National Electric Power Regulatory Authority
Islamic Republic of Pakistan

Registrar

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

No. NEPRA/R/DL/LAG-345/ 4220-26

March 28, 2017

Mr. Rafique Khanani
Chief Financial Officer
Artistic Wind Power (Private) Limited
Plot 4 & 8, Sector-25, Korangi Industrial Area,
Karachi.
Phone: 92-21-111016

Subject: **Grant of Generation Licence No. WPGL/41/2017**
Licence Application No. LAG-345
Artistic Wind Power (Private) Limited (AWPPL)

Reference: Your application vide letter No. Nil, dated May 24, 2016 (received on May 26, 2016).

Enclosed please find herewith Generation Licence No. WPGL/41/2017 granted by National Electric Power Regulatory Authority (NEPRA) to Artistic Wind Power (Private) Limited (AWPPL) for its 50.00 MW Wind Power Plant located at Jhimpir, District Thatta in the province of Sindh, pursuant to Section 15 of the Regulation of Generation, Transmission and Distribution of Electric Power Act (XL of 1997). 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: Generation Licence (WPGL/41/2017)

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28/03/17

(Syed Safeer Hussain)

Copy to:

1. Secretary, Ministry of Water and Power, 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, NTDC, 414-WAPDA House, Lahore
4. Chief Executive Officer, CPPA-G, 6th Floor, Shaheed-r-Millat Secretariat, Jinnah Avenue, Blue Area, Islamabad
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 Artistic Wind Power (Private) Limited for the Grant of Generation Licence

March 16, 2017
Case No. LAG-345

(A). Background

(i). In order to harness the potential of Renewable Energy (RE) in the country, Government of Pakistan (GoP) has formulated a policy for the development of RE resources. The policy titled "Policy for Development of Renewable Energy for Power Generation 2006 ("the RE Policy") is in field since 2006.

(ii). Under the above mentioned RE Policy, the Federal Government or the Provincial Governments can support the implementation of RE projects. Energy Department of Government of Sindh (EDGoS) issued Letter of Intent (LoI) to Artistic Wind Power (Private) Limited (AWPPL) for setting up a 50.00 MW wind based generation facility/Wind Power Plant/Wind Farm in the Jhimpir wind corridor of district Thatta, in the province of Sindh.

(iii). According to the terms and conditions of the above mentioned LoI, company carried out a feasibility study of the project. After completion of the said milestone, the sponsors of the project decided to approach the Authority for the grant of generation licence for the proposed generation facility/Wind Power Plant/Wind Farm.

(B). Filing of Application

(i). In accordance with Section-15 of the Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997 ("the NEPRA Act"),

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AWPPL submitted an application on May 26, 2016 for grant of the generation licence.

(ii). The Registrar examined the submitted application to confirm its compliance with the NEPRA Licensing (Application and Modification Procedure) Regulations, 1999 ("the Licensing Regulations"). It was observed that the application lacked some of required information/documentation as stipulated in the Licensing Regulations. Accordingly, Registrar directed AWPPL was to submit the missing information/documentation. AWPPL provided the same on June 07, 2016 and the Registrar submitted the case for consideration of the Authority.

(iii). The Authority considered the matter and found the form and content of the application in compliance with Regulation-3 of the Licensing Regulations. Accordingly, the Authority decided to admit the application for the grant of the generation licence as stipulated in Regulation-7 of the Licensing Regulations. The Authority approved the advertisement containing the prospectus and a notice to the general public about the admission of the application of AWPPL, to invite the general public for submitting their comments as stipulated in Regulation-8 of the Licensing Regulations. Further, the Authority also approved the list of the relevant stakeholders including government ministries, their attached departments, representative organizations and individual experts for informing about the admission of the application of AWPPL and for inviting their comments for the assistance of the Authority under Regulation-9 of the Licensing Regulations.

(iv). In consideration of the above, the advertisement was published in one (01) Urdu and one (01) English national newspapers i.e. "Daily Jang" and "Daily Times" respectively on June 28, 2016. Apart from the said, separate letters were also sent to abovementioned relevant stakeholders on June 28, 2016.

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(C). Comments of Stakeholders

(i). In reply to the above, the Authority received comments from four (04) stakeholders. These included Anwar Kamal Law Associates (ALKA), Pakistan Council of Renewable Energy Technologies (PCoRET), EDGoS and Central Power Purchasing Agency (Guarantee) Limited (CPPA-G). The salient points of the comments of said stakeholders are summarized below:-

(a). AKLA raised various issues being faced by the electric power sector of the country. It was highlighted that there is under-utilization of various existing generation facilities and resultantly there is surplus capacity. Therefore, induction of new power plants on "take or pay basis" etc. is not justifiable. AKLA contested that RE based generation facilities have higher upfront tariff and also enjoy the status of "must run" making such facilities not viable financially and economically. AKLA questioned the induction of RE projects in the scenario of reducing oil prices, proposed long term contracts of R-LNG, and the under construction coal power projects. AKLA opined that instead of setting up new power plants at costlier cost, efforts should be made to utilize the available generation capacity first to its full. Further, efforts should be made to encourage investors to setup new generation facilities under 'Take and Pay' regime in a competitive power market. ALKA opposed the grant of generation licence to AWPPL;

(b). PCoRET submitted that it has no objection on the grant of generation licence to AWPPL;

(c). EDGoS confirmed the issuance of LoI for the project and supported the grant of generation licence to AWPPL; and

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(d). CPPA-G confirmed that NTDC had given assurance that the dispersal arrangement for evacuation of electric power from the project would be available by December 2019. CPPA-G submitted that AWPPL has planned installing 20 x 2.50 MW Wind Turbine Generator (WTG) of Gold Wind (GW-121/2.50MW). In this regard it is pertinent to mention that higher capacity WTG having same Hub height as that of GW-121/2.50MW are now available. Therefore, AWPPL may consider installing such WTG for the proposed project. In consideration of the said, AWPPL needs to ensure that the selected WTG complies with the provisions of the Grid Code as amended from time to time.

(ii). The Authority examined comments of the above stakeholders and found that PCoRET and EDGoS have supported the grant of generation licence in explicit terms. CPPA-G has made observations about the selection of WTG and compliance with the Grid Code. Whereas, AKLA overwhelmingly opposed the grant of generation licence to AWPPL. In view of the said, the Authority decided seeking the perspective of AWPPL on the comments of CPPA-G and AKLA.

