

**AGREEMENT**  
**FOR**  
**INTERCONNECTION AND PARALLEL OPERATION**  
**OF**  
**DISTRIBUTED GENERATION (DG)**

(FOR NON-RESIDENTIAL DISTRIBUTED GENERATION 10MW OR LESS)

**Revised 1/5/2011**

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**AGREEMENT  
FOR  
INTERCONNECTION AND PARALLEL OPERATION OF  
DISTRIBUTED GENERATION**

This Interconnection Agreement ("Agreement") is made and entered into this \_\_\_\_ day of \_\_\_\_\_, 20\_\_, by and between \_\_\_\_\_, a \_\_\_\_\_ organized and existing under the laws of the state of \_\_\_\_\_, herein after referred to as "DG Owner/Operator" and \_\_\_\_\_ Electric Power Association, hereinafter referred to as "Cooperative" and South Mississippi Electric Power Association, hereinafter referred to as "SMEPA", both being Electric Power Associations organized under the laws of the state of Mississippi, and each hereinafter sometimes referred to individually and collectively as "Party" or "Parties". In consideration of the mutual covenants set forth herein, the Parties agree as follows:

**1. Scope of Agreement** – This Agreement is applicable to conditions under which SMEPA, the Cooperative, and the DG Owner/Operator agree that one or more generating facilities, associated protective devices and isolating equipment ("Facilities"), as described in Exhibit A, owned by the DG Owner/Operator of \_\_\_\_\_ kW or less, to be interconnected at \_\_\_\_\_ kV or less, may be interconnected to the Cooperative's electric power distribution system ("System").

**2. Establishment of Point of Interconnection** – The point where the electric energy first leaves the wires or facilities owned by the Cooperative and enters the wires or facilities provided by DG Owner/Operator is the "Point of Interconnection." Cooperative and DG Owner/Operator agree to interconnect the Facilities at the Point of Interconnection in accordance with the Cooperative's rules, regulations, by-laws, rates, and tariffs (the "Rules") which are incorporated herein by reference. The interconnection equipment installed by the DG Owner/Operator ("Interconnection Facilities") shall be in accordance with the Rules as well as with the South Mississippi Electric Power Association and Member Cooperative's Interconnection Requirements for Distributed Generation, the current requirements which are included as Exhibit D.

**3. Establishment of Point of Dedicated Facilities** – The point where the electric energy first leaves the facilities owned by the Cooperative that are used to serve its customers and enters the electric distribution system constructed, owned, operated, and maintained by the Cooperative that are used exclusively for providing electric service to the DG Owner/Operator is the "Point of Dedicated Service."

**4. Responsibilities of Cooperative and DG Owner/Operator for Installation, Operation and Maintenance of Facilities** – DG Owner/Operator will, at its own cost and expense, design, install, construct, operate, maintain, repair, and inspect, and shall be fully responsible for, its Facilities and Interconnection Facilities, unless otherwise specified in Exhibit A. DG Owner/Operator shall conduct operations of its Facilities and Interconnection Facilities in compliance with all aspects of the Rules and in accordance with industry standard prudent engineering practice. The Cooperative shall conduct operations of its electric distribution facilities in compliance with all aspects of the Rules, or as further described and mutually agreed to in the applicable Facilities Schedule attached hereto as Exhibit A. Maintenance of Facilities and Interconnection Facilities shall be performed in accordance with standard industry practices. The DG Owner/Operator agrees to cause its Facilities and Interconnection Facilities to be designed, installed constructed, inspected, repaired, maintained and operated in accordance with the Rules and specifications equal to or better than those provided by the National Electrical Safety Code

and the National Electrical Code, both codes approved by the American National Standards Institute and the IEEE 1547 series of standards as they may be amended from time to time.

The DG Owner/Operator covenants and agrees to cause the design, installation, construction, inspection, repair, maintenance, and operation of its Facilities and Interconnection Facilities so as to reasonably minimize the likelihood of a malfunction or other disturbance, damaging or otherwise affecting or impairing the System. DG Owner/Operator shall comply with all applicable laws, regulations, zoning codes, building codes, safety rules and environmental restrictions applicable to the design, installation, construction, inspection, repair, maintenance and operation of its Facilities and Interconnection Facilities.

Cooperative will notify DG Owner/Operator if there is evidence that the Facilities' or Interconnection Facilities' operation causes disruption or deterioration of service to other Customers served from the System or if the Facilities' or Interconnection Facilities' operation causes damage to the System. DG Owner/Operator will notify the Cooperative of any emergency or hazardous condition or occurrence with the DG Owner/Operator's Facilities or Interconnection Facilities, which could affect safe operation of the System.

The Distribution System is a dynamic and changing system. Upgrades to the system are often necessary to prepare for continued load growth. Unless the Cooperative has a policy otherwise, the DG Owner/Operator will be responsible for paying for all modifications required for reconnecting to the reconfigured Distribution System.

**5. Operator in Charge** – The DG Owner/Operator shall each identify an individual (by name or title) who will perform as “Operator in Charge” of the Facilities and the DG Owner/Operator portion of the Interconnection Facilities. This individual must be familiar with this Agreement, the technical details of the Facilities, the Rules, and any other agreements or regulations that may apply. This individual is listed in Exhibit A.

**6. Stand-by Capacity and Energy Service** – In order to provide reliable service to any DG Owner/Operator having on-site generation, the DG Owner/Operator is required to purchase stand-by service from the Cooperative in the amount equal to the rated output of the DG Owner/Operator's on-site generation. The rated output is determined as the nameplate rating of the generation equipment or the rated output agreed to by all Parties, whichever is less. The agreed upon rated output would establish the initial Contract Rating. If the Contract Rating is less than the nameplate rating, metering capable of recording the monthly 15-minute peak generation demand, as measured at the generator terminals, must be installed by DG Owner/Operator as specified by the Cooperative. Unless the Cooperative decides otherwise, the metering will be owned and operated by the Cooperative and must be accessible to Cooperative and SMEPA. The future Contract Rating would be re-determined, three (3) months after commencing operation, and thereafter each December, and would be the greater of the existing Contract Rating or the average of the three highest monthly generation demand peaks.

Stand-by Capacity and Energy Service is required for all DG Owner/Operators with on-site generation with a Contract Rating of 100kW or more, for the Term of this Agreement. See Exhibit C for Stand-by Capacity and Energy Service charges and details.

**7. Power Sales to SMEPA** – The DG Owner/Operator, or its agent, is prohibited from selling energy and/or transmitting power and/or energy from DG Owner/Operator's Facilities to SMEPA, Cooperative, or third parties without prior written agreement between DG Owner/Operator, Cooperative, and SMEPA.

Interconnection of the Facilities with the System does not grant the DG Owner/Operator the right to export power across the Point of Dedicated Service to the System nor does it constitute an agreement by the Cooperative or SMEPA to purchase or wheel excess power. Prior to selling and/or wheeling power from the facility, a separate power purchase and/or wheeling agreement between the Parties must be in place. See Exhibit E.

## **8. Limitation of Liability**

a. Notwithstanding any other provision in this Agreement, with respect to the Cooperative's provision of electric service to DG Owner/Operator and the services provided by the Cooperative pursuant to this Agreement, Cooperative's liability to DG Owner/Operator shall be limited as set forth in the currently effective Cooperative's tariffs and terms and conditions for electric service, which are incorporated herein by reference.

b. For the purposes of this Agreement, a Force Majeure event is any event: (a) that is beyond the reasonable control of the affected party; and (b) that the affected party is unable to prevent or protect against by exercising reasonable diligence, including the following events or circumstances, but only to the extent that they satisfy the preceding requirements: acts of war, public disorder, rebellion or insurrection; floods, hurricanes, earthquakes, lightning, storms or other natural calamities; explosions or fires; strikes, work stoppages or labor disputes; embargoes; or sabotage. If a Force Majeure event prevents a party from fulfilling any obligations under this agreement, such party will promptly notify the other party in writing and will keep the other party informed on a continuing basis as to the scope and duration of the Force Majeure event. The affected party will specify the circumstances of the Force Majeure event, its expected duration and the steps that the affected party is taking to mitigate the effect of the event on its performance. The affected party will be entitled to suspend or modify its performance of obligations under this Agreement but will use reasonable efforts to resume its performance as soon as possible. Lack of funds is not a Force Majeure event.

c. Notwithstanding Paragraph 8.b of this Agreement, Paragraph 13 of this Agreement shall apply.

d. Cooperative and DG Owner/Operator shall each be responsible for the safe installation, maintenance, repair and condition of their respective lines, wires, switches, or other equipment or property on their respective sides of the Point of Interconnection. The Cooperative does not assume any duty of inspecting the DG Owner/Operator's lines, wires, switches, or other equipment or property and will not be responsible therefor. DG Owner/Operator assumes all responsibility for the electric service supplied hereunder and the Facilities used in connection therewith at or beyond the Point of Interconnection.

e. For the mutual protection of the DG Owner/Operator and the Cooperative at the time of initial interconnection, only with Cooperative prior written authorization shall the connections between the Cooperative's service wires and the DG Owner/Operator's service entrance conductors be energized.

**9. Testing and Testing Records** – The DG Owner/Operator shall maintain all records of testing of the Facilities as required by UL1741 and by the IEEE 1547 series of standards as they may be amended from time to time and as described in Exhibit D . These records shall be provided upon request of Cooperative at any time and shall include testing at the start of commercial operation and a minimum of the first anniversary and every five years thereafter. Factory testing of pre-packaged Interconnection

Facilities and the protective systems of small units shall be acceptable for initial commercial operation tests. In the case of a factory test, the DG Owner/Operator shall provide a written description and certification by the factory of the test, the test results, and the qualification of any independent testing laboratory. In addition, the settings of the equipment being installed shall be approved by the Cooperative prior to operation of the Facilities by the DG Owner/Operator.

**10. Right of Access, Equipment Installation, Removal & Inspection** – The Cooperative may send an employee, agent or contractor to the premises of the DG Owner/Operator at any time whether before, during or after the time the Facilities first produce energy to inspect the Facilities and Interconnection Facilities, and observe the Facility's installation, commissioning (including any testing), startup, operation, and maintenance.

