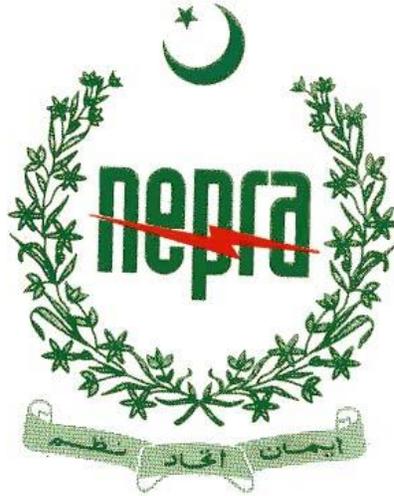


NATIONAL ELECTRIC POWER REGULATORY AUTHORITY



NEPRA ARE (Alternative & Renewable Energy) Distributed Generation/Net Metering Rules

October, 2014

In exercise of the powers conferred by section 46 of the Regulation of Generation, Transmission, and Distribution of Electric Power Act, 1997 (XL of 1997), the National Electric Power Regulatory Authority, with the approval of Federal Government, is pleased to make the following Rules namely:-

PART I PRELIMINARY

1. Short title and commencement: - (1) These Rules may be called the National Electric Power Regulatory Authority ARE Distributed Generation/Net Metering Rules 2014.

(2) These shall come into force at once:-

2. Definitions:-

2.1 “**ARE**” means Alternative & Renewable Energy;

2.2 “**DG**” means Distributed Generation;

2.3 “**Distributed Generation**” means electrical power generation by Solar or Wind that is interconnected to DISCO’s distribution system at interconnection point;

2.4 “**DG Facility**” means a distributed generating facility using Solar or Wind energy resource for generation of electricity up to 1 MW;

2.5 “**Distributed Generator**” means a person who is DISCO’s 3 phase 400V or 11kV consumer i.e. Domestic, Commercial or Industrial and who owns and/or operates the DG facility, and is responsible for the rights and obligations related to the Agreement;

2.6 “**Applicant**” means a person who is registered with the Authority as Distributed Generator and applies to a DISCO to interconnect a DG facility to the DISCO’s distribution system;

2.7 “**Application**” means the application submitted by a Distributed Generator to DISCO on Authority’s approved format (**Annexed-B**) for interconnection of a DG facility to the DISCO’s distribution system;

2.8 “**Test Report**” means a report provided by the Electric Inspector;

2.9 “**Authority**” means National Electric Power Regulatory Authority (NEPRA) established under section 3 of Regulation of Generation, Transmission, & Distribution of Electric Power Act (XL of 1997);

2.10 “**Distribution Facilities/ Distribution System**” means electrical facilities/system operating at distribution voltage and used for the movement or delivery of electric power;

2.11 “**DISCO**” means a Distribution Company;

2.12 “**Distribution Company**” means the person engaged in the distribution of electric power;

2.13 “**Licensee**” means a holder of a licence;

2.14 “**Person**” means an association of persons, concern, company, firm or undertaking;

2.15 “**Interconnection Point**” means the point where the metering, installation and protection apparatus of the distributed generator is connected to the DISCO’s distribution facilities;

2.16 “**Agreement**” means the agreement between the DISCO and the distributed generator on the Authority’s approved format (**Annex-C**);

2.17 “**Interconnection Facilities**” means the equipment, including, without limitation, electrical lines or circuits, transformers, switch gear, safety and protective devices, meters or electrical plant, used for interconnection services;

2.18 “**Fault**” means an equipment failure, conductor failure, short circuit, or other condition resulting from abnormally high amounts of current from the power system;

2.19 “**Net Metering Facility**” means a facility comprising of one or two meters for measuring the kWh generated by Distributed Generator and supplied by DISCO and determining the net energy;

2.20 “**Net Energy**” means a balance (positive or negative) of the kWh generated by Distributed Generator against the kWh supplied by DISCO at the end of billing cycle;

2.21 “**Net Energy Billing**” means a billing and metering practice under which a Distributed Generator is billed on the basis of net energy over the billing cycle;

2.22 “**Billing Cycle**” means energy recorded by the meters in a period of thirty days;

2.23 “**Tariff**” means the rates, charges, terms and conditions for sale of electric power to consumers as approved by the Authority and duly notified by Government of Pakistan from time to time.

