



**INTERCONNECTION STANDARDS
FOR
ELECTRIC POWER-PRODUCING FACILITIES
OF 10 KW OR LESS
IN THE STATE OF NEW JERSEY**

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Rockland Electric Company
390 West Rt. 59
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I. INTRODUCTION

The interconnection standards set forth in this document (“Interconnection Standards”) describe the minimum operating, metering, and protective equipment that Rockland Electric Company (“RECO”) requires for operation of its electric distribution system in parallel with electric power-producing facilities with total output of 10KW or less. These Interconnection Standards have been established for the protection of life and property and are intended to assist owners of electric power-producing facilities with total output of 10KW or less (referred to hereafter as the “Applicant”) in evaluating their electrical generating system requirements.

A. Application Procedure

This application procedure is consistent with the requirements of the New Jersey Board of Public Utilities (“Board”), as set forth in the Board’s regulations, N.J.A.C. 14:4-9.1 to 14:4-9.11, “Net Metering and Interconnection Standards for Class 1 Renewable Energy Systems.” The Applicant should file the appropriate form with RECO. Upon request, RECO shall meet or speak with the Applicant to assist in preparing the application.

II. TECHNICAL REQUIREMENTS FOR INTERCONNECTING ELECTRIC POWER-PRODUCING FACILITIES 10 KW OR LESS, SINGLE-PHASE, 600 VOLTS OR LESS, IN PARALLEL WITH A UTILITY SYSTEM.

A. Design Requirements

1. A customer-generator facility must be certified as complying with the following standards, as applicable:
 - a. IEEE 1547, Standard for Interconnecting Distributed Resources with Electric Power Systems, as amended and supplemented (“IEEE Standard 1547”), which is incorporated by reference herein. IEEE Standard 1547 can be obtained through the IEEE website at www.ieee.org; and
 - b. UL 1741, Inverters, Converters, and Controllers for Use in Independent Power Systems (January 2001), as amended and supplemented (“UL Standard 1741”), which is incorporated by reference herein. UL Standard 1741 and other UL standards can be obtained through the Underwriters Laboratories website at www.ul.com.

An equipment package shall be considered certified as complying with the above-referenced standards if it has been submitted by a manufacturer to a nationally recognized testing and certification laboratory, and has been tested and listed by the laboratory for continuous interactive operation with an electric distribution system in compliance with the applicable standards listed above.

2. The electric power-producing facility shall conform to all applicable local, state and federal building codes and National Standards and any authorities having jurisdiction.
3. The electric power-producing facility shall have an automatic switching device operated by over- and under-voltage protection and over- and under-frequency protection. The trip settings shall be per IEEE Standard 1547.
 - a. Following a disconnect of the electric power-producing facility as a result of a voltage or frequency excursion, the electric power-producing facility shall remain disconnected until the utility service voltage has recovered to utility-acceptable voltage and frequency limits for a minimum of five minutes.
 - b. The above trip settings shall not be changed or modified by the electric power-producing facility owner or representative.
 - c. All devices or systems used for voltage and frequency measurement and automatic disconnection shall be tested by the manufacturer for both static and dynamic performance. At the time of production, design and performance, such devices or systems must meet or exceed requirements of ANSI/IEEE Standards C37.90.1 and 929-2000. Proof of proper performance shall be in the form of a certified test report acceptable to RECO.
4. If the electric power-producing facility does not comply with these requirements, utility-grade protective relays, approved by RECO, are required.

A. Manual Disconnect Switch

1. The electric power-producing facility shall be capable of being isolated from the RECO distribution system by means of an external, manual, visible load break, disconnect switch installed by the owner of the electric power-producing facility, electrically located between the electric power-producing facility and the RECO distribution system.
2. The disconnect switch shall be located within ten feet of the external electric service meter.

3. The disconnect switch shall be readily accessible for operation by RECO personnel at all times and be capable of being padlocked only in the open position. Operation of this switch is at the sole discretion of RECO without prior notice.
4. The disconnect switch shall be clearly marked "Generator Disconnect Switch" with permanent 3/8-inch letters or larger.

B. Dedicated Distribution Transformer

1. RECO reserves the right to require that the electric power-producing facility connects to the RECO's distribution system through a dedicated distribution transformer if RECO decides that the transformer is necessary to ensure conformance with utility safe work practices, to enhance service restoration operations or to prevent detrimental effects to other utility customers.

C. Electric Power-Producing Facility Performance

1. The electrical output of the electric power-producing facility shall meet the latest IEEE Standard 519 and ANSI C84.1 at the time of placement into service.

D. Testing and Maintenance

Upon initial parallel operation of an electric power-producing facility, or any time interface hardware or software is changed, verification testing must be performed. A qualified individual must perform verification testing in accordance with the manufacturer's published test procedure. Qualified individuals include professional engineers, factory-trained and certified technicians, and licensed electricians with experience in testing protective equipment. RECO reserves the right to witness verification testing or require written certification that the testing was successfully performed.

Verification testing shall be performed at least once every four years. All verification tests prescribed by the manufacturer shall be performed. If wires must be removed to perform certain tests, each wire and each terminal must be clearly and permanently marked. The Applicant shall maintain verification test reports for inspection by RECO.

Single-phase inverters and inverter systems rated 15 kVA and below may be verified upon initial parallel operation and once per year as follows: the Applicant or its agent shall operate the load break disconnect switch and verify the electric power-producing facility automatically shuts down and does not restart for five minutes after the switch is closed. The Applicant shall maintain a log of these operations for inspection by RECO. Any system that depends upon a battery for trip power shall be checked and logged once per month for proper voltage. Once every four years the battery must be either replaced or a discharge test performed.

Figure 1 set forth below, shows typical net metering and protection schemes for electric power-producing facilities with total output of 10KW or less.

FIGURE 1

TYPICAL PROTECTION & NET METERING
INSTALLATION FOR ELECTRIC POWER
PRODUCING FACILITIES OF
10 KILOWATTS AND LESS

