

# **SAWNEE EMC**

## **DISTRIBUTED GENERATION INTERCONNECTION PROCEDURES**

**SMALL DISTRIBUTED GENERATION RESOURCES  
(RESIDENTIAL – GREATER THAN 2 kW AND NOT GREATER THAN 10 kW  
COMMERCIAL – GREATER THAN 2 kW AND NOT GREATER THAN 100 kW)**

**JULY 2015**



# **DISTRIBUTED GENERATION INTERCONNECTION PROCEDURES**

## **SMALL DISTRIBUTED GENERATION RESOURCES**

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# **DISTRIBUTED GENERATION INTERCONNECTION PROCEDURES**

## **SMALL DISTRIBUTED GENERATION RESOURCES**

### **I. GENERAL CONSIDERATIONS**

- A. This process, requirements and document (“procedures”) establish guidelines for Sawnee EMC (or “the Cooperative”) under which certain Distributed Generation Equipment will be considered for interconnection to Sawnee EMC’s distribution system. The interconnection procedures contained herein are available to Distributed Generation (“DGen”) Customers proposing to interconnect distributed generation facilities under Sawnee EMC's Policy No. 412.
- B. This procedure is designed to ensure that all applications are considered in an efficient, fair and consistent manner. Most importantly, however, the purpose of this procedure is to ensure that Sawnee EMC does not permit interconnection of Distributed Generation Equipment when doing so presents an unreasonable risk to the safety of Sawnee EMC’s employees or the general public, or if it may adversely affect the reliability, integrity or quality of Sawnee EMC’s facilities or service.
- C. The installation of generation that is isolated through a double-throw, open-transition manual disconnect switch or open-transition automatic transfer switch is not subject to these procedures and does not require an application.
- D. To that end, notwithstanding any provision of this procedure to the contrary, Sawnee EMC does, and shall always, retain the right and authority to deny an application if Sawnee EMC determines that the applicant presents an unreasonable threat to the safety, reliability, integrity or quality of Sawnee EMC’s facilities or service.
- E. The interconnection procedure contained herein has been developed for all generation facilities interconnected with Sawnee EMC’s distribution facilities rated 10 kW and less. The procedures differ based on the DGen Resource size. Any such resources are categorized according to the following capacity ratings of the generation resource:
  - 1. “Micro” – means a generation resource with a capacity rating of 2 kW or less. In all cases, this equipment shall be single phase in nature.

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2. “Small” - means a generation resource with a capacity rating of greater than 2 kW and not greater than 10 kW for residential customers and 100 kW for commercial customers. In all cases, equipment for residential applications shall be single phase in nature. Customers that own and operate Small generation resources that meet the criteria of the Georgia Cogeneration and Distributed Generation Act of 2001, as amended (OCG 46-3-52) may also be referred to as a Net Metering Customer.
  3. “Medium” - means a generation resource with a capacity rating of greater than 10 kW for residential customers and 100 kW for commercial customers, and not greater than 2 MW.
  4. “Large” - means a generation resource with a capacity rating of greater than 2 MW and not greater than 10 MW.
- F. This document provides interconnection procedures for only “Small” DGen resources.
- G. It is the sole responsibility of the DGen customer to obtain all necessary governmental permits that are required for the DGen resource to operate in compliance with all applicable federal, state and county/city regulations.
- H. Sawnee EMC has an obligation to provide a safety for its employees and public. If after the interconnection is made in accordance with the requirements herein, in Sawnee EMC’s sole discretion, the DGen resource does not continue to meet or exceed these interconnection requirements or comply with prudent utility practices, Sawnee will disconnect the DGen resource from its system.
- I. Proposed DGen Resources that meet the requirements contained herein will be approved for interconnection.
- J. Proposed Small DGEN Resources shall execute Interconnection Agreement (Appendix “L”) prior to Commission Testing or the start of the Distribution Impact Study whichever occurs first.
- K. Terms used herein shall have the meanings specified in the Glossary of Terms appended to this document.

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### **II. SMALL DISTRIBUTED GENERATION RESOURCES**

#### **A. Application Process**

1. The Small DGen Customer will submit the appropriate interconnection application, appendices, along with the application fee, defined below, and states the purpose for which the Small DGen Resource is to be installed. The following must be submitted:
  - a. Signature pages: from Appendix “C” and “E”,
  - b. Appendix “G” – Application for Paralleling Equipment to Electric System – Greater than 2 kW and less than 10 kW; and
  - c. Appendix “L” – Interconnection Agreement (Short Form)
  - d. Application Fee of \$0 will apply.
2. To assist a Small DGen Customer in the interconnection process, Sawnee EMC will designate an employee from which information on the application process can be obtained through informal requests by the Small DGen Customer presenting a proposed project for a specific site.
3. The Small DGen Customer’s installation shall comply with the certification requirements for Micro and Small Distributed Generation systems contained in Appendix “C”.
4. The Small DGen Customer’s installation shall comply with the Interconnection Technical Requirements for Small, Medium and Large Distributed Generation contained in Appendix “E”.

#### **B. Initial Screening of Small DGen Application**

1. Sawnee EMC will conduct an initial screening of the application. The initial screening will indicate if the proposed generator(s) will have a significant impact on the operation of Sawnee EMC’s electrical distribution system.
2. The criteria for the initial screening are contained in Appendix “I”.

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3. For Residential Small DGen Resources that pass the initial screening, the application is approved subject to certification of the equipment described in Appendix “B” and “C”.
4. For Commercial Small DGen Resources that pass the initial screening, the application is approved subject to certification of the equipment described in Appendix “B” and “E”. Small Commercial DGen Resources are also subject to commission testing (See Appendix “E”)
5. If the proposed generation resource fails the initial screening, Sawnee EMC will complete a Distribution Impact Study based on the customer’s application within sixty (60) days of its receipt. For Small DGen Customers, there is no fee charged for the Distribution Impact Study. The Distribution Impact Study will include a distribution load flow study, an analysis of equipment interrupting ratings, protection coordination study, voltage and flicker studies, protection and set point coordination studies, grounding reviews, and the impact on system operation, as necessary. The detailed contents and considerations of the Distribution Impact Study are contained in Appendix “J”.

### **C. Facilities Study**

1. If requested by the DG Customer, to implement the recommendations of the Distribution Impact Study, a Facility Study will be conducted.
2. The electric power distribution system interconnection design for any required Interconnection Facilities and/or System Upgrades will be performed by a Facility Study. The detailed contents of the Facility Study are contained in Appendix “K”.
3. Upon completion of the Facility Study, the DGen Customer will be responsible for the estimated cost for the facility upgrades/modification before proceeding with the installation of the interconnection with the DGen Resource.

### **D. Additional Requirements for Residential Small DGen Customer**

1. A lockable disconnect switch shall be installed by or for the Small DGen Customer. Sawnee EMC will open and lock the

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disconnect switch for safe live-line maintenance of Sawnee EMC facilities.

2. The Residential Small DGen Customer can self-certify their equipment and installation for interconnection as defined by the standards listed in Appendix "B". Sawnee EMC will accept self-certification for inverters certified by a nationally recognized testing and certification laboratory. Reference Appendix "C" for details.
3. Commission testing (See Appendix "E" for details) may be required for the Small DGen Customer. As part of a commission test, Sawnee EMC will verify that the installation complies with the non-islanding provisions of IEEE 1547.
4. Small DGen Customer shall provide Sawnee EMC access to the generator during normal business hours and as needed for emergency access.
5. Small DGen Customer is responsible for obtaining Green-e certification necessary for RECs.
6. Net Metering will be used for Small DGen Resources except as provided in Section III - Disposition of Energy.
7. Sawnee EMC has no requirement for liability insurance for Residential Small DGen Resources.

