National Electric Power Regulatory Authority
Islamic Republic of Pakistan

Registrar

NEPRA Tower, Attaturk Avenue (East), G-5/1, Islamabad
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Web: www.nepra.org.pk, E-mail: registrar@nepra.org.pk

No. NEPRA/R/LAG-256/ 2583-89

February 24, 2016

Mrs. Afshan Hamid Mir,
Chief Executive Officer,
Safe Solar Power (Private) Limited,
House 28, Street 24, F-8/2,
Islamabad.

Subject: **Modification-I in Generation Licence No: SPGL/07/2014**
Licence Application No. LAG-256
Safe Solar Power (Private) Limited (SSPPL)

Reference: *Your application vide letter No. Nil, dated October 08, 2015.*

It is intimidated that the Authority has approved "Licensee Proposed Modification" in Generation Licence No. SPGL/07/2014 (issued on September 12, 2014) in respect of Safe Solar Power (Private) Limited (SSPPL), pursuant to Regulation 10(11)(a) of the NEPRA Licensing (Application and Modification Procedure) Regulations 1999.

2. Enclosed please find herewith determination of the Authority in the matter of Licensee Proposed Modification in the Generation Licence of SSPPL along with Modification-I in the Generation Licence No. SPGL/07/2014, as approved by the Authority.

Encl:/As above

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24/2/16

(Iftikhar Ali Khan)

Copy to:

1. Chief Executive Officer, NTDC, 414-WAPDA House, Lahore
2. Chief Operating Officer, CPPA-G, 107-WAPDA House, Lahore
3. Chief Executive Officer, Multan Electric Power Company Limited (MEPCO), WAPDA Colony, Khanewal Road, Multan.
4. Director General, Environment Protection Department, National Hockey Stadium, Ferozpur Road, Lahore.
5. Managing Director, Punjab Power Development Board (PPDB), Central Design Building, Irrigation Secretariat, Old Anarkali, Lahore.
6. Chief Executive Officer, Altemative Energy Development Board (AEDB), 2nd Floor, OPF Building, G-5/2, Islamabad.

National Electric Power Regulatory Authority (NEPRA)

Determination of the Authority in the Matter of Licensee Proposed Modification of Safe Solar Power (Private) Limited

February 16, 2016
Case No. LAG-256

(A). Background

(i). The Authority in terms of Section-15 of the Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997 ("the NEPRA Act") granted a Generation Licence (No. SPGL/07/2014, dated September 12, 2014) to Safe Solar Power (Private) Limited (SSPPL).

(ii). The above mentioned Generation Licence was granted to the SSPPL/the Licensee for setting a 10.2816 MW_P Photo Voltaic (PV) based Generation Facility/Solar Power Plant (SPP)/Solar Farm (SF) to be located at Quaid-e-Azam Solar Park (QASP), Lal Sohanra in Cholistan, District Bahawalpur, in the Province of Punjab.

(B). Communication of Modification

(i). In accordance with Regulation-10 of the NEPRA Licensing (Application & Modification Procedure) Regulations, 1999 ("the Regulations"), SSPPL communicated a Licensee Proposed Modification (LPM) in its above mentioned Generation Licence on October 09, 2015.

(ii). In the "Text of the Proposed Modification", SSPPL submitted that the project is being re-located to Chak No. 139-140, Dharanwala, District Bahalwalnagar in the Province of Punjab instead of QASP. Regarding the "Statement of the Reasons in Support of the Modification", SSPPL submitted that due to the delay in possession of allocated land for its project, it intends to change the location of the Generation Facility/SPP/SF as mentioned above.

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(iii). About the statement of "the Impact on the Tariff", "Quality of Service (QoS)" and "the Performance" by the Licensee of its obligations under the Licence", SSPPL submitted that there will be no adverse impact of the proposed modification on Tariff and QoS. Further, the modification will not have any undesirable impact on its performance/obligations as a Licensee.

(C). Processing of LPM

(i). After completion of all the required information as stipulated under the Regulation-10 (2) and 10 (3) of the Regulations, the Authority accepted the application for further processing under the Regulation-10 (4) of the Regulations.

(ii). In terms of Regulation-10(4)(b) of the Regulations, a notice regarding the LPM was published in one English and one Urdu newspapers on November 05, 2015, informing the general public about the modification and for submitting their views/comments in the matter.

(iii). Apart from the above, separate letters were also sent to various Ministries of the Government of Pakistan (GoP), their attached Departments, representative organizations and Individual Experts, inviting their views and comments on the subject for the assistance of the Authority.

(D). Comments of Stakeholders

(i). In reply to the above, the Authority received comment of four (04) stakeholders. These included Board of Investment (BoI), Mr. Anwar Kamal of Anwar Kamal Law Associates (AKLA), Pakistan Council of Renewable Energy Technologies (PCRET) and Multan Electric Power Company Limited (MEPCO).

(ii). The salient points of the comments offered by the said stakeholders are summarized in the following paragraphs: -

(a). BoI supported the LPM of SSPPL subject to reasonable tariff and completion of all formalities under NEPRA rules &

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regulations;

(b). AKLA opposed allowing modification to SSPPL on the basis that solar power plants have low plant factor and higher tariff. AKLA stated that these plants are non-base load and their technology is undeveloped. AKLA submitted that as they do not meet the Economic Merit Order therefore, cannot be declared as must run Power Plants. AKLA objected allowing these Power Plants to execute long term Energy Purchase Agreements on Take or Pay basis. AKLA requested that NEPRA should disallow the commissioning of these Power Plants. AKLA added that after being declared as Must Run Plants with Take or Pay contracts, these Plants are supplying costlier electricity to NTDC while at the same time cheaper electricity plants are not being operated. AKLA highlighted that cheaper plants which are not being operated to their full capacity, are getting Capacity Payments as well. AKLA urged the Authority that not only the LPM filed by SSPPL be rejected but the Generation Licence and tariff granted to Generation Facilities/SPPs/SFs be cancelled;

(c). PCRET supported the LPM of SSPPL however it stated that it cannot comment on financial and other terms of references of the project;

(d). MEPCO has expressed its no objection to the issuance of LPM subject to determination of Tariff by NEPRA.