(iii). Regarding the objections of AKLA, it was submitted that comments are general in nature and are filed without fully understanding the dynamics of the electric power sector of the country and project financing etc. It was submitted that presently the country has the lowest contribution of RE in the energy mix which needs to be improved to the level of the other regional countries and other developing countries. The greater use of indigenous resources would not only help in diversifying the energy mix but also reduce the dependence on imported fossil fuels, mitigating the supply disruptions and price fluctuation risks.

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(iv). Further to the above, AWPPL submitted that AKLA is not fully conversant with the concepts of the installed and operational capacities. In this regard, attention is drawn to the hydel projects which are part of the multi purposes dams primarily meant for storage of water for agriculture purposes and are heavily dependent on the available hydrology. Further, another significant portion of installed capacity is inefficient and it is not economically viable to operate the same. Further, the fuel prices are volatile and cannot be assumed to remain on the existing low level to decide the future projects.

(v). In addition to the above, AWPPL acknowledged that new projects on coal and RLNG are being set up. However, AWPPL maintained that demand for the electric power would continue to rise therefore, efforts should be made to maintain the sizeable share of the RE in the overall energy mix of the country. Further to the said, AWPPL stressed that addition of RE will not only provide clean energy but result in savings of precious foreign exchange of the country. AWPPL submitted that in view of the current position of the electric power sector, it would be detrimental for the future projects and the sponsors changing from "take or pay" to "take and pay" as in the later situation there cannot be any guarantee for lenders for the required payments to pay off the debt.

(vi). On the comments/observations of CPPA-G, the company submitted that the selection WTG was made after a thorough analysis duly considering various world-class manufactures of WTG including General Electric, VESTAS, Gamesa, Nordex, Suzlon and Goldwind etc. After duly considering the various factors including (a). Wind Resource Position of the Corridor of Jhimipir (b). capital cost of equipment/WTG; (c). Lead time for Supply of Equipment/WTG; (d). Expected Energy Yield of WTG; (e). Reliability and Compliance with Grid Code; (f). Availability of suitable operation and maintenance teams (including easiness/availability spare parts for WTG etc., the company decided to select WTG of 2.50 MW of GW121/2.50 MW. It was clarified that proposed WTG is fourth generation (Type-IV) machine with

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synchronous generator without any gearbox. The said features of selected WTG will result in more energy yield and stability for grid as stipulated in the Grid Code.

(vii). The Authority considered the above submissions of AWPPL and found the same satisfactory. Regarding comments of AKLA, the Authority observed that most of the comments are related to regulatory and policy decisions and reiteration of its earlier comments which have already been deliberated in the upfront tariffs and generation licence applications in detail. In view of the above, the Authority decided to process the application of AWPPL for the grant of generation licence as stipulated in the Licensing Regulations and NEPRA Licensing (Generation) Rules, 2000 ("the Generation Rules").

(D). Evaluation of the Case

(i). The Authority has examined the submissions of AWPPL including the information provided in its application for the grant of generation licence, comments of stakeholders and response of AWPPL on the said same. The Authority has duly considered the feasibility study of the project, interconnection & dispersal arrangement studies etc., provisions of the RE Policy and relevant rules & regulations.

(ii). The Authority has observed that main sponsor(s) of the project include Artistic Milliners (Private) Limited (AMPL) which is an export oriented textile unit involved in manufacturing of denim fabrics and apparel. It is pertinent to mention that AMPL is already developing an approximately 50.00 MW generation facility/Wind Power Plant/Wind Farm in the name of Hartford Alternative Energy (Private) Limited for which the Authority had granted a generation licence WPGL/30/2016, dated April 26, 2016. Based on the financial strength and other evaluation parameters, EDGoS issued LoI and allocated 462 acres of land in Jhimpir, District Thatta, in the province of Sindh for setting up a generation facility/Wind Power Plant/Wind Farm of approximately 50.00 MW. In order to implement the project, the sponsors incorporated a Special

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Purpose Vehicle (SPV) in the name of AWPPL under Section-32 of the Companies Ordinance 1984. The memorandum of association of SPV interalia, includes the business of power generation and sale as one of its business objects.

(iii). The Authority has observed that according to the terms and conditions of the LoI, the SPV carried out a feasibility study of the project including inter alia, generation facility/Wind Power Plant/Wind Farm equipment details, micro-sitting details, power production estimates based on wind mast data of the project site, soil tests reports, technical details pertaining to selected wind turbine generator and other allied equipment to be used in the generation facility/Wind Power Plant/Wind Farm, electrical studies, environmental study and project financing etc. According to the above mentioned feasibility study, the SPV i.e. AWPPL will be setting up a 50.00 MW wind based generation facility/Wind Power Plant/Wind Farm in the Jhimpir wind corridor, district Thatta, in the province of Sindh. In this regard, AWPPL has confirmed that the proposed generation facility/Wind Power Plant/Wind Farm will be consisting of 20 x 2.50 MW of WTG (i.e. GW-121/2.5MW) of Xinjiang Goldwind Science & Technology Company Limited China (Goldwind). The Authority has observed that Goldwind is one of leading WTG manufacturer in the world and has its presence all over the world including Pakistan. In this regard, the Authority has observed that Goldwind has provided or providing WTG for four project with a cumulative capacity of around 300.00 MW. Further, the selected WTG are of Type-IV which is the latest generation of its type with characteristics supporting grid reliability and stability.

(iv). The Authority has observed that AWPPL carried out the required interconnection and system stability study for dispersal of electric power from the proposed generation facility/Wind Power Plant/Wind Farm. According to the said study, the dispersal of electric power will be made on 132 KV Voltage. The dispersal/interconnection arrangement will be consisting of a 132-KV Double Circuit (D/C) transmission line (measuring about 14 KM) for making an In-Out

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of 132-KV Single Circuit transmission line connecting the wind farms of Cacho Wind Energy (Private) Limited and Act-2 Wind (Private) Limited. In this regard, NTDC has also confirmed that necessary arrangements will be made ensuring availability of the dispersal arrangement well before the Commercial Operation Date (COD) of the generation facility/Wind Power Plant/Wind Farm.

