National Electric Power Regulatory Authority
Islamic Republic of Pakistan

Registrar

NEPRA Tower, Ataturk Avenue (East) G-5/1, Islamabad
Ph: +92-51-9206500, Fax: +92-51-2600021
Web: www.nepra.org.pk, E-mail: info@nepra.org.pk

No. NEPRA/R/LAG-252/ 7212-17

June 26, 2014

Mr. Najam Ahmed Shah
Chief Executive Officer
Quaid-e-Azam Solar Power (Pvt.) Limited
3rd Floor, 83-A, E/1,
Main Boulevard, Gulberg III,
Lahore

Subject: **Generation Licence No. SPGL/04/2014**
Licence Application No. LAG-252
Quaid-e-Azam Solar Power (Private) Limited

Reference: *Your letter No. QAS-14/04/25-03, dated April 23, 2014*

Enclosed please find herewith Determination of the Authority in the matter of Generation Licence Application of Quaid-e-Azam Solar Power (Private) Limited (QSPPL) along with Generation Licence No. SPGL/04/2014 annexed to this determination granted by the National Electric Power Regulatory Authority to QSPPL for its 100.00 MW Solar generation facility located at Lal Sohanra in Cholistan, District Bahawalpur, Punjab, pursuant to Section 15 of the Regulation of Generation, Transmission and Distribution of Electric Power Act (XL of 1997).

2. Please quote above mentioned Generation Licence No. for future correspondence.

Enclosure: **Generation Licence (SPGL/04/2014)**

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(Syed Safeer Hussain)

Copy to:

1. Managing Director, Punjab Power Development Board, Government of Punjab, 1st Floor, Central Design Building, Irrigation Secretariat, old Anarkali, Lahore.
2. Chief Executive Officer, NTDC, 414-WAPDA House, Lahore
3. Chief Operating Officer, CPPA, 107-WAPDA House, Lahore
4. Chief Executive Officer, Multan Electric Power Company (MECO), MEPCO Complex, WAPDA Colony, Khanewal Road, Multan
5. Director General, Pakistan Environmental Protection Agency, Plot No. 41, Street No. 6, H-8/2, Islamabad.

National Electric Power Regulatory Authority (NEPRA)

Determination of the Authority in the Matter of Generation Licence Application of Quaid-E-Azam Solar Power (Pvt.) Limited

June 20, 2014
Case No. LAG-252

(A). Background

(i). Punjab Power Development Board (PPDB) issued a Letter of Interest (LoI) on February 17, 2014 in favor of Quaid-e-Azam Solar Power (Pvt.) Limited (QSPPL), for the development of a 100.00 MW Photo Voltaic (PV) Power Generation Project/Solar Power Plant/Generation Facility to be located at Quaid-e-Azam Solar Park, District Bahawalpur in the Province of Punjab.

(ii). According to the terms and conditions of the LoI, the QSPPL carried out a detailed Feasibility Study (FS) for the project through different consultants and submitted the same to PPDB for its approval. Further, QSPPL decided approaching the Authority for the grant of Generation Licence.

(B). Filing of Generation Licence Application

(i). In accordance with Section 15 of Regulation of Generation, Transmission and Distribution of Electric Power Act 1997 (the NEPRA Act), QSPPL filed an application on April 28, 2014, requesting for the grant of Generation Licence.

(ii). The Registrar examined the application to confirm its compliance with the NEPRA Licensing (Application and Modification Procedure) Regulations, 1999 (the "Regulations"). The Registrar observed that the application of QSPPL was not compliant with the provisions of the Regulations. Accordingly, QSPPL was directed

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for submitting the missing information. QSPPL submitted the missing information on May 13, 2014.

(iii). After completion of the missing information as required under the Regulations, the Authority admitted the application under Regulation 7 of the Regulations on May 21, 2014 for consideration of grant of a Generation Licence. The Authority approved the draft of the Advertisement/Notice of Admission (NoA) to be published in daily newspapers, for informing and seeking comments of the general public as stipulated in Regulation 8 of the Regulations. The Authority also approved the list of interested/affected parties for inviting comments or otherwise assisting the Authority in the matter as stipulated in Regulation 9(2) of the Regulations.

(iv). Accordingly, Advertisement/NoA was published in one Urdu and one English National Newspaper on May 22, 2014. Further, separate notices were also sent to Individual Experts/Government Ministries/Department and Representative Organizations etc. on May 26, 2014 for submitting their views/comments in the matter for the assistance of the Authority.

(C). Comments of Stakeholders

(i). In reply to the above, the Authority received comments from three (03) stakeholders. These included Gresham's Eastern (Private) Limited (GEPL), Pakistan Council of Renewable Energy Technologies (PCoRET) of Ministry of Science and Technology Government of Pakistan (MoS&T) and Central Power Purchasing Agency (CPPA) of National Transmission and Despatch Company Limited (NTDC).

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

(a). GEPL commented that the 250 Watts per panel Polycrystalline would work between 5% to 15% efficiency, when clean. Has a

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dust repellent film been used on the panels to provide 12 month clean surface of the solar panel? Has cooling of the Solar Panels been provided as otherwise in 55°C temperature, the peak efficiency of the panel would drop to no more than 10%. If storage batteries were included U.S. $ 1500 per Kw_e would be a right figure for an EPC Job for the reason (a). Solar Panel Cost U.S. $ 500/kw_e, (b). Inverter system (U.S. $ 300/kw_e), (c). Film cost (U.S. $ 20/kwe), (d). Civil works (U.S. $ 50/kw_e), (e). Cabling Costs (U.S. $ 80/kw_e) & EPC (U.S. $ 50/kw_e). The CAPEX Cost increases the cost per Kw_e - as well as the calculation of the rate of return becomes flawed. Many installations have failed in Pakistan due to efficiency factor. The whole project must be appraised for Environmental Impact Assessment Study. The technical and commercial proposal must be vetted by an International Third Party such as SGS/ German Lloyds;

(b). PCoRET remarked that it had always supported various solar power plants being installed. However, prior to giving any comments, PCoRET needs explanation about one of the parameter shown in Plant Details "Net Capacity Factor 18.2%". Is this figure of 18.2% is about the efficiency of the PV Polycrystalline Modules or something else?

(c). CPPA appreciated the proposal of QSPPL for the setting up a Solar Power Plant as it would be based on Renewable Energy (RE) resource and would be beneficial to the customers as well as society at large. CPPA submitted that the concerned DISCO for the project is MEPCO. The power plant site is located in the vicinity of 132 kV S/C Bahawalpur - Lal Suhanra within the area of MEPCO. The project/power plant of QSPPL would be connected by a 132 kV D/C transmission line approx. 4 km long on Rail conductor for looping In-Out of the proposed 132 kV

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Bahawalpur - Lal Suhanra Transmission Line. CPPA, supported the grant of Generation Licence to QSPPL subject to fulfilling the regulatory and policy requirements. Further, CPPA clarified that QSPPL would have to ensure that its Power Plant would comply with the latest version of Grid Code approved by NEPRA.

(iii). The perspective of QSPPL on the aforesaid position of GEPL, PCoRET and CPPA was sought. In its rejoinder, to the observations of the GEPL, it was submitted that the PV panels selected for the project would be of JA Solar which is one of the biggest solar panel manufacturer. The Panels have an anti-static and anti-soiling surface which does not attract sand/dust. Furthermore, regular cleaning of the PV Panels would be scheduled during the Operation and Maintenance (O&M) period to reduce the soiling losses. It was clarified that the highest temperature ever recorded in Pakistan is 53.5°C which was recorded in Mohenjo-Daro, in the Province of Sindh on May 26, 2010. The figure of 55°C temperature is overstated. The drop in efficiency due to temperature depends on number of factors such as wind speed and heat loss factor of the panel. Moreover, in our case the EPC and O&M Contractor has guaranteed the Performance Ratio of 80.2% and in order to ensure it, QSPPL has built in Liquated Damages in the EPC and O&M Agreements. QSPPL clarified that having a battery backup for a 100 MW PV plant is very impractical as battery banks need to be changed after every 2 to 3 years depending on the number of deep-cycle of the battery chosen, also O&M cost would increase significantly. Furthermore, as a global convention and international practice the solar plants at the utility level are not designed with backup battery bank. The electricity produced by 100.00 MW PV Plant of QSPPL would be instantaneously evacuated to the national grid. QSPPL submitted that the Initial Environment Examination was conducted by the ECSP (an in-house consultant of QSPPL). Environmental Protection Agency, Punjab, accorded approval for construction phase under Section 12(2)(a) of PEP Act, 1997. In reply to the said rejoinder, GEPL confirmed its no objection for the grant of Generation Licence to QSPPL but raised certain queries pertaining to the EPC Cost the Project. The Authority observed that the current application pertained to the grant of the Generation Licence only.

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Whereas, the Authority intends initiating suo-motto proceedings for the determining of tariff for QSPPL. Therefore, the Authority decided that the observations GEPL for the EPC Cost would be duly considered at the appropriate time during the proceedings for Tariff of QSPPL.

(iv). About the comments of PCoRET, it was submitted that the Capacity Factor is the ratio of the net electricity generated, for the time considered to the energy that could have been generated at continuous full-power operation during the same period. The capacity factor has been taken as the ratio of simulated production of power i.e. ac power after considering all losses divided by the theoretical full capacity production throughout the year i.e. the peak production of the plant for the whole year including day and night hours. This method is universally acceptable and used for utility scale solar generation plants and is also recognized by NEPRA. After the submitted clarification, PCoRET expressed its no objection for the Project

(v). Regarding the comments of CPPA/NTDC, it was reiterated that Grid Code would be complied with as an applicable document. QSPPL clarified that a 132-kV S/C Transmission line already exists across the road adjacent to its project of 100-MW. The site of proposed substation for connecting the project for evacuation of power.

(vi). The Authority considered the comments of the stakeholders and the rejoinder filed by QSPPL in its Regulatory Meeting (RM-14-391), held on June 11, 2014 and found the same appropriate. Accordingly, the Authority decided to process the application of QSPPL for the grant of Generation Licence in terms of the Regulations and NEPRA Licensing (Generation) Rules 2000 (the Rules).

(D). Grant of Generation Licence

(i). Energy, especially Electric Power/Electricity is considered synonymous for the Economy of any Country as blood for the human body. The sustainable and

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affordable energy is a key prerequisite for socio-economic development of any Country.

(ii). The Various Studies on the subject have proved that the Economic Growth of any Country is directly linked with the availability of safe, secure, reliable and cheaper supply of electricity. In view of the said reasons, the Authority is of the considered opinion that for sustainable development, all indigenous power generation resources including various RE resources (i.e. Hydel, Wind, Bio Gas, Bio Mass and Solar) must be developed on priority basis.

(iii). The Authority has observed that project of QSPPL is of RE resource which is environment friendly. However, the fact remains that while incurring comparatively lower cost/investment, the consumer can be provided continuous supply of electric power in the case of base load power plants which have plant factor around 80%-90% compared to that of Solar with Plant Factor of around 15%-18%. Therefore, the Authority is of the considered view that projects with comparatively lower Plant Factor, having similar project cost may be undertaken in the Private Sector. Whereas, the Public Sector Investment should focus on higher Plant Factor Projects with same investment (i.e. Base Load Plants).

(iv). The term of a Generation Licence under the Rules is to be commensurate with the maximum expected useful life of the units comprised in a generating facility. The Authority considers that as per the International benchmarks available, the useful life of a typical PV Solar Power Plant is taken as twenty five (25) years. Therefore, the Authority fixes the term of the Generation Licence of QSPPL to twenty five (25) years from Commercial Operation Date-COD of the Project.

(v). In view of this, the Authority hereby decides to approve the grant of Generation Licence to QSPPL on the terms set out in the Generation Licence annexed to this determination. The grant of Generation Licence will be subject to

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the provisions contained in the NEPRA Act, relevant rules, regulations framed there under and other applicable documents including the Grid and Distribution Codes.

Authority

Maj. (R) Haroon Rashid
Member

Khawaja Muhammad Naeem
Member

Habibullah Khilji
Member/Vice Chairman

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26.06.14

National Electric Power Regulatory Authority
(NEPRA)
Islamabad – Pakistan

GENERATION LICENCE

No. SPGL/04/2014

In exercise of the Powers conferred upon the National Electric Power Regulatory Authority (NEPRA) under Section 15 of the Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997, the Authority hereby grants a Generation Licence to:

QUAID-E-AZAM SOLAR POWER (PRIVATE) LIMITED

Incorporated under the Companies Ordinance, 1984
Corporate Universal Identification No. 0085152, dated September 16, 2013

for its Solar Generation Facility/Solar Power Plant/Solar Farm Located at Lal Sohanra in Cholistan, District Bahawalpur in the Province of Punjab

(Installed Capacity: 100.00 MW_P Gross ISO)

to engage in generation business subject to and in accordance with the Articles of this Licence.

Given under my hand this 26th day of June Two Thousand & Fourteen and expires on 30th day of December Two Thousand & Thirty Nine.

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). "Authority" means "the National Electric Power Regulatory Authority constituted under section 3 of the Act";

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

(d). "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 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, which are available or can be obtained in relation to the generation facility after the COD;

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

(f). "CPPA" means "the Central Power Purchasing Agency of NTDC" or any other entity created for the like purpose;

(g). "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, as may be amended by the parties thereto from time to time;

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(h). "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 any necessary approval by the Authority;

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

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

(k). "Licensee" means "Quaid-E-Azam Solar Power (Private) Limited" and its successors or permitted assigns;

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

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

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

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

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

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

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(r). "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 in the Rules.

Article-2
Application of Rules

This Licence is issued subject to the provisions of the Rules, as amended 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 details specific to the generation facility/Solar Farm of the Licensee are set out in Schedule-I to 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 The Licence is granted for a term of twenty five (25) years after the Commercial Operation Date (COD).

4.2 Unless suspended or revoked earlier, the Licensee may within ninety (90) days prior to the expiry of the term of the Licence, apply for renewal of the Licence under the National Electric Power Regulatory Authority Licensing (Application &

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Modification Procedure) Regulations, 1999 as amended or replaced from time to time.

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 in terms of Rule-6 of the Rules.

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.

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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 132 KV grid station. The up-gradation (step up) of generation voltage up to 132 KV will be the responsibility of the Licensee.

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

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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 credit the proceeds to 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.

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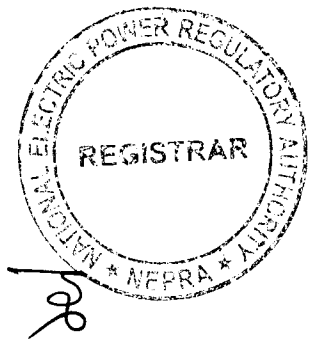
SCHEDULE-I

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.

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Jammu and Kashmir
Leh
Hemis National Park
Wah
Rawalpindi
Ghazni
Gardez
Gizab
Loman
Day Chopan
Farah
Gujrat
Sialkot
Gujranwala
Himachal Pradesh
Amritsar
Laskar Gah
Kandahar
Sargodha
Faisalabad
Lahore
Layyah
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Sahiwal
Chandigarh
Punjab
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Quetta
Loralai
Multan
Vehari
Mastung
Sibi
Bahawalpur
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Rahim Yar Khan
Gurgaon
Jacobabad
Bikaner
Sukkur
Khairpur
Nokha
Nagaur
Delhi
Saravan
Dadu
Jaipur
Rajasthan
Jodhpur
Ajmer
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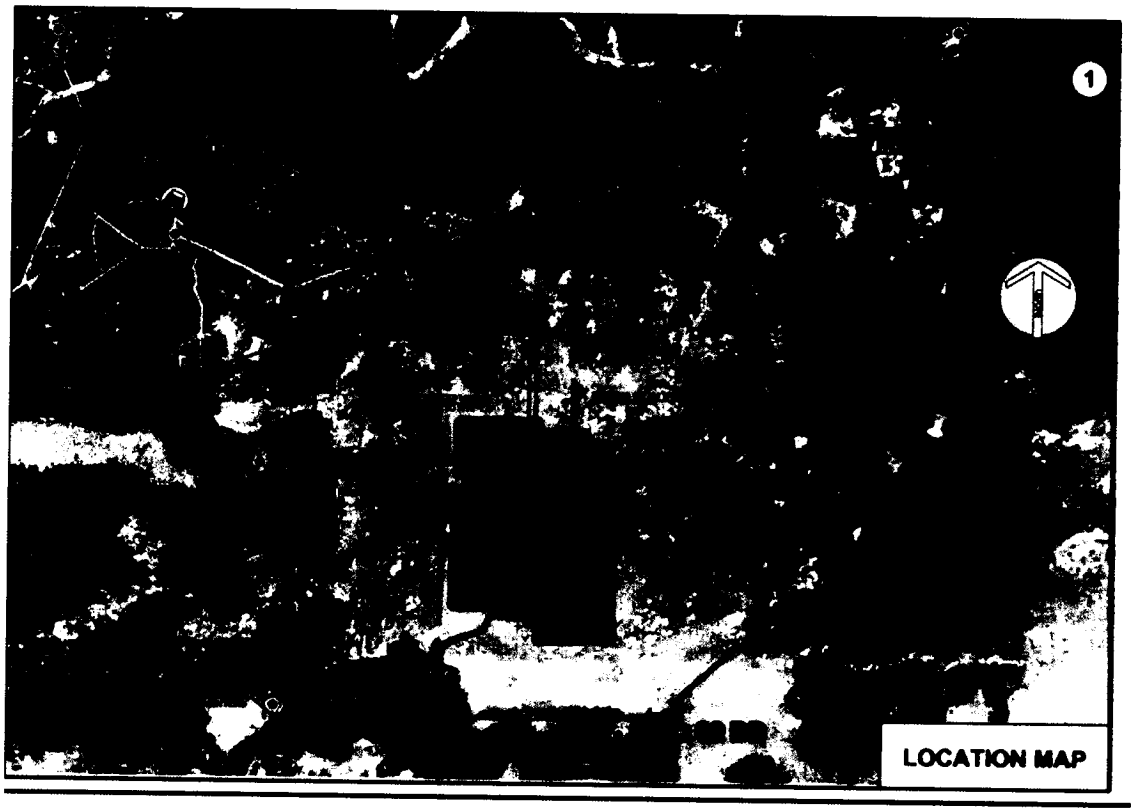

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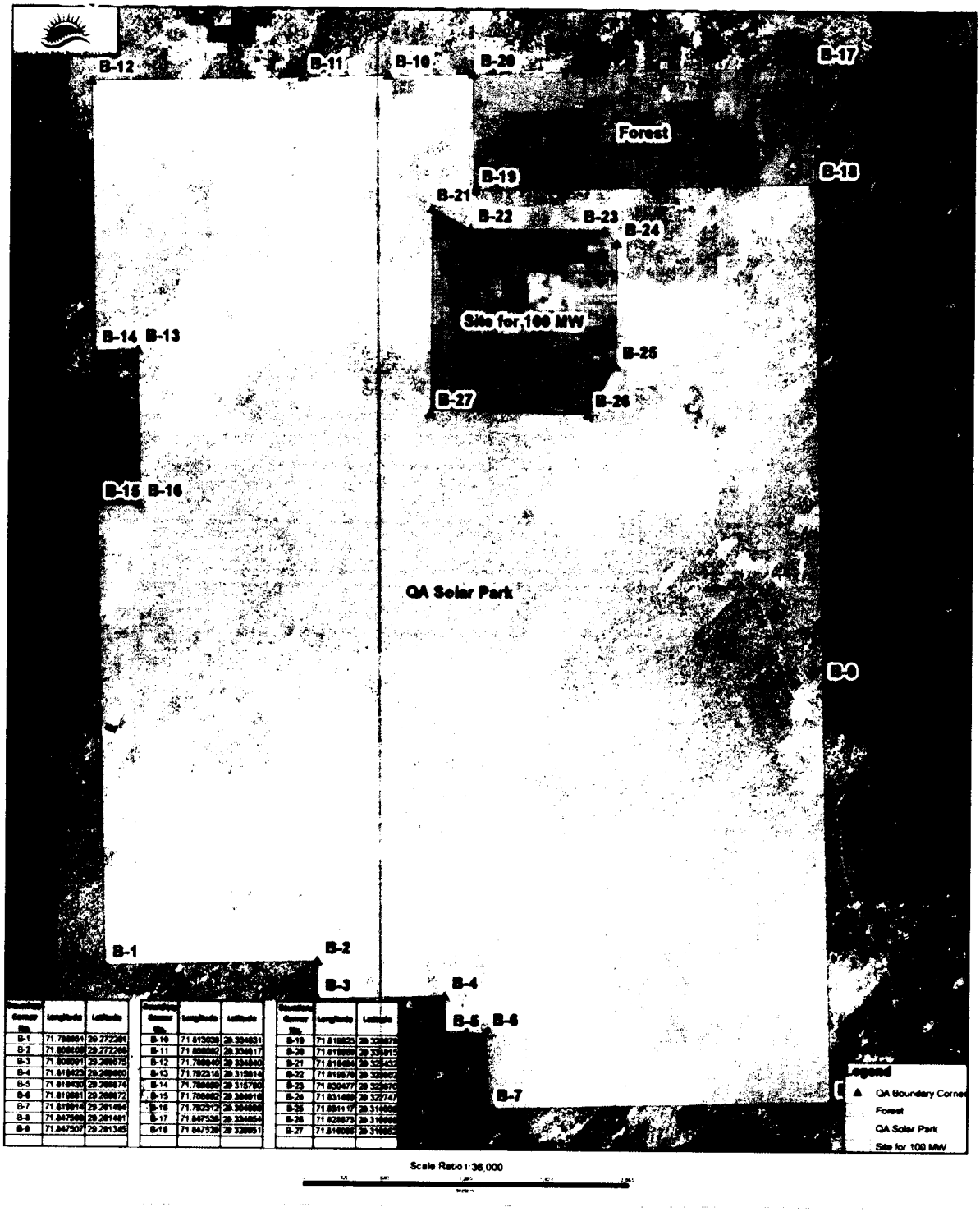

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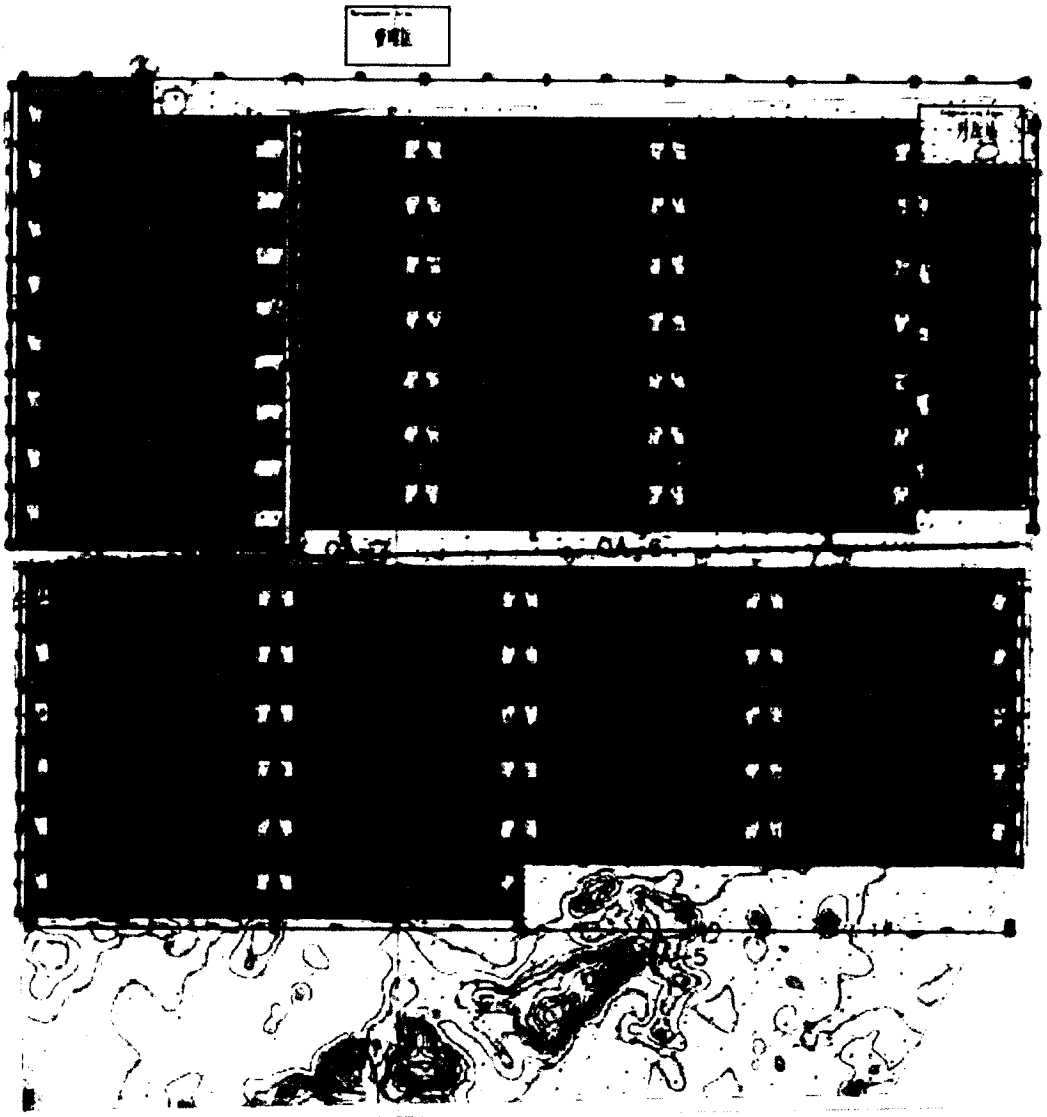

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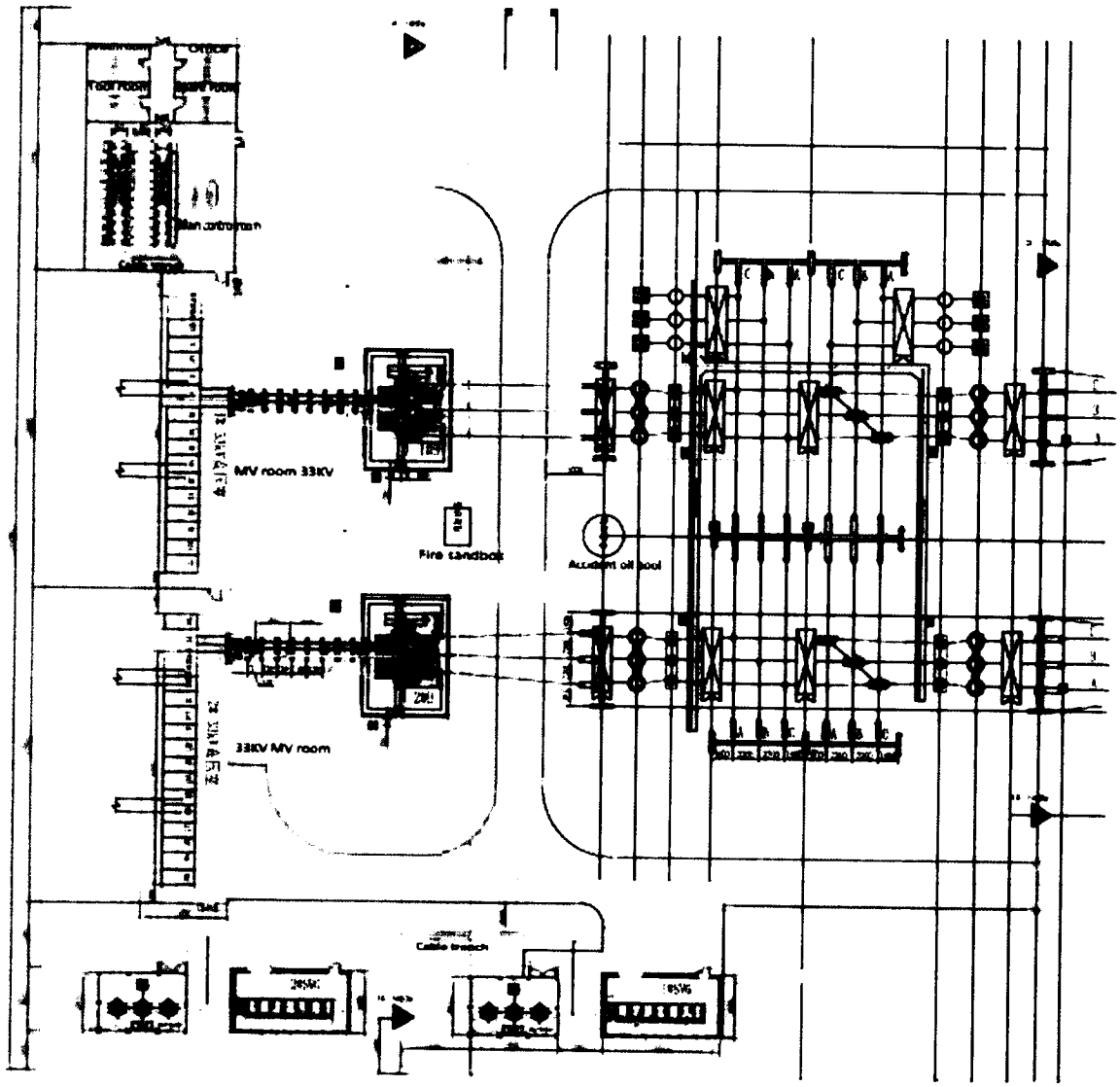

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Interconnection Arrangement/Transmission Facilities for Dispersal of Power from the Generation Facility/ Solar Power Plant /Solar Farm of Quaid-E-Azam Solar Power (Private) Limited (QSPPL)

The power generated from the Generation Facility/Power Plant/Solar Farm of QSPPL shall be dispersed to the load center of MEPCO.

(2). The proposed Interconnection/dispersal arrangement for the Generation Facility/Power Plant/Solar Farm will be consisting of the following:-

(a). 132 KV D/C Transmission Line (Measuring about 4.0 KM in length on ACSR Rail Conductor) for Making an In-Out of 132 KV S/C Bhawalpur - Lal Suhanra Transmission Line;

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

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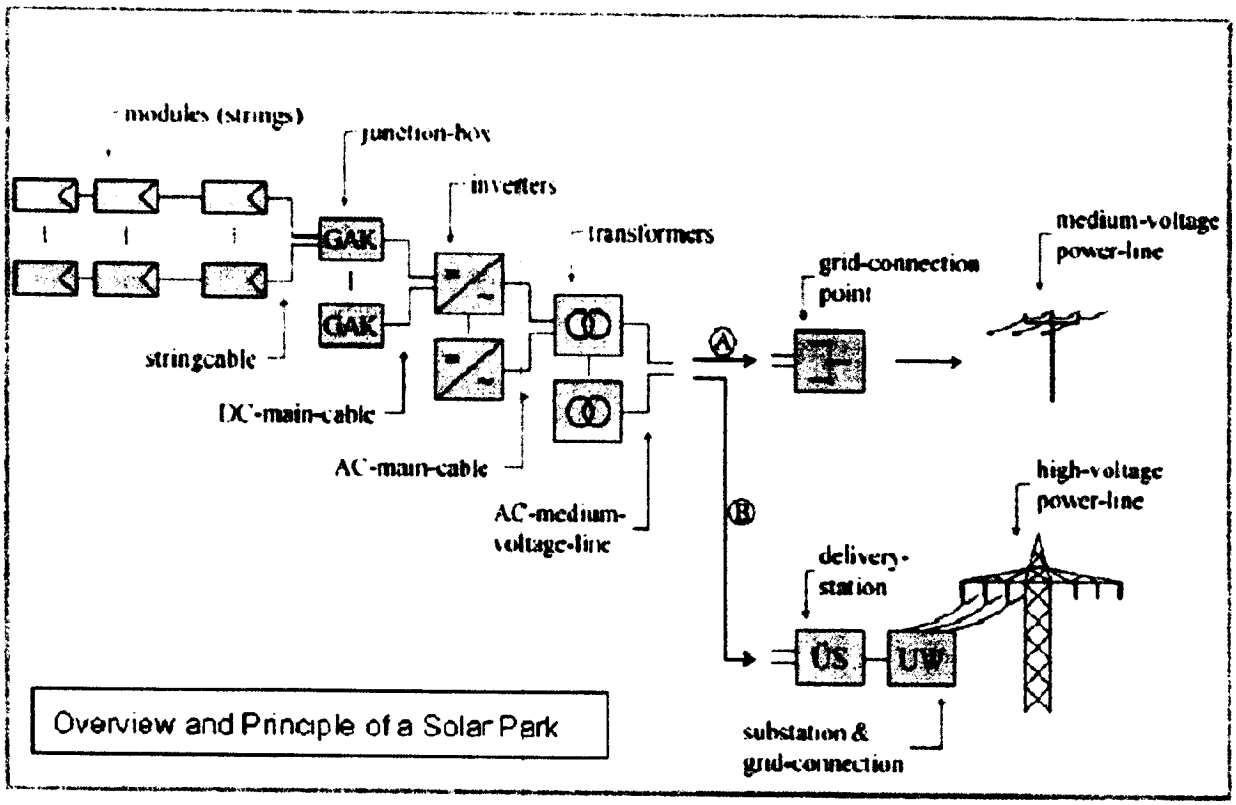

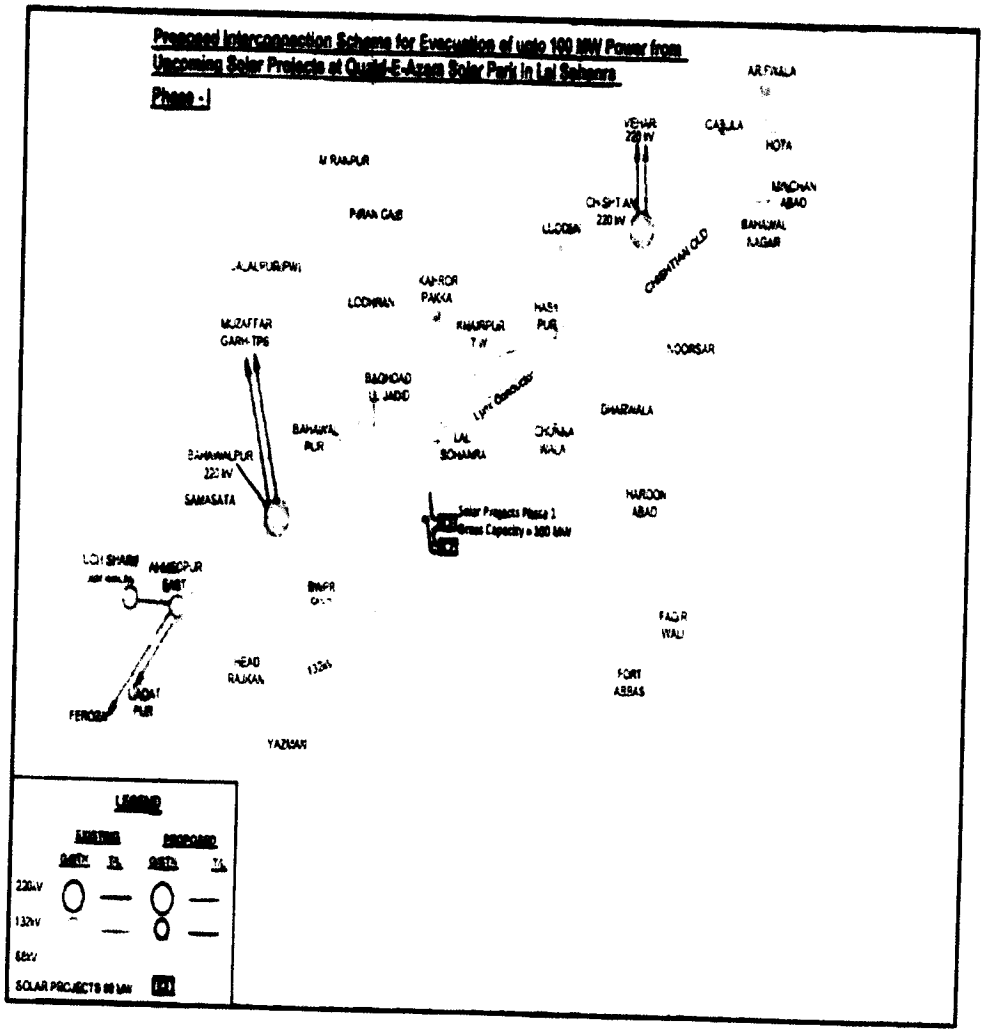

Detail of Generation Facility/Solar Power Plant/ Solar Plant/Solar Farm

(A). General Information

(i).	Name of Licensee	Quaid-e-Azam Solar Power (Pvt.) Limited
(ii).	Registered/Business Office	3rd Floor 83-A, E/1 Main Boulevard, Gulberg, Lahore
(iii).	Plants Location	Lal Sohanra in Cholistan, District Bahawalpur, in the Province of Punjab
(iv).	Type of Generation Facility	Solar Photovoltaic (PV).

(B). Solar Power Generation Technology & Capacity

(i).	Type of Technology	Photovoltaic (PV) Cell
(ii).	System Type	Grid Connected
(iii).	Installed Capacity of Solar (MW)	100 MW_P DC

(C). Technical Details of Equipment

(a).	**Solar Panels – PV Modules**		
(i).	Type of Module	Polycrystalline	
(ii).	No of PV Modules	In Series	20 Modules
		In Parallel	20,000 Strings
(iii).	Total number of PV Modules	Nb Modules	400,000
		Unit Norm Power	250 Wp
(iv).	Array Global Power	Nominal (STC)	100,000 kWp
(v).	Array Operating Characteristics (50°C)	U mpp	604 V
		I mpp	8.28 A

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(vi).	Total Module Area	650,752 m^2
(vii).	Panel power	250 Wp Multi-crystalline silicon photovoltaic
(viii).	Panel's Frame	Aluminium
(ix).	Solar Cells	Poly crystalline
(x).	Panels Warranty	25 Years
(xi).	Number of Solar Cells used	60
(xii).	Efficiency of module	15.4%
(xiii).	Environment Protection System	Encapsulation and sealing arrangements for protection from environment.
(xiv).	Maximum Power (Pmax)	250 W
(xv).	Voltage @ (P_{max})	30.2 V
(xvi).	Current @ Pmax	8.28 A
(xvii).	Open circuit voltage (Voc)	37.6 V
(xviii).	Short circuit current (Isx)	8.7 A
(xix).	Maximum system Voltage	1000Vdc
(xx).	Temperature coefficient of Pmax	-0.4%/ Degree centigrade
(xxi).	Temperature coefficient of V_{oc}	-0.33%/ Degree centigrade
(xxii).	Temperature coefficient of I_{sc}	+0.052%/ Degree centigrade
(b).	**Inverters**	
(i)	Operating Voltage	500-820 V
(ii)	Unit Nom Power	500 kWp AC
(iii)	Number of Invertors	174 units
(iv)	Total Power	87000 kW AC
(v)	Efficiency	Peak Efficiency 98.5%
		Euro Efficiency >98.4%

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(vi)	Features	MPP Tracker IP 54
(vii)	MPPVoltageRange	450-940 Vdc
(viii)	Nominal DC Voltage	315 Vdc
(ix)	Maximum Input Current	2400A
(x)	Power Control	MPP Tracker
(xi)	Max. OutputVoltageRange	267-363 Vac
(xii)	FrequencyRange	50Hz (+/-0.2Hz)
(xiii)	Power Factor	>0.95
(xiv)	Total Harmonic Distortion	<3%
(xv)	AC Connector	According to Global Standards
(xvi)	Cooling Method	Forced Air Cooling
(xvii)	Detection of Insulation Faults	Yes (30 k ohms)
(xviii)	Noise Level at a distance of five meters	<60 db
(xix)	Humidity Tolerance	0-95%, non – condensing
(xx)	Dimensions and Weight	6058 X 2896 X 2438 Tonnes
(xxi)	Anti Discharge, Reverse polarity and lighting	Yes
(xxii)	Protection rating : NEMA 3R, IP 54/IP55IP60	IP54
(c).	**Transformers**	
(i).	Transformer Power	132KV ,2 x 50 MVA
(ii).	Type of Transformer	Step-up Out door type
(d).	**Lightning Protection and Ear thing and Grounding System**	
(i).	Number of Light arrestors	Available
(e).	**Testing and measurement Equipment**	
(i).	Multimeter (volt, amp & resistor)	
(ii).	Irradiation meter	

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(iii).	Mega resistor meter	
(iv).	Earth resistor meter	
(f).	Control Room	
(i).	Data record	Continuous logging with data logging software
(ii).	Control Room System	Computerized data acquisition system
(g).	**Mounting Structure**	
(i).	Structure use	Array frames
(iii).	Array Specification	Certified for wind and seismic requirements
(iii).	Mounting Structure	Sustainable for 25 Years
(h).	**Grid Connection**	
(i).	Type of Control Room	Control Building for grid connection supervision available
(ii).	Data record	Continuous logging with data logging software
(iii).	Control Room System	Computerized data acquisition system

(D). Other Details

(i).	Project Commissioning date (Anticipated)	December 31, 2014
(ii).	Expected Life of the Project from the COD	25 Years

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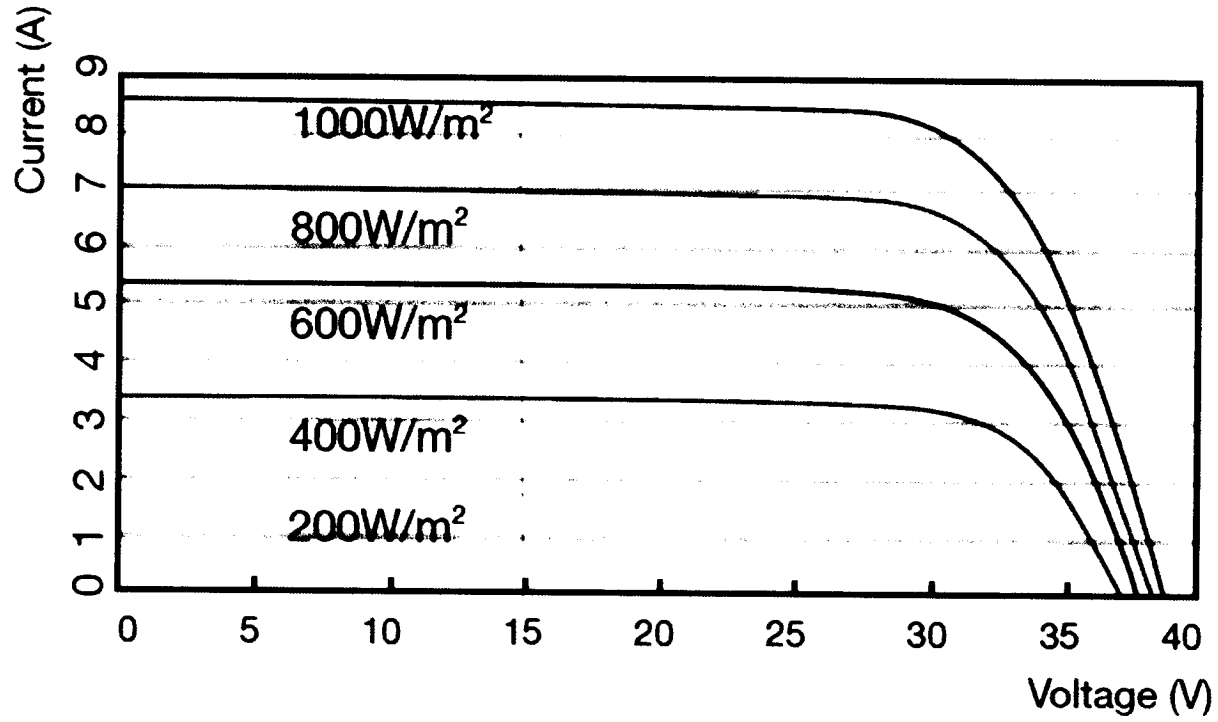
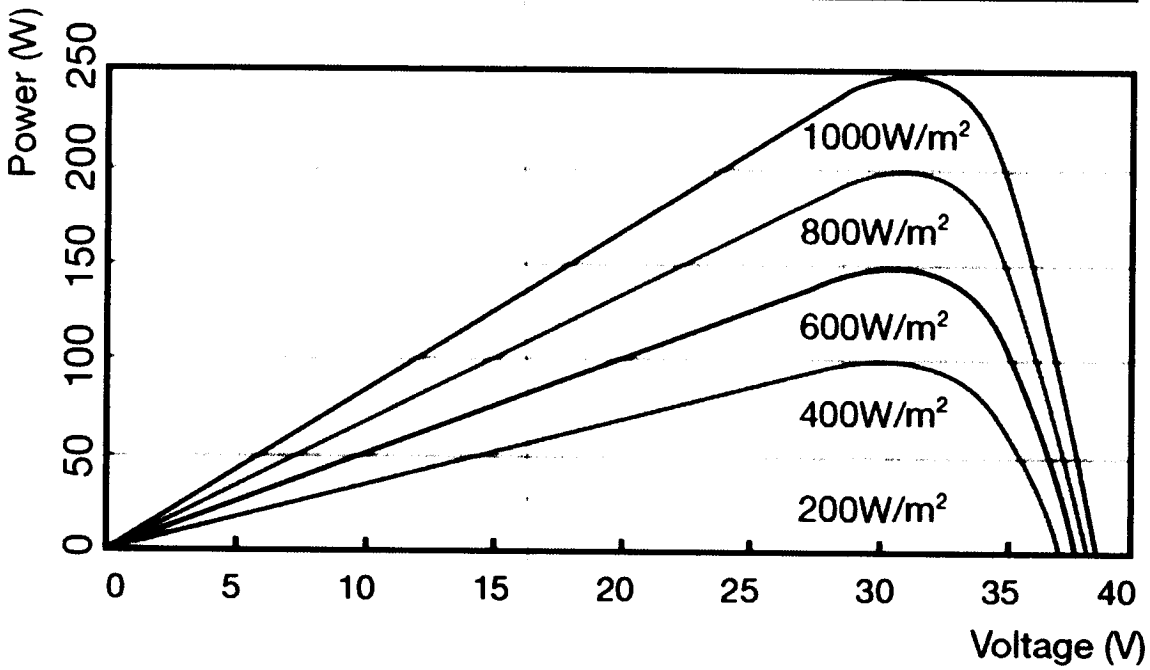


Power Vs Voltage Curve of Solar Panel at different Irradiation Levels



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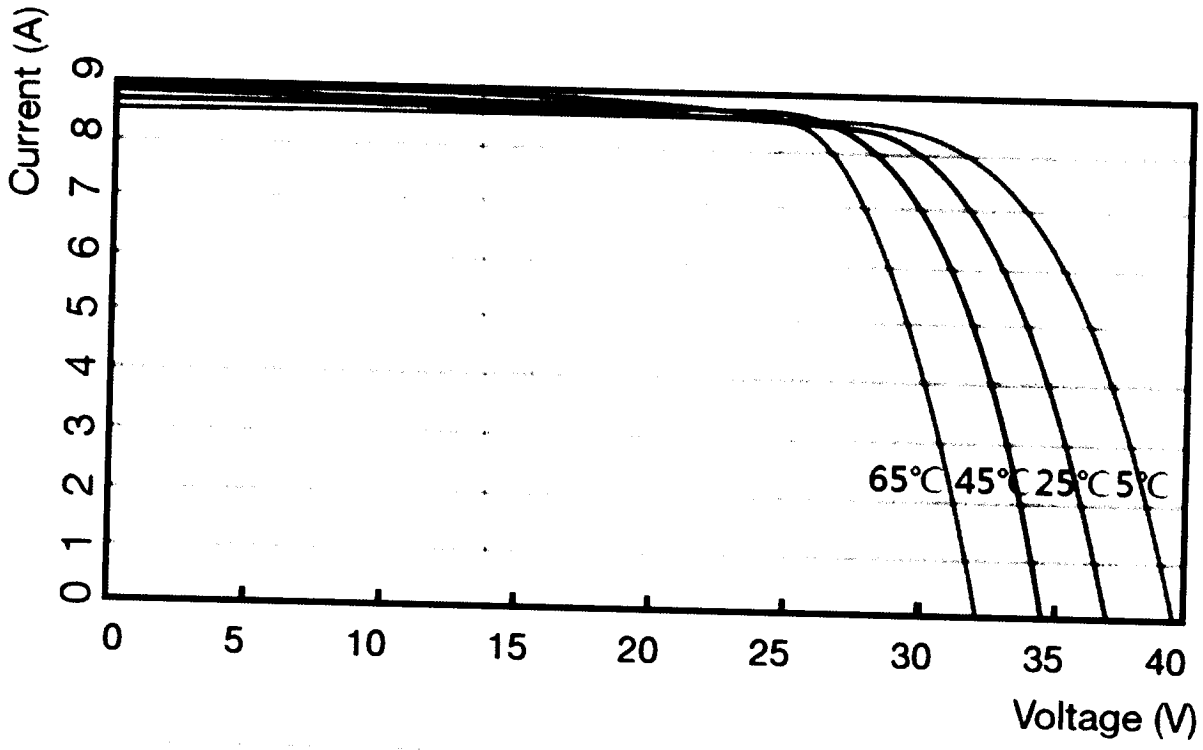

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SCHEDULE-II

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 year 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.

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SCHEDULE-II

(1).	Total PV Installed Capacity of Generation Facility	100MW_P DC
(2).	Average Sun Hour Availability/Day (Irradiation on Inclined Surface)	5.18 Hours/Day
(3).	Days per Year	365
(4).	PV Plant Generating Capacity Annually (As Per Simulation)	160,313 MWh
(5).	Expected Total Generation in 25 years Life Span	3,727,586 MWh
(6).	Generation per Year from plant keeping 24 Hours Working	100 x 24 x 365 = 876,000 MWh
(7).	Net Capacity Factor (4/6)	18.30%

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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