



Registrar

National Electric Power Regulatory Authority Islamic Republic of Pakistan

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

No. NEPRA/R/DL/LAG-376/14SSO-57

August 23, 2017

Mr. Nasir Ahmed Malik
Chief Executive Officer,
Mandi Baha Ud Din Energy Limited,
64 – Ahmed Block, New Garden Town,
Lahore.
Tel: 042-35851559-60

Subject: **Generation Licence No. IGSP/88/2017**
Licence Application No. LAG-376
Mandi Baha Ud Din Energy Limited (MBDEL)

Reference: *MBDEL's application vide letter dated December 28, 2016 (received on December 30, 2016).*

Enclosed please find herewith Generation Licence No. IGSP/88/2017 granted by National Electric Power Regulatory Authority (NEPRA) to Mandi Baha Ud Din Energy Limited (MBDEL) for its 3.30 MW Hydel Generation facility located on Lower Jhelum Feeder Canal at RD 2+000 near Rasul Town, District Mandi Baha Ud Din, in the province of Punjab, 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 (IGSP/88/2017)



23 08 17

(Syed Safer Hussain)

Copy to:

1. Secretary, Ministry of Water and Power, Block – A, Pak Secretariat, Islamabad.
2. Chief Executive Officer, NTDC, 414-WAPDA House, Lahore.
3. Chief Executive Officer, CPPA-G, ENERCON Building, Sector G-5/2, Islamabad.
4. Managing Director, Punjab Power Development Board (PPDB), Energy Department 1st Floor, Irrigation Secretariat, Old Anarkali, Lahore.
5. Director General, Environment Protection Department, National Hockey Stadium, Ferozpur Road, Lahore.
6. Chief Executive Officer, Gujranwala Electric Power Company (GEPCO), 565/A, Model Town, G.T Road, Gujranwala
7. Chairman, Indus River System Authority (IRSA), Service Road South, 44100, Kashmir Highway, Islamabad

National Electric Power Regulatory Authority
(NEPRA)

Determination of the Authority
in the Matter of Application of Mandi Baha Ud Din Energy
Limited for the Grant of Generation Licence

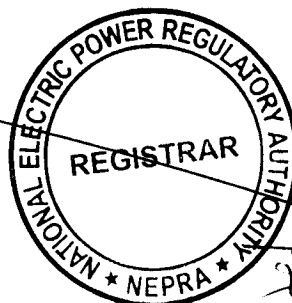
August , 2017
Case No. LAG-376

(A). Background

(i). Pakistan is primarily an agricultural country and to fulfill the water requirements of the said sector, a number of dams, link canals and head works have been built all over the country. A significant portion of the said network is located in the province of Punjab and offers a good hydel potential for generation of clean energy.

(ii). In order to tap the available resources for power generation in the province, the Government of Punjab (GoPb) has formulated a policy titled as Punjab Power Generation Policy 2006 (the "Punjab Power Policy"). Further, GoPb has set up Punjab Power Development Board (PPDB) as one window facilitator for private sector investment in the province. In this regard, PPDB has issued Letter of Intent (LoI) to different project developers/entrepreneurs for setting up hydropower projects on canals. One such LoI has been issued to consortium of companies led by China Sinogy Electric Investment Co. Limited (the "main sponsor") under the Punjab Power Policy. The LoI envisaged development of a hydropower plant on Lower Jhelum Feeder Canal at RD 8+626, district Mandi Baha Ud Din, in the province of Punjab.

(iii). According to the terms and conditions of LoI, the sponsors of the project incorporated Special Purpose Vehicle (SPV) in the name of Mandi Baha Ud Din Energy Limited (MBDEL) and completed a detailed feasibility study of the project. Thereafter, MBDEL decided to approach the Authority for the grant of generation licence.



(B). Filing of Application

(i). MBDEL submitted an application on December 30, 2016 for the grant of generation licence in terms of Section-15 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").

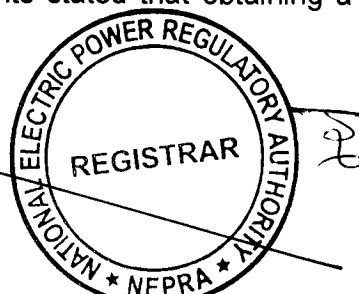
(ii). The Registrar examined the application to confirm its compliance with the Licensing Regulations and observed that the application lacked some of the required information/documentation. Accordingly, MBDEL was directed for submitting the missing information/documentation and the same was submitted on January 25, 2017. The Authority considered the matter and found the form and content of the application in substantial compliance with Regulation-3 of the Licensing Regulations. Accordingly, the Authority admitted the application on February 07, 2017 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, advertisement was published in one (01) Urdu and one (01) English newspapers on February 09, 2017 respectively.

(iii). In addition to the above, the Authority approved a list of stakeholders for seeking their comments for assistance of the Authority in the matter in terms of Regulation-9(2) of the Licensing Regulations. Accordingly, letters were sent to different stakeholders as per approved list on February 09, 2017, soliciting their comments for the assistance of the Authority.

(C). Comments of Stakeholders

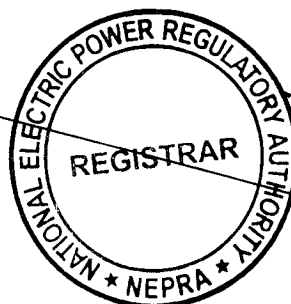
(i). In response to the above, the Authority received comments from four (04) stakeholders. These included Indus River System Authority (IRSA), Alternative Energy Development Board (AEDB), Anwar Kamal Law Associates (AKLA) and Ministry of Water & Power (MoW&P). The salient points of the comments offered by the said stakeholders are summarized below:-

(a). IRSA in its comments stated that obtaining a No Objection



Certificate (NOC) from it is a mandatory requirement prior to the construction of the project. Therefore, the company must apply to it for the said NOC;

- (b). AEDB supported the grant of generation licence to MBDEL for its proposed 3.30 MW hydel project;
- (c). AKLA highlighted different issues pertaining to the power sector of the country including (a). surplus capacity; (b). under-utilization of power plant; and (c). induction of new power plants on "Take or Pay" basis etc. Further, AKLA contested that Renewable Energy (RE) power plants are not viable financially and economically due to higher upfront tariff and "must run conditions". AKLA also questioned the induction of RE projects in the current scenario (i.e. reduction in oil prices, RLNG contract with Qatar, upcoming coal power projects and introduction of competitive market etc.), affordability vs. availability of electric power and long term Power Purchase Agreements (PPAs) on "Take or Pay" basis etc. AKLA stated that it is not against setting up of new power plants and in this regard a careful estimates of required generation capacities should be made or the licences should be granted on "Take and Pay" basis; and
- (d). MoW&P commented that the Authority may confirm the design aspects and available water flows for the proposed hydel based project. It also commented that the total cost of the project i.e. US\$ 11.713 million which is on higher side. Further, the ministry suggested that the comments from other stakeholders including Gujranwala Electric Power Company Limited (GEPCO) may be sought and thereafter, the generation licence application may be processed according to the relevant provisions of the NEPRA Act and Government of Pakistan policy guidelines.

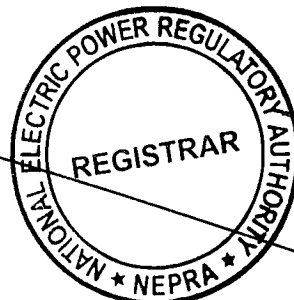


(ii). The Authority examined the comments of the stakeholders and decided to seek the perspective of MBDEL on the observations of IRSA, AKLA and MoW&P. On the comments of IRSA, the company took up the matter with IRSA for issuance of NOC. After going through the various aspects of project, IRSA informed that as MBDEL is developing a run of canal project on Lower Jhelum Feeder Canal therefore, the matter may be taken up with Irrigation department, Govt. of Punjab. In this regard, the Authority observed that PPDB while issuing Lol to the company had already taken the Irrigation department on board and it did not express any reservation in the matter at that time therefore, the Authority considered it appropriate not to further refer the matter to Irrigation department, Govt. of Punjab.

(iii). On the observations of AKLA, it was submitted that the main focus is on under-utilization of thermal generation facilities mainly operating on imported oil. MBDEL stated that the use of imported oil is not only burdening foreign exchange reserves but is also an environmental concern. It was submitted that the shortage of electricity in the country can be best bridged by utilizing the indigenous resources specially hydel, wind and solar. MBDEL submitted that in other countries conventional sources for power generation are being replaced with environment friendly RE therefore, similar effort should be made in the country. The use of indigenous resources will help in curtailing the circular debt which will result in socio-economic uplift as the Government will have more fiscal space for public sector projects.

(iv). Further to above, MBDEL submitted that National Power System Expansion Plan 2011-2030, foresee the continuation of electricity shortage leading to load-shedding in the coming years. MBDEL submitted that the project is being set up under the policy of Government of Pakistan which not only encourages induction of RE based power generation but also promotes utilization of indigenous resources and its project has priority over others.

(v). Regarding observation of MoW&P, it was confirmed that the installed capacity of the hydropower plant had been determined keeping in view economical design discharge of available water. About the project base cost of



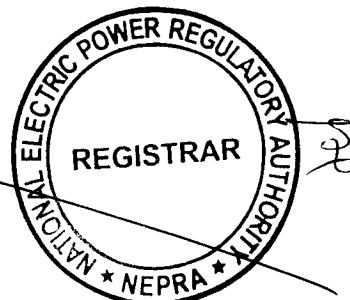
US\$ 11.713 million, MBDEL stated that the same is in line with the upfront tariff for small hydropower projects determined by the Authority.

(vi). The Authority has considered the comments of the stakeholders, reply of MBDEL and observes that AKLA has raised certain observations regarding the project. The Authority observes that AKLA while submitting its comments has referred to its previous correspondences in different matters relating to licences and tariff which include (a). surplus capacity; (b). capacity payments without supplying electricity; (c). addition of high cost renewable plants; (d). under-utilization of power plants; and (e). induction of new power plants on "Take or Pay" basis and others. In this regard, the Authority observes that it has duly addressed the aforementioned objections/comments and sent a comprehensive reply to AKLA through letter no. NEPRA/SAT-I/TRF-100/17060, dated December 27, 2016. The Authority reiterates its earlier findings and observations given in the aforementioned letter. Further, the Authority is of the considered opinion that there is considerable supply-demand gap resulting in load shedding and load management. The same is substantiated by the fact that the proposed generation facility/Hydel Power Plant of MBDEL is included in the future expansion plan of GEPCO for which it has already given a consent to Central Power Purchasing Agency (Guarantee) Limited (CPPA-G). In view of the foregoing, the Authority considers that the observations of AKLA and MoW&P stand addressed.

(vii). In consideration of the above and having addressed the abovementioned comments/objections, the Authority considered it appropriate to proceed further in the matter of application of MBDEL for the consideration of grant of generation licence as stipulated in the Licensing Regulations and NEPRA Licensing (Generation) Rules 2000 (the "Generation Rules").