(v). The Authority considers that the proposed project, for which generation licence is being sought, is based on RE source and does not cause pollution as in the case of conventional power plants. However, the Authority considers that the operation of the generation facility/Wind Power Plant/Wind Farm may cause soil pollution, water pollution and noise pollution during construction and operation. In this regard, the Authority has observed that AWPPL also carried out the Initial Environment Examination Study and submitted the same for the consideration and approval of Environmental Protection Agency, Government of Sindh (EPAGoS). In this regard, EPAGoS issued a No Objection Certificate for the project.

(vi). In terms of Rule-3 of the Generation Rules, the Authority may grant a generation licence to any person to engage in the generation business. The said rule stipulates various conditions pertaining to the grant of generation licence as explained in Rule-3(2), Rule-3(3), Rule-3(4), Rule-3(5) and Rule-3(6) of the Generation Rules. In the particular case under consideration, the Authority has observed that conditions of Rule-3(2) and Rule-3(3) stands satisfied as AWPPL has provided details of location, technology, size, net capacity/energy yield, interconnection arrangements, technical limits, technical functional specifications and other details specific to the generation facilities. The provision of Rule-3(4) of the Generation Rules regarding holding a public hearing is not applicable as there is no issue which require this exercise. The Rule-3(5) of the Generation Rules stipulates that the Authority may refuse to issue a generation licence where the site, technology, design, fuel, tariff or other relevant matters pertaining to the generation facility proposed in an application for a generation licence are either not suitable on environmental

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grounds or do not satisfy the least cost option criteria. In this regard, the Rule 3 of the Rules also stipulates the conditions pertaining to least cost option criteria which include (a). sustainable development or optimum utilization of the renewable or non-renewable energy 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 against the preferences indicated by the Authority; (d). the costs and rights-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 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 tariffs resulting or likely to result from the construction or operation of the proposed generation facility; and (h) the optimum 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.

(vii). In consideration of the above, the Authority clarifies that AEDB/GoP has identified two wind corridors (of Jhimpir and Gharo) in the province of Sindh of the country. The estimated potential for these two corridors is more than 50,000 MW. At the moment, around thirteen (13) projects with a cumulative Installed Capacity of around 650.00 MW have been installed and commissioned whereas another twenty five (25) projects including that AWPPL with cumulative capacity of around 1400.00 MW are in various stages of implementation.

(viii). 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 wind is an indigenous fuel and such fuels have a preference for the energy security. It is pertinent to mention that the Authority through its determination No. NEPRA/TRF-WPT/2017/1542-1544 January 27, 2017 has announced a Benchmark Levelized Tariff for the future wind projects

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which works out to be U.S. cents 7.7342/kWh. The said determination envisages conducting bidding among companies/sponsors of the project(s) as stipulated in NEPRA Competitive Bidding (Approval Procedure) Regulations, 2014. The said regulation envisages that companies/sponsors of the project(s) will be offering a discount on the announced benchmark tariff meaning thereby that tariff for future wind projects will be less than U.S Cents 7.742/kwh which will be very competitive.

(ix). As explained at Para-D(iv) above, the sponsors of the project carried out the grid interconnection study which concludes that the project will not face any constraints in transmission system. Further, being located at reasonable distance from the thick population, the project will not result in costs and rights-of-way issues for the provision of transmission and interconnection facilities. It is pertinent to mention that NTDC has included the project in its long-term forecasts for additional capacity requirements. In view of the explanation give above, it is clear that the project fulfills the requirements of the Least Cost Option Criteria.

(x). In view of the clarification and justifications given above, the Authority is of the considered view that the project of AWPPL fulfills the eligibility criteria for grant of generation licence as stipulated in the NEPRA Act, rules and regulations and other applicable documents.

(E). Grant of Generation Licence

(i). The 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 reasons, the Authority is of the considered opinion that for sustainable development, all indigenous power generation resources including RE must be developed on priority basis.

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(ii). The existing energy mix of the country is heavily skewed towards thermal power plants, mainly operating on imported fossil fuel. The continuous import of fossil fuel 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 Energy Security Action Plan 2005 approved by GoP, duly recognizes this very aspect of power generation through renewable energy and envisages that at least 5% of total national power generation capacity (i.e. 9700 MW) to be met through RE resources by 2030.

(iii). The Authority considers that the proposed project of AWPPL is consistent with the provisions of Energy Security Action Plan 2005. The project will help in diversifying the energy portfolio of the country. Further, it will not only enhance the energy security of the country by reducing the dependence on imported fuel but will also help reduction in carbon emission by generating clean electricity, thus improving the environment.

(iv). As explained at Para-D(vi) above, AWPPL has provided the details of location, technology, size, net capacity/energy yield, interconnection arrangements, technical details and other related information for the proposed generation facility/Wind Power Plant/Wind Farm. In this regard, the Authority has observed that EDGoS allocated land to AWPPL for setting up a generation facility/Wind Power Plant/Wind Farm. The said details have been incorporated in Schedule-I of the proposed generation licence. The Authority directs AWPPL to utilize the allocated land exclusively for the proposed wind power project and not to carry out any other generation activity on the said land except with its prior approval.

(v). Rule-5(1) of the Generation Rules stipulates that the term of a generation licence must be consistent with the maximum expected useful life of the units comprised in a generating facility, except where an applicant for a

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generation licence consents to a shorter term. According to the information provided by AWPPL, its generation facility/Wind Power Plant/Wind Farm will achieve COD by December 31, 2019 and will have a useful life of more than twenty (20) years from its COD. In this regard, AWPPL has requested that the term of the proposed generation licence may be fixed as at least twenty (20) years. As AWPPL has consented for a shorter term of twenty (20) years, the Authority fixes the term of the generation licence as twenty (20) years from COD of the project.

(vi). Regarding the tariff, it is hereby clarified that under Section-7(3)(a) of the NEPRA Act, determining tariff, rate and charges etc. is the sole prerogative of the Authority. In view of the said, the Authority through Artcile-6 of the generation licence directs AWPPL to charge the power purchaser only such tariff which has been determined, approved or specified by the Authority. The Authority directs AWPPL to adhere to the Article-6 of the generation licence in letter and spirit without any exception.

(vii). Regarding compliance with the environmental standards, the Authority directs AWPPL to ensure that the project will comply with the environmental standards during the term of the generation licence. In view of the said, the Authority has included a separate article (i.e. Artcle-10) in the generation licence along with other terms and conditions that the licensee will comply with relevant environmental standards. Further, the Authority directs AWPPL to submit a report on a bi-annual basis, confirming that operation of its project is compliant with required environmental standards as prescribed by the concerned environmental protection agency.

(viii). The proposed generation facility/Wind Power Plant/Wind Farm of AWPPL will be using renewable energy resource for generation of electric power. Therefore, the project may qualify for the carbon credits under the Kyoto Protocol. Under the said protocol, projects coming into operation up to the year 2020 can qualify for the carbon credits. AWPPL has informed that the project

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will achieve COD by December 31, 2019 which is within the deadline of the Koyoto Protocol. In view of this, an article (i.e. Article-14) for carbon credits and its sharing with the power purchaser has been included in the generation licence. In view of the said, the Authority directs AWPPL to initiate the process in this regard at the earliest so that proceeds for the carbon credits are materialized. AWPPL shall be required to share the proceeds of the carbon credits with the power purchaser as stipulated in Article-14 of the generation licence.

(ix). In view of the above, the Authority hereby approves the grant of generation licence to AWPPL 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 there under and other applicable documents.

Authority:

Maj. (R) Haroon Rashid
(Member)

17/3/17

Syed Masood-ul-Hassan Naqvi
(Member)

17/3/17

Himayat Ullah Khan
(Member/Vice Chairman)

23.3.17

Tariq Saddozai
(Chairman)

28.03.17

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National Electric Power Regulatory Authority (NEPRA)
Islamabad – Pakistan

GENERATION LICENCE

No. WPGL/41/2017

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

ARTISTIC WIND POWER (PRIVATE) LIMITED

Incorporated under the Companies Ordinance, 1984 Having Corporate Universal Identification No. 0095853, dated October 26, 2015

for its Generation Facility/Wind Power Plant Located at Jhimpir, District Thatta, in the Province of Sindh

(Installed Capacity: 50.00 MW Gross ISO)

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

Given under my hand on 28th day of March Two Thousand & Seventeen and expires on 30th day of December Two Thousand & Thirty Nine.

28/03/17

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 Alternate 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, 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;

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

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(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/Wind Power Plant/Wind 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/Wind Power Plant/Wind Farm, which are available or can be obtained in relation to the generation facility/Wind Power Plant/Wind Farm after the COD;

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

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

(j). "Distribution Code" means the distribution code prepared by the concerned XW-DISCO and approved by the Authority, as it 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/Wind Power Plant/Wind Farm, as may be amended by the parties thereto from time to time;

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

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(m). "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/Wind Power Plant/Wind Farm;

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

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

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

(q). "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/Wind Power Plant/Wind Farm, as may be amended from time to time;

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

(s). "Licensee" means **ARTISTIC WIND POWER (PRIVATE) LIMITED** or its successors or permitted assigns;

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

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

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

(w). "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;

(x). "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;

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

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

(aa). "Wind Power Plant/Wind Farm" means a cluster of WTGs situated in the same location of a generation facility used for production of electric energy;

(bb). "Wind Turbine Generator (WTG)" means the machines installed at the generation facility/Wind Power Plant/Wind Farm with generators for conversion of wind energy into electric energy;

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

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1.2 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.

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/Wind Power Plant/Wind 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/Wind Power Plant/Wind 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/Wind Power Plant/Wind Farm before its COD.

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 (20) years from the COD of the generation facility/Wind Power Plant/Wind Farm of the Licensee.

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 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. 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 or replaced from time to time.

Article-10
Compliance with Environmental & Safety Standards

10.1 The generation facility/Wind Power Plant/Wind 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/Wind Power Plant/Wind 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/Wind Power Plant/Wind Farm. The Licensee shall be responsible for the up-gradation (step up) of generation voltage up to the required dispersal voltage level.

Article-12
Performance Data

12.1 The Licensee shall install monitoring mast with properly calibrated automatic computerized wind speed recording meters at the same height as that of the WTG.

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

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12.3 The Licensee shall transmit the wind speed and power output data of its generation facility/Wind Power Plant/Wind 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/Wind Power Plant/Wind Farm. The Licensee shall share the said proceeds with the Power Purchaser as per the Policy.

Article-15
Design & Manufacturing Standards

The WTGs and other associated equipment of the generation facility/Wind Power Plant/Wind 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 the generation facility/Wind Power Plant/Wind Farm shall be unused and brand new.

Article-16
Power Curve

The power curve for the WTG 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/Wind Power Plant/Wind Farm.