At any time, Cooperative shall have access to DG Owner/Operator's premises for any reasonable purpose in connection with the interconnection described in this Agreement, the Rules, or to provide service to its DG Owner/Operators. Neither the Cooperative nor SMEPA are required to inspect the Facilities and are not in any way responsible for inspection of the Facilities or Interconnection Facilities.

**11. Disconnection of Facilities** – DG Owner/Operator retains the option to disconnect its Facilities from the System, provided that DG Owner/Operator notifies the Cooperative of its intent to disconnect by giving the Cooperative at least thirty (30) days' prior written notice. Such disconnection shall not be a termination of this Agreement unless DG Owner/Operator exercises rights under Section 14 that do not lead to a resolution of the issue.

DG Owner/Operator shall disconnect Facilities from the System upon the effective date of any termination resulting from and required by actions under Section 14.

Cooperative, in its sole discretion, shall have the right to disconnect or cause the DG Owner/Operator to disconnect the Facilities from the System and suspend service in cases where continuance of service to DG Owner/Operator will endanger persons or property. During the forced outage of the System serving DG Owner/Operator, Cooperative shall have the right to suspend service and disconnect or cause the DG Owner/Operator to disconnect the Facilities from the System to effect repairs on the System, but the Cooperative shall use its reasonable efforts to provide the DG Owner/Operator with reasonable prior notice. Cooperative shall also have the right to suspend service and disconnect the DG Owner/Operator facilities from the System to allow Cooperative to perform System maintenance, switching operations, and emergency restoration.

**12. Metering** - DG Owner/Operator will be responsible for the cost to install a disconnect switch as specified in Exhibit D. The Cooperative shall purchase, own, install and maintain such metering equipment as may be necessary to meter the electrical output of the Facilities in accordance with the Interconnection Requirements for Distributed Generation as shown in Exhibit D. All costs associated therewith shall be borne by the DG Owner/Operator. The type metering required will vary with the Facilities application. Metering in general shall track the kW and kWh production of the Facilities. Any special metering will be specified in Exhibit A. Metering shall meet accuracy standards required for equivalent electrical services and can be done with standard meters or any devices that meet data collection and accuracy requirements. If required, telemetry data shall be provided to the Cooperative and/or SMEPA and the communication of such data shall be compatible with the Cooperative's and/or SMEPA's standard communication methods.

### **13. Insurance and Protection of System Facilities and Indemnification**

If the DG Owner/Operator's Facilities or Interconnection Facilities cause damage to the System, the DG Owner/Operator shall be responsible for all costs associated with the repair and/or replacement of such System. If DG Owner/Operator's Facilities in any way cause a loss or damage to SMEPA's or Cooperative's Customers, wholesale or retail, DG Owner/Operator shall be responsible for such damages, claims and losses. SMEPA or Cooperative shall be entitled to credit or offset any such loss or damage against amounts owed, or which are subsequently owed, to DG Owner/Operator. This credit will not limit or prevent claims above the amount credited.

If DG Owner/Operator's Facilities cause damage to or interfere with SMEPA or Cooperative System or facilities, DG Owner/Operator's Facilities will be disconnected from the System until the cause of the damage or interference is remedied.

DG Owner/Operator shall assume all liability for and shall save, defend, and hold harmless SMEPA and Cooperative and their members, directors, officers, employees, agents, successors and assigns from any and all claims demands, actions, suits, losses, charges, expenses, damages, injuries and all liabilities whatsoever arising out of or resulting from the design, construction, installation, operation, repair, inspection and maintenance of the DG Owner/Operator's Facilities and Interconnection Facilities except to the extent that the loss or damage results from the sole negligence or reckless acts or omissions of SMEPA or Cooperative. Such indemnity shall include without limiting the generality of the foregoing, financial responsibility for (a) monetary losses; (b) reasonable costs and expenses of defending an action or claim including attorney fees and costs of expert witnesses; (c) damages related to death or injury; (d) damages to property or the environment. This indemnity shall not cover consequential damages.

DG Owner/Operator is solely responsible for the risk of loss of, or damage to, DG Owner/Operator's Facilities and Interconnection Facilities.

Without limiting any obligations or liabilities under this Agreement the DG Owner/Operator shall, at its expense, provide and maintain in effect for the life of this Agreement, minimum insurance coverage as follows:

- a. Workers' Compensation Insurance, with statutory limits as required by the laws and regulations applicable to employees.
- b. Comprehensive or Commercial General Liability Insurance, including Contractual Liability Coverage for liabilities assumed under this Agreement, and Personal Injury Coverage in the amount of \$2 million per occurrence for Bodily Injury and Property Damage.
- c. DG Owner/Operator's policy shall list SMEPA and Cooperative, as "additional insured".
- d. DG Owner/Operator shall execute a Waiver of Subrogation in favor of SMEPA and Cooperative and obtain an endorsement from the insurance company.
- e. DG Owner/Operator shall provide a mechanical breakdown insurance policy or endorsement in the amount of \$2M.

The policies of insurance shall be in such form and issued by such insurer as shall be satisfactory to SMEPA and Cooperative. DG Owner/Operator shall furnish SMEPA and Cooperative a certificate evidencing compliance with the foregoing requirements, which shall provide not less than (30) days prior written notice to SMEPA and Cooperative of any cancellation or material change in the insurance coverages.

**14. Effective Term and Termination Rights** – This Agreement becomes effective when executed by the Parties and shall continue in effect until terminated. This Agreement may be terminated as follows: (a) DG Owner/Operator may terminate this Agreement at any time by giving the Cooperative at least sixty (60) days' written notice; (b) Cooperative may terminate upon failure by the DG Owner/Operator to generate energy from the Facilities and deliver such energy to the Cooperative within six (6) months after completion of the interconnection; (c) either Party may terminate by giving the other Party at least thirty (30) days prior written notice that the other Party is in default of any of the terms and conditions of the Agreement or the Rules or any rate schedule, tariff, regulation, contract, or policy of the Cooperative, so long as the notice specifies the basis for termination and there is opportunity to cure the default; (d) Cooperative may terminate by giving DG Owner/Operator at least sixty (60) days notice in the event that there is a material change in an applicable law, or any requirement of the Cooperative's wholesale electric suppliers or of any transmission utility, independent system operator or regional transmission organization having responsibility for the operation of any part of the System.

**15. Compliance with Laws, Rules and Tariffs** – All Parties to this Agreement shall be responsible for complying with the laws of the state of Mississippi, and the Rules. The interconnection and services provided under this Agreement shall at all times be subject to the terms and conditions set forth in the Rules, which Rules are hereby incorporated into this Agreement by this reference. The Cooperative and/or SMEPA shall have the right to publish changes in any of the Rules at any time.

**16. Dispute Resolution** - In the event any dispute arises under this Agreement, the following process will be used to resolve such dispute:

A. Informal Dispute Resolution

Each party shall designate in writing to the other party or representative who shall be authorized to resolve any dispute arising under this Agreement in an equitable manner and, unless expressly provided herein, to exercise the authority of such party to make decisions by mutual agreement. If such designated representatives are unable to resolve a dispute under this Agreement, such dispute shall be referred by each party's representative to a senior officer designated by each party for resolution upon five (5) days' written notice from any party. Any dispute that may arise in connection with this Agreement which cannot be resolved within thirty (30) days following submission to a senior officer shall be settled by arbitration in accordance with Paragraph 16 B.

The parties agree:

- i. To attempt to resolve any dispute arising hereunder promptly, equitably, and in a good faith manner;
- ii. To provide each other with reasonable access during normal business hours to any and all non-privileged records, information and data pertaining to any such dispute.

B. Binding Dispute Resolution

The parties may initiate binding dispute resolution procedures by one party notifying any other party stating the names of ten (10) eligible arbitrators experienced in the industry with no financial interest in any party. Within ten (10) days of receiving the list, the other parties shall agree on a single arbitrator from the list to conduct the arbitration, or notify the originating party of an additional ten (10) eligible arbitrators and the process will

continue until one (1) arbitrator has been selected. The arbitrator shall not possess a direct or indirect interest in any party or the subject matter of the arbitration. The procedures to be used for this arbitration will be generally consistent with the commercial arbitration rules of the American Arbitration Association though not involving the Association.

Each party shall be responsible for its own costs and those of its counsel and representatives. The parties shall equally divide the costs of the arbitrator and the hearing.

Any arbitration shall be conducted on a confidential basis and not disclosed, including any documents or results which shall be considered confidential, unless the parties otherwise agree or such disclosure is required by law.

THE PARTIES UNDERSTAND THAT BY SIGNING THIS ARBITRATION AGREEMENT THAT THEY WILL NOT BE ABLE TO BRING A LAWSUIT CONCERNING ANY DISPUTE THAT MAY ARISE UNDER THIS AGREEMENT AND THEY ARE GIVING UP THE RIGHT TO A TRIAL IN COURT, BOTH WITH AND WITHOUT A JURY.

**17. Severability** –If any portion or provision of this Agreement is held or adjudged for any reason to be invalid or illegal or unenforceable by any court of competent jurisdiction, such portion shall be deemed separate and independent, and the remainder of this Agreement shall remain in full force and effect.

**18. Amendment** – This Agreement may be amended only upon mutual agreement of the Parties, which amendment will not be effective until reduced to writing and executed by the Parties.

**19. Entirety of Agreement and Prior Agreements Superseded** – This Agreement, including the Rules and all attached Exhibits and Facilities Schedules, which are expressly made a part hereof for all purposes, constitutes the entire agreement and understanding between the Parties with regard to the interconnection of the facilities of the Parties at the Points of Interconnection expressly provided for in this Agreement. The Parties are not bound by or liable for any statement, representation, promise, inducement, understanding, or undertaking of any kind or nature (whether written or oral) with regard to the subject matter hereof not set forth or provided for herein or in the DG Owner/Operator application, or other written information provided by the DG Owner/Operator in compliance with the Rules. It is expressly acknowledged that the Parties may have other agreements covering other services not expressly provided for herein, which agreements are unaffected by this Agreement.

**20. Assignment** – At any time during the term of this Agreement, the DG Owner/Operator may assign this Agreement to a corporation, an entity with limited liability or an individual (the “Assignee”) to whom the DG Owner/Operator transfers ownership of the Facilities; provided that the DG Owner/Operator obtains the consent of the Cooperative and SMEPA in advance of the assignment. The parties acknowledge that the consent of the Cooperative and SMEPA shall not be unreasonable withheld or conditioned. The Cooperative’s and SMEPA’s consent will be based on a determination that the Assignee is financially and technically capable to assume ownership and/or operation of the Facilities. The company or individual to which this Agreement is assigned will be responsible for the proper operation and maintenance of the Facilities, and must agree in writing to be subject to all provisions of this Agreement. Cooperative and SMEPA may also assign the Agreement to another entity with the written approval of the DG Owner/Operator.

