

2023

# DISTRIBUTED *GENERATION* INTERCONNECTION

GUIDELINES & MANUAL FOR MEMBER-GENERATORS



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# GENERAL

This interconnection manual covers distributed generation (DG) operation that is connected or may be connected to the Central Rural Electric Cooperative distribution system. The Member-Generator may operate a DG installation in stand-alone or isolated fashion. Member-Generators that have DG must follow the provisions of this manual for any DG operation connected in any way to the Cooperative's distribution system.

This manual is not a complete description or listing of all the laws, ordinances, rules and regulations that the Member-Generator must or should follow, nor is it an installation or safety manual. The Member-Generator requesting DG service must follow, in addition to all provisions of this Manual, the Cooperative's Rules and Regulations, Terms and Conditions, and Tariffs for Electric Service, Line Extension Policy, the Policies and Procedures of the Cooperative's power supplier where applicable, the current IEEE 1547 Standard Guide for Distributed Generation Interconnection (a copy is on file at Central Rural Electric Cooperative for inspection along with information on how the Member-Generator may obtain his/her own copy), and any other applicable governmental and regulatory laws, rules, ordinances and/or requirements. All legal, technical, financial, and other requirements in the following sections of this manual must be met prior to interconnection.

A Member-Generator may serve all loads behind the meter at the location serving the DG installation but will not be allowed to serve multiple meters, multiple consuming facilities or multiple Members with a single DG installation or under a single DG application without prior approval by the Cooperative. The Member-Generator must conduct his/her own analysis to determine the economic benefit of DG operation for the Member-Generator.

**DG facilities larger than 300 kW are not covered by this manual and will be considered by Central Rural Electric Cooperative on a case-by-case basis.**

## I. DETERMINE THE CATEGORY OF DISTRIBUTED GENERATION FACILITY

### 1) Connection Level Category

#### a.) **Connected to Central's system:**

The Member-Generator requests and/or the Member-Generator's DG facility require connection to Central's electrical system. All provisions of this manual cover this category.

#### b.) **Connected to Central's Power Supplier's system:**

The Member-Generator requests and/or the Member-Generator's DG facility require connection to Central's Power Supplier's electrical system. This manual does NOT cover this category. The Member-Generator should contact Central's Power Supplier directly at the following address:

KAMO Power  
Transmission Planning Engineer  
500 South KAMO Drive  
Vinita, OK 74301  
918-256-5551

### 2) Qualifying or Non-Qualifying Category (PURPA)

- a) Qualifying Facilities (QF) are defined by the Public Utility Regulatory Policies Act of 1978 (PURPA). Refer to CFR Title 26, Volume 4, Section 292.204.
- b) The distinction between QF and Non-Qualifying Facilities (NQF) mainly deals with fuel use.
  - (1) In general, a QF must have as its primary energy source biomass, waste, renewable resources, geothermal resources or any combination.
  - (2) All other DG will be considered NQF by Central.
- c) Central will provide interconnection to Member-Generators with Qualifying Facilities, subject to the provisions of this policy and other applicable rules and regulations.
- d) Net metering rules will apply for Member-Generators with Qualifying Facilities not exceeding 300 kW and not exceeding 125% of the average peak load.
- e) Central may negotiate a power purchase agreement with NQF Member-Generators.

### 3) Size Category

Facilities capable of supporting a demand of 300 kW or less of connected generation, shall be eligible for service under this manual. Facilities capable of supporting greater than 300 kW of demand are not covered by this manual and will be considered by Central on a case-by-case basis.

## II. MEMBER-GENERATOR-GENERATOR'S INITIAL REQUIREMENTS

### 1) Notification

- a) The Member-Generator must meet all of Central's Membership and service requirements in addition to all requirements in this manual.
- b) Anyone owning and/or operating a Distributed Generation (DG) facility on facilities served by Central Rural Electric Cooperative must notify the cooperative of the existence, location and category of the facility.

### 2) Service Request

- a) In advance of potential interconnection, the Member-Generator must contact Central and

complete and submit the “Interconnection Application and Agreement” for approval.

b) QF will always be considered for connection by Central. NQF may be considered for connection at the sole discretion of Central.

c) A separate form must be submitted for each facility and each location.

3) Submit a DG Plan

a) Along with the application, the Member-Generator shall submit a plan detailing the electrical design, interconnection requirements, size, and operational plans. Central may require additional information and/or may require the plans to be prepared by a registered Professional Engineer in the state.

b) In the case of DG facilities with no intention to export power to Central that are of standard design and intended entirely as emergency or back-up power supply for the facility, Central may, at its sole discretion, waive the application fee.

c) Prior to interconnection with Central Rural Electric Cooperative's Distribution System, the Member-Generator shall pay an application fee as indicated below. A separate fee must be submitted for each facility and location.

