

Interconnection Standards
for
Parallel Installation and Operation
of
Customer-Owned
Renewable Electric Generating Facilities
for
Coon Rapids Municipal Utilities



Adopted: September 24, 2015
Version: Version 1.0

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Part 1. OVERVIEW

1. PURPOSE:

The purpose of this document is to establish standards for the Utility to interconnect and operate in parallel with customer-owned renewable electric generators.

2. DEFINITIONS:

- a. **Applicable Laws and Regulations** – All duly promulgated applicable federal, state and local laws, regulations, rules, ordinances, codes, decrees, judgments, directives, or judicial or administrative orders, permits and other duly authorized actions of any Governmental Authority.
- b. **Avoided Costs** – The incremental costs to the Utility of electric energy or capacity or both which, but for the purchase from the Customer's Generating Facility, the Utility would generate itself or purchase from another source.
- c. **Customer** – Any entity interconnected to the Utility's distribution system for the purpose of receiving retail electric power service from the Utility's distribution system.
- d. **Customer Generator** – The owner or operator of a Generating Facility which:
 - i. is powered by a renewable energy resource;
 - ii. is located on a premises owned, operated, leased or otherwise controlled by the Customer Generator;
 - iii. is interconnected and operates in parallel phase and synchronization with an affected utility and is in compliance with the standards established by the affected utility;
 - iv. is intended primarily to offset part or all of the Customer Generator's own electrical energy requirements;
 - v. contains a mechanism, approved by the utility, that automatically disables the unit and interrupts the flow of electricity back onto the supplier's electricity lines in the event that service to the Customer Generator is interrupted.
- e. **Distribution System** – The Utility's facilities and equipment used to transmit electricity to ultimate usage points such as homes and industries directly from nearby generators or from interchanges with higher voltage transmission networks which transport bulk power over longer distances.
- f. **Force Majeure** – A Force Majeure event shall mean "any act of God, labor disturbance, act of the public enemy, war, insurrection, riot, fire, storm or flood, explosion, breakage or accident to machinery or equipment, any order, regulation or restriction imposed by governmental, military or lawfully established civilian authorities, or any other cause beyond a Party's control". A Force Majeure event does not include an act of negligence or intentional wrongdoing.
- g. **Generating Facility** – For purposes of this Standard, the Customer's device for the conversion of wind or solar energy to electricity, as identified in the Interconnection Application.

- h. **Good Utility Practice** – Any of the practices, methods and acts engaged in or approved by a significant portion of the electric industry during the relevant time period, or any of the practices, methods and acts which, in the exercise of reasonable judgment in light of the facts known at the time the decision was made, could have been expected to accomplish the desired result at a reasonable cost consistent with good business practices, reliability, safety and expedition. Good Utility Practice is not intended to be limited to the optimum practice, method, or act to the exclusion of all others, but rather to be acceptable practices, methods, or acts generally accepted in the region.
- i. **Governmental Authority** – Any federal, state, local or other governmental regulatory or administrative agency, court, commission, department, board, or other governmental subdivision, legislature, rulemaking board, tribunal, or other governmental authority having jurisdiction over the Parties, their respective facilities, or the respective services they provide, and exercising or entitled to exercise any administrative, executive, police, or taxing authority or power; provided, however, that such term does not include the Customer or any Affiliate thereof.
- j. **Interconnection Application** – The Customer's request to interconnect a new Generating Facility, or to increase the capacity of, or make a material modification to the operating characteristics of, an existing Generating Facility that is interconnected with the Utility's electrical system.
- k. **Interconnection Standard** – Any reference to Interconnection Standard shall mean all the provisions, forms and related documents described in the collective parts of this document, the Interconnection Standards for Parallel Installation and Operation of Customer-Owned Renewable Electric Generating Facilities, as of the date adopted and and printed on the cover page.
- l. **Metering** - A metering process using equipment sufficient to measure the difference between the electrical energy and capacity supplied by a Customer Generator to the Utility's Distribution System and the electrical energy and capacity supplied by the Utility to the Customer Generator and over an applicable billing period.
- m. **Qualifying Facility** – A cogeneration facility or a small power production facility that is a qualifying facility under 18 CFR Part 292, Subpart B, used by an interconnection customer to generate electricity that operates in parallel with the electric distribution system or local electric power system. Qualifying Facilities that are not Generating Facilities under subparagraphs "g" above may qualify for interconnection with the Utility under provisions of the Public Utilities Regulatory Policies Act (PURPA), but the terms and conditions of interconnection shall be determined on a case-by-case basis.
- n. **Reasonable Efforts** – With respect to an action required to be attempted or taken by a Party under the Interconnection Agreement, efforts that are timely and consistent with Good Utility Practice and are otherwise substantially equivalent to those a Party would use to protect its own interests.
- o. **System Average Energy Cost** – The current average cost of fuel and purchased energy for the billing period as determined by the Utility.