2.24 “**kWh**” means kilowatt hour;

2.25 “**MW**” means megawatt;

2.26 “**Applicable Tariff**” means tariff approved by NEPRA for the relevant period and category of consumers of the Disco;

2.27 Words and expressions used but not defined in these rules shall have the same meaning as in the Regulation of Generation, Transmission, & Distribution of Electric Power Act (XL of 1997)

PART II
GENERAL REQUIREMENTS

4. General Rules, Rights and Obligations:-

- (1) A Distributed Generator who intends to sell electrical power to a DISCO shall be registered with the Authority as per procedure given below;
 - i) The request for registration shall be submitted to the Authority on the approved format (**Annex-A**) along with the fee of rupees 500/- (non-refundable) drawn through a cross cheque in favor of Authority.
 - ii) The request for registration may be examined by Authority and either is registered or returned to the Distributed Generator with objections within fifteen days of its receipt.
- (2) A DISCO, shall allow any of its consumers to establish Distributed Generating facilities to be interconnected with the DISCO's Distribution facilities using either (a) a standard meter capable of registering the flow of electricity in two directions, or (b) two separate meters one is for selling electricity to the DISCO and other is for purchasing electricity from the DISCO.
- (3) A Distributed Generator shall enter into an Agreement (**Annex-C**) with the DISCO, and receive DISCO's express written approval for interconnection. The DISCO shall not unreasonably withhold its approval to interconnect DG facility with DISCO's Distribution System.
- (4) The Distributed Generator shall not have any right to utilize DISCO's interconnection facilities for the sale of electricity to any other person.
- (5) DISCO shall have the right to review the design of a DG facility and interconnection facilities and to inspect the DG facilities and interconnection facilities prior to the commencement of parallel operation with DISCO's Distribution System. DISCO may require the Distributed Generator to make modifications as necessary to comply with the requirements of these Rules.
- (6) A Distributed Generator shall operate and maintain its DG facility and interconnection facilities in accordance with Prudent Electrical Practices.
- (7) DISCO may limit the operation and/or disconnect or require the disconnection of a DG facility from DISCO's Distribution System at any time, with or without notice, in the event of fault. DISCO may also limit the operation and/or disconnect or require the disconnection of DG facility from DISCO's Distribution System upon the provision of thirty days written notice for the conditions which include as follows:
 - 1) To allow for routine maintenance, repairs or modifications to DISCO's Distribution System;
 - 2) Upon DISCO's determination that DG facility is not in compliance with these Rules;
 - 3) Upon termination of the Agreement.

PART III
APPLICATION AND INTERCONNECTION PROCESS

5. Application Process for Interconnecting DG facilities:-

- (1) The DISCO shall provide information and Authority's approved documents in response to the request from Applicant free of cost within three working days.
- (2) Application along with necessary documents shall be submitted by Distributed Generator to DISCO.
- (3) Within ten working days of receiving an application, the DISCO shall normally acknowledge its receipt and intimate to the Applicant whether the Application has been completed adequately. In case of any missing information or documents the Applicant shall provide the same to DISCO within ten working days of the receipt of intimation from DISCO.
- (4) Upon receipt of a satisfactory completed Application, the DISCO shall perform an initial review. The initial review determines if the Applicant qualifies for interconnection, or may qualify subject to additional requirements. The DISCO shall complete its initial review within twenty working days.
- (5) If an initial review reveals that the proposed facility is not technically feasible, the DISCO shall return the application and communicate the reasons to applicant within seven working days after the completion of initial review.
- (6) If the DISCO is satisfied that the applicant qualifies as Distributed Generator, then the DISCO and the Applicant shall enter into an agreement within twenty working days. DISCO shall send a copy of the Agreement to the Authority within seven working days of the signing of the agreement.
- (7) Within seven working days of execution of the Agreement, the DISCO shall issue the Connection Charge Estimate to the applicant for deposition of the charges for the proposed interconnection facility up to the interconnection point including the metering installation.
- (8) The Applicant shall make the payment of Connection Charge Estimate within thirty days of its issuance.
- (9) The DISCO shall install and commission the proposed interconnection facility within thirty eight days of the payment of demand notice by the Applicant.

PART IV
DG FACILITY DESIGN AND OPERATING REQUIREMENTS

6. Protection Requirements:-

- (1) The Distributed Generator's protection and control diagrams for the interconnection shall be in accordance with the provisions of the Grid and Distribution Codes and approved by the DISCO prior to commissioning of the proposed interconnection facilities. A typical single line diagram is shown as **Figure**.
- (2) Applicant shall be responsible for the installation of equipment, including, without limitation, electrical lines or circuits, transformers, switch gear, safety and protective devices, meters or electrical plant, used for interconnection.
Provided however, if the applicant is unable to install equipment, including, without limitation, electrical lines or circuits, transformers, switch gear, safety and protective devices, meters or electrical plant, used for interconnection, the DISCO may execute the requisite work in case applicant offers to deposit the cost to be incurred on the requisite work at mutually agreed terms.
- (3) Protective functions shall be equipped with automatic means to prevent reconnection of the DG facility with the DISCO's Distribution facilities unless the Distribution facilities service voltage and frequency is of specified setting and is stable for time to be mutually agreed.
- (4) The Distributed Generator will furnish and install a manual disconnect device that has a visual break to isolate the DG facility from the Distribution facilities.
- (5) The grid connected inverters and generators shall comply with Underwriter Laboratories UL 1741 standard (*Inverters, Converters, Controllers and Interconnection System Equipment for Use with Distributed Energy Resources*) which addresses the electrical interconnection design of various forms of generating equipment, IEEE 1547 2003, *IEC 61215* or other international standards.

7. Prevention of Interference: - The Distributed Generator shall not operate such equipment that superimposes upon the Distribution System a voltage or current that interferes with DISCO operations, service to DISCO consumers, or DISCO communication facilities. If such interference occurs, the Distributed Generator must diligently pursue and take corrective action at its own expense after being given notice and reasonable time to do so by DISCO. If the Distributed Generator does not take timely corrective action, the DISCO may, without liability, disconnect the DG facility from the Distribution System, in accordance with sub rule (7) of Rule 4 of these Rules.

8. Voltage and Frequency Range: - A variation of $\pm 5\%$ and $\pm 1\%$ are permissible to the nominal voltage and frequency respectively.

PART V
INTERCONNECTION FACILITY FINANCING

9. Responsibility for Costs of Interconnecting a DG facility:-

- (1) A Distributed Generator shall be responsible for all costs associated with interconnection facilities.
- (2) The Distributed Generator shall also be responsible for any costs reasonably incurred by DISCO in providing, operating, or maintaining Interconnection facilities and Distribution System improvements required solely for the interconnection of the DG facility with DISCO's Distribution System.

PART VI
NET ENERGY METERING SERVICES

10. Metering Requirements:-

- (1) The equipment installed for net metering may be single meter or two separate meters. In case of single meter the equipment installed for net energy metering shall be capable of accurately measuring the flow of electricity in two directions.
- (2) If the two separate meters are installed, as described above, the net energy metering calculation shall yield the same result as when a single meter is used.
- (3) The Net Energy Metering Facility, at the Distributed Generator's expense, shall meet all safety and protection requirements that are necessary to assure safe and reliable operation of the DG facility when connected to the DISCO's Distribution facilities and that have been approved by the Authority.

11. Billing for Net Metering:-

- (1) At the end of each billing cycle following the date of final interconnection of DG facility to the DISCO's Distribution facilities, the DISCO shall net off the kWh supplied by Distributed Generator against the kWh supplied by the DISCO.
- (2) If the kWh supplied by DISCO exceed the kWh supplied by Distributed Generator, the Distributed Generator shall be billed by DISCO for the net kWh in accordance with the Applicable Tariff.
- (3) If the kWh supplied by Distributed Generator exceed the kWh supplied by DISCO, the net kWh shall be credited against Distributed Generator's next billing cycle for future consumption, or shall be paid by the DISCO to the Distributed Generator annually in accordance with the Applicable Tariff at the option of Distributed Generator.

- (4) The tariff applicable for purchase of electricity from the Distributed Generator shall be the same at which the Distributed Generator has been billed by the DISCO for electric power sold to the Distributed Generator.

PART VII

Terms of Agreement, Termination of Agreement and Dispute Resolution

16. Terms of Agreement:-

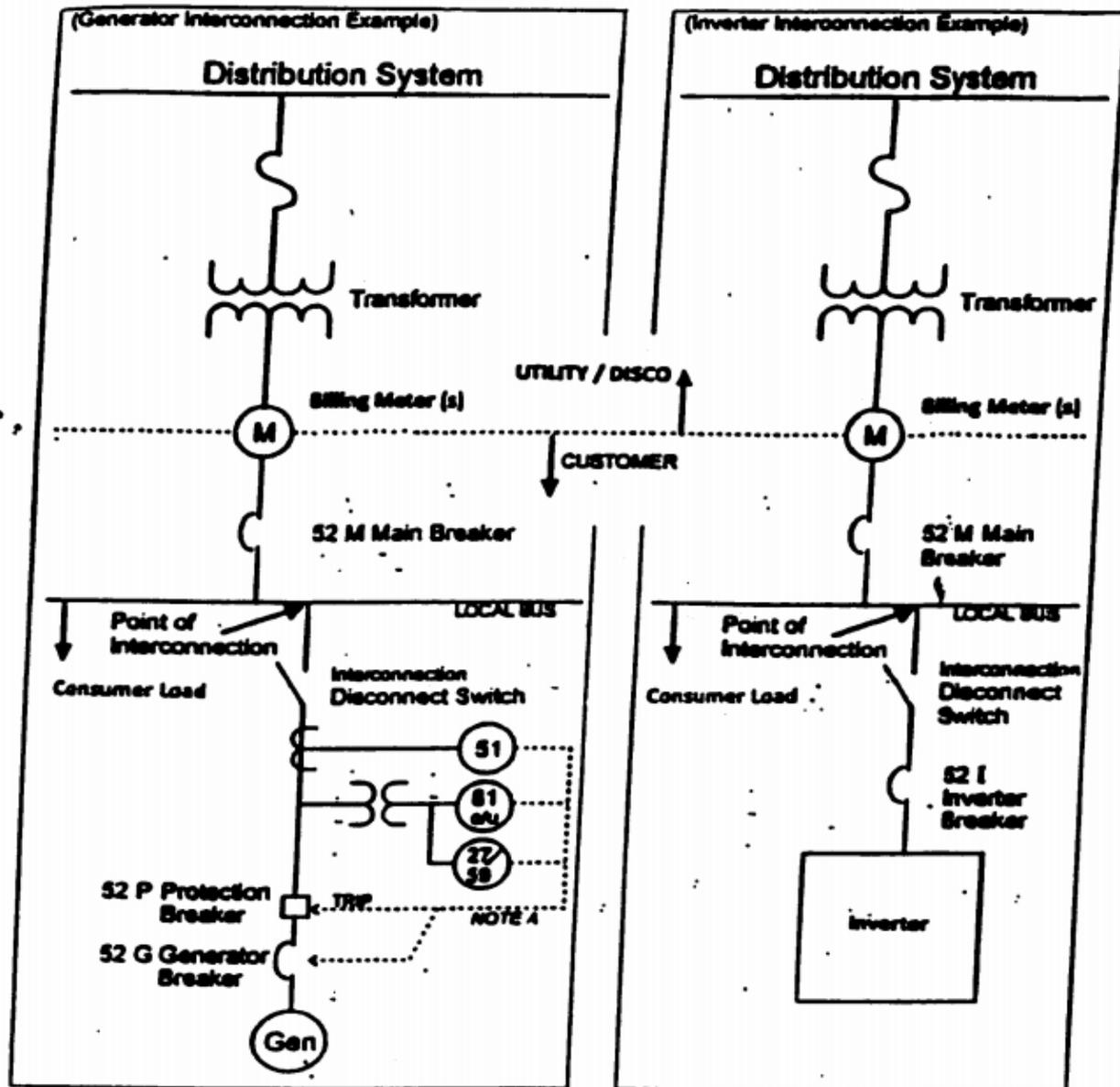
- (1) The term of Agreement between Distributed Generator and DISCO shall be three years with effect from commissioning of DG facility.
- (2) At the expiry of initial term, the Agreement may be automatically renewed by the mutual understanding between Distributed Generator and DISCO for another term of three years and so on.

