National Electric Power Regulatory Authority
Islamic Republic of Pakistan

Registrar

NEPRA Tower, Attaturk Avenue (East), G-5/1, Islamabad
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No. NEPRA/R/DL/LAG-471/2797-77 September 07, 2020

Mr. Farman Ahmed Khan Lodhi,
Chief Executive Officer,
Solis Alpha Energy (Private) Limited,
3rd Floor, Horizon Vista, Block-4, Clifton,
Karachi.

Subject: **Grant of Generation Licence No. SGC/138/2020**
Licence Application No. LAG-471
Solis Alpha Energy (Private) Limited (SAEPL)

Reference: SAEPL's application submitted vide letter dated September 13, 2019.

Enclosed please find herewith Generation Licence No. SGC/138/2020 granted by National Electric Power Regulatory Authority (NEPRA) to Solis Alpha Energy (Private) Limited (SAEPL) for its 01.00 MW Solar Power Plant located at Chor Cantonment, in the Province of Sindh, pursuant to Section 14B of the Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997/Amendment Act, 2018. Further, the determination of the Authority in the subject matter is also attached.

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

Enclosure: As Above

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY ★ NEPRA ★ REGISTRAR

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(Syed Safeer Hussain)

Copy to:

1. Secretary, Ministry of Energy, Power Division, A-Block, Pak Secretariat, Islamabad.
2. Chief Executive Officer, Alternative Energy Development Board (AEDB), 2nd Floor, OPF Building, G-5/2, Islamabad.
3. Chief Executive Officer, CPPA-G, ENERCON Building, Sector G-5/2, Islamabad.
4. Managing Director, NTDC, 414-WAPDA House, Lahore.
5. Chief Executive Officer, Hyderabad Electric Supply Company Limited (HESCO), WAPDA Offices Complex, Hussainabad, Hyderabad.
6. 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 Application of Solis Alpha Energy (Private) Limited for the Grant of Generation Licence

September 07, 2020
Case No. LAG-471

(A). Filing of Application

(i). Solis Alpha Energy (Private) Limited (SAEPL) submitted an application on September 16, 2019 for the grant of generation licence in terms of Section-14B of Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997 (the "NEPRA Act") read with the relevant provisions of the NEPRA Licensing (Application and Modification Procedure) Regulations, 1999 (the "Licensing Regulations").

(ii). The Registrar examined the submitted application and found that same in compliance with the Licensing Regulations. Accordingly, the Registrar submitted the application for the consideration of the Authority to decide the admission of the application or otherwise. The Authority considered the matter and found the form and content of the application in substantial compliance with Regulation-3 of the Licensing Regulations.

(iii). Accordingly, the Authority admitted the application on October 25, 2019 for consideration of the grant of the generation licence as stipulated in Regulation-7 of the Licensing Regulations. The Authority approved an advertisement to invite comments of general public, interested and affected persons in the matter as stipulated in Regulation-8 of the Licensing Regulations. Accordingly, notices were published in one (01) Urdu and one (01) English newspapers on October 31, 2019.

(iv). In addition to the above, the Authority also approved a list of stakeholders for seeking their comments for its assistance in the matter in

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terms of Regulation-9(2) of the Licensing Regulations. Accordingly, letters were sent to different stakeholders as per the approved list on October 31, 2019, soliciting their comments for assistance of the Authority.

(B). Comments of Stakeholders

(i). In reply to the above, comments were received from four (04) different stakeholders. These included Central Power Purchasing Agency (Guarantee) Limited (CPPAGL), Hyderabad Electric Supply Company (HESCO), Environmental Protection Agency of Government of Sindh (EPAGoS) and Ministry of Science and Technology of Govt. of Pakistan (MoST). The salient points of the comments offered by the said stakeholder are summarized below:

(a). CPPAGL submitted that SAEPL is planning to set up a 1.00 MW_P Photo Voltaic (PV) cell based generation facility for supplying/selling to Military Engineering Services (MES) at Chor Cantonment in the province of Sindh. In light of the provisions of the NEPRA Licensing (Generation) Rules, 2000 (the "Generation Rules"), the Authority is required to scrutinize all applications for the generation licence on "Least Cost Option Criteria (LCOC)". According to the existing tariff structure for the end consumer, the more the number of units being sold, less will be the per unit rate for the fixed capacity charges and vice versa. In the view of foregoing, it is suggested that (a). a quantum for Distributed Generation needs to be ascertained in light of the demand projections (against which agreements/procurements have already taken place) while keeping in view the Energy charge avoided by the Distributed Generation consumers/source against which the capacity charge was supposed to be recovered (as per existing tariff structure of the end consumers); (b). a uniform tariff required to be introduced (in the existing end

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consumer tariff setting framework) for the Grid Connected Distributed Generator Consumer (be it for Net-Metering or Self-Consumption) by incorporating a new tariff category in the Schedule of Tariff-SOT; (c). a separate Category for Grid-Connected Distribution Generation (be it for Net-Metering or Self-Consumption) needs to be introduced through a Central Planning Mechanism in order to ensure proper registration and charge of respective tariff; (d). The design of the competitive wholesale market i.e. CTBCM has already been submitted by CPPA to NEPRA for regulatory approval in March 2018. Unless the design of the competitive wholesale market is approved and the wholesale market become functional, the retail suppliers could not carry out the sales/purchase transactions without any market framework. Therefore, the first prerequisite in this regard is to have an approved model of the competitive wholesale market from the regulator in order to proceed further towards the retail market.

