National Electric Power Regulatory Authority
Registrar Office
*****

No. NEPRA/R/LAG-357/4454 January 27, 2021

Subject: **Modification in Generation Licence No. SPGL/24/2017**
Licence Application No. LAG-357
Siachen Energy Limited (SEL)

The Authority has approved Modification in Generation Licence No. SPGL/24/2017 dated October 10, 2017 in respect of Siachen Energy Limited (SEL), pursuant to Section 26 of the Regulation of Generation, Transmission, Transmission and Distribution of Electric Power Act, 1997 (XL of 1997) read with Regulation 10(11) 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 SEL along with Modification-I in the Generation Licence No. SPGL/24/2017 as approved by the Authority.

Enclosure: **As above**

27 01 21

(Syed Safeer Hussain)
Registrar

ADG (Licensing)
Mr. Zainuallah Khatak (for updating the database)
Mr. Rizwan Piracha (to retain the original licence)
Master File [*w.r.t. ATC/Chairman# 967 dated 22-01-2021*]

Information:

1. Chairman
2. V. Chairman / Member (Tariff)
3. Member (Consumer Affairs)
4. Member (Licensing)
5. Member (M&E)

Distribution:

1. Senior Advisor (Technical)
2. ADG (Tariff)
3. ADG (Finance)
4. Deputy Director (IT) (Please place it on the NEPRA Website)

NEPRA Licensing Department Diary No. 294 Date 1-2-21

Dir-T

update T/sheet

National Electric Power Regulatory Authority
Islamic Republic of Pakistan

NEPRA Tower, Attaturk Avenue (East), G-5/1, Islamabad
Ph: +92-51-9206500, Fax: +92-51-2600026
Web: www.nepra.org.pk, E-mail: registrar@nepra.org.pk

Registrar

No. NEPRA/R/LAG-357/4448-53

January 27, 2021

Mr. Muhammad Sohail Shamsi,
Chief Executive Officer,
Siachen Energy Limited,
4th Floor, Plot No. 36-C, Lane No. 13,
Commercial Area, Phase VI, DHA,
Karachi-75500
Contact No. 021-35156172-3

Subject: **Modification-I in Generation Licence No. SPGL/24/2017**
Licence Application No. LAG-357
Siachen Energy Limited (SEL)

Reference: *SEL's LPM submitted vide letter No. SEL/NEPRA/LPM/2020-0013 dated July 29, 2020.*

The Authority has approved Modification in Generation Licence No. SPGL/24/2017 dated October 10, 2017 in respect of Siachen Energy Limited (SEL), pursuant to Section 26 of the Regulation of Generation, Transmission, Transmission and Distribution of Electric Power Act, 1997 (XL of 1997) read with Regulation 10(11) 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 SEL along with Modification-I in the Generation Licence No. SPGL/24/2017 as 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. Managing Director, NTDC, 414-WAPDA House, Lahore.
3. Chief Executive Officer, CPPA-G, ENERCON Building, Sector G-5/2, Islamabad.
4. Chief Executive Officer, Hyderabad Electric Supply Company Limited (HESCO), WAPDA Offices Complex, Hussainabad, Hyderabad
5. Director General, Environment Protection Department, Government of Sindh, Complex Plot No. ST-2/1, Korangi Industrial Area, Karachi.

National Electric Power Regulatory Authority (NEPRA)

Determination of the Authority in the Matter of Licensee Proposed Modification in the Generation Licence of Siachen Energy Limited

January 27, 2021
Case No. LAG-357

(A). Background

(i). Siachen Energy Limited (SEL) holds a Generation Licence (No. SPGL/ 24/2017, dated October 10, 2017) in terms of Section-15 (Now Section-14B) of the Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997 ("the NEPRA Act").

(ii). The Authority granted the above mentioned licence for a 100.00 MW_P Photo Voltaic (PV) Cell based generation facility to be set up at Deh Sukhpur/Bhalki Rayati/Morjhar Tapo Sukhpur/Karampur Taluka Mirpur Sakro, district Thatta in the province of Sindh.

(B). Communication of Modification

(i). SEL in accordance with Regulation-10(2) of the NEPRA Licensing (Application & Modification Procedure) Regulations, 1999 (the "Licensing Regulations") communicated a Licensee Proposed Modification (LPM) in its above mentioned Generation Licence on August 06, 2020.

(ii). In the "text of the proposed modification", SEL stated that it plans to change the type of the PV Cell from existing Poly Crystalline to Monocrystalline. In view of the said, there will be changes in Number of Panels/ Modules, Maximum Power (P_{max}), Installed Capacity, Expected Commercial Operation Date (COD), and Net Capacity Factor of the project.

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(iii). Regarding the "statement of the reasons in support of the modification", SEL, inter alia, submitted that the Authority granted it a tariff vide its determination dated November 19, 2018 requiring it to achieve Financial Close (FC) within one (01) year. The company could not achieve FC of the project for various reasons beyond its control and has now filed a new petition for determination of tariff based on a superior technology. In order to incorporate the changes in technology in the generation licence, a modification is necessary.

(iv). About the statement of "the impact on tariff", "Quality of Service (QoS)" and "the performance by the licensee of its obligation under the licence", SEL submitted that the proposed changes will have a positive impact on tariff as the new technology will result in higher energy yield resulting less per kWh of rate. Further, SEL confirmed that the proposed modification will not have any effect on the QoS and the performance by the Licensee of its obligations under its existing Generation Licence.

(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, the Registrar published the communicated LPM in one (01) English and one (01) Urdu daily newspaper on September 08, 2020, informing the general public, interested/affected parties and other stakeholders about the said LPM as required under the Regulation-10(4) of the Licensing Regulations.

(ii). The Registrar also invited comments of the relevant Govt. Ministries, their attached Departments, representative organizations and individual experts etc. for the assistance of the Authority, by sending separate letters to the said stakeholders dated September 09, 2020, in favor or against the communicated LPM as stipulated in Regulation-10(9) of the Licensing Regulations.

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(D). Comments of Stakeholders & Findings of the Authority

(i). In response to the above, the Authority did not receive any comment from any of the stakeholders. Accordingly, considered appropriate to proceed further as stipulated in the NEPRA Licensing (Generation) Rules, 2000 (the "Generation Rules") and the Licensing Regulations. The Authority has examined the entire case in details including the already granted licence, communicated LPM, provisions of the relevant rules and regulations in the matter and the findings are as under: -

(ii). As explained above, the Authority granted SEL a Generation Licence (No. SPGL/ 24/2017, dated October 10, 2017) for setting up a PV based generation facility of 100.00 MW_P to be set up at Taluka Mirpur Sakro, District Thatta in the Province of Sindh. The above generation licence envisaged installing PV cells of 400,000 x 250Wp having polycrystalline technology on fixed tilt system. Further, the generation licence envisaged a Net Capacity Factor of 19.25% with COD of the project December 31, 2018.

