National Electric Power Regulatory Authority
Islamic Republic of Pakistan

Registrar

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-402/ 11821-27 April 29, 2020

The Project Director,
Jabori Hydropower Project,
Pakhtunkhwa Energy Development Organization,
38/B2, Phase-V, Hayatabad,
Peshawar

Subject: **Grant of Generation Licence No. GL(Hydel)/15/2020**
Licence Application No. LAG-402
Pakhtunkhwa Energy Development Organization (PEDO)
(Jabori Hydropower Project)

Reference: PEDO's application vide letter No. 1132/PEDO/PD/JB dated May 22, 2017

Enclosed please find herewith Determination of the Authority in the matter of Application of "Pakhtunkhwa Energy Development Organization (PEDO)" for the Grant of Generation Licence along with Generation Licence No. GL(Hydel)/15/2020 annexed to this determination granted by the National Electric Power Regulatory Authority (NEPRA) to Pakhtunkhwa Energy Development Organization (PEDO) for its 10.824 MW Jabori Hydropower Project located on River Siran, Tehsil Baffa, District Mansehra, in the Province of Khyber Pakhtunkhwa, pursuant to Section 14B of the Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997/Amendment Act, 2018.

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

Enclosure: As Above

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY ★ NEPRA ★ REGISTRAR

29 04 2

(Syed Safeer Hussain)

Copy to:

1. Secretary, Power Division, Ministry of Energy, A-Block, Pak Secretariat, Islamabad.
2. Managing Director, NTDC, 414-WAPDA House, Lahore.
3. Chief Executive Officer, CPPA-G, ENERCON Building, Sector G-5/2, Islamabad.
4. Chief Executive Officer, Peshawar Electric Supply Company Limited, PESCO House, Shami Road Peshawar.
5. Director General, Environment Protection Department, Government of KPK, 3rd Floor, Old Courts Building, Khyber Road, Peshawar.
6. Secretary, Energy and Power Department, Government of Khyber Pakhtunkhwa, 1st Floor, A-Block, Abdul-Wali Khan Multiplex, Civil Secretariat, Peshawar.

National Electric Power Regulatory Authority (NEPRA)

Determination of the Authority in the Matter of Application of Pakhtunkhwa Energy Development Organization for the grant of Generation Licence for its Jabori Hydel Power Plant

April 29, 2020
Case No. LAG-402

(A). Background

(i). The province of Khyber Pakhtunkhwa of the country is blessed with huge hydropower potential. In order to harness hydropower potential in the province, the Government of Khyber Pakhtunkhwa has set up Pakhtunkhwa Energy Development Organization (PEDO).

(ii). PEDO has identified around 6000 MW hydropower potential at various sites all over the province. The identified/selected sites are at different stages of implementation. One of such sites is located at Jabori, tehsil and district Mansehra, in the province of Khyber Pakhtunkhwa.

(B). Filing of Application

(i). PEDO submitted an application for its Jabori Hydel Power Plant (HPP) on May 25, 2017 for the grant of generation licence in terms of the then Section-15 (now Section-14B) of Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997 (the "NEPRA Act") read with the relevant provisions of the NEPRA Licensing (Application and Modification Procedure) Regulations, 1999 (the "Licensing Regulations").

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

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY ★ NEPRA ★ REGISTRAR

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 July 06, 2017 for consideration of the grant of the generation licence as stipulated in Regulation-7 of the Licensing Regulations. The Authority also approved a notice of admission to be published in the press for inviting comments of general public, interested and affected persons in the matter as stipulated in Regulation-8 of the Licensing Regulations. Accordingly, the said notices were published in one (01) Urdu and one (01) English newspapers on July 12, 2017.

(iii). In addition to the above, the Authority also 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 the approved list on July 12, 2017, soliciting their comments for assistance of the Authority.

(C). Comments of Stakeholders

(i). In reply to the above, the Authority received comments from four (04) stakeholders. These included Indus River System Authority (IRSA), Energy Department Government of Sindh (EDGoS), Water and Power Development Authority (WAPDA) and Irrigation Department Govt. of Punjab (IDGoPb). The salient points of the comments offered by the said stakeholders are summarized below:-

(a). IRSA submitted that the Authority may ask the sponsors to provide it a copy of PC-1, along with feasibility report, of the project and also apply for No Objection Certificate (NOC);

(b). EDGoS submitted that there is a huge potential of hydropower in the country including the province of Khyber Pakhtunkhwa which has not been utilized properly

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
REGISTRAR
NEPRA

despite severe energy crisis faced by the country for the last ten years. Therefore, EDGoS supports the grant of generation licence to PEDO;

(c). WAPDA supported the grant of generation licence to PEDO for its HPP of Jabori as it will provide low-priced green energy to National Gird which will lessen dependence on thermal generation and expensive furnace oil; and

(d). IDGoPb commented PEDO is setting up a Run of River (RoR) based HPP on Siran river a tributary of Indus river. As construction of the proposed HPP will not involve any consumption of water therefore, there is no objection to the grant of generation licence.

(ii). The Authority reviewed the above comments of the stakeholders and considered it appropriate to seek the perspective of PEDO on the observations of IRSA. On the comments of IRSA, it was submitted that the matter has already been taken with IRSA providing necessary documentations including PC-I of the project/feasibility study etc. Later on, PEDO provided a copy of the NOC from IRSA.

(iii). The Authority considered the above submissions of PEDO and considered it appropriate to proceed further in the matter as stipulated in the Licensing Regulations and NEPRA Licensing (Generation) Rules 2000 (the "Generation Rules").

