

Interconnection and Power Purchase Agreement

THIS AGREEMENT, made this _____ day of _____ 20__, by and between _____ (hereinafter called “Cooperative”), _____ (hereinafter called “Generator”) and Allegheny Electric Cooperative (hereafter called “Allegheny”).

WITNESSETH

WHEREAS, the Generator has indicated a desire to install electric generating facilities described on the attached Schedule A on his/her property located at _____ within the service territory of Cooperative; and

WHEREAS, the subject generating facilities will utilize renewable resources as fuel and/or otherwise meet the qualification standards for 1) Qualifying Facilities (QF) established by the Federal Energy Regulatory Commission (FERC) in regulations at 18 C.F.R. Part 292 and in Docket No. RM79-54, Order No. 70 and/or 2) Alternative Energy Systems (AES) established by the Pennsylvania Alternative Energy Portfolio Standards Act of 2004 (Act 213); and

WHEREAS, the Generator wishes to generate electric energy for sale to Allegheny or for his/her own uses with sale of any excess energy to Allegheny; and

WHEREAS, the Cooperative and Allegheny, consistent with their policies of encouraging innovation in the energy field, are willing to interconnect and operate in parallel with the said AES/QF and, if required, to furnish parallel electric service to the Generator for the operation of his/her AES/QF and/or other uses;

NOW THEREFORE, Cooperative, Allegheny and the Generator agree as follows:

1. The Cooperative shall furnish electric service and supply the energy requirements of the Generator that are not supplied by the AES/QF in accordance with the rate schedule applicable to the Generator’s class of service as a member of the Cooperative.

2. The Cooperative shall credit an AES at the full retail rate for each kilowatt-hour produced by an AES installed on the member's side of the electric revenue meter, up to a total amount of electricity used by the member during the billing period. For AESs involved in virtual meter aggregation, a credit shall be applied first to the meter through which the Cooperative supplies electricity to the distribution system, then through the remaining meters for the AES's account equally at each meter's designated rate.

3. Allegheny shall purchase all power and energy delivered into the Cooperative's electric system by the Generator on the terms and conditions of Rate Schedule SPP, which is attached and made part of this Agreement by reference, as such Schedule may be modified by any revisions approved by Allegheny's Board of Directors.

4. The installation and operation of the AES/QF shall be in accordance with the policies, rules, regulations and applicable rate schedule, copies of which are attached and made part of this Agreement by reference, which from time to time may be modified or adopted by the Cooperative and / or Allegheny.

5. Prior to the installation of the AES/QF, the Generator shall submit his/her plans and specifications for the AES/QF to Cooperative for review to assure compliance with the Cooperative's rules, regulations and interconnection policy. Such review shall not be construed as permission to operate the facilities without written authorization from Cooperative after inspection of the completed facilities as hereinafter provided.

6. Prior to interconnection of the AES/QF, the Generator shall notify Cooperative and the Cooperative shall inspect the facilities for compliance with the Cooperative's or Allegheny's rules, regulations and bylaws. Cooperative shall inspect and test the operation of the AES/QF to assure the safety of the personnel of the Cooperative and the satisfactory operation of the AES/QF in parallel with the Cooperative's system before authorizing the operation of the AES/QF. Such inspection by the Cooperative shall not relieve the Generator from his/her responsibility to install, operate, and maintain the AES/QF in a safe and satisfactory manner. The above-described inspection does not impose any obligation upon the Cooperative or Allegheny to warrant or ensure in any manner the AES/QF's safety or compliance with this Agreement. Further, the Cooperative and Allegheny make no representations concerning, and expressly disclaim any expertise or specialized knowledge relating to the particular type of generation employed by the Generator or the equipment associated with such generation.

7. The Generator shall reimburse the Cooperative and Allegheny for their respective costs of providing additional facilities or modifying existing facilities, including metering, required to interconnect with the AES/QF. Payment shall be due within 30 days of receipt of a statement thereof from the Cooperative and/or Allegheny. Said payment shall be received prior to physical interconnection of the facilities.
8. The Cooperative or Allegheny may at any time install or modify its equipment as it deems necessary to ensure the safety of its personnel and the satisfactory operation of its system, and/or the accuracy of its meter as a result of the operation of the AES/QF. The Generator shall reimburse the Cooperative or Allegheny for the total cost of such installation or modification within 30 days of receipt of a statement thereof from the Cooperative or Allegheny.
9. Authorized Cooperative or Allegheny personnel shall have the right to enter upon the Generator's property at any time for the purpose of inspecting the AES/QF and making additional tests to ensure the continued safe operation of the AES/QF and the accuracy of the meter. Such inspections shall not relieve the Generator from his/her obligation to install, operate, and maintain the AES/QF in a safe and satisfactory manner.
10. If, in the judgment of the Cooperative or Allegheny, the Generator has failed to maintain the AES/QF in satisfactory operating condition, the Cooperative or Allegheny may notify the Generator to disconnect the AES/QF from the Cooperative's system. In the event the Generator fails to immediately comply with such notice, the Cooperative may discontinue service to the Generator until the AES/QF is disconnected or restored to a satisfactory operating condition.
11. The Generator shall have the sole responsibility for the safety and electrical protection of his/her AES/QF, without regard to the condition of the Cooperative's or Allegheny's facilities.
12. The Generator agrees that he/she shall indemnify and hold harmless the Cooperative and Allegheny for any personal injuries to any person and/or damage to property of any type arising out of the existence, maintenance, and operation of the Generator's AES/QF regardless of whether the injury or damage occurs on the Cooperative's and/or Allegheny's side of the interconnection point.
13. The Generator shall procure and maintain the following liability insurance in the amounts stated:
 - A. Bodily injury in the amount of \$1,000,000 or greater per occurrence.

The Cooperative and Allegheny shall be listed as Additional Named Interest on the Policy and the Cooperative and Allegheny shall be given a minimum of twenty (20) days advance notice of cancellation or non-renewal of the Policy.

14. This Agreement shall become effective immediately upon the execution hereof and shall continue in effect until terminated by any party upon thirty (30) days written notice given to the other parties. Termination shall require permanent disconnection of the AES/QF.

IN WITNESS WHEREOF, the parties have caused this Agreement to be duly executed as of the day and year first above written.