(iii). The Authority examined the above comments and observed that BoI and PCRET have supported the LPM in explicit term. Further, MEPCO has also supported the same subject to approval of Tariff by the Authority. Whereas, AKLA has raised various concerns pertaining to setting up of PV based Generation Facilities/SPPs/SFs.

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(iv). On the comments of MEPCO, the Authority observes that SSPPL was already granted a Tariff through determination of the Authority dated April 22, 2014 and May 22, 2014 but the project could not achieve the Financial Close due to various reasons including non-availability of concessional documents etc. However, SSPPL has already decided to approach the Authority for accepting Upfront Tariff announced through Determination dated January 22, 2015. The Authority has accepted/admitted the request of SSPPL and a decision/determination is expected shortly. In view of the said, SSPPL will be getting a tariff determined by the Authority therefore, the observations of MEPCO stand resolved.

(v). Regarding the observations of AKLA, the Authority considers that previously similar comments were offered during proceedings for determining Upfront Generation Tariff for Solar PV Power Plants. The Authority through its determination No. NEPRA/UTS-01/905-907, dated January 22, 2015 addressed all the observations/comments of AKLA. Therefore, the Authority does not find any cogent reason to address the comments of AKLA afresh.

(vi). In view of the said, the Authority considered it appropriate to proceed further with the communicated LPM as stipulated in the Regulations and the NEPRA Licensing (Generation) Rules, 2000 (the Rules).

(E). Approval of LPM

(i). In terms of Regulation-10(5) of the Regulations, the Authority is entitled to modify any licence subject to and in accordance with such further changes as the Authority may deem fit if, in the opinion of the Authority such modification (a). does not adversely affect the performance by the licensee of its obligations; (b). does not cause the Authority to act or acquiesce in any act or omission of the licensee in a manner contrary to the provisions of the NEPRA Act or the rules or regulations made pursuant to the NEPRA Act; (c). is or is likely to be beneficial to the consumers; (d). is reasonably necessary for the licensee to effectively and efficiently perform its obligations under the licence; and (e). is reasonably

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necessary to ensure the continuous, safe and reliable supply of electric power to the consumers keeping in view the financial and technical viability of the licensee.

(ii). The Authority has observed that as per the original scheme in the already granted Generation Licence (No. SPGL/07/2014, dated September 12, 2014), SSPPL planned for setting up its PV based Generation Facility/SPP/SF at QASP, Lal Suhanara in Cholistan District Bahawalpur in the Province of Punjab. However, due to issues relating to allocation of land, the company has decided to relocate the project to Chak 139-140, Dharanwala, District Bahalwalnagar in the Province of Punjab. The Authority considers that proposed change of location will not have any adverse affect on the performance of the Licensee/SSPPL of its obligations. The Authority considers that the LPM is not contrary to the provisions of the NEPRA Act or the Rules and Regulations made pursuant to the Act as provisions of all the Rules and Regulations have been strictly followed in processing of the communicated LPM. The modification will be beneficial to the consumers of MEPCO as the consumers will be getting RE based electric power. Further, the Authority considers that with the proposed modification, the Licensee/SSPPL will perform its obligations efficiently and effectively. The Authority also considers that the modification is reasonably necessary to ensure the continuous, safe and reliable supply of electric power to the consumers keeping in view the financial and technical viability of the Licensee/SSPPL. The Authority has also observed that the Licensee/SSPPL has duly carried out the required IEE/EIA for the Project based on the new location for which EPA Punjab has granted the necessary approval in the matter. Further, to the said, MEPCO has also approved the Interconnection Study of the project based on the new location.

(iii). About the Impact on Tariff of the communicated LPM, for the reasons explained at Para D(iv) above, the change in location will not have any impact on Tariff. In fact, the Licensee/SSPPL is planning to opt for a new up-front tariff which is significantly lower than the previous one. Therefore, the proposed change in site will not have any negative impact on Tariff. The Authority is satisfied that the Licensee/SSPPL has complied with all the requirements of the Regulations

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pertaining to the modification. Accordingly, the Authority in terms of Regulation-10(11)(a) of the Regulations approves the communicated LPM without any changes. Accordingly, the already granted Generation Licence (No. SPGL/07/2014, dated September 12, 2014) in the name of SSPPL is hereby modified. The changes in "Face Sheet", "Articles of the Generation Licence", "Schedule-I" and "Schedule-II" of the Generation Licence are attached as annexure to this determination. The grant of the LPM will be subject to the provisions contained in the NEPRA Act, relevant rules framed there under, terms & conditions of the Generation Licence and other applicable documents.

Authority

Syed Masood-ul-Hassan Naqvi
(Member)

18/2/16.

Himayatullah Khan
(Member)

22.2.16.

Khawaja Muhammad Naeem
(Member)

– Away –

Maj. (R) Haroon Rashid
(Member)/(Vice Chairman)

22/2/16

Brig. (R) Tariq Saddozai
(Chairman)

23/2/16

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24-2-16

National Electric Power Regulatory Authority (NEPRA)
Islamabad – Pakistan

GENERATION LICENCE

No. SPGL/07/2014

In exercise of the Powers conferred upon the National Electric Power Regulatory Authority (NEPRA) under Section-26 of the Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997, the Authority hereby modifies the Generation Licence granted to SAFE SOLAR POWER (PRIVATE) LIMITED [illegible] 29, 2040, to the extent [illegible] under:

(i). Changes [illegible] of [illegible] Licence attached as Revised/Modified Articles of Generation Licence;

(ii). Changes in Schedule-I attached as Revised/Modified Schedule-I; and

(iii). Changes in Schedule-II attached as Revised/Modified Schedule-II.