(D). Evaluation/Findings

(i). The Authority reviewed the submissions of PEDO including the information provided in its application for the grant of generation licence, comments of the stakeholders and the rejoinder in the matter. Further to the

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY ★ NEPRA ★ REGISTRAR

said, the Authority also considered the feasibility study of the project, Grid Interconnection Study (GIS) of the project and the provisions of the NEPRA Act and the relevant rules & regulations made thereunder.

(ii). The Authority has observed that PEDO is an autonomous organization governed by its Board of Directors and is under the administrative control of Irrigation and Power Department of Khyber Pakhtunkhwa. It is pertinent to mention that under Section-24 of the NEPRA Act, the licensees are required to be companies registered under the Companies Ordinance, 1984 (XLVII of 1984) except WAPDA and PEDO. In view of provisions of the NEPRA Act, PEDO fulfills the said basic criteria for the consideration of a licence. PEDO has successfully completed eight (08) small and medium sized hydel power projects. These include (a). 81.00 MW Malakand-III; (b). 18.00 MW Pehur; (c). 1.80 MW Shishi; (d). 4.20 MW Reshun; (e). 2.40 MW Machai; (f). 17.00 MW Ranolia; (g). 36.60 MW Daral Khwar; and (h). 11.80 MW Karora Projects.

(iii). The Authority has considered the submission and has observed that currently, PEDO is working on a number of hydropower projects which are at different stages of implementation. These hydropower potential sites are mainly located in the Northern districts of Khyber Pakhtunkhwa i.e. Chitral, Dir, Swat, Mansehra and Kohistan. The major source of funding for financing these projects had been the Hydel Development Fund and the Annual Development Program of Govt. of Khyber Pakhtunkhwa. In view of the above, it is clear that PEDO has the required financial and technical capability to implement hydel power projects.

(iv). The Authority has observed that PEDO in collaboration with GTZ (i.e. German Agency for Technical Cooperation) now GIZ (German development agency), identified a number of small/medium size hydel schemes in the province. The HPP of Jabori was identified through the joint effort of PEDO and GTZ/GIZ during the year 1992-1998. The work of carrying out the detailed feasibility study was awarded to Associated Consulting Engineers – ACE (Pvt.)

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
REGISTRAR
NEPRA

Limited in August 2008 and was completed in May 2011 which identified the potential of the site to 6.50 MW. In this regard, the PDWP approved the PC-I of the project with a total cost of Rs. 2331.0 Million on January 09, 2012. The Administrative approval and the technical sanction for the project were accorded on March 27, 2012 and June 12, 2012 respectively.

(v). After completing necessary formalities, PEDO awarded the work of the management consultancy of the project to the consortium of the AGES (Pakistan), IDC (Pakistan) and HCE (Nepal) Consultants with AGES Consultants as the lead partner on October 22, 2013. The said consultants carried out the review of the feasibility study of the project during the period of 2013-2014 and recommended some adjustment in the positioning of the weir and sizing of the tunnel resulting in the increase of the sizing of the project to 10.824 MW. The EPC contract for the project was awarded to a joint venture of local and foreign contractors on November 13, 2014. The joint venture consisted of Ghulam Rasool and Company (Private) Limited (GR&CPL), Tianjin Design and Research Institute of Electric Drive Company Limited (TRIED) and Hydrochina Zhongnan Engineering Corporation Limited (Hydro China) through a competitive bidding process. In view of the reasons explained above, PDWP approved the revised PC-I of the project with a total cost of Rs. 3798.26 Million on December 03, 2014.

(vi). The Authority has reviewed the profiles of the Joint Venture (JV) of the EPC contractors and has observed that the local partner of the JV i.e. GR&CPL is one of the largest private construction company of the country which has been in business since 1965. The company has been involved in large construction projects including EPC Contracting, Bridges & Roads Water Resources, Urban Development/Buildings, Power, Port & Harbour, Rail & Transit, Tunnel and Oil & Gas. The projects executed by GR&CPL includes Construction of Hassanabdal – Havelian Expressway, EPC of Karora Hydropower Project, and construction of Mangla Dam Raising Project.

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
REGISTRAR
NEPRA

(vii). Similarly, the other JV partner i.e. TRIED is directly under the former National Machinery Industry Ministry, is a China National Machinery Industry Corporation owned science and technology enterprises, mainly engaged in electric drive automation system engineering, small hydroelectric power equipment, low voltage electrical distribution equipment and new energy research and development, production of electronic equipment manufacturing and testing and certification.

(viii). The third partner of the JV i.e. Hydro China is mainly engaged in five major business fields, i.e., hydropower and water resources engineering, new energy development, environmental engineering, water utilities and traffic engineering, and municipal works and industrial and civil construction. The business mainly consists of five parts, i.e., planning, survey and design for hydropower and wind power projects, engineering consultation, supervision and monitoring, EPC contracting and supply of complete sets of electrical and mechanical equipment, investment and financing, and international business. Hydro China has extensive experience in the EPC worldwide covering projects of hydropower, water conservancy, wind power and new energy as well as municipal, industrial and civil works.

(ix). The Authority has reviewed a feasibility study, the original and revised PC-I of the project and has observed that project is being developed as a Run of River on the Siran River which is a left tributary of the Indus River. The weir site of the project was initially located at village Jabori due to which the project was named as Jabori HPP. Later on, on the recommendations management consultants of the project, the weir of the project was shifted about 1-km up stream of the village of Jabori near Giyar Sacha, while the powerhouse is located near Granthali Village about 3 km downstream of Jabori. As explained above, the above changes resulted in enhanced installed capacity of the project resulting in better economics of the project. The UTM coordinates of the weir of the project are 43 S, Easting = 338482.00 m and Northing = 3831554.0 m.