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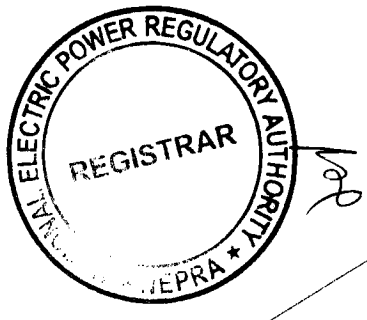
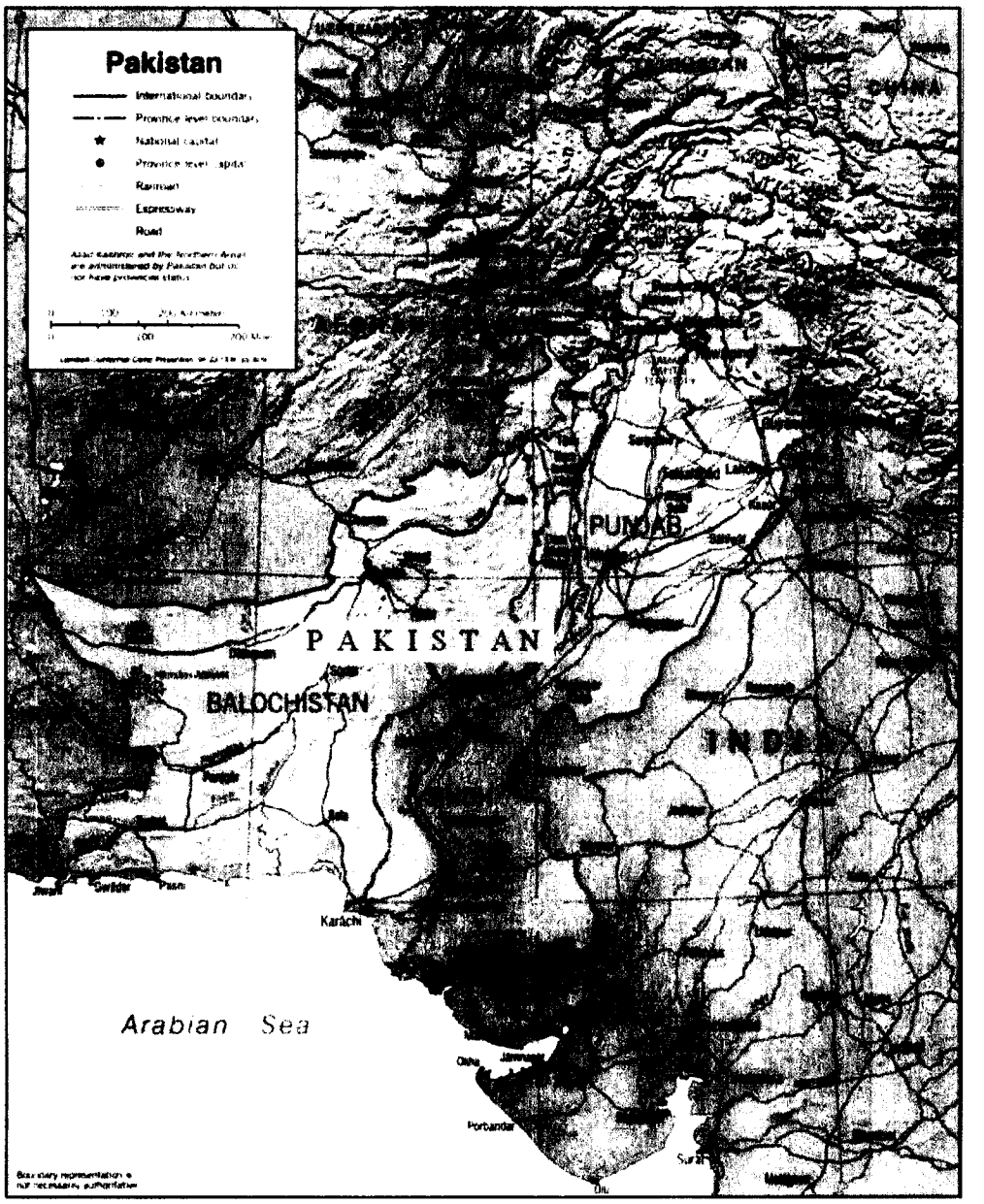
SCHEDULE-I

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



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



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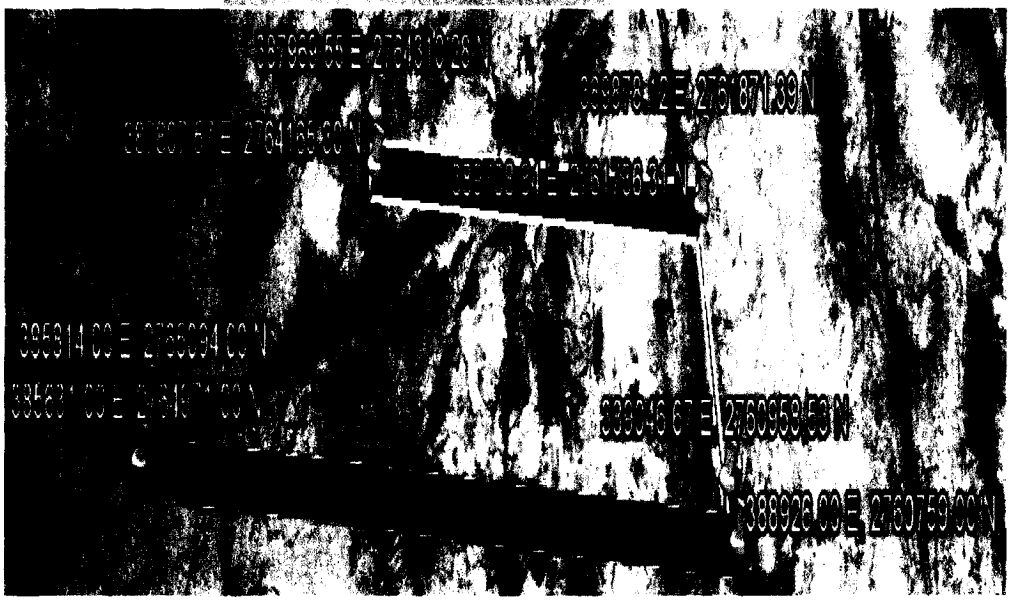
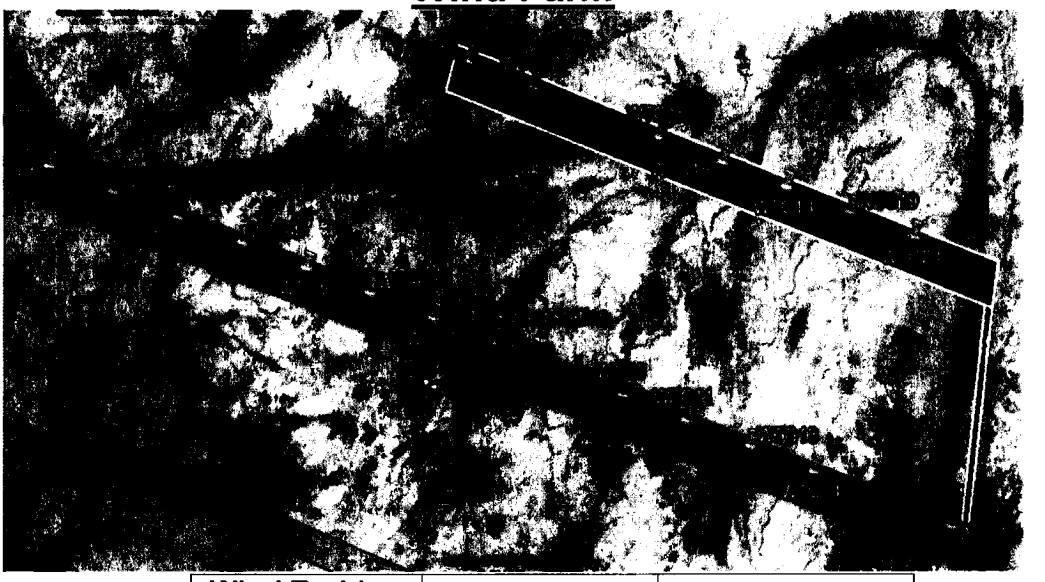
Land Coordinates of the Generation Facility/Wind Power Plant/ Wind Farm