(b). HESCO remarked that Bluk Power Consumer (s) (BPC(s)) are the back bone of it financial system as it receives handsome revenue from them. The direct sale/purchase agreement between Private Power Producers-PPP(s) and BPC(s) will deprive it from ample revenue which will result in increase in losses, resulting in higher tariff to left over small consumers or higher subsidy for the Govt. of Pakistan which is already unbearable. HESCO submitted that the Authority should review the demand and supply projections before granting any further generation licence as per the existing legal and regulatory framework, thus avoiding concomitant financial implications. HESCO opposed the grant of generation licence to SAEPL as it will open the door to sale and purchase of power in territory of

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HESCO, as well as it will also affect the future demand and supply projection worked out by NTDC/CPPAGL;

(c). EPAGoS submitted that according to Section 17 of Sindh Environmental Protection Act-2014, no proponent of a project shall commence construction or operation unless he has filed with it an initial environmental examination or environmental impact assessment, and has obtained from the Agency approval in respect thereof". In view of the above, EPAGoS submitted that SAEPL may be directed to submit the above said report along with the Government Fees, Pay Order in favor of "Sindh Sustainable Development Fund" for further necessary approval; and

(d). MoST submitted that installation of 1.00 MW_P Solar Power Generation Plant at Chor Cantonment will result in reduction of power consumption from the grid in the area. Furthermore, MoST recommended that the panels should be in latest Tier-I list and be IEC (International Electrotechnical Commission) and UL (Underwriters Laboratories) certified. However, MoST cannot comment on the financial or other ToR's of the aforementioned project.

(ii). The Authority considered the above comments of CPPAGL, HESCO, EPAGoS and MoST and considered it appropriate seeking perspective of SAEPL. On the observations of CPPAGL and HESCO, it was submitted that *prime facie* the application of SAEPL fulfills the LCOC considering the fact that as new transmission facilities are not required therefore, no such costs is involved. There are no constraints for transmission system as the generation facility is located on the premises of MES, owned by Pakistan Army and the existing infrastructure for supply for electric power will be used. Further to the said, it was submitted that the proposed generation

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facility will not be addition in capacity and in fact work to augment the supply for MES by injecting low cost clean energy. It was submitted that the tariff for the proposed BPC(s) will be very competitive as compared to other sources of energy prevailing this time. MES will only be sharing minimum load on solar, while the major bulk of its load shall remain with the relevant DISCO. Since such a minimal load is being shared, that too during a few hours of the day, there should not be that significant of an effect on the fixed capacity charges. The load will remain connected with the local grid and get the electricity supply through its respective DISCO to fulfill the maximum demands of the respective Army Garrisons.

(iii). Regarding the observations of EPAGoS, it was confirmed that the required IEE for the project has already been carried out and the same has been submitted. In this regard, the required No Objection Certificate (NOC) is expected in due course of time. On the comments of MoST, it was confirmed that the proposed PV cells will be from Tier-I suppliers having the required certification.

(iv). The above submissions of SAEPL were reviewed and in view the submitted clarification it was considered appropriate to process the generation licence application of SAEPL as stipulated in the Licensing Regulations and NEPRA Licensing (Generation) Rules, 2000 (the "Generation Rules").

(C). Findings/Comments

(i). The Authority examined the submissions of SAEPL including the information provided with its application, comments of the stakeholders, rejoinder submitted by SAEPL, the relevant rules & regulations in the matter. The observations in the matter are explained in the following paragraphs.

(ii). The Authority has observed that the applicant i.e. SAEPL is an entity incorporated under Section 16 of the Companies Act, 2017 (XIX of 2017), having Corporate Universal Identification No. 0135094, dated June 11, 2019. It is a private limited company having Business Office at D-180, Block-5, Clifton

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Karachi, South Sindh. According to the Memorandum of Association, the objects of the company, *inter alia*, including business of electric power generation. The main sponsor of the SAEPL is Solis Energy Solutions Private Limited which is involved in providing solar based solutions for different clients. The said company is also certified by AEDB for providing Net-Metering Solutions to various household and industrial consumers.

(iii). As explained above, the application for grant of generation licence under consideration envisages setting up 1.00 MW_P generation facility for MES Chor Cantonment, District Umer Kot in the province of Sindh. In this regard, it is pertinent to that SAEPL plans supplying to the aforementioned facility of MES as BPC through cable located on private property owned by Pakistan Army. According to the submitted information, the total cost of the project will be about Pak. Rs. 47.704 million which will be financed through a combination of debt (80% of the total cost of project i.e. Rs. 38.163 million) and equity (20% of the total cost of project i.e. Rs. 09.541 million). In this regard, a number of financial institution/commercial banks have shown their willingness to finance the debt portion of the project.

(iv). The Authority has considered the submissions of SAEPL and observed that the company carried out a feasibility study of the project including, *inter alia*, details of equipment of PV solar plant, PV-sitting details, power production estimates and other allied equipments. The review of the feasibility study reveals that for the above mentioned one location to achieve the total capacity of 1.00 MW_P the company will be installing a total of 3080 PV cells each of 330 W_P. In consideration of the said, it is clarified that the company plans installing PV cells from Tier-I manufactures including Jinko Solar, JA Solar, Renesola or Trina Solar Limited. It is pertinent to mention that the company has confirmed the deal for purchase of PV Cells of TSM-330 PE14A with Trina Solar where the manufacturer has assured an average capacity factor of 17.07%.

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(v). As explained above, the supply from proposed generation facility will be supplied to different entities of MES. According to the system study of the project, the dispersal to the BPC will be made at 11kV voltage through cables located on the private property owned by the Pakistan Army not involving any public. In this regard, it is pertinent to mention BPC is defined term as stipulated in Section 2 (ii) of the NEPRA Act. According to the said, a BPC is a consumer which purchases or receives electric power, at one premises, in an amount of one megawatt 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. In terms of Section 2 (xxva) of the NEPRA Act, for the purpose of specified means specified by regulations made by the Authority under the NEPRA Act. It is pertinent to mention that the relevant regulation in this regard are still under formation and in the absence of the same the Authority has been allowing even amount of less than 1.00 MW to be treated as BPC therefore, all the loads of entities explained in the preceding Paras may be considered as BPC.