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
REGISTRAR
NEPRA

(x). The hydrology of the project consists of a catchment area 236 km^2 with Normal Reservoir Level 1413.75 masl. The design discharge for power generation has been taken as 8.00 m^3/sec. The components of the project consist of construction of diversion weir, a connecting channel leading the diverted discharge to sand trap from where the sediments free discharge will be collected by means of power channel which will ultimately enter into the power tunnel. A surge shaft has been provided at the end of power tunnel. The tunnel is connected with a steel penstock proposed on slope of the hill. A surface powerhouse is proposed which has two Francis units. Tailrace channel is provided at the downstream of powerhouse to carry the outflow back into the Siran River. The switchyard of the HPP is being located at the right side of Siran River to evacuate the power to national grid located at Battal through 132 KV transmission line.

(xi). As explained above, the total installed capacity of the HPP is 10.824 MW consisting of two (02) Horizontal Francis type turbines (2 x 5.412 MW). The said capacity of the project has been optimized keeping in view the design discharge of 8.00 m^3/s. The Jabori HPP is a high head (gross head of 156.75 m and net head 148.00 meter) Run of River project with mean annual energy of approximately 71.10 GWh at plant factor of 79.57%. The project is in advanced stage and is expected to be completed by June 30, 2020.

(xii). PEDO through its consultant has carried out the required GIS to determine the arrangement for dispersal of electric power from the proposed generation facility/HPP. According to the said study, the interconnection for the project will be a 132 kV and will be consisting of a D/C transmission line (measuring approx. 15.0 km long on ACSR Lynx Conductor) connecting the generation facility/HPP to Battal Grid Station of PESCO. In this regard, PESCO has also approved the above mentioned GIS, confirming compliance of the Grid Code.

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
REGISTRAR
NEPRA

(xiii). The Authority has observed that National Transmission & Despatch Company Limited (NTDC) had pointed out that GIS conforms to the provision of N-1 contingency for its main transmission line connecting the HPP with the Grid Station of PESCO but the same does not fulfil the said contingency between Battal and Oghi being the Single Circuit (S/C) transmission line. The Authority has observed that according to the Demand Forecast of PESCO, in case of outage of 132 KV S/C transmission line from Battal to Oghi, the load at Battal Grid Station would be 60.60 MW for the year 2019-20 however, the actual load as confirmed by PESCO will be around 35-40 MW and power generated from the generation facility/HPP of Jabori during peak time will be easily absorbed by the system even in the breakdown scenario. In view of the said, the Authority considers that the proposed GIS of the project fulfills the provisions of the Grid Code.

(xiv). The Authority has observed 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 hydro power plants. However, the operation of the generation facility/HPP may cause soil pollution, water pollution and noise pollution during construction and operation. In this regard, the Authority has observed that PEDO carried out the Environmental and Social Soundness Assessment (ESSA) study for the project and submitted the same for the consideration and approval of Environmental Protection Agency, Government of Khyber Pakhtunkhwa (EPAGoKP). In this regard, EPAGoKP had already issued a No Objection Certificate (NOC) to the company for the construction of the project.

(xv). 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) and Rule-3(5) of the Generation Rules. In the particular case under consideration, the Authority considers that conditions of Rule-3(2) and Rule-3(3) stand satisfied as PEDO

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
REGISTRAR
NEPRA

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/HPP. The provision of Rule-3(4) of the Generation Rules regarding holding a public hearing is not applicable as there was no issue which required this exercise.

(xvi). 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 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 against the preferences indicated by the Authority; (d). the cost and right-of-way considerations related to the provision of transmission and interconnection facilities; (e). the constraints on the transmission system likely to result from the proposed generation facility 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; 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. In consideration of the above, the Authority considers that the proposed project will result in optimum utilization of the RE of the province of Khyber Pakhtunkhwa which is untapped, resulting in pollution free electric power.

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY ★ NEPRA ★ REGISTRAR

(xvii). As explained in the preceding paragraphs, the sponsor 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 thin population of the area, the project will not result in cost and right-of-way issues for the provision of transmission and interconnection facilities. In view of the said, the Authority is of the considered opinion that the project of PEDO fulfills the eligibility criteria for grant of generation licence as stipulated in the NEPRA Act, rules, 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.

(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 electric power generation and their development is encouraged. In view of the said, the Authority is of the considered opinion that there is a worldwide trend to increase the share of RE in the energy mix of any country and it is very likely that the Govt. of Pakistan will also be considering to increase the share of RE substantially in the coming years.

(iii). The current case under consideration of the Authority is that PEDO which plans setting up a hydel based generation facility/HPP a Run-of-River scheme on Siran River located at about 10-Km downstream of Timergara Town

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY ★ NEPRA ★ REGISTRAR

in district lower Dir of the province of KPK of an installed capacity of 10.824 MW. As explained in the preceding paragraphs, the proposed project not only fulfils the eligibility criteria for grant of generation licence as envisaged in the existing regulatory regime but all the stakeholders has supported the grant of generation licence to PEDO for its Jabori Project.

(iv). In view of the above, the Authority considers that the proposed project of PEDO will help in diversifying the energy portfolio as well increasing share of RE in 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 in reducing carbon emissions by generating clean electricity, thus improving the environment.

(v). As explained in the preceding paragraphs, PEDO 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/HPP. The said details are being incorporated in the generation licence.

(vi). The term of a generation licence under Rule-5(1) of the Generation Rules is required to commensurate with the maximum expected life of the units comprised in a generating facility, except where an applicant for a generation licence consents to a shorter term. According to the information provided by PEDO, its generation facility/HPP will achieve COD by June 30, 2020 and will have a useful life of more than thirty (30) years from its COD. In this regard, PEDO has requested that the term of the proposed generation licence may be fixed as thirty (30) years. The Authority considers that said submission of PEDO about the useful life of the generation facility/HPP and the subsequent request to fix the term of the generation licence is consistent with international benchmarks therefore the Authority fixes the term of the generation licence as thirty (30) years from COD of the project.