### **E. Additional Requirements for Commercial Small DGen Customer**

1. A lockable, accessible disconnect switch shall be installed by or for the Small DGen Customer in a location approved by Sawnee EMC. Sawnee EMC will open and lock the disconnect switch for safe live-line maintenance of Sawnee EMC facilities.
2. Commercial Small DGen Customer shall certify their equipment and installation for interconnection as defined by the standards listed in Appendix "B". This certification shall be provided by a qualified independent electrical engineer licensed to practice in Georgia. Sawnee EMC will accept self-certification for inverters certified by a nationally recognized

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testing and certification laboratory. Reference Appendix “C” for details.

3. Commission testing is required for Commercial Small DGen Customers. As part of the witness test, Sawnee EMC will verify that the installation complies with the non-islanding provisions of IEEE 1547.
4. Commercial Small DGen Resource rated not greater than 10kW shall provide Sawnee EMC access during normal business hours and during emergencies. All other Commercial Small DGen Resources shall provide Sawnee EMC access to 24 hours a day, 7 days a week.
5. Periodic testing maybe required for Commercial Small DGen Resources. If required, the Customer will maintain records for testing and maintenance of the installation. When required to test, failure to maintain adequate records of testing can be the basis for disconnecting the Commercial Small DGen Resource.
6. The Commercial Small DGen Customer is responsible for obtaining Green-e certification necessary for RECs.
7. Sawnee EMC will install utility grade metering at the Commercial Small DGen Resource, at the cost of the DGen Customer, according to the provisions defined in Section III. Disposition of Energy.
8. Sawnee EMC has no requirement for liability insurance for Commercial Small DGen Resources.

### **III. DISPOSITION OF ENERGY**

All service rules, regulations and restrictions outlined under the Cooperative’s schedules for the purchase and sale of electricity will apply, in addition to the following provisions.

- A. Small DGen Resources

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For DGen Customers of Sawnee that own and operate a Small DGen Resource that meets all of the following conditions immediately below, the Net Metering provisions below shall apply.

- i. For DGen Resources that are primarily intended to offset part or all of the consumer's electrical requirements
  - ii. Have executed the Cooperative's Net Metering Interconnection Agreement
  - iii. Are eligible for net-metering as defined by the terms of The Georgia Cogeneration and Distributed Generation Act, O.C.G.A. §46-3-52
1. For other DGen Customers with Small DGen Resources, the Net Metering provisions shall apply at the discretion of the Cooperative.
2. When the Net Metering provisions in this section do not apply<sup>1</sup>, the Interconnection without Net Metering provisions described below in Section 2 shall apply.
  - a. Metering
    - i. The Cooperative will use either a single-directional or bi-directional meter depending upon how the distributed generation facility is connected to the distribution system.
    - ii. If the distributed generation facility is connected to the distribution system on the Net Metering Customer's side of the retail service meter, the Cooperative will use a bi-directional meter for net metering.
    - iii. If the distributed generation facility is connected to the distribution system on the Cooperative's side of the retail service meter, the Cooperative will install an additional single directional meter for net metering.

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<sup>1</sup> Examples include, but are not limited to: a) the DGen Resource is used for purposes of only exporting energy and not to serve the energy requirements of the DGen Customer, and b) the sum of the installed capacity of generation pursuant to the Net Energy Metering Rider, Schedule "NEM", exceeds 0.2% of the Cooperative's annual peak demand or the Cooperative has exceeded any other threshold for limiting the amount of Net Metering installations on its system.

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- iv. At the option and at the cost of the Cooperative, utility grade hourly metering may be installed at the generator
  - b. Obligations to Purchase Excess Net Energy
    - i. When the electricity generated by the Net Metering Customer's distributed generation facility exceeds the electricity supplied by the Cooperative during the billing period, the Net Metering Customer shall receive a credit for the excess net energy pursuant to the Cooperative's applicable net energy metering rider.
    - ii. The net metering customer shall be charged for electric service under that rate schedule which would otherwise be applicable if the customer was not a net metering customer.
  - c. Charges for Interconnection And Net Metering
    - i. The Net Metering Customer shall be responsible for all costs of installing, operating and maintaining protective equipment and/or electrical facilities required to interconnect with the Cooperative's electric distribution system.
    - ii. The Net Metering Customer shall be charged for the direct and indirect costs incurred by the Cooperative as a result of the interconnection and for providing net metering service.
    - iii. Said charges will be determined in accordance with the Cooperative's applicable net energy metering rider, or as outlined in the Distributed Generation Interconnection Requirements document.
- 3. Interconnection without Net Metering
  - a. Metering
    - i. The Cooperative shall not install either a single-directional or a bi-directional meter for the purpose of net metering.
    - ii. The Cooperative shall install utility grade metering at the DGen Resource, at the cost of the DGen Customer, if there is an agreement to purchase the energy provided by the DGen Resource.
  - b. Purchase of Energy

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- i. The Cooperative is not obligated to purchase any energy produced by the DGen Resource, but may do so at the discretion of the Cooperative.
  - ii. If any energy from the DGen Resource is purchased by the Cooperative, such purchase shall be made for all non-QF resources in compliance with the Cooperative's Net Energy Metering rider, Schedule "NEM".
  - iii. The purchase shall be conducted under net billing arrangements:
    - a) When the Energy Payment exceeds the Retail Billing Amount during the billing period, the customer generator shall receive a credit to the member's account for the next month's billing.
    - b) If the Retail Billing Amount exceeds the Energy Payment, then the customer generator shall be billed for the difference in accordance with normal billing practices.
  - c. Charges for Interconnection and Net Metering
    - i. The DGen Customer shall be responsible for all costs of installing, operating and maintaining protective equipment and/or electrical facilities required to interconnect with the Cooperative's electric distribution system.
    - ii. The DGen Customer shall be charged for the direct and indirect costs incurred by the Cooperative as a result of the interconnection and for providing net metering service.
    - iii. Said charges will be determined in accordance with the requirements contained herein.
4. Qualifying Facilities
- For any DGen customer that also has formal status as a Qualifying Facility (QF), the following provisions shall apply:
- a. The credit for the excess net energy pursuant to the Cooperative's applicable net energy metering rider, or net billing procedures, shall be

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based upon Sawnee EMC's Qualifying Facilities Rate for Power Purchase, Schedule "QFPP".

b. The Cooperative has a retail service rate available for any supplemental, back-up, or maintenance power service requirements, as may be requested by the Small DGen Customer and such service will be provided under Schedule "QF", Qualifying Facilities Service.

### **5. Renewable Energy Credits**

The Micro and Small DGen Customer shall retain ownership of all RECs produced by the DGen Resource, and the ownership of such RECs shall not be transferred to Sawnee EMC unless there are specific provisions in the Interconnection Agreement for such transfer or for their sale and purchase. Sawnee shall not be obligated to purchase RECs but may do so at rates as negotiated between the Cooperative and the DGen Customer.

The DGen Customer shall be responsible for:

- a. Gaining Green-e certification, a pre-requisite necessary to produce RECs
- b. Either i) installing separate utility grade metering at the DGen Resource, or ii) developing and gaining approval from the Center for Resource Solutions of an engineering estimate of the DGen Resource output.
- c. Maintaining auditable records of the actual energy generated by the DGen Resource used for purpose of producing RECs.

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**“APPENDICES”**

# DISTRIBUTED GENERATION INTERCONNECTION PROCEDURES

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### APPENDIX “A”

#### GLOSSARY OF TERMS

**“Affected Systems”** – means any electric system that is either directly or indirectly connected to Sawnee EMC’s electric system that could be adversely affected by the interconnection and parallel operation of the DGen Customer’s DGen Resources.

**“Agreement”** – means an Interconnection and Parallel Operation Agreement for Distributed Generation Resources by and between Sawnee EMC and the DGen Customer.

**“Automatic Disconnect Device”** – an electronic or mechanical switch used to isolate a circuit or piece of equipment from a source of power without the need for human intervention.

**“Commissioning Test”** – a series of tests and inspections performed by DGen Customer on its installed equipment for adherence to applicable codes and standards.

**“Company Grade Relay”** – a relay that is constructed to comply with, as a minimum, the most current version of the industry standards for non-nuclear Company facilities.

**“DGen Customer”** – means a customer of Sawnee EMC that owns (or leases) and operates a distributed generation resource subject to these interconnection procedures.

**“Dedicated Service Transformer or Dedicated Transformer”** – a transformer with a secondary winding that serves only one customer.

**“Delivery Service”** – means the services the Company may provide to deliver capacity or energy generated by DGen Customer to a buyer to a delivery point(s), including related ancillary services.

**“Disconnect (verb)”** – To isolate a circuit or equipment from a source of power. If isolation is accomplished with a solid-state device, “disconnect” shall mean to cease the transfer of power.

**“Disconnect Switch”** – a mechanical device used for isolating a circuit or equipment from a source of power.

**“Distributed Generation Equipment”** – includes any on-site DGen Resources: distributed generation facilities, self-generators, small electric generation facilities, and electric customer-owned generators.

**“Distributed Generation (or DGen) Facility ”** – means a Customer owned or leased generation facility operating at a distribution voltage of 25 kV or less, including any generation

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resource and associated equipment, wiring, protective devices or switches owned or leased by the Customer.

**“Distributed Generation (or DGen) Resource”** – means a generation resource that is: i) located on the Customer premises, ii) operates in parallel with the Cooperative's distribution facilities at a distribution voltage of 25 kV or less, and iii) is connected to the Cooperative's distribution system on either side of the Cooperative's retail service meter, and is iv) subject to these procedures. Any such resources are categorized according to the following capacity ratings of the generation resource:

- a. “Micro” – means a generation resource with a capacity rating of 2 kW or less. In all cases, this equipment shall be single phase in nature.
- b. “Small” - means a generation resource with a capacity rating of greater than 2 kW and not greater than 10 kW for residential customers and 100 kW for commercial customers. In all cases, equipment for residential applications shall be single phase in nature. Customers that own and operate Small generation resources that meet the criteria of the Georgia Cogeneration and Distributed Generation Act of 2001, as amended (OCG 46-3-52) may also be referred to as a Net Metering Customer.
- c. “Medium” - means a generation resource with a capacity rating of greater than 10 kW for residential customers and 100 kW for commercial customers, and not greater than 2 MW.
- d. “Large” - means a generation resource with a capacity rating of greater than 2 MW and not greater than 10 MW.

**“Energy Payment”** is limited to net billing and means the electricity generated and fed into the electric grid by the customer generator multiplied by the applicable capacity and energy purchase rates, as defined by the terms of the distributed generation interconnection agreement.

**“FERC”** – means the Federal Energy Regulatory Commission

**“IEEE”** – means Institute of Electrical and Electronics Engineers, Inc., a non-profit technical professional organization responsible with members in 150 countries, responsible for technical publishing, conferences, and consensus-based standards activities ([www.ieee.org](http://www.ieee.org)).

**“Islanding”** – a condition in which a portion of Sawnee EMC’s system that contains both load and a small distributed generator resource is isolated from the remainder of Sawnee EMC’s system [adopted from the Institute of Electrical and Electronics Engineers (IEEE)].

**“Non-Renewable Resource or Facility”** – A DGen Resource that generates electricity using a fuel source that is not renewable, as defined by the Georgia Cogeneration and Distributed Generation Act of 2001, as amended (OCG 46-3-52).

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**“Point of Common Coupling (PCC)”** – The point at which the interconnection between Sawnee EMC’s system and the DGen Customer’s equipment interface occurs. Typically, this is the customer side of Sawnee EMC’s revenue meter.

**“Pre-certified, Pre-certification”** – a specific generating and protective equipment system or systems that have been certified and documented as meeting applicable test requirements and standards relating to safety and reliability by a nationally recognized testing laboratory or, in the absence of such test requirements and standards, by tests and standards approved by Sawnee EMC.

**“Qualifying Facility” or “QF”** - a generating facility which meets the requirements set forth in federal regulations promulgated under Sections 201 and 210 of the Public Utility Regulatory Policies Act of 1978 (PURPA). In general, a QF must either produce useful thermal energy and electricity through sequential use of energy or have a renewable resource (e.g. biomass, waste, geothermal, etc...) as its primary energy source.

**“Radial Feeder”** – a distribution line that branches out from a substation and is normally not connected to another substation or another circuit sharing the common supply of electric power.

**“Renewable Energy Credit” or “REC”** - means a renewable energy credit as defined in the Green-e Energy National Standard and shall include all the renewable attributes associated with one (1) MWh of energy production.

**“Renewable Resource”** – a DGen Resource that generates electricity using a renewable fuel source, as defined by the Georgia Cogeneration and Distributed Generation Act of 2001, as amended (OCG 46-3-52).

**“Retail Billing Amount”** is limited to net billing and means the dollar amount calculated by applying the electricity supplied to a customer generator from the electric grid to the applicable retail rate of the Cooperative.

**“Short Circuit Contribution”** – the result of dividing the maximum short circuit contribution of the distributed DGen Resources(s) by the short circuit contribution available from the Cooperative’s system without the distributed DGen Resource(s), converted to a percentage.

**“System Impact Study”** – any study or studies performed by a Sawnee EMC or a designated third party to ensure that the safety and reliability of the electric power system with respect to the interconnection of DGen Resources as discussed in this document.

**“Transmission Service Provider”** – means Georgia Transmission Corporation or another electric utility in Georgia that provides transmission and related services for the delivery of electric power and energy to the Cooperative’s substations, as well as the necessary ancillary services which are necessary to support the reliable operations of the transmission of electric power.

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**“Type Test”** a test performed or witnessed once by a qualified independent testing laboratory for a specific protection package or device to determine whether the equipment can be certified.

**“UL”** – means Underwriters Laboratory, Inc., an independent, not-for-profit product safety testing and certification organization operating in Canada, Europe, Asia, Latin America, and the U.S.A. ([www.ul.com](http://www.ul.com)).

**“Verification Test”** - a test performed upon initial installation and repeated periodically to determine that there is continued acceptable performance.

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### **APPENDIX “B”**

#### **CODES AND STANDARDS**

1. **IEEE 1547™ (2008)** Standard for Interconnecting Distributed Resources with Electric Power Systems as adopted and successor or related IEEE-approved standards
2. **UL 1741** Inverters, Converters, and Controllers for Use in Independent Power Systems
3. **IEEE Std 929-2000** IEEE Recommended Practice for Utility Interface of Photovoltaic (PV) Systems
4. **NFPA 70 (2008)**, National Electrical Code
5. **IEEE Std C37.90.1-1989 (R1995)**, IEEE Standard Surge Withstand Capability (SWC) Tests for Protective Relays and Relay Systems
6. **IEEE Std C37.90.2 (1995)**, IEEE Standard Withstand Capability of Relay Systems to Radiated Electromagnetic Interference from Transceivers
7. **IEEE Std C37.108-1989 (R2002)**, IEEE Guide for the Protection of Network Transformers
8. **IEEE Std C57.12.44-2000**, IEEE Standard Requirements for Secondary Network Protectors
9. **IEEE Std C62.41.2-2002**, IEEE Recommended Practice on Characterization of Surges in Low Voltage (1000V and Less) AC Power Circuits
10. **IEEE Std C62.45-1992 (R2002)**, IEEE Recommended Practice on Surge Testing for Equipment Connected to Low-Voltage (1000V and Less) AC Power Circuits
11. **ANSI C84.1-2006** Electric Power Systems and Equipment – Voltage Ratings (60 Hertz)
12. **IEEE Std 100-2000**, IEEE Standard Dictionary of Electrical and Electronic Terms
13. **NEMA MG 1-1998**, Motors and DGen Resources, Revision 3

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14. **IEEE Std 519-1992**, IEEE Recommended Practices and Requirements for Harmonic Control in Electrical Power Systems
15. **IEEE Std C62.42-1992(2002)**, IEEE Recommended Practice on Surge Testing for Equipment Connected to Low Voltage (1000V and Less) AC Power Circuits
16. **ANSI/IEEE Std 446-1995**, Recommended Practice for Emergency and Standby Power Systems for Industrial and Commercial Applications
17. **ANSI/IEEE Std 142-1991**, IEEE Recommended Practice for Grounding of Industrial and Commercial Power Systems – Green Book
18. **ANSI/IEEE C2-2007**, National Electric Safety Code (NESC)

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### **APPENDIX “C”**

#### **CERTIFICATION OF MICRO AND SMALL DISTRIBUTION RESOURCE EQUIPMENT PACKAGES**

##### **I. Overview**

- a. A DGen Resource equipment package shall be considered certified for interconnected operation to Sawnee EMC’s electric power distribution system if it has been approved under the certification process described below.
- b. After installation, Sawnee EMC may require a Commissioning Test to ensure adherence to local codes and applicable standards contained in Appendix B requirements. Sawnee EMC at its sole discretion may waive the requirement to witness this test.

##### **II. CERTIFICATION PROCESS**

- a. An equipment package shall be considered certified for interconnected operation if it has been submitted, tested, and listed by a nationally recognized testing and certification laboratory and approved by Sawnee EMC for continuous utility interactive operation in compliance with the applicable codes and standards listed in Appendix B, above.
- b. An “equipment package” shall include all interface components including switchgear, inverters, or other interface devices and may include an integrated DGen Resource.
- c. If the “equipment package” has been tested and listed as an integrated package which includes a DGen Resource, it shall not require further design review, testing or additional equipment to meet the certification requirements.
- d. If the equipment package includes only the interface components (switchgear, inverters, or other interface devices), then a DGen Customer must demonstrate that the DGen Resource being utilized with the equipment package is compatible with the equipment package and consistent with the testing and listing specified for the package.
- e. Provided the DGen Resource combined with the equipment package is

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consistent with the testing and listing performed by the nationally recognized testing and certification laboratory, no further design review, testing or additional equipment shall be required to meet the certification requirements.

- f. A certified equipment package does not include equipment provided by the utility, nor does certification necessarily exempt an equipment package or DGen Resource from Commissioning Testing required for installation and operation.

**APPENDIX “C”**

**CERTIFICATION OF MICRO AND SMALL DISTRIBUTION  
RESOURCE EQUIPMENT PACKAGES**

**Applicant Signature**

**I hereby certify that, to the best of my knowledge, all equipment used in my distributed generation resource meets all certification requirements listed in this section.**

Printed Name of Applicant: \_\_\_\_\_

Signature of Applicant: \_\_\_\_\_ Date: \_\_\_\_\_

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### **APPENDIX “E”**

#### **SMALL, MEDIUM, AND LARGE DISTRIBUTED GENERATION INTERCONNECTION TECHNICAL REQUIREMENTS**

##### **I. INTRODUCTION**

A. This Section contains additional technical requirements for interconnecting small, medium, and large generators with the Sawnee EMC electric system.

##### **II. OPERATING LIMITS**

A. Operation of DGen Resource Customer-owned parallel generating equipment shall not compromise the quality of electric service to other members on the System.

B. The DGen Resource Customer’s parallel generating equipment shall meet the following minimum requirements:

###### 1. Voltage

- a. The DGen Resource Customer shall be capable of operating its generating equipment at a voltage level of 114 to 126 volts AC in accordance with ANSI Standard C84.1-2006.
- b. For DGen Resource Customers with generators over 10 KW, utility grade negative sequence/under-voltage relaying shall be used to trip the equipment off the line for negative excursions below 118 volts for a maximum duration of six electrical cycles.
- c. Positive excursions exceeding 126 volts shall cause the equipment to trip off line.
- d. Voltage regulating equipment shall maintain stable excitation levels with negligible hunting (less than 2% of nominal phase current).

###### 2. Flicker

- a. Customer shall operate and maintain the generation equipment such that any power output fluctuations do not cause voltage flicker that exceeds the visible flicker limit as defined in IEEE

# **DISTRIBUTED GENERATION INTERCONNECTION PROCEDURES**

## **SMALL DISTRIBUTED GENERATION RESOURCES**

519-1992 as measured at the primary terminals of the DGen Resource Customer's generator interface transformer.

### 3. Frequency

- a. While operating in parallel with the System, the DGen Resource Customer with generating equipment over 10 KW shall provide a utility grade precision over/under frequency relay calibrated to trip for frequency excursions exceeding plus/minus 0.25 Hz for greater than 10 electrical cycles on a 60 Hz base.

### 4. Power Factor

- a. DGen Resource Customer-owned generation shall employ automatic means of reactive power regulation while operating in parallel with the System.
- b. Generating equipment shall operate as near unity power factor as possible, but in no case below 0.9 or 90% lagging.
- c. Leading power factor shall not be used for voltage regulation or other purposes except by written permission of Sawnee EMC.

### 5. Harmonics

- a. Total current harmonic distortion shall not exceed 5.0%.
- b. Total voltage harmonic distortion shall not exceed 5.0%, with a limit of 3.0% on any individual harmonic.
- c. Special consideration will be given to regenerative drive systems and invertors reviewed on an individual case-by-case basis.

### 6. Stability

- a. While operating in parallel with the System, the DGen Resource Customer's generating equipment shall maintain a stable output level with no noticeable hunting exhibited.
- b. In the event a system instability condition arises due to DGen Resource Customer-owned generation, it is the DGen Resource

# **DISTRIBUTED GENERATION INTERCONNECTION PROCEDURES**

## **SMALL DISTRIBUTED GENERATION RESOURCES**

Customer's responsibility to take measures to rectify the source of instability.

### **7. Fault Current Margin**

- a. Sawnee EMC's substations and distribution lines are subject to fault duty limitations.
- b. Adding generation will increase the fault current imposed on the system.
- c. No generating equipment which increases the fault current beyond the design rating of the distribution system equipment may be installed.
- d. Customer may obtain a waiver of this requirement by paying the cost of any upgrades deemed necessary by Sawnee EMC.

### **III. GENERATOR INTERFACE TRANSFORMER**

- A. The generator interface transformer is intended to provide isolation of the DGen Resource Customer's generating equipment from the System.
- B. The inherent impedance of the transformer will minimize the impact on the System due to faults originating at the DGen Resource Customer's generation equipment.
- C. This transformer may consist of an existing transformer serving the DGen Resource Customer's loads or a dedicated transformer dictated by generator or prevailing system characteristics.
- D. Interface transformer specifications are determined by the Cooperative and determination of ownership of said transformer shall be at the Cooperative's option.

### **IV. GENERATOR PARALLELING BREAKER**

- A. It is required that a generator-paralleling breaker be electrically operated and rated as a five electrical cycle device for fault clearing or tripping.

# **DISTRIBUTED GENERATION INTERCONNECTION PROCEDURES**

## **SMALL DISTRIBUTED GENERATION RESOURCES**

### **V. SYNCHRONIZATION**

- A. It is the DGen Resource Customer's responsibility to provide proper synchronizing of its parallel generating equipment.
- B. The Cooperative assumes no liability for any DGen Resource Customer-owned generation and assumes that the DGen Resource Customer operates its equipment at its own risk.
- C. Synchronizing equipment shall be capable of matching frequency within plus/minus 0.05 Hz and plus/minus 10 electrical degrees phase angle prior to paralleling breaker closure.
- D. Voltage shall be matched within plus/minus 4%.