(D). Evaluation/Findings

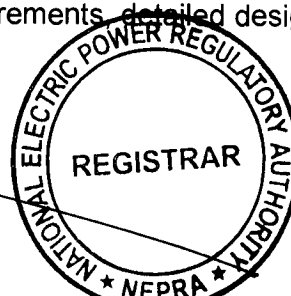
(i). The Authority has considered the submissions of MBDEL including the information provided in its application for the grant of generation licence. The Authority has also considered the feasibility study of the project, Grid Interconnection Study (GIS), provisions of the Punjab Power Policy, the relevant rules & regulations.



(ii). In consideration of the above, the Authority has observed that PPDB issued Lol to the consortium of (a). China Sinogy Electric Investment Co. Ltd. (CSEICL); (b). China Sinogy Electric Engineering Co. Ltd. (CSEEL), (c). NETCO Rental Services (NETCO); (d). Habib Rafiq (Private) Limited (HRPL); and (e). Zhejiang Jinlun Electro-mechanic Co. Ltd. (ZJEMCL). In order to implement the project, the sponsors incorporated SPV in the name of MBDEL. The Authority has noted that CSEICL has vast experience in project planning, electric power engineering design, engineering management, project Engineering, Procurement & Construction (EPC) and equipment integration. NETCO holds expertise in providing services for procurement, repair and maintenance of equipment for power generation. ZJEMCL, a partner company in the project, is ranked among the top manufacturers in small hydropower equipment (including Francis, Pelton, Kaplan and Tubular turbines) having single unit capacity of up to 100 MW. Coastal Saba Power Limited is also among the sponsors of the project and owns 94% equity in Saba Power Company (Private) Limited which owns and operate 134 MW RFO based generation facility. The Authority has noted that the sponsors have a total assets of more than RMB 5.00 billion Yuan (around Rs. 78 billion). In consideration of the above, the Authority is of the considered opinion that the sponsors have reasonable financial and technical capability to develop the proposed generation facility/Hydel Power Plant.

(iii). The Authority has observed that MBDEL is a public limited company incorporated on July 13, 2016 under Section-32 of the Companies Ordinance, 1984 (XLVII of 1984) having Corporate Identification No. 0100639. The registered/business office of the company is located at House No. 156, Block-N Model Town Extension, Lahore. The memorandum of association of the company, *inter alia*, includes the business of power generation as one of its business objects.

(iv). The Authority has observed that MBDEL carried out detailed feasibility study of the project through Technical, Engineering and Management Consultants Pakistan (TEAM). The scope of the feasibility study included the site investigations, infrastructure requirements, detailed design of power house,

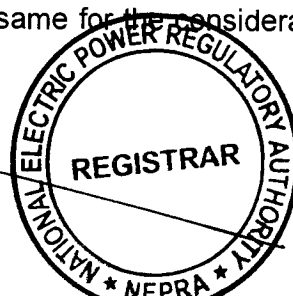


load flow & stability studies, Initial Environmental Examination, tariff calculation (including economic/financial analysis), term of financing and project cost etc. PPDB through its Panel of Experts approved the same with revised capacity of 3.30 MW.

(v). The Authority has noted that MBDEL plans setting up a hydel based generation facility/Hydel Power Plant at Lower Jhelum Feeder Canal at RD 2+000 near Rasul town, 10 KM from Mandi Baha Ud Din, district Mandi Baha Ud Din in the province of Punjab. The said feeder canal is emanating from left bank of Rasul barrage on river Jhelum. The total installed capacity of the proposed hydropower plant will be 3.30 MW consisting of two (02) Pit type horizontal Kaplan turbines (of 1.65 MW each). The said hydropower plant will be run of canal, having very low head with a maximum design discharge of 187 m³/s at variable head of up to 7.52 meters. The project will result in mean annual energy of 19.007 GWh at plant factor of 64%. The total cost of project will be around US\$ 11.713 million with a debt equity ratio of 75% and 25% of the project cost.

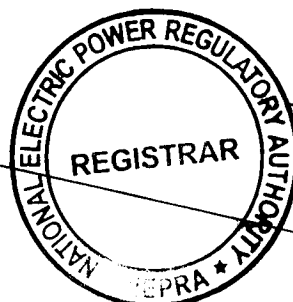
(vi). The Authority has observed that MBDEL carried out the required GIS for dispersal of electric power from the proposed generation facility/Hydel Power Plant. According to the said study, the dispersal of electric power will be made at 11 kV voltage level. The dispersal/interconnection arrangement will be consisting of an 11 kV Double Circuit (D/C) feeders [measuring about ten (10) Kilometer on ACSR Osprey conductor] connecting the generation facility/Hydel Power Plant to 132/11 kV Mandi Baha Ud Din grid station of GEPCO. It is pertinent to mention that GEPCO has already approved the said dispersal/interconnection arrangement of the generation facility/Hydel Power Plant.

(vii). The Authority is encouraged that the proposed generation facility/Hydel Power Plant of MBDEL will be utilizing water which is RE source. However, the Authority has observed that the construction and operation of the proposed generation facility/Hydel Power Plant may cause some environmental concerns including soil pollution, water pollution and noise pollution. The Authority has observed that MBDEL carried out the required Initial Environment Examination Study and submitted the same for the consideration and approval



of Environmental Protection Department, Government of Punjab (EPDGoPb). In this regard, the Authority is satisfied that EPDGoPb has issued a NOC for the construction of the project.

(viii). 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(5) and Rule-3(6) of the Generation Rules. In this particular case, the Authority has observed that conditions of Rule-3(2) and Rule-3(3) stands satisfied as MBDEL 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 facility/Hydel Power Plant. 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/Hydel Power Plant 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 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/Hydel Power Plant 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/Hydel Power Plant 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/Hydel Power Plant; 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.

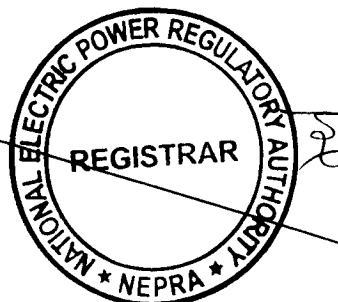


(ix). In consideration of the above, the Authority clarifies that the project will be utilizing clean and cheap resource (i.e. water) for power generation. The proposed generation facility/Hydel Power Plant is being developed in terms of the upfront tariff for small hydropower projects. Further, PPDB has made it obligatory for MBDEL to opt for upfront tariff determined by the Authority. It is pertinent to mention that the Authority through its determination No. NEPRA/UTH-01/4744-4746 dated April 02, 2015 announced a levelized upfront tariff for the future small hydropower projects of up to 25 MW. The said tariff works out to be Pak. Rs. 9.9960/kWh and Rs. 7.6177/kWh based on 100% local and foreign financing which is very competitive considering the fact that not only cheap electric power will be generated but it will utilize the indigenous hydel potential.

(x). As explained in the preceding paragraphs, the sponsors of the project carried out the GIS 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 right-of-way issues for the provision of transmission and interconnection facilities. It is pertinent to mention that GEPCO has included the project in its mid and long-term forecasts for additional capacity requirements. In view of the clarification and justifications given above, the Authority is of the considered view that the project of MBDEL 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. The costs of producing energy vary between different energy sources and technologies. A competitive energy mix will keep overall costs as low as possible given the available resources.

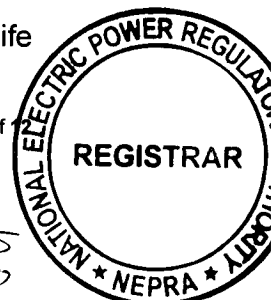


(ii). The existing energy mix of the country is heavily skewed towards thermal power plants, mainly operating on imported fossil fuel. In this regard, the Authority is of considered opinion that use of imported fossil fuel for power generation is not only an environmental concern but also creates pressure on the precious foreign exchange reserves of the country. Therefore, the Authority considers that in order to achieve sustainable development, it is imperative that all indigenous RE resources including hydel, wind, solar and other RE resources are given priority for power generation and their development is encouraged.

(iii). The Authority considers that the proposed project of MBDEL is consistent with the provisions of Energy Security Action Plan 2005 which not only emphasizes the use of indigenous resources for power generation but also considers that RE resources are given priority in this regard. In consideration of the said, the Authority considers that 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 it will also help in reducing carbon emissions by generating clean electricity, thus improving the environment.

(iv). As explained in the preceding paragraphs, the Authority considers that MBDEL 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/Hydel Power Plant. Further, the Authority has observed that sponsors of the project will be utilizing around sixty four (64) acres of land for setting up the generation facility/Hydel Power Plant. In this regard, the Authority directs MBDEL that the aforementioned land shall be exclusively used for the proposed generation facility/Hydel Power Plant and any other generation activity cannot be carried out on this land except with the prior approval of the Authority.

(v). The term of a generation licence under Rule-5(1) of the Generation Rules is to be commensurate with the maximum expected useful life of the units comprised in a generating facility. According to the information provided, the generation facility/Hydel Power Plant of MBDEL will achieve Commercial Operation Date (COD) on May 30, 2021 and will have a useful life

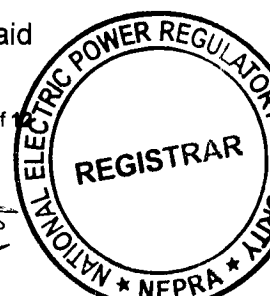


of more than thirty (30) years from its COD. The applicant/MBDEL has requested that the term of the proposed generation licence may be fixed to thirty (30) years, in consistent with the term of the proposed Energy Purchase Agreement (EPA) to be signed with the power purchaser. The Authority considers that information provided by MBDEL about the useful life of generation facility/Hydel Power Plant and the subsequent request to fix the term of the generation licence is consistent with international benchmarks. Foregoing in view, the Authority fixes the term of the generation licence to thirty (30) years from its COD.

(vi). Regarding the tariff, the Authority hereby clarifies that under Section-7(3)(a) of the NEPRA Act, determining tariff, rate and charges etc. is its sole prerogative. In this regard, a specific article (i.e. Article-6) has been included in the generation licence. The Authority through Article-6 of the generation licence directs MBDEL to charge the power purchaser only such tariff which has been determined, approved or specified by it. Further, the Authority directs MBDEL to adhere to the Article-6 of the generation licence in letter and spirit without any exception.