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
REGISTRAR
NEPRA

(vii). 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 this regard, the PEDO has already submitted a petition for determination of its tariff for generation of electric power. The Authority has already admitted the petition and the same is in advanced stage of processing. In view of the said, the Authority considers appropriate to direct PEDO to charge the power purchaser only such tariff which has been determined, approved or specified by it. Accordingly, the Authority decides to include a specific article in the generation licence. Further, the Authority directs PEDO to adhere to the said in letter and spirit without any exception.

(viii). About the compliance with the environmental standards, as discussed in the preceding paragraphs, PEDO has provided the NOC from EPAGoKP and has confirmed that the project will comply with the required standards during the term of the generation licence. In view of the importance of the issue, the Authority has decided to include a specific article in the generation licence along with other terms and conditions making it obligatory for PEDO to comply with relevant environmental standards at all times. Further, the Authority directs PEDO to submit a report on a bi-annual basis, confirming that operation of its generation facility/HPP is in compliance with the required environmental standards as prescribed by the concerned environmental protection agency.

(ix). The proposed generation facility/HPP of PEDO will be using RE 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. PEDO has informed that the project will achieve COD by June 30, 2020, which is within the deadline of the Kyoto Protocol. In view of the said, an article for carbon credits and its sharing with the power purchaser has been included in the generation licence for which PEDO must take the appropriate actions at the suitable earliest time so that proceeds for the carbon credits are materialized.

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
REGISTRAR
NEPRA

PEDO shall be required to share the proceeds of the carbon credits with the power purchaser as stipulated in the generation licence.

(x). In view of the above, the Authority hereby approves the grant of generation licence to PEDO 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:

Engr. Rafique Ahmed Shaikh
(Member)

Engr. Rehmatullah Baloch
(Member) — Did Not Attend

Saif Ullah Chattha
(Member)

Engr. Bahadur Shah
(Member/Vice Chairman)

Engr. Tauseef H. Farooqi
(Chairman) — Did Not Attend

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
REGISTRAR
NEPRA

National Electric Power Regulatory Authority (NEPRA)
Islamabad – Pakistan

GENERATION LICENCE

No. GL (Hydel)/15/2020

In exercise of the powers conferred upon the National Electric Power Regulatory Authority (NEPRA) under Section 14B of the Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997/Amendment Act, 2018, the Authority hereby grants a Generation Licence to:

Pakhtunkhwa Energy Development Organization-(PEDO)

[formerly Sarhad Hydel Development Organization/(SHYDO) Established under the SHYDO/PEDO Act of 1993 of Government of Khyber Pakhtunkhwa (KP) as amended from time to time.

for its Jabori Project Located on River Siran Tehsil Baffa, District Mansehra in the Province of Khyber PakhtunKhwa

(Total Installed Capacity: 10.824 MW Gross)

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

Given under my hand this on 29th day of April Two Thousand & Twenty and expires on 29th day of June Two Thousand & Fifty.

29/04/20

Registrar

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
REGISTRAR
NEPRA

Article-1
Definitions

1.1 In this licence

(a). "Act" means the Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997 as amended or replaced from time to time;

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

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

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

(e). "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;

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY ★ NEPRA ★ REGISTRAR

(f). "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/Hydel Power Plant 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/Hydel Power Plant, which are available or can be obtained in relation to the generation facility/Hydel Power Plant after the COD;

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

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

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

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

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

(l). "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;

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY ★ NEPRA ★ REGISTRAR

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

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

(o). "Hydel Power Plant " means a generation facility for production of electric power using water as source;

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

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

(r). "Licensee" means **Pakhtunkhwa Energy Development Organization (PEDO)** or its successors or permitted assigns;

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

(t). "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;

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

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY ★ NEPRA ★ REGISTRAR

(v). "PESCO" means Peshawar Electric Supply Company Limited or its successors or permitted assigns;

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

(x). "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;

(y). "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;

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

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

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 of this licence. 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.

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
REGISTRAR
NEPRA

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 subject to Section 14-B of the Act.

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

Article-5
Licence fee

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

Article-6
Tariff

The Licensee shall charge only such tariff from the Power Purchaser which has been determined, approved or specified by the Authority.

Article-7
Competitive Trading Arrangement

7.1 The Licensee shall participate in such manner as may be directed by the Authority from time to time for development of a Competitive Trading Arrangement.

7.2 The Licensee shall in good faith work towards implementation and operation of the aforesaid Competitive Trading Arrangement in the manner and time period specified by the Authority. Provided that any such participation shall be subject to any contract entered into between the Licensee and another party with the approval of the Authority.

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
REGISTRAR
NEPRA

7.3 Any variation or modification in the above-mentioned contracts for allowing the parties thereto to participate wholly or partially in the Competitive Trading Arrangement shall be subject to mutual agreement of the parties thereto and such terms and conditions as may be approved by the Authority.

Article-8
Maintenance of Records

For the purpose of sub-rule(1) of Rule-19 of the Generation Rules, copies of records and data shall be retained in standard and electronic form and all such records and data shall, subject to just claims of confidentiality, be accessible by authorized officers of the Authority.

Article-9
Compliance with Performance Standards

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

Article-10
Compliance with Environmental & Safety Standards

10.1 The generation facility/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.

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
REGISTRAR
NEPRA

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/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 properly calibrated automatic computerized recording device(s) for measuring flow of water at its generation facility/Hydel Power Plant for recording of data.

12.2 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.