- p. **System Upgrades** – The additions, modifications, and upgrades to the Utility's Distribution System at or beyond the point of interconnection to facilitate interconnection of the Generating Facility and render the transmission service necessary to effect the Interconnection Customer's wholesale sale of electricity in interstate commerce. Distribution Upgrades do not include Interconnection Facilities.

3. ELIGIBILITY:

- a. Interconnection to the electric system shall be granted only to new or existing customers, in good standing, under the Utility's electric service schedules. The Interconnection Agreement shall be between the Customer and the Utility and will not include third parties.
- b. The Interconnection Standards apply to a customer-owned Generating Facility with a rated output of 100 kilowatts (kW) or fewer. Proposals to interconnect a customer-owned generator with output rated at more than 100 kW or Qualifying Facility not covered by this standard will be subject to a review process that may take into account the impact of the interconnection on reliability, rates, power supply agreements, and local and regional system planning.

4. REQUEST:

The Customer shall make a request by completing the document entitled "Application for Operation of Customer-Owned Generation." The Utility may require additional details or clarifications as needed to properly evaluate the application.

5. SYSTEM EFFECTS:

The Utility will analyze the overall impact of the proposed generating facility on the transmission and distribution system. Such analyses will be based on Good Utility Practice to determine thermal effects, voltage ranges, power quality, system stability, etc.

6. SYSTEM UPGRADES:

As a result of the above analysis, the Utility will provide the Customer with a cost estimate and projected timeframe for any system upgrades that may be necessary to accommodate the generating facility.

7. AGREEMENT:

Once the Customer and the Utility have identified and mutually agreed on the scope of the overall project including the generating facility, system upgrades and estimated costs, the Customer and the Utility shall execute the document entitled "Coon Rapids Municipal Utilities Agreement for Electric Service and Interconnection of a Distributed Generation Facility."

8. CODES AND PERMITS:

- a. The Customer shall be responsible for procuring all building, operating and environmental permits that are required by any Governmental Authority having jurisdiction for the type of generating facility and for the necessary ancillary structures to be installed.
- b. The equipment shall meet the standards listed in the attached document entitled "National Certification Codes and Standards."
- c. The construction and facilities shall meet all applicable building and electrical codes.

9. METERING:

Customer Generators shall be equipped with properly approved Utility metering equipment capable of recording real and reactive power flow and demand and energy in fifteen (15) minute intervals for the entire billing period format compatible with CRMU's metering system. Meter(s) shall be read monthly by CRMU at the time required by CRMU. Any costs incurred for meter reading, data retrieval, data manipulation and translation shall be borne by owner of the qualifying facility. CRMU shall bill customer for any such costs on a one-time and/or monthly basis as appropriate.

10. CERTIFICATE OF COMPLETION:

Upon completion of the generating facility and prior to normal operation, the Customer shall provide a signed copy of the attached document entitled "Certificate of Completion".

11. NORMAL OPERATION:

The Customer may begin normal operation of the generating facility upon completion of all documentation and receipt of written approval from the Utility.

Part 2. TECHNICAL REQUIREMENTS

1. CHARACTER OF SERVICE:

The electrical service shall be 60 cycle per second alternating current (AC) at supply voltages and number of phases that apply under the Utility's rate schedules.

2. CODE REQUIREMENTS:

The Generating Facility shall meet all requirements established by the National Electrical Code (NEC), National Electrical Safety Code (NESC), Institute of Electrical and Electronics Engineers (IEEE), Underwriters Laboratories (UL), and Occupational Safety and Health Administration. Specific codes are listed in Section 7 of this Part 2, below as "National Certification Codes and Standards". In addition, Manufacturer's Ownership, Operating and Maintenance Manuals shall be reviewed and accepted by both parties prior to beginning operation.