(vii). As explained in the preceding paragraphs, MBDEL has already obtained NOC from EPDGoPb. Further, the Authority directs MBDEL to ensure that its project complies 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. Article-10) in the generation licence along with other terms and conditions. Further, the Authority directs MBDEL 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 Authority has observed that the proposed generation facility/Hydel Power Plant will be using RE resource for generation of electric power and may earn carbon credits. In this regard, it is pertinent to mention that the existing Kyoto Protocol governing the carbon credits cater projects coming on line by end of 2020. The project of MBDEL is expected to achieve COD by May 30, 2021 which is beyond the said deadline. The Authority considers that in view of importance of the matter, it is very likely that the deadline of the said

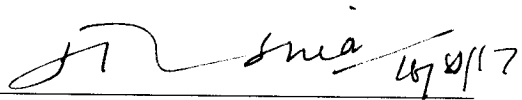


protocol may be extended as done previously. In view thereof, the Authority has decided to include an article (i.e. Article-14) for carbon credits and its sharing with the power purchaser in the generation licence. The Authority directs MBDEL to adhere to the Article-14 of the generation licence in letter and spirit without any exception.

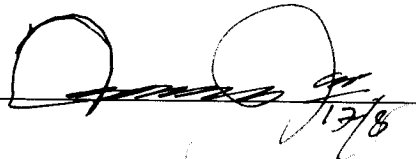
(ix). In view of the above, the Authority hereby approves the grant of generation licence to MBDEL on the terms and conditions set out in the generation licence annexed to this determination. The grant of generation licence will be subject to the provisions contained in the NEPRA Act, relevant rules,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

Authority:

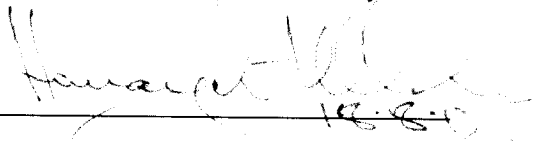
Maj. (R) Haroon Rashid
(Member)



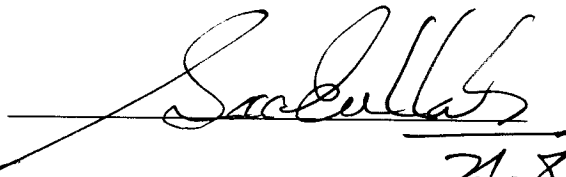
Syed Masood-ul-Hassan Naqvi
(Member)



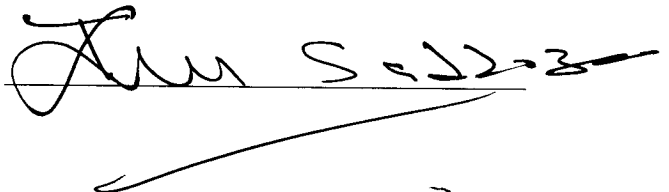
Himayat Ullah Khan
(Member)



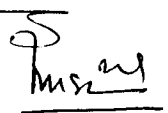
Saif Ullah Chattha
(Member/Vice Chairman)


_____ 21.8.2017

Tariq Sadozai
(Chairman)






23 08 17

**National Electric Power Regulatory Authority
(NEPRA)
Islamabad – Pakistan**

GENERATION LICENCE

No. IGSP/L/88/2017

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

Mandi Baha Ud Din Energy Limited

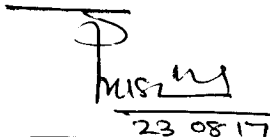
Incorporated under Section-32 of the Companies Ordinance, 1984 having Corporate Universal Identification No. 0100639, dated July 13, 2016

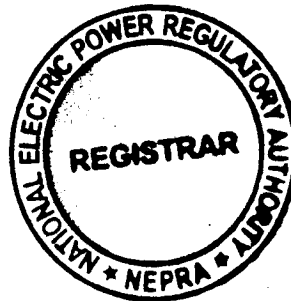
for its Hydel Based Generation Facility Located on Lower Jhelum Feeder Canal at RD 2+000 near Rasul Town, District Mandi Baha Ud Din in the Province of Punjab

(Installed Capacity: 3.30 MW Gross ISO)

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

Given under my hand this 23rd day of August Two Thousand & Seventeen and expires on 29th day of May Two Thousand & Fifty One.


23 08 17
Registrar

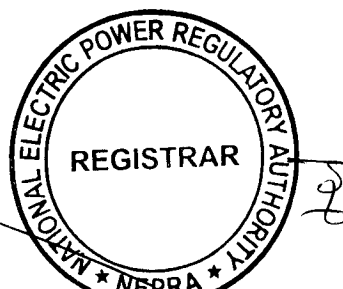




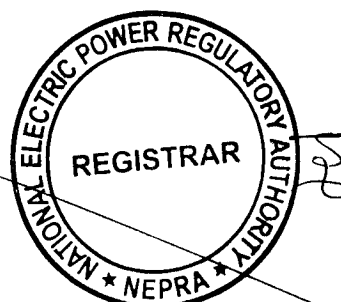
Article-1
Definitions

1.1 In this licence

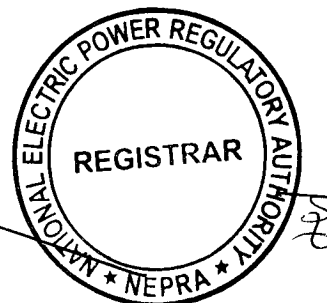
- (a). "Act" means the Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997 as amended or replaced from time to time;
- (b). "AEDB" means the Alternative Energy Development Board or any other entity created for the like purpose established by the GoP to facilitate, promote and encourage development of renewable energy in the country;
- (c). "Applicable Documents" mean the Act, the rules and regulations framed by the Authority under the Act, any documents or instruments issued or determinations made by the Authority under any of the foregoing or pursuant to the exercise of its powers under the Act, the Grid Code, the applicable Distribution Code, 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/Hydel Power Plant of the Licensee on which the electric power from all the generators is collected for supplying to the Power Purchaser;



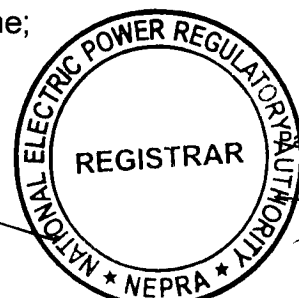
- (g). "Carbon Credits" mean the amount of Carbon Dioxide (CO₂) and other greenhouse gases not produced as a result of generation of energy by the generation facility/Hydel Power Plant and other environmental air quality credits and related emissions reduction credits or benefits (economic or otherwise) related to the generation of energy by the generation facility/Hydel Power Plant, which are available or can be obtained in relation to the generation facility/Hydel Power Plant after the COD;
- (h). "Commercial Operations Date (COD)" means the day immediately following the date on which the generation facility/Hydel Power Plant of the Licensee is commissioned;
- (i). "Commissioned" means the successful completion of Commissioning of the generation facility/Hydel Power Plant for continuous operation and despatch as stipulated in the EPA;
- (j). "Commissioning" means the undertaking of the Commissioning Tests of the generation facility/Hydel Power Plant as stipulated in the EPA;
- (k). "Commissioning Tests" means the tests to be carried out pursuant to provisions of EPA;
- (l). "CPPA-G" means Central Power Purchasing Agency (Guarantee) Limited or any other entity created for the like purpose;
- (m). "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;



- (n). "Energy Purchase Agreement (EPA)" means the energy purchase agreement, entered or to be entered into by and between the Power Purchaser and the Licensee, for the purchase and sale of electric energy generated by the generation facility/Hydel Power Plant, as may be amended by the parties thereto from time to time;
- (o). "Generation Rules" mean the National Electric Power Regulatory Authority Licensing (Generation) Rules, 2000 as amended or replaced from time to time;
- (p). "GEPCO" means Gujranwala Electric Power Company Limited or its successors or permitted assigns;
- (q). "Grid Code" means the grid code prepared by NTDC and approved by the Authority, as it may be revised from time to time by NTDC with necessary approval by the Authority;
- (r). "GoP" means the Government of Pakistan acting through the AEDB which has issued or will be issuing to the Licensee a LoS for the design, engineering, construction, insuring, commissioning, operation and maintenance of the generation facility/Hydel Power Plant;
- (s). "GoPb" means the Government of the Province of Punjab acting through the PPDB which has issued letter of intent for the design, engineering, construction, insuring, commissioning, operation and maintenance of the generation facility/Hydel Power Plant;
- (t). "Hydel Power Plant" means a generation facility using water flows of canal or rivers for generation of electric power;
- (u). "IEC" means the International Electrotechnical Commission or its successors or permitted assigns;



- (v). "IEEE" means the Institute of Electrical and Electronics Engineers or its successors or permitted assigns;
- (w). "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/Hydel Power Plant, as may be amended from time to time;
- (x). "Letter of Support (LoS)" means the letter of support issued or to be issued by the GoP through the AEDB to the Licensee;
- (y). "Licensee" means **Mandi Baha Ud Din Energy Limited** or its successors or permitted assigns;
- (z). "Licensing Regulations" mean the National Electric Power Regulatory Authority Licensing (Application & Modification Procedure) Regulations, 1999 as amended or replaced from time to time;
- (aa). "Net Delivered Energy" means the net electric energy expressed in kWh generated by the generation facility/Hydel Power Plant of the Licensee at its outgoing Bus Bar and delivered to the Power Purchaser;
- (bb). "NTDC" means National Transmission and Despatch Company Limited or its successors or permitted assigns;
- (cc). "Policy" means the Policy for Development of Renewable Energy for Power Generation, 2006 of GoP as amended from time to time;
- (dd). "Punjab Power Policy" means the Punjab Power Generation Policy, 2006 of GoPb as amended from time to time;



- (ee). "Power Purchaser" means CPPA-G which will be purchasing electric power from the Licensee either on behalf of all XW-DISCOs or any single XW-DISCO, pursuant to the EPA for procurement of electric power;
- (ff). "PPDB" means the Punjab Power Development Board or any other entity created for the like purpose established by the GoPb to facilitate, promote and encourage development of private sector participation for development of projects for electric power in the Province of Punjab;
- (gg). "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;
- (hh). "XW-DISCO" means "an ex-WAPDA distribution company engaged in the distribution of electric power".

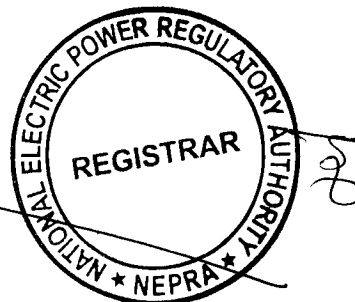
1.2 Words and expressions used but not defined herein bear the meaning given thereto in the Act or rules and regulations issued under the Act.

Article-2
Applicability of Law

This licence is issued subject to the provisions of the Applicable Law, as amended 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/Hydel 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/Hydel Power Plant of the Licensee is set out in Schedule-II hereto. The Licensee shall provide the final arrangement, technical and financial specifications and other specific details pertaining to its generation facility/Hydel Power Plant 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 thirty (30) years from the COD of the generation facility/Hydel Power Plant 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.

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 the Power Purchaser only such tariff 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.

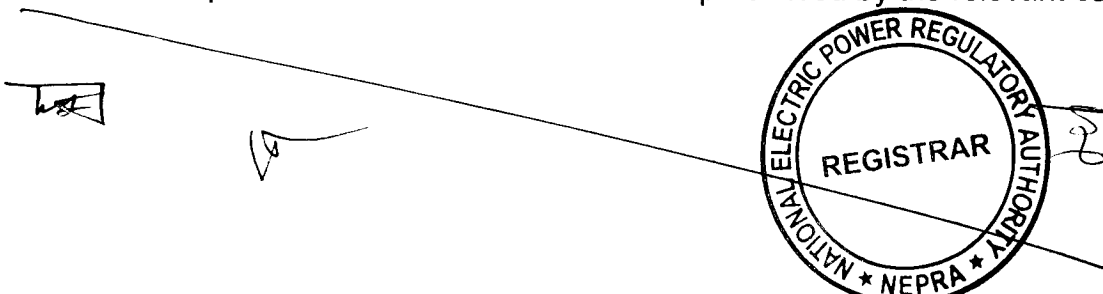
Article-9
Compliance with Performance Standards

The Licensee shall comply with the relevant provisions of the National Electric Power Regulatory Authority Performance (Generation) Rules 2009 as amended from time to time.

Article-10
Compliance with Environmental & Safety Standards

10.1 The generation facility/Hydel Power Plant 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/Hydel Power Plant 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 power to the Power Purchaser at the outgoing Bus Bar of its generation facility/Hydel 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
Performance Data

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

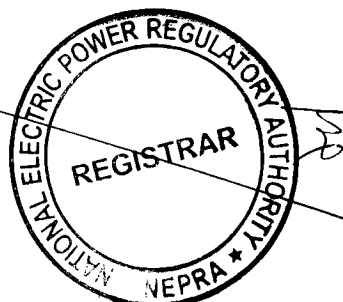
12.2 The Licensee shall transmit the data for the flow of water and electric power output data of its generation facility/Hydel Power Plant to the control room of the Power Purchaser.

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/Hydel Power Plant. The Licensee shall share the said proceeds with the Power Purchaser as per the Policy.

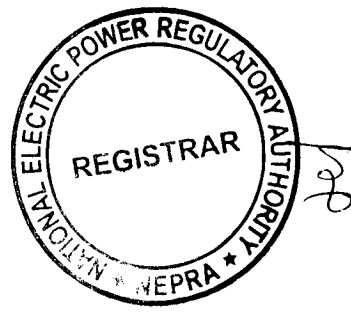
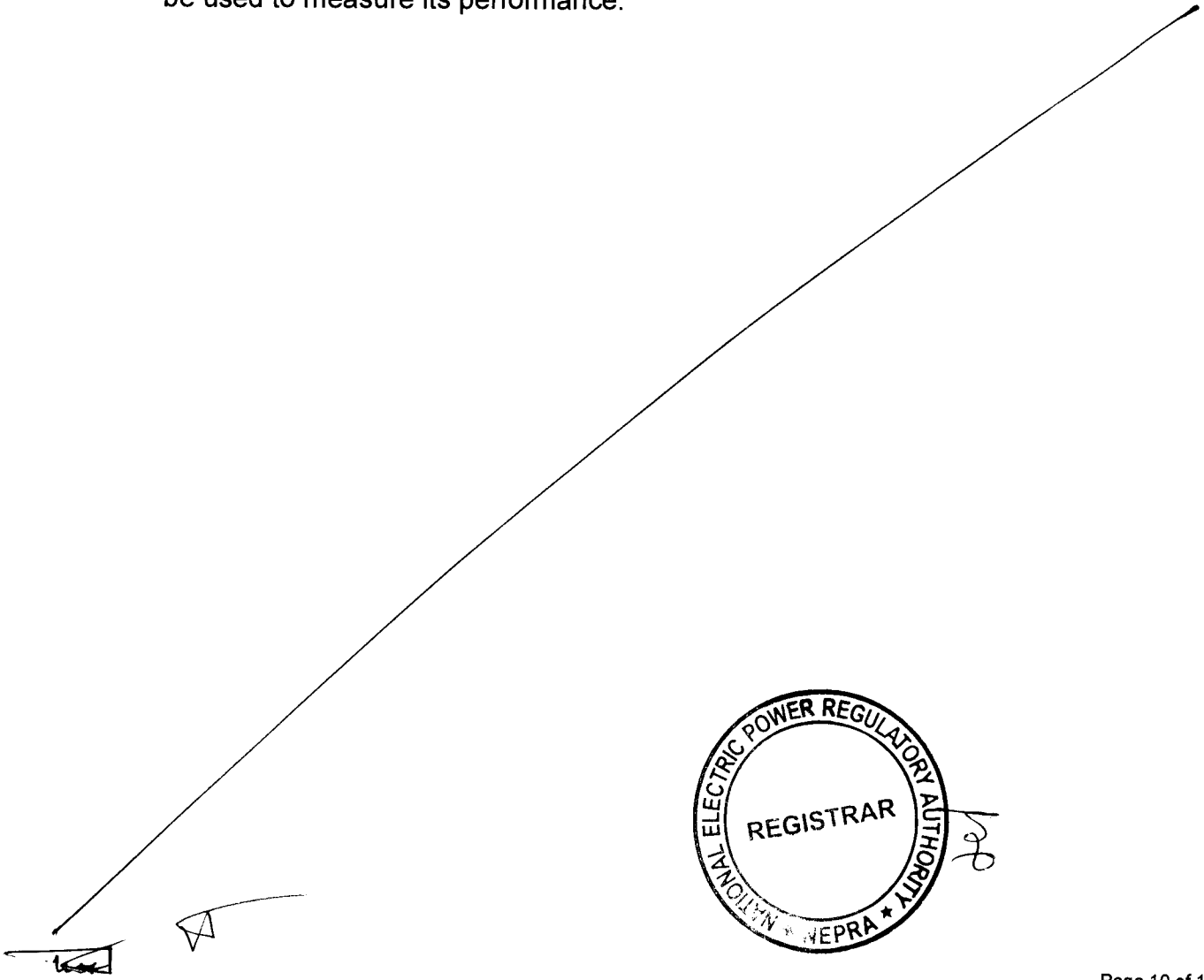


Article-15
Design & Manufacturing Standards

The generation facility/Hydel Power Plant of the Licensee shall be designed, manufactured and tested according to the latest IEC or IEEE or any other equivalent standard. All the plant and equipment of the generation facility/Hydel Power Plant shall be unused and brand new.

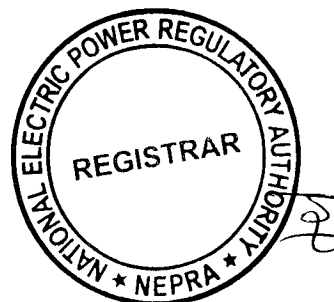
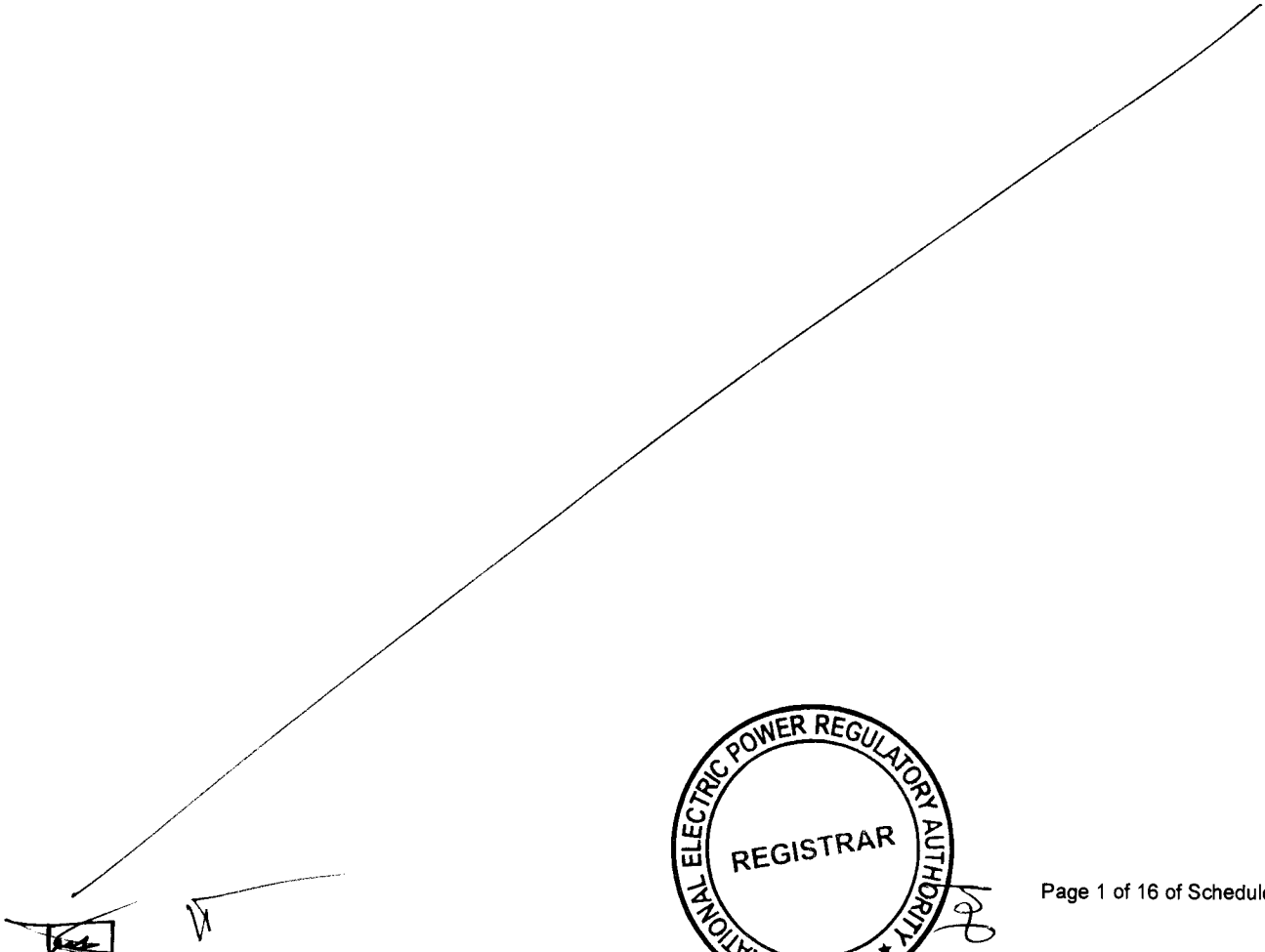
Article-16
Power Curve

The Power Purchaser shall verify the power curve of the generation facility/Hydel Power Plant of the Licensee, as part of the Commissioning Tests according to the latest IEC or IEEE or any other equivalent standard and shall be used to measure its performance.