12.3 The Licensee shall transmit the data for flows of water and power output 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.

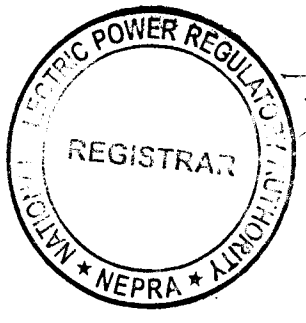
Article-14
Emissions Trading /Carbon Credits

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.

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
REGISTRAR
NEPRA

SCHEDULE-I

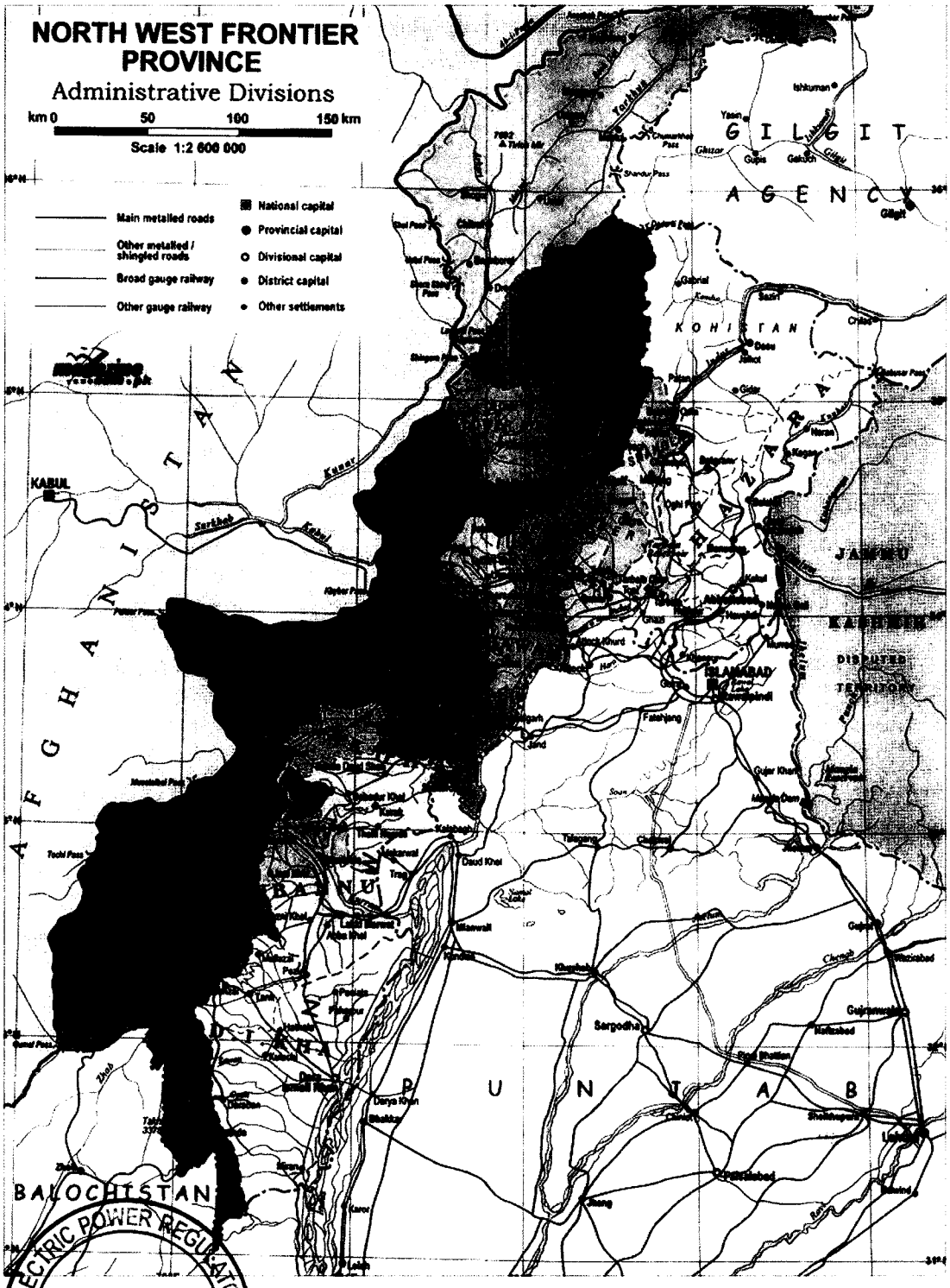
The Location, Size (i.e. Capacity in MW), Type of Technology, Interconnection Arrangements, Technical Limits, Technical/Functional Specifications and other details specific to the Generation Facilities of the Licensee are described in this Schedule.