(vi). Further to the above, Section 2(v) of the NEPRA Act defines the term "Distribution" wherein the ownership, operation, management and control of distribution facilities located on private property and used solely to move or deliver electric power to the person owning, operating, managing and controlling those facilities or to tenants thereof is not included in the definition of "distribution". As explained above, the distribution facilities to be used for delivery of electric power to one (01) location of MES are located on private property (without involving any public property or any third party) will be owned, operated, managed and controlled by the respective entity therefore, the supply of electric power to various entities by SAEPL does not constitute a distribution activity under the Act, and a distribution licence will not be required by the company.

(vii). The Authority has considered that the proposed project, for which generation licence is being sought, is based on RE source and does

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not cause pollution as in the case of conventional power plants. However, the Authority considers that the operation of the generation facility/Solar Power Plant/Solar Farm may cause soil pollution, water pollution and noise pollution during construction and operation. In this regard, the Authority has observed that SAEPL has completed the Initial Environmental Examination (IEE) for the project and Environmental Protection Agency, Government of Sindh (EPAGoS), has also issued the NOC for the project.

(viii). The grant of a generation licence is governed by the provisions of Rule-3 of the Generation Rules. It is pertinent to mention that SAEPL has provided the details of the proposed generation facility about (a). location; (b). size; (c). technology; (d). interconnection arrangement; (e). technical limits; (f). technical functional specification and (g). other specific/relevant details as stipulated in Rule-3 (1) of the Generation Rules. According to the Rule-3(5) of the Generation Rules, the Authority may refuse to issue a generation licence where the site, technology, design, fuel, tariff or other relevant matters pertaining to the proposed generation facility/solar power plant/ Solar Farm proposed in an application for a generation licence are either not suitable on environmental grounds or do not satisfy the least cost option criteria. In this regard, the Rule-3(5) of the Generation Rules stipulates the conditions pertaining to Least Cost Option Criteria which includes (a). sustainable development or optimum utilization of the RE or non-RE resources proposed for generation of electric power; (b). the availability of indigenous fuel and other resources; (c). the comparative costs of the construction, operation and maintenance of the proposed generation facility/solar power plant/ Solar Farm against the preferences indicated by the Authority; (d). the cost and right-of-way considerations related to the provision of transmission and interconnection facilities; (e). the constraints on the transmission system likely to result from the proposed generation facility/solar power plant/Solar Farm and the costs of the transmission system expansion required to remove such constraints; (f). the short-term and the long-term forecasts for additional capacity requirements; (g). the tariff resulting or likely to result from the construction or operation of the proposed generation facility/solar power plant/Solar Farm; and (h). the optimum

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utilization of various sites in the context of both the short-term and the long-term requirements of the electric power industry as a whole.

(ix). In view of the above, the Authority considers that the proposed project will result in optimum utilization of the RE which was earlier untapped, resulting in pollution free electric power. It is pertinent to mention that solar is an indigenous resource and such resources should be given preference for the energy security. As explained in the preceding paragraphs above, the company will be supplying electric power to a BPC directly which only involve laying a feeder measuring a few meters, this concludes that the project will not face any constraints in transmission of electric power. Further, being located in the same vicinity as that of the BPC, the project will not result in cost and right-of-way issue for the provision of interconnection `. In view of the said, it is considered that the project of SAEPL fulfills the eligibility criteria for grant of generation licence as stipulated in the NEPRA Act, rules and regulations and other applicable documents.

(D). Grant of Licence

(i). The Authority considers that sustainable and affordable energy/electricity is a key prerequisite for socio-economic development of any country. In fact, the economic growth of any country is directly linked with the availability of safe, secure, reliable and cheaper supply of energy/electricity. In view of the said, the Authority is of the considered opinion that for sustainable development, all indigenous power generation resources especially RE must be developed on priority basis.

(ii). The Authority observes that the existing energy mix of the country is heavily skewed towards the thermal power plants, mainly operating on imported fossil fuels. The continuous import of fossil fuels not only creates pressure on the precious foreign exchange reserves of the country but is also an environmental concern. Therefore, in order to achieve sustainable development, it is imperative that indigenous RE resources are given priority for power generation and their development is encouraged. The Authority is really

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encouraged to observe that with each passing day, the cost of RE technologies is showing downward trend making the same affordable for commercial use. The Authority is also encouraged to observe that the Govt. of Pakistan is planning to enhance the share of RE from its current level of 5% of the Installed capacity to 30% of the total installed capacity by 2030. Furthermore, a number of initiatives are also being undertaken in the private sector in this regard.

(iii). The Authority has observed that in the current case, SAEPL has approached for the grant of a Generation Licence for setting up a generation facility with a cumulative Installed Capacity of 1.00 MW_p for supplying to a BPC which is also existing consumer of its respective DISCO. The Authority considers that the above proposal of SAEPL is in line with the provisions of the NEPRA Act, relevant rules and regulations framed thereunder and vision of the Govt. of Pakistan to enhance the contribution of RE in generation of electric power. The project will not only help SAEPL in diversifying its portfolio but will also enhance the energy security of the BPC. Further, the project will also help in reducing the carbon emission by generating clean electricity, thus improving the environment.

(iv). As explained above, SAEPL has provided the details of location, technology, size, net capacity/energy yield, interconnection arrangements, technical details and other related information for the proposed PV based generation facility/solar power plant/ Solar Farm. In this regard, the Authority has observed that sponsors of the project have acquired/available with them the required land for setting up the distinct PV based generation facility. The said details are being incorporated in the generation licence.

(v). The Authority has observed that proposed generation facility of SAEPL will be used for supplying to BPC i.e. MES. According to Section-2(ii) of the NEPRA Act, a consumer which purchases or receives electric power at one premises, in an amount of one megawatt or more or in such amount and voltage level and with such characteristics as the Authority may determine/specify is treated as BPC. It is pertinent to mention that the relevant

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regulation in this regard are still under formation and in the absence of the same the Authority has been allowing even amount of less than 1.00 MW to be treated as BPC therefore, the Authority allows the above mentioned entity explained in the preceding Paras to be BPC of SAEPL.

(vi). Regarding supply to the BPC, the Authority observes that the BPC and the proposed generation facility of SAEPL is located within the same premises and the BPC will be supplied through underground cable/feeder of 11kV. Pursuant to proviso to Section-21 of the NEPRA Act, the Authority is empowered to allow a generation company to sell electric power to a BPC located in the service territory of a distribution company. In view of the said, the Authority allows the SAEPL to sell electricity to BPC. Further, under Section-2(v) of the NEPRA Act, ownership, operation, management and control of distribution facilities located on private property and used solely to move or deliver electric power to the person owning, operating, managing and controlling those facilities or to tenants thereof has not been included in the definition of "distribution". Based on the said considerations that the proposed BPC is located within the same premises and no public areas are involved, the supply of power to BPC by SAEPL does not constitute a distribution activity under the NEPRA Act, and SAEPL will not require a distribution licence for supplying to the BPC.

(vii). The term of a generation licence under Rule-5(1) of the Generation Rules is required to match with the maximum expected useful life of the units comprised in a generation facility. According to the information provided by SAEPL, the Commercial Operation Date (COD) of the proposed generation facility/solar power plant/ Solar Farm will be February 28, 2021 and it will have a useful life of around twenty five (25) years from its COD. In this regard, SAEPL has requested that the term of the proposed generation licence may be fixed as per the said useful life of generation facility/solar power plant/ Solar Farm. The Authority considers that said submission of SAEPL about the useful life of the generation facility/solar power plant/ Solar Farm and the subsequent request of SAEPL to fix the term of the generation licence is

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consistent with international benchmarks; therefore, the Authority fixes the term of the generation licence to twenty five (25) years from COD of the project subject to Section-14 B of the NEPRA Act.

(viii). The Authority considers the environmental issues arising from the installation of any project of prime importance. As explained in the preceding paragraphs, SAEPL has confirmed that it has carried out IEE of the project. Further, SAEPL has also confirmed that the project will not have any adverse impact on the environment and the necessary NOC will be submitted in due course of time. In view of the importance of the matter, the Authority decides to make SAEPL obligatory for compliance of environmental standards. In this regard, the Authority includes a specific article pertaining to compliance of environmental standards in the generation licence. Further, the Authority directs SAEPL to submit the required approval/NOC from EPAGoS in due course of time but not later than six months of issuance of this determination.

(ix). Regarding the rates, charges and terms and conditions of tariff between SAEPL and its BPC, it is reiterated that under Section-7(3)(a) of the NEPRA Act, determining tariff, rate and charges etc. is the sole prerogative of the Authority. However, the Authority observes that tariff between SAEPL and its BPC, does not affect any other consumer or third party. Therefore for the purpose of tariff, the Authority considers it appropriate directing SAEPL and its BPC to agree on a bilateral agreement and accordingly SAEPL will be allowed to charge the agreed tariff subsequent to the grant of the generation licence.

(x). The Authority has duly considered the comments of different stakeholders as explained above. In this regard, the Authority has observed that CPPAGL and HESCO has raised various concerns including (a). compliance of the LCOC; (b). new tariff for consumers having dual connection; (c). specifying share of distributed generation in the IGCEP; (f). approval of design of competitive wholesale market; (g). decrease in revenue of HESCO and higher tariff to left over small consumers; and (h). review of supply and demand projections before issuance of any further Licence.

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(xi). In consideration to the above, the Authority hereby confirms that it has duly considered the relevant provisions of related rules to confirm that proposal of SAEPL fulfils the requirements prescribed under the relevant rules and regulations including LCOC as explained in preceding paragraph. About the proposal of CPPAGL to have a new tariff for such consumers having dual supply arraignment (i.e. from the grid through DISCO as well as self-generation/third party source as in the current case), the Authority considers this an important issue but at the same time is of the view that it has not relevant to current case being an application of a generation licence. The Authority is cognizant of the situation and has already included this issue as part of the proceedings for the tariff petitions of the DISCO(s) which is under deliberation and is expected to be decided in due course of time without affecting the grant of generation licence to SAEPL. Regarding the suggestion to specify the share of distributed generation in the IGCEP, the Authority considers that planning function needs special consideration to have a true picture of the demand-supply situation of the system. The Authority emphasizes that DISCO(s) and NTDC must refine their process to capture a true picture for the future requirements by revitalizing their planning function by having suitable tools in the matter including the process of registration for entities like SAEPL etc. As regards the approval of design of competitive wholesale market, the Authority through its determination NEPRA/DG(Lic)/LAM01-26389-398 dated December 05, 2019, has already approved the same.

(xii). With regard to observations of HESCO about its loss of revenue and increase in capacity charges for the leftover consumers, the Authority observes that proposed BPC of SAEPL is also existing consumer of HESCO and will continue to maintain their connection in future due to the fact that solar energy will be available in day time from six to eight hours only. In this regard, the Authority considers that efforts of BPC to have cheaper and alternate source of electricity are legitimate and same cannot be denied. The Authority considers that all DISCO(s) including HESCO should improve the quality of service in order to retain their consumers. Moreover, DISCO(s) should also concentrate on expanding their consumer base in addition to existing

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consumers. In this regard, the Authority have noticed that a large number of applications for new connection are pending in various DISCO(s) including HESCO. The Authority directs all DISCO(s) including HESCO to process these applications and clear the backlog thus increasing their consumer base. Further, the Authority directs to all DISCO(s) not to create obstacles for consumers opting for alternate/cheaper resources of energy. In consideration of the said, the observations of CPPAGL and HESCO stand addressed and settled.

(xiii). In consideration of the above, the Authority hereby approves the grant of generation licence to SAEPL on the terms and conditions set out in the generation licence annexed to this determination. The grant of generation licence will be subject to the provisions contained in the NEPRA Act, relevant rules, regulations framed thereunder and other applicable documents.

Authority:

Rafique Ahmed Shaikh
(Member)

31/8/20

Rehmatullah Baloch
(Member)

2/9/2020

Engr. Bahadur Shah
(Member)

Saif Ullah Chattha
(Member/Vice Chairman)

2-9-2020

Engr. Tauseef H. Farooqi
(Chairman)

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National Electric Power Regulatory Authority
(NEPRA)
Islamabad – Pakistan

GENERATION LICENCE

No. SGC/138/2020

In exercise of the powers conferred upon under Section 14B of the Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997, as amended or replaced from time to time, the Authority hereby grants a Generation Licence to:

SOLIS ALPHA ENERGY (PRIVATE) LIMITED

Incorporated Under Section-16 of the
Companies Act, 2017 (XIX of 2017) Having Corporate Universal
Identification No. 0135094, dated June 11, 2019

for its Generation Facility/ Solar Power Plant/ Solar Farm Located at Chor Cantonment in the Province of Sindh

(Total Installed Capacity: ≈ 01.00 MW_P Gross)

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

Given under my hand this on 07th day of September Two Thousand & Twenty and expires on 27th day of February Two Thousand & Forty-Six.

07 09 20

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 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;

(c). "Applicable Law" means 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 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;

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

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the Power Purchaser;

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

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

(i). "Commissioned" means the successful completion of commissioning of the generation facility/Solar Power Plant for continuous operation and despatch to the Power Purchaser;

(j). "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;

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

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

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

(n). "Licence" means this licence granted to the Licensee for its generation facility/Solar Power Plant/Solar Farm;

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(o). "Licensee" means **Solis Alpha Energy (Private) Limited** or its successors or permitted assigns;

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

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

(r). "Power Purchaser" means the BPC which will be purchasing electric power from the Licensee, pursuant to a EPA for procurement of electric power;

(s). "Solar Farm" means a cluster of photovoltaic cells installed on the ground or any other suitable place in the same location used for production of electric power";

(t). "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 rules and regulations issued under the Act.

Article-2
Applicability of Law

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

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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 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 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 before it is Commissioned.

Article-4
Term of Licence

4.1 This Licence shall become effective from the date of its issuance and will have a term of twenty five (25) years from the COD of the generation facility/Solar Power Plant, subject to the provisions of Section-14(B) of the Act.

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

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 is allowed to charge the Power Purchaser/BPC a mutually agreed tariff.

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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.

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 of the Licensee shall comply with the environmental and safety standards as may be prescribed by the relevant competent authority as amended or replaced from time to time.

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10.2 The Licensee shall provide a certificate on a bi-annual basis, confirming that the operation of its generation facility/Solar Power Plant is in conformity with required environmental sta

ndards as prescribed by the relevant competent authority as amended or replaced from time to time.

Article-11
Power off take Point and Voltage

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

Article-12
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-13
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.

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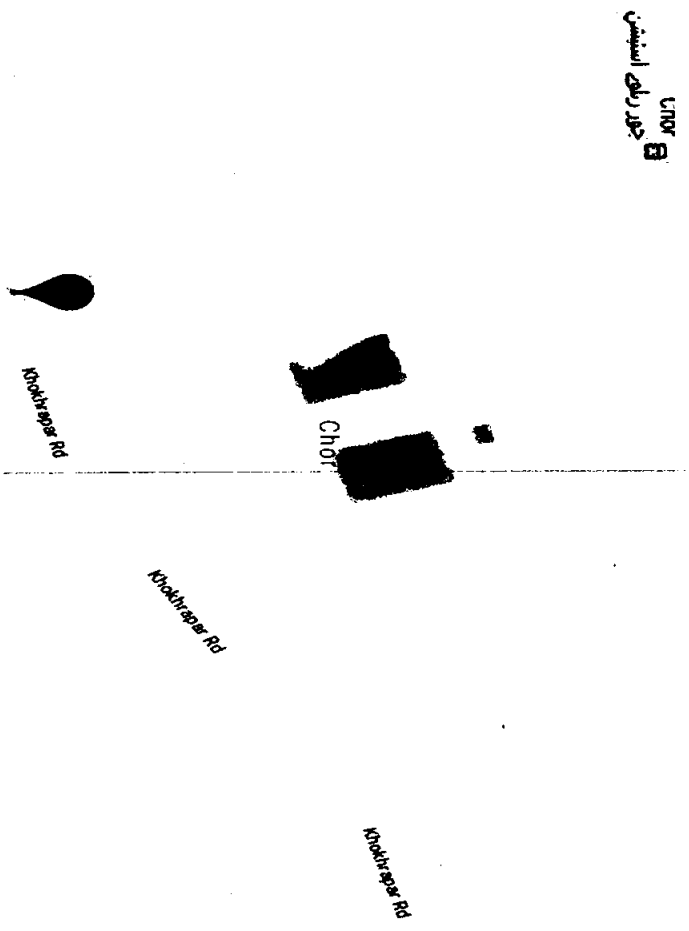
Location of the Generation Facility/ Solar Power Plant/ Solar Farm of the Licensee



Chor Cantonment

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

Geographical Land Coordinates of Pannu Aqil Cantonment

Total Project Land			
Serial Number	**Location**	**Coordinates**	
1.	Chor Cantonment	Latitude	$25^0$30'14.14"N
		Longitude	$69^0$46'36.41"E

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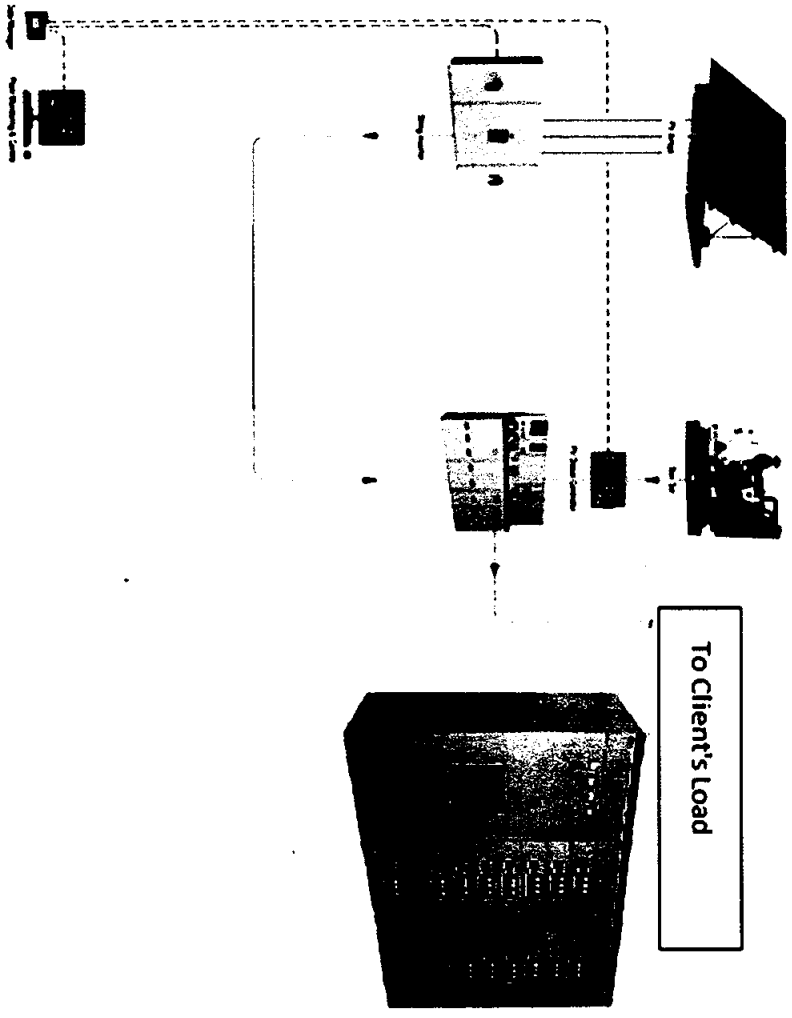
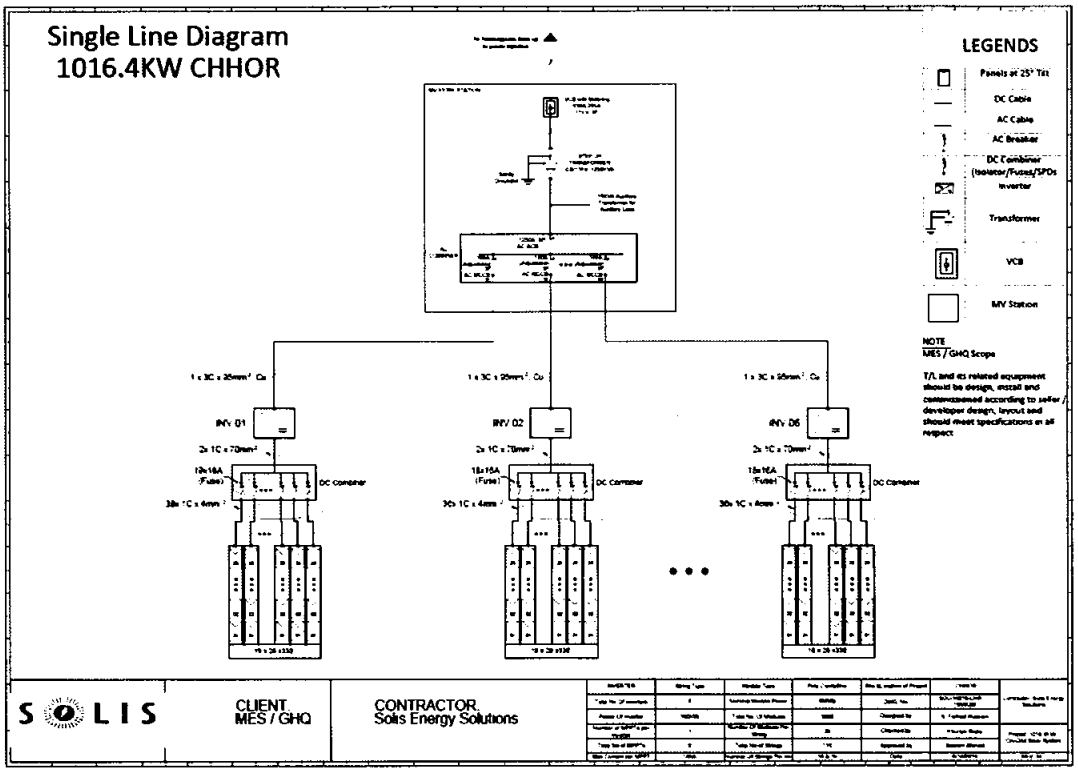
Process Flow Diagram of the Generation Facility/Solar Power Plant/Solar Farm of the Licensee



Process Flow of Chor Cantonment

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



Single Line Diagram of Chor Cantonment

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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/Solar Power Plant/Solar Farm of the Licensee will be delivered/supplied to a Bulk Power Consumer (BPC) in the name of Military Engineering Services (MES) located at Chor Cantt, Mirpur Khas, in the province of Sindh.