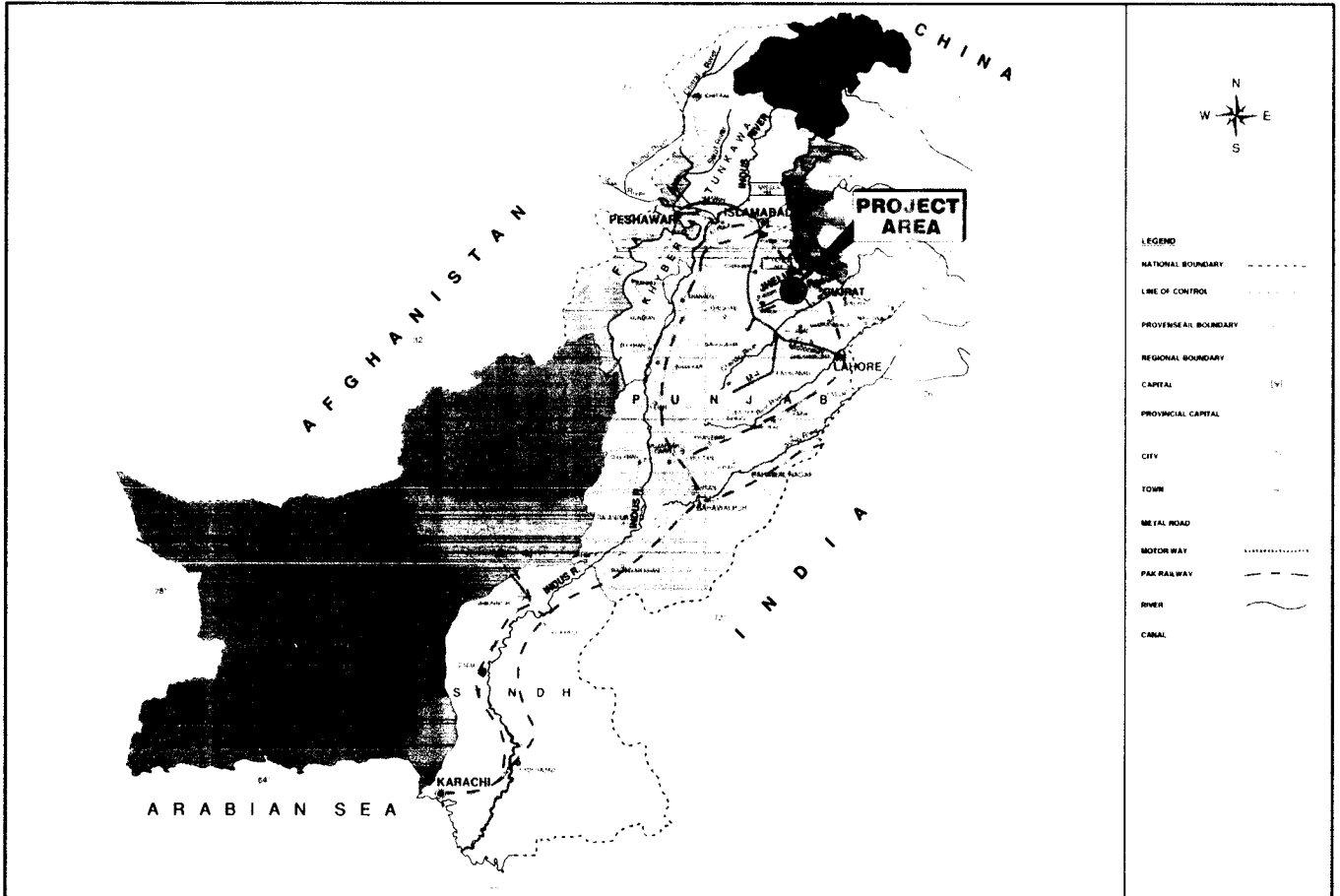
SCHEDULE-I

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.

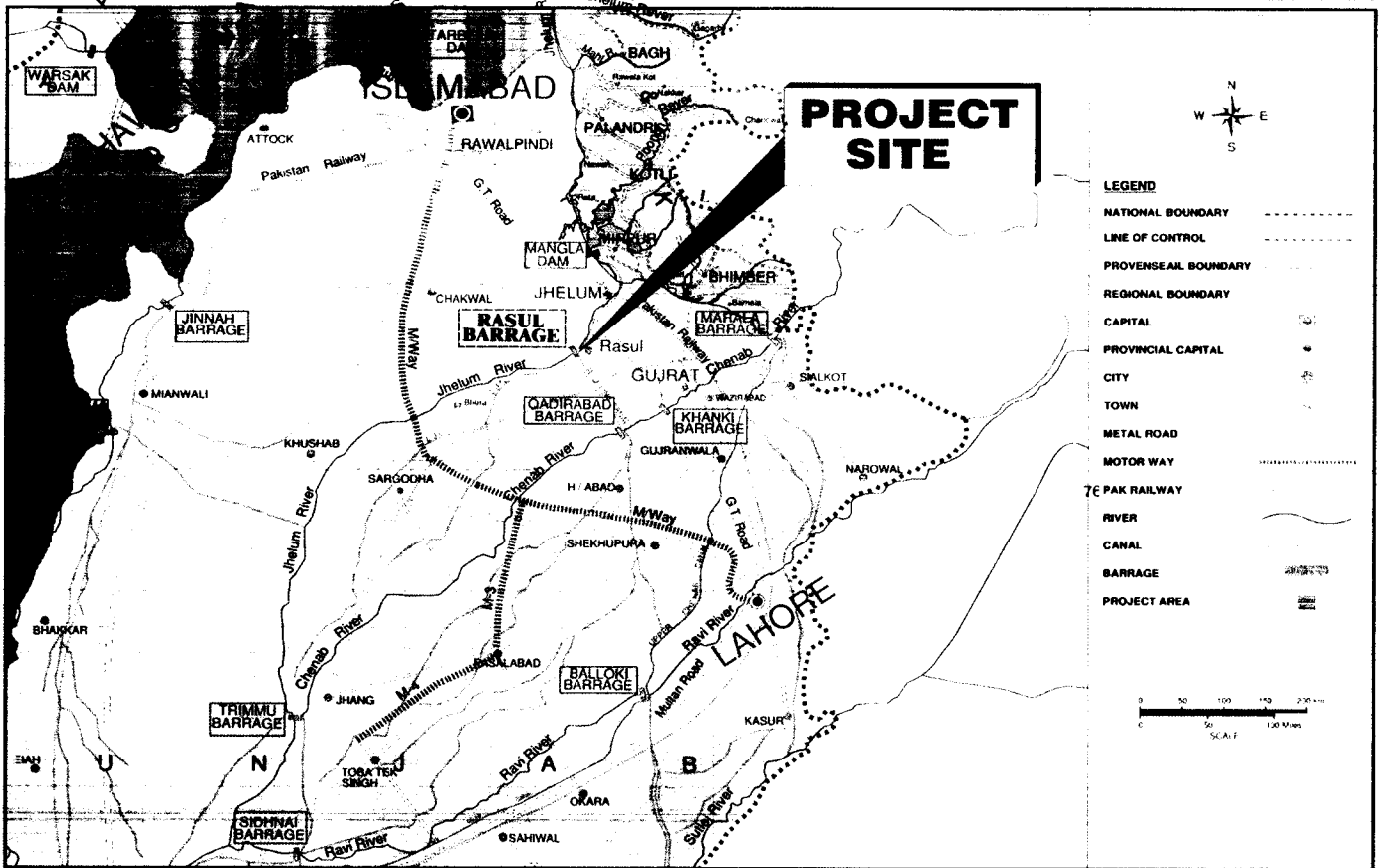


Generation Licence
Mandi Baha Ud Din Energy Limited
Lower Jhelum Canal Feeder at RD 2+000,
District Mandi Baha Ud Din
In Province of Punjab

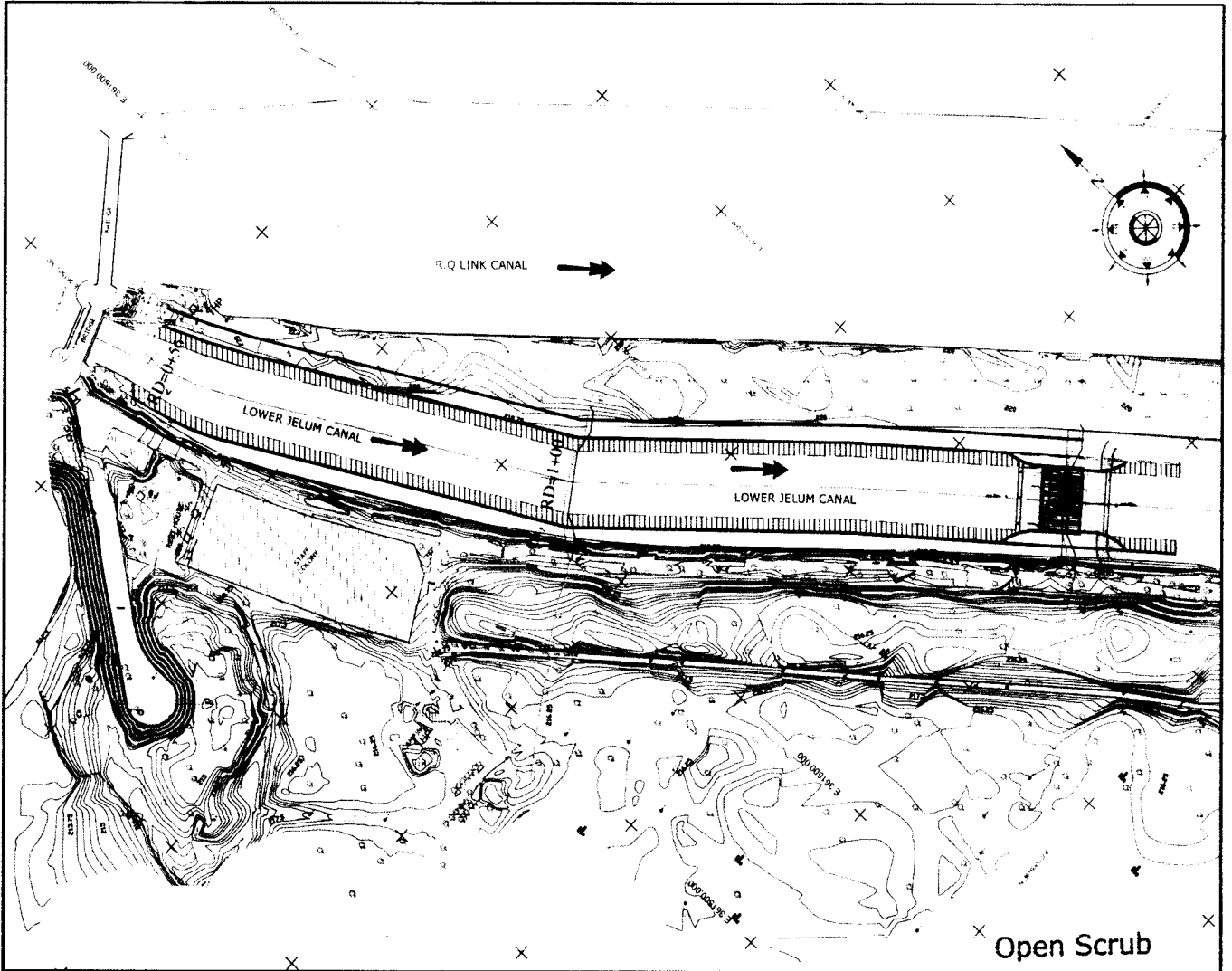
Location of the Generation Facility/Hydel Power Plant of the Licensee