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

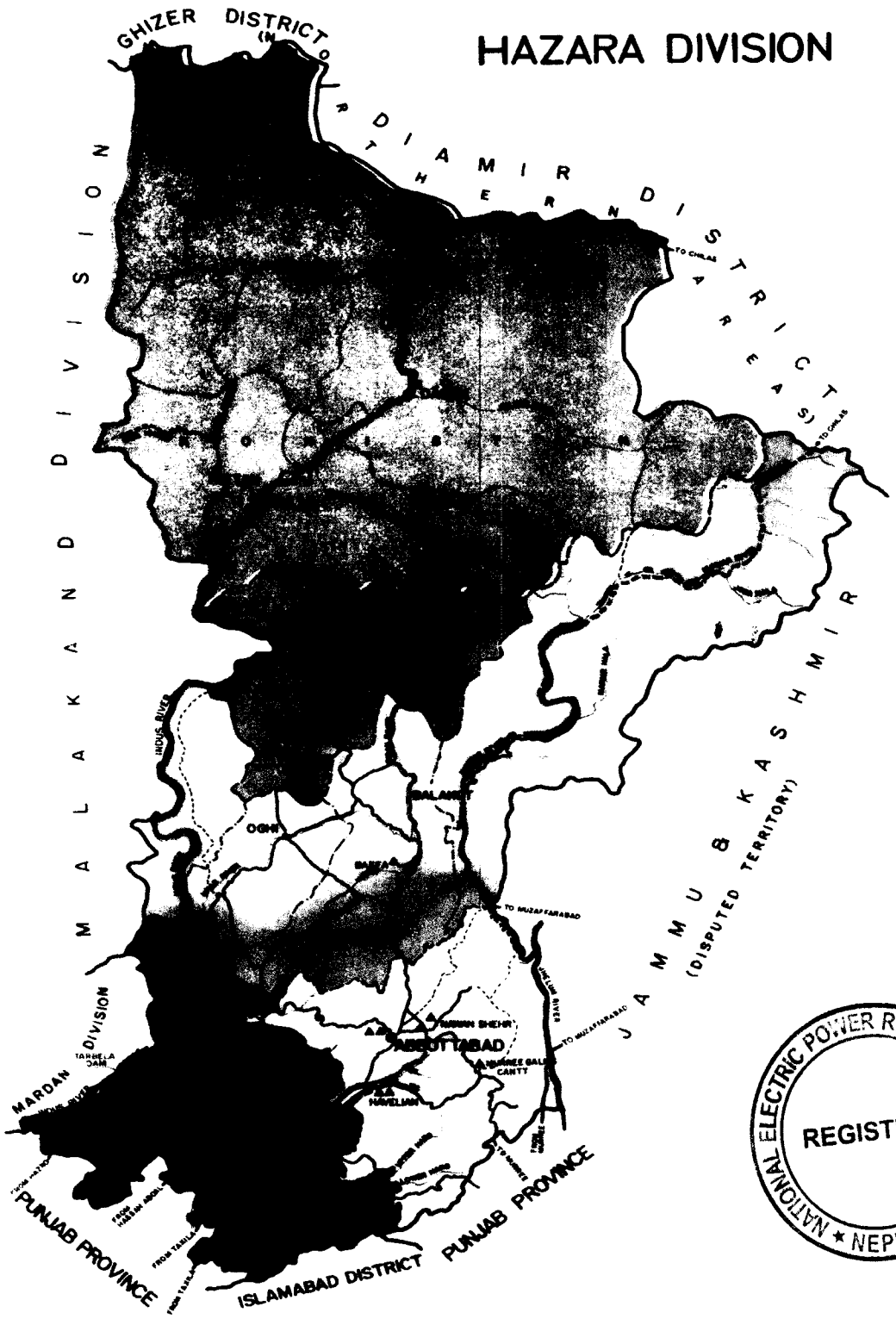
NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
REGISTRAR
NEPRA

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



NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
REGISTRAR
NEPRA

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



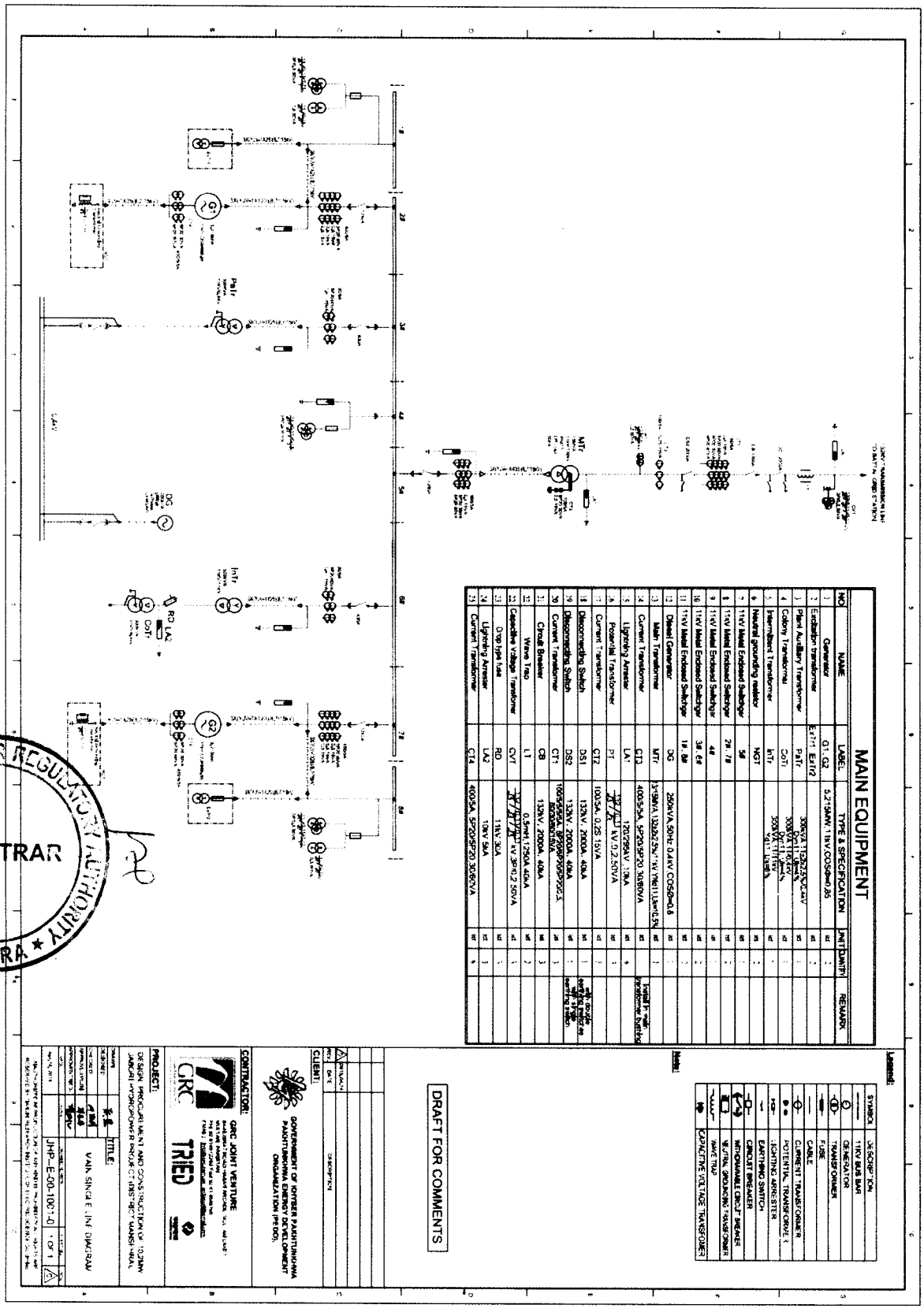
NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
REGISTRAR
NEPRA