**21. Notices** – Notices given under this Agreement are deemed to have been duly delivered if sent by United States certified mail, return receipt requested, postage prepaid, or if sent by e-mail with a read receipt requested to:

(a) If to DG Owner/Operator:

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(b) If to Cooperative:

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(c) If to SMEPA:

South Mississippi Electric Power Association  
Attn: Roger Smith  
P.O. Box 15849  
Hattiesburg, MS 39404-5849  
[rsmith@smepa.coop](mailto:rsmith@smepa.coop)

The above-listed names, titles, and addresses of either Party may be changed by written notification to the other, notwithstanding Section 19.

**22. Invoicing and Payment** – Invoicing and payment terms for services associated with this Agreement shall be consistent with applicable Rules.

**23. Limitations (No Third-Party Beneficiaries, Waiver, etc.)** – This Agreement is not intended to and does not create rights, remedies, or benefits of any character whatsoever in favor of any persons, corporations, associations, or entities other than the Parties, and the obligations herein assumed are solely for the use and benefit of the Parties. The failure of a Party to this Agreement to insist, on any occasion, upon strict performance of any provision of this Agreement will not be considered to waive the obligations, rights, or duties imposed upon the Parties.

**24. Headings** – The descriptive headings of the various articles and sections of this Agreement have been inserted for convenience of reference only and are to be afforded no significance in the interpretation or construction of this Agreement.

**25. Multiple Counterparts** – This Agreement may be executed in two or more counterparts, each of which is deemed an original but all constitute one and the same instrument.

REMAINDER OF THIS PAGE LEFT BLANK INTENTIONALLY

**IN WITNESS WHEREOF**, the Parties have caused this Agreement to be signed by their respective duly authorized representatives.

\_\_\_\_\_ (DG Owner/Operator)

By: \_\_\_\_\_

Title: \_\_\_\_\_

Date: \_\_\_\_\_

\_\_\_\_\_ Electric Power Association (Cooperative)

By: \_\_\_\_\_

Title: \_\_\_\_\_

Date: \_\_\_\_\_

South Mississippi Electric Power Association (SMEPA)

By: \_\_\_\_\_

Title: \_\_\_\_\_

Date: \_\_\_\_\_

## EXHIBIT A

### Application for Interconnection and Parallel Operation of Distributed Generation

Return completed application to your local Cooperative contact or to:

South Mississippi Electric Power Association  
Attn. Manager of Power Supply  
P.O. Box 15849  
Hattiesburg, MS 39404-5849  
Fax: (601) 261-2395

Customer's Name: \_\_\_\_\_

Address: \_\_\_\_\_

Contact Person: \_\_\_\_\_

Telephone Number: \_\_\_\_\_ e-mail: \_\_\_\_\_ Fax: \_\_\_\_\_

Service Point Address: \_\_\_\_\_

Information Prepared and Submitted By: \_\_\_\_\_

(Name and Address) \_\_\_\_\_

Signature \_\_\_\_\_

The Customer or Customer's designated representative shall supply the following information. All applicable items must be accurately completed in order for the Cooperative or SMEPA to effectively evaluate the Customer's DG for Interconnection with the Distribution System.

#### GENERATOR

Number of Units<sup>1</sup>: \_\_\_\_\_

Manufacturer & model number: \_\_\_\_\_

Type (Synchronous, Induction, or Inverter): \_\_\_\_\_

Fuel Source Type (Solar, Natural Gas, Wind, etc.): \_\_\_\_\_

Kilowatt Rating (nameplate and at 95 degree F at location) \_\_\_\_\_

Kilovolt-Ampere Rating (nameplate and at 95 degree F at location): \_\_\_\_\_

Power Factor: \_\_\_\_\_

Voltage Rating: \_\_\_\_\_

<sup>1</sup> If multiple units are installed and the units are not identical, one application must be prepared for each dissimilar unit.

Ampere Rating: \_\_\_\_\_  
Number of Phases: \_\_\_\_\_  
Frequency: \_\_\_\_\_

Will Customer supply the necessary VAR requirements? \_\_\_\_\_ Yes \_\_\_\_\_ No

Does Customer plan to export power? \_\_\_\_\_ Yes \_\_\_\_\_ No

If Yes, maximum amount expected: \_\_\_\_\_

Expected Energizing and Start-up Date: \_\_\_\_\_

Normal Operation of Interconnection: (examples: provide power to meet base load, demand management, standby, back-up, other (please describe)) \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

One-line diagram attached: \_\_\_\_\_ Yes

Is list of specifications on protective devices attached? \_\_\_\_\_ Yes

Has the generator Manufacturer supplied its dynamic modeling values to SMEPA? \_\_\_\_\_ Yes

Is layout sketch showing lockable, "visible" disconnect device provided? \_\_\_\_\_ Yes

CUSTOMER: \_\_\_\_\_

BY: \_\_\_\_\_

TITLE: \_\_\_\_\_

DATE: \_\_\_\_\_

**EXHIBIT B**  
**LIST OF FACILITIES SCHEDULES**

*DG Owner/Operator will, at its own cost and expense, operate, maintain, repair, and inspect, and shall be fully responsible for its Facilities, unless otherwise specified herein Exhibit A.*

Cooperative will obtain and record generator meter reading monthly.

<b>Facility Schedule No.</b>	<b>Name of Facility</b>

**Operator in Charge:**

**FACILITIES SCHEDULE NO. \_\_\_\_\_**

1. Name:
2. Facilities location:
3. Delivery voltage:
4. Metering (voltage, location, losses adjustment due to metering location, and other):
  
5. Normal Operation of Interconnection:
  
6. One line diagram attached (check one): \_\_\_\_\_ Yes \_\_\_\_\_ No
7. Facilities to be furnished/installed by Cooperative:
  
8. Facilities to be furnished/installed by DG Owner/Operator:
  
9. Cost Responsibility:
  
10. Control area interchange point (check one): \_\_\_\_\_ Yes \_\_\_\_\_ No
11. Supplemental terms and conditions attached (check one): \_\_\_\_\_ Yes \_\_\_\_\_ No
12. Cooperative requirements for DG interconnection attached (check one): \_\_\_\_\_ Yes \_\_\_\_\_ No

# **Exhibit C**

## **South Mississippi Electric Power Association And Member Cooperatives**

### **Interconnection Requirements for Distributed Generation**

**January 2011**

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## 1.0 **Introduction**

### 1.1 Purpose

The purpose of these Interconnection Requirements is to describe the requirements and procedures for safe and effective Interconnection and Parallel Operations of Distributed Generation (DG).

Included are the typical Interconnection Requirements for DG connecting to the Distribution System of a South Mississippi Electric Power Association (SMEPA) member cooperative (Cooperative). Certain specific Interconnection locations and conditions may require the installation and use of more sophisticated protective devices and operating schemes, especially when the DG is exporting power through the Distribution System.

A Customer that is a member of the Cooperative may operate 60 Hertz (Hz), three-phase or single-phase generating equipment in Parallel Operation with the Distribution System pursuant to an Agreement for Interconnection and Parallel Operation of Distributed Generation, provided that the equipment meets or exceeds the Interconnection Requirements.

If the Cooperative concludes that an Application for Interconnection and Parallel Operation of Distributed Generation describes facilities that may require additional devices and operating schemes, these additional requirements will be made known to the Customer at the time the Pre-interconnection Study is completed, or as soon as determined.

### 1.2 Scope

DG installed on the Distribution System will fall into one of six scenarios:

1. The Customer may build DG that is NEVER connected to the Distribution System. All loads become displaced and no stand-by service is requested.
2. The Customer may build DG that is NOT NORMALLY connected to the Distribution System. All loads become displaced and stand-by service is requested. No contract is signed with SMEPA to purchase power or wheel output energy.
3. The Customer may build DG that is normally connected to the Distribution System. Some or the entire load becomes displaced and stand-by service is requested. No contract is signed with SMEPA to purchase or wheel energy output.
4. The Customer may build DG that is normally connected to the Distribution System. Some or the entire load becomes displaced and stand-by service is requested. A contract is signed for selling energy to SMEPA.

5. The Customer may build DG that is normally connected to the Distribution System. The Customer has no on-site load and no stand-by service is needed. A contract is signed for selling all energy output to SMEPA.
6. The Customer may build DG that is normally connected to the Distribution System. Some or the entire load becomes displaced and stand-by service is requested. A contract is signed with SMEPA for wheeling all energy output.

The Interconnection Requirements apply to all Scenarios listed above **except** for Scenario 1. Interconnection Requirements specific to a facility paralleling with the Distribution System **only** during closed transition switching is **not** addressed in this document.

These provisions are the minimum requirements for DG operating in parallel with the Distribution System.

DG of significant size on radial distribution systems can cause relaying and voltage control problems. Therefore, SMEPA and the Cooperative retain the option to connect any DG at either the transmission or the distribution voltage level.

Any change to the initial installation, such as replacement or enlargement of the DG equipment or change in the initial Customer Scenario, defined in this Section 1.2, will require a new application from the Customer detailing the modifications and a new or amended Agreement for Interconnection and Parallel Operation of Distributed Generation.

## **2.0 Definitions**

Abnormal Operating Conditions – A situation in which the Distribution System is operating in other than normal configuration or under conditions that do not normally exist. Examples of Abnormal Operating Conditions are: (1) high usage days when Customers are requested to conserve energy or, (2) Distribution System is switching feeders out of use for repairs and switching in alternate feeders to deliver energy to Customers.

Agreement for Interconnection and Parallel Operation of Distributed Generation (Interconnection and Operating Agreement) – The document that sets forth the contractual conditions under which the Cooperative and a Customer agree that one or more DG may be interconnected with the Distribution System.

Application for Interconnection and Parallel Operation of Distributed Generation (Application) - The standard form of application is included in Section 5.4.

Customer - Any entity that is a member of the Cooperative and interconnected to a Distribution System for the purpose of receiving or exporting electric power.