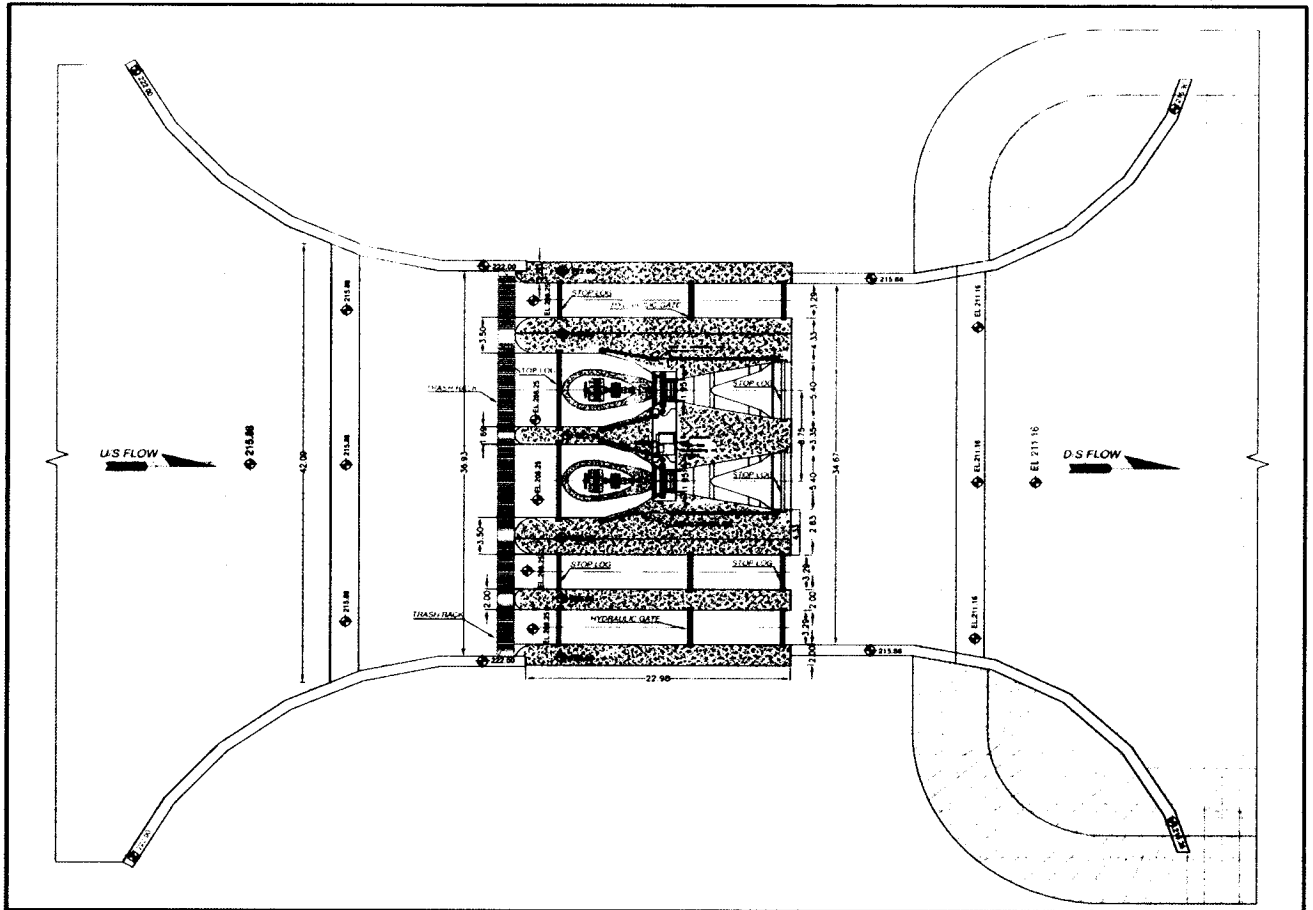
Location of
the Generation Facility/Hydel Power
Plant of the Licensee



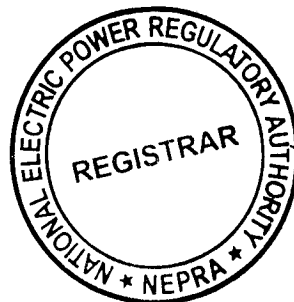
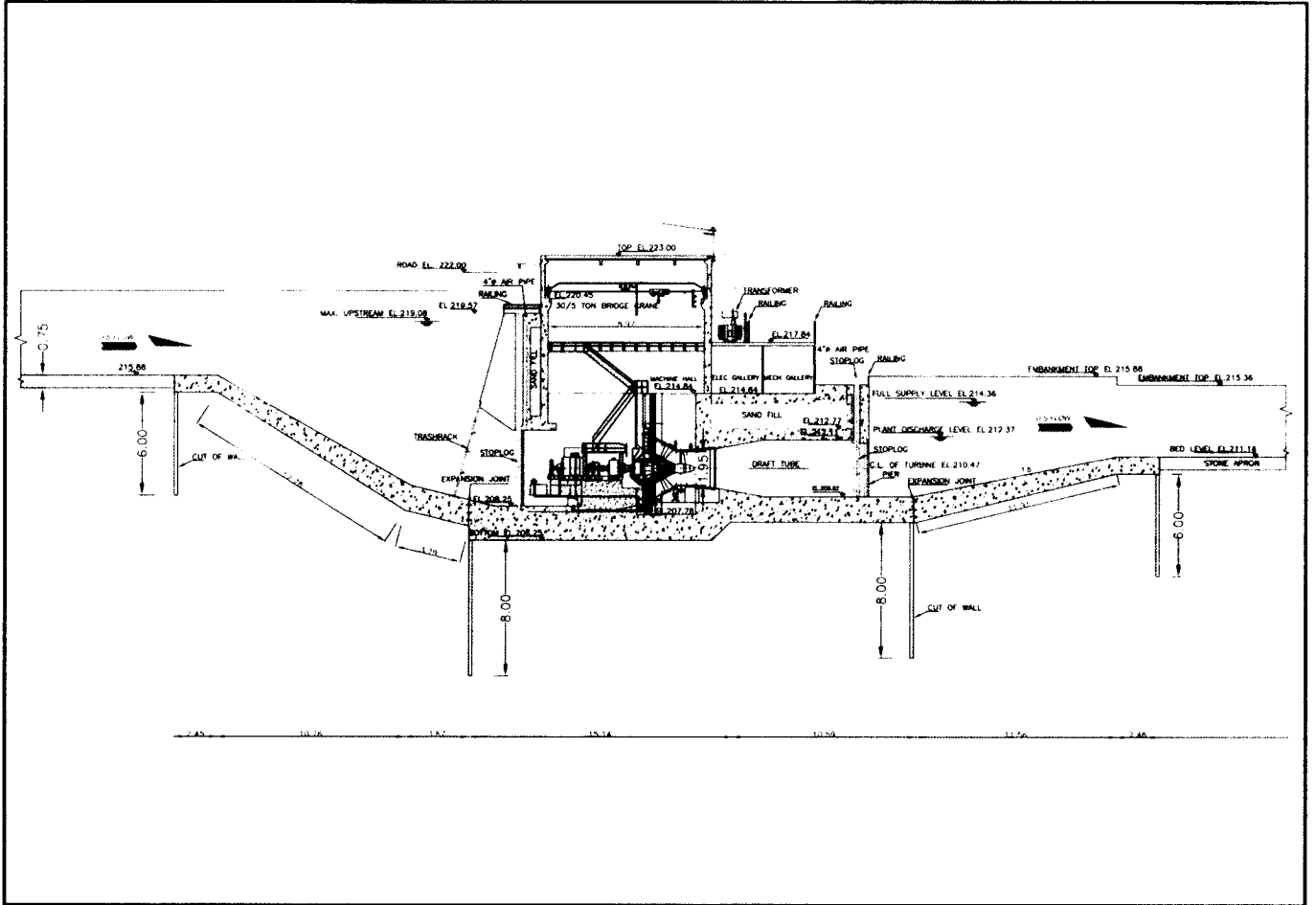
Layout of
the Generation Facility/Hydel Power
Plant of the Licensee



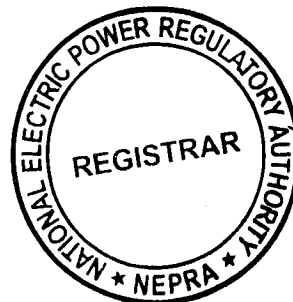
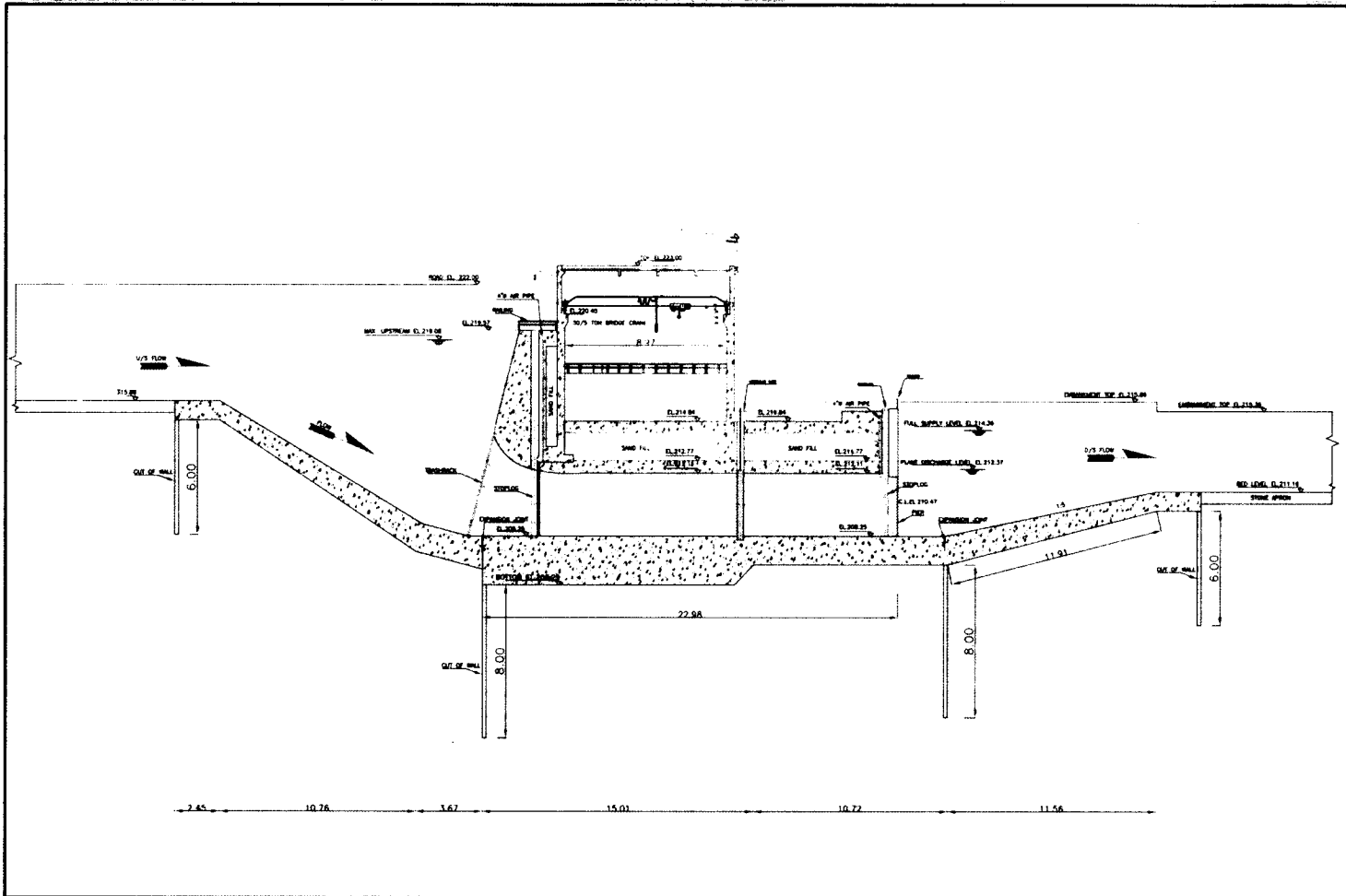
**Combined Powerhouse & Bottom Outlet Layout of
the Generation Facility/Hydel Power
Plant of the Licensee**



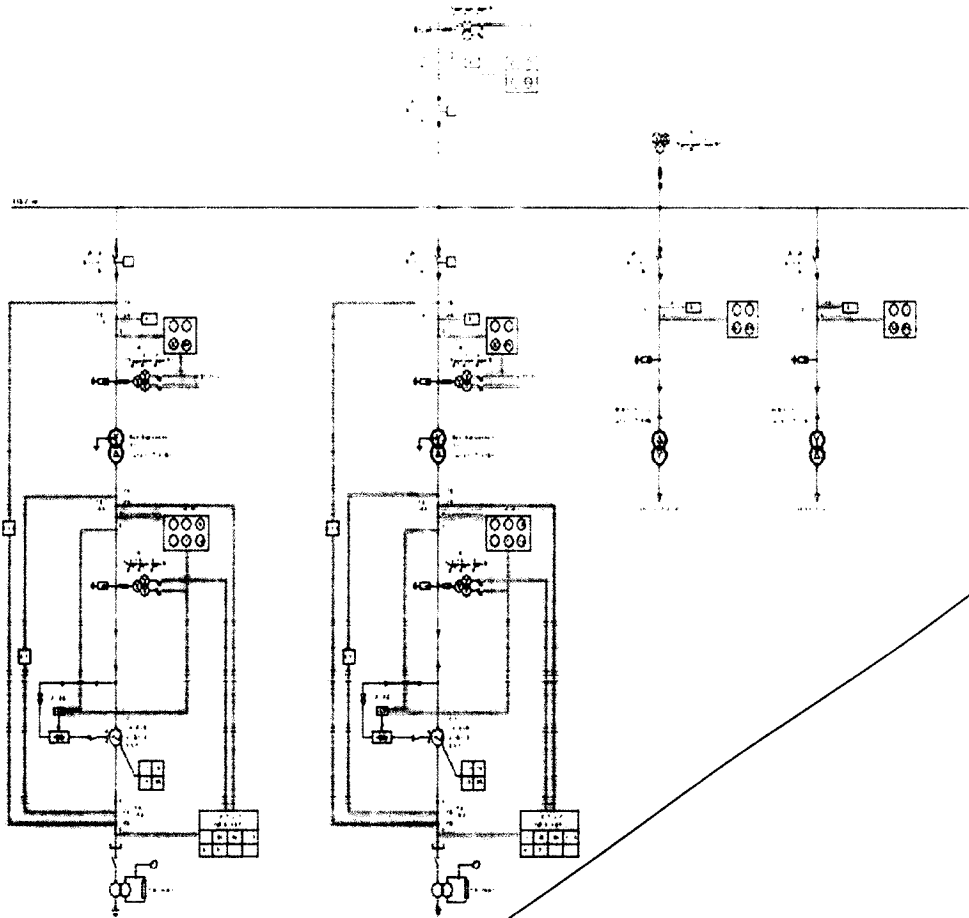
Longitudinal Section of Powerhouse
of the Generation Facility/Hydel Power
Plant of the Licensee



Longitudinal Section of the Bottom Outlet
of the Generation Facility/Hydel Power
Plant of the Licensee



Single line Diagram
of the Generation Facility/Hydel Power
Plant of the Licensee

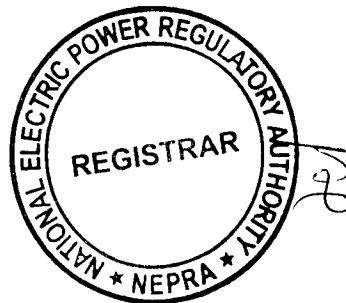


**Interconnection Arrangement/Transmission Facilities
for Dispersal of Power from Generation Facility/Hydel
Power Plant of the Licensee**

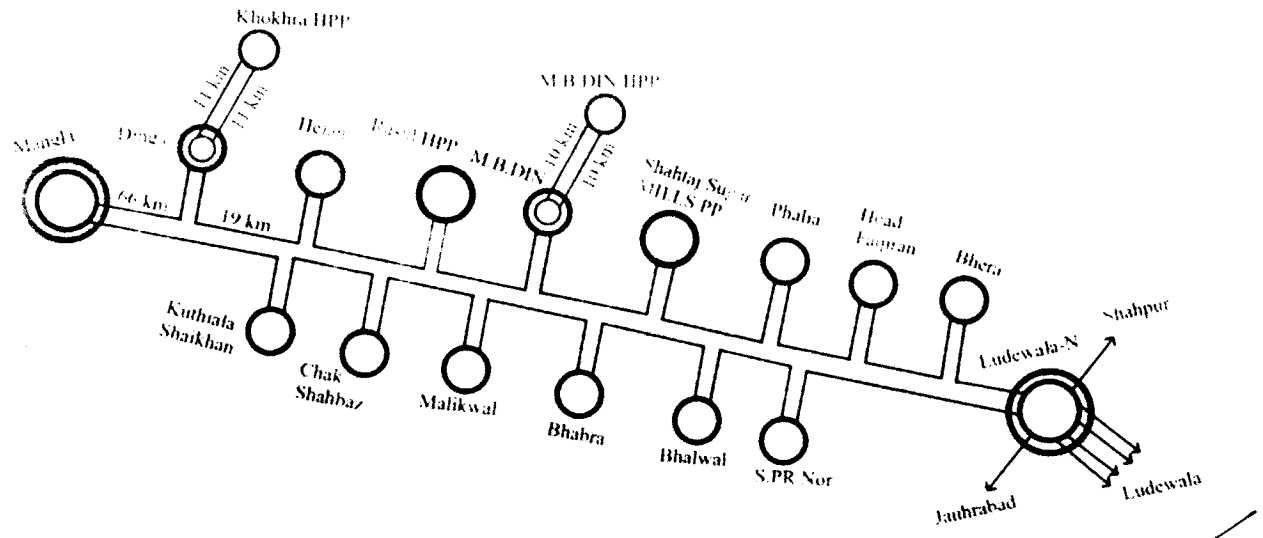
The power generated by the generation facility/Hydel Power Plant of Mandi Baha Ud Din Energy Limited (MBDEL) will be dispersed to the load center of Gujranwala Electric Power Company Limited (GEPCO) at 11 kV voltage level.

(2). The proposed interconnection arrangement/transmission facilities for dispersal of electric power will be consisting of a Double Circuit (D/C) 11 kV feeders [measuring about ten (10) km in length using ACSR Osprey conductor] connecting the generation facility/Hydel Power Plant of MBDEL to Mandi Baha Ud Din 132/11 kV grid station of GEPCO.

(3). Any change in the final interconnection arrangement and transmission facilities, for the dispersal of power other than the above, as agreed by the Licensee, Power Purchaser and GEPCO shall be communicated to the Authority in due course of time.

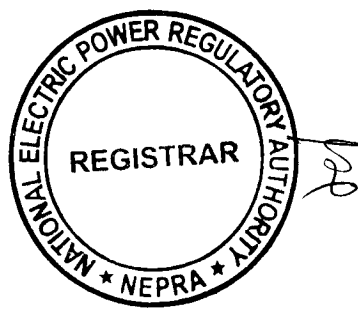


Schematic Diagram
for Interconnection/Transmission Arrangement for
Dispersal of Power from Generation Facility/Hydel Power
Plant of the Licensee



Legend

220 kV	=====
132 kV	=====
11 kV	-----
Proposed 11 kV	-----



Details
of Generation Facility/Hydel Power
Plant of the Licensee

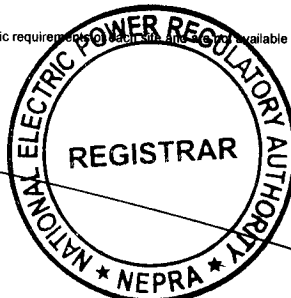
(A). General Information

(i).	Name of the Company/ Licensee	Mandi Baha Ud Din Energy Limited
(ii).	Registered/Business Office of the Company/Licensee	House No. 156, Block-N Model Town Extension, Lahore
(iii).	Location of the Generation Facility	Lower Jhelum Feeder Canal at RD 2+000, near Rasul town, district Mandi Baha Ud Din in the province of Punjab
(iv).	Type of Generation Facility	Hydropower Plant

(B). Plant Configuration

(i).	Size/Installed Capacity (Gross) of the Generation Facility	3.30 MW
(ii).	Type of Storage etc.	Run of Canal Hydropower Plant
(iii).	Water Source	Lower Jhelum Feeder Canal at RD 2+000
(iv).	Type of Technology	Two (02) Pit type Horizontal Kaplan Turbines
(v).	Number of Units & Size(MW)	2 x 1.65 MW
(vi).	Turbine Make & Model*	Andritz Hydro, Mavel, HP or Equivalent
(vii).	Expected COD of the Generation Facility	May 30, 2021
(viii).	Expected Life of the Generation Facility from COD	Thirty (30) Years

* Hydro turbines are designed and manufactured to meet the specific requirements of the licensee and are available off the Shelf as per standard models.