(iii). The Authority has observed that the main features of the LPM communicated by the company/Licensee/SEL are (a). change in the type of PV modules from Polycrystalline to Monocrystalline; (b). change in number of Panel/Modules for selecting PV Cell of 200,016 x 500 Watt; (c). change in the COD of the generation facility and expected useful life of the generation facility ; and (d). modification in the schedule-I & II of the existing generation licence to reflect the above mentioned changes in the equipment and other related characteristics etc.

(iv). The Authority has observed that in terms of Regulation-10(5) of the Licensing Regulations, it is empowered to modify an existing licence of a licensee 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 it; (c).

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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 of the licensee;

(v). In consideration of the above, the Authority clarifies that (a). the proposed LPM will not affect the performance by the licensee of its obligations considering the fact that a better technology is now being proposed; (b). the LPM has 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). the LPM is likely to be beneficial to the consumers considering the fact the company is deploying better technology which will result in higher yield and thus possible lowering of its generation tariff for which company has already submitted a new petition for determination of tariff indicating lower tariff as compared to the earlier determined tariff and the same is in advance stage of processing; (d). the LPM is reasonably necessary for the licensee to effectively and efficiently perform its obligations under the licence; and (e).the LPM 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.

(E). Approval of LPM

(i). In view of the above, the Authority is satisfied that the Licensee has complied with all the requirements of the Licensing Regulations pertaining to the modification. Therefore, the Authority in terms of Section-26 of the NEPRA Act read with Regulation-10(11) of the Licensing Regulations approves the communicated LPM of SEL without changes.

(ii). Accordingly, the Generation Licence (No. SPGL/24/2017, dated October 10, 2017) of SEL is hereby modified. The changes made in the said licence are attached as annexure to this determination. The approval is subject to the

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provisions contained in the NEPRA Act, relevant rules, regulations, terms & conditions of the generation licence and other applicable documents.

Authority

Rafique Ahmed Shaikh
(Member)

Did not attend

Rehmatullah Baloch
(Member)

21/1/2021

Engr. Bahadur Shah
(Member)

Saif Ullah Chattha
(Member/Vice Chairman)

22.1.2021

Tauseef H. Farooqi
(Chairman)

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National Electric Power Regulatory Authority
(NEPRA)
Islamabad – Pakistan

GENERATION LICENCE
No. SPGL/24/2017

In exercise of the Powers conferred under Section-26 of the Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997 (as amended from time to time), the Authority hereby modifies the Generation Licence (No. SPGL/24/2017, dated October 10, 2017) granted to **Siachen Energy Limited** to the extent of changes mentioned hereunder: -

(a). The expiry date of the Licence mentioned on the face sheet of the original licence may be read as **20th day of December 2046**;

(b). The Changes made in Articles of the Generation Licence are attached as **Revised/Modified Articles of Generation Licence**;

(c). The Changes made in Schedule-I of the Generation Licence are attached as **Revised/Modified Schedule-I**;

(d). The Changes made in Schedule-II of the Generation Licence are attached as **Revised/Modified Schedule-II**.

This **Modification-I** is given under my hand on this 27th day of **January Two Thousand & Twenty One.**

27/01/21

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). "AEDB" means the Alternative Energy Development Board or any other entity created for the like purpose established by the GoP to facilitate, promote and encourage development of renewable energy in the country;

(c). "Applicable Documents" mean the Act, the rules and regulations framed by the Authority under the Act, any documents or instruments 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, the Commercial 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;

(d). "Applicable Law" means all the Applicable Documents;

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

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

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

(h). "Commercial Code" means the commercial code under the National Electric Power Regulatory Authority (Market Operator, Registration, Standards and Procedure) Rules, 2015 as amended or replaced from time to time;

(i). "Commercial Operations Date (COD)" means the day immediately following the date on which the generation facility/Solar Power Plant/Solar Farm of the Licensee is commissioned;

(j). "Commissioning" means the undertaking of the Commissioning Tests of the generation facility/Solar Power Plant/Solar Farm as stipulated in the EPA;

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

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

(m). "EDGoS" means department of energy or any other entity created for the like purpose established by the GoS to facilitate, promote and encourage development of private sector participation for development of projects for electric power in the province of Sindh;

(n). "Energy Purchase Agreement (EPA)" 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 Power Plant/Solar Farm, as may be amended by the parties thereto from time to time;

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

(p). "Grid Code" means the grid code prepared and revised from time to time by NTDC with necessary approval of the Authority;

(q). "GoS" means the Government of the province of Sindh acting through its Department of Energy which has issued letter of intent to the Licensee for the design, engineering, construction, insuring, commissioning, operation and maintenance of the generation facility/Solar Power Plant/Solar Farm;

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(r). "GoP" means the Government of Pakistan acting through the AEDB which has issued or will be issuing to the Licensee a LoS for the design, engineering, construction, insuring, commissioning, operation and maintenance of the generation facility/Solar Power Plant/Solar Farm;

(s). "HESCO" means Hyderabad Electric Supply Company Limited or its successors or permitted assigns;

(t). "IEC" means "the International Electrotechnical Commission or its successors or permitted assigns;

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

(v). "Implementation Agreement (IA)" means the implementation agreement signed or to be signed between the GoP and the Licensee in relation to this particular generation facility/Solar Power Plant/Solar Farm, as may be amended from time to time;

(w). "Letter of Support (LoS)" means the letter of support issued or to be issued by the GoP through the AEDB to the Licensee;

(x). "Licensee" means **Siachen Energy Limited** or its successors or permitted assigns;

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

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

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

(bb). "Policy" means the Policy for Development of Renewable Energy for Power Generation, 2006 of GoP as amended or replaced from time to time;

(cc). "Power Purchaser" means CPPA-G which will be purchasing electric energy from the Licensee either on behalf of all XW-DISCOs or any single XW-DISCO, pursuant to an EPA for procurement of electric energy;

(dd). "SCADA System" means the supervisory control and data acquisition system for gathering of data in real time from remote locations to control equipment and conditions;

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

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

1.2 The words and expressions used but not defined herein bear the meaning given thereto in the Act or Generation Rules and Licensing 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

3.1 The location, size (capacity in MW), technology, interconnection arrangements, technical limits, technical 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.

3.2 The net capacity/Net Delivered Energy of the generation facility/Solar Power Plant/Solar Farm of the Licensee is set out in Schedule-II of this licence. The Licensee shall provide the final arrangement, technical and financial specifications and other specific details pertaining to its generation facility/Solar Power Plant/Solar Farm before its COD.

Article-4
Term of Licence

4.1 This licence is effective from the original date of its issuance i.e. October 10, 2017 and will have a term of twenty-five (25) years from the COD of the generation facility/Solar Power Plant/Solar Farm of the Licensee subject to Section 14-B of the Act.

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

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Article-5
Licence fee

The Licensee shall pay to the Authority the licence fee as stipulated in the National Electric Power Regulatory Authority (Fees) Rules, 2002 as amended or replaced from time to time.

Article-6
Tariff

The Licensee shall charge only such tariff from the Power Purchaser 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.

7.2 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.

7.3 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.

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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.

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 or replaced from time to time.

Article-10
Compliance with Environmental & Safety Standards

10.1 The generation facility/Solar Power Plant/Solar Farm of the Licensee shall comply with the environmental and safety standards as may be prescribed by the relevant competent authority from time to time.

10.2 The Licensee shall provide a certificate on a bi-annual basis, confirming that the operation of its generation facility/Solar Power Plant/Solar Farm is in conformity with required environmental standards as prescribed by the relevant competent authority.

Article-11
Power off take Point and Voltage

The Licensee shall deliver the electric energy to the Power Purchaser at the outgoing Bus Bar of its generation facility/Solar Power Plant/Solar Farm. The Licensee shall be responsible for the up-gradation (step up) of generation voltage up to the required dispersal voltage level.

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Article-12
Performance Data

12.1 The Licensee shall install properly calibrated automatic computerized solar radiation recording device(s) at its generation facility/Solar Power Plant/Solar Farm for recording of data.

12.2 The Licensee shall install SCADA System or compatible communication system at its generation facility/Solar Power Plant/Solar Farm as well as at the side of the Power Purchaser.

12.3 The Licensee shall transmit the solar radiation data and power output data of its generation facility/Solar Power Plant/Solar Farm to the control room of the Power Purchaser.

Article-13
Provision of Information

In accordance with provisions of Section-44 of the Act, the Licensee shall be obligated to provide the required information in any form as desired by the Authority without any exception.

Article-14
Emissions Trading /Carbon Credits

The Licensee shall process and obtain expeditiously the Carbon Credits admissible to the generation facility/Solar Power Plant/Solar Farm. The Licensee shall share the said proceeds with the Power Purchaser as per the Policy.

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Article-15
Design & Manufacturing Standards

The photovoltaic cells and other associated equipment of the generation facility/Solar Power Plant/Solar Farm shall be designed, manufactured and tested according to the latest IEC, IEEE standards or any other equivalent standard in the matter. All the plant and equipment of generation facility/Solar Power Plant/Solar Farm shall be unused and brand new.

Article-16
Power Curve

The power curve for the individual photovoltaic cell provided by the manufacturer and as mentioned in Schedule-I of this generation licence, shall form the basis in determining the cumulative power curve of the generation facility/Solar Power Plant/Solar Farm.

Article-17
Compliance with Applicable Law

The Licensee shall comply with the provisions of the Applicable Law, guidelines, directions and prohibitory orders of the Authority as issued from time to time.

Article-18
Corporate Social Responsibility

The Licensee shall provide the descriptive as well as monetary disclosure of its activities pertaining to corporate social responsibility (CSR) on an annual basis.

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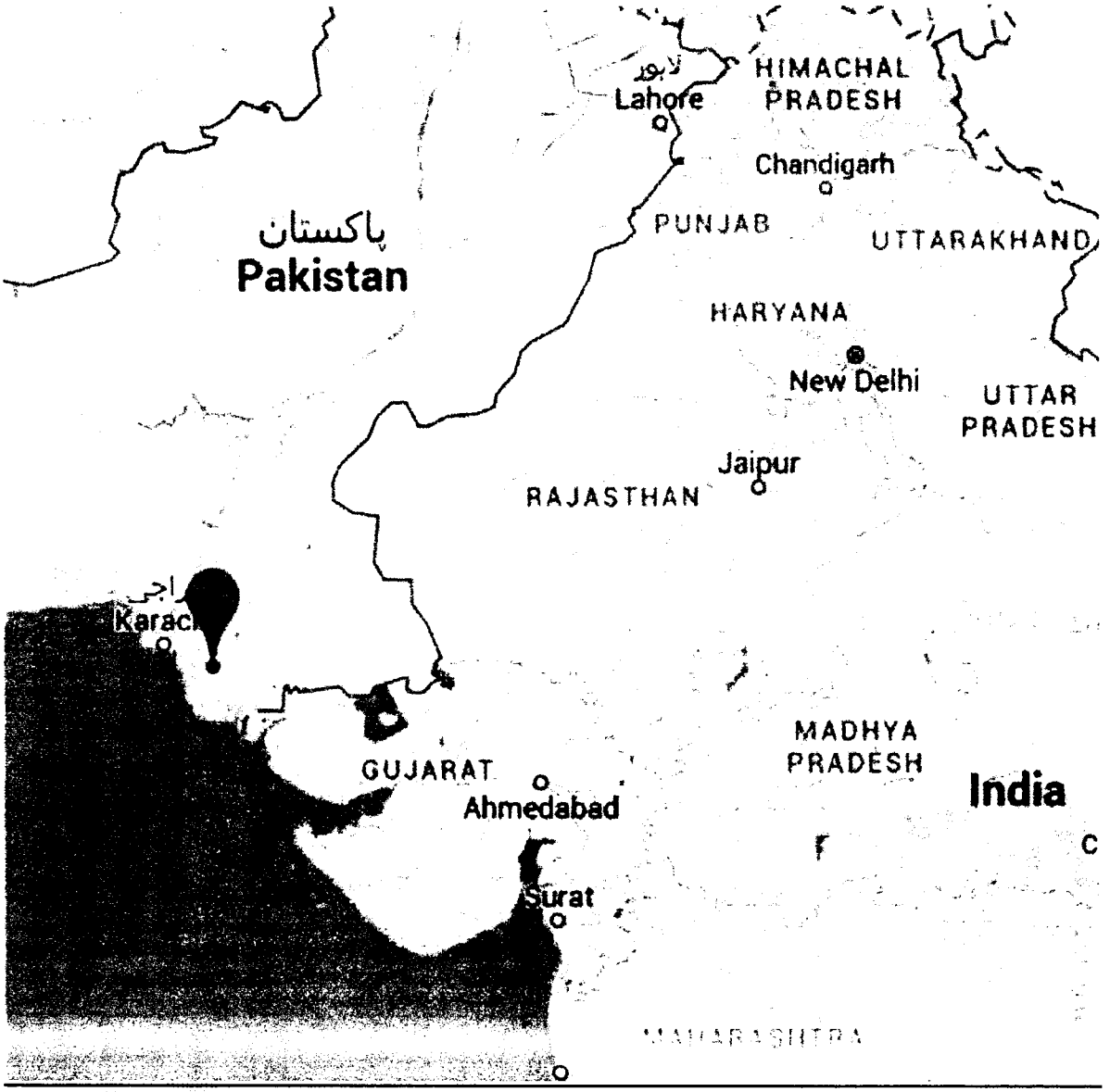
Revised/Modified SCHEDULE-I

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 of the Licensee



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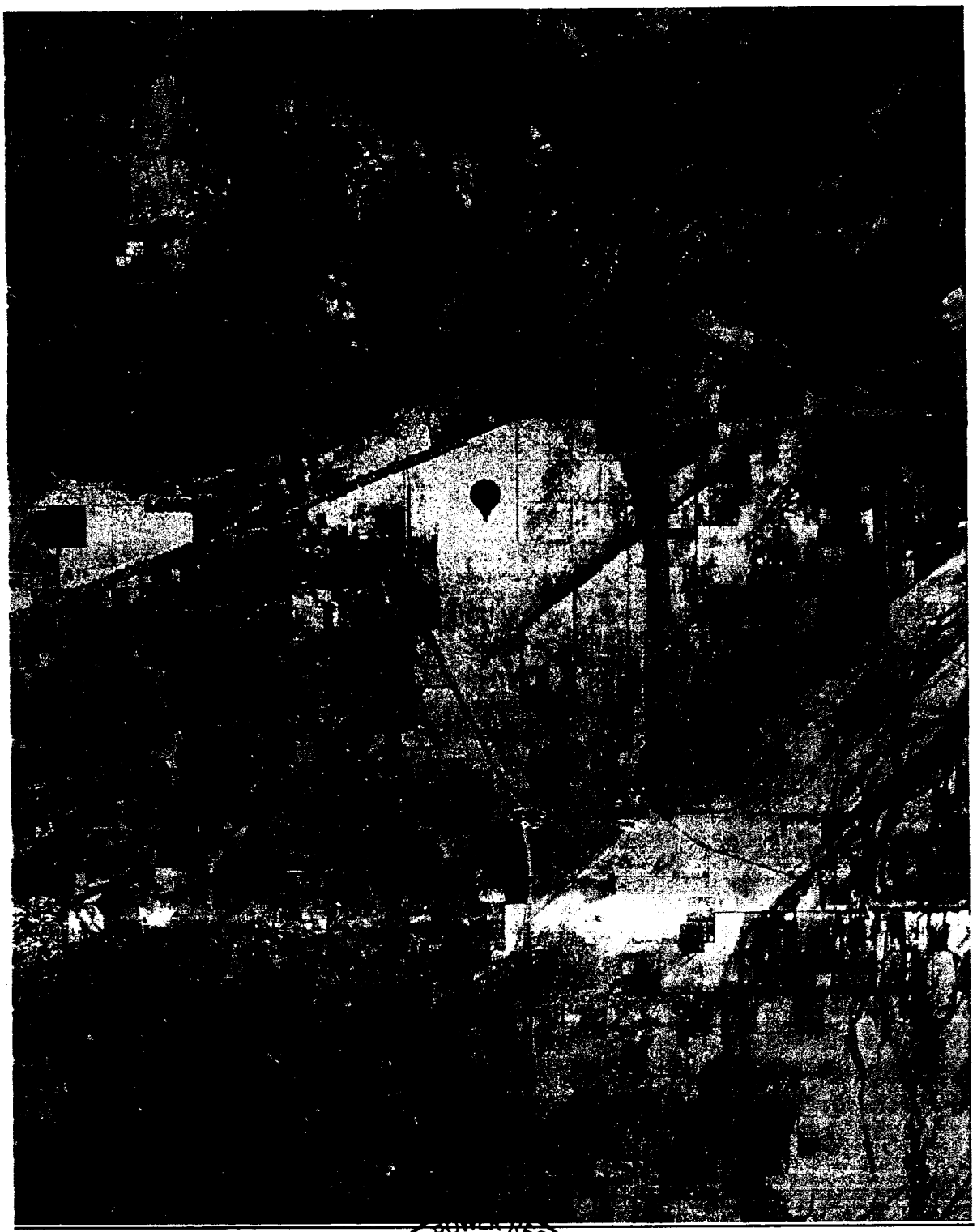
Location of the Generation Facility/Solar Power Plant/Solar Farm of the Licensee



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Land Coordinates of the Generation Facility/Solar Power Plant/Solar Farm of the Licensee

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Land Coordinates of the Generation Facility/Solar Power Plant/Solar Farm of the Licensee

Boundary Point	Geodetic	
	Latitude	Longitude
Boundary 1	24°34'28.39 "N	67°42'33.74"E
Boundary 2	24°34'28.61"N	67°42'41.95"E
Boundary 3	24°34'18.69"N	67°42'42.38"E
Boundary 4	24°34'18.52"N	67°42'34.05"E
Boundary 5	24°33'37.28"N	67°42'35.06"E
Boundary 6	24°33'36.60"N	67°43'01.20"E
Boundary 7	24°33'36.60"N	67°43'03.1"E
Boundary 8	24°33'17.5"N	67°43'02.9"E
Boundary 9	24°33'17.5"N	67°43'01.2"E
Boundary 10	24°33'05.2"N	67°43'01.2"E
Boundary 11	24°33'05.2"N	67°43'03.2"E
Boundary 12	24°32'59.1"N	67°43'03.3"E
Boundary 13	24°32'51.1"N	67°43'07.1"E
Boundary 14	24°32'50.8"N	67°43'08.7"E
Boundary 15	24°32'40.6 "N	67°43'20.9"E
Boundary 16	24°32'34.3"N	67°43'39.4"E
Boundary 17	24°32'33.8"N	67°43'39.4"E
Boundary 18	24°32'33.7"N	67°43'23.5"E
Boundary 19	24°32'34.1"N	67°43'12.2"E
Boundary 20	24°32'24.8"N	67°43'11.6"E
Boundary 21	24°32'25.0"N	67°42'49.8"E
Boundary 22	24°32'37.3"N	67°42'49.2"E
Boundary 23	24°52'37.3"N	67°42'45.4"E
Boundary 24	24°32'33.7"N	67°42'45.6"E
Boundary 25	24°32'33.5"N	67°42'36.3"E

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Land Coordinates of the Generation Facility/Solar Power Plant/Solar Farm of the Licensee

Boundary Point	Geodetic	
	Latitude	Longitude
Boundary 26	24°32'49.3"N	67°42'35.1"E
Boundary 27	24°33'05.3"N	67°42'35.0"E
Boundary 28	24°33'05.3"N	67°42'48.9"E
Boundary 29	24°33'18.8 "N	67°42'48.9"E
Boundary 30	24°33'18.8"N	67°42'24.7"E
Boundary 31	24°33'25.9"N	67°42'24.7"E
Boundary 32	24°33'25.9"N	67°42'17.9"E
Boundary 33	24°33'31.0"N	67°42'17.9"E
Boundary 34	24°33'31.3"N	67°42'13.9"E
Boundary 35	24°34'18.0"N	67°42'13.3"E
Boundary 36	24°34'17.5"N	67°42'04.8"E

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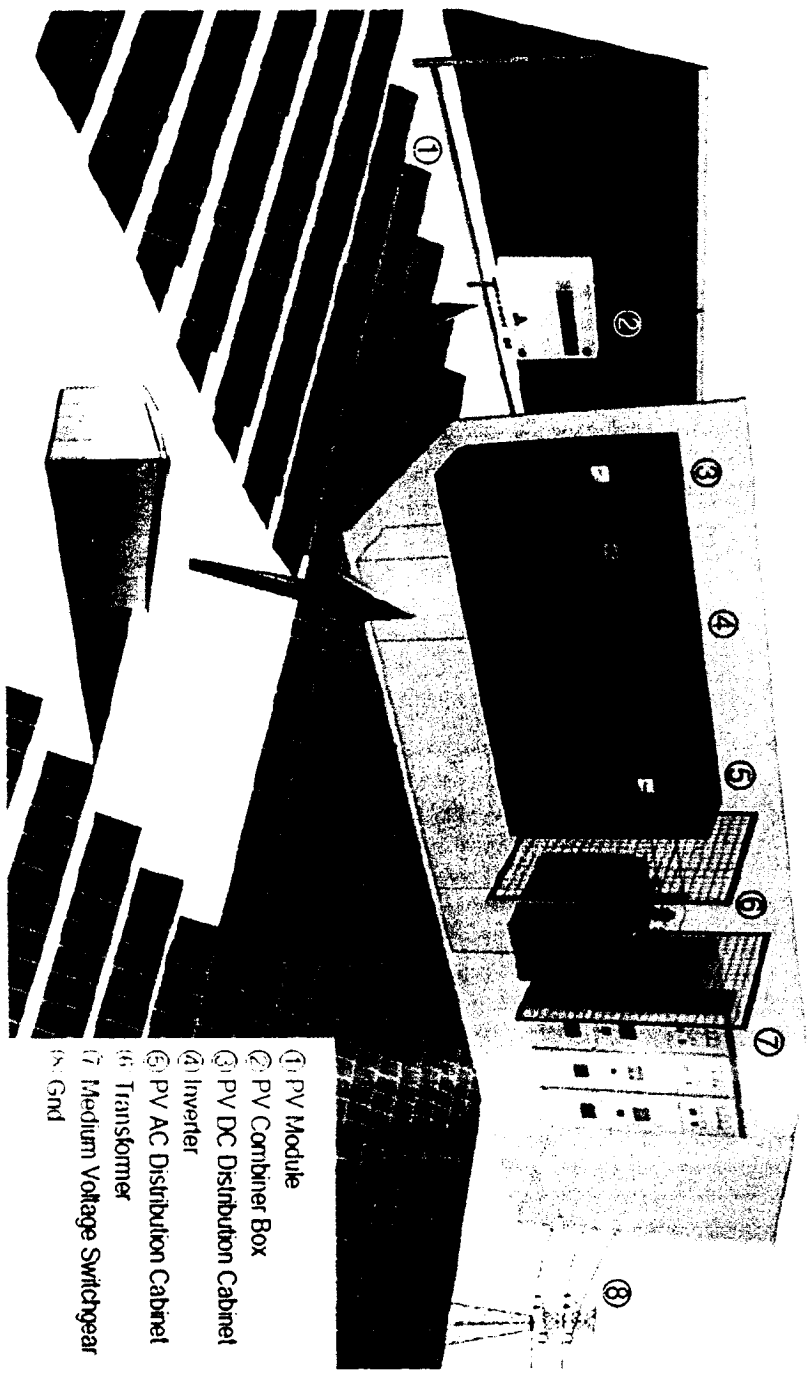
Process Flow Diagram of the Layout of the Generation Facility/Solar Power Plant/Solar Farm of the Licensee



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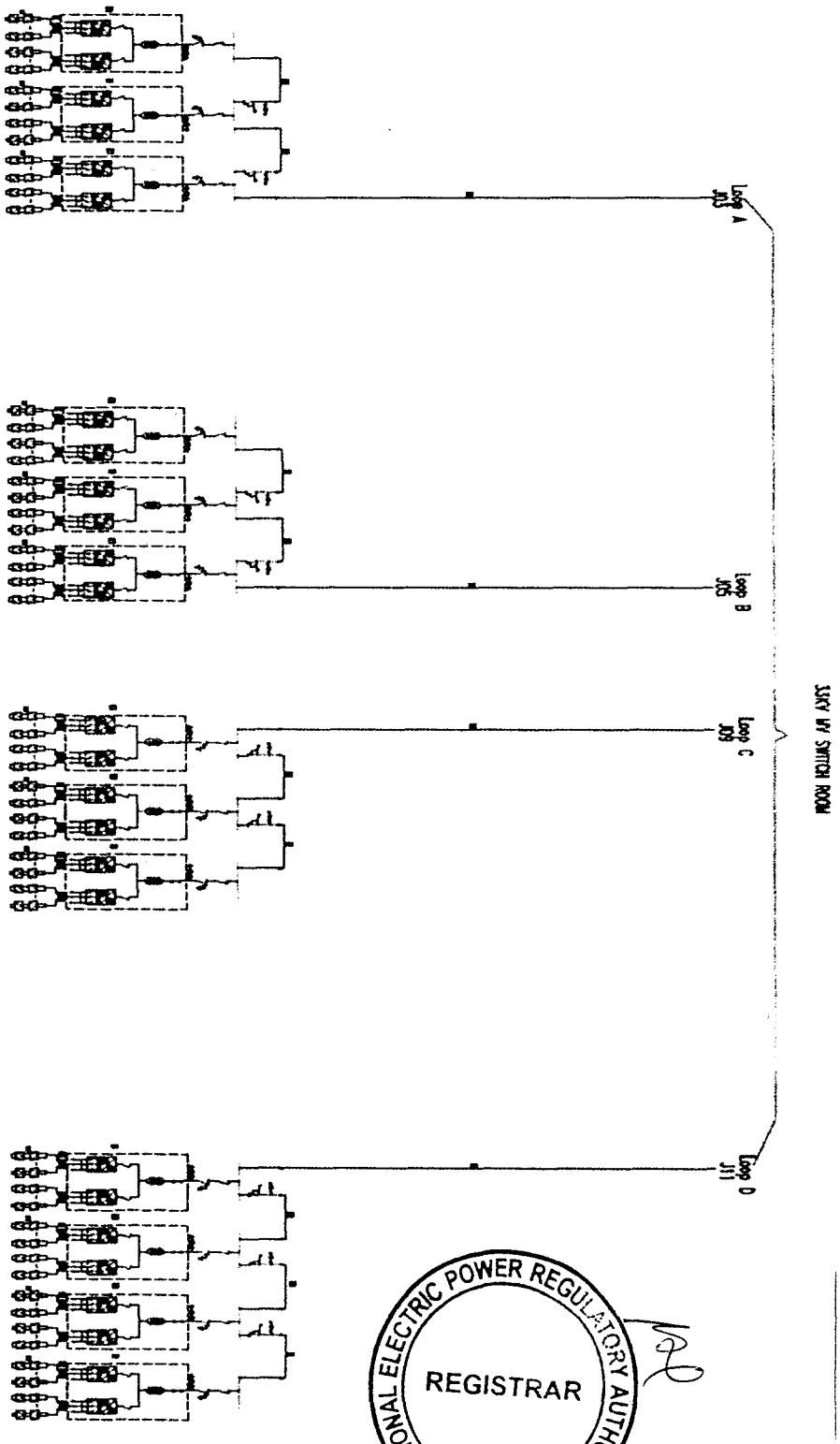
Single Line Diagram of the Generation Facility/Solar Power Plant/Solar Farm of the Licensee



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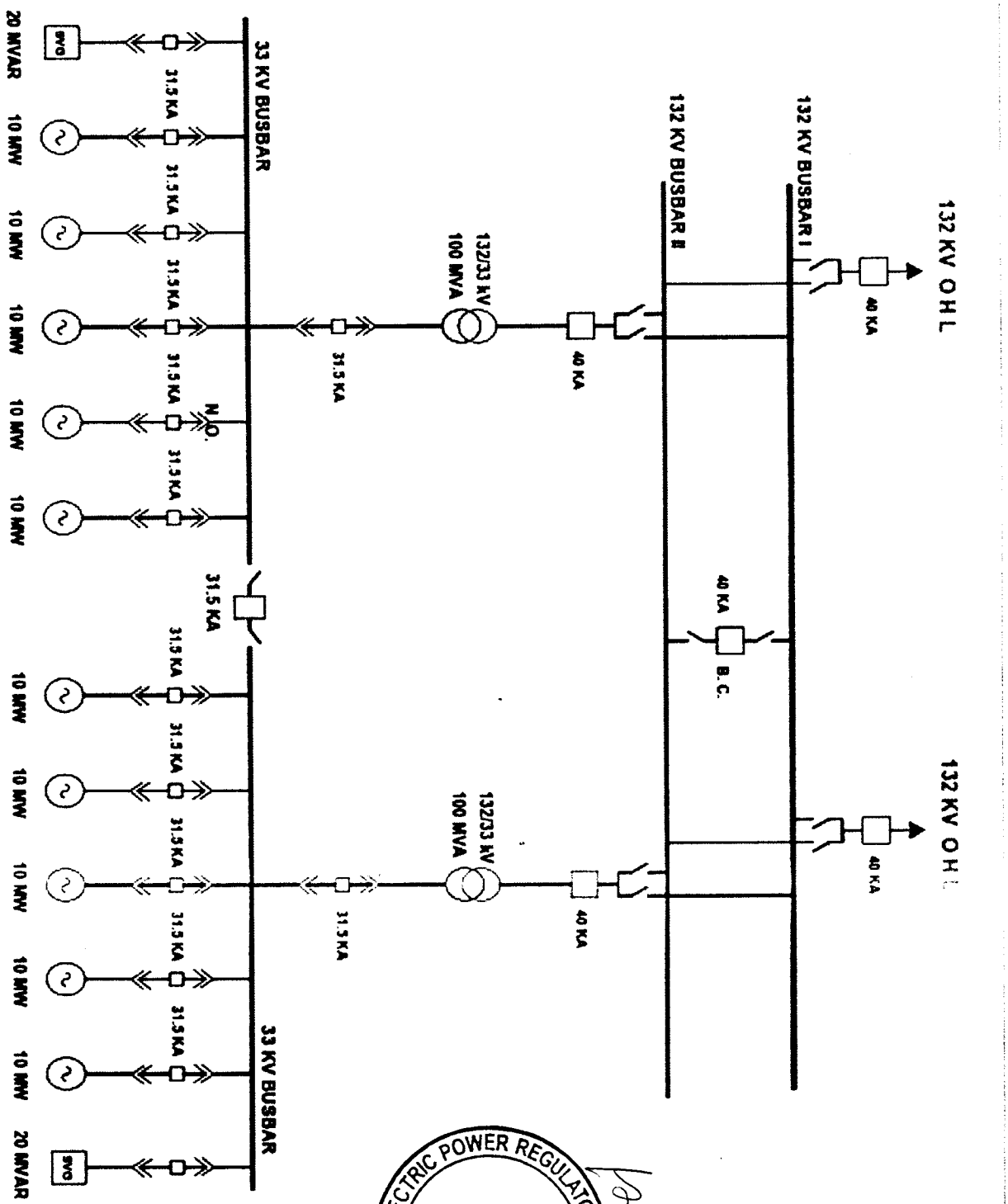
Single Line Diagram of the Generation Facility/Solar Power Plant/Solar Farm of the Licensee



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

The electric power generated from the Generation Facility/Power Plant/Solar Farm of Siachen Energy Limited-SEL shall be dispersed to the load center of HESCO.

(2). The proposed Interconnection Arrangement/Transmission Facility for dispersal of electric power for the Generation Facility/Solar Power Plant/Solar Farm comprises the following: -

(a). A direct 132 kV double circuit of measuring about 18 km in length on AASC Greely Conductor connecting the Generation Facility/Solar Power Plant/Solar Farm with 132 kV Gharo-NEW grid station of HESCO.

(3). Any change in the above Interconnection Arrangement/Transmission Facility duly agreed by SEL, NTDC or HESCO shall be communicated to the Authority in due course of time.

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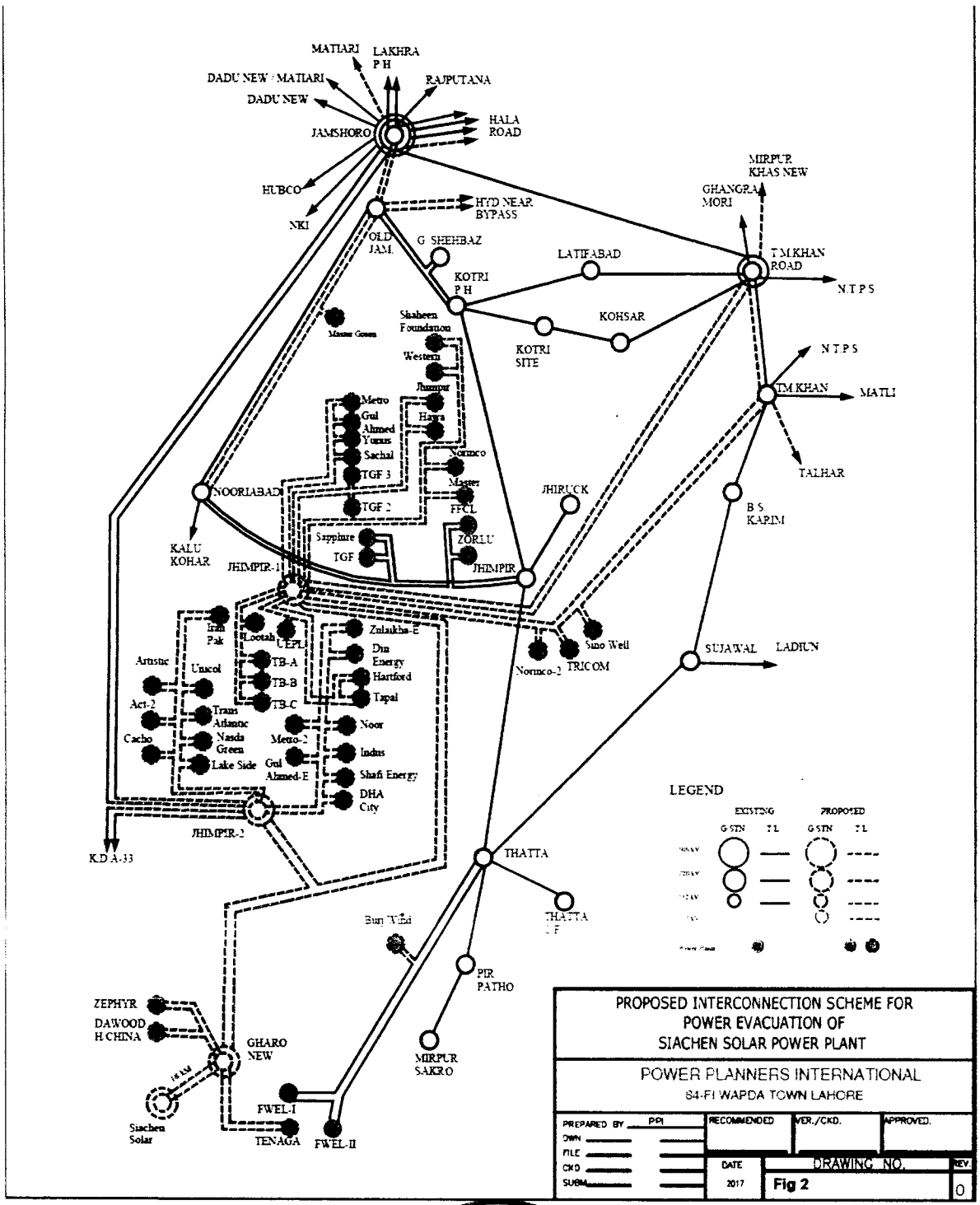
Schematic Diagram of the Interconnection Arrangement/Transmission Facility for Dispersal of Power from the Generation Facility/Solar Power Plant /Solar Farm



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Detail of Generation Facility/Solar Power Plant/ Solar Farm

(A). General Information

(i).	Name of the Company/Licensee	Siachen Energy Limited
(ii).	Registered/ Business office of the Company/Licensee	4th Floor, Plot No. 36-C, Lane # 13, Bukhari Commercial Area, Khayaban-e-Shujaat, DHA Phase-6, Karachi, Pakistan.
(iii).	Location of the generation facility Solar Power Plant/ Solar Farm	Mirpur Sakro, District Thatta, in the Province of Sindh
(iv).	Type of the generation facility/ Solar Power Plant/Solar Farm	Solar PV Power Plant

(B). Solar Power Generation Technology & Capacity

(i).	Type of Technology	Photovoltaic (PV) with single-axis tracking	
(ii).	System Type	Grid Connected	
(iii).	Installed Capacity of the generation facility Solar Power Plant/Solar Farm (MW)	100.00 MW_P	
(iv).	No. of Panel/Modules	200016	
(v).	PV Array	Nos. of Strings	7408
		Modules in a string	27
(vi).	Invertor(s)	Quantity	26
		Make	Sineng or equivalent
		Capacity of each unit	3125KW

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(C). Technical Details of Equipment

(a).	**Solar Panels – PV Modules**	
(i).	Type of Module	Mono 500W
(ii).	Type of Cell	Bifacial mono-crystalline
(iii).	Dimension of each Module	2244±2mmX1112±2mm X35mm±1mm
(iv).	Total Module Area	2.50 m^2
(v).	Frame of Panel	Anodized Aluminum Alloy
(vi).	Weight of one Module	32.5 kg±3%
(vii).	No. of Solar Cells in each module	150(5 X30)
(viii).	Efficiency of module	20.0%
(ix).	Maximum Power (P_{max})	500Wp
(x).	Voltage @ P_{max}	42.75V
(xi).	Current @ P_{max}	11.70A
(xii).	Open circuit voltage (V_{oc})	51.54V
(xiii).	Short circuit current (I_{sc})	12.14A
(xiv).	Maximum system open Circuit Voltage	1500VDC
(b).	**PV Array**	
(i).	No of string	7408
(ii).	Modules in string	27
(c).	**Inverters**	
(i).	Rated AC output power(@50℃)	3125 kW
(ii).	Efficiency of inverter	98.7%
(iii).	Max. Allowable Input voltage	1500VDC
(iv).	Max. Current	4075A
(v).	Max. Power Point Tracking Range	900-1300V

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(vi).	Output electrical system	3 phase, 3 wire	
(vii).	Rated Output Voltage	630V	
(viii).	Power Factor (adjustable)	>0.99/0.8 leading to 0.8 lagging	
(ix).	Power control	MPP tracker	
(x).	Rated Frequency	50/60 Hz	
(xi).	Environmental Enclosures	Relative Humidity	0-95%
		Audible Noise	IP65
		Operating Elevation	4000m(>3000 derating)
		Operating temperature	-30°C~+60°C(>50°C derating)
(xii).	Grid Operating protection	A	DC circuit breaker
		B	AC circuit breaker
		C	DC overload protection
		D	Leakage current monitoring
		E	Grid monitoring
		F	Insulation monitoring
		G	Ground fault monitoring
		H	Overheat protection
		I	Smoke detecting
(d).	**Junction Boxes Installed and fixed on main steel structure in Array Yard**		
(i).	Number of Junction Box units	312	
(ii).	Input circuits in each box	24	
(iii).	Max. Input current for each circuit	15A	

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(iv).	Protection Level	IP68
(v).	Over Current protection	Include
(vi).	Surge Protection	Class II
(e).	**Data Collecting System**	
(i).	System Data	Hardwire connection via RS485 and/or UTP
(f).	**Power Transformer**	
(i).	Rating	2*90MVA
(ii).	Type of Transformer	ONAF
(iii).	Purpose of Transformer	Step-up(33kv/132kv)
(iv).	Output Voltage	132kv
(g).	**Unit Transformer**	
(i).	Rating	13*6250KVA
(ii).	Type of Transformer	33kv Oil Typed Transformer
(iii).	Purpose of Transformer	Step-up(2.5x0.63kv/33kv)
(iv).	Output Voltage	33kv

(D). Other Details

(i).	Expected COD of the generation facility Solar Power Plant/Solar Farm	December 21, 2021
(ii).	Expected useful Life of the generation facility Solar Power Plant/Solar Farm from the COD	25 years

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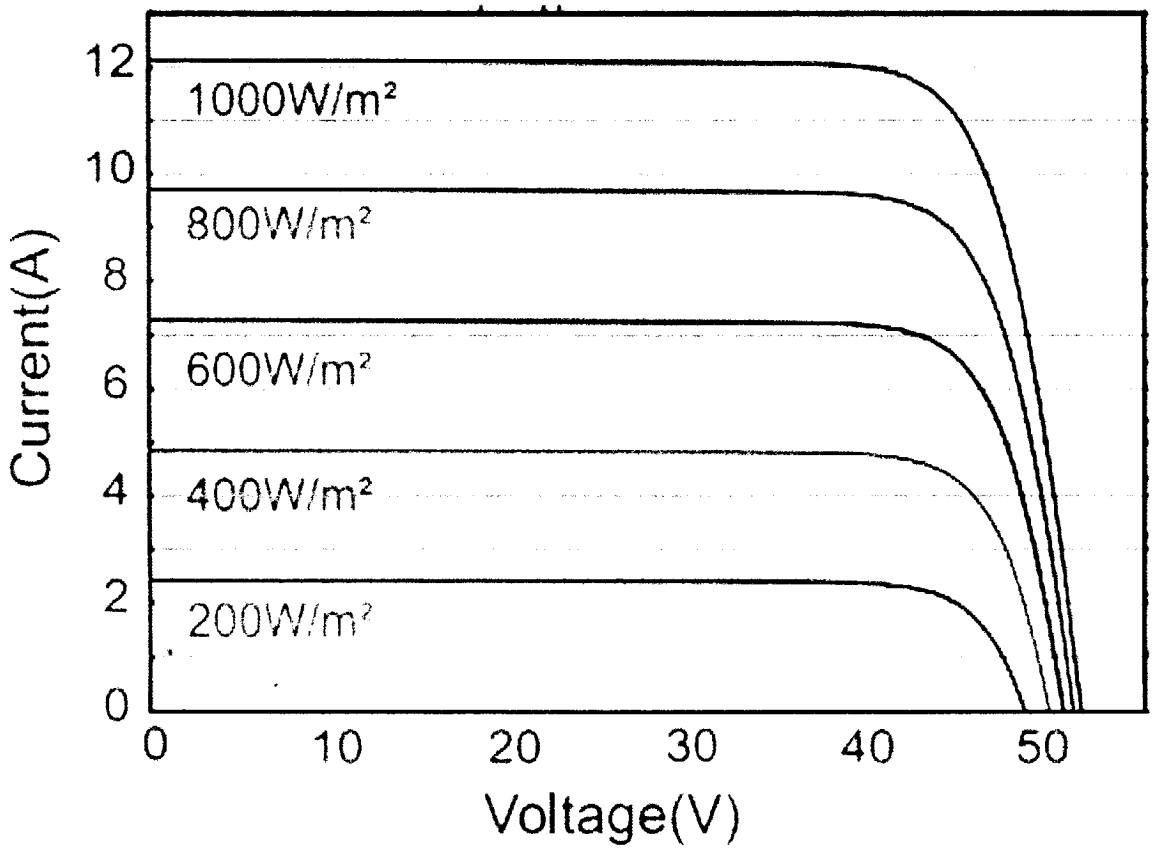
V-I Curve of PV Cell of Generation Facility/Solar Power Plant/ Solar Farm



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Revised/Modified 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.

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SCHEDULE-II

(1).	Total Installed Capacity of the Generation Facility/Solar Power Plant/Solar Farm	100.00 MW_P
(2).	Average Sun Hour Availability/Day (Irradiation on Inclined Surface)	5-6 hours
(3).	No. of days per Year	365
(4).	Annual generating capacity of Generation Facility/Solar Power Plant/Solar Farm (As Per Simulation)	200,133 MWh (first year)
(5).	Total expected generation of the Generation Facility/Solar Power Plant/Solar Farm during the twenty five (25) years term of this licence	4,692,855 MWh
(6).	Annual generation of Generation Facility/Solar Power Plant/Solar Farm based on 24 hours of working	100x24x365 =876,000 MWh
(7).	Net Capacity Factor of Generation Facility/Solar Power Plant/Solar Farm	22.84%(first year)

Note

All the above figures are indicative as provided by the Licensee. The Net Delivered Energy available to Power Purchaser for dispatch will be determined through procedures contained in the Energy Purchase Agreement (EPA) or the Applicable Document(s).

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