17. Termination of Agreement:-

- (1) The Agreement may be terminated in accordance with the sub rule (7) of Rule 4 of these Rules.
- (2) The Distributed Generator may terminate the Agreement upon thirty days written notice if the Distributed Generator decides to discontinue the sale of electricity to the DISCO.
- (3) The DISCO shall not terminate the Agreement on any event without prior approval of the Authority.
- (4) All rights and obligations accrued up to termination shall continue in force upon termination.

18. Dispute Resolution: - Any dispute in relation to this Agreement shall be referred to the Authority. The decision of the Authority in the referred matter shall be final.

FIGURE



Relay Key:

- 27 / 59 under/over voltage relay
- S1 over current relay
- S2 circuit breaker
- 81 o/u over/under frequency relay

Indicate grounding configuration of generator or inverter transformer, if present, e.g.



Notes:

- A) Trip of either breaker is acceptable.
- B) Compliance with IEEE 1547 and UL 1741 required

**APPLICATION FOR REGISTRATION WITH
NATIONAL ELECTRIC POWER REGULATORY AUTHORITY (NEPRA)**

1. Name of Applicant:	
1(a) Address:	
1(b) Contact Nos:	Office _____ Fax _____ Cell _____
1(c) Email Address:	
2. Location of DG facility:	
3. Name of DISCO with which the DG facility is proposed to be interconnected	
4. Size of DG facility:	
5. Approximate monthly energy proposed to be supplied to DISCO (kWh):	
6. Registration Fee to be deposited: (Non-Refundable)	

Applicant's Signature

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Date

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Standard Distributed Generation Application Form

Distributed by	Approved by
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Name & Address of DISCO

	National Electric Power Regulatory Authority (NEPRA)
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1. Contact Information--The applicant is the person that is legally responsible for the generating system

Applicants Last Name First Name

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Applicant's Mailing Address

Applicant's Phone Number & Email Adress

Office:	Fax:
Cell:	Email:

Emergency Contact Numbers

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2. Location of Generation System

Address at which DG facility is located

latitude - Longitude (i.e. 49o 32' 06'' N -- 91o 64' 18''-- optional)

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3. Applicant/Consumer Reference Number

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4. Applicant's Ownership Interest in the Generation System

Owner
 Co-owner
 Lease
 Other: _____

5. primary Intent of the Generation System

Onsite Use of Power
 Net Energy Billing

6. Electricity Use, Production and Purchases

(a) Anticipated annual electricity consumption of the facility or site: (kWh)/yr.

(b) Anticipated annual electricity production of the generation system: (kWh)/yr.

(c) Anticipated annual electricity purchases (i.e., (a) minus (b)) (kWh)/yr.

* Value will be negative if there are net sales to the DISCO.

7. Installing Contractor Information (If Applicable)

Contractor's Last Name First Name

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Name of Firm

--

Contractor's Phone Number E-mail Address

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Mailing Address

8. Requested In-Service Date

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9. Provide one-line Schematic Diagram of the System

Schematic is Attached Number of Pages

--	--

10. Generator / Inverter Information

Manufacturer Model No.

--	--

Version No. Serial No.

--	--

Generation Type (check one) Generation Type (check one)

Single Phase Three Phase Inverter Other: _____

Name Plate AC Ratings (check one)

_____ kW _____ kVA _____ volts

Primary Energy Source

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Note: If there is more than one inverters, attach an additional sheet describing each

11. Site Plan Showing Location of the External Disconnect Switch (attach additional sheets as needed)

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13. Design Requirements

(a) Has the proposed distributed generation paralleling equipment been certified by Electrical inspector? Y N

14. Other Comments, Specification and Exceptions (attach additional sheets if needed)

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15. Application and Installer Signature

To the best of my knowledge, all the information provided in this application form is completed and correct.

Applicant Signature

Date

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Installer Signature (if applicable)

Date

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Distributed Generation Interconnection Agreement (1 KW to 1MW)
between Distributed Generator and DISCO

The Distributed Generation Interconnection Agreement (the “Agreement”), is made and entered in to this _____ (day) of _____ (month), _____ (year) by and between _____ hereinafter called “DISCO” and _____ hereinafter called the “Applicant”. Applicant shall be 3 phase 400V or 11kV DISCO’s consumer. DISCO and the Applicant are hereinafter collectively referred to as the “Parties” and individually as a “Party”.