3. GENERATING FACILITY CONTROL AND OPERATION:

The control system of the Generating Facility shall comply with the IEEE specifications and standards for parallel operation with the Utility and in particular as follows:

- a. Power output control system shall automatically disconnect from Utility source upon loss of Utility voltage and not reconnect until Utility voltage has been restored by the Utility.
- b. Power output control system shall automatically disconnect from Utility source if Utility voltage fluctuates beyond plus or minus 10% (ten percent).
- c. Power output control system shall automatically disconnect from Utility if frequency fluctuates plus or minus 2 cycles (Hertz).
- d. Inverter output distortion shall meet IEEE requirements.
- e. The Generating Facility shall meet the applicable IEEE standards concerning impacts to the Distribution System with regard to harmonic distortion, voltage flicker, power factor, direct current injection and electromagnetic interference.

4. FAULT CURRENT CONTRIBUTION

The Generating Facility shall be equipped with protective equipment designed to automatically disconnect during fault current conditions and remain disconnected until the voltage and frequency have stabilized.

5. RECLOSING COORDINATION

The Generating Facility shall be coordinated with the Distribution System reclosing devices by disconnecting from the system during the initial de-energized operation and shall remain disconnected until the voltage and frequency have stabilized.

6. DISCONNECT DEVICE:

A safety disconnect switch shall be installed that is visible to and readily accessible by Utility personnel in accordance with IUB regulations. The switch shall be capable of being locked in the open position and shall prevent the generator from supplying power to the distribution system.

7. STANDARDS FOR INTERCONNECTION, SAFETY, AND OPERATING RELIABILITY

The interconnection of a Customer-Owned Generating Facility and associated interconnection equipment to the Utility's Distribution Facilities shall meet the applicable provisions of the following publications:

- a. ANSI/IEEE1547-2003 Standard for Interconnecting Distributed Resources with Electric Power Systems (including use of IEEE 1547.1 testing protocols to establish conformity). The following standards shall be used as guidance in applying IEEE 1574:
 - i. IEEE Std 519-1992, IEEE Recommended Practices and Requirements for Harmonic Control in Electrical Power Systems
 - ii. IEC/TR3 61000-3-7 Assessment of emission limits for fluctuating loads in MV and HV power systems
- b. Iowa Electric Safety Code, as defined in 199 IAC Chapter 25
- c. ANSI/NFPA 70 (2008), National Electrical Code
- d. OSHA (29 CFR § 1910.269)

Part 3. RATES FOR PURCHASES BY CRMU

Payment to customer for the power purchased by CRMU shall appear as bill credits on your monthly bill. CRMU's obligation for payment to customer shall not commence until customer has received written approval to energize QF from CRMU.

Please see CRMU's Qualifying Facility (QF) Rate Schedule for a detailed description of charges and credits.

Part 4. CERTIFICATE OF COMPLETION

Application No. _____

Coon Rapids Municipal Utilities

Is the Generating Facility installed, tested and ready for operation? Yes _____ No _____

Customer: _____

Address: _____

Telephone (Day): _____ (Evening): _____

Fax: _____ E-Mail Address: _____

Location of the Generating Facility (if different from above):

Electrician/Service Company:

Name: _____

Address: _____

City/State/ZIP: _____

Telephone (Day): _____ (Evening): _____

Fax: _____ E-Mail Address: _____

License number: _____

Date Utility approved installation facility: _____

Application number: _____

Inspection:

The Generating Facility has been installed and inspected in compliance with applicable electrical codes.

A copy of the signed electrical inspection form is attached. Yes No

(If inspection form is not attached)

Signature of inspector:

Date

Printed name of inspector

Part 5. APPROVAL TO ENERGIZE GENERATING FACILITY

Application No. _____

Coon Rapids Municipal Utilities

The Utility, having entered into an Interconnection Agreement for the facility described in the Application noted by number above and having received a Certificate of Completion with proper documentation of the electrical inspection hereby authorizes the Generating Facility to be energized:

Utility Signature: _____

Title: _____ Date: _____