthly credit, if any, is calculated as follows:

Each kWh delivered from the customer's approved system to GEUS' electric system is multiplied by the Fuel Adjustment Charge (FAC). See Appendix "A"

Any credit shall be applied to the electric service charges due from the customer to GEUS.

APPENDIX "A"

FUEL ADJUSTMENT CHARGE (FAC): Fuel and purchased energy, including cost of losses, are collected by charging each customer an adjustable rate per kilowatt each month in addition to the base rate for electricity. The cost per kilowatt-hour is estimated each month for the following year and is adjusted to reconcile differences in fuel adjustment revenues and fuel adjustment energy related costs. Such adjustment will be accomplished by increasing or decreasing the fuel adjustment charge by an amount which will bring the revenues and costs back in balance within a period of one year or less.

Only direct costs of fuel and fuel costs components of purchased power plus losses, as certified by a qualified independent auditor, shall be used in determining the fuel adjustment factor. Direct costs of fuel shall include the cost charged to FERC Account 501. Fuel cost components of purchased power shall include all energy related purchases in FERC Account 555, less the fuel cost associated with the energy revenues recovered from corresponding sales; excluding Transmission Cost of Service (TCOS) revenues and expenses; and excluding TMPA Fixed Cost. GEUS internal Power Supply management costs in FERC Account 575 (also referred to as Regional Market expenses) shall also be included in determining the fuel adjustment factor.

The fuel adjustment is calculated by adding:

- a. The costs of fossil fuel consumed at GEUS generating plants;
- b. The energy costs associated with GEUS' share of TMPA's Gibbons Creek;
- c. The costs of power purchases from other utilities;
- d. The costs of brokers expenses used in the purchase of power;
- e. ERCOT charges including Uplift Costs and ancillary purchases, EILS, RUC <less revenues> and Congestion costs/<less revenues>;
- f. Control Center costs and GEUS Power Supply costs
- g. Any revenues collected for fuel for energy sold off-system is subtracted from the above sum.

The costs of fuel and purchased energy will be calculated each month and summarized on worksheets which will include:

- a. Breakdown of revenue and cost components listed above;
- b. Rolling average 12-month fuel adjustment cost per kilowatt-hour each month.



**APPLICATION FOR INTERCONNECTION AND PARALLEL OPERATION OF
DISTRIBUTED GENERATION**

Customer Information			
Customer Name			
Service Address	City	State	Zip
Home Phone	Cell Phone	Email Address	

Contractor Information			
Contractor Name		Business Name	
Address	City	State	Zip
Office Phone	Alt. Phone	Email Address	

The following information shall be supplied by the Customer or Customer's designated representative. All applicable items must be accurately completed in order that the Customer's generating facilities may be effectively evaluated by GEUS for interconnection.

Distributed Generation Information	
Number of inverters:	Manufacturer:
Inverter Model Number:	Fuel Source: (Solar, Natural Gas, Wind, etc.)
kW Rating of Device Connecting to Grid (Inverter) (95 Deg. F at location):	
kVA Rating of Device Connecting to Grid (Inverter) (95 Deg. F at location):	
Voltage Rating:	Ampere Rating:
Frequency:	Number of Phases:

UTILITY INTERCONNECTION AND GENERATOR PROTECTION EQUIPMENT:

Submit a detailed, one line, electrical diagram of the generating equipment and interconnection to GEUS. Include lockable, "visible" disconnect device or breaker indicating full load, momentary, and interrupting ratings as applicable. Show all the protective devices and include, as applicable, size, rating, manufacturer, style, type, model, settings, and any other information which is appropriate. Indicate location and ratings of all instrument transformers. Show all metering schemes on one line diagram.

Additional Information	
Do you plan to export power: (yes or no)	If Yes, maximum amount expected:
Equipment Meets Requirements of the following Certification(s): (ex. UL 1741, IEEE 1547):	
Expected Energizing and Start-up Date:	
Will system have metering (Independent of GEUS meters)?	
DG System (Y/N)	Energy to and from GEUS (Y/N)
Normal Operation of Interconnection (please describe - examples: provide power to meet base load, demand management, standby, back-up, other)	
City of Greenville Permit #:	

Customer Certification	
I certify that the above listed Renewable Energy equipment has been purchased and is wholly owned by	
Customer Name:	Address:
Signature:	Date:

Information Prepared and Submitted By	
Name:	Address:
Signature:	Date:

GEUS Internal Use	
Approval to Build	
Granted on: (date) _____	By: (GEUS Engineer) _____
Authorization to Interconnect	
Granted on: (date) _____	By: (GEUS Engineer) _____

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Application Package Checklist

- Copy of “Distributed Generation Rider”
- Copy of “Technical Requirements for Distributed Generation Agreement”
- Copy of “Application for Interconnection and Parallel Operation of Distributed Generation”
- Copy of site electrical one-line diagram of the generating equipment and interconnection to GEUS.
- Copy of site documentation that indicates the precise physical location of the proposed distributed generation facility, proposed meter locations, and proposed manual disconnects.
- Copy of site documentation that describes and details the operation of the protection and control schemes with schematic drawings for all protection and control circuits, relay current circuits, relay potential circuits, and alarm/monitoring circuits (if applicable).
- Copy of purchase agreement between customer and contractor that shows proof of ownership of installed equipment.

ITEMS MUST BE REVIEWED AND APPROVED BEFORE AUTHORIZATION IS GIVEN TO INTERCONNECT WITH UTILITY.