This **Modification-I** is given under my hand on this [illegible] day of **February Two Thousand & Sixteen.**

Registrar

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Article-1
Definitions

1.1 In this Licence

(a). "Act" means "the Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997";

(b). "Applicable Documents" have the same meaning as defined in the Rules;

(c). "Authority" means "the National Electric Power Regulatory Authority constituted under Section-3 of the Act";

(d). "Bus Bar" means a system of conductors in the generation facility/Solar Farm of the Licensee on which the electric power of all the photovoltaic cells is collected for supplying to the Power Purchaser;

(e). "Carbon Credits" mean the amount of Carbon Dioxide (CO_2) and other greenhouse gases not produced as a result of generation of energy by the generation facility/Solar Farm and other environmental air quality credits and related emissions reduction credits or benefits (economic or otherwise) related to the generation of energy by the generation facility/Solar Farm, which are available or can be obtained in relation to the generation facility/Solar Farm after the COD;

(f). "Commercial Operations Date (COD)" means the Day immediately following the date on which the generation facility/Solar Farm of the Licensee is Commissioned;

(g). "CPPA-G" means "Central Power Purchasing Agency (Guarantee) Limited" or any other entity created for the like purpose;

(h). "Distribution Code" means the distribution code prepared by MEPCO and approved by the Authority, as it may be revised from time to time by MEPCO with any necessary approval by the Authority;

(i). "Energy Purchase Agreement" means the energy purchase agreement, entered or to be entered into by and between the Power Purchaser and the Licensee, for the purchase and sale of electric energy generated by the generation facility/Solar Farm, as may be amended by the parties thereto from time to time;

(j). "Grid Code" means the grid code prepared by NTDC and approved by the Authority, as it may be revised from time to time by NTDC with the necessary approval of the Authority;

(k). "IEC" means "International Electrotechnical Commission" or any other entity created for the like purpose and its successors or permitted assigns;

(l). "IEEE" means the Institute of Electrical and Electronics Engineers and its successors or permitted assigns;

(m). "Licensee" means "Safe Solar Power (Private) Limited" and its successors or permitted assigns;

(n). "Law" means the Act, relevant rules and regulations made there under and all the Applicable Documents;

(o). "MEPCO" means "Multan Electric Power Company Limited" and its successors or permitted assigns;

(p). "NTDC" means National Transmission and Despatch Company Limited and its successors or permitted assigns;

(q). "Policy" means "The Policy for Development of Renewable Energy for Power Generation, 2006 of Government of Pakistan" as amended from time to time;

(r). "Power Purchaser" means the CPPA-G purchasing power on behalf of all XW-DISCOs or MEPCO;

(s). "Regulations" mean "the the National Electric Power Regulatory Authority Licensing (Application & Modification Procedure) Regulations, 1999 as amended or replaced from time to time",

(t). "Rules" mean "the National Electric Power Regulatory Authority Licensing (Generation) Rules, 2000",

(u). "Solar Farm" means "a cluster of photovoltaic cells in the same location used for production of electric power";

(v). "XW DISCO" means "an Ex-WAPDA distribution company engaged in the distribution of electric power".

1.2 Words and expressions used but not defined herein bear the meaning given thereto in the Act or Rules and regulations issued under the Act.

Article-2
Application of Law

This Licence is issued subject to the provisions of the Law, as amended or replaced from time to time.

Article-3
Generation Facilities

3.1 The location, size (capacity in MW), technology, interconnection arrangements, technical limits, technical and functional specifications and other

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details specific to the generation facility/Solar Farm of the Licensee are set out in Schedule-I of this Licence.

3.2 The net capacity of the generation facility/Solar Farm of the Licensee is set out in Schedule-II hereto.

3.3 The Licensee shall provide the final arrangement, technical and financial specifications and other specific details pertaining to its generation facility/Solar Farm before its commissioning.

Article-4
Term of Licence

4.1 This Licence is valid from the date of its issuance (i e September 12, 2014) and will remain enforce upto its expiry i.e. November 29, 2040

4.2 Unless suspended or revoked earlier, the Licensee may apply for renewal of the Licence within ninety (90) days prior to the expiry of the term of the Licence, as stipulated in the Regulations.

Article-5
Licence fee

After the grant of the Generation Licence, the Licensee shall pay to the Authority the Licence fee in the amount and manner and at the time set out in the National Electric Power Regulatory Authority (Fees) Rules, 2002.

Article-6
Tariff

The Licensee shall charge only such tariff which has been determined, approved or specified by the Authority.

Article-7
Competitive Trading Arrangement

7.1 The Licensee shall participate in such manner as may be directed by the Authority from time to time for development of a Competitive Trading Arrangement. The Licensee shall in good faith work towards implementation and operation of the

aforesaid Competitive Trading Arrangement in the manner and time period specified by the Authority. Provided that any such participation shall be subject to any contract entered into between the Licensee and another party with the approval of the Authority.

7.2 Any variation or modification in the above-mentioned contracts for allowing the parties thereto to participate wholly or partially in the Competitive Trading Arrangement shall be subject to mutual agreement of the parties thereto and such terms and conditions as may be approved by the Authority.

Article-8
Maintenance of Records

For the purpose of sub-rule (1) of Rule-19 of the Rules, copies of records and data shall be retained in standard and electronic form and all such records and data shall, subject to just claims of confidentiality, be accessible by authorized officers of the Authority.

Article-9
Compliance with Performance Standards

The Licensee shall comply with the relevant provisions of the National Electric Power Regulatory Authority Performance Standards (Generation) Rules 2009 as amended from time to time.

Article-10
Compliance with Environmental Standards

The Licensee shall comply with the environmental standards as may be prescribed by the relevant competent authority from time to time.

Article-11
Power off take Point and Voltage

The Licensee shall deliver power to the Power Purchaser at the outgoing Bus Bar of its grid station. The up-gradation (step up) of generation voltage up to required dispersal voltage level will be the responsibility of the Licensee.

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Article-12
Performance Data of Generation Facility/Solar Farm

The Licensee shall install properly calibrated automatic computerized solar radiation recording device(s) and a compatible communication/SCADA system both at its generation facility/Solar Farm and control room of the Power Purchaser for transmission of solar radiation data and power output data to the control room of the Power Purchaser for recording of data.

Article-13
Provision of Information

13.1 The obligation of the Licensee to provide information to the Authority shall be in accordance with Section-44 of the Act.

13.2 In addition to 13.1 above, the Licensee shall supply information to the Power Purchaser regarding solar data specific to the generation facility of the Licensee and other related information on a regular basis and in a manner required by the Power Purchaser.

13.3 The Licensee shall be subject to such penalties as may be specified in the relevant rules made by the Authority for failure to furnish such information as may be required from time to time by the Authority and which is or ought to be or has been in the control or possession of the Licensee.

Article-14
Emissions Trading /Carbon Credits

The Licensee shall process and obtain emissions/Carbon Credits expeditiously and share/credit the proceeds with the Power Purchaser as per the Policy.

Article-15
Design & Manufacturing Standards

Solar photovoltaic cells shall be designed, manufactured and tested according to the latest IEC, IEEE or any other equivalent standards. All plant and equipment shall be unused and brand new.