DG Size (Connected Load)	Application Fee	Additional Engineering Fee
Transfer of Existing Agreement	\$50	Not Applicable
< 100 kW	\$100	As Required
100-300 kW	\$500	As Required
Adding Additional Capacity	\$100	As Required

**III. CENTRAL'S REVIEW PROCESS**

1) Plan Review Process

a) Central will review the application and accompanying documents, plans, specifications, and other information provided and will approve, deny, or request more information from the Member-Generator within 30 days of receipt of final plans and specifications.

b) Technical review will be consistent with guidelines established by the most recent IEEE Standard 1547 Guide for Distributed Generation Interconnection.

c) If corrections or changes to the plans, specifications and other information are to be made by the Member-Generator, the 30-day period may be reinitialized when such changes or corrections are provided to Central. In addition, any changes to the site or project requiring new analysis by Central may require additional cost and a new plan. The cost will be determined by Central.

d) Any review or acceptance of such plans, specifications and other information by Central shall not impose any liability on Central and does not guarantee the adequacy of the Member-Generator's equipment to perform its intended function. Central disclaims any expertise or special knowledge relating to the design or performance of generating installations and does not warrant the efficiency, cost-effectiveness, safety, durability, or reliability of such DG installations.

e) In the event it is necessary at the time of initial interconnection or at some future time for Central to modify electric delivery systems in order to serve the Member-Generator's DG facilities and/or receive or continue to receive the Member-Generator's output, or because the quality of the power provided by the Member-Generator's DG adversely affects Central's delivery system, the Member-Generator will reimburse Central for all costs of modifications required for the interconnection of the Member-Generator's DG facilities.

#### **IV. SALES TO AND PURCHASES FROM A DG INSTALLATION**

- a) All sales of electric power and energy by the Cooperative to a Member-Generator shall be consistent with the applicable retail rate schedule as if there were no DG installation at the Member-Generator's premises.
- b) For Member-Generators with facilities having total capacity not exceeding 300 kW, Purchases from a DG installation shall occur by either of two options. The first is being compensated by the retail purchase meter running in reverse (Net Metering). The second is to have all energy supplied by the Member-Generator's facility in excess of the Member-Generator's instantaneous load requirement which is delivered to the cooperative's system be compensated at Central's avoided cost rate.
- c) For Member-Generators with facilities having total capacity exceeding the greater of either 300 kW or 125% of the average peak load, no net metering will be allowed. All energy supplied by the Member-Generator's facility in excess of the Member-Generator's instantaneous load requirement which is delivered to the cooperative's system shall be compensated at Central's avoided cost rate.

#### **V. MEMBER-GENERATOR'S RESPONSIBILITIES PRIOR TO OPERATION**

##### **1) Line Extension and Modifications to Central Facilities**

- a) As a part of the interconnection analysis performed by Central, the Member-Generator will be provided with an estimate of any line extension or other cost to be incurred in providing service to the Member-Generator's DG facility.
- b) With regard to Central's line extension policy, the Member-Generator shall pay in advance the full cost of the construction of any transmission, substation, distribution, transformation, metering, protective, or other facilities or equipment which, at the sole discretion of Central, is required to be installed to serve the Member-Generator's DG facility.
- c) In the event it is necessary at the time of initial interconnection or at some future time for Central to modify electric delivery systems in order to serve the Member-Generator's DG facilities and/or purchase or continue to purchase the Member-Generator's output, or because the quality of the power provided by the Member-Generator's DG adversely affects Central's delivery system, the Member-Generator will reimburse Central for all costs of modifications required for the interconnection of the Member-Generator's DG facilities.
- d) In the event Central at any time in the future changes primary voltage of distribution facilities serving the DG installation such that metering equipment, transformers and/or any

Member-Generator owned equipment must be changed, the full cost of the change will be borne by the Member-Generator.

e) In all cases, the Member-Generator shall pay the full cost of the installation of a visible load break disconnect switch. The switch will be readily accessible to Central personnel and of a type that can be secured in an open position by a Central lock.

## 2) Applicable Regulations

a) The Member-Generator shall comply with all applicable tariffs, policies and procedures of Central. (DG tariffs, policies and procedures included.)

b) The Member-Generator shall comply with all applicable laws, ordinances, rules and regulations of any federal, county, state, and/or local authority, including, but not limited to: the most recent National Electric Code, National Electric Safety Code, IEEE Standard 1547 Guide for Distributed Generation Interconnection, applicable ANSI standards, including ANSI C84.1 Range A relating to installation, safety, easements, code restrictions, operation and other matters.

c) The Member-Generator shall be solely responsible for compliance with all applicable environmental laws, requirements and regulations, including but not limited to reporting and permits.

## 3) Liability Insurance

a) Central will determine if the type of generation warrants the Member-Generator to carry liability insurance.

b) Should insurance be required, prior to interconnection, the Member-Generator will obtain the recommended level of coverage by contracting with a provider of liability insurance licensed to conduct business in the State of Oklahoma. In such event, the Member-Generator will upon request, furnish the Cooperative with a certificate of insurance evidencing such coverage

c) The certificate shall provide that the insurance policy will not be changed or canceled during its term without thirty days written notice to Central. The term of the insurance shall be coincident with the term of the interconnection contract or shall be specified to renew throughout the length of the interconnection contract.

d) The Member-Generator shall provide proof of such insurance to Central upon request.

## 4) Contracts

a) For each generation system connected to the Central's distribution system, the Member-Generator will sign and deliver an separate "Interconnection Application and Agreement" for approval.

## 5) Initial Interconnection

a) Upon satisfactory completion of the review process and execution of required agreements as outlined in this manual, Central will begin interconnection of DG facilities. Interconnection will be completed as soon as practical after completion of the review process and execution of the necessary contracts. After completion of interconnection requirements and prior to initiation of service, Central will conduct a final inspection of the facilities and interconnection

to Central's system. Upon satisfactory final inspection, Central will initiate service to the DG Member-Generator and a Permission to Operate (PTO) DG letter will be mailed to the Member-Generator.

b) Central's review process and final inspection is intended as a means to safeguard Central's facilities and personnel. Any review by Central shall not impose any liability on Central and does not guarantee the adequacy of the Member-Generator's equipment to perform its intended function. Central disclaims any expertise or special knowledge relating to the design or performance of generating installations and does not warrant the efficiency, cost-effectiveness, safety, durability, or reliability of such DG installations.

## **VI. REFUSAL TO INTERCONNECT SERVICE OR DISCONNECTION OF INTERCONNECTED SERVICE**

Central may, at its sole discretion, prevent the interconnection of or disconnect an interconnected DG installation, for reasons such as safety concerns, reliability issues, power quality issues, breach of interconnection contract or any other reasonable issue. Such disconnection may be without prior notice.

## **VII. OPERATION OF DG FACILITY**

The purpose of this section is to outline Central's DG operational requirements and is not intended to be a complete listing of all operational, regulatory, safety and other requirements.

### **1) Ownership of Facilities**

a) The Member-Generator shall own and be solely responsible for all procurement, installation, maintenance, and operation of all facilities, including all power generating facilities, at and beyond the point of common coupling as defined by IEEE, except as indicated in item VII. 1) b).

b) At its sole discretion, Central may install and maintain Central-owned metering equipment and transformers past the point of common coupling.

c) The Member-Generator shall provide access to facility production and status if relevant to Central.

### **2) Self-Protection of DG Facilities**

a) The Member-Generator will furnish, install, operate and maintain in good order and repair all equipment necessary for the safe operation of the power generating installation in parallel with the Central electric distribution system.

b) Equipment will have capability to both establish and maintain synchronism with Central's system and to automatically disconnect and isolate the DG installation from Central's system.

c) The Member-Generator's DG installation will be designed, installed and maintained to be self-protected from normal and abnormal conditions on Central's system including, but not limited to, overvoltage, undervoltage, overcurrent, frequency deviation, and faults. Self-protection will be compatible with all applicable Central protection arrangements and operating policies.

d) Additional protective devices and/or functions may be required by Central when, in the sole judgment of Central, the particular DG installation and/or Central system characteristics so warrant.

### 3) Quality of service

- a) The Member-Generator's DG installation will generate power at the nominal voltage of the Central electrical distribution system at the Member-Generator's delivery point as defined by ANSI C84.1 Range A.
- b) Member-Generator's DG installation will generate power at a frequency within the tolerances as defined by IEEE 1547.
- c) Member-Generator's DG installation shall produce power at a minimum power factor of at least 95% or shall use power factor correction capacitors to ensure at least a 95% power factor.
- d) The overall quality of the power provided by the Member-Generator's DG installation including, but not limited to, the effects of harmonic distortion, voltage regulation, voltage flicker, switching surges and power factor, will be such that Central's system is not adversely affected in any manner.
- e) In the event that the adverse effects are caused in whole or in part by the Member-Generator's DG installation, the Member-Generator will correct the cause of such effects, reimburse Central for required correction, or be disconnected from Central's system.

### 4) Safety disconnects

- a) The Member-Generator shall install a visible load break disconnect switch at the Member-Generator's expense and to Central's specifications.
- b) The switch will be located so as to be readily accessible to Central personnel in a location acceptable to both the Member-Generator and Central.
- c) The switch shall be a type that can be secured in an open position by a Central lock. If Central has locked the disconnect switch open, the Member-Generator shall not operate and/or close the disconnect switch
- d) Central shall have the right to lock the switch open when, in the judgment of Central:
  - i) It is necessary to maintain safe electrical operating and/or maintenance conditions,
  - ii) The Member-Generator's DG adversely affects Central system, or
  - iii) There is a system emergency or other abnormal operating condition warranting disconnection.
- e) Central reserves the right to operate the disconnect switch for the protection of Central's system even if it affects the Member-Generator's DG installation. In the event Central opens and/or closes the disconnect switch:
  - i) Central shall not be responsible for energization or restoration of parallel operation of the DG installation.
  - ii) Central will make reasonable efforts to notify the Member-Generator.
- f) The Member-Generator will not bypass the disconnect switch at any time for any reason.
- g) Signage shall be placed by Central at the location of the disconnect indicating the purpose of the switch.
- h) Member-Generators with DG facilities, as defined in this manual, which are solely for the purpose of emergency backup or peak shaving without intent to export power shall not operate their DG facilities unless visibly disconnected from Central's system.
- i) Should Central lose power from its system serving the Member-Generator's DG facilities for

any reason, Member-Generators with DG facilities which are intended to export power shall not operate their DG facilities unless disconnected from Central's system.

5) Access

- a) Persons authorized by Central will have the right to enter the Member-Generator's property for purposes of testing, operating the disconnect switch, reading or testing the metering equipment or other DG and/or service requirement. Such entry onto the Member-Generator's property may be without notice.
- b) If the Member-Generator erects or maintains locked gates or other barriers, the Member-Generator will furnish Central with convenient means to circumvent the barrier for full access for the above-mentioned reasons.

6) Liability for Injury and Damages

- a) The Member-Generator assumes full responsibility for electric energy furnished at and past the point of interconnection and shall indemnify Central against and hold Central harmless from all claims for both injuries to persons, including death resulting there from, and damages to property occurring upon the premises owned or operated by Member-Generator arising from electric power and energy delivered by Central or in any way arising directly or indirectly from the Member-Generator's DG installation.
- b) Central shall not be liable for either direct or consequential damages resulting from failures, interruptions, or voltage and waveform fluctuations occasioned by causes reasonably beyond the control of Central including, but not limited to, acts of God or public enemy, sabotage and/or vandalism, accidents, fire, explosion, labor troubles, strikes, order of any court or judge granted in any bona fide adverse legal proceeding or action, or any order of any commission, tribunal or governmental authority having jurisdiction.

7) Metering/Monitoring

- a) Central shall specify, install and own all metering equipment.
  - i) The facility will have the opportunity to be net metered by installing a meter which measures the flow of energy in each direction.
  - ii) Power transfer at the point of interconnection will be measured by metering equipment as installed and specified at the sole discretion of Central.
  - iii) The meter shall be read at a time or times of month determined at the sole discretion of Central for remotely acquiring metering data. The Member-Generator shall provide an approved communications link at the Member-Generator's cost for this purpose if so requested by Central.
  - iv) The type of communications link and metering equipment measuring purchase of power by Central shall be installed and specified at the sole discretion of Central.
- b) Central may, at its sole discretion, require the Member-Generator to reimburse Central for metering and monitoring equipment and installation expense.
- c) Meter testing shall follow Central's standard policy on metering testing and accuracy.
- d) At its sole discretion, Central may meter the facility at primary or secondary level.

8) Notice of Change in Installation

- a) The Member-Generator will notify Central in writing thirty (30) days in advance of making

any change affecting the characteristics, performance, or protection of the DG installation.

b) If any modification undertaken by the Member-Generator will create or has created conditions which may be unsafe or adversely affect Central system, the Member-Generator shall immediately correct such conditions or be subject to immediate disconnection from Central's system.

c) Any change in the operating characteristics of the DG installation including, but not limited to, size of generator, total facility capacity, nature of facility, fuel source, site change, hours of operation, or type of generator used, will require a new application process, including, but not limited to, application form, application fee, DG plan and DG plan review by Central .

9) Testing and Record Keeping

a) The Member-Generator will test all aspects of the protection systems up to and including tripping of the generator and interconnection point at start-up and thereafter as required. Testing will verify all protective set points and relay/breaker trip timing and shall include procedures to functionally test all protective elements of the system. Central may request to be present during the testing or to evaluate the test report upon completion.

b) The Member-Generator will maintain records of all maintenance activities, which Central may review at reasonable times.

10) Disconnection of Service

Central may, at its sole discretion, discontinue the interconnection of DG installations due to reasons such as safety concerns, reliability issues, power quality issues, breach of interconnection contract or any other reasonable issue.