Recitals

- A. DISCO is the owner of the electric distribution system serving _____ [Insert legal description of property or address] “DISCO’s Distribution System”.
- B. Applicant desires to install a Distributed Generator (DG) facility or energy storage device using solar or wind energy resources with a capacity greater than 1 KW but no more than 1 MW, including related interconnection equipment (the “DG Facility”) and to interconnect the DG Facility to the DISCO’s distribution system.
- C. DISCO has previously reviewed and approved Applicant’s DG Interconnection Applicant Form dated _____, and supporting materials (the Application”). The completed Application is attached as Exhibit 1 and incorporated into this Agreement.
- D. Applicant wishes to interconnect the DG Facility to DISCO’s distribution system and DISCO is willing to permit such interconnection subject to the terms and conditions set forth: (1) the completed Application approved by DISCO; (2) this Agreement.
- E. No agency or partnership is created with the interconnection of the applicants DG Facility.

Agreement

NOW THEREFORE, in consideration of the foregoing Recitals and for good and valuable consideration, the DISCO and Applicant agree as follows:

1. Design Requirement

The DG Facility shall be installed in compliance with NEPRA ARE Distributed Generation/ Net Metering Rules 2014.

2. Applicant’s Representations and Warranties

Applicant represents and warrants that:

- a The DG Facility is fully and accurately described in the Application;

- a. All information in the Application is true and correct;
- b. The DG Facility has been installed to Applicant's satisfaction;
- c. Application has been given warranty information and an operation manual for the DG Facility;
- d. Applicant has been adequately instructed in the operation and maintenance of the DG Facility.

3. Interconnection Disconnect Switch

The DISCO may require that the Applicant furnish and install an interconnection disconnect switch that opens, with a visual break, all underground poles of the interconnection circuit. The interconnection disconnect switch shall be rated for the voltage and fault current requirements of the DG Facility, and shall meet all applicable IEC, IEEE Standards, as well as applicable requirements of the NEPRA Grid Code. The switch enclosure shall be properly grounded. The interconnection disconnect switch shall be accessible at all times, located for ease of access of DISCO personnel, and shall be capable of being locked in the open position. The Applicant shall follow the DISCO's recommended switching, clearance, tagging, and locking procedures.

4. Modifications to the DG Facility

Applicant shall notify DISCO of plans for any material modification to the DG Facility by providing at least forty working days of advance notice. "Material Modification" is defined as any modification that changes the maximum electrical output of the DG Facility or changes the interconnection equipment. The notification shall consist of a completed, revised Application and such supporting materials as may be reasonably requested by DISCO. Applicant agrees not to commence installation of any material modification to the DG Facility until DISCO has approved the revised Application.

5. Insurance, Indemnification, Liability

5.1 Distributed Generator shall obtain and maintain appropriate insurance for third party personal injury and general commercial liability.

5.2 Each party as indemnitor shall defend, hold harmless, and indemnify the other party and the directors, officers, employees, and agents of the other party against and from any and all loss, liability, damage, claim, cost, charge, demand, or expense (including any direct, indirect or consequential loss, liability, damage, claim, cost, charge, demand, or expense, including attorneys' fees) for injury or death to persons, including employees of either party, and damage to property, including property of either party, arising out of or in connection with (a) the engineering, design, construction, maintenance, repair, operation, supervision, inspection, testing, protection or ownership of the indemnitor's facilities, or (b) the making of replacements, additions, betterments to, or reconstruction of the indemnitor's facilities. This indemnity shall apply notwithstanding the active or passive negligence of the indemnitee. However, neither party shall be indemnified hereunder for its loss, liability, damage, claim, cost, charge, demand, or expense resulting from its sole negligence or willful misconduct.

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5.3 The indemnitor shall, on the other party's request, defend any suit asserting a claim covered by this indemnity and shall pay for all costs, including reasonable attorney fees, that may be incurred by the other party in enforcing this indemnity.

5.4 The provisions of this Section shall not be construed to relieve any insurer of its obligations to pay any insurance claims in accordance with the provisions of any valid insurance policy.

5.5 Except as otherwise provided in this section, neither party shall be liable to the other party for consequential or remote damages incurred by that party.