Article-16
Power Curve

The power curve for the individual solar photovoltaic cell provided by the manufacturer and as mentioned in this Generation Licence shall form the basis in determining the cumulative power curve of generation facility/Solar Farm.

Revised/Modified
SCHEDULE-I

The Location, Size (i.e. Capacity in MW), Type of Technology, Interconnection Arrangements, Technical Limits, Technical/Functional Specifications and other details specific to the Generation Facilities of the Licensee are described in this Schedule.

Location of the Generation Facility/Solar Power Plant/Solar Farm

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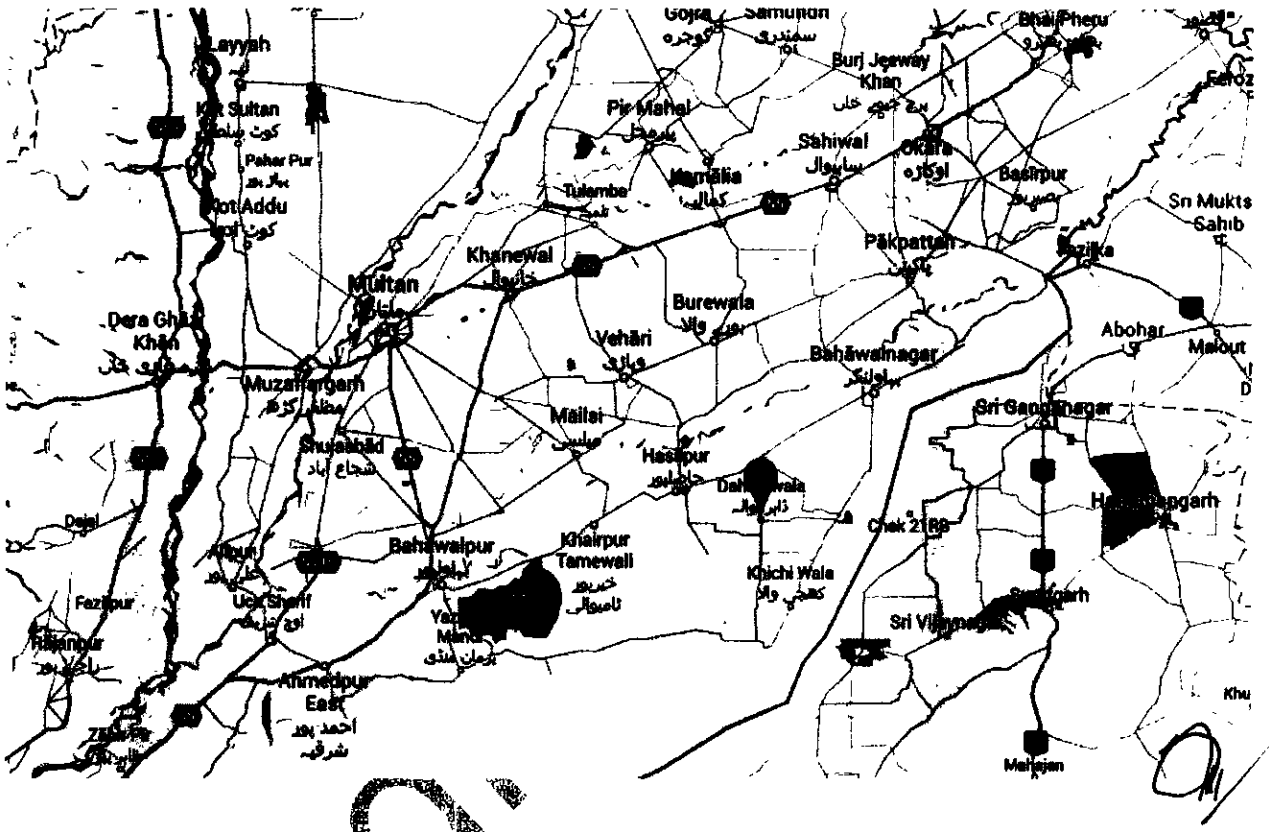
Access of the Generation Facility/Solar Power Plant/Solar Farm



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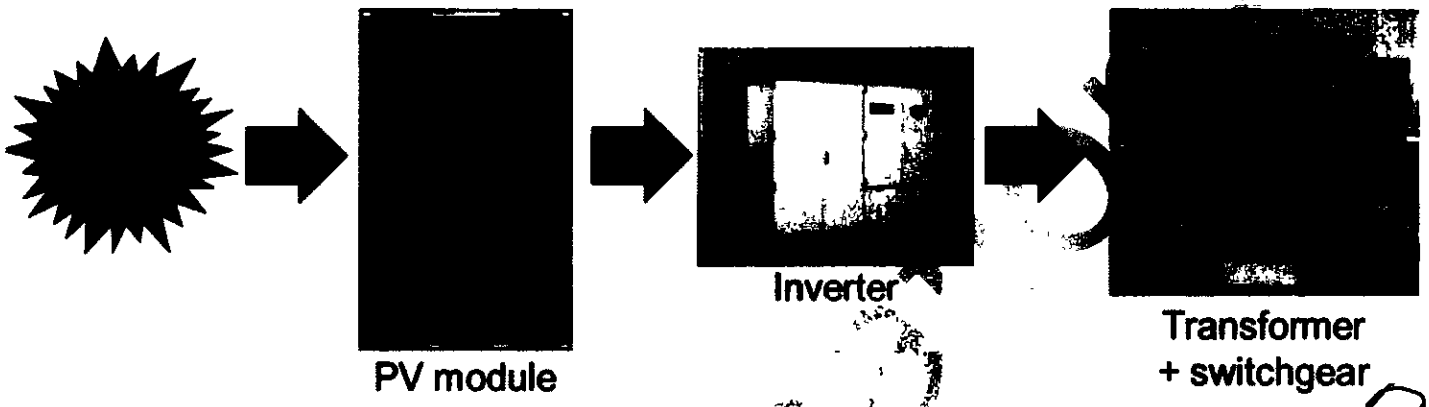
Location Coordinates of the Generation Facility/Solar Power Plant/Solar Farm

Node	Longitude (East)	Latitude (North)
1	29°36'07.60"	73°47'47.91"