	Total Land [illegible] 482 Acres	
	Geodetic Coordinates	
[illegible]	Latitude (N)	Longitude (E)
Boundary 1	27° 65' 094.70"	38° 58' 14.82"
Boundary 2	27° 64' 871.39"	38° 56' 31.01"
[illegible]	27° 60' 759.29"	38° 89' 26.70"
Boundary 4	27° 66' [illegible]	38° 90' 49.67"
[illegible]	27° 61' 871.39"	38° 98' 75.12"
Boundary 6	27° 61' [illegible]	38° 97' 08.84"
[illegible]	27° 64' 165.30"	38° 78' 07.57"
Boundary 8	27° 64' 310.28"	38° 79' 69.55"



Micro-Sitting of the Generation Facility/Wind Power Plant/ Wind Farm



Wind Turbine Generator (WTG)	Longitude (N)	Latitude (E)
WTG01	2,764,982	385,771
WTG02	2,764,696	385,994
WTG03	2,764,410	386,218
WTG04	2,764,124	386,441
WTG05	2,763,838	386,665
WTG06	2,763,552	386,889
WTG07	2,763,266	387,112
WTG08	2,762,980	387,336
WTG09	2,762,408	387,783
WTG10	2,764,170	387,935
WTG11	2,762,122	388,006
WTG12	2,763,885	388,159
WTG13	2,761,836	388,230
WTG14	2,761,550	388,453
WTG15	2,763,316	388,609
WTG16	2,763,031	388,834
WTG17	2,760,926	388,938
WTG18	2,762,746	389,059
WTG19	2,762,461	389,284
WTG20	2,762,176	389,509

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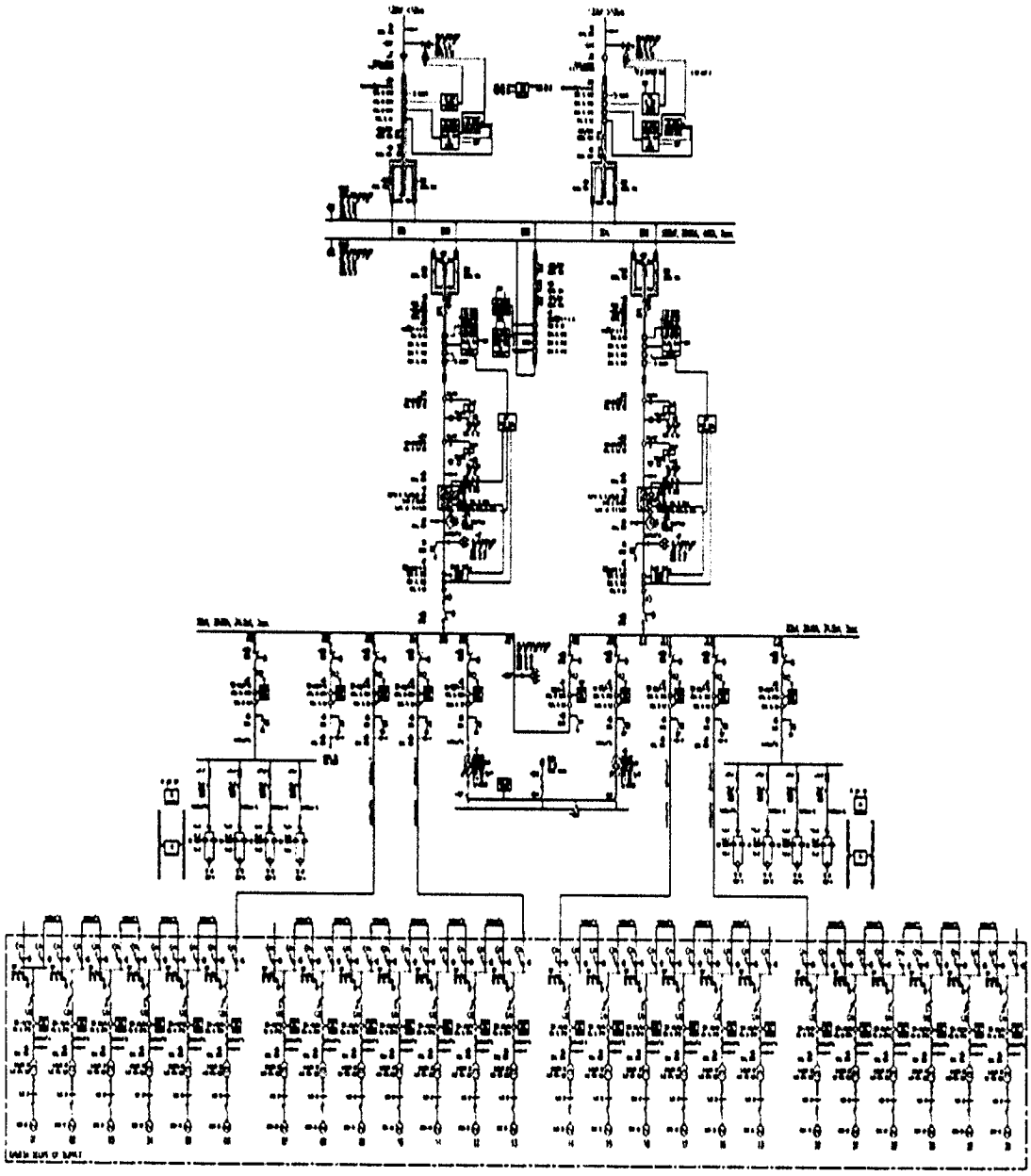
Single Line Diagram of the Generation Facility/Wind Power Plant/ Wind Farm



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Interconnection Arrangement/Transmission Facilities for Dispersal of Power from Generation Facility/Wind Power Plant/Wind Farm

The electric power generated from the Generation Facility/Wind Power Plant/Wind Farm of Artistic Wind Power (Private) Limited (AWPPL) shall be dispersed to the National Grid through the load center of HESCO.