Displaced Load – A reduction in the Customer's load as a result of the DG operating in parallel with the interconnected power system with the primary intention of reducing electrical requirements from the Distribution System. Electricity flow at the Point of Interconnection is usually from the Distribution System to the DG.

Distributed Generation (DG) - An electrical generating facility located at a Customer's Point of Interconnection of ten (10) megawatts (MW) or less and connected at a voltage less than or

equal to 34.5 kilovolts (kV) which may be connected in Parallel Operation to the Distribution System.

Distribution System – The Cooperative’s electrical conductors, equipment, and facilities operated with a nominal voltage of 34.5 kV or below.

Interconnection - The physical connection of DG to the Distribution System to allow Parallel Operations in accordance with the Interconnection Requirements.

Interconnection Facilities - All facilities installed solely to interconnect and deliver/receive power from/to the Customer’s DG to/from the Distribution System including, but not limited to, connection, transmission, distribution, engineering, administration, transformation, switching, metering, and safety equipment. Interconnection Facilities shall include any additions and/or modifications to the Distribution System deemed necessary by the Cooperative.

Interconnection Requirements for Distributed Generation (Interconnection Requirements) – The requirements outlined in this document for the sole purpose of describing the requirements and procedures required by SMEPA and the Cooperative for safe and effective Interconnection and Parallel Operation of distributed generation.

Network Service - Two or more primary distribution feeder sources electrically tied together on the secondary (or low voltage) side to form one power source for one or more Customers. This configuration is designed to maintain service to the Customers even after the loss of one of these primary distribution feeder sources.

Parallel Operation - The operation of on-site DG by a Customer while the Customer’s Interconnection Facilities are electrically connected to the Distribution System.

Point of Interconnection - The point where transfer of any electric power between the Customer’s Interconnection Facilities and the Distribution System takes place, normally at the point of attachment.

Pre-interconnection Study - A study or studies that may be required by the Cooperative in response to its receipt of a completed Application for Interconnection and Parallel Operation of Distributed Generation with the Distribution System.

Protection Equipment - The equipment required to protect the Distribution System and its other customer’s from Unsafe Operating Conditions occurring by the Customer’s DG. This includes inverter systems and any other devices provided with the DG for providing the system protection functions.

Protection System - A system that uses hardware (including switching devices), relay protection schemes and software that prevents Unsafe Operating Conditions from occurring before, during, and after the Interconnection of the generating unit with the Distribution System. This system will include isolating the Customer’s DG or decoupling it from the Distribution System.

Quality of Service – An operating state of the Distribution System that provides usable power to a Customer. This state of usable power includes the parameters specified for voltage flicker (Section 3.9.10), voltage surges and sags (Section 3.9.9), power factor (Section 3.9.8), frequency (Section 3.9.11), and harmonics (Section 3.9.12).

Scenario – One of the six DG connection types defined in Section 1.2.

SMEPA Member Cooperative (Cooperative) – One of eleven distribution cooperatives whose generation and transmission requirements are served by all-requirements contracts with South Mississippi Electric Power Association.

Stabilized - The Distribution System is considered Stabilized when, following a disturbance, the system returns to the normal range of voltage and frequency for a duration of two minutes or a shorter time as mutually agreed to by the Cooperative and Customer.

Standard of Care - A term defining the level of awareness to maintain workplace and public safety in the design, installation and operation of a DG facility.

Unsafe Operating Conditions – A situation that if left uncorrected would result in: (1) harm to any personnel, damage to any equipment, (2) unacceptable system instability or, (3) operating outside legally established parameters affecting the Quality of Service to other customers connected to the Distribution System.

### **3.0 Details**

#### **3.1 Available Voltage Systems**

The Cooperative Distribution System which is available for Parallel Operation with DG is grounded wye configuration of various voltage levels from 4.16 kV to 34.5 kV (phase to phase). The voltage level available for connecting the DG for Parallel Operation with the Distribution System depends on the location and the size of the generation and the distribution systems voltages.

#### **3.2 Reasons for Disconnection from the Distribution System**

The Cooperative may disconnect a DG unit from the Distribution System under the following conditions:

1. Expiration or termination of Interconnection and Operating Agreement
2. Non-compliance with the technical requirements
3. System emergency - The Cooperative may temporarily disconnect a Customer's facility without prior written notice in cases where continued Interconnection will endanger persons or property. During the forced outage of the Distribution System, the Cooperative shall have the right to temporarily disconnect a Customer's facility to make immediate repairs on the Distribution System. When possible, the Cooperative shall provide the Customer with reasonable notice and reconnect the Customer as quickly as reasonably practical.
4. Routine maintenance, repairs, and modifications - The Cooperative may disconnect a Customer or a Customer's DG, with prior notice when possible, of a service interruption for maintenance, repairs, and modifications to the Distribution System.
5. Lack of approved Application - In order to interconnect the Customer's DG to the Distribution System, the Customer must first submit to the Cooperative an Application for Interconnection and Parallel Operation for Distributed Generation with the Cooperative and execute an Interconnection and Operating Agreement. The Cooperative may refuse to connect or may disconnect the Customer or the Customer's DG if such application has not been received and approved.

#### **3.3 Pre-interconnection Study for Interconnection of Distributed Generation.**

The Cooperative shall, at the Customer's expense, conduct one or more Pre-interconnection Studies prior to Interconnection of a DG.

Certain aspects of secondary network systems create technical difficulties that may make Interconnection more costly to implement. In instances where a Customer requests Interconnection to a secondary network system, the ability of the DG owner to have access to the Distribution System may be limited. The Cooperative shall conduct a Pre-interconnection Study to determine the size DG that can be safely connected to the Distribution System or accommodated in some other fashion.

### 3.4 System Changes

#### 3.4.1.1 Changes to the Distribution System

The Distribution System is a dynamic and changing system. Upgrades to the system are often necessary to prepare for continued load growth. Unless the Cooperative has a policy otherwise, the Customer will be responsible for paying for all modifications required for reconnecting to the reconfigured Distribution System.

#### 3.4.1.2 Customer Changes to Interconnection

The Customer shall notify the Cooperative to obtain prior approval for any proposed modifications to the Interconnection Facilities.

### 3.5 Allowable Tie Points

Normally, only one tie point between the Customer and the Cooperative will be allowed at the Customer's site.

### 3.6 Energy Flow during Emergencies

Purchases from or sales to a Customer during periods of system emergencies may be discontinued.

### 3.7 Types of Allowed Generators

Single phase or three-phase alternating current generating units can be operated in Parallel Operations with the Distribution System. The equipment may be synchronous generators, induction generators, or inverter controlled systems. The total connected capacity shall not exceed ten (10) MW. Direct-current generation shall not be operated in parallel with the Distribution System.

#### 3.7.1 Limits on Three Phase Generators

If three-phase service is not available in the area or if the Distribution System must be upgraded or modified in order to enable the Customer to interconnect with the Distribution System, the Customer must bear the additional cost for such service or improvements as determined by the Cooperative. The Cooperative reserves the right to refuse three-phase service under certain circumstances.

#### 3.7.2 Limits on Single Phase Generators

Where necessary, to avoid the potential for a DG to cause problems with the service of other customers, the Cooperative may limit the capacity and operating characteristics of single-phase generators in a manner consistent with its existing limitations for single-phase motors. Ordinarily, single-phase generators shall be limited to a capacity of 10 kW or less.

### 3.8 Explicit Criteria for Parallel Operations

A Customer shall be permitted to interconnect and operate its DG in Parallel Operations with the Distribution System provided that all of the following criteria are met throughout the life of the Interconnection and Operating Agreement.

### 3.8.1 Safety

In general, the Customer's DG will be held to the same Standard of Care (see Section 3.9.1) as the Cooperative is required to maintain. The safety of the general public and the personnel and equipment of the Cooperative shall in no way be reduced or impaired as a result of the Interconnection. Also, two installation criteria must be met:

- (1) The Customer's DG shall be equipped with a Protection System designed to prevent the DG from being connected to a de-energized circuit owned by the Cooperative.
- (2) The Customer's DG shall be equipped with a Protection System designed to prevent Interconnection or Parallel Operation of the DG with the Distribution System to assure the system voltage and frequency is of normal magnitude.
- (3) The Customer's DG shall be equipped with a Protection System designed to prevent attempted synchronization to the Distribution System during an out-of-phase condition.

### 3.8.2 Impact of Interconnection

The quality, reliability and the availability of delivery service to the Cooperative's customers shall not be diminished or impaired as a result of the Interconnection.

## 3.9 General Interconnection Requirements

The Customer's DG shall meet the technical requirements as prescribed in this section.

### 3.9.1 Customer's DG and Interconnection Requirements

The Customer's DG and Interconnection Facilities shall meet all applicable national, state, and local construction and safety codes.

The Customer shall be responsible for the design, installation, operation and maintenance of all equipment and facilities installed or that will be installed on the Customer's side of the point of common coupling specified by the parties involved. Such design shall meet the latest standards of Rural Utilities Service (RUS), Institute of Electrical and Electronics Engineers (IEEE), National Electrical Manufacturers Association (NEMA), American National Standards Institute (ANSI), National Electrical Code (NEC), National Electrical Safety Code (NESC), other national codes, and any local codes pertaining to the design and construction of electrical facilities. The DG shall be subject to the requirements of all authorities having jurisdiction and shall comply with all applicable codes and ordinances.

### 3.9.2 Rating of Customer's Interconnection Facilities

The Interconnection Facilities selected by the Customer shall be rated for continuous Parallel Operation with the Distribution System.

### 3.9.3 Protection of Customer's DG and Interconnection Facilities

The Customer will be responsible for protecting its DG and Interconnection Facilities in such a manner that Distribution System outages, short circuits, or other disturbances including zero sequence currents and ferroresonant over-voltages do not damage the Customer's DG or Interconnection Facilities. The Customer's Protection Scheme shall also prevent unnecessary tripping of the Distribution System breakers that would affect the Distribution System's capability of providing reliable service to other customers.

### 3.9.4 Required Drawings

Adequate drawings of the proposed Customer's DG, which will include a one-line diagram and proposed relay systems, shall be submitted to the Cooperative for review during the planning stage. Additional drawings may be required which will be determined on a case by case basis.

### 3.9.5 Changes to the Distribution System

The total cost of any additional equipment that must be installed by the Cooperative on its Distribution System to allow Parallel Operation must be borne by the Customer, including the transformers and any facilities which must be added due to increased fault current or special operating conditions, unless the Cooperative has a policy otherwise.

### 3.9.6 Communications Facilities

For DG greater than one (1) megawatt (MW), the Cooperative and/or SMEPA may require that a communication channel be supplied by the Customer to provide communication between the Cooperative and/or SMEPA and the Customer's DG.

### 3.9.7 Reactive Power Requirements

The Customer's DG shall normally be responsible for supplying its own reactive power as required by the load supplied from its own generation. Should the Customer be unable or unwilling to supply the reactive power, a separate rate schedule shall apply and the installation shall be metered for VAr flow.

### 3.9.8 Power Factor

The power factor of the Customer's DG at the Point of Interconnection with the Cooperative shall be in accordance with the appropriate rate schedule for this installation.

### 3.9.9 Voltage Surges or Sags

The Customer will operate its DG in such a manner that the voltage levels on the Distribution System are in the same range as if the DG were not connected to the Cooperative's system. The Customer shall be liable for any damages done to his own DG, Interconnection Facilities, the Distribution System, SMEPA's Transmission System, transmission and distribution systems owned by others, or the facilities of other customers due to any under voltage or over voltage contribution from the DG unit.

The Customer shall provide an automatic method of disconnecting the generating equipment from the Distribution System, within the times shown, if the voltage falls within those shown in Table 1 below.

**Table 1-- Response to Abnormal Voltages Under Fault Conditions**

<b>Percent of Normal Voltage</b>	<b>Clearing Time in Seconds</b>
Below 50	0.16
50 to 88	2.0
110 to 120	1.0
120 and above	0.16

(From IEEE 1547 4.2.3)

The Customer may reconnect when the Distribution System voltage and frequency return to normal range and the system is Stabilized.

### 3.9.10 Voltage Flicker

Voltage flicker on the Distribution System caused by the Customer's DG will be limited to the "Border Line of Irritation" curve in section 5.1. Failure to meet these limits shall result in immediate disconnection by the Cooperative until such time that all problems are corrected.

### 3.9.11 Frequency

When the system frequency is in a range shown in Table 2 below, the Customer's DG shall automatically disconnect from the Distribution System as indicated. Adjustable under-frequency trip settings and clearing times shall be coordinated with Cooperative.

**Table 2-- Response to Abnormal Frequency Conditions**

Generator Size	Frequency Range (Hz)	Clearing Time in Seconds
30kW and smaller	Above 60.5	0.16
	Below 59.3	0.16
Larger than 30kW	Above 60.5	0.16
	57.0 to 59.8 Adjustable set point	Adjustable 0.16 to 300
	Below 57.0	0.16

(From IEEE 1547 4.2.4)

The Customer may reconnect when the Distribution System voltage and frequency return to normal range and the system is Stabilized.

### 3.9.12 Harmonics

Harmonic current injection into the Distribution System at the point of common coupling shall not exceed the limits stated below in Table 3. The harmonic current injections shall be exclusive of any harmonic currents due to harmonic voltage distortion present in the Distribution System without the DG connected.

**Table 3—Maximum Harmonic Current Distortion in Percent of Current**

Individual Harmonic Order $h$ (odd harmonics) <sup>b</sup>	$h < 11$	$11 \leq h < 17$	$17 \leq h < 23$	$23 \leq h < 35$	$35 \leq h$	Total Demand Distortion (TDD)
Percent (%)	4.0	2.0	1.5	0.6	0.3	5.0

<sup>b</sup>Even harmonics are limited to 25% of the odd harmonic limits above.

(From IEEE 1547 4.3.3)

### 3.10 Inspection Prior to Operations and Additional Requirements

The Cooperative reserves the right, but has no responsibility either actual or implied, to impose any additional requirements necessary and to make final inspection before operation of the DG to verify that all requirements have been satisfied. The Customer shall be responsible for making necessary changes, at the Customer's expense, to the equipment should such changes be required.

### 3.11 Responsibility for Customer's Operations

The Cooperative is not responsible for proper operations of the Customer's DG upon connection to the Distribution System.

### 3.12 Responsibility for Customer's Maintenance

Customer shall be solely responsible for the maintenance of the Customer's electrical equipment. The Customer shall maintain records of such maintenance activities, which the Cooperative may review at reasonable times. All interconnection-related protective functions and associated batteries shall be periodically tested at intervals specified by the DG manufacturer. For DG greater than 50 kW, a log of generator operations shall be kept. At a

minimum, the log shall include the date, generator time on, and generator time off, and megawatt and megaVAr output. Maintenance records shall be made available for the Cooperative's inspection upon request. The Cooperative reserves the right to inspect the records, but has no responsibility for maintenance either actual or implied.

### 3.13 Load Shed Responsibilities

If the DG drops off line, an automatic load shed scheme shall be used to shed the Customer's load should this additional load exceed the available capacity of or causes excessive voltage sag on the Distribution System. The load shall be shed within 10 cycles of the generator dropping off line. Such requirements shall be noted in the Interconnection and Operating Agreement and communicated to the appropriate system control center.

For Customers whose DG operations are described by Scenarios 2, 3, 4, or 6, and who also have a contract for stand-by or maintenance power, arrangements shall be made in the design of the Customer's Interconnection Facilities to shed load during emergency conditions on the Distribution System.

### 3.14 Protection/Interface Requirements

Protecting both the Distribution System and the Customer's DG and Interconnection Facilities are of great importance. Proper Protective Systems shall be established in the design phase and confirmed prior to start-up of the Customer's DG. **An Interconnection between the Cooperative and the Customer will not be allowed prior to the proper coordination of protective devices.** The Customer shall be responsible for providing to the Cooperative the necessary documentation certifying that maintenance and testing have been satisfactorily performed, prior to start-up of the Customer's DG.

#### 3.14.1 Changes to the Cooperative's Protection System

A generator source on the Distribution System will provide an additional source of fault current during system faults. The Customer's Protection System shall be coordinated with existing fault interrupting devices on the Distribution System. The Customer shall be responsible for all costs of these changes to the Cooperative's Protection System, unless the Cooperative has a policy otherwise. It is also possible that the Customer's contribution will increase the available fault current on the Distribution System beyond the interrupting capability of the existing interrupting devices. The Customer may be required to limit the Customer's fault current. Should the Cooperative also be required to make changes, the Customer shall pay the cost of the required changes. The changes will be examined on a case by case basis.

#### 3.14.2 Tests of the Customer's Equipment

The Cooperative reserves the right, but has no responsibility either actual or implied, to observe the Customer's tests and/or inspection of any of the Customer's Protection System that is essential to the Interconnection, including relays, circuit breakers, protective devices, and related equipment. Inspection may include simulated test tripping of the Customer's Interconnection breakers by the protective relays to verify all protective set points and relay/breaker trip timing prior to connection to the Distribution System.

The Customer shall provide the Cooperative with notice at least two weeks before the initial energizing and start-up testing of the Customer's DG so that the Cooperative may witness testing of the Protection Systems associated with the Interconnection.

If upon connecting to the Distribution System, a system emergency develops, safety issues arise, or the Quality of Service to other customers deteriorates, the Cooperative may perform additional inspections or tests of the Customer's Protection System.

### 3.14.3 Specifying Protection Equipment

The Cooperative shall have the right to specify certain Protection Equipment, including relays and circuit breakers that the Customer must install. The Customer's Protection System settings shall be specified by the Customer, but will be checked, coordinated with, and reviewed by the Cooperative before approval of Application or subsequent modification.

#### 3.14.3.1 Manually Operated Load Break Switch

The Customer's DG shall have a lockable, manually operated load break switch that shall be in a location accessible to the Cooperative's personnel. For a three phase generator, this disconnect shall be a group operated device that through one operation will open/close all three phases simultaneously. (If the circuit breaker is accessible to Cooperative personnel, this requirement may be waived.) The Cooperative reserves the right, but has no responsibility either actual or implied, to open the disconnect switch without prior notice to the Customer for any of the following reasons:

- A. Distribution System emergency,
- B. Elimination of a safety hazard, protection of the public or on-site personnel, or if instructed to do so by public safety personnel (law enforcement, fire department or other governmental personnel),
- C. Inspection of Customer's DG and Protection Equipment reveals a hazardous condition, a lack of scheduled maintenance, or maintenance records,
- D. The operation of the Customer's DG results in a deteriorated Quality of Service with other customers or with the operation of the Distribution System, or
- E. Unauthorized modifications to the Customer's Interconnection Facilities.

#### 3.14.3.2 Service Interruption Equipment

Circuit breakers or other interrupting devices at the Point of Interconnection must be capable of interrupting maximum available fault current. When DG is larger than one (1) MW and when an inverter or similar system is used, the Cooperative shall be consulted for additional requirements.

Since most short circuits on overhead lines are of a temporary nature, it is the Cooperative's normal practice to automatically reclose any circuit breaker, recloser, or equivalent interrupting and reclosing device on distribution lines after the automatic trip. Instantaneous reclosing (10-15 cycles) of circuit breakers and line reclosers may also be used. The Customer shall be responsible for automatically disconnecting its DG from the Distribution System prior to the automatic reclosing of a distribution circuit breaker or recloser. The Customer's DG shall not automatically or manually interconnect with the Distribution System until the Distribution System is Stabilized.

#### 3.14.3.3 Fault Interrupting Device

A fault-interrupting device shall be installed at the Point of Interconnection between the Cooperative and the Customer. The type fault-interrupting device will be specified by the Cooperative and will be made on a case by case basis depending on location, available fault current, and size of the facility.

#### 3.14.3.4 Equipment to Block Energizing Dead Circuits

**Under no condition will the Customer be permitted to energize a non-energized Cooperative distribution circuit.** Equipment to effectively block the Customer from energizing a non-energized Cooperative circuit shall be installed by the Customer.

### 3.14.3.5 Control, Protection and Safety Equipment Requirements For Specific Technologies

Different technologies have some unique requirements. The specifications in this section list those requirements unique to the technologies.

#### 3.14.3.5.1 Synchronous Generators

For a Customer's synchronous generator, circuit breakers shall be three-phase devices with electronic or electromechanical control, as required by the Cooperative. The Customer shall be solely responsible for properly synchronizing its DG with the Distribution System. The excitation system response ratio shall be 0.5 or greater. The DG excitation system(s) shall conform, as near as reasonably achievable, to the field voltage versus time criteria specified in American National Standards Institute Standard C50.13-1989 in order to permit adequate field forcing during transient conditions. For DG larger than one (1) MW, the Customer shall maintain the automatic voltage regulator (AVR) of each generating unit in service and operable at all times. If the AVR is removed from service for maintenance or repair, the Cooperative's dispatching office shall be notified.

#### 3.14.3.5.2 Induction Generators and Inverter Systems

Induction generation may be connected and brought up to synchronous speed (as an induction motor) if it can be demonstrated that the initial voltage drop measured on the Distribution System side at the Point of Interconnection is within the allowable visible flicker standard in Figure 5.1. Otherwise, the Customer may be required to install hardware or employ other techniques to bring voltage fluctuations to acceptable levels.

Line-commutated inverters do not require synchronizing equipment.

Self-commutated inverters whether of the utility-interactive type or stand-alone type shall be used in parallel with the Distribution System only with synchronizing equipment.

### 3.15 Susceptibility to Transmission Faults

A Customer connected to the Distribution System might be affected by faults occurring on the transmission system. Neither SMEPA nor the Cooperative is responsible for damage to the DG as a result of transmission system faults.

### 3.16 Synchronizing Requirements

The Customer shall be solely responsible for synchronizing and properly connecting and disconnecting its electrical system relative to Parallel Operation with the Distribution System. The Customer shall provide an automatic or semi-automatic synchronizing scheme to prevent the closing of its circuit breaker when the two electrical systems are out of synchronism. The DG unit shall parallel with the Distribution System without causing a voltage fluctuation at the point of common coupling greater than  $\pm 5\%$ . (From IEEE 1547 4.1.3)

### 3.17 Summary of Protection System Requirements

The size of the DG dictates many of the functional requirements. These sections summarize the required functions by the installed capacity of the DG.

#### 3.17.1 DG Rated 10 kW or Less

All DG must have an interconnect/disconnect device, a generator disconnect device, an over/under voltage trip, an over/under frequency trip, and a manual or automatic synchronizing check (for DG with stand alone capability).

### 3.17.2 DG Rated in Excess of 10 kW but No More than 500 kW

The DG shall meet all requirements listed in section 3.17.1 plus either a ground over-voltage or over-current trip relay scheme depending on the grounding system as specified by the Cooperative. For DG not exporting power, a reverse power-sensing scheme is also required. (This requirement may be waived if the generator is rated at less than the minimum load of the Customer.)

### 3.17.3 DG Rated More than 500 kW but not More than 1 MW

The DG shall meet all requirements listed in sections 3.17.1 and 3.17.2. The synchronizing check must be automatic. If the DG is exporting power, the power direction may be used to block or delay the under frequency trip with the agreement of the Cooperative.

### 3.17.4 DG Rated More than 1 MW but not More than 10 MW

The DG shall meet all requirements listed in sections 3.17.1, 3.17.2., and 3.17.3. The synchronizing check must be automatic, and the facility shall have an automatic voltage regulator. A telemetry/transfer trip may also be required by the Cooperative as part of a transfer tripping or blocking protective scheme.

## 3.18 Metering Requirements

Attachment 5.2 outlines the three metering arrangements approved by the Cooperative. Unless the Cooperative has a policy otherwise, the metering will be owned and operated by the Cooperative and paid for by the DG Owner Operator. All equipment required to accurately meter the DG Owner Operator facility must be accessible to the Cooperative and SMEPA. The Cooperative will determine the applicable metering configuration as described in Attachment 5.2. Other metering configurations may be required and will be determined by the Cooperative and/or SMEPA on a case-by-case basis.

For DG metered according to Option 2 as shown in Attachment 5.2, the auxiliary equipment necessary for the operation of the DG are to be transferred and served from the generator bus (not the load bus) no later than five minutes after the generator is on line. Equipment for operating the remainder of the Customer's DG is not included in this transfer ability requirement.

The generator step-up transformer losses shall be the Customer's responsibility; therefore the metering shall be at the distribution voltage level. Rate considerations will reflect these requirements.

## 3.19 Communication Criteria for Requiring Telemetry

Telemetry requirements will be based on the Scenarios described under **Section 1.2**,

### Scope:

1. Scenarios 1 through 3 will require no telemetry. (Note: The metering requirements in **Section 3.18 Metering Requirements** apply to all Scenarios.)
2. Scenarios 4 and 5 may or may not require telemetry depending on the rated output of the Customer's DG.
  - A. For Customer's installations generating less than one (1) MW:

The Customer shall furnish a telephone number that is manned during all hours of operation where the Cooperative's dispatch center can contact the Customer in the event of trouble on the distribution circuit serving the Customer.

The Cooperative **may** require that Customer provide a dedicated telephone circuit at the site of the Customer's Interconnection to provide communication with the Cooperative's dispatch center.

B. For Customer's DG of One (1) MW or Larger:

The Cooperative and the Customer shall maintain operating communications at the Customer's expense with the Cooperative's dispatch center or the designated representative. The operating communications shall include, but not be limited to, system Parallel Operation or isolation, scheduled and unscheduled shutdowns, equipment clearances, and hourly and daily load schedules and reports.

The Customer shall install a Remote Terminal Unit (RTU) to gather accumulated and instantaneous data. SMEPA or the Cooperative shall approve the RTU and its configuration. The data obtained by the RTU shall be telemetered to SMEPA's control center and the appropriate control area control center. The data will be incorporated into the appropriate Control Area computer system. The DG shall be properly integrated into the appropriate communication and control systems prior to operation of the DG.

3. Scenario 6 will always require the Customer to install telemetering as described in section 2.B above regardless of the size of the DG.

3.20 Transformation Requirements

The Interconnection must be connected in such a manner as to isolate the zero sequence circuit of the Customer's DG from the zero sequence network of the Distribution System.

The Interconnection transformer that ties the DG to the Distribution System is recommended to be grounded wye on the Cooperative's side and delta or floating wye on the Customer's side. A pure delta connection on the Cooperative side is not allowed. The grounded wye connection on the Cooperative's side is necessary for the Customer to detect single phase to ground faults on the Distribution System. The Customer's side of the transformer is to be delta or floating wye so the Cooperative's Protection System will be isolated and will not "look" into the Customer's facility. This connection will allow the Customer's overcurrent protection equipment to isolate faults locally and minimize frequent operations of the Cooperative's feeder breaker that results in added exposure to other customers served from the same feeder.

The high voltage side of the transformer may be a delta connection with a grounding bank installed on the Customer's DG if the technical conditions described in the following paragraph are met. (Note: The grounding bank is used as a method of detecting single phase to ground faults by generating fault current through its neutral which can be detected by a relay system.)

For a grounding bank to be installed, the following conditions must be met:

1. The grounding bank must be connected to the Distribution System through "hard" connections, not a switching device. The Customer's DG shall not be allowed to operate any time the grounding bank is out of service.
2. The grounding bank must be on the Customer's side of the switching device at the Interconnection at the distribution voltage level.
3. The presence of a grounding bank requires that the fault interrupting device between the Cooperative and the Customer (usually three fused devices) be a three-phase relayed device such as a circuit breaker. (NOTE: The operation of a single phase device such

as a fuse for a single phase to ground fault on the Distribution System would cause the Customer's transformer to operate as an open delta bank if the Customer's side is grounded wye or delta. An open fuse at the Interconnection would not affect the Customer's operation and could go undetected for a significant period of time. The resultant loading on two phases instead of three could cause the remaining two phases of the transformer to overload and result in failure of the transformer.)

4. The grounding bank size (kVA and impedance) must be properly determined so the grounding bank contributes adequate fault current for relay detection but not increased currents that can lead to overheating and possible damage to the transformers that make up the grounding bank. The size of the grounding bank may need to be changed as the driving point impedance at the Interconnection changes with system changes. The Customer shall be responsible for paying for any alteration to the grounding bank as may be needed to comply with this requirement.
5. A delta connection on the Cooperative's side of the Interconnection transformer shall also require the examination of all phase to neutral connected devices (for example transformers, lightning arresters, potential transformers, capacitors) for over voltage capability and duration for the breaker clearing times during feeder faults. (NOTE: Experience has shown that lightning arresters located electrically near the delta connection will have to be replaced with higher voltage ratings.)
6. The Customer shall be responsible for paying for all upgrades required by using a grounding bank.

### 3.21 Operating Agreement Requirements

A written Agreement will be required between the Cooperative, the Customer, and SMEPA outlining the liability provisions, indemnities, payment of cost to modify Distribution System (if not paid in advance), and other items affecting service under this document. This agreement will explain in detail the authority or responsibilities of the parties involved. **An Interconnection between the Cooperative and a Customer will not be allowed prior to the execution of an Agreement for Interconnection and Parallel Operation for Distributed Generation between the DG Owner/Operator, the Cooperative, and SMEPA.**

### 3.22 Other Agreements

The Cooperative and/or SMEPA may require other agreements with the Customer before service is provided to DG.

### 3.23 Installation Certification of a Component DG Interconnection System

Certification by a State Registered Professional Engineer (PE) shall be required for all Component DG Interconnection Systems. A Component DG System consists of individual components that are not factory tested as a complete unit and not commercially available as a Pre-packaged DG system. The PE shall certify and submit a report to the Cooperative that the technical requirements of this document and the current IEEE SCC21 1547 Series of Interconnection Standards (IEEE 1547 Standards) have been met. The PE's report shall include the test data required by this document and the IEEE 1547 Standards including without limitation IEEE 1547 sections 5.3 and 5.4 and IEEE 1547.1. The PE shall contact the Cooperative so that Cooperative representatives can be present during the Commissioning tests described in IEEE1547 section 5.4 and IEEE 1547.1. The PE shall prepare a written periodic interconnection test procedure agreed upon by the DG Owner and the Cooperative as specified in the IEEE 1547 section 5.5 and IEEE 1547.1. The PE shall develop a maintenance plan and log that the DG Owner shall comply with and maintain and make available to Cooperative upon request.

## **4.0 References**

IEEE Guide for Protective Relaying of Utility-Consumer Interconnection  
C37.95 (Latest revision)

IEEE Recommended Practices and Requirements for Harmonic Control in Electric Power  
Systems, 519-1992

IEEE Recommended Practice for Electric Power Distribution for Industrial Plants, 141-1993

IEEE Standard for Interconnecting Distributed Resources with Electric Power Systems, 1547-  
2003

IEEE Standard Conformance Test Procedures for Equipment Interconnecting Distributed  
Resources with Electric Power Systems, 1547.1-2005

## **5.0 Attachments**

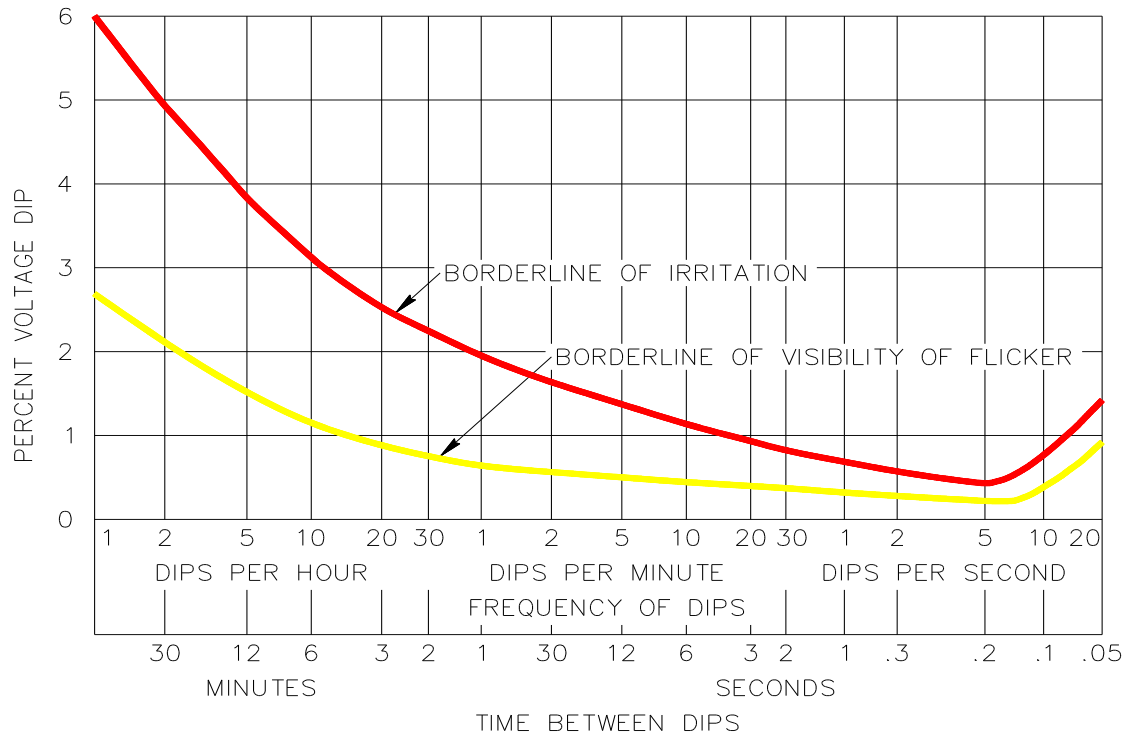
5.1 Flicker Chart

5.2 Metering Arrangements

5.3 Co-Generation Technical Requirements Compliance Checklist

5.4 Application for Interconnection and Parallel Operation for Distributed Generation

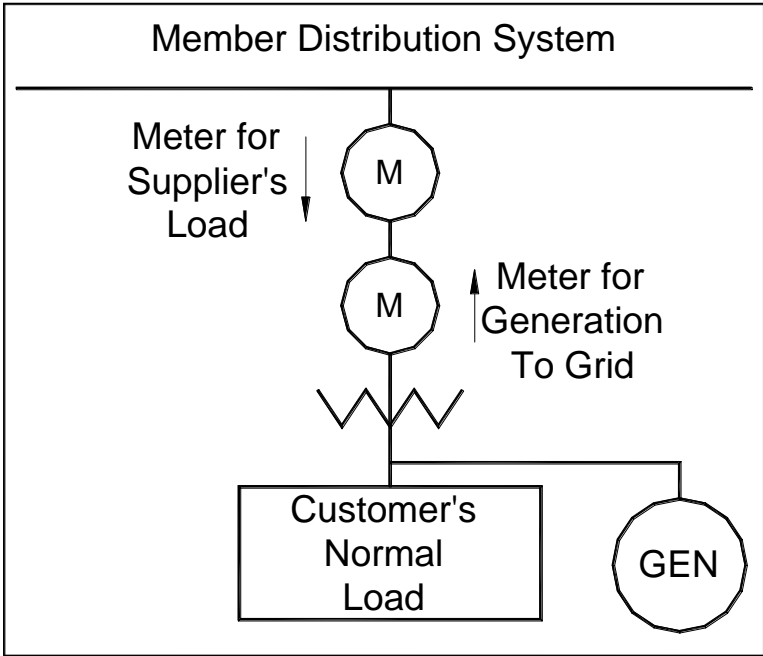
## 5.1 Flicker Chart



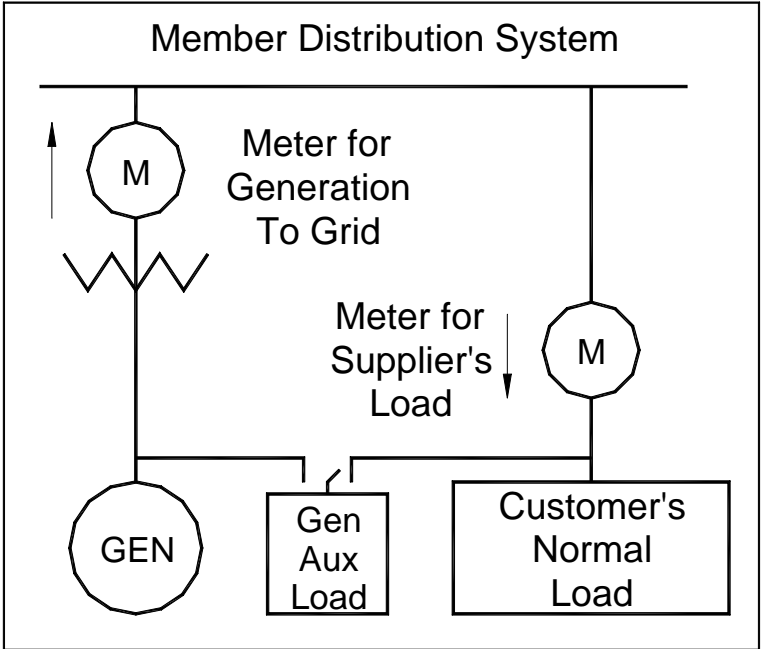
**Flicker Curve. Source: IEEE Std. 141-1993**

5.2 Metering Arrangements  
 5.2.1 System-wide Options

**Option (1)**  
 Power Supplier sells excess generation.  
 One meter measures power in for billing.  
 One meter measures power out for calculation of credit.

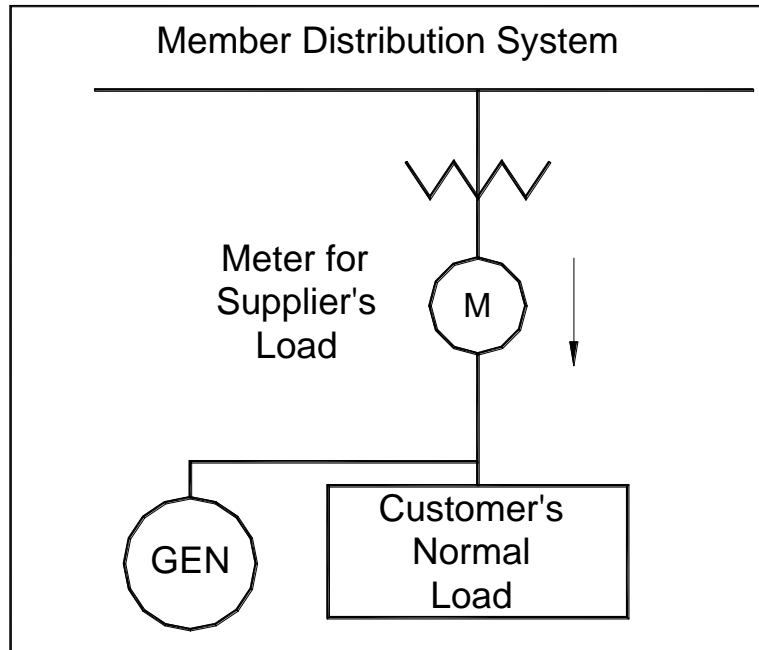


**Option (2)**  
 Power Supplier sells all generation  
 One meter measures power in for billing.  
 One meter measures power out for calculation of credit.



### 5.2.1 System-wide Options (Continued)

**Option (3)**  
Displaced Load only. Supplier does not sell any power.  
Meter measures power in for billing.



### 5.3 Co-Generation Technical Requirements Compliance Checklist

This checklist is a summary of the requirements for Interconnection and Parallel Operation of DG. Two objectives must be met to arrive at compliance by the proposed installation:

1. **Safety:** The Customer's DG will be held to the same Standard of Care, as the Cooperative is required to maintain. In addition, the safety of the general public and the personnel and equipment of the Cooperative shall in no way be reduced or impaired as a result of the Interconnection.
2. **Customer Impact:** The quality, reliability and the availability of service to the Cooperative's other customers shall not be diminished or impaired as a result of the Interconnection.

Cooperative Requirements	Description of Proposed Compliance	Adequate (Y/N)	Comments
1. Supply reactive power. (3.9.7)			
2. Limit voltage flicker. (3.9.10)			
3. Limit voltage surges. (3.9.9)			
4. Limit voltage sags. (3.9.9)			
5. Identify power factor. (3.9.8)			
6. Limit harmonic voltage and current. (3.9.12)			
7. Control effect of additional fault current. (3.14.3.3)			
8. Specify protective devices and settings. (3.14)			
9. Provide accessible gang operated load break switch. (3.14.3.1)			
10. Disconnect Interconnection within 10 cycles of a service interruption or fault. (3.14.3.2)			
11. Install fault-interrupting device. (3.14.3.3)			
12. Block generator from energizing dead circuits. (3.14.3.4)			
13. Synchronize system within ½ cycle. (3.16)			
14. Install telemetering equipment. (3.19)			
15. Maintain continual operating communications. (3.19 – 2.B)			
16. Isolate zero sequence circuit between systems. (3.20)			

## EXHIBIT D

### Stand-by Capacity and Energy Service For

\_\_\_\_\_ (DG Owner/Operator)  
Distributed Generation Facility

#### Availability

Stand-by Capacity and Energy will be made available up to the rated output or nameplate rating of the generation equipment or the rated output agreed to by all Parties, whichever is less. Stand-by Capacity and Energy Service is required for all DG Owner/Operators with on-site generation with a rated output of 100kW or more, for the Term of the Agreement.

#### Requirements for Service

DG Owner/Operator shall furnish or cause to be furnished the necessary equipment and facilities, to the satisfaction of SMEPA and Cooperative, as required in the Agreement for Interconnection and Parallel Operation of Distributed Generation between \_\_\_\_\_, \_\_\_\_\_ Electric Power Association and South Mississippi Electric Power Association (Agreement).

#### Stand-By Capacity Rate

The rate for Stand-by Capacity is \_\_\_\_\_ per kW Month for all capacity required in excess of 100kW. The initial Contract Rating of the facility is \_\_\_\_\_ kW, as agreed to by the Parties, and Stand-by Capacity would therefore be charged initially for \_\_\_\_\_ kW. The future Contract Rating would be re-determined, three (3) months after commercial operation, and thereafter each December, and would be the greater of the existing Contract Rating or the average of the three highest monthly generation 15-minute demand peaks.

#### Energy Rate

The energy rate for the Stand-by Capacity and Energy rate will be the same as the rate charged by Cooperative to serve the load of the DG Owner/Operator.

#### Power Factor

The power factor of the facility shall be maintained within the Cooperatives specifications.

#### Effective Date

Stand-by Capacity and Energy will be available upon execution of the Agreement, and commercial operation of the facility. The terms and conditions of the Stand-by Capacity and Energy Service described herein can be changed or modified upon written notification by SMEPA or Cooperative. Cancellation of the Stand-by Capacity and Energy Service shall be as prescribed in the Agreement.

**EXHIBIT E**  
**POWER PURCHASE AGREEMENT**  
**FOR**  
**PURCHASE OF EXCESS ELECTRIC ENERGY**  
**FROM**  
**DISTRIBUTED GENERATION (DG) RATED GREATER THAN 10KW**

This Purchase Agreement ("Purchase Agreement") is made and entered into this \_\_\_\_ day of \_\_\_\_\_, 20\_\_, by and between \_\_\_\_\_, herein after referred to as "DG Owner" and \_\_\_\_\_ Electric Power Association, hereinafter referred to as "Cooperative" and South Mississippi Electric Power Association, hereinafter referred to as "SMEPA," both being Electric Power Associations organized under the laws of the state of Mississippi, and each hereinafter sometimes referred to individually and collectively as "Party" or "Parties." In consideration of the mutual covenants set forth herein, the Parties agree as follows:

1. **Interconnection of Facilities:** Prior to purchase of excess electric energy from DG Owner, an Agreement for Interconnection and Parallel Operation of Distributed Generation ("Agreement") shall be executed between the Parties. DG Owner shall satisfy all terms and conditions of the Agreement as determined by SMEPA and Cooperative.
2. **Monthly DG Connection Fee:** DG Owner shall pay a monthly DG Connection Fee to Cooperative. Cooperative shall add to the monthly bill of DG Owner for a DG Connection Fee in the amount of \$\_\_\_\_\_ per month to cover administrative, metering and other SMEPA and Cooperative expenses related to serving interconnected distributed generation. Cooperative may revise the amount charged for the monthly DG Connection Fee upon giving thirty (30) day advance written notice of such change.
3. **DG Energy Rate:** SMEPA shall pay DG Owner for all metered excess electric energy, as adjusted for losses to the high side of the distribution transformer, delivered into the electric facilities of Cooperative from the DG facilities of DG Owner in accordance with Distributed Generation Rate DG-1 attached hereto as Attachment 1.
4. **Metering:** Metering suitable to Cooperative and SMEPA for measuring excess electric energy delivered into the electric facilities of Cooperative shall be provided in accordance with the Agreement.
5. **Reading of Meter:** Cooperative shall read the meter monthly and report to SMEPA by the first day of the succeeding month, or the next business day thereafter, the excess electric energy delivered to the electric facilities of Cooperative from the DG facilities of DG Owner (Delivered Energy).
6. **Determination of Delivered Energy:** The Delivered Energy (kWh) shall be measured energy at the high side of the transformer or adjusted to the high side of the transformer.
7. **Payment for Excess Electric Energy:** Statements covering credits for Delivered Energy shall be rendered by SMEPA by the twentieth day of the month, or the next business day thereafter, subsequent to having received meter readings from Cooperative. The Statement will be

accompanied by a check for the amount due if the DG Owner credit for energy delivered exceeds \$25.00. A monthly credit of \$25.00 or less will be accumulated and paid when the total amount due DG Owner exceeds \$25.00. Regardless of the accumulated amount due DG Owner for sale of excess electric energy to SMEPA by December 31 of each year this agreement is in effect, SMEPA shall pay the amount due DG Owner for sale of such excess electric energy by the twentieth (20<sup>th</sup>) day of February in the subsequent year.

8. **Severability:** If any portion or provision of this Purchase Agreement is held or adjudged for any reason to be invalid or illegal or unenforceable by any court of competent jurisdiction, such portion shall be deemed separate and independent, and the remainder of this Agreement shall remain in full force and effect.
9. **Amendment:** This Purchase Agreement may be amended only upon mutual agreement of the Parties, which amendment will not be effective until reduced to writing and executed by the Parties.
10. **Assignment:** At any time during the term of this Purchase Agreement, the DG Owner may assign this Purchase Agreement to a corporation, an entity with limited liability or an individual (the "Assignee") to whom the DG Owner transfers ownership of the Facilities; provided that the DG Owner obtains the written consent of the Cooperative and SMEPA in advance of the assignment. Consent of Cooperative and SMEPA consent will be based on a determination that the Assignee is financially and technically capable to assume ownership and/or operation of the Facilities. The company or individual to which this Purchase Agreement is assigned will be responsible for the proper operation and maintenance of the Facilities, and must agree in writing to be subject to all provisions of this Purchase Agreement. Cooperative and SMEPA may also assign the Purchase Agreement to another entity with the written approval of the DG Owner.
11. **Headings:** Headings used in this Purchase Agreement are inserted for convenience of reference only and shall not be deemed to be a part of this Purchase Agreement for any purpose.
12. **Governing Law:** This Purchase Agreement shall be governed and construed in accordance with the laws of the State of Mississippi.
13. **Effective Term and Termination Rights:** This Purchase Agreement shall become effective when executed by the Parties and shall continue in effect until terminated in accordance with Article 15, Effective Term and Termination Rights, in the Agreement for Interconnection and Parallel Operation of Distributed Generation executed by the Parties.

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**IN WITNESS WHEREOF**, the Parties have caused this Purchase Agreement to be signed by their respective duly authorized representatives.

\_\_\_\_\_ (DG Owner/Operator)

By: \_\_\_\_\_

Title: \_\_\_\_\_

Date: \_\_\_\_\_

\_\_\_\_\_ Electric Power Association (Cooperative)

By: \_\_\_\_\_

Title: \_\_\_\_\_

Date: \_\_\_\_\_

South Mississippi Electric Power Association (SMEPA)

By: \_\_\_\_\_

Title: \_\_\_\_\_

Date: \_\_\_\_\_

**AVAILABILITY OF SERVICE**

This rate and the terms and conditions set out herein are available for and applicable to purchases of energy only by SMEPA from the owner of distributed generation with a rated output no greater than 10,000 kW (such owner being hereafter called "Customer"). Such distributed generation shall be installed on the property of Customer and interconnected with the distribution system of a SMEPA Member Cooperative (such SMEPA Member Cooperative being hereafter called "Cooperative") to provide all or part of Customer requirements of electrical energy, or from which facilities Customer may elect to sell to SMEPA such output of electrical energy delivered into the distribution system of Cooperative.

SMEPA and Cooperative will permit generating facilities of Customer to operate in parallel with the systems of Cooperative and SMEPA under conditions as outlined below under Parallel Operation.

SMEPA will purchase such energy from Customer at the Rate as defined below and under the terms and conditions stated herein. SMEPA reserves the right to change the said Rate at its discretion, effective upon renewal of the term for the Agreement for Interconnection and Parallel Operation of Distributed Generation between Customer, Cooperative and SMEPA (such agreement being hereafter called "Agreement") provided SMEPA has notified Customer of such change in writing at least thirty (30) days prior to the expiration of the term of the then current Agreement.

**RATE**

For all KWH purchased by SMEPA

43.87 Mills per KWH

**METERING**

The Customer shall be responsible for the cost of installing and maintaining acceptable metering and telemetry equipment that satisfies the metering and telemetry equipment requirements as detailed in the Agreement.

SMEPA and Cooperative shall have access to all such meters at reasonable times during normal business hours of Customer, and shall regularly provide to Customer copies of all information provided by such meters.

**DUE DATE OF BILL**

SMEPA or Cooperative shall read monthly, the meter used for measuring electric energy purchases from Customer. Any payment due from SMEPA to Customer will be due no later than the twentieth day, or the first business day thereafter, of the subsequent month from date of SMEPA or Cooperative reading the meter.

**PARALLEL OPERATION**

Distributed generation facilities desiring to interconnect with the distribution system of the Cooperative must meet the specifications, terms and conditions contained in the Agreement. Upon approval and completion of the Agreement, SMEPA and Cooperative will, in accordance with the terms and conditions of said Agreement, permit Customer to operate its generating facilities in parallel with the systems of Cooperative and SMEPA.

**CURTAILMENT**

In addition to the terms of the Agreement, SMEPA and/or Cooperative reserve the right to curtail a purchase from Customer when:

1. SMEPA or Cooperative has a system emergency and purchases would (or could) contribute to such emergency, or
2. SMEPA has been directed by the regional Reliability Coordinator that the purchase of energy from Customer must be curtailed because of a system emergency or for other reliability related reasons.

Customer will be notified of each curtailment.

**EXHIBIT F**

**ONE LINE DIAGRAM**