Process Flow Diagram of the Generation Facility/Solar Power Plant/Solar Farm



Modified

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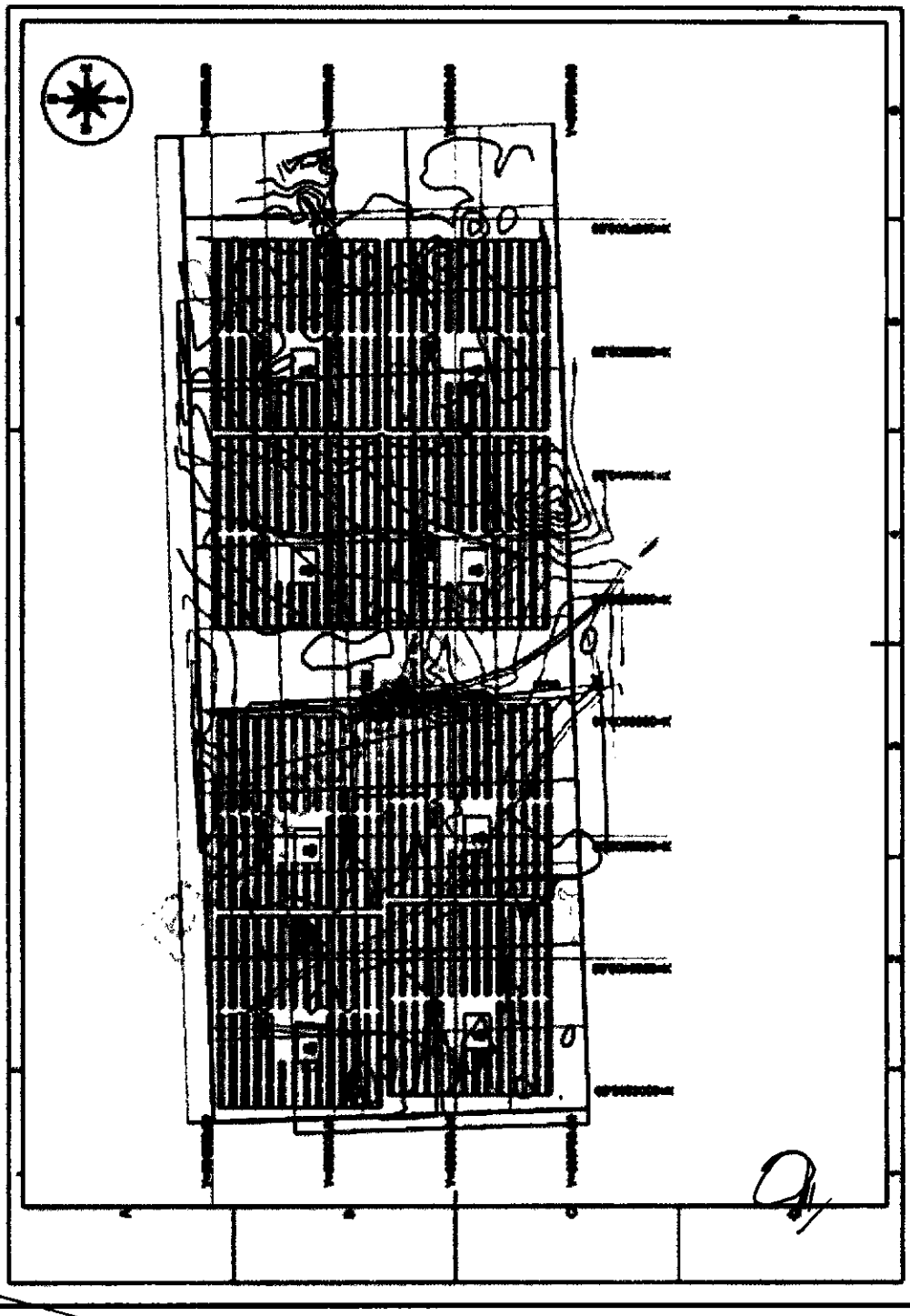
Block Diagram of the Generation Facility/Solar Power Plant/Solar Farm



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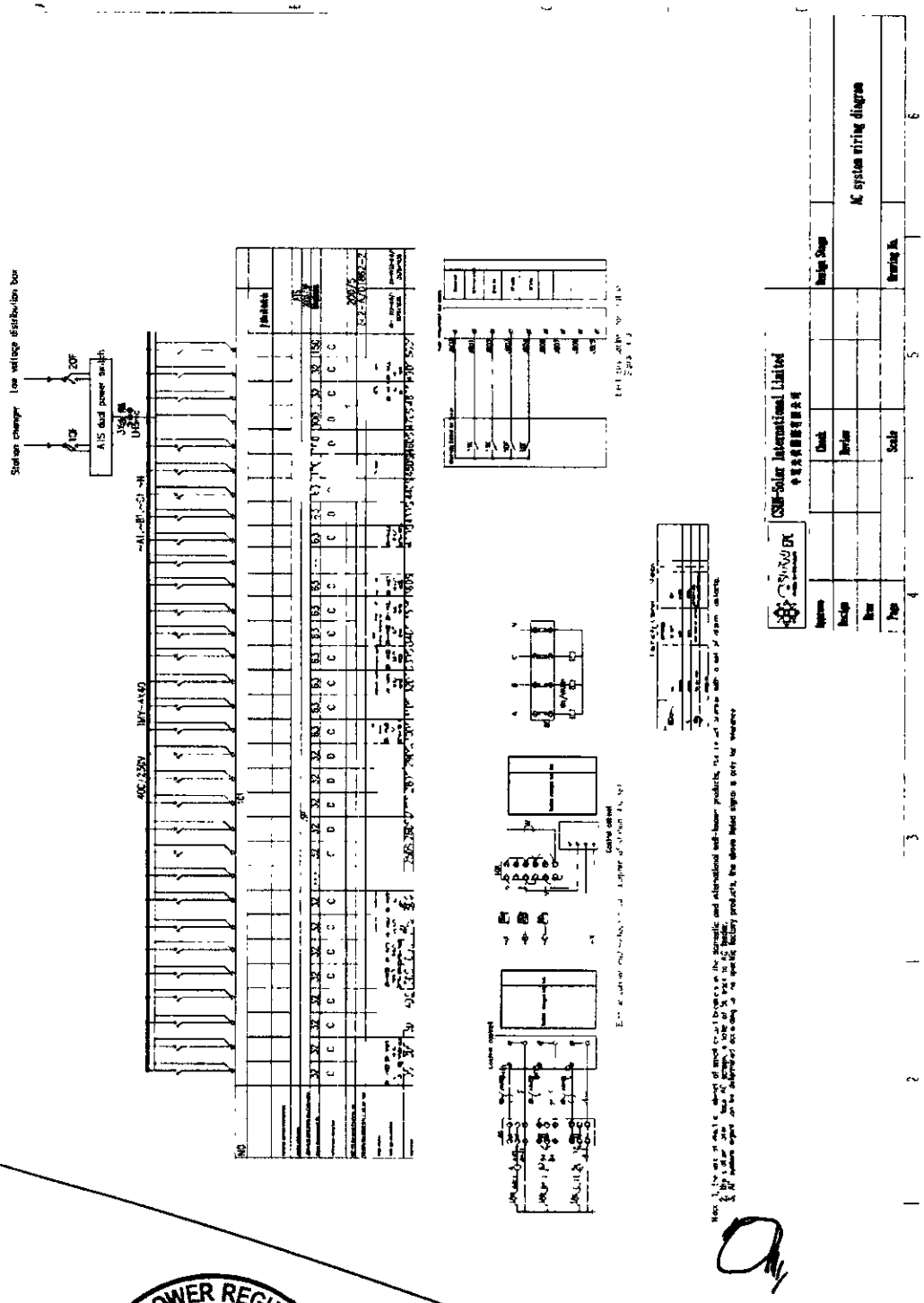
Wiring Diagram of the Generation Facility/Solar Power Plant/Solar Farm