(2). The proposed Interconnection Arrangement/Transmission Facilities for dispersal of power from Generation Facility/Wind Power Plant/Wind Farm of AWPPL will consist of the following:-

(a). A 132-KV double circuit transmission line (measuring about 14 KM) for making In-Out of the 132-KV single circuit from Cacho Wind Energy (Private) Limited to Act-2 Wind (Private) Limited.

(3). The scheme of interconnection of Generation Facility/Wind Power Plant/Wind Farm of AWPPL also proposes the following reinforcement already in place in Jhimpir cluster:-

(a). A new 220/132 KV Jhimpir-2 substation 3x250 MVA, 220/132 KV transformers;

(b). 220 kV double circuit (D/C) transmission line, approximately 18 km long, on twin-bundled Greeley conductor for making In/Out of one circuit of the existing Jamshoro – KDA-33 D/C transmission line at Jhimpir-2;

(c). 220 kV D/C transmission line, approximately 7 km long, on twin-bundled Greeley conductor for making In/Out of one of the planned Jhimpir-New (Jhimpir-1) - Gharo new D/C transmission line at Jhimpir-2; and

(d). 132 kV D/C transmission line, approximately 50 km long on twin bundled Greeley conductor for connecting the seven (07) wind

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power plants including Artistic Wind Power (Private) Limited with Jhimpir-2.

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

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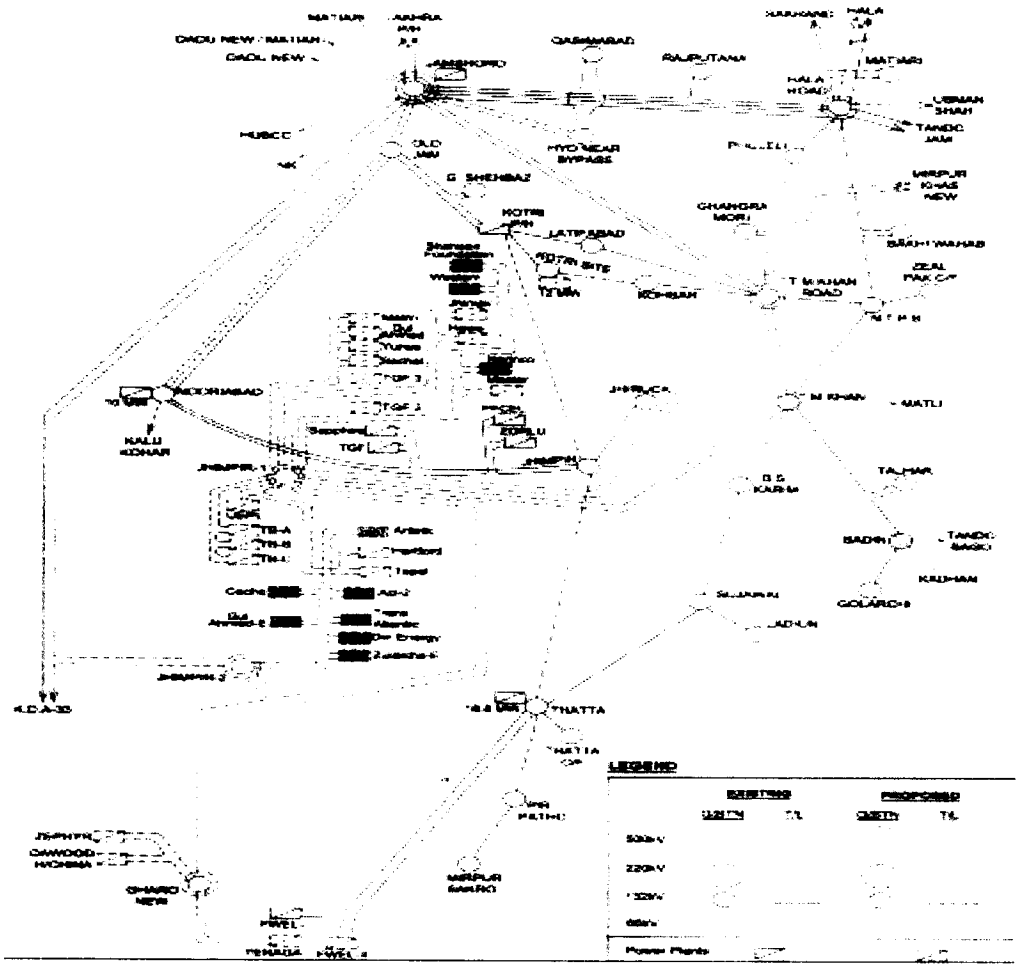
Schematic Diagram of Interconnection Arrangement/Transmission Facilities for Dispersal of Power from the Generation Facility/Wind Power Plant/Wind Farm



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Details of Generation Facility/Wind Power Plant/ Wind Farm

(A). General Information

(i).	Name of the Company/Licensee	Artistic Wind Power (Private) Limited
(ii).	Registered/Business Office of the Company	Plot No. 4 & 8, Korangi Industrial Area, Karachi, Pakistan
(iii).	Location of the Generation Facility	Jhimpir, Nooriabad, District Thatta, Sindh
(iv).	Type of Generation Facility	Wind Power Plant

(B). Wind Farm Capacity & Configuration

(i).	Wind Turbine Type, Make & Model	Goldwind (GW 121/2500)
(ii).	Installed Capacity of the Generation Facility	50 MW
(iii).	Number of Units/Size of each Unit	20 x 2.50 MW

(C). Wind Turbine Details

(a).	**Rotor**	
(i).	Number of Blades	3
(ii).	Rotor Speed	13.5 rpm
(iii).	Rotor Diameter	121 m
(iv).	Swept Area	11,595 m^2
(v).	Power Regulation	blade pitch angle adjustment
(vi).	Cut-in wind speed	3 m/s