### **VI. SAFETY**

- A. Operation of DGen Resource Customer-owned generation equipment shall not present a safety hazard to the Cooperative employees or other members connected to the System or the public at large.
- B. Under no circumstances shall the DGen Resource Customer-owned generation be used or be capable of energizing a dead System circuit.
- C. A positive means of disconnecting and locking out the DGen Resource Customer-owned generation equipment with visible air-gap shall be provided to ensure safety of Cooperative operating personnel during line maintenance.
- D. This disconnecting means may be via a lockable air-break disconnect or by a lockable draw out circuit breaker, and must be in a location approved by Sawnee EMC.
- E. Islanding of the DGen Resource Customer-owned generation (a situation whereby the DGen Resource Customer's loads and generation remains connected to the bus) shall be prevented by protective relaying specified by the Cooperative based on individual review of the DGen Resource Customer's proposed generating system.
- F. It is not the intent of this document to specify protection of the DGen Resource Customer's generator. Protection of the DGen Resource Customer's generating equipment is the responsibility of the DGen Resource Customer and the Cooperative assumes no liability for damage or failure of the DGen Resource Customer's generation equipment.

# **DISTRIBUTED GENERATION INTERCONNECTION PROCEDURES**

## **SMALL DISTRIBUTED GENERATION RESOURCES**

- G. The DGen Resource Customer must provide verification that a qualified independent electrical engineer licensed to practice in Georgia has certified that the required manual disconnect switch has been installed properly; that the distributed generation facility has been installed in accordance with the manufacturer's specifications; and that the installation meets all applicable safety, power quality, and interconnection requirements established by the National Electrical Code, the National Electrical Safety Code and the Institute of Electrical and Electronics Engineers and other standard as required by Sawnee EMC. Sawnee EMC may at its sole discretion allow a State of Georgia certified licensed electrician to certify the installation and operation of the manual disconnect switch in lieu of a State of Georgia registered Professional Engineer's (PE) certification. Sawnee EMC will consider each certification of this type on a case-by-case basis.
- H. The DGen Resource Customer must provide verification that the vendor has certified that the distributed generation facility which has been installed is in compliance with the requirements established by Underwriters Laboratories (UL) or other national testing laboratories.
- I. In the case of static inverter-connected renewable fuel generators with an alternating current capacity in excess of 10 kilowatts, the DGen Resource Customer has had the inverter settings inspected by the Cooperative. The Cooperative may impose a fee on the DGen Resource Customer for such inspection.
- J. In the case of non-static inverter-connected renewable fuel generators, the DGen Resource Customer has interconnected according to the Cooperative's interconnection guidelines and the Cooperative has inspected all protective equipment settings. The Cooperative may impose a fee on the DGen Resource Customer for such inspection.

### **VII. TESTING**

- A. Small residential generators greater than 2 KW and not greater than 10 KW can be self-certified.
- B. For all other generators, the DGen Resource Customer shall retain a qualified independent electrical engineer licensed to practice in Georgia to maintain and annually test system protective relaying for the Customer-owned generating equipment. Sawnee EMC may at its sole discretion allow a State of Georgia certified licensed electrician to maintain and annually test protective relaying in lieu of having a Professional Engineer (PE) perform the annual testing and

# **DISTRIBUTED GENERATION INTERCONNECTION PROCEDURES**

## **SMALL DISTRIBUTED GENERATION RESOURCES**

maintenance. Sawnee EMC will consider each activity of this type on a case-by-case basis.

- C. Upon demand, the DGen Resource Customer shall produce records of testing and relay setting sheets for review by the Cooperative. Failure to maintain records will be grounds for refusal of permission to operate parallel generating equipment. This requirement does not apply to small residential generators greater than 2 KW and not greater than 10 KW .
- D. The DGen Resource Customer shall verify proper tripping and lockout of the generator system for all defined faults as determined by the Cooperative during final review of system relay requirements.
- E. Under no circumstances shall parallel generating equipment be operated with inoperative or defective protective relays.

### **VIII. COMPLIANCE PROCEDURE**

- A. The Cooperative reserves the right to automatically or manually disconnect the DGen Resource Customer's generation equipment without prior notice whenever, at the Cooperative's sole discretion, the DGen Resource Customer is deemed by the Cooperative to not be in compliance with the minimum interconnection requirements as specified via this Agreement.
- B. The interconnection will remain open until corrective action is taken and suitable testing is completed.

### **IX. INDUCTION GENERATORS**

- A. Starting
  - 1. Induction generators shall be started using techniques that minimize voltage flicker.
  - 2. Customer shall submit studies showing impact on the system of any capacitors used for starting or power factor correction.
- B. Protection
  - 1. Induction generators of any size shall be provided with over and under voltage, over and under frequency, utility grade relay protection.

# **DISTRIBUTED GENERATION INTERCONNECTION PROCEDURES**

## **SMALL DISTRIBUTED GENERATION RESOURCES**

### **C. Grounding**

1. An appropriate grounding scheme suitable for the type of transformer and generator connections shall be provided.
2. The effects of ground-fault overvoltage, Ferro resonance, harmonics, and ground-fault contribution and detection shall be studied and the results submitted to the Cooperative for approval.

### **X. STATIC POWER CONVERTERS**

- A. Static power converters shall meet the requirements of UL 1741, IEEE 929-2000, and IEEE-1547-2003.
- B. Soft starting shall be used to minimize voltage flicker.
- C. Inverter shall operate as near unity power factor as possible, but in no case below 0.9. Power factor shall not be used for voltage regulation purposes except by written permission of Sawnee EMC.
- D. Inverters 10 KW or less shall provide protective functions required in UL 1741.
- E. Inverters over 10 KW shall provide utility grade relays with over and under voltage, over and under frequency, phase and ground over-current functions.
- F. The Cooperative reserves the right to require sensing on the primary connections if deemed necessary.
- G. Proposed protection settings shall be submitted to the cooperative for approval prior to connecting the inverter to the /cooperative's system.

### **H. Islanding**

1. Inverters with stand-alone capability shall be provided with protection functions to isolate the customer's island from the Cooperative's system.
2. Customer shall not energize any part of the Cooperative's system at any time.

### **I. Grounding**

1. An appropriate grounding scheme suitable for the type of transformer and generator connections shall be provided. The effects of ground-fault

# **DISTRIBUTED GENERATION INTERCONNECTION PROCEDURES**

## **SMALL DISTRIBUTED GENERATION RESOURCES**

overvoltage, Ferro resonance, harmonics, and ground-fault contribution and detection shall be studied and the results submitted to the Cooperative for approval.

### **XI. SYNCHRONOUS GENERATORS**

#### **A. General**

1. All synchronous generators, regardless of size, shall meet the requirements of this section.

#### **B. Power Factor**

1. Customer shall operate the synchronous generator in the voltage following mode at near unity power factor.
2. The Cooperative will consider the use of reactive current-based regulation for the purpose of improving Customer's power factor or to improve voltage regulation.
3. Customers wishing to use reactive current-based regulation shall submit a request in writing to the Cooperative.

#### **C. Voltage Flicker**

1. Customer shall operate and maintain the generation equipment such that any power output fluctuations do not cause voltage flicker that exceeds the visible flicker limit as defined in IEEE 519-1992.

#### **D. Protection**

1. Synchronous generator installations shall include the following functions, using utility grade relays, as a minimum:
  - a. Over and under-voltage relays
  - b. Over and under-frequency relays
  - c. Sync check relay
  - d. Ground fault detection (Device 51N), providing detection on the primary side of the service transformer.
  - e. Phase fault detection (Device 50/51)

# **DISTRIBUTED GENERATION INTERCONNECTION PROCEDURES**

## **SMALL DISTRIBUTED GENERATION RESOURCES**

E. Reclosing protection for the generator

1. Customer shall be responsible for providing protection to the generator from automatic reclosing of the Cooperative's breakers.
2. Reclosing protection must respond to reclose operations of 0.65 seconds.

F. Grounding

1. An appropriate grounding scheme suitable for the type of transformer and generator connections shall be provided.
2. The effects of ground-fault overvoltage, Ferro resonance, harmonics, and ground-fault contribution and detection shall be studied and the results submitted to the Cooperative for approval.

G. Harmonics

1. Synchronous generators shall not supply objectionable harmonics beyond the PCC.
2. The generation system design shall consider effects of transformer connections, grounding, and winding arrangement in mitigating harmonics.

H. Synchronous generators shall be designed to maximize stability and to minimize impacts to other customers on the system.

### **APPENDIX "E"**

#### **SMALL, MEDIUM, AND LARGE DISTRIBUTED GENERATION INTERCONNECTION TECHNICAL REQUIREMENTS**

##### **Applicant Signature**

**I hereby certify that, to the best of my knowledge, the distributed generation resource meets all applicable technical requirements listed in this section.**

Printed Name of Applicant: \_\_\_\_\_

Signature of Applicant: \_\_\_\_\_ Date: \_\_\_\_\_



**DISTRIBUTED GENERATION  
INTERCONNECTION PROCEDURES**

**SMALL DISTRIBUTED GENERATION RESOURCES**

FAX: \_\_\_\_\_

E-Mail Address: \_\_\_\_\_

Will the generation resource be used for any of the following (check all that apply):

To supply power to the DGen Customer? Yes \_\_\_ No \_\_\_

To export power to Sawnee EMC? Yes \_\_\_ No \_\_\_

Emergency Use? Yes \_\_\_ No \_\_\_

For generators installed at locations with existing electric service to which the proposed generator will interconnect, provide:

Existing Account Number \_\_\_\_\_

Interconnection Applicant's requested in-service date: \_\_\_\_\_

**Existing Electric Service**

Capacity: \_\_\_\_\_ Amperes Voltage: \_\_\_\_\_ Volts

Service Type:

\_\_\_ Single Phase

\_\_\_ Three Phase

**Location of Protective Interface Equipment on Property**

(Include address if different from customer address)

**Section 2 – Generator Qualifications**

**All data collected in Section 2 is applicable only to the generator facility, NOT the necessary interconnection facilities.**

Energy source:

\_\_\_ Solar

\_\_\_ Wind

\_\_\_ Hydro

\_\_\_ Hydro \_\_\_ Type (e.g. Run-of-River)

\_\_\_ Diesel

\_\_\_ Natural Gas

\_\_\_ Fuel Oil

Other (state type) \_\_\_\_\_

**DISTRIBUTED GENERATION  
INTERCONNECTION PROCEDURES**

**SMALL DISTRIBUTED GENERATION RESOURCES**

Type of Generator:

- Synchronous
- Induction
- DC Generator or Solar with Inverter

List components of the Generating Facility that are currently certified by a U.S. Department of Energy-approved laboratory and/or listed by the Underwriters Laboratory (include panels, inverters, disconnects):

Equipment Type	UL Listing or U.S. Lab Certification (Identify)
1. _____	_____
2. _____	_____
3. _____	_____
4. _____	_____
5. _____	_____

**Section 3 – Generator Technical Information**

Generator (or solar collector) Manufacturer \_\_\_\_\_  
Model Name \_\_\_\_\_  
Model Number \_\_\_\_\_

Nameplate Output Power Rating in kW: (Summer) \_\_\_\_\_ (Winter) \_\_\_\_\_  
Nameplate Output Power Rating in kVA: (Summer) \_\_\_\_\_ (Winter) \_\_\_\_\_

Total capacity of generator in kW (AC): \_\_\_\_\_

**DISTRIBUTED GENERATION  
INTERCONNECTION PROCEDURES**

**SMALL DISTRIBUTED GENERATION RESOURCES**

**Section 4 – Additional Information**

Provide a block diagram or one-line diagram of the proposed interconnection. Indicate following items as applicable.

- Generator
- Inverter
- Protective equipment
- Lockable disconnect switch
- Utility electric meter

**Section 5 – Applicant Signature**

**I hereby certify that, to the best of my knowledge, all the information provided in the Interconnection Application is true and correct.**

Printed Name of Applicant: \_\_\_\_\_

Signature of Applicant: \_\_\_\_\_ Date: \_\_\_\_\_

# **DISTRIBUTED GENERATION INTERCONNECTION PROCEDURES**

## **SMALL DISTRIBUTED GENERATION RESOURCES**

### **Appendix “I”**

#### **Initial Screening Criteria – Small and Medium Distributed Generation Resources**

1. For interconnection of a proposed DGen Resource to a radial distribution circuit, the aggregated generation, including the proposed DGen Resource, on the circuit will not exceed fifteen percent (15%) of the total circuit annual peak load as most recently measured at the substation. In addition, the aggregate generation will not exceed 15% of a distribution circuit line section’s annual peak load. A line section is defined as that section of the distribution system between two (2) sectionalizing devices in the area electric power system, as defined in national industry standards.
2. The proposed DGen Resource, in aggregation with other generation on the distribution circuit, will not contribute more than ten percent (10%) to the distribution circuit’s maximum fault current at the point on the high voltage (primary) level nearest the proposed point of common coupling.
3. The proposed DGen Resource, in aggregate with other generation on the distribution circuit, will not cause any distribution protective devices and equipment (including but not limited to substation breakers, fuse cutouts, and line reclosers), or DGen Customer equipment on the system to exceed eighty-five percent (85%) of the equipment short circuit interrupting capability.
4. For interconnection of a proposed single-phase DGen Resource where the primary distribution system is single-phase two-wire, the DGen Resource will be connected line-to-neutral.
5. For interconnection of a proposed three-phase DGen Resource to a three-phase four-wire distribution circuit, the DGen Resource will be connected line-to-line.
6. If the proposed DGen Resource is to be interconnected on single-phase shared secondary, the aggregate generation capacity on the shared secondary, including the proposed DGen Resource, will not exceed 10 kW.
7. If the proposed DGen Resource is single-phase and is to be interconnected on a center tap neutral of a 240 volt service, its addition will not create an imbalance between the two (2) sides of the 240-volt service of more than twenty percent (20%) of nameplate rating of the service transformer.
8. The proposed DGen Resource’s point of common coupling will not be on a transmission line.

# **DISTRIBUTED GENERATION INTERCONNECTION PROCEDURES**

## **SMALL DISTRIBUTED GENERATION RESOURCES**

### **Appendix “J”**

#### **Distribution Impact Study** **Medium and Large Distributed Generation Resources**

##### **1. PURPOSE**

- a. The purpose of a Distribution Impact Study is to identify and detail the system impacts that would result if the proposed unit were interconnected to the distribution system. The Impact Study shall evaluate the impact of the proposed interconnection on the reliability of the electric power distribution system.
- b. The Distribution Impact Study prepared by Sawnee EMC will not address power flows onto the transmission system. These power flows and interconnection issues with the Transmission Service Provider will be addressed by the Transmission Service Provider. Sawnee EMC will not permit power flows onto the transmission system without a signed agreement between the Transmission Service Provider and the DGen Customer.

##### **2. THE DISTRIBUTION IMPACT STUDY**

- a. This Study will consist of a short circuit analysis, a stability analysis, a power flow analysis, voltage drop and flicker studies, protection and protective coordination studies, and grounding reviews, as necessary. The Distribution Impact Study will consider the Interconnection Technical Requirements for Small, Medium, and Large Distribution Generation Resources contained in Appendix E and the standard listed in Appendix B.
- b. The Impact Study will state the assumptions upon which it is based, state the results of the analyses, and provide the requirement or potential impediments to providing the requested interconnection service, including a preliminary indication of the cost and length of time that would be necessary to correct any problems identified in those analyses and implementation of the interconnection. The Impact Study will provide a list of facilities that are required as a result of the Interconnection Request and a non-binding good faith estimate of cost responsibility and a non-binding good faith estimated time to construct.
- a. The Distribution Impact Study will include a distribution load flow study, an analysis of equipment interrupting ratings, protection coordination study, voltage drop and flicker studies, protection and set point coordination studies, grounding reviews, and the impact on system operation, as necessary. A deposit of the estimated cost of the Study will be required from the DGen Customer.

# **DISTRIBUTED GENERATION INTERCONNECTION PROCEDURES**

## **SMALL DISTRIBUTED GENERATION RESOURCES**

- b. Upon receipt of the deposit, the Distribution Impact Study should be completed within 90 business days for Medium DGen Resources, and 90 days for large DGen Resources.
3. TRANSMISSION IMPACT STUDY
- a. DGen Resources shall not normally export to the transmission system. However, a DGen Resource may inadvertently export fault current to the transmissions system.
  - b. In those instances where a Distribution Impact Study shows potential for high voltage transmission system Violations, Sawnee EMC shall notify the appropriate high voltage transmission service provider.
  - c. The DGen Customer must make an application to the Transmission Service Provider for an interconnection agreement and for any ancillary services, as appropriate.
  - d. Sawnee EMC will not permit exports on to the transmission system without a signed agreement between the Transmission Service Provider and the DGen Customer.
  - e. If the Distribution Impact Study shows no potential export onto the high voltage transmission system, it will be stated as such by Sawnee EMC in the Distribution Impact Study.

# **DISTRIBUTED GENERATION INTERCONNECTION PROCEDURES**

## **SMALL DISTRIBUTED GENERATION RESOURCES**

### **Appendix “K”**

#### **Facility Study**

#### **Distributed Generation Resources**

1. **PURPOSE**

- a. The purpose of a Facility Study is to design and estimate the cost for any required Interconnection Facilities and/or System Upgrades identify by the Distribution Impact Study.
- b. The Facility Study prepared by Sawnee EMC will not address changes to the Transmission Service Provider’s system. The DGen Customer must make separate arranges with the Transmission Service Provider for design and costs related to export sales off of Sawnee EMC’s distribution system.

2. **THE FACILITY STUDY**

- a. The DGen Customer must request that Sawnee EMC perform a Facility Study after the completion of the Distribution Impact Study. Sawnee EMC will provide an outline of the scope of the Facility Study and the cost to perform the Facilities Study.
- b. Cost of the Facility Study
  - i. A deposit of the cost of Facility Study shall be required from the DGen Customer.
- c. Sawnee EMC may contract with consultants to perform the bulk of the activities required to complete the Study.
- d. Where additional facilities are required to permit the interconnection of a Resource, and offer no benefit to system capacity, DGen Customer will bear the entire reasonable cost of such facilities as determined by the Facilities Study, but will not be subject to retroactive increases or decreases in such costs, unless determined by credits or refunds provided by mutual agreement with subsequent interconnection Customers.
- e. Sawnee EMC may propose to group facilities required for more than one DGen Customer addition in order to minimize facilities costs through economies of scale, but any Medium or Large DGen Customer may require the installation of facilities required for its own system if it is willing to pay the costs of those facilities.
- f. If the Medium or Large DGen Resource was invited or otherwise selected to provide benefits to Sawnee EMC’s system, costs charged to the interconnection Customer will be reduced commensurate with such benefit. Benefits must be measurable and verifiable.

# **DISTRIBUTED GENERATION INTERCONNECTION PROCEDURES**

## **SMALL DISTRIBUTED GENERATION RESOURCES**

- g. Where multiple interconnection requests require system facilities, interconnection Customers will be assigned costs or benefits separately where impacts can be separately attributed to respective projects.

### **3. CONFIDENTIALITY**

- a. In accordance with operative State laws, each Party shall hold in confidence and shall not disclose Confidential Information to any person (except to employees, officers, representatives and agents that agree to be bound by this provision), except as required by law.
- b. Confidential Information shall mean any confidential and/or proprietary information provided by one Party (“Disclosing Party”) to the other Party (“Receiving Party”) that is clearly marked or otherwise designated “Confidential”.
- c. For purposes of procedures, all design, operating specifications, and metering data provided by Medium or Large DGen Resource shall be deemed Confidential Information regardless of whether it is clearly marked or otherwise designated as such.
- d. Confidential Information shall not include information that the Receiving Party can demonstrate is as follows:
  - i. Is generally available to the public other than as a result of a disclosure by the Receiving Party;
  - ii. Was in the lawful possession of the Receiving Party on a non-confidential basis before receiving it from the Disclosing Party;
  - iii. Was supplied to the Receiving Party without restriction by a third party, who, to the knowledge of the Receiving Party, was under no obligation to the Disclosing Party to keep such information confidential;
  - iv. Was independently developed by the Receiving Party without reference to Confidential Information of the Disclosing Party; or
  - v. Was disclosed with the prior written approval of the Disclosing Party. If a Party believes it is required by law to disclose Confidential Information, that Party shall provide the other Party with prompt notice of such requirement(s) so that the other Party may seek an appropriate protective order or waive compliance with the terms of these procedures.

**DISTRIBUTED GENERATION  
INTERCONNECTION PROCEDURES**

**SMALL DISTRIBUTED GENERATION RESOURCES**

**APPENDIX "L"  
SAWNEE EMC**

**INTERCONNECTION AGREEMENT (SHORT FORM)**

This Agreement made \_\_\_\_\_, 20\_\_\_\_, between Sawnee Electric Membership Corporation (hereinafter called "Cooperative"), and \_\_\_\_\_ (hereinafter called the "Distributed Generation Customer"), at Sawnee EMC Account \_\_\_\_\_

**WITNESSETH:**

WHEREAS, the Cooperative is a non-profit electric membership corporation providing retail electric service; and

WHEREAS, the Distributed Generation Customer is a member of the Cooperative; and

WHEREAS, the Distributed Generation Customer desires to install, own, operate and maintain a distributed generation facility; and

WHEREAS, the Distributed Generation Customer desires to interconnect with the Cooperative's electric distribution system (hereinafter called "System") of the Cooperative and has complied with the provisions for interconnection contained in the Cooperative's Distributed Generation Policy; and

WHEREAS, the Distributed Generation Customer desires to operate its generation equipment in parallel with the Cooperative's System.

NOW THEREFORE, it is understood and agreed that the Cooperative shall permit the Distributed Generation Customer to connect its generation system to the System and to operate its generation equipment in parallel with the System subject to the following terms and conditions:

1. **COST OF INTERCONNECTION AND PROTECTIVE EQUIPMENT:**

The Distributed Generation Customer shall be responsible for all costs of installing, operating and maintaining protective equipment and/or electrical facilities required to interconnect the Customer's generation equipment with the System.

2. **OPERATING LIMITS:**

Operation of Distributed Generation Customer-owned parallel generating equipment shall not compromise the quality of electric service to other members on the System. The Distributed Generation Customer's parallel generating equipment shall meet the following minimum requirements:

# **DISTRIBUTED GENERATION INTERCONNECTION PROCEDURES**

## **SMALL DISTRIBUTED GENERATION RESOURCES**

- a) Voltage  
The Distributed Generation Customer shall be capable of operating its generating equipment within Range A of ANSI Standard C84.1. For nominal 120 volt service, this Range A is a voltage level of 114 volts to 126 volts.
- For generators over 10kW, utility grade relays or other pre-approved methods shall be used to cause the equipment to trip off line for negative excursions exceeding 118 volts for a maximum of six (6) electrical cycles.
- Positive excursions exceeding 126 volts shall cause the equipment to trip off line. Voltage regulating equipment shall maintain stable excitation levels with negligible hunting (less than 2% of nominal phase current).
- b) Flicker  
Parallel operation of the generating equipment shall not cause voltage flicker to exceed the visible flicker limit as defined by IEEE 519-1992 as measured at the primary terminals of the interfacing transformer.
- c) Frequency  
While operating in parallel with the System, the Distributed Generation Customer must provide a utility grade relays or other pre-approved methods to trip for frequency excursions exceeding plus/minus 0.25 Hz for greater than 10 electrical cycles on a 60 Hz base. Greater excursions may be allowed if pre-approved by Sawnee EMC
- d) Power Factor  
Distributed Generation Customer-owned generation shall employ automatic means of reactive power regulation while operating in parallel with the System. The Distributed Generation Customer's generating equipment shall be capable of operation within the range of 0.9 lagging to 0.9 leading power factor as required by the Cooperative. Leading power shall not be used for voltage regulation or other purposes except by written permission from the Cooperative.
- e) Harmonics  
Total current harmonic distortion shall not exceed 5.0%. Total voltage harmonic distortion shall not exceed 5.0%, with a limit of 3.0% on any individual harmonic. Special consideration will be given to regenerative drive systems and invertors reviewed on an individual case-by-case basis.
- f) Stability  
While operating in parallel with the System, the Distributed Generation Customer's generating equipment shall maintain a stable output level with no noticeable hunting exhibited. In the event a system instability condition arises due to Distributed Generation Customer-owned generation, it is the Distributed Generation Customer's responsibility to take measures to rectify the source of instability.

# **DISTRIBUTED GENERATION INTERCONNECTION PROCEDURES**

## **SMALL DISTRIBUTED GENERATION RESOURCES**

### **3. GENERATOR INTERFACE TRANSFORMER:**

The generator interface transformer is intended to provide isolation of the Distributed Generation Customer's generating equipment from the System. The inherent impedance of the transformer will minimize the impact on the System due to faults originating at the Distributed Generation Customer's generation equipment. This transformer may consist of an existing transformer serving the Distributed Generation Customer's loads or a dedicated transformer dictated by generator or prevailing system characteristics. Interface transformer specifications are determined by the Cooperative and determination of ownership of said transformer shall be at the Cooperative's option.

### **4. GENERATOR PARALLELING BREAKER:**

For generators larger than 2 MW, it is required that a generator-paralleling breaker be of draw-out construction, electrically operated, and rated as a five electrical cycle device for fault clearing or tripping.

### **5. SYNCHRONIZATION:**

It is the Distributed Generation Customer's responsibility to provide proper synchronizing of its parallel generating equipment. The Cooperative assumes no liability for any Distributed Generation Customer-owned generation and assumes that the Distributed Generation Customer operates its equipment at its own risk. Synchronizing equipment shall be capable of matching frequency within plus/minus 0.05 Hz and plus/minus 10 electrical degrees phase angle prior to paralleling breaker closure. Voltage shall be matched within plus/minus 4%.

### **6. SAFETY:**

a) Operation of Distributed Generation Customer-owned generation equipment shall not present a safety hazard to the Cooperative employees or other members connected to the System or the public at large. Under no circumstances shall the Distributed Generation Customer-owned generation be used or be capable of energizing a dead System circuit. A positive means of disconnecting and locking out the Distributed Generation Customer-owned generation equipment with visible air-gap shall be provided to insure safety of Cooperative operating personnel during line maintenance. This disconnecting means may be via a lockable air-break disconnect or by a lockable drawout circuit breaker. Islanding of the Distributed Generation Customer-owned generation (a situation whereby the Distributed Generation Customer's loads and generation remains connected to the bus) shall be prevented by protective relaying specified by the Cooperative based on individual review of the Distributed Generation Customer's proposed generating system or through the use of equipment packages design for interconnected operation that have been certified by a nationally recognized testing and certification laboratory for continuous utility interactive operation.

# **DISTRIBUTED GENERATION INTERCONNECTION PROCEDURES**

## **SMALL DISTRIBUTED GENERATION RESOURCES**

- b) It is not the intent of this document to specify protection of the Distributed Generation Customer's generator. Protection of the Distributed Generation Customer's generating equipment is the responsibility of the Distributed Generation Customer and the Cooperative assumes no liability for damage or failure of the Distributed Generation Customer's generation equipment.
- c) The Distributed Generation Customer must certify that the required manual disconnect switch has been installed properly; that the distributed generation facility has been installed in accordance with the manufacturer's specifications; and that the installation meets all applicable safety, power quality, and interconnection requirements established by the National Electrical Code, the National Electrical Safety Code and the Institute of Electrical and Electronics Engineers. Two methods are available:
  - i) Verification provided by a qualified independent electrical engineer licensed to practice in Georgia.
  - ii) Provide documentation that the equipment package used is certified for interconnected operation has been certified by a nationally recognized testing and certification laboratory, and provide verification that the vendor has certified that the distributed generation facility which has been installed is in compliance with the requirements established by Underwriters Laboratories or other national testing laboratories.

### **7. TESTING:**

The Distributed Generation Customer shall verify proper tripping and lockout of the generator system for all defined faults as determined by the Cooperative during final review of system relay requirements. Failure to maintain records will be grounds for refusal of permission to operate parallel generating equipment. Under no circumstances shall parallel generating equipment be operated with inoperative or defective protective relays.

Commercially owned distributed generation greater than 2 kW shall retain a qualified independent electrical engineer licensed to practice in Georgia to maintain and annually test system protective relaying for the Customer-owned generating equipment. Upon demand, the Distributed Generation Customer shall produce records of testing and relay setting sheets for review by the Cooperative.

### **8. COMPLIANCE PROCEDURE:**

The Cooperative reserves the right to automatically or manually disconnect the Distributed Generation Customer's generation equipment without prior notice whenever, at the Cooperative's sole discretion, the Distributed Generation Customer is deemed by the Cooperative to not be in compliance with the minimum interconnection requirements as specified via this Agreement. The interconnection will remain open until corrective action is taken and suitable testing is completed.

**DISTRIBUTED GENERATION  
INTERCONNECTION PROCEDURES**

**SMALL DISTRIBUTED GENERATION RESOURCES**

**9. NET METERING AND INTERCONNECTION CHARGE:**

The Distributed Generation Customer shall pay the Cooperative in accordance with the rates, terms and conditions of the "Net Energy Metering Rider" attached to and made a part of this Agreement.

**INTERCONNECTION CHARGE (ALTERNATE #9 FOR NON-NET METERING):**

The Distributed Generation Customer shall pay the Cooperative in accordance with the applicable rate for retail electric service and for all costs associated with the interconnection of the distributed generation facility.

**10. TERM:**

This Agreement shall become effective on the date first above written and shall remain in effect until one (1) year following the start of the initial billing period and thereafter until terminated by either party giving to the other three (3) months' notice in writing; provided, however, the Cooperative may terminate this Agreement prior to the expiration of the term hereof upon any breach of this Agreement by the Distributed Generation Customer.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement all as of the day and year first above written.

SEMC ATTEST:

\_\_\_\_\_  
Witness Printed Name

\_\_\_\_\_  
Witness Signature

By:

\_\_\_\_\_  
Michael A. Goodroe, President & CEO  
Sawnee EMC

MEMBER ATTEST:

\_\_\_\_\_  
Witness Printed Name

\_\_\_\_\_  
Witness Signature

By:

\_\_\_\_\_  
Member Printed Name (Business Name if applicable)

\_\_\_\_\_  
Member Signature

\_\_\_\_\_  
Name and Title of Officer (if Business)