Interconnection Arrangement/ Transmission Facilities for Dispersal of Electric Power from the Generation Facility/Solar Farm/Solar Power Plant

The electric power generated from the Generation Facility/Solar Farm/Solar Power Plant of the Licensee/Safe Solar Power (Private) Limited (SSPPL) shall be dispersed to the load center of MEPCO.

(2). The proposed Interconnection/dispersal arrangement for the project will be consisting of two (02) Feeders of 11 KV voltage, using ACSR OSPREY Conductor connecting the Generation Facility/Solar Farm/Solar Power Plant with 132 KV Dharanwala Grid Station located in the service area of MEPCO. In this regard, the Licensee shall adhere to the provisions of the Distribution Code/Grid Code to the extent applicable.

(3). Any change in the above Interconnection Arrangement/Transmission Facilities duly agreed by SSPPL, CPPA-G, NTDC and MEPCO, shall be communicated to the Authority in due course of time.

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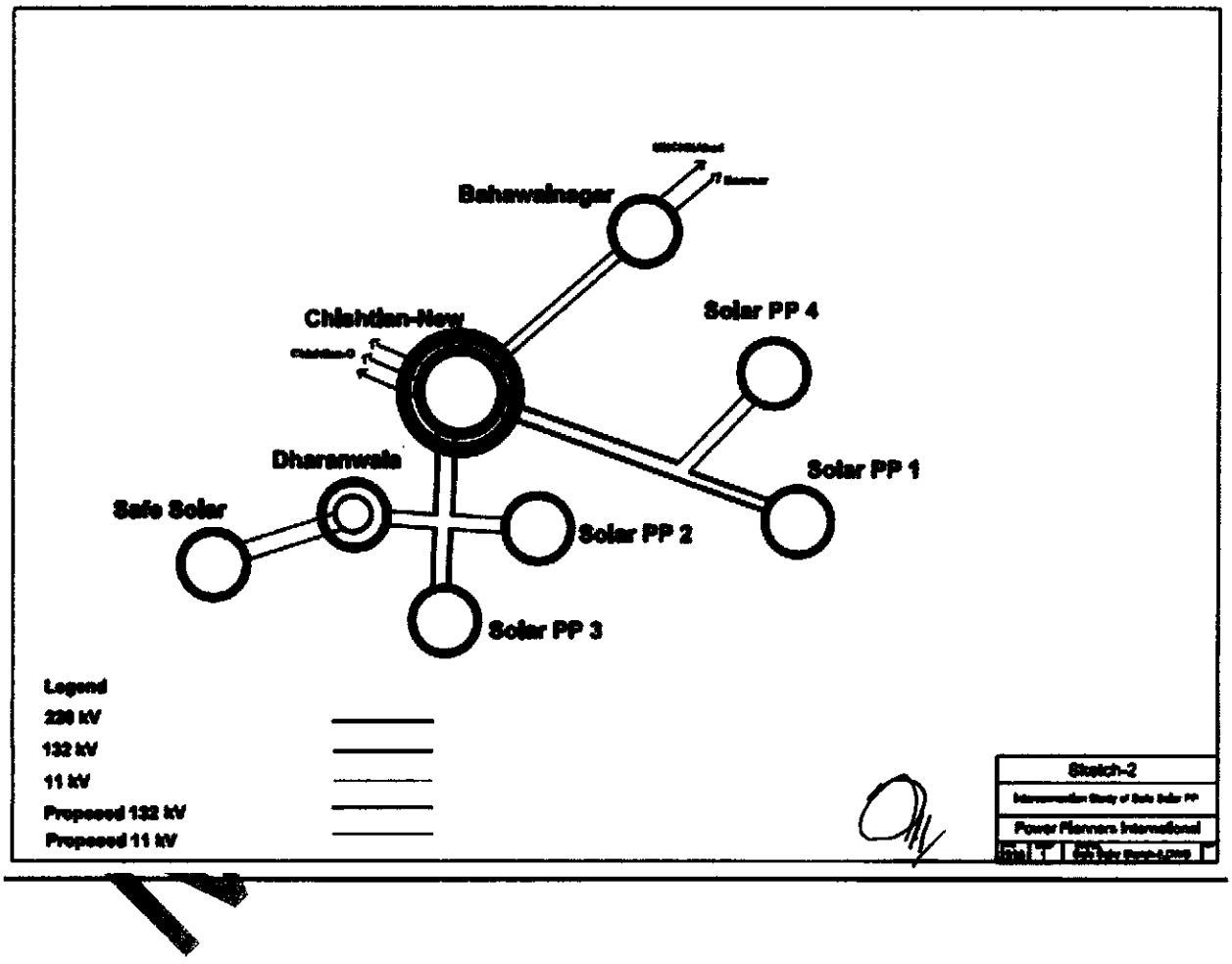
Schematic Diagram for Interconnection Arrangement/ Transmission Facilities for Dispersal of Electric Power from the Generation Facility/Solar Farm/Solar Power Plant



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Detail of Generation Facility/Solar Farm/ Solar Power Plant

(A). General Information

(i).	Name of the Company/Licensee	Safe Solar Power (Pvt.) Limited
(ii).	Registered/Business Office of the Company	House No.28, Street No.24, Sector F-8/2, Islamabad
(iii).	Location of the Generation Facility	Dharanwala, Bahawalnagar in the Province of Punjab
(iv).	Type of Generation Facility	Solar Photovoltaic (PV).

