

# **SAWNEE EMC**

## **DISTRIBUTED GENERATION INTERCONNECTION PROCEDURES**

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# **DISTRIBUTED GENERATION INTERCONNECTION PROCEDURES**

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# **DISTRIBUTED GENERATION INTERCONNECTION PROCEDURES**

## **I. GENERAL CONSIDERATIONS**

- A. These process, requirements and documents (“procedures”) establish guidelines for Sawnee EMC (or “the Cooperative”) under which 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. All distributed generation facilities greater than 10 MW are not subject to these procedures and will be handled on a case by case basis.
  
- B. These procedures are designed to ensure that all applications are considered in an efficient, fair and consistent manner. Most importantly, however, the purpose of these procedures 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 these procedures 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 procedures contained herein have been developed for all generation facilities interconnected with Sawnee EMC’s distribution facilities rated 10 MW 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.
  
  - 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

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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 based on DGen Resource size categories, i.e., Micro, Small, Medium and Large.

Section II – Micro Distributed Generation Resources

Section III – Small Distributed Generation Resources

Section IV – Medium and Large Distributed Generation Resources

Issues related to metering and energy sales/purchases for all DGen Resources are contained in Section V - Disposition of Energy

- 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 permitted interconnection approval.
- J. Except for Micro DGen Resources where there are no net metering or net billing arrangements, proposed DGen Resources shall execute Interconnection Agreement 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. MICRO DISTRIBUTED GENERATION RESOURCES**

- A. No application is required to be submitted to Sawnee EMC for the installation of Micro DGen Resources. Sawnee EMC is committed to help ensure the safe operation of all customer-owned generation and thus the Micro DGen Customer is required to provide notice to the Cooperative prior to the installation Micro DGen Resources.
- B. Owners of Micro DGen Resources shall provide notice to Sawnee prior to the installation such resources. The notice is contained in Appendix "F".
- C. Micro DGen Resources must comply with the Interconnection Technical Requirements for Micro Distributed Generation contained Appendix D.
- D. Micro DGen Resource may self-certify their system in accordance with Appendix C.
- E. Sawnee EMC may request Commission Testing of Micro DGEN Resources after receiving notice of their installation.
- F. Micro DGen Customer shall provide Sawnee EMC access to the generator during normal business hours and as needed for emergency access.
- G. Net Metering will be used for Micro DGen Resources except as provided in Section V - Disposition of Energy.
- H. The Micro DGen Resources must comply with Section V Disposition of Energy of these procedures.
- I. Sawnee EMC has no requirement for liability insurance for Micro DGen Resources.
- J. Additional Requirements for Residential Micro DGen Customer
  - 1. A lockable, accessible disconnect switch shall be installed by or for the Micro DGen Customer in a location approved by Sawnee EMC. Sawnee EMC may open and lock the disconnect switch for safe live-line maintenance of Sawnee EMC facilities.

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### **III. SMALL DISTRIBUTED GENERATION RESOURCES**

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

1. The Small DGen Customer will submit the appropriate interconnection application along with the application fee, defined below, and states the purpose for which the Small DGen Resource is to be installed;
  - a. Appendix “G” – Application for Paralleling Equipment to Electric System –Greater than 2 kW and less than 10 kW
  - b. Appendix “H” – Application for Paralleling Equipment to Electric System –Greater than 10 kW and less than 10 MW
  - c. 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 submits documentation of site control along with the appropriate application. The site control may be demonstrated through
  - a. Ownership of ,a leasehold interest in, or a right to develop a site for the purpose of constructing a Small DGen Resource Facility, or
  - b. an option to purchase or acquire a leasehold site for such purpose; or
  - c. an exclusivity or other business relationship between Small DGen Resource Facility and the entity having the right to sell, to lease or to grant the Small DGen Resource Facility the right to possess or occupy a site for such purpose.
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.
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 60 days of its receipt. For Small DGen Customers, there is no fee charged for the Distribution Impact Study. The Distribution Impact Study will incorporate 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 applicable, to implement the recommendations of the Distribution Impact Study, a Facility Study will be conducted. 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.
2. 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 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.

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3. Commission testing is required for the Small DGen Customer. As part of the 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 V - 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 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 is required for Commercial Small DGen Resources. The Customer will maintain records for testing and maintenance of the

## **DISTRIBUTED GENERATION INTERCONNECTION PROCEDURES**

installation. 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 V. Disposition of Energy.
8. Sawnee EMC has no requirement for liability insurance for Commercial Small DGen Resources.

### **IV. MEDIUM AND LARGE DISTRIBUTED GENERATION RESOURCES**

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

1. The Medium or Large DGen Customer will submit the appropriate interconnection application along with the application fee, defined below, and states the purpose for which the Medium or Large DGen Resource is to be installed;
  - a. Appendix “H” – Application for Paralleling Equipment to Electric System – Greater than 10kW and less than 10 MW
  - b. Medium Distributed Generation Resource. Application Fee of \$100.
  - c. Large Distributed Generation Resource. Application Fee of \$250.
2. To assist a Medium or Large DGen Customer in the interconnection process, Sawnee EMC will designate an employee from which information on the application process can be obtained.
3. The Medium or Large DGen Customer submits documentation of site control along with the appropriate application. The site control may be demonstrated through
  - a. Ownership of, a leasehold interest in, or a right to develop a site for the purpose of constructing a Medium or Large DGen Resource Facility, or
  - b. an option to purchase or acquire a leasehold site for such purpose; or

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- c. an exclusivity or other business relationship between the Medium or Large DGen Resource Facility and the entity having the right to sell, to lease or to grant the Medium or Large DGen Resource Facility the right to possess or occupy a site for such purpose.
4. The Medium or Large 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 Medium 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 in the operation of the Sawnee EMC's electrical distribution system.
2. Due to their capacity as defined herein, Initial Screening does not apply to Large DGen resources.
3. The criteria for the initial screening are contained in Appendix I.
4. If the proposed generation resource passes the initial screening, the application is approved subject to certification of the equipment described in Appendix B and E.
5. If the proposed generation resource fails the initial screening, a Distribution Impact Study will be required.

### **C. Distribution Impact Study**

1. For Large DGen resources, a Distribution Impact Study will be required.
2. For Medium DGen Resources which failed the initial screening and for Medium DGen Customers who desire to proceed with the application, a Distribution Impact Study will be required.
3. A Scoping Meeting is recommended prior to the start of the Distribution Impact Study. At the request of either Party, a Scoping Meeting will generally be held within thirty (30) business days, or as otherwise mutually agreed to by the Parties, after Sawnee EMC notifies the Medium DGen Customer that the Application has failed the Initial Screening or notifies the Large DGen Customer once the application is thoroughly reviewed. Sawnee EMC and Medium or

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Large DGen Customer will bring to the meeting personnel, including system engineers, and other resources as may be reasonably required, to accomplish the purpose of the meeting. The purpose of the Scoping Meeting shall be to discuss the Medium or Large DGen Customer's interconnection request, and any known system limitations relevant to the Medium or Large DGen Customer's interconnection request.

4. Sawnee EMC will provide an outline of the scope of the study and an estimate of the cost to perform the study.
5. A payment of the estimated cost of the Distribution Impact Study shall be required from the Medium or Large DGen Customer.
6. The Distribution Impact Study will incorporate 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 Distribution Impact Study are contained in Appendix J.
7. Upon payment of the estimated cost for the Distribution Impact and receipt of required data on the application form, Sawnee EMC will complete the study in 60 days for Medium DGen Resources and 90 days for Large DGen Resources.

### **D. Facility Study**

1. To implement the recommendations of the Distribution Impact Study, a Facility Study is required. 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.
2. Upon completion of the Facility Study, the DGen Customer will be responsible for the cost for the required facilities before proceeding with the installation of the interconnection with the DGen Resource.

### **E. Additional Requirements for Medium and Large DGen Customer**

1. A lockable, accessible disconnect switch shall be installed by or for the Medium or Large DGen Customer in a location approved by SEMC. Sawnee EMC will open and lock the disconnect switch for safe live-line maintenance of Sawnee EMC facilities.

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2. Medium and Large DGen Customers shall certify their equipment and installation for interconnect as defined by the standards listed in Appendix B. This certification shall be provided a qualified independent electrical engineer licensed to practice in Georgia as described in Appendix E. Sawnee EMC will accept self-certification for inverters certified by a nationally recognized testing and certification laboratory. Reference Appendix C for details regarding self-certification.
3. A transfer trip scheme or relay protection is required for Medium DGen Resources to prevent islanding and to coordinate with Sawnee EMC's over current protection system. A transfer trip scheme will generally be required when the capacity of the aggregated generation, including the proposed Medium DGen Resource, on the circuit exceeds twenty five percent (25%) of the total circuit annual peak load as most recently measured at the substation. The transfer trip scheme will be designed to coordinate the protective device(s) of the Medium DGen Resource and Sawnee EMC's protective device(s). The Medium DGen Customer will be responsible for the cost of the installation and implementation of the transfer trip system.
4. A transfer trip scheme is required for Large DGen Resources. The transfer trip scheme will be designed to coordinate with the protective device(s) of the Large DGen Resource and Sawnee EMC's protective device(s). The Large DGen Customer will be responsible for the cost of the installation and implementation of the transfer trip system.
5. Commission testing is required for Medium and Large DGen Customers. As part of the commission test, Sawnee EMC will verify that the installation complies with the non-islanding provisions of IEEE 1547.
6. Medium and Large DGen Customers shall provide Sawnee EMC access to the DGen Resource 24 hours a day, 7 days a week.
7. Disturbance monitoring is required for Medium and Large DGen Resources. These Medium or Large DGen Resources must be equipped with a system that has the capability for detailed data logging around fault conditions, with storage in a non-volatile format. This information will be supplied to Sawnee EMC upon reasonable request. Sawnee EMC will at its sole discretion use this monitoring data to verify compliance with the Interconnection Technical Requirements in Appendix E.

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8. Real time monitoring is required for Medium and Large DGen Resources. The real time monitoring will provide connection status, real power output, reactive power output, and voltage at the point of connection. The Medium or Large DGen Customer will be responsible for all costs and methods to transmit this data to Sawnee EMC. While not its only purpose, the real time monitoring could be used by Sawnee EMC, at its sole discretion, to verify compliance with the Interconnection Technical Requirements in Appendix D.
9. Periodic testing is required for Medium and Large DGen Resources. The Medium or Large DGen Customer will maintain records for testing and maintenance of the installation. Failure to maintain adequate records of testing can be the basis for disconnecting the DGen Resource.
10. Medium DGen Customer will be required to obtain a minimum \$1,000,000 Liability Coverage to insure for claims of property damage and injury.
11. Large DGen Customer will be required to obtain Liability Coverage to insure for claims of property damage and injury. The amount will be defined by Sawnee EMC but will not be less than \$10,000,000.
12. Sawnee EMC will be named as Additional Insured on all insurance liability policies required herein. The DGen Customer shall furnish Sawnee EMC a certificate evidencing compliance with the foregoing requirements which shall provide no less than thirty days prior written notice to Sawnee EMC of any cancellation or material change in the insurance.

### **F. Interconnection Metering**

1. Any metering necessitated by the use of the Medium or Large DGen Resource shall be installed at the DGen Customer's expense in accordance with State or local regulatory requirements or Sawnee EMC's specifications.
2. Sawnee EMC will install utility grade metering at the Medium or Large DGen Resource, at the cost of the DGen Customer, according to the provisions defined in Section V. Disposition of Energy.

### **G. Commissioning**

1. Commissioning tests of a Medium or Large DGen Customer's installed equipment will be performed pursuant to applicable codes and standards.

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2. Sawnee EMC must be given at least fifteen (15) business day's written notice, or as otherwise mutually agreed to by the Parties, of the tests and may be present to witness the commissioning tests.

### **V. 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. Micro and Small DGen Resources**

For DGen Customers of Sawnee that own and operate a Micro or Small DGen Resource that meets all of the following conditions immediately below, the Net Metering provisions in Section 1 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 Micro or Small DGen Resources, the Net Metering provisions shall apply at the discretion of the Cooperative. When the Net Metering provisions in Section 1 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.

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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.

## **DISTRIBUTED GENERATION INTERCONNECTION PROCEDURES**

- 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.
  - 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. For QF's such credits shall be determined using the Cooperative's avoided cost rates.
  - 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.
2. Interconnection without Net Metering

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- 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
  - 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 using rates as negotiated between the Cooperative and the DGen Customer, except for QF's, such rates shall be the Cooperative's avoided cost rates.
  - 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 cycle.
    - 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.

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### 3. 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 based upon Sawnee EMC's avoided costs.
- b. The Cooperative will have retail service rates available for any supplemental, back-up, or maintenance power service requirements, as may be requested by the Micro and Small DGen Customer. (Standard rates that would otherwise apply for QF's with capacity of less than 100 kW.)

### 4. 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.

### B. Medium and Large DGen Resources

For DGen Customers of Sawnee EMC that own and operate a Medium or Large DGen Resource, net metering provisions do not apply; however the following provisions are applicable.

- a. Metering
  - i. The Cooperative shall install utility grade metering at the Medium and Large DGen Resource, at the cost of the DGen Customer, if there is an agreement to purchase the energy provided by the DGen Resource.

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b. Purchase of Energy

- i. The Cooperative is not obligated to purchase any energy produced by the Medium and Large DGen Resource, but may do so at the discretion of the Cooperative.
- ii. If any energy from the Medium and Large DGen Resource is purchased by the Cooperative, such purchase shall be made using rates as negotiated between the Cooperative and the DGen Customer, except for QF's, such rates shall be the Cooperative's avoided cost rates..

c. Charges for Interconnection and 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.

d. Retail Sales

- i. The Cooperative will have retail service rates available for any back-up power service requirements, as may be required for the DGen Customer.
- ii. The Cooperative may use an existing rate for backup service requirements or may establish a new retail rate applicable to customers with generators.

e. Qualifying Facilities

For any Medium and Large DGen customer that also has formal status as a QF, the following provisions shall apply:

- i. The purchase rate for any capacity and energy purchased by the Cooperative shall be based upon Sawnee EMC's avoided costs.
- ii. The Cooperative will have retail service rates available for any supplemental, back-up or maintenance power service requirements, as may be requested by the DGen Customer. (The Cooperative's applicable retail rates applicable for service to QF's with capacity of 100 kW or greater, as may be amended from time to time).

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### f. Renewable Energy Credits

The DGen Customer shall retain ownership of all RECs produced by the Medium and Large DGen Resource, and the ownership of such RECs shall not be transferred to Sawnee EMC unless a) there are specific provisions in the Interconnection Agreement for such transfer or for their sale and purchase. Sawnee EMC 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:

- i. Gaining Green-e certification, which is a pre-requisite necessary to produce RECs.
- ii. Installing separate utility grade metering at the DGen Resource.
- iii. Maintaining auditable records of the actual energy generated by the DGen Resource used for purpose of producing RECs.

**DISTRIBUTED GENERATION  
INTERCONNECTION PROCEDURES**

**“APPENDICES”**

# DISTRIBUTED GENERATION INTERCONNECTION PROCEDURES

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

## **DISTRIBUTED GENERATION INTERCONNECTION PROCEDURES**

**“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).

**“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.

## **DISTRIBUTED GENERATION INTERCONNECTION PROCEDURES**

**“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 Energy Regulatory Rules 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 Resource(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.

**“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.

## **DISTRIBUTED GENERATION INTERCONNECTION PROCEDURES**

“**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.

# DISTRIBUTED GENERATION INTERCONNECTION PROCEDURES

## 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
14. **IEEE Std 519-1992**, IEEE Recommended Practices and Requirements for Harmonic Control in Electrical Power Systems

## **DISTRIBUTED GENERATION INTERCONNECTION PROCEDURES**

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)

# **DISTRIBUTED GENERATION INTERCONNECTION PROCEDURES**

## **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 consistent with the testing and listing performed by the nationally recognized testing and certification laboratory, no further design review,

## **DISTRIBUTED GENERATION INTERCONNECTION PROCEDURES**

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.

# **DISTRIBUTED GENERATION INTERCONNECTION PROCEDURES**

## **APPENDIX “D”**

### **MICRO DISTRIBUTED GENERATION INTERCONNECTION TECHNICAL REQUIREMENTS**

#### **I. INTRODUCTION**

This Section contains additional technical requirements for interconnecting micro-generators with the Sawnee EMC electric distribution 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

The DGen Resource Customer shall be capable of operating its generating equipment at a voltage level of 118 to 126 volts AC in accordance with ANSI Standard C84.1-2006.

2. Power Factor

- i. DGen Resource Customer-owned generation shall employ automatic means of reactive power regulation while operating in parallel with the System.
- ii. Generating equipment shall operate as near unity power factor as possible, but in no case below 0.9 or 90% lagging.

3. Harmonics

- i. Total current harmonic distortion shall not exceed 5.0%.
- ii. Total voltage harmonic distortion shall not exceed 5.0%, with a limit of 3.0% on any individual harmonic.

## **DISTRIBUTED GENERATION INTERCONNECTION PROCEDURES**

### **III. 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%.

### **IV. 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 and accessible to ensure safety of Cooperative operating personnel during line maintenance.
- d. Islanding of the DGen Resource Customer-owned generation (a situation whereby the DGen Resource Customer's loads and generation remains connected to the bus) is prohibited. Islanding prevention will be verified by Commission Testing.
- e. 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.
- f. The DGen Resource Customer's equipment is subject to certification as described in Appendices B and C.

## **DISTRIBUTED GENERATION INTERCONNECTION PROCEDURES**

### **V. TESTING**

- a. The DGen Resource Customer shall verify proper tripping and lockout of the generator system to prevent islanding.
- b. Under no circumstances shall parallel generating equipment be operated with inoperative or defective protective relays.

### **VI. 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.

### **VII. INDUCTION GENERATORS**

- a. Induction generators shall be started using techniques that minimize voltage flicker.
- b. Induction generators of any size shall be provided with over and under voltage, over and under frequency, and utility grade relay protection.
- c. An appropriate grounding scheme suitable for the type of transformer and generator connections shall be provided.

### **VIII. 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. Inverters 10 KW or less shall provide protective functions required in UL 1741.

### **IX. SYNCHRONOUS GENERATORS**

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

## **DISTRIBUTED GENERATION INTERCONNECTION PROCEDURES**

- b. Customer shall operate the synchronous generator in the voltage following mode at or near unity power factor.
- c. 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. Synchronous generator installations shall include the following functions, using utility grade relays, as a minimum:
  - i. Over and under-voltage relays
  - ii. Over and under-frequency relays
  - iii. Sync check relay
  - iv. Ground fault detection (Device 51N), providing detection on the primary side of the service transformer.
  - v. Phase fault detection (Device 50/51)
- e. Reclosing protection for the generator
  - i. Customer shall be responsible for providing protection to the generator from automatic reclosing of the Cooperative's breakers.
  - ii. Reclosing protection must respond to reclose operations of 0.65 seconds.
- f. An appropriate grounding scheme suitable for the type of transformer and generator connections shall be provided.
- g. 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.

# **DISTRIBUTED GENERATION INTERCONNECTION PROCEDURES**

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

## **DISTRIBUTED GENERATION INTERCONNECTION PROCEDURES**

### 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 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.

## **DISTRIBUTED GENERATION INTERCONNECTION PROCEDURES**

- 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.

### **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%.

## **DISTRIBUTED GENERATION INTERCONNECTION PROCEDURES**

### **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.
- 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.

## **DISTRIBUTED GENERATION INTERCONNECTION PROCEDURES**

- 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 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.

## **DISTRIBUTED GENERATION INTERCONNECTION PROCEDURES**

### **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.

#### 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.

## **DISTRIBUTED GENERATION INTERCONNECTION PROCEDURES**

- 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 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.

## **DISTRIBUTED GENERATION INTERCONNECTION PROCEDURES**

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)

### **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.

## **DISTRIBUTED GENERATION INTERCONNECTION PROCEDURES**

### 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.



## DISTRIBUTED GENERATION INTERCONNECTION PROCEDURES

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 \_\_\_\_\_

Planned in-service date: \_\_\_\_\_

### Existing Electric Service

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

Service Type:

\_\_\_ Single Phase

\_\_\_ Three Phase

### Section 2 – Generator Qualifications

Energy source:

\_\_\_ Solar

\_\_\_ Wind

\_\_\_ Hydro

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

\_\_\_ Diesel

\_\_\_ Natural Gas

\_\_\_ Fuel Oil

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

Type of Generator:

\_\_\_ Synchronous

\_\_\_ Induction

\_\_\_ DC Generator or Solar with Inverter

## **DISTRIBUTED GENERATION INTERCONNECTION PROCEDURES**

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:

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

### **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) \_\_\_\_\_

### **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

**DISTRIBUTED GENERATION  
INTERCONNECTION PROCEDURES**

**Section 5 – Applicant Signature**

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

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



## DISTRIBUTED GENERATION INTERCONNECTION PROCEDURES

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) \_\_\_\_\_

Type of Generator:

\_\_\_ Synchronous

\_\_\_ Induction

\_\_\_ DC Generator or Solar with Inverter

## DISTRIBUTED GENERATION INTERCONNECTION PROCEDURES

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:

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) \_\_\_\_\_

### **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

# **DISTRIBUTED GENERATION INTERCONNECTION PROCEDURES**

## **Section 5 – Site Control**

Enclose documentation verifying site control. The site control may be demonstrated through

- a) Ownership of the site,
- b) a leasehold interest in, or a right to develop a site for the purpose of constructing a distributed generation resource facility,
- c) an option to purchase or acquire a leasehold site for such purpose;
- d) an exclusivity or other business relationship between distributed generation resource facility and the entity having the right to sell, to lease or to grant the distributed generation resource facility the right to possess or occupy a site for such purpose.

## **Section 6 – Applicant Signature**

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

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



**DISTRIBUTED GENERATION  
INTERCONNECTION PROCEDURES**

Telephone (Daytime): \_\_\_\_\_ Telephone (Evening): \_\_\_\_\_

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

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

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

Net Metering? Yes  No

To supply power to the DGen Customer? Yes  No

To export power to Sawnee EMC? Yes  No

To export power to the Transmission Service Provider? Yes  No

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

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

Requested Point of Interconnection: \_\_\_\_\_

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)

# DISTRIBUTED GENERATION INTERCONNECTION PROCEDURES

## **Section 2 – Generator Qualifications**

**All data collected in Sections 2 and 3 are 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) \_\_\_\_\_

Type of Generator:

- Synchronous
- Induction
- DC Generator or Solar with Inverter

Applicant or Customer-Site Load \_\_\_\_\_ kW (if none so state); \_\_\_\_\_  
(Reactive Load, if known)

Maximum Physical Export Capability Requested \_\_\_\_\_ kW

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:

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

# DISTRIBUTED GENERATION INTERCONNECTION PROCEDURES

## **Section 3 – Generator Technical Information**

Generator (or solar collector) Manufacturer, Model Name & Number:

Version Number \_\_\_\_\_

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

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

Individual Generator Power Factor

Rated Power Factor Leading: \_\_\_\_\_

Rated Power Factor Lagging: \_\_\_\_\_

Total Number of Generators in Wind Farm to be interconnected pursuant to this application:

\_\_\_\_\_

Elevation \_\_\_\_\_ Single phase \_\_\_\_\_ Three phase \_\_\_\_\_

Inverter Manufacturer, Model Name & Number (if used): \_\_\_\_\_

List of Adjustable Set points the protective equipment or software: \_\_\_\_\_

### **Generator Characteristic Data (for rotating machines)**

**[Note: For Wind Generators, a completed General Electric Company Power Systems Load Flow (PSLF) data sheet must be supplied with the application.]**

#### For Synchronous and Induction Generators

Direct Axis Transient Reactance, X'd: \_\_\_\_\_ P.U.

Direct Axis Unsaturated Transient Reactance, X'di: \_\_\_\_\_ P.U.

Direct Axis Subtransient Reactance, X'd: \_\_\_\_\_ P.U.

Generator Saturation Constant (1.0): \_\_\_\_\_

Generation Saturation Constant (1.2): \_\_\_\_\_

Negative Sequence Reactance: \_\_\_\_\_ P.U.

Zero Sequence Reactance: \_\_\_\_\_ P.U.

kVA Base: \_\_\_\_\_

RPM Frequency: \_\_\_\_\_

#### Additional information for Induction Generators

\*Field Volts \_\_\_\_\_

\*Field Amperes \_\_\_\_\_

\*Motoring Power (kW) \_\_\_\_\_

\*Neutral Grounding Resistor (If Applicable) \_\_\_\_\_

\*I<sup>2</sup>t or K (Heating Time Constant) \_\_\_\_\_

\*Rotor Resistance \_\_\_\_\_

\*Stator Resistance \*Stator Reactance \_\_\_\_\_

\*Rotor Reactance \*Magnetizing Reactance \_\_\_\_\_

\*Short Circuit Reactance \_\_\_\_\_

## DISTRIBUTED GENERATION INTERCONNECTION PROCEDURES

- \*Exciting Current \_\_\_\_\_
- \*Temperature Rise \_\_\_\_\_
- \*Frame Size \*Design Letter \_\_\_\_\_
- \*Reactive Power Required In Vars (No Load) \_\_\_\_\_
- \*Reactive Power Required In Vars (Full Load) \_\_\_\_\_
- \*Total Rotating Inertia, H: \_\_\_\_\_ Per Unit on kVA Base

**[\*Note: Please contact Sawnee EMC prior to submitting the Application to determine if the specified information above is required.]**

### **Excitation & Governor System Data for Synchronous Generators only**

Provide appropriate IEEE model block diagram of excitation system, governor system, and power system stabilizer (PSS) in accordance with the regional reliability council criteria. A PSS may be determined to be required by applicable studies.

A copy of the manufacturer's block diagram may not be substituted.

### **Section 4 – Interconnection Equipment Technical Data Information**

Will a transformer be used between the generator and the point of interconnection?  
\_\_\_ Yes \_\_\_ No

Will the transformer be provided by Interconnection Applicant? \_\_\_ Yes \_\_\_ No

#### **Transformer Data (if applicable, for Interconnection Applicant-Owned Transformer):**

Is the transformer: \_\_\_ single-phase \_\_\_ three-phase

Size: \_\_\_\_\_ kVA

Transformer Impedance: \_\_\_\_\_ % on \_\_\_\_\_ kVA Base

If Three-Phase:

Transformer Primary: \_\_\_\_\_ Volts \_\_\_ Delta \_\_\_ Wye \_\_\_ Wye Grounded

Transformer Secondary: \_\_\_\_\_ Volts \_\_\_ Delta \_\_\_ Wye \_\_\_ Wye Grounded

#### **Transformer Fuse Data (if applicable, for Interconnection Applicant-Owned Fuse):**

(Attach copy of fuse manufacturer's Minimum Melt & Total Clearing Time-Current Curves)

Manufacturer: \_\_\_\_\_ Type: \_\_\_\_\_ Size: \_\_\_\_\_ Speed: \_\_\_\_\_

#### **Interconnecting Circuit Breaker (if applicable)**

Manufacturer: \_\_\_\_\_ Type: \_\_\_\_\_ Load Rating (Amps): \_\_\_\_\_

Interrupting Rating: \_\_\_\_\_ (Amps) Trip Speed: \_\_\_\_\_ (Cycles)

#### **Interconnection Protective Relays (if applicable)**

## DISTRIBUTED GENERATION INTERCONNECTION PROCEDURES

(Enclose copy of any proposed Time-Overcurrent Coordination Curves)

Manufacturer: \_\_\_\_\_ Type: \_\_\_\_\_ Style/Catalog No.: \_\_\_\_\_ Proposed setting: \_\_\_\_\_  
Manufacturer: \_\_\_\_\_ Type: \_\_\_\_\_ Style/Catalog No.: \_\_\_\_\_ Proposed setting: \_\_\_\_\_  
Manufacturer: \_\_\_\_\_ Type: \_\_\_\_\_ Style/Catalog No.: \_\_\_\_\_ Proposed setting: \_\_\_\_\_  
Manufacturer: \_\_\_\_\_ Type: \_\_\_\_\_ Style/Catalog No.: \_\_\_\_\_ Proposed setting: \_\_\_\_\_  
Manufacturer: \_\_\_\_\_ Type: \_\_\_\_\_ Style/Catalog No.: \_\_\_\_\_ Proposed setting: \_\_\_\_\_

### Current Transformer Data (if applicable)

(Enclose a copy of manufacturer's Excitation & Ratio Correction Curves)

Manufacturer: \_\_\_\_\_ Type: \_\_\_\_\_ Accuracy Class: \_\_\_\_\_ Proposed Ratio Connection \_\_\_\_\_  
Manufacturer: \_\_\_\_\_ Type: \_\_\_\_\_ Accuracy Class: \_\_\_\_\_ Proposed Ratio Connection \_\_\_\_\_

### Potential Transformer Data (if applicable)

Manufacturer: \_\_\_\_\_ Type: \_\_\_\_\_ Accuracy Class: \_\_\_\_\_ Proposed Ratio Connection \_\_\_\_\_  
Manufacturer: \_\_\_\_\_ Type: \_\_\_\_\_ Accuracy Class: \_\_\_\_\_ Proposed Ratio Connection \_\_\_\_\_

### **Section 5 – General Technical Information**

Enclose a copy of site electrical One-Line Diagram showing the configuration of all generating facility equipment, current and potential circuits, and protection and control schemes.

Is One-Line Diagram Enclosed? \_\_\_\_\_ Yes \_\_\_\_\_ No

**[Note: This one-line diagram must be signed and stamped by a licensed Professional Engineer if the generating facility is larger than 50 kW.]**

Enclose a copy of any site documentation that indicates the precise physical location of the proposed generating facility (e.g., USGS topographic map or other diagram or documentation).

Is Site Documentation Enclosed? \_\_\_\_\_ Yes \_\_\_\_\_ No

Proposed Location of Protective Interface Equipment on Property:

(Include Address if Different from Application Address) \_\_\_\_\_

Enclose copy of any site documentation that describes and details the operation of the protection and control schemes. Is Any Available Documentation Enclosed? \_\_\_\_\_ Yes \_\_\_\_\_ No

Enclose copies of schematic drawings for all protection and control circuits, relay current circuits, relay potential circuits, and alarm/monitoring circuits (if applicable).

Are Schematic Drawings Enclosed? \_\_\_\_\_ Yes \_\_\_\_\_ No

## **DISTRIBUTED GENERATION INTERCONNECTION PROCEDURES**

### **Section 6 –Site Control**

Enclose documentation verifying site control. The site control may be demonstrated through:

- a) Ownership of the site,
- b) a leasehold interest in, or a right to develop a site for the purpose of constructing a distributed generation resource facility,
- c) an option to purchase or acquire a leasehold site for such purpose;
- d) an exclusivity or other business relationship between distributed generation resource facility and the entity having the right to sell, to lease or to grant the distributed generation resource facility the right to possess or occupy a site for such purpose.

### **Section 7 – Applicant Signature**

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

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

# **DISTRIBUTED GENERATION INTERCONNECTION PROCEDURES**

## **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**

## **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 incorporate 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**

- 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**

## **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**

- 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.