Coordinates of Start of the Intake and Powerhouse of the Generation Facility/Hydel Power Plant of the Licensee

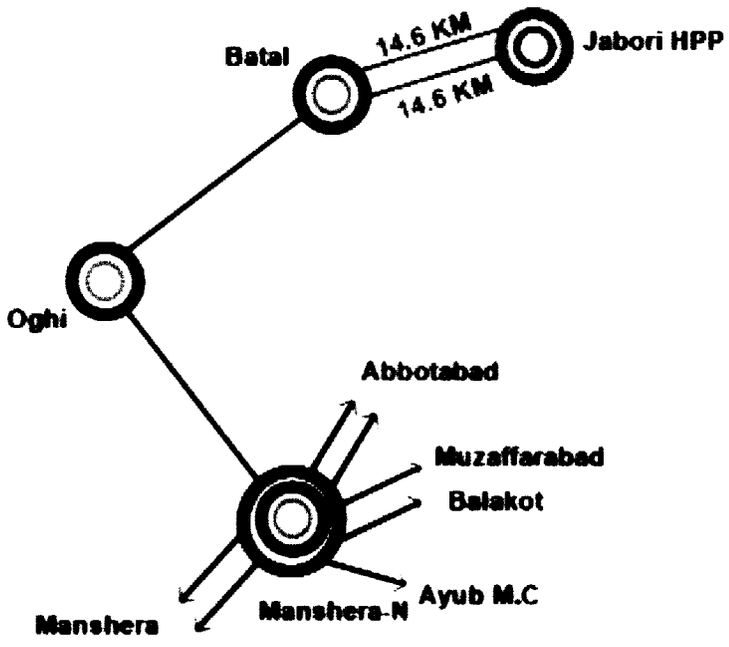
Site	Latitude	Longitude
Weir Intake	34°-45'-33.3"	71°-48'-18.2"
Powerhouse	34°-45'-12.2"	71°-47'-58.6"

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
REGISTRAR
NEPRA

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



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



Legend

220 kV
132 kV
11 kV
Proposed 132 kV
Proposed 11 kV

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
REGISTRAR
NEPRA

Interconnection Arrangement for Dispersal of Electric Energy/Power from the Generation Facility/Hydel Power Plant of the Licensee

The electric power generated from the generation facility/Hydel Power Plant/Jabori Project of the Licensee/Pakhtunkhwa Energy Development Organization-PEDO shall be dispersed to the load centre of PESCO.

(2). The proposed Interconnection Arrangements/Transmission Facilities for dispersal of power from generation facility/Hydel Power Plant of the Licensee/PEDO will consist of the following: -

(a). A 132 kV D/C transmission line (measuring approx. 15.00 km long on ACSR Lynx Conductor) connecting the proposed generation facility/ Hydel Power Plant with 132 kV Battal Grid Station of PESCO;

(3). Any change in the above Interconnection Arrangement/Transmission Facility duly agreed by Licensee/PEDO and PESCO, shall be communicated to the Authority in due course of time.

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
REGISTRAR
NEPRA

Detail of Generation Facility/Hydel Power Plant of the Licensee

(A). General/Business Information

(i).	Name of the Entity/ Licensee	Pakhtunkhwa Energy Development Organization (PEDO)
(ii).	Registered/Business Office of Entity/Licensee	Plot No. 38, Sector B-2, Phase-5 Hayatabad, Peshawar

(B). Location & Type of Facility

(i).	Location	Jabori Village, District Mansehra, Khyber Pakhtunkhwa, Pakistan
(ii).	UTM coordinates of weir	43 S, Easting = 338482.00 m Northing = 3831554.0m
(iii).	Hydropower type	Run-off River
(iv).	River Name	Siran River

(C). Hydrology

(i).	Catchment area	236 km^2
(ii).	Normal Reservoir Level	1413.75
(iii).	Design discharge for power	8.00 m^3/sec
(iv).	Selected Design flood for weir	100 year frequency
(v).	Flood discharge 100yr	686 m^3/sec
(vi).	Flood discharge 1000 yr	1144 m^3/sec

(D). Diversion Weir

(i).	Type of Weir	Tyrolean
(ii).	Crest level of Tyrolean section	1413.5 masl
(iii).	Crest of overflow section	1414.0 masl
(iv).	Min. Head on crest	0.25 m
(v).	Length of weir	45 m
(vi).	Design Flood	100 year frequency
(vii).	Flood discharge	686 m^3/sec
(viii).	Surcharge due to design flood	3.38 m
(ix).	Weir height	3.0 m from river bed
(xii).	Stilling Basin	USBR Type II
(xiii).	Size of basin	45 x 18 m
(xiv).	Embedded channel design	25% extra over discharge (8.00 cumecs)
(xv).	Size of embedded channel	2.35 m x 2.0 m
(xvi).	Size of intake gate	Lift gate (2.2 m x 2.3m)
(xvii).	Water level in embedded channel	1412.58 masl