(B). Solar Power Generation Technology & Capacity

(i).	Type of Technology	Poly Crystalline Photovoltaic (PV) Cell
(ii).	System Type	Grid Connected
(iii).	Installed Capacity of Solar (MW)	≈10.2816 MW_p

(C). Technical Details of Equipment

(a).	**Solar Panels – PV Modules**	
(i).	Type of Module	Poly Crystalline PV modules CSUN 310-72P
(ii).	Type of Cell	Poly Crystalline
(iii).	Dimension of each Module	1956mm x 990mm x 50mm
(iv).	No. of Panel/ Modules	33166

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(v).	Total Module Area	64,251m^2
(vi).	Total Land Area Used	232,649 M^2
(vii).	Frame of Panel	Aluminum
(viii).	Weight of one Module	23.8Kg
(ix).	Module Output Warranty	310W$_P$/25 years Warranty for depreciation not more than 0.7 %
(x).	Number of Solar Cells in each module	72 Cells
(xi).	Efficiency of module	16.1%
(xii).	Environment Protection System	Encapsulation and sealing arrangements for protection from environment.
(xiii).	Maximum Power (P_{max})	310W$_P$
(xiv).	Voltage @ P_{max}	36.1V
(xv).	Current @ P_{max}	8.58A
(xvi).	Open circuit voltage (V_{oc})	44.8V
(xvii).	Short circuit current (I_{sc})	9.04 A
(xviii).	Maximum system open Circuit Voltage	1000V
(b).	**PV Array**	
(i)	No. of Sub-arrays	165.8
(ii).	Modules in a string	23
(iii).	Total No. of Strings	1442
(iv).	Modules in Sub-Array	200
(v).	Total Modules	33,166
(c).	**PV Capacity**	

Modification-I

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(i).	Total	≈10.2816 MWp	
(d).	**Inverters**		
(i).	Capacity of each unit	1260 KW	
(ii).	Inverter Model	SG1260T	
(iii).	Manufacturer	Sungrow	
(iv).	Rated Input Voltage	500V	
(v).	Input Operating Voltage Range	450-850V	
(vi).	Number of Inverters	8 units	
(vii).	Total Power	10080 kW AC	
(viii).	Efficiency	97%	
(ix).	Max. Allowable Input voltage	1000V	
(x).	Max. Current	3104A	
(xi).	Max. Power Point Tracking Range	0~1422 KW	
(xii).	Output electrical system	AC	
(xiii).	Rated Output Voltage	315V	
(xiv).	Rated Frequency	50 Hz	
(xv).	Power Factor	Adjustable 0.9 Induction to 0.9 Capacitance	
(xvi)	Power Control	MPP Tracker	
(xvii).	Environmental Enclosures	Operating Temperature Range	-25° C to 62° C
		Relative Humidity	15% - 95% non-condensing
		Audible Noise	<61 dB(A)
		Operating Elevation	<2000 m

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		Warranty Period	5 Years
(xviii).	Grid Operation Protection	(a).	DC circuit breaker
		(b).	AC circuit breaker
		(c).	DC overvoltage protection
		(d).	Lightning protection level III
		(e).	Grid monitoring
		(f).	Insulation monitoring
		(g).	Anti-Islanding
(e).	**<u>Junction Boxes Installed and fixed on main steel structure in Array Yard.</u>**		
(i).	Number of Junction Box units	128	
(ii).	Input circuits in each box	16	
(iii).	Max. Input current for each circuit	10A	
(iv).	Max. Input voltage	1000 V	
(v).	Power at each box	99.2 KW	
(vi).	Protection Level	IP 65	
(vii).	Over-Current protection	Fuse	
(viii).	Output switch	125A, 1000V disconnector	
(ix)	Surge protection	1000V, Type II	
(x).	Purpose of Junction Box	(a).	To provide Isolation of Sub Arrays
		(b).	In case of fault provide arrangement for disconnection of each of the Sub-Arrays or Strings.
		(c).	To ensure safety of the electric works in the Solar Module Arrays

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		(d)	Protection from back flow of short circuit current through use of semi-diodes.
		(e)	To combine groups of strings into Sub-Arrays that will be wired into the Inverter
(f).	**Data Collecting System**		
(i).	Weather Data	(a).	data collected for Direct Solar Radiation (W/m^2) using two LI-COR Pyrano meter installed with the NRG Symphonies Plu3 Data Logger at the site
		(b).	data collected for Temperature (0°C) using NRG 110s Sensor attached to the Solar Resource Assessment Equipment
		(c).	data collected for Rain in mm/m^2 using NRG Nova Lynx Rain Sensor attached to the Solar Resource Assessment Equipment
		(d).	data collected for Wind Speed (ms^{-1}) using CSUN Wind Speed Sensor attached to the Solar Resource Assessment Equipment
		(e).	data collected for Wind Direction (deg) using NRG 200P Wind Vane Sensor attached to the Solar Resource Assessment Equipment

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(ii).	System Data	(a).	DC input voltage (V), Current (A) of each module, string, sub array &Inverter
		(b).	Total Sub Array Power Generated and Inverter Power
		(c).	AC output voltage (V) and current (A) of each inverter (Phase, total)
		(d).	AC Output power (kW) and Energy (kwh) of each inverter
		(e).	Frequency (Hz)
		(f).	Power Factor (PF)
		(g).	Temperature inside inverter station
(g).	**Isolating Transformer**		
(i).	Rating	11KV/0.315-0.315KV 1260/630-630KVA	
(ii).	Type of Transformer	Box Type	
(iii).	Input voltage	3150V	
(iv).	Output Voltage	11kV	
(v).	Purpose of Transformer	Step Up Voltage, Galvanic Isolation and Eliminate DC Current Injection	
(vi).	Efficiency	98.89%	
(h).	**Outdoor Cubicle Control Room**		
(i).	Data record	Data Logging using software and hardware provided by CSUN China SMA Germany	
(ii).	Control Room System	Computerized Data Monitoring and communication systems using latest Satellite Technology	

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(iii)	Control room System Detail	Interfacing, Hardware and Software, suitable for such Multi-MW systems
(i).	**Mounting Structure**	
(i).	Structure	HDG Steel
(ii).	Tilt of Array Frame	26°
(iii).	Array Specification	Designed and Certified for Wind Speed and Seismic Requirements
(j).	**Foundation Pillars**	
(i).	No. of Foundations	14930
(ii).	Foundation Structure	Ground Screw

(D). Other Details

(i).	COD of the Generation Facility/Solar Power Plant/Solar Farm (Anticipated)	June 30, 2016
(ii).	Expected Useful Life of the Generation Facility/Solar Power Plant/Solar Farm from the COD	25 Years

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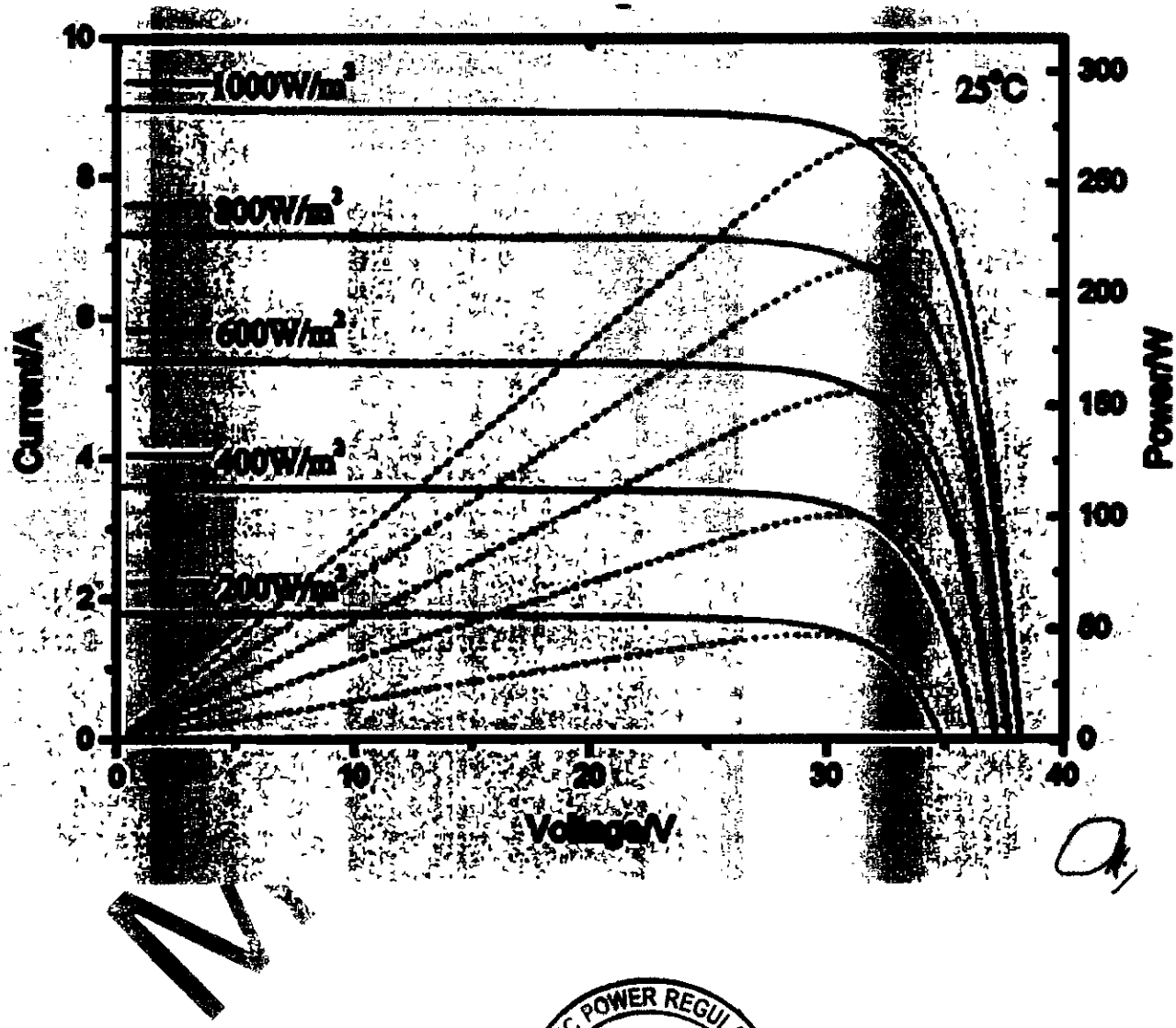
V-I Curve of Solar Cell at 25° C



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SCHEDULE-II

The Total Installed Gross ISO Capacity of the Generation Facility/Power Plant/Solar Plant (MW), Total Annual Full Load (Hours), Average Sun Availability, Total Gross Generation of the Generation Facility/Solar Farm (in kWh), Annual Energy Generation (25 years Equivalent Net Annual Production-AEP) KWh and Net Capacity Factor of the Generation Facility/Power Plant/Solar Farm of Licensee is given in this Schedule

SCHEDULE-II

(1).	Total PV Installed Capacity of Generation Facility	≈10.2816 MW
(2).	Average Sun Hour Availability/Day (Irradiation on Inclined Surface)	5.01 Hrs
(3).	Days per Year	365
(4).	PV Plant Generating Capacity Annually (As Per Simulation)	15,759 MWh
(5).	Expected Total Generation in 25 years Life Span	393,975 MWh
(6).	Generation per Year from plant keeping 24 Hours Working	10.28 x 24 x 365 = 90, 052.8 MWh
(7)	Net Capacity Factor (4/6)	17.5%

Note

All the above figures are indicative as provided by the Licensee. The Net energy available to the Power Purchaser for dispatch will be determined through procedures contained in the Energy Purchase Agreement.

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