(2). The details pertaining to BPC, supply arrangement and other relating information is provided in the subsequent description of this Schedule. Any change in the said, shall be communicated to the Authority in due course of time.

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Details of Generation Facility/Solar Power Plant/ Solar Farm

(A). General Information

(i).	Name of the Company/Licensee	Solis Alpha Energy (Private) Limited
(ii).	Registered/ Business office of the Company/Licensee	D-180, Block 5, Clifton Karachi, in the Province of Sindh
(iii).	Location of the generation facility Solar Power Plant/ Solar Farm	Military Engineering Services, Chor Cantonment, Mirpur Khas, Sindh
(iv).	Type of the generation facility/ Solar Power Plant/ Solar Farm	Solar Photovoltaic (PV)

(B). Solar Power Generation Technology & Capacity

(i).	Type of Technology	Photovoltaic (PV) Cell	
(ii).	System Type	On Grid	
(iii).	Installed Capacity of the generation facility/ Solar Power Plant/ Solar Farm (MW)	01.00 MW_P	
(iv).	Number of Panel/Modules	3080	
(v).	PV Array	No. of Strings	110
		Modules in a string	28
(vi).	Invertor	Quantity	6
		Make	SMA Sunny High-power 150-20
		Capacity of each Unit	150 kW

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(C). Technical Details of Equipment

(a).	**Solar Panels – PV Modules**	
(i).	Type of Module	TSM-330 PE14A
(ii).	Type of Cell	Polycrystalline
(iii).	Dimension of each Module	1956×992×40mm
(iv).	No. of Panels	3080
(v).	Total Module Area	1.94 m^2
(vi).	Frame of Panel	Silver Anodized Aluminium Alloy
(vii).	Weight of one Module	22.5 kg
(viii).	No of Solar Cells in each module	72
(ix).	Efficiency of module	17%
(x).	Maximum Power (P_{max})	330
(xi).	Voltage @ P_{max}	37.3
(xii).	Current @ P_{max}	8.87
(xiii).	Open circuit voltage (V_{oc})	46.1
(xiv).	Short circuit current (I_{sc})	9.38
(xv).	Maximum system open Circuit Voltage	1500 V
(b).	**PV Array**	

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(i).	Nos. of Strings	110
(ii).	Modules in a string	28 each
(c).	**Inverter**	
(i).	Capacity of each unit	150 kW
(ii).	Manufacturer	SMA Sunny High-power 150-20
(iii).	Input Operating Voltage Range	800 - 1450 V
(iv).	Number of Inverters	6
(v).	Efficiency of inverter	99.1% (Max.), 98.8% (Euro.)
(vi).	Max. Allowable Input voltage	1500 V DC
(vii).	Max. Current	180 A
(viii).	Max. Power Point Tracking Range	880 - 1450 V
(ix).	Output electrical system	3P + PE, 350 / 600 V
(x).	Rated Output Voltage	600 V
(xi).	Power Factor (adjustable)	> 0.99; 0.8 leading – 0.8 lagging adjustable
(xii).	Power control	MPP tracker
(xiii).	Rated Frequency	50/60 Hz

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(xiv).	Environmental Enclosures	Relative Humidity	0-100%, condensing
		Operating temperature	-25 to +60°C
(xv).	Grid Operating protection	A	DC switch
		B	AC short circuit protection
		C	DC overvoltage protection (Type 2)
		D	Anti-Island Protection
		E	DC Reverse connection protection
(d).	**Data Collecting System**		
(i).	System Data	Continuous online logging with data logging software to portal.	

(D). Other Details

(i).	Expected COD of the generation facility Solar Power Plant/ Solar Farm	February 28, 2021
(ii).	Expected useful Life of the generation facility Solar Power Plant from the COD	25 years

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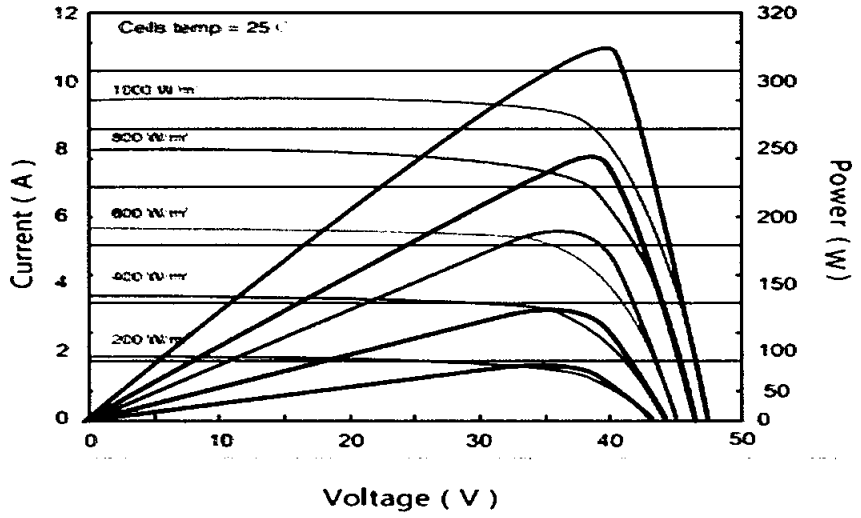
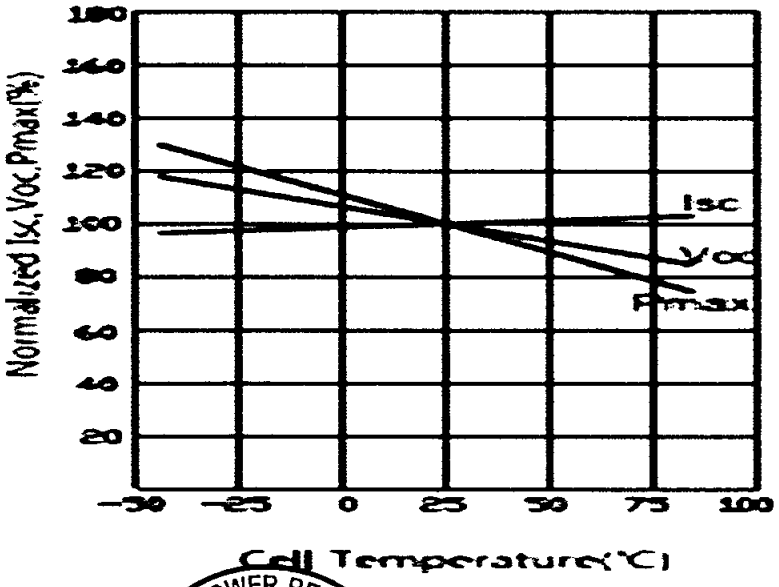
V-I Curve
of Solar Cell of Generation Facility/Solar Power Plant/ Solar Farm

Current-Voltage & Power-Voltage Curves (315W)



Temperature Dependence of Isc,Voc,Pmax



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Information
Regarding BPC i.e. MES to be Supplied by the Licensee i.e. SAEPL

(i).	No. of locations		One (01) unit of MES
(ii).	Location of consumers (distance and/or identity of premises)		Chor Cantonment, Mirpur Khas, in the Province of Sindh
(iii).	Contracted Capacity		01.00 MW_P
(iv).	Specify Whether		
	(a).	The consumer is an Associate undertaking of the SAEPL -If yes, specify percentage ownership of equity;	MES does not have direct association with SAEPL.
	(b).	There are common directorships:	Currently, there are no common directors of MES and SAEPL.
	(c).	Either can exercise influence or control over the other.	No
(v).	Specify nature of contractual Relationship		
	(a).	Between the consumer and SAEPL.	SAEPL will construct and operate solar plant and provide electricity for MES operations.
	(b).	Consumer and HESCO.	Client is C-2b(29)T consumer of HESCO with sanctioned load of 700kW.
(vi)	Any other network information deemed relevant for disclosure to or consideration of the Authority.		NA

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Information
Regarding Distribution Network for Supply of Electric Power to BPC in the name of MES

(i).	No. of Feeder		One (01)
(ii).	Length of Feeder		110m
(iii).	In respect of all the Feeders, describe the property (streets, farms, Agri land, etc.) through, under or over which they pass right up to the premises of customer, whether they cross-over.		The 11 kV feeder supplying power to MES Chor Cantonment is located on private property owned by the MES itself, without crossing of any public or third party private property etc.
(iv).	Whether owned by SAEPL, Consumer or HESCO (deal with each Feeder Separately)		
	(a).	If owned by HESCO, particulars of contractual arrangement	NA
	(b).	Operation and maintenance responsibility for each feeder	MES
(v).	Whether connection with network of HESCO exists (whether active or not)- If yes, provide details of connection arrangements (both technical and contractual)		Yes (C-2b(29)T)
(vi).	Any other network information deemed relevant for disclosure to or consideration of the Authority.		NA

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SCHEDULE-II

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

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SCHEDULE-II

(1).	Total Installed Capacity of the Generation Facility	1.00 MW_P
(2).	Average Sun Hour Availability/Day (Irradiance on Inclined Surface)	7 to 7.5 Hours
(3).	No. of days per year	365
(4).	Annual generating capacity of Generation Facility (As Per Simulation reports of 1 unit)	1,520.552 MWh
(5).	Total expected generation of the Generation Facility/Solar Power Plant/Solar Farm during the twenty five (25) years term of this license	34,985.598 MWh
(6).	Annual generation of Generation Facility/Solar Power Plant/Solar Farm based on 24 hours working	8,903.664 MWh
(7).	Net Capacity Factor of Generation Facility/Solar Power Plant/Solar Farm	17.07%

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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Authorization of Authority to Solis Alpha Energy (Private) Limited (SAEPL)

Incorporated under Section-16 of the Companies Act, 2017 (XIX of 2017) having Corporate Universal Identification No. 0135094, dated June 11, 2019

GENERATION LICENCE No. SGC/138/2020
For
Sale to Bulk Power Consumer

Pursuant to Section-22 of the Act and Rule-7 of the Generation Rules, the Authority hereby authorizes the SAEPL (the Licensee) to engage in Second-Tier Supply business, limited to the consumer as follows:

(1). Military Engineering Services (MES) for its Chor Cantonment, in the province of Sindh

Authority

Engr. Rafique Ahmad Sheikh (Member)	Rehmatullah Baloch (Member)
Engr. Bhadur Shah (Member)	Saif Ullah Chattha (Member)/Vice Chairman

Tauseef H. Farooqi
(Chairman)

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