(C). Main Design Features

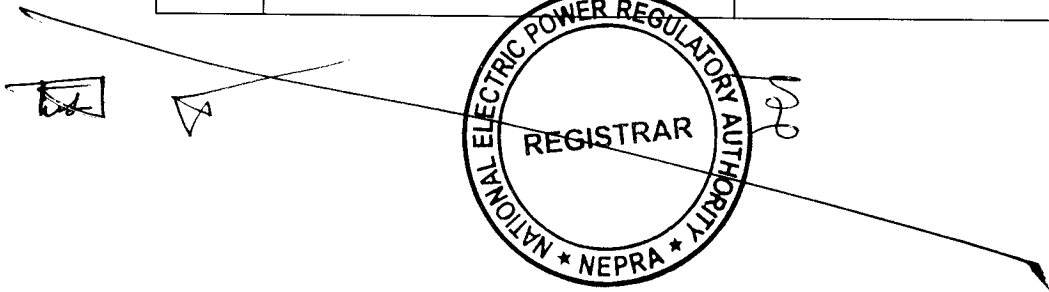
(i).	Design Discharge	60 m ³ /s
(ii).	Maximum Discharge	187 m ³ /s
(iii).	Maximum Gross Head	7.52 meters
(iv).	Minimum Gross Head	5.20 meters
(v).	Head Loss	0.30 meters
(vi).	Plant Factor	64%
(vii).	Mean Annual Energy	19.007 GWh

(D). Head Race Channel

(i).	Water level at start of Headrace	219.08 m.a.s.l.
(ii).	Canal Bed depth	46.63 meters
(iii).	Flow depth	3.01 meters
(iv).	Bed Slope	0.12 meters

(E). Trash Racks

(i).	Width	9.65 meters
(ii).	Height	5.50 meters



(iii).	Inclination	15°
(iv).	Bar Distance	50 millimeters

(F). Stop Logs

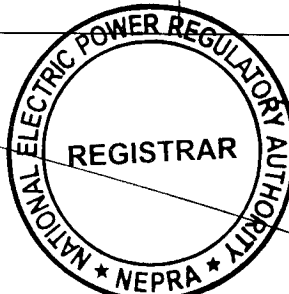
		Width	Height
(i).	Intake	9.65 meters	4.58 meters
(ii).	Spillway/Bottom outlets	As above	As above

(G). Draft Tube

(i).	No. of Bays	02
(ii).	Type	Conical
(iii).	Head on Sill	6.0 meters
(iv).	Width	5.40 meters
(v).	Height	3.29 meters

(H). Powerhouse

(i).	Powerhouse level	Bottom: 206.25 m.a.s.l.
		Top: 223.00 m.a.s.l.
(ii).	Machine Hall Width	10.0 meters
(iii).	Machine Hall Length	22.80 meters



(iv).	Machine Hall Height	9.0 meters
-------	---------------------	------------

(I). Tailrace Channel

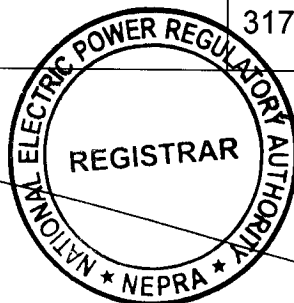
(i).	Maximum Tailrace Water Level	219.08 m.a.s.l.
(ii).	Minimum Tailrace Water Level	211.90 m.a.s.l.
(iii).	Bed Level	211.16 m.a.s.l.
(iv).	Canal Bed Width	46.63 meters
(v).	Bed Slope	0.12 meters

(J). Bottom Outlets

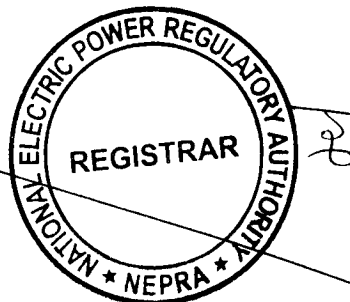
(i).	No. of Bays	03
(ii).	Sill level	208.25 m.a.s.l.
(iii).	Design Pressure at Sill	11 meters
(iv).	Height	3.91 meters
(v).	Width	3.26 meters

(K). Electrical & Mechanical Specifications

a) Turbine		
(i).	Turbine Speed	317.4 r.p.m



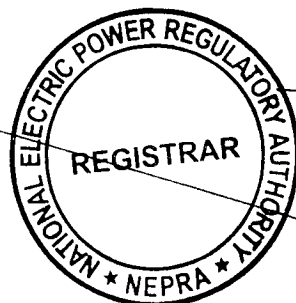
(ii).	Turbine Runner Diameter	2.10 meters
(iii).	Rated Head	6.75 meters
(iv).	Rated Flow for each unit	30.0 m ³ /s
b) Generator		
(i).	Type	Synchronous Generator
(ii).	Nominal Speed	1000 r.p.m
(iii).	No. of Units	02
(iv).	Capacity	1833 kVA
(v).	Power factor	0.90
(vi).	Frequency	50 Hz
(vii).	Nominal Voltage	6.30 kV
(viii).	Insulation class	F
(ix).	Ambient temperature	50°C
(x).	Connection	Y, High Impedance Grounded
(xi).	Protection Class	IP 54/23
c) Transformer		
(i).	No. of Transformers	02



(ii).	Capacity	1833 kVA each
(iii).	Low Voltage (Primary)	6.30 kV
(iv).	High voltage (secondary)	11 kV
(v).	Frequency	50 Hz
(vi).	Vector Group	Dyn 11
(vii).	Impedance	4%
(viii).	Type of Tap Changer	±2x2.5%, On Load
(ix).	Cooling	ONAN

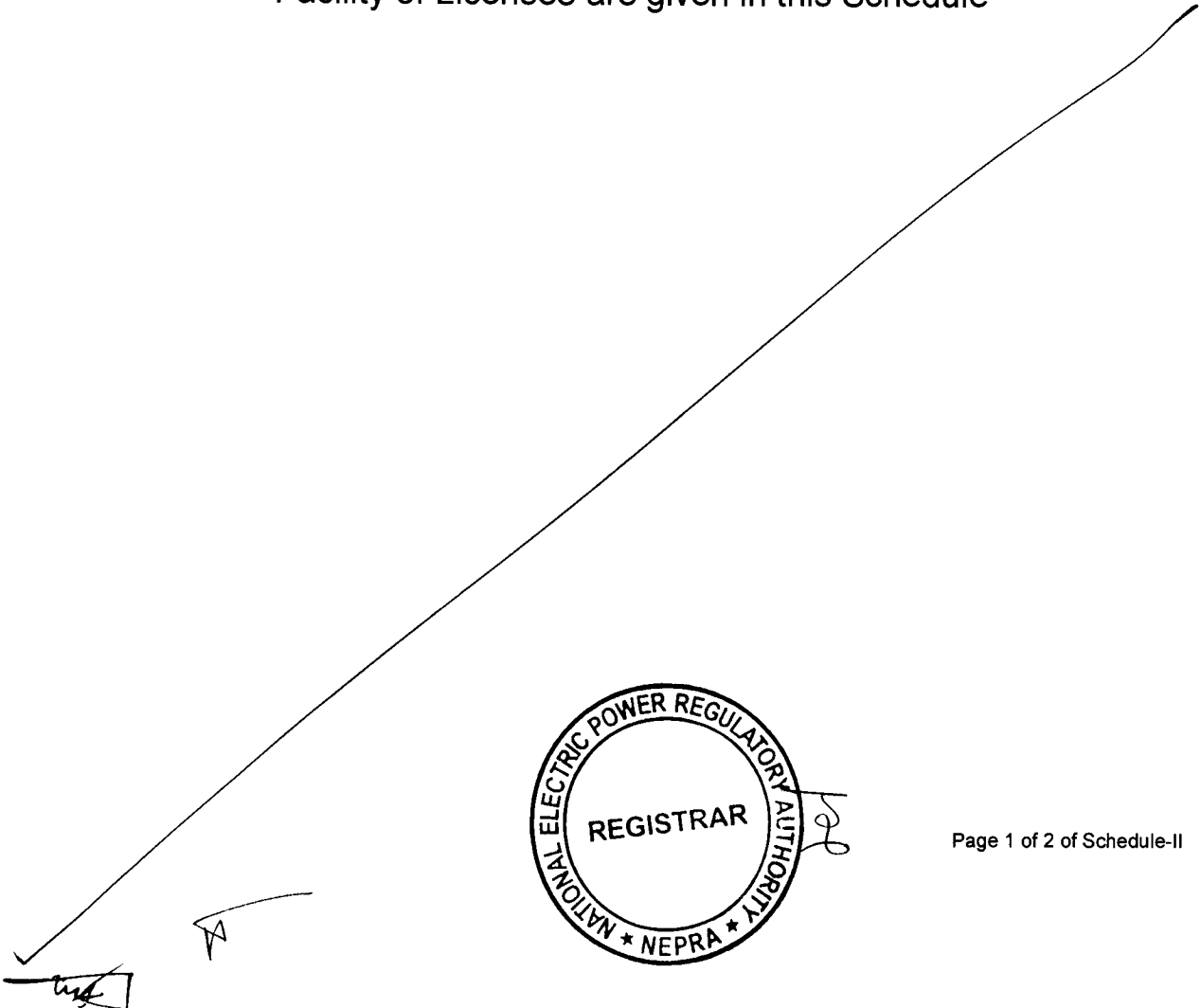
(L). Plant Characteristics

(i).	Generation Voltage	11 kV
(ii).	Frequency	50 Hz
(iii).	Power Factor	0.90 Leading
(iv).	Automatic Generation Control	Yes
(v).	Ramping Rate	330 kW/min
(vi).	Time required to Synchronize to Grid and loading the Complex to full load.	To be provided later



SCHEDULE-II

The Total Installed Gross Capacity (MW), De-Rated Capacity at Reference Site Conditions (MW), Auxiliary Consumption (MW) and the Net Capacity at Reference Site Conditions (MW) of the Generation Facility of Licensee are given in this Schedule



SCHEDULE-II

(1).	Total Installed Gross Capacity of the Generation Facility (2 x 1.65 MW horizontal Kaplan Turbines)	3.30 MW
(2).	De-Rated Capacity of the Generation Facility at Reference Site Conditions	3.30 MW
(3).	Total Auxiliary Consumption of the Generation Facility	0.033 MW
(4).	Net Capacity of the Generation Facility at Reference Site Conditions	3.267 MW

Note

All the above figures are indicative as provided by the Licensee. The net capacity available to Power Purchaser for dispatch will be determined through procedure(s) contained in the Energy Purchase Agreement or any other applicable document(s).