ATTEST:

COOPERATIVE

ATTEST: By _____

GENERATOR

Signature:

Print Name:

Address

Telephone No.

ATTEST:

ALLEGHENY ELECTRIC COOPERATIVE, INC.

By _____

ALLEGHENY ELECTRIC COOPERATIVE, INC.
EXHIBIT C – Small Power and Qualifying Facilities Purchases– Rate Schedule SPP
Effective - January 1, 2020

AVAILABILITY:

Available to any and all Alternative Energy Systems (AES) as defined by the Pennsylvania Alternative Energy Portfolio Standards Act of 2004 (Act 213), qualifying small power providing facilities under the New Jersey Electric Discount and Energy Competition Act (PL 1999, C.23) and Qualifying Facilities (QF) as defined under Section 201 and Small Power Production (SPP) facilities as defined under Section 204 of the Public Utility Regulatory Policies Act of 1978, as amended (PURPA), which receive electric service under existing retail tariffs from any of Allegheny Electric Cooperative, Inc.'s (Allegheny) 14 member distribution cooperatives (Members) located throughout Pennsylvania and New Jersey.

This Schedule applies to a QF which can be: (1) either a cogeneration facility that produces electric energy and steam or other forms of useful energy (such as heat) that is used for industrial, commercial or cooling purposes such as Combined Heat and Power (CHP) and has no size limitation for PURPA qualification; or (2) a SPP facility of 80 MW or less whose primary energy source is renewable (hydro, wind, solar, biomass, geothermal, biologically derived methane gas, coal-mine methane or fuel cell) resources.

PROVISIONS:


- A. In compliance with Section 210 of PURPA, Allegheny will purchase: (1) at Allegheny's Standard Avoided Cost Rate (as described in Section G), all excess energy (kWh) generated by an AES/QF which is not directly consumed by that AES/QF; or (2) transmit the output of the AES/QF across its and/or its Members' systems for purchase by third parties. The AES/QF will be required to install metering equipment, satisfactory to Allegheny, to demonstrate the amount of generation the AES/QF provided to Allegheny.
- B. If the AES/QF has an installed capacity greater than 100 kW, at the option of the AES/QF, Allegheny will purchase energy (kWh) at a price based on Allegheny's avoided energy costs and firm, controllable generating capacity (kW) based on actual avoided capacity costs as defined in Section F of this Schedule. The AES/QF will be required to demonstrate or otherwise financially guarantee that such capacity will be or was available during the period(s) defined by PJM for determining capacity credits or obligations. To qualify for compensation under this option, the AES/QF will be required to install metering equipment, satisfactory to Allegheny, to demonstrate the amount of generation the AES/QF provided to Allegheny during period(s) defined by PJM for determining capacity credits or obligations. If this option is requested, the AES/QF will be required to compensate Allegheny for any and all costs associated with the equipment necessary to determine the expected availability, timing (controllability) and magnitude of the furnished generation.
- C. At times when an AES/QF must purchase capacity, transmission, and associated energy from

an Allegheny Member to supply its electrical requirements, all such retail transactions will be priced and conducted between the AES/QF and the Member which is interconnected with the AES/QF.

- D. Allegheny recognizes that it is in the best interest of its Members and the AES/QF that the Member determines all technical requirements and specifications that govern the connection of an AES/QF with its system. These technical requirements for interconnection are designed to assure the integrity and safe operation of the interconnected system while maintaining the quality and reliability of service to all consumer-members of the Member.
- E. Allegheny's avoided cost for capacity and energy provided by an AES/QF or in the alternative, the mutually agreed upon value of such products for longer term, firm supply arrangements, will be dependent upon and determined by, but not limited to, the following types of factors:
 - 1. The specific times of the day, month and year that the AES/QF operates and the level at which it operates.
 - 2. Allegheny's need for and price of capacity and energy during the times that the AES/QF operates.
 - 3. The specific Member delivery point to which the AES/QF is connected.
 - 4. Allegheny's specific power supply arrangements, including rate structure, for supplying the delivery point to which the AES/QF is connected.
- F. Capacity Payment: The monthly payment for capacity will be equal to the product of: (1) the average generation provided to Allegheny by the AES/QF during the period(s) defined by PJM for determining capacity obligations during the applicable planning period year as measured on the AES/QF meter required pursuant to Section B of this Schedule SPP; and (2) the applicable annualized PJM Auction capacity price divided by 12. This capacity payment definition will be updated periodically to address material changes to PJM capacity market rules.
- G. Standard Avoided Cost Rate: Allegheny will pay for energy output at an annually adjusted rate which reflects Allegheny's avoided energy and capacity costs.
- H. Renewable Energy Certificates: If the parties mutually agree that Allegheny will purchase the capacity and/or energy output of the AES/QF, then the value for all renewable energy or other certificates generated by the AES/QF facility may be included in the negotiated rate. Otherwise, the AES/QF will retain ownership of any such renewable energy or other certificates.
- I. No AES/QF, other generator or consumer-member of a Member may be compensated under this or a similar wholesale rate schedule of Allegheny if the AES/QF is also being compensated by PJM or another entity under a PJM or similar program for providing the same generation services during the same times.
- J. Allegheny will make direct payments to the AES/QF on a monthly basis or an otherwise mutually agreed upon longer period.

K. Any other considerations, payments, or responsibilities of either or both Parties are subject to the mutual agreement of the Parties.

This current Rate Schedule SPP was reviewed and approved by the Allegheny Board of Directors on October 30, 2019, and supersedes all previous versions.


Secretary

October 30, 2019

ALLEGHENY ELECTRIC COOPERATIVE, INC.
212 Locust Street, P.O. Box 1266
Harrisburg, PA 17108-1266

**SOMERSET RURAL ELECTRIC COOPERATIVE, INC.
SERVICE RATE
FOR
MEMBER ALTERNATIVE ENERGY PRODUCTION**

AVAILABILITY

Available in all territories served by the Cooperative. Subject to the established rules and regulations of the Cooperative, the aggregate capacity of members' alternative energy systems (AES) may be limited by the Cooperative's system, substation area and/or circuit.

APPLICABILITY

Applicable to all members of the Cooperative meeting criteria contained herein.

The member's AES must:

- 1) Be owned, operated, leased, or otherwise controlled by the member;
- 2) Be operated in parallel with the Cooperative's distribution system;
- 3) Have a nameplate capacity:
 - a. For a member's primary residence, no greater than 25 kilowatts (kW)
 - b. For a member's commercial account, no greater than 300 kilowatts (kW)
- 4) Be primarily intended to offset part or all a member's electric generation requirements.

Member AESs that qualify under this Service Rate: solar photovoltaic or other solar energy, solar thermal energy, wind power, hydropower, biomass, and bio-digester gas and fuel cells as defined in Pa. Act 213 (Alternative Energy Portfolio Standards Act of 2004).

The member's AESs must meet or exceed the standards and requirements of the National Electrical Code, the National Electrical Safety Code, the Institute of Electrical and Electronics Engineers, Underwriters Laboratories, and Pennsylvania Public Utility Commission, as well as the Cooperative's Policy on Alternative Energy Production; Safety and Interconnection Requirements for Alternative Energy Production; and local requirements.

The member must have executed a Power Purchase Contract with Allegheny Electric Cooperative (Allegheny) to sell excess energy produced by the member's AES to Allegheny.

TYPE OF SERVICE

60 cycles, at available secondary voltage.

Service under this rate schedule requires metering equipment that can measure the flow of electricity in both directions.

COOPERATIVE MONTHLY BILLING

The Cooperative bills the member on a monthly basis according to the applicable rate schedule. Except as limited below, the Cooperative shall credit an AES at the full retail rate for each kilowatt-hour produced by an AES installed on the member's side of the electric revenue meter, up to a total amount of electricity used by the member during the billing period.

For AESs involved in virtual meter aggregation, a credit shall be applied first to the meter through which the Cooperative supplies electricity to the distribution system, then through the remaining meters for the AESs account equally at each meter's designated rate. At the end of each billing period, the Cooperative shall allow kilowatt-hours in excess of the monthly billing to accumulate to the extent that kilowatt-hours generated by the AES exceed the amount of kilowatt-hours delivered by the Cooperative during the billing period.

For all AES installations, any accumulated kilowatt-hours shall be used to credit an AES at the full retail rate for each kilowatt-hour for any monthly bill up to and including the March bill after the kilowatt-hours are produced with the following limitation:

- 1) For each 12-month April to March period, up to 110% of the total kilowatt hours based on Cooperative billing records in the twelve billing periods prior to the AES application submission will be eligible for full retail rate credits.
- 2) A member will not be eligible for net metering until they have been a member for at least twelve (12) billing cycles.

For all kilowatts remaining after the March bill or in excess of 110% of the total kilowatt hours based on Cooperative billing records in the twelve billing periods prior to the AES application, the Cooperative shall choose, at its sole discretion, to either 1) carry-over accumulated kilowatt-hours to the next April to March billing periods or 2) compensate the AES for at the Cooperative's avoided cost of wholesale power.

METER AGGREGATION

The combination of readings from, and billing for, all meters regardless of rate class on properties owned or leased and operated by a member operating an AES within the Cooperative's service territory whether the aggregation is completed through physical or virtual meter aggregation within two circuit miles of the point of interconnection of the member's AES equipment.

TERMS OF PAYMENT

The monthly charges for service will follow the applicable rate schedule for net and gross charges.

SOMERSET RURAL ELECTRIC COOPERATIVE

Application for Operation of Interconnected Customer-Owned Generation

This application must be completed and returned to the Cooperative Contact in order to begin processing the request. In addition to the completed application, a \$700 non-refundable application fee applies.

INFORMATION: *This application is used by the Cooperative to determine the required equipment configuration for the Member interface. Every effort should be made to supply as much information as possible.*

*NOTE: Members installing direct grid interconnected (non-battery inverter) generators only need to complete the highlighted portions of this application. Other types of generation must complete the entire application.

PART 1

MEMBER/APPLICANT INFORMATION

Name:			
Mailing			
Address:			
City:	County:	State:	ZipCode:
Daytime Phone No.:		Evening Phone No.:	
Account Number:		Map Number:	
Email Address:		Fax:	

PROJECT DESIGN/ENGINEERING (ARCHITECT) (if applicable)

Company:		Contact Person:	
Mailing Address:			
City:	County:	State:	Zip Code:
Phone Number:		Fax umber:	
Email Address:			

ELECTRICAL CONTRACTOR (if applicable)

Company:		Contact Person:	
Mailing Address:			
City:	County:	State:	Zip Code:
Phone Number:		Fax Number:	

PART 2

Complete all applicable items. This information is required for your installation to be considered. The equipment manufacturer will be able to provide the information requested in this section.

SYNCHRONOUS GENERATOR DATA

Unit Number: _____ Total number of units with listed specifications on site: _____
Manufacturer: _____
Type: _____ Model No. _____
Serial Number (each): _____ Date of manufacture: _____
Phases: Single _____ Three _____
R.P.M.: _____ Frequency (Hz): _____
Rated Output (for one unit): _____ Kilowatt _____ Kilovolt-Ampere
Rated Power Factor (%): _____ Rated Voltage (Volts): _____
Rated Amperes: _____
Field Volts: _____ Field Amps: _____ Motoring power (kW): _____
Synchronous Reactance (Xd): _____ % on _____ KVA base
Transient Reactance (X'd): _____ % on _____ KVA base
Subtransient Reactance (X'd): _____ % on _____ KVA base
Negative Sequence Reactance (Xs): _____ % on _____ KVA base
Zero Sequence Reactance (Xo): _____ % on _____ KVA base
Neutral Grounding Resistor (if applicable): _____
I₂²t or K (heating time constant): _____
Additional information: _____

INDUCTION GENERATOR DATA

Rotor Resistance (Rr): _____ ohms Stator Resistance (Rs): _____ ohms
Rotor Reactance (Xr): _____ ohms Stator Reactance (Xs): _____ ohms
Magnetizing Reactance (Xm): _____ ohms Short Circuit Reactance (Xd''): _____ ohms
Design letter: _____ Frame Size: _____
Exciting Current: _____ Temp Rise (deg C°): _____
Reactive Power Required: _____ Vars (no load), _____ Vars (full load)
Additional information: _____

GENERATOR STEP-UP TRANSFORMER (if applicable)

Generator unit number: _____ Date of manufacturer: _____
Manufacturer: _____
Serial Number: _____
High Voltage: _____ KV, Connection: delta wye, Neutral solidly grounded? _____
Low Voltage: _____ KV, Connection: delta wye, Neutral solidly g rounded? _____
Transformer Impedance (Z): _____ % on _____ KVA base.
Transformer Resistance (R): _____ % on _____ KVA base.
Transformer Reactance (X): _____ % on _____ KVA base.
Neutral Grounding Resistor (if applicable): _____

INVERTER DATA (if applicable)

Manufacturer: _____ Model: _____
 Rated Power Factor (%): _____ Rated Voltage (Volts): _____ Rated Amperes: _____
 Inverter Type (ferroresonant, step, pulse-width modulation, etc): _____
 Inverter Rating (kw): _____ Phases: _____

 Type commutation: forced _____ line _____
 Harmonic Distortion: Maximum Single Harmonic (%) _____
 Maximum Total Harmonic (%) _____

Note: Attach all available calculations, test reports, and oscillographic prints showing inverter output voltage and current waveforms.

POWER CIRCUIT BREAKER (if applicable)

Manufacturer: _____ Model: _____
 Rated Voltage (*kilovolts*): _____ Rated ampacity (*Amperes*) _____
 Interrupting rating (*Amperes*): _____ BIL Rating: _____
 Interrupting medium / insulating medium (ex. Vacuum, gas, oil) _____ / _____
 Control Voltage (Closing): _____ (Volts) AC DC
 Control Voltage (Tripping): _____ (Volts) AC DC Battery Charged Capacitor
 Close energy: Spring Motor Hydraulic Pneumatic Other: _____
 Trip energy: Spring Motor Hydraulic Pneumatic Other: _____
 Bushing Current Transformers: _____ (Max. ratio) Relay Accuracy Class: _____
 Multi ratio? No Yes: (Available taps) _____

SHORT CIRCUIT CURRENT CONTRIBUTION AND UNIT INRUSH CURRENT OF THE PROPOSED GENERATING FACILITY

Distributed Generator Short Circuit Current

Single Phase to Ground _____ Amperes
 Three-Phase Symmetrical _____ Amperes
 Three-Phase Asymmetrical _____ Amperes

Does the Facility Start with the Aid of Grid Power? _____ Yes _____ No

If yes, what is the inrush Current? _____ amps (inrush current)

Will this Generation be used to primarily offset the members' electrical energy consumption?
 _____ Yes _____ No

If yes, generators up to 25 KW for residential consumer class and up to 300 KW for all other consumer classes qualify for the cooperatives net metering AES service rate.

ADDITIONAL INFORMATION

In addition to the items listed above, please attach the following:

- detailed one-line diagram of the proposed facility
- all applicable elementary diagrams
- control schematics
- site plan
- major equipment, (generators, transformers, inverters, circuit breakers, protective relays, etc.)
- specifications
- test reports
- any other applicable drawings or documents necessary for the proper design of the interconnection

SIGN OFF AREA

Somerset Rural Electric Cooperative is committed to providing safe and effective power delivery to all members. Failure to comply with any of the following will result in immediate disconnection of the member from Somerset Rural Electric lines.

Any interconnected generator must have a meter base installed between the generator and the interconnection point, prior to interconnection. Somerset REC will provide a bi-directional meter at this point to continually monitor the output of the generator, as well as energy consumed to perform net metering functions.

A pad lockable disconnect must be installed in close proximity to the meter on the load side, providing access to the cooperative.

Failure to comply with AES policies will result in a penalty in the amount of up to \$1,000 per occurrence.

Somerset REC personnel must make a site visit to inspect the generator and set the appropriate meters prior to interconnection of any system. Members must call to schedule this appointment. When scheduling this appointment with Somerset REC, please allow 10 business days (see contact information on page 6).

The member agrees to complete, sign and submit the required documentation (this application, the Interconnection Agreement and Renewable Energy Assistance Program application). This paperwork must be received by Somerset REC prior to interconnection.

As a Somerset REC member applying for interconnection, I understand that it is my responsibility to submit all required information and documentation and to operate my equipment within the guidelines set forth by the cooperative’s policy on alternate energy production. I take complete responsibility for the installation and operation of the generator and will not in any manner hold Somerset REC responsible for the performance of the generator. I understand that Somerset REC may share the generation data from my generator and use this data for public and member educational purposes.

All product warranties and performance claims are limited to that of the manufacturer or installer. The cooperative provides no warranties of any kind, expressed or implied, including the implied warranties of merchantability and fitness for a particular purpose; the cooperative will not perform warranty repairs of any kind. The cooperative is not responsible, and will not be held liable for special, indirect or consequential damages including non-performance issues, injury or damage to property or person, whether in contract, in tort, under warranty or otherwise.

Applicant Signature: _____

Date _____

Print Name: _____

Application Received By: _____

Date _____

ELECTRIC COOPERATIVE CONTACT FOR APPLICATION SUBMISSION AND FOR MORE INFORMATION:

Cooperative contact: **Emily Baer**
Title: **Director of Marketing & Member Service**
Address: **223 Industrial Park Road**
Somerset PA 15501

Phone: **814/445-4106**
Fax: **814/445-5526**
E-mail: **ebaer@somersetrec.com**

SOMERSET RURAL ELECTRIC COOPERATIVE, INC.

POLICY on ALTERNATE ENERGY PRODUCTION

It is the policy of *Somerset Rural Electric Cooperative, Inc.* (“the Cooperative”) to permit and encourage Alternative Energy System (AES)/Qualifying Facility (QF) Owners to operate cogeneration and small power production facilities and safely and reliably interconnect them with the Cooperative's electric distribution system. The term AES/QF shall be used throughout this document to define any form of generation that is not owned and operated by the Cooperative, and is interconnected to the Cooperative. Alternative Energy Systems are defined under Pennsylvania’s Alternate Energy Portfolio Standards Act of 2004 (Act 213-2004). Qualifying Facilities are defined under the Public Utility Regulatory Policies Act of 1978 (PURPA). This policy will enable the AES/QF Owner to deliver total or excess energy into the Cooperative's distribution system. Compensation for such delivered energy shall be based on Allegheny Electric Cooperative’s (Allegheny) avoided costs. The interconnection of a AES/QF and the Cooperative's distribution system is subject to the following conditions:

- A. If the AES/QF has nondiscriminatory access to one of the following: (1) independently administered, auction-based day ahead and real time energy markets and wholesale markets for long-term capacity sales, or
(2) an open access transmission and interconnection service provided by a FERC-approved regional transmission organization and competitive wholesale markets that provide an opportunity to sell capacity and energy, then Allegheny’s obligation to purchase the energy and capacity generated by a AES/QF may be waived by petitioning FERC for relief from the obligation to purchase energy and capacity on a service territory-wide basis by demonstrating that options (1) and (2) are available to the AES/QF.
- B. Prior to the time of interconnection, the AES/QF Owner must submit to the Cooperative complete and detailed electrical drawings, signed by a licensed Professional Engineer of the AES/QF of the state in which the panels are being installed. Any new or proposed AES/QF must undergo an operational, safety, and technical screening and review to determine potential effects on the Cooperative’s electrical system. The AES/QF Owner shall provide the Cooperative with a Certificate of Completion when the unit is ready to be energized. Written approval must be received from the Cooperative prior to the physical interconnection of the AES/QF to the Cooperative's electrical system.

*THE SAFETY & INTERCONNECTION REQUIREMENTS FOR
ALTERNATE ENERGY PRODUCTION Document* provides additional
details regarding the evaluation or proposed generators.

The AES/QF Owner shall be responsible for payment of any incremental costs incurred by the Cooperative or Allegheny to interconnect with, synchronize, or accept output from the AES/QF. This would include, but not be limited to:

1. The costs associated with an engineering or evaluation study to accommodate the AES/QF interconnection.
2. Increase in transformer capacity and service conductor size or length.
3. Change or addition of type of service; e.g.
 - a. Single-phase to three-phase.
 - b. Voltage change (120/240 to 240/480, etc.).
4. Line extension or system upgrade for a AES/QF.
 - a. Single-phase line extension to the facility
 - b. Three-phase extension line to the facility
 - c. Reconductoring a circuit to increase current carrying capability

All AES/QF wiring must be in compliance with the National Electrical Code (NEC) and all other applicable codes and ordinances, and must be approved by an electrical inspection agency acceptable to the Cooperative. Proper grounding is imperative in ensuring safe operation. NEC Section 250-2005 and IEEE Green Book ANSI C114.1-1973 / IEEE Standard 142-1972 should be referenced.

Any reference in this Policy to a code, standard, regulation, or guideline shall be construed to mean the then-current version of that document.

C. The interconnection equipment must be of a "fail safe" design to ensure, in the event of any electrical supply or equipment failure, that the AES'/QF's and the Cooperative's electrical system will be physically separated automatically. To prevent islanding on specific AES/QF applications, a transfer trip scheme may be required. The AES/QF will remain separated until the Cooperative's electrical system returns to its normal operating status. The AES/QF will synchronize with the Cooperative's electrical system only when the Cooperative electrical facilities' voltage and frequency are within acceptable industry

tolerances. Adherence to IEEE 1547-2003 relaying guidelines is required.

The AES/QF electrical system should be able to withstand all expected electrical transients that occur on Cooperative's electrical distribution and transmission systems, including outages. For instance, fuse coordination and operation of Cooperative reclosers should not cause damage that would require repair of the AES/QF's electrical system. Manual or automatic reset of system protective devices, either by the Cooperative or the AES/QF Owner, is acceptable.

- D. The interconnection equipment must include an approved manual, visible load break safety switch pad lockable in the open position, and be accessible at all times to the Cooperative's personnel. The AES/QF Owner shall agree that the Cooperative may open the disconnect switch without prior notice for the following reasons:
 - 1. Emergency conditions on the Cooperative's system.
 - 2. Inspection of the AES/QF by the Cooperative reveals a hazardous condition or lack of proper maintenance of AES/QF facilities.
 - 3. The AES/QF interferes with electrical service to Cooperative Members or with the Cooperative's electrical system. Interference may include, but not be limited to: over or under voltage or frequency, harmonics, etc.
 - 4. Repair work on the Cooperative's system. Where time permits, the Cooperative will attempt to provide advance notice to the AES/QF Owner of imminent disconnection of the AES/QF and the reasons for same.
- DI. The AES/QF must be operated so that no adverse effect(s) or power quality issue(s) occur to the Cooperative's electrical system or to others connected thereto. If such adverse effect(s) occur, the AES/QF Owner must discontinue operation of the AES/QF and take corrective action(s) at the AES/QF Owner's sole expense, as deemed necessary by the Cooperative, and/or industry standards, including IEEE Standard 1547-2003, IEEE 929-2000, and UL 1741-2001. Adverse effect(s) and power quality issues include, but are not limited to, voltage regulation, flicker, and/or harmonics.
- DII. The AES/QF Owner must inform the Cooperative of any changes to the AES/QF and obtain the Cooperative's approval, in writing, before changes are made to the AES/QF in order to address the adverse effect(s) referred to in Paragraph D above. Prior to reconnecting, the AES/QF Owner must inform the Cooperative of their intent to reconnect.

- G. The AES/QF Owner will own, install, and maintain at his expense, all safety and interconnection equipment as specified by the Cooperative. Minimum required interconnection facilities are described in Section B hereto. The Cooperative reserves the right to observe and witness the installation and testing of interconnection facilities pursuant to industry practices, codes, and IEEE Standard 1547-2003, IEEE 929-2000, and UL 1741-2001.
- H. The AES/QF must be installed to meet the C2-2002 National Electrical Safety Code (NESC) or other applicable code requirements for clearances from the nearest Cooperative electric facility, or such other distance as the Cooperative deems necessary for safety or electric operation-related reasons.
- I. The Cooperative or Allegheny reserves the right to inspect the AES/QF and interconnection equipment at any time.
- J. The AES/QF Owner must have a current liability insurance policy adequate in amount to cover all forms of liability that may arise from the operation of the AES/QF interconnected to the Cooperative's electrical system. The policy must list the Cooperative and Allegheny as additional named interest. A copy of this policy must be on file with the Cooperative. Lapse of the policy must be automatically reported to the Cooperative by the insurer, and shall result in the immediate disconnection of the AES/QF from the Cooperative's electrical system. In general, a minimum of \$1 Million in liability insurance is required. The specific amount will be based on the Cooperative's review of the specific AES/QF.
- K. The AES/QF Owner shall agree to hold the Cooperative and/ or Allegheny harmless and indemnify the Cooperative and/ or Allegheny in connection with any damages or injury affecting any party, resulting from the installation or the interconnection of the AES/QF to the Cooperative's or Allegheny's system, and the purchase of any output from the AES/QF, or operation of the AES/QF. The AES/QF Owner agrees to indemnify the Cooperative and/ or Allegheny for any money damages, liabilities, administrative and/or legal expenses incurred by the Cooperative and/ or Allegheny as a result of the failure of the AES/QF Owner's equipment to meet any requirement or condition set forth herein.
- L. The AES/QF Owner shall sell electrical energy to Allegheny, pursuant to PURPA or ACT 213-2004 (as applicable) requirements, or upon

written notification to Allegheny, to another entity. If another power purchasing entity is selected, a transmission or other charge may apply to wheel or transport the electrical power over the Cooperative's or Allegheny's electric facilities.

- M. The AES/QF Owner is responsible for executing a contract with Allegheny to receive compensation for energy and/or capacity delivered into the Cooperative's electrical system. The Cooperative shall credit a AES at the full retail rate for each kilowatt-hour produced by a AES installed on the member's side of the electric revenue meter, up to a total amount of electricity used by the member during the billing period. For AESs involved in virtual meter aggregation, a credit shall be applied first to the meter through which the Cooperative supplies electricity to the distribution system, then through the remaining meters for the AES's account equally at each meter's designated rate. At the end of each billing period, Allegheny shall compensate the AEGS for kilowatt-hours generated by the AES over the amount of kilowatt-hours delivered by the Cooperative during the billing period at Allegheny's avoided cost of wholesale power. The combination of readings from, and billing for, all meters regardless of rate class on properties owned or leased and operated by a member operating an AES within the Cooperative's service territory whether the aggregation is completed through physical or virtual meter aggregation.
- N. For AES/QF's of 100 kW or less, the attached Rate Schedule applies (Section C).
- O. For AES/QF facilities of more than 100 kW, Allegheny will evaluate the proposed facility and negotiate potential purchase rates on a case-by-case basis, which rates will be based on Allegheny's avoided costs.
- P. Allegheny may refuse to purchase output from a AES/QF from time to time so the Cooperative can (1) construct, install, maintain, repair, replace, remove, investigate or inspect any of the Cooperative's equipment or any part of the Cooperative's System; or (2) if the Cooperative and/or Allegheny determine(s) that curtailment, interruption, or reduction of deliveries of energy or energy and capacity is appropriate because of emergencies, forced outages, operating conditions on the Cooperative's system, or as otherwise required by industry standard electrical practices.
- Q. Synchronous Generators will operate in the lagging VAR area of the capability curve at a power factor recommended by the Cooperative.

SOMERSET RURAL ELECTRIC COOPERATIVE , INC.

**SAFETY & INTERCONNECTION REQUIREMENTS FOR
ALTERNATE ENERGY PRODUCTION**

**SUPPLEMENT TO POLICY on
ALTERNATE ENERGY PRODUCTION**

The ***SOMERSET RURAL ELECTRIC COOPERATIVE , INC.***, (“the Cooperative”) has developed the *POLICY on ALTERNATE ENERGY PRODUCTION* enabling residential and commercial/industrial consumers to safely use electric power generated from non-traditional or renewable resources. Renewable resources, such as photovoltaics and fuel cells, may supplement the consumer’s source of energy.

AES/QF Owners, as defined in the *SOMERSET RURAL ELECTRIC COOPERATIVE, INC., POLICY on ALTERNATE ENERGY PRODUCTION*, can generate electricity for their own use, or for resale, within specific guidelines. AES/QF installations generally are non-utility sources of electric power that are connected to, and can supply power to, the cooperative-owned distribution or transmission system. The AES/QF can be non-consumer-owned, and can be powered either by renewable resources, or by non-renewable resources.

The Cooperative recognizes the various electric industry standards and safety codes as they pertain to Alternative Energy System (AES) or Qualifying Facilities (QF). The standards and codes to be followed include, but are not limited to: Institute of Electronic and Electrical Engineers (IEEE), the Mid-Atlantic Distributed Resource Initiative (MADRI), PJM Interconnection, National Electric Safety Code (NESC), National Electric Code (NEC), National Fire Protection Association (NFPA), Underwriters Laboratories (UL), state, and local entities. Any reference in this Policy to a code, standard, regulation, or guideline shall be construed to mean the then-current version of that document.

At a minimum, the Cooperatives require the use of AES/QF equipment that meets the intent of the IEEE 1547-2003, and/ or IEEE 929-2000, and/ or UL 1741-2001 Standards, and any other current industry standards.

GENERAL TECHNICAL REQUIREMENTS

Overview

The technical requirements for connection of AES/QF will be those necessary to assure the safety and integrity of the Cooperative's electric system, and to maintain the quality and reliability of service to the Cooperative's electrical system or to others connected thereto. If an adverse effect(s) occurs in the sole opinion of the Cooperative, the AES/QF Owner must discontinue operation and take corrective action.

Disconnecting Device

The technical requirements require a pad lockable disconnecting device, installed at a Cooperative approved location, with an appropriate control and protective scheme that automatically isolates the AES/QF from the utility system for, but not necessarily limited to, the following conditions:

- An electrical or mechanical fault on the AES/QF.
- An electrical or mechanical fault on the Cooperative's electrical system.
- An abnormal operating voltage and/or frequency on either system.
- A separation of the Cooperative's main system from the circuit that is interconnected with the AES/QF.

The reconnection of the AES/QF to the Cooperative distribution system shall NOT occur until normal system conditions are present and authorization from Somerset Rural Electric Cooperative is given.

Installation

The AES/QF units are to be installed in a workmanlike manner. Minimum Interconnection requirements will include, but may not be limited to, meeting or exceeding IEEE 1547-2003 and/ or UL 1741-2001 functionality requirements, or any other code or ordinance listed in this document. Facilities shall be installed to current NFPA 70-2005 codes or applicable electrical/ building codes. Additional operational or equipment requirements may be imposed on the AES/QF depending on the point of connection on the Cooperative's electrical facilities and the impact of the AES/QF on the Cooperatives' system. The Cooperative reserves the right to observe Generator start-up testing procedures to verify the proper system AES/QF interaction, or testing after modifications have been made to the Member's system.

Related Information

Depending on the size of the AES/QF, guidelines established by the PJM Interconnection L.L.C. will need to be followed. The PJM website at www.pjm.com contains details on IEEE 1547-2003, and other interconnection information.

If the electrical output of the AES/QF will be transmitted over the electric system of another entity, the AES/QF may need to meet additional requirements of that entity.

Assumptions and Limitations

IEEE 1547-2003 is not all-encompassing in its coverage of AES interconnections. Limitations and assumptions affecting its application include:

- The assumption that the AES/QF operates at 60 Hz.
- The assumption that the aggregate capacity of the AES is 10 MVA or less at the point of common connection.
- The assumption that IEEE 1547-2003 is focused on the activities of a AES on radial primary and secondary distribution systems.
- The limitation that IEEE 1547-2003 does not address the protection or operating requirements, planning, designing, or maintenance of the distribution system.

Monitoring Provisions / Other Communications / Control

Depending on the intended use and application of the AES/QF, monitoring provisions may be needed. Small units providing supplemental residential power likely will not need monitoring, whereas larger units generating power in excess of local use may require additional metering, or the use of an indicator sent either to the Cooperative or another entity controlling the electric system. The communication capabilities required to coordinate the AES/QF with protective or monitoring devices, may include but not be limited to, a Remote Terminal Unit (RTU), and shall be installed at the AES/QF Owners expense.

Net Metering will require the use of metering equipment, located between the Cooperative's source and the Owner's electrical load, that will measure the flow of electricity from the Cooperative to the Owner. The metering will also measure the flow of electricity supplied by the AES/QF Owner to the Cooperative. These independent meter registers will be used to determine the amount of energy provided to the Cooperative, and will be the basis for potential monthly billing credits.

SPECIFIC TECHNICAL REQUIREMENTS – PROTECTION

- A. Fault protection can be provided by various methods, but must be capable of detecting and clearing faults that can occur in AES/QF and/or Cooperative facilities. Typical schemes are shown in, but are not limited to, Exhibit 1.
- B. Isolation protection is required to immediately and automatically disconnect AES/QF generation from the Cooperative system upon the loss of Cooperative power.

This protection generally can be accomplished by either a synchronous inverter used in DC generation or by applying the following isolation relays:

1. Undervoltage relay which may be time-delayed and instantaneous overvoltage relay.
2. Underfrequency relay where generators equal to or greater than 100 kW are utilized.
3. Overfrequency relay on certain installations.

Typical protection schemes are illustrated in Figures 1 through 5 of Exhibit 1 for Qualifying Facilities of 100 kW or less. Requirements for Qualifying Facilities of greater than 100 kW will be developed on a case by case basis.

- C. AES/QF fault protection must coordinate with Cooperative system protective devices for faults in AES/QF equipment. The Cooperative will provide the characteristics of the protective device with which the AES/QF must coordinate. All required protection design and associated settings must be provided to and approved formally by the Cooperative prior to connecting AES/QF equipment to the Cooperative system. The following information must be supplied to the Cooperative:

1. One-line relay application diagram.
2. Connection diagrams showing all external connections to individual components of the protective scheme.
3. Instruction manuals for all protective components. Component specifications and internal wiring diagrams must be provided. If not included in manuals.
4. Generator data - equivalent impedances, time constants, etc. required to analyze fault contributions and load current flows.
5. All protective equipment ratings.

- CI. All relay settings for isolation protection must be coordinated and consistent with Cooperative equipment.
- CII. Maintenance for required fault and isolation protection must be performed and documented by the AES/QF Owner at specified intervals and specifications established by the equipment manufacturer or at intervals otherwise acceptable to the Cooperative.
- CIII. A pad lockable, manually operable, visible load-break disconnecting device is required for all AES/QF interconnections. The device will be installed at a Cooperative-approved and accessible location.

- G. The AES/QF will contain or employ a disconnecting device to automatically isolate the AES/QF generation from the Cooperative system when the Cooperative's circuit is either partially energized or fully de-energized. The disconnecting device also must be blocked from closing in on a partially energized or a de-energized Cooperative circuit.
- H. The Cooperative has the right, as required, to inspect all required protective equipment associated with the AES/QF interconnection.
- I. The AES/QF is responsible for properly synchronizing the Facility's generation with the Cooperative system.
- J. The AES/QF is responsible for providing a phase protection device on three-phase generators that will prevent damage to the generator or the Cooperative's system or Cooperative Members' equipment due to the loss of energy in any phase of a poly-phase system.
- K. The AES/QF electrical system should be able to withstand any and all electrical transients that occur on Cooperative's electrical distribution and transmission systems, including but not limited to, voltage surges, sags, swells, and outages. For instance, fuse coordination and operation of Cooperative reclosers should not cause damage that would require repair of the AES/QF's electrical system. Manual or automatic reset of system protective devices, either by the Cooperative or the AES/QF Owner, is acceptable.
- L. It is acknowledged that AES/QF technologies, such as fuel cells and wood powered steam turbines, continue to evolve. While the latest industry standard may not be specifically listed in this document, the Cooperative expressly reserves the right to use the latest industry standards in the interconnection evaluation process for any AES/QF technology.
- M. Additional resources on protection systems:
- ANSI/IEEE Std 1001-1988 "IEEE Guide for Interfacing Dispersed Storage and Generation Facilities with Electric Power Systems."
 - PJM "Small Generator (2 MW or less) Technical Requirements and Standards."
 - NFPA 70-2005 National Electric Code. *Note: Attention is directed to Article 250 – Grounding and Bonding.*
 - IEEE Green Book – ANSI C114.1-1973/IEEE Std 142-1972 "IEEE Recommended Practice for Grounding of Industrial and Commercial Power Systems."

- IEEE Orange Book – ANSI/IEEE Std 446-1980 “IEEE Recommended Practice for Emergency and Standby Power Systems for Industrial and Commercial Applications.”

PROJECT REVIEW

Additionally, to ensure that other Cooperative Members’ electric service is not negatively affected by one (or more) operating AES/QF units, the Cooperative will perform a technical review of the AES/QF unit. The review process should reveal potential problems prior to the operation of the AES/QF, as well as provide a cost estimate for the necessary work to accept AES/QF generation. Any cost of studies associated with the proposed installation of a AES/QF shall be borne by the AES/QF Owner.

The Cooperative, however, reserves the right to reevaluate the continued operation of the AES/QF if any actual or potential safety, quality, or reliability issues arise or occur. Any corrective actions recommended by the Cooperative or its agent must be implemented at the AES/QF Owner’s expense. This may include termination of the operation of one or more AES/QF units interconnected on the same line section.

RESPONSIBILITY

It shall be the responsibility of the AES/QF Owner to design and operate a system adequate to meet the technical requirements generally set forth above and to assure reliability of the protection scheme as predicated by the design and location of Member generation. In addition, this protection must be compatible with Cooperative system protective devices. Paralleling Member generation with the Cooperative system will be permitted only upon obtaining formal Cooperative approval in advance.

The AES/QF Owner is solely responsible for providing adequate protection for his equipment.

TESTING

PRELIMINARY TESTING

The Generator will notify SREC ten (10) business days prior of preliminary testing, to coordinate the days required to do the testing, as defined in IEEE 1547. SREC has the right to witness all testing and to review all records prior to allowing the system to be made ready for normal operation.

TESTING CYCLE

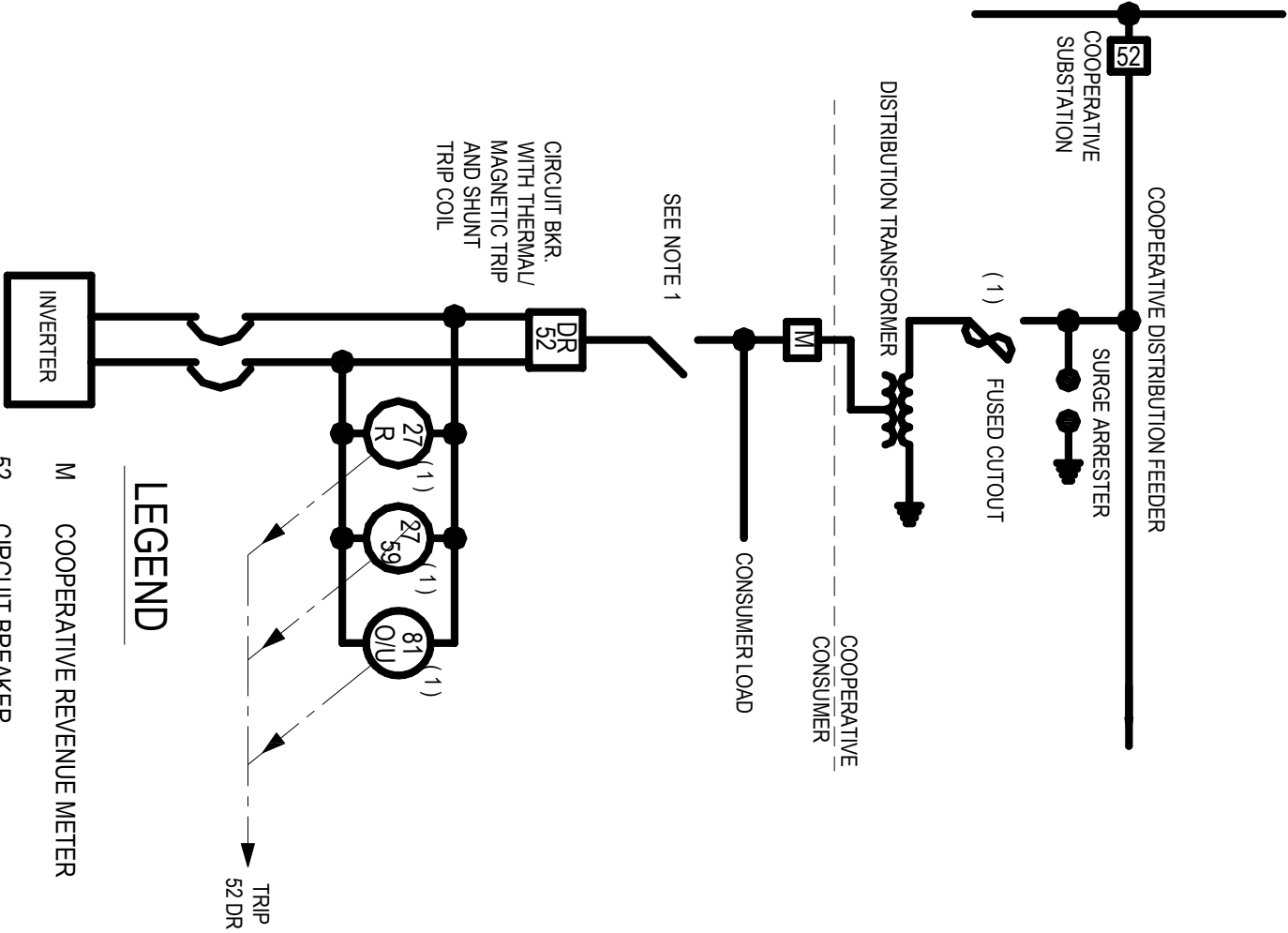
The Generator is responsible for the periodic maintenance of the equipment involved in the protection of SREC’s system. The test cycle for protective relaying must be less than 5-years, or the manufacturer’s warranty, whichever is less. The Generator must contact SREC ten (10) business days prior to testing the equipment. SREC has the right to witness all testing and to review all records. The Generator must keep all testing records and be able to provide them to SREC at any time.

EXHIBIT 1

GENERAL PROTECTION REQUIREMENTS

Figure

- 1 Protection for a single-phase induction generator
- 2 Protection for a single-phase inverter



Revisions
RFG 1/9/06

SOMERSET RURAL ELECTRIC COOPERATIVE

Somerset, PA

Drawn: DRF

Checked: _____

Approved: BH

Date: 11-03-05

TYPICAL PROTECTION
EXAMPLE FOR SINGLE
PHASE INVERTER

Dwg. No. CCS - IPD - 01