(E). Connecting Channel

(i).	Type of Channel	Rectangular covered channel
(ii).	Design discharge	Designed for 25% extra discharge
(iii).	Dimensions	2.35 x 2.0m waterway
(iv).	Freeboard	0.27 m
(v).	Total length	140 m

(vi).	Average flow Velocity	2.50 m/sec
(vii).	Water level at start	1412.58 masl
(viii).	Water level at end of channel	1412.23 masl

(F). Connecting Channel

(i).	Type of Channel	Concrete lined trapezoidal section
(ii).	Design discharge	Designed for 25% extra discharge (10 m^3/sec)
(iii).	Invert level	1410.82 masl
(iv).	Water level at start	1412.23 masl
(v).	Bed width	2 m
(vi).	Flow depth	1.41 m
(vii).	Side slope	1.5: 1 (H:V)
(viii).	Bed slope	1 in 1000 m
(ix).	Free board	0.3 m
(xii).	Flow velocity in channel	1.7 m/sec
(xiii).	Total length of Trapezoidal channel	150 m

(G). Sand Trap

(i).	Type of Sand Trap	Two chambers
(ii).	Limit particle size	0.2 mm
(iii).	Average velocity in chambers	0.2.16 m/sec
(iv).	Length of chamber	65 m
(v).	Length of upstream transition	10.0 m

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
REGISTRAR
NEPRA

(vi).	Length of downstream transition	10.0 m
(vii).	Freed board	0.4 m
(viii).	Size of Chamber at start	B = 4.5 m , D = 4.5 m
(ix).	Size of Chamber at end	B = 4.5 m , D = 5.8 m
(xii).	Inlet gates	Two lift gates with hoisting (2.1 m x 1.8 m)
(xiii).	Outlet gates	Two lift gates with hoisting (2.0 m x 0.3 m)
(xiv).	Flushing Arrangement	Two rectangular gates (0.8 m x 0.55 m)
(xv).	Flushing discharge	2.0 m^3/sec, i.e. 25% of design discharge
(xvi).	Spillway section	Overflow type
(xvii).	Crest level of spill section	1412.10 masl
(xviii).	Length of spill section	22 m
(xix).	Surcharge due to overflow	0.2 m
(xx).	Total head losses in the sand trap	0.04 m

(H). Headrace Channel

(i).	Type of channel	Concrete lined Rectangular section
(ii).	Design discharge	8.00 m^3/sec
(iii).	Invert level	1410.40 masl
(iv).	Water level at start	1412.07 masl
(v).	Size of channel	3 m x 1.9 m
(vi).	Bed slope	1 in 1000 m
(vii).	Free board	0.3 m
(viii).	Flow velocity in Headrace channel	1.67 m/sec

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
REGISTRAR
NEPRA

(ix).	Total length of Headrace channel	94 m, including 10 m long Aqueduct

(I). Aqueduct

(i).	Design discharge	8.00 m^3/sec
(ii).	Length of throat	10 m
(iii).	Dimensions of turf	3 x 1.9 m (BxD)
(iv).	Free board	0.3 m
(v).	Bed slope	1 in 1000 m

(J). Intake Portal

(i).	Invert elevation at start	1410.0 masl
(ii).	Invert elevation at tunnel inlet	1405.6 masl
(iii).	Water level in intake	1411.74 masl
(iv).	Freeboard	0.6 m
(v).	Minimum submergence provided	3.25 m
(vi).	Spillway section	Overflow sharp crested at 1411.85 masl
(vii).	Length of spillway section	25 m
(viii).	Surcharge due to design discharge	0.34 m

(K). Power Tunnel

(i).	Type of Power Tunnel	Horseshoe shape concrete lined
(ii).	Height and width	2.5 m and 2.3 m
(iii).	Invert elevation of Tunnel	1405.9 masl
(iv).	Upstream water level at design discharge	1411.5 masl

(v).	Flow area	5.51 m^2
(vi).	Bed slope	1 in 1000 m
(vii).	Average flow velocity	1.5 m/sec
(viii).	Equivalent diameter of tunnel	2.65 m
(ix).	Length of tunnel upto surge tank	2730 m
(xii).	Bed level of tunnel at surge tank	1403.17 masl
(xiii).	Total losses in tunnel	2.76 m

(L). Surge Tank

(i).	Type of Surge Tank	Simple orifice type
(ii).	Maximum Surge level	1421.1 masl
(iii).	Minimum Surge level	1401.6 masl
(iv).	Head losses	0.05 m
(v).	Dia meter of surge tank	5.0 m
(vi).	Height of surge tank	25 m

(M). Penstock

(i).	Type of Penstock	Steel
(ii).	Invert level of Penstock	1395.3 masl
(iii).	Total length of Penstock	548 m
(iv).	Diameter of penstock	1.6 m
(v).	Thickness of penstock	14 ~16 mm
(vi).	Average velocity in penstock	3.98 m/sec

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
REGISTRAR
NEPRA

(vii).	Gross head at penstock	155.8 m
(viii).	Head losses in Penstock	3.81m
(ix).	Invert level of penstock at powerhouse	1256 masl
(x).	Bifurcation length	Two pipes 50 m each
(xi).	Diameter of Bifurcation	1.1 m

(N). Power Facilities

(i).	Type of Powerhouse	Surface powerhouