National Electric Power Regulatory Authority
Islamic Republic of Pakistan

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Registrar

No. NEPRA/R/LAG-197/ 8971 (A-D) May 24, 2019

Mr. Tashhir Uddin
Chief Executive Officer
Sanjwal Solar Power (Private) Limited
Wah Industries Limited
Quaid Avenue, Wah Cantt

Subject: **Modification Generation Licence No. SPGL/01/2012 (Modification-II)**
Licence Application No. LAG-197
Sanjwal Solar Power (Private) Limited, (SSPPL)

Reference: *SSPPL's LPM submitted vide letter No. SSPPL/18/NEPRA dated 15.01.2019 (received on 16.01.2019)*

It is intimated that the Authority has approved Modification in Generation Licence No. SPGL/01/2012 (issued on July 27, 2012) in respect of Sanjwal Solar Power (Private) Limited (SSPPL) pursuant to Regulation 10(11)(a) of the NEPRA Licensing (Application and Modification Procedure) Regulation 1999.

2. Enclosed please find herewith determination of the Authority in the matter of Licensee Proposed Modification of SSPPL alongwith Modification-II in the Generation Licence No. SPGL/01/2012, approved by the Authority.

Enclosure: As Above

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(Syed Safeer Hussain)

Copy to:

1. Secretary, Power Division, Ministry of Energy, 'A' Block, Pak Secretariat, Islamabad
2. Chief Executive Officer, CPPA(G), Ground Floor, Enercon Building, G-5/2, Islamabad
3. Chief Executive Officer, Islamabad Electric Supply Company (IESCO), IESCO Head Office Street 40, Sector G-7/4, Islamabad
4. 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 Licensee Proposed Modification in the Generation Licence of Sanjwal Solar Power (Private) Limited

May 24, 2019
Case No. LAG-197

(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/01/2012, dated July 27, 2012 and subsequent Modification-I dated December 12, 2013 to Sanjwal Solar Power (Private) Limited (SSPPL).

(ii). The above mentioned generation licence was granted to SSPPL for its 5.04 MW, Photovoltaic (PV) based solar generation facility/Solar Power Plant/Solar Farm located at POF Sanjwal, District Attock in the Province of Punjab for the purpose of supplying electric power to the concerned utility i.e. Islamabad Electric Supply Company Limited (IESCO).

(B). Communication of Modification

(i). In accordance of Regulation-10(2) of the NEPRA Licensing (Application & Modification Procedure) Regulations, 1999 ("the Licensing Regulation"), SSPPL communicated a Licensee Proposed Modification (LPM) on January 16, 2019 in the above-mentioned generation licence.

(i). In the "Text of the Proposed Modification", SSPPL submitted that against the original arrangement envisaged of supplying to utility i.e. IESCO, the company intends to supply electric power from its PV based generation facility to two (02) Bulk Power Consumers (BPCs).

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(ii). Regarding the "Statement of the Reasons in Support of the Modification", SSPPL submitted that the existing generation licence envisaged supplying to IESCO as an Independent Power Producer however, the arrangement did not materialize. Now, SSPPL is planning to utilize the existing PV solar based generation facility for supplying to POF Sanjwal and POF Wah as its BPCs

(ii). About the statement of "the Impact on the Tariff", "Quality of Service (QoS)" and "the Performance by the Licensee of its obligation under the Licence, it was submitted that the proposed LPM will not have any adverse impact on any of the above factors including tariff, QoS and performance.

(C). Processing of Modification

(i). After completion of all the required information as stipulated under the Regulation-10(2) and 10(3) of the Licensing Regulations by SSPPL, the Registrar published the communicated LPM in one (01) English and one (01) Urdu daily newspaper on March 12, 2019, for seeking comments of the general public, interested/affected parties, and different stakeholders about the said LPM as required under the Regulation-10(4) of the Licensing Regulations.

(ii). Apart from the above notice in the press, separate letters were also sent to Government ministries/attached departments and other representative organizations etc. on March 13, 2019. In the said letters, the stakeholders were informed about the communicated LPM and publication of notice in the press and were invited for submitting their views and comments for the assistance of the Authority.

(D). Comments of Stakeholders

(i). In response to the above, comments were received from Central Power Purchasing Agency (Guarantee) Limited (CPPAGL). The salient points of the comments offered by the said stakeholder are summarized in the following paragraphs: -

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(a). CPPAGL submitted that the company intends to sell electricity to two (02) BPCs which would impact the projected demand of IESCO and the Authority needs to consider the same. According to the NEPRA Licensing (Generation) Rules, 2000 (the "Generation Rules"), the Authority is required to scrutinize an application for the generation licence, and if dissatisfied, may refuse to issue a licence. In this regard, specific reference is made to Rule-3(5) of the Generation Rules which lays down the criteria for the grant of a generation licence and needs to be considered while approving this modification. Further, it was stated that the existing tariff structure of the IESCO recovers only a small portion of the total fixed cost whereas, the major portion of it is recovered from the variable charges. It is submitted that any method to avoid/minimize exposure of energy demand to the National Energy Pool, for the demand against whom capacity has already procured by Power Purchaser, will translate into the stranded capacity cost to be borne by the other regulated consumers. In view of the said, a few suggestions are made including (a). when BPC intends to stop purchase of electric power from distribution company, (b). when BPC plans to use supply from distribution company as a back-up only or for fulfilling its partial requirements. In this regard, for the former a mechanism is required to be established for the recovery of the capacity cost (incurred by the distribution company/power purchaser) through BPC in a reasonable time frame. Whereas, for the later, separate tariff category may be devised with (i). a fixed component to recover the incurred capacity cost through BPC within the determined term at the sanctioned MDI; (ii). a variable component to cover the share of BPC in the overall energy pool cost (of the

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concerned distribution company), with applicable indexation.

(ii). The Authority considered the above comments of CPPAGL and in view of the observations made, decided to seek the perspective of SSPPL. In consideration of the said, SSPPL submitted that POF Sanjwal is a B-4 consumer of IESCO whereas POF Wah is C-2 consumer of the same, having connected load of 12.00 MW and 52.00 MW respectively. SSPPL has installed capacity of 5.04 MW_P which is currently stranded as IESCO did not showed its inclination to buy electric power from it. In order to utilize the said capacity, SSPPL has decided to supply to POF Sanjwal by directly linking it with the PV generation facility and wheeling some of the surplus available to POF Wah using the network of IESCO. In this regard, SSPPL submitted that its solar based generation facility will be able to operate during sunlight and due to this very reason neither POF Sanjwal nor POF Wah will be discontinuing supply from IESCO. The potential impact on the projected demand of IESCO against the procurement of the electric energy from SSPPL will almost be negligible considering the fact that only 20,000 ~ 25,000 units of electricity will be supplied on daily basis from the generation facility and will not have any adverse impact on the demand of IESCO. Further, SSPPL submitted that IESCO has already consented to the wheeling arrangement and has already issued a demand note for interconnection of its network with its PV based generation facility.

(iii). The Authority examined the above submissions of SSPPL and found the same plausible. In view of the said, the Authority considered it appropriate to proceed further with the LPM of SSPPL as stipulated in the relevant Regulations and the Generation Rules.

(E). Observations/Findings of the Authority

(i). The Authority has examined the entire case in detail including the already granted generation licence, communicated LPM, comments of the CPPAGL, submissions/rejoinder of SSPPL and the provisions of the NEPRA Act, relevant rules & regulations.

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(ii). As explained above, SSPPL holds a generation licence with a cumulative installed capacity of 5.04 MW_P. According to the terms and conditions of the said generation licence, SSPPL envisaged to supply all the generated electric power to IESCO however, the utility did not show the required interest and the matter did not move ahead. Now, SSPPL intends supplying to two (02) BPCs i.e. POF Sanjwal and POF Wah as stipulated under Section-22 of the NEPRA Act for which a modification has been submitted.

(iii). In this regard, the Authority has observed that in terms of Regulation-10(5) of the Licensing Regulations, it is empowered to modify a licence if, it (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 it; (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 necessary to ensure the continuous, safe and reliable supply of electric power to the consumers keeping in view the financial and technical viability.

(iv). As explained above, the current LPM is meant for adding two (02) BPCs whereas, the proposition of supplying to IESCO is being dropped. The Authority considers that the communicated LPM will not have any adverse effect on the performance of the licensee of its obligations under its generation licence considering the fact that it does not have any obligation towards any entity including the utility i.e. IESCO. The Authority is of the view that the LPM has not caused it to act or acquiesce in a manner contrary to the provisions of the NEPRA Act or the rules or regulations made thereunder. The Authority is of the considered view that the LPM will be beneficial to its BPCs as relatively cheap and environment friendly electricity will be available to the them. The Authority considers that the LPM is necessary for the licensee to perform its obligations effectively and efficiently under the licence. Further, the LPM is also necessary as it will enable SSPPL to

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utilize the stranded capacity and ensure continuous, safe and reliable supply of electric power to its BPCs during 4-5 hours of sunshine keeping in view its financial and technical viability.

(v). The Authority has considered the comments of CPPAGL and has observed that it has raised different issues including (a). impact on the projected demand of the utility if SSPPL is allowed supplying to proposed BPCs; (b). scrutinizing the LPM in terms of provision of Rule-3(5) of the Generation Rules and (c). possible loss of revenue for the utility on account of shifting of consumers to other sources and suggesting alternate measures so that utilities do not suffer financial loss.

(vi). In consideration of the above, the Authority has observed that the installed capacity of the generation facility of SSPPL is 5.04 MW_P which is available for 4-5 hours of the day. The total requirement of IESCO as depicted on the official website/portal of CPPAGL is around 2500 MW. In view of the said, the induction of the installed capacity which is only 0.20 % of the total demand of IESCO will not have any adverse impact. Regarding observation of CPPAGL that the communicated LPM should be securitized in terms of Rule-3(5) of the Generation Rules, it is clarified that the said provision is applicable in the case of grant of a new Generation Licence. However, the current case is for a modification in the existing licence and the relevant provisions for the same are enshrined in Regulation-10(5) of the Licensing Regulations for which the Authority has given its determination as explained at Para-(E)(iv) above. About the suggestion of CPPAGL for devising suitable tariff for those BPC which are either shifting to self-generation/other sources other than the utility, the Authority has considered the submissions however, CPPAGL has not referred to any legal provision while making these submissions. In view of the said, the Authority is constraint not to consider the same. In light of the said, the Authority considers that all the observations of CPPAGL stands addressed and resolved.

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(F). Approval of LPM

(i). The Authority is satisfied that the licensee/SSPPL has complied with all the requirements of the Licensing Regulations pertaining to the Modification. Therefore, the Authority in terms of Regulation-10(11)(a) of the Licensing Regulations approves the communicated LPM. Accordingly, the already granted Licence No. SPGL/01/2012, dated July 27, 2012 in the name of SSPPL is hereby modified.

(ii). The changes in "face sheet," "Articles of the Generation Licence," "Schedule-I," "Schedule-II" of the generation licence and STSA are attached as annexures to this Determination. The grant of 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

Rafique Ahmed Shaikh
(Member)

24/5/19

Saif Ullah Chattha
(Member)

Rehmatullah Baloch
(Member/Vice Chairman)

24/5/19

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National Electric Power Regulatory Authority (NEPRA)

Islamabad – Pakistan

GENERATION LICENCE

SPGL/01/2012

In exercise of the Powers conferred 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 Sanjwal Solar Power (Private) Limited to the extent of changes mentioned as here under: -

(i). Changes in the **Articles** of the Generation Licence attached as Revised/Modified Articles of the Generation Licence;

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

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

(iv). **Addition of Second Tier Supply Authorization (STSA)** as attached with the modified Generation Licence.

This **Modification-II** is given under my hand on **24th day** of **May Two Thousand & Nineteen**

24-05-19

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 as amended or replaced from time to time;

(b). "Applicable Documents" mean the Act, the rules and regulations framed by the Authority under the Act, any document or instrument issued or determinations made by the Authority under any of the foregoing or pursuant to the exercise of its powers under the Act, the Grid Code, the applicable Distribution Code, if any, or the documents or instruments made by the Licensee pursuant to its generation licence, in each case of a binding nature applicable to the Licensee or, where applicable, to its affiliates and to which the Licensee or any of its affiliates may be subject;

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

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

(e). "Bulk Power Consumer (BPC)" means a consumer which purchases or receives electric power, at one premises, in an amount of one (01) Megawatt (MW) or more or in such other amount and voltage level and with such other characteristics as the Authority may specify and the Authority may specify different amounts and voltage levels and with such other characteristics for different areas;

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

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

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

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

(j). "Generation Rules" mean the National Electric Power Regulatory Authority Licensing (Generation) Rules, 2000 as amended or replaced from time to time;

(k). "Grid Code" means the Grid Code prepared by the National Grid Company and approved by the Authority;

(l). "IESCO" means Islamabad Electric Supply Company Limited and its successors or permitted assigns;

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

(n). "Licensee" means **Sanjwal Solar Power (Private) Limited** and its successors or permitted assigns;

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

(p). "Net Delivered Energy" means the net electric energy expressed in kWh that is generated by the generation facility/Solar Power Plant or Solar Farm of the Licensee at its outgoing Bus Bar and delivered to the Power Purchaser or BPC;

(q). "Power Purchaser" means a person or registered entity/licence holder which will be purchasing electric power from the Licensee, pursuant to a EPA for procurement of electric power;

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

(s). "Wheeling of Electric Power" means the use of the Transmission or/and Distribution system(s) of the respective distribution company/distribution licensee for the transport of electric power from the generation facility/Solar Power Plant or Solar Farm to the Power Purchaser/BPC.

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.

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Article-2
Applicability of Law

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

Article-3
Generation Facilities

The location, size (capacity in MW), technology, interconnection arrangements, technical limits, technical and functional specifications and other details specific to the generation facility/Solar Power Plant/Solar Farm of the Licensee are set out in Schedule-I of this licence. The Net Delivered Energy of the generation facility/Solar Power Plant/Solar Farm of the Licensee is set out in Schedule-II hereto.

Article-4
Term of Licence

4.1 This licence is effective from the original date of its issuance i.e. July 27, 2012 and has the term of twenty-five (25) years from the said date subject to the provisions of Section-14B of the Act.

4.2 However, unless suspended or revoked earlier, the Licensee may apply for renewal of this licence within ninety (90) days prior to the expiry of the above term, as stipulated in Generation Rules read with the Licensing 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 NEPRA (Fees) Rules, 2002 as amended or replaced from time to time.

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Article-6
Tariff

The Licensee is allowed to charge such tariff which has been agreed between the Licensee and Power Purchaser or BPCs, pursuant to an Energy Purchase Agreement.

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 Generation 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 & Safety Standards

The generation facility of the Licensee shall comply with the environmental and safety 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 electric power at its outgoing 11 KV Busbar. The up gradation (step up) of generation voltage up to 11 KV will be the responsibility of the Licensee.

Article-12
Provision of Information

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

12.2 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 reasonably 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.

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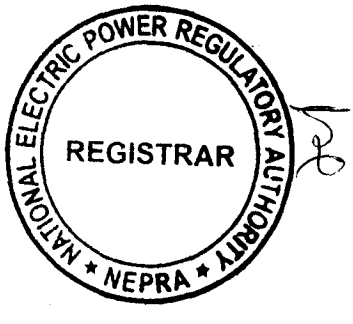
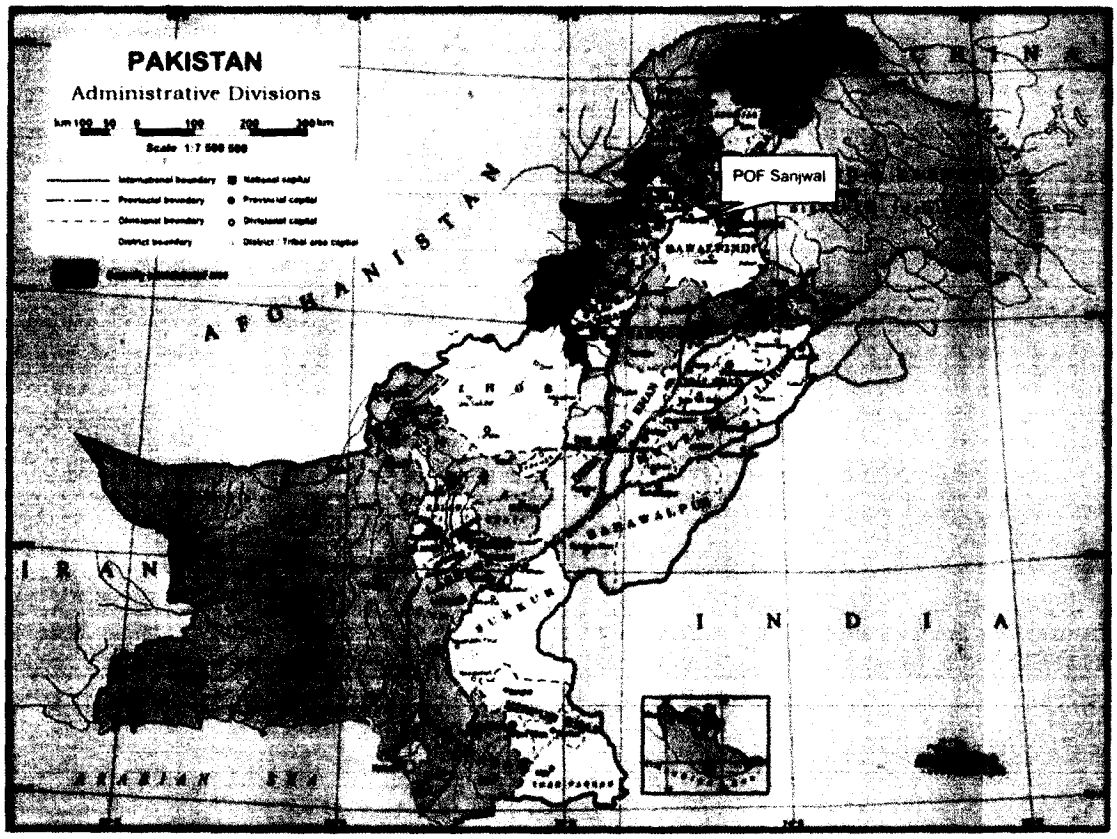
SCHEDULE-I
(Revised/Modified)

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 Facility of the Licensee are described in this Schedule.



Location of the of the Generation Facility/Solar Power Plant/Solar Farm of the Licensee/SSPPL on the Map of Pakistan



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

Longitude	Latitude
72°25'30" E	33°47'24" N

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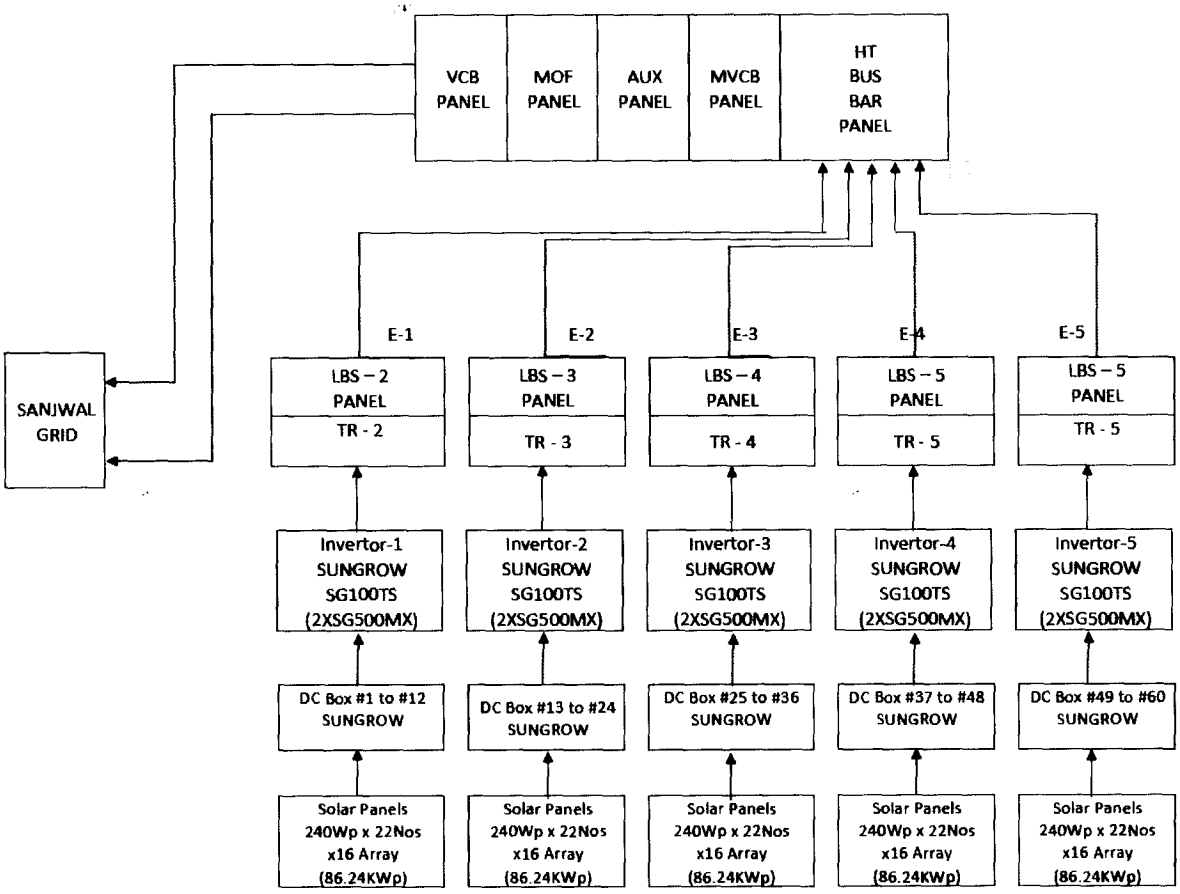
Design of the Generation Facility/Solar Power Plant/Solar Farm of the Licensee/SSPPL



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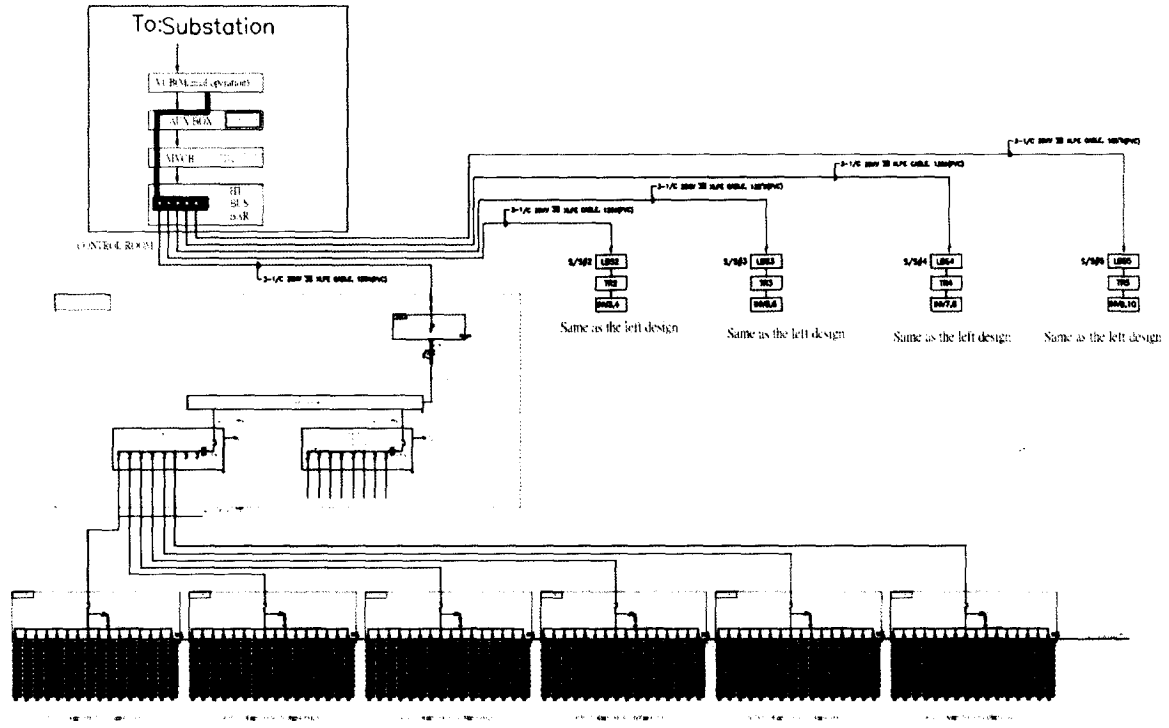
Single Line Diagram of the Generation Facility/Solar Power Plant/Solar Farm of the Licensee/SSPPL



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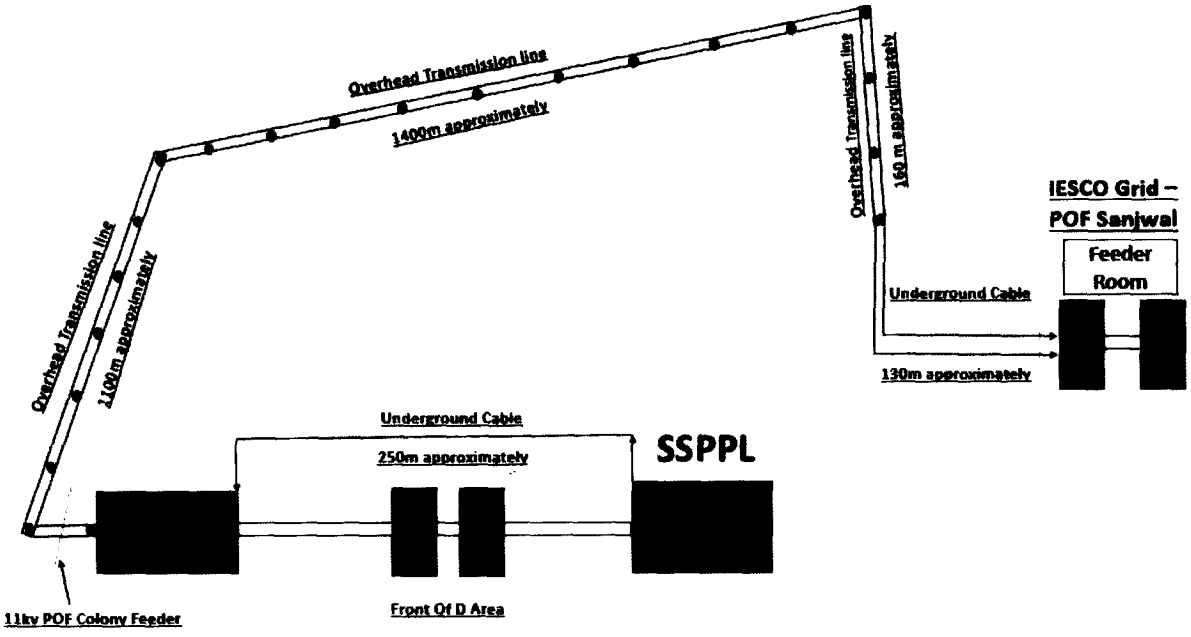
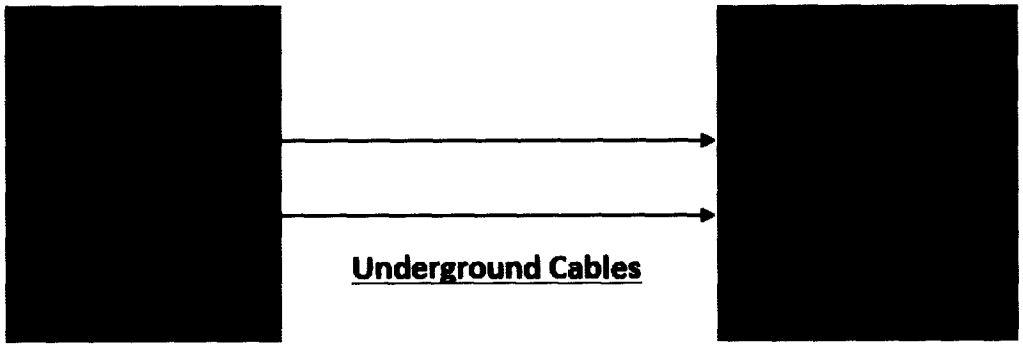
Feeders Layout of the Generation Facility/Solar Power Plant/Solar Farm of the Licensee/SSPPL





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Interconnection Arrangement for Dispersal/Wheeling of Power from the Generation Facility/Solar Power Plant/Solar Farm of the Licensee/SSPPL

The electric power generated from the generation facility/Solar Power Plant/Solar Farm of the Licensee/SSPPL will be delivered/supplied/wheeled to two (02) Bulk Power Consumers (BPCs) in the name of POF Sanjwal and POF Wah respectively.

(2). The Interconnection Arrangement for dispersal of electric power for POF Sanjwal will be through 11 KV Feeder(s) connecting the Generation Facility/Solar Power Plant/Solar Farm of the Licensee with its BPC i.e. POF Sanjwal.

(3). The supply to the other BPC i.e. POF Wah will be through the Wheeling arrangement using the transmission/distribution network of the utility/distribution company i.e. IESCO. In this regard, the electric power from the Generation Facility/Solar Power Plant/Solar Farm of the Licensee will be injected into the system of IESCO i.e. 132/11 KV Sanjwal grid station and will be wheeled to POF Wah.

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Details of Generation Facility/Solar Power Plant/Solar Farm of the Licensee/SSPPL

(A). General Information

(i).	Name of the Company/ Licensee	Sanjwal Solar Power (Private) Limited
(ii).	Registered/Business office of the Company/Licensee	Wah Industries Limited, Quaid Avenue, Wah Cantt.
(iii).	Location of the generation facility/solar power plant/solar farm.	Pakistan Ordnance Factories (POF), Sanjwal Cantonment, District Attock, Punjab
(iv).	Type of generation facility/solar power plant/solar farm.	Solar Photovoltaic (PV)

(B). Technology & Capacity

(i).	Type of Technology	Photovoltaic (PV) Cell
(ii).	Type of Cell	Polycrystalline
(iii).	Type of System	Grid Tied
(iv).	Installed Capacity of generation facility/solar power plant/solar farm	5.04 MW_P DC or 4.575 MW inverter's output (AC)

(C). Technical Details of Equipment

(a).	**Solar Panels – PV Modules**		
(i).	Type of Module	Poly-crystalline	
(ii).	Total number of PV Modules	Number of Modules	21,000
		Unit Norm Power	240 W_p

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(iii).	Array Global Power	Nominal (STC)	5,040 kW_p
		At operating cond.	4,500 kW_p (50°C)
(iv).	Total Module Area	30,688meter square	
(v).	Manufacturer	HB Kiyoto Compliant Sources International Co., Ltd (HBKCS)	
(vi).	Model	PV Module Model HB-6PB 240Wp Poly-Crystalline Silicon PV Module	
(vii).	Panel power	240 Wp Poly-crystalline silicon photovoltaic	
(viii).	No. Of Panel	21,000 solar panels	
(ix).	Efficiency of module	14.75%	
(x).	Panels power generating efficiency	Degradation @ 0.54%	
(xi).	Maximum Power (P_{max})	240 W	
(xii).	Voltage @ (P_{max})	39.8 V	
(xii).	Current @ P_{max}	8.05 A	
(xiv).	Open circuit voltage (Voc)	36.9 V	
(xvi).	Short circuit current (Isx)	8.6 A	
(xvii).	Temperature coefficient of P_{max}	-0.42%/ Degree centigrade	
(xviii).	Temperature coefficient of Voc	-0.32%/ Degree centigrade	
(xix).	Temperature coefficient of Isc	+0.04%/ Degree centigrade	
(b).	**PV Array**		

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(i).	No. of Sub-Arrays	960
(ii).	Modules in a String	22
(c).	**PV Capacity**	
(i).	Total Capacity	5.04 MWpDC or 4.575 MW inverter's output (AC)
(ii).	Net Capacity Factor	18.5%
(d).	**Inverters**	
(i).	Inverters Model	Sungrow, SG1000TS, Qty: 05 Nos.
(ii).	Manufacturer	Sungrow, China
(iii).	Number of Invertors	05 units
(iv).	Total Power	4,575 kW AC
(v).	Max. DC power (@ cos φ =1)	1120kW
(vi).	Max. DC input voltage	1000V
(vii).	Rated AC power	1000kW
(viii).	Max. output AC power	1100kVA
(ix).	Max. efficiency	98.7%
(x)	Protection	DC disconnect device
		AC disconnect device
		DC overvoltage protection

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		AC overvoltage protection	
		Grid monitoring	
		Ground fault monitoring	
		Overheat protection	
		Insulation monitoring	
(e).	**DC Junction Boxes**		
(i).	Specification	DC Distribution (Junction) Box	
(ii).	Number of units	60 Nos.	
(iii).	Type of Junction Boxes	DC junction Box	
(iv).	Purpose of Junction Box	(a).	Provide arrangement for disconnection for each of the groups.
		(b).	Provide a test point for each sub-group for quick fault location
		(c).	To provide group array isolation.
		(d).	The current carrying ratings of the junction boxes shall be suitable with adequate safety factor to inter connect the Solar PV array.
(f).	**AC MP Panel**		
(i).	AC MP Panel Detail	AC breaker, Copper bus Panel PT/CT multi-function meters	
(ii).	Number of units	5 set	

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(g).	**Monitoring System**	
(i).	Irradiance Meter	03 Nos.
(ii).	Module Temp Meter	01 Nos. PT-100, -40 to +250°C, 4~20mA
(iv).	55" TV Display + PC Monitor	01 No.
(h).	**Transformers**	
(i).	Transformer Power	SHIHLIN Electric, Taiwan, 3-Phase 1250 KVA, 330V / 11 KV
(ii).	Type of Transformer	Step-up
(iii).	Purpose of Transformer	Transferring AC power coming from the power plant to Grid.
(i).	**Lightning Protection and Earthing and Grounding System**	
(i).	Number of Light arrestors	5
(j).	**Control Room**	
(i).	Type of Control Room	Brick structure with RCC roof.
(ii).	Data record	Continuous logging with data logging software
(iii).	Control Room System	Computerized data acquisition system
(k).	**Screw Piles**	
(i).	Structure use	Galvanized Iron (GI)
(ii).	Tilt of Array Frame	tilted at 23° angle, facing south will be capable to capture maximum sunlight for efficient operation of the power plant
(iii).	Array Specification	Certified for wind and seismic requirements

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(D). Other Details

(i).	COD of the generation facility/solar power plant/solar farm	January 13, 2017
(ii).	Expected useful life of the generation facility/solar power plant/solar farm from the COD	25 Years

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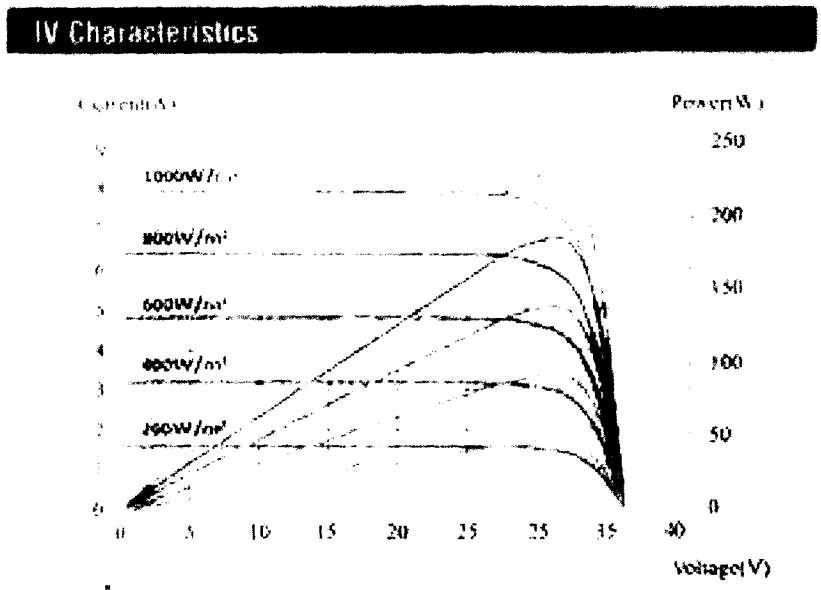
V-I Curve of the PV Cell at STC



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SCHEDULE-II
Revised/Modified

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.

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SCHEDULE-II

(1).	Total PV Installed Capacity of Generation Facility	5.04 MW_p
(2).	Average Sun Hour Availability/Day (Irradiation on Inclined Surface)	4.72 hrs/day
(3).	Days per Year	365
(4).	PV Plant Generating Capacity Annually (As Per Simulation)	8,170,661 kWh/Annum
(5).	Expected Total Generation in 25years Life Span	190,634,584 kWh
(6).	Generation per Year from plant keeping 24 Hours Working	5,040 x 24 x 365 = 44,150,400 KWh
(7).	Net Capacity Factor (4/6)	18.5%

Note

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

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Authorization by
National Electric Power Regulatory Authority

To

Sanjwal Solar Power (Private) Limited (SSPPL)

**Incorporated Under Section-32
of the Companies Ordinance 1984 (XLVII of 1984) Having Corporate Universal
Identification No. 007725107, dated September 30, 2011**

Generation Licence No. SPGL/01/2012, dated July 27, 2012

For
Sale to Bulk Power Consumer

Pursuant to Section-22 of the NEPRA Act and Rules-7 of the NEPRA Licensing (Generation) Rules, 2000, the Authority hereby authorizes SSPPL/(the Licensee) to engage in Second Tier Supply business, limited to the following consumers/BPCs also mentioned in Schedule-I of the Generation Licence No. SPGL/01/2012 dated July 27, 2012;

(a). POF Sanjwal Attock (Direct Supply)

(b). POF Wah Cantt (through Wheeling)

Authority

24/5/19

(Rafique Ahmed Sheikh)
Member

(Saif Ullah Chattha)
Member

(Rehmatullah Baloch)
Member/Vice Chairman

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