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(vii).	Rated power wind speed	9.3 m/s (air density = 1.225 kg/m^3)
(viii).	Cut-out wind speed	22 m/s
(ix).	Survival wind speed	52.5 m/s
(x).	Pitch regulation	Independent electrical pitch control system, belt transmission, one for each blade
(b). Blades		
(i).	Blade Length	40.3 m
(ii).	Material	Fiberglass polyester resin
(c). Gear Box		
(i).	Type	Gearless Wind Turbine Generator
(ii).	Gear ratio	
(iii).	Weight	
(iv).	Oil quantity	
(v).	Main shaft bearing	
(d). Converter		
(i).	Type	Full load power converter, double PWM IGBT technology
(ii).	Rated Voltage	690 V
(iii).	Rated Current	2200 A
(e). Generator		
(i).	Power	2,500 kW
(ii).	Voltage	690 V

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(iii).	Type	Permanent Magnet Direct Drive Synchronous Generator
(iv).	Enclosure class	IP 54
(v).	Coupling	PMDD uses a generator close coupled to the rotor
(vi).	Efficiency	≥ 98%
(vii).	Power Factor	±0.95 (Leading to Lagging)
(f). Yaw System		
(i).	Yaw Bearing	4 points-contact, double row ball slewing ring
(ii).	Brake	Hydraulic Disc Brakes
(iii).	Yaw Drive	4 x electrical asynchronous Motors with 4 x planetary gears, 4 stages
(iv).	Speed	0.5 degree/s
(g). Control System		
(i).	Type	Microprocessor Controlled, DFU (SCADA)
(ii).	Grid Connection	Full Load IGBT Converter
(iii).	Scope of Monitoring	Remote monitoring of different parameters, e.g. temperature sensors, pitch parameters, speed, generator torque, wind speed and direction, etc.
(iv).	Recording	Production data, event list, long and short-term trends
(h). Brake		
(i).	Design	Three independent systems, fail safe (individual pitch)
(ii).	Operational Brake	Aerodynamic brake achieved by feathering blades.
(iii).	Secondary Brake	Hydraulic rotor brake for generator

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(i). Tower		
(i).	Type	Tubular steel tower
(ii).	Hub Heights	90 m

(D). Other Details

(i).	COD of the Generation Facility (Anticipated)	December 31, 2019
(ii).	Minimum Useful Life of the Generation Facility from COD	20 years

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Power Curve of Wind Turbine Generator Goldwind (GW 121/2500) (Tabular)

3	63
3.5	113
4	188
4.5	279
5	384
5.5	513
6	666
6.5	876
7	1114
7.5	1365
8	1640
8.5	1904
9	2181
9.5	2428
10	2494
10.5	2520
11	2530
11.5	2538
12	2545
12.5	2550
13	2550
13.5	2550
14	2550
14.5	2550
15	2550
15.5	2550
16	2550
16.5	2550
17	2550

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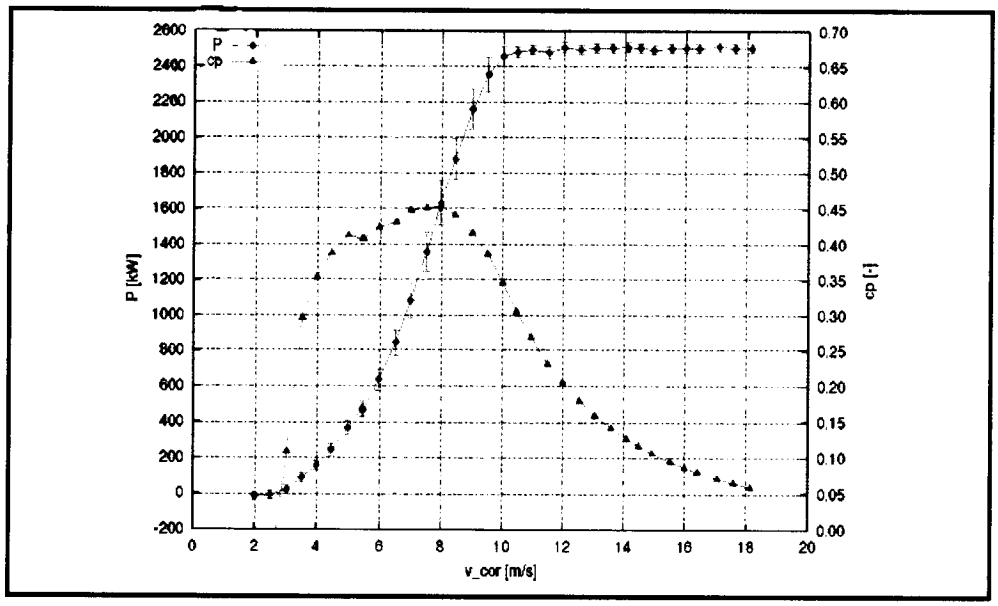
Power Curve of Wind Turbine Generator Goldwind (GW 121/2500) (Graphical)

Power Curve according to IEC 61400-12-1



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SCHEDULE-II

The Total Installed/Gross ISO Capacity (MW), Total Annual Full Load Hours, Average Wind Turbine Generator (WTG) Availability, Total Gross Generation of the Generation Facility/Wind Farm (in GWh), Array & Miscellaneous Losses (GWh), Availability Losses (GWh), Balance of Plant Losses (GWh) and Annual Energy Generation (GWh) of the Generation Facility /Wind Farm of Licensee is given in this Schedule

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SCHEDULE-II

(1).	Total Installed Gross ISO Capacity of the Generation Facility /Wind Farm (MW)	50 MW
(2).	Total Annual Full Load Hours	3066.0 Hrs
(3).	Average Wind Turbine Generator (WTG) Availability	98.0 %
(4).	Total Gross Generation of the Generation Facility/Wind Farm (in GWh)	173.74 GWh
(5).	Array & Miscellaneous Losses GWh	13.62 GWh
(6).	Availability Losses GWh	3.41 GWh
(7).	Balance of Plant Losses GWh	3.41 GWh
(8).	Annual Energy Generation (20 year equivalent Net AEP) GWh	153.30 GWh
(9).	Net Capacity Factor	35.00 %

Note

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

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