6. DG Facility commissioning Testing

Applicant shall notify DISCO in writing that installation of DG Facility is complete and that the interconnection equipment is available for testing by DISCO at least fifteen working days duly certified by Electrical Inspector before Applicant interconnects the DG Facility with DISCO's Distribution System. DISCO shall thereupon have the right to test the DG Facility. DISCO shall also have the right to witness any testing by Applicant of the DG Facility. Any DISCO testing of the DG Facility shall be completed within ten working days. After the testing which is to the satisfaction of both parties, the DG facility may be interconnected with the distribution system of DISCO to be witnessed by representatives of both parties within thirty eight days.

7. Access to DG Facility

Applicant shall permit DISCO's employees and agents to enter the property on which the DG Facility is located at any reasonable time for the purposes of inspecting and/or testing Applicant's DG Facility to ensure its continued safe and satisfactory operation and the accuracy of DISCO meters. Such inspections shall not relieve Applicant from its obligation to maintain the DG Facility and any related equipment owned by Applicant in safe and satisfactory operating conditions.

DISCO shall have the right to witness any testing by Applicant of the DG Facility.

8. Temporary Disconnection of a DG Facility

DISCO may limit the operation and/or disconnect or require the disconnection of a DG facility from DISCO's Distribution System at any time, with or without notice, in the event of fault. DISCO may also limit the operation and/or disconnect or require the disconnection of DG facility from DISCO's Distribution System upon the provision of 30 days written notice for the conditions which including as follows:

- a. To allow for routine maintenance, repairs or modifications to DISCO's Distribution System;

9. Disputes; Right to Appeal to Authority

Nothing in this agreement prevents Applicant from filing a petition with the Authority to appeal any requirement imposed by DISCO as a condition to interconnection of DG Facility, that applicant alleges is unreasonable. In case of a dispute, the decision of the Authority shall be final and binding on both the parties.

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10. Amendments; Non-Waiver

Any amendment or modification to this Agreement must be in writing and executed by Applicant and DISCO. The failure of Applicant or DISCO to insist on performance by the other Party of any provision of this Agreement shall not waive the right of the Party who failed to insist on performance to enforce the same provision at a later time.

11. Term and Termination of Agreement

The term of Agreement between Distributed Generator and DISCO shall be three years with effect from the date of commissioning of DG facility. At the expiry of initial term, the Agreement may be automatically renewed by the mutual understanding between Distributed Generator and DISCO for another term of three years and so on.

- a. DISCO may limit the operation and/or disconnect or require the disconnection of a DG facility from DISCO's Distribution System at any time, with or without notice, in the event of fault. DISCO may also limit the operation and/or disconnect or require the disconnection of DG facility from DISCO's Distribution System upon the provision of 30 days written notice for the conditions which including as follows:
 - To allow for routine maintenance, repairs or modifications to DISCO's Distribution System;
 - Upon DISCO's determination that DG facility is not in compliance with these Rules;
 - Upon termination of the Agreement.
- b. This Agreement may be terminated in accordance with the sub rule (7) of Rule 4 of these Rules.
- c. The Distributed Generator may terminate the agreement upon thirty days written notice if the Distributed Generator determines to discontinue the sale of electricity to the DISCO.
- d. The DISCO shall not terminate the Agreement in any event without prior approval of the Authority.
- e. All rights and obligations accrued up to termination shall continue in force upon termination.

12. Successors and Assigns

- a. Assignment by Applicant: Applicant shall not assign its rights and obligations under this Agreement in whole or in part without the prior written consent of DISCO, which consent shall not be unreasonably withheld or unduly delayed. DISCO may withhold its consent to any proposed assignment if the proposed assignee fails to assume the obligations of Applicant under this Agreement in writing.
- b. Assignment by DISCO. The DISCO shall have the right to assign this agreement in whole upon written notification to the Applicant.
- c. Successors. This Agreement shall be binding upon the personal representatives, heirs, successors, and permitted assigns of the respective Parties.

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13.Applicant and DISCO Signature and Seal

IN WITNESS WHEREOF, Applicant and Company have executed this Agreement as of the year and date first set forth above.

Applicant Signature & Date

DISCO's Signature with Seal & Date

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Title

Title

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Witness No.1 (Name & Signature)

Witness No. 1(Name & Signature)

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Witness No. 2 (Name & Signature)

Witness No. 2 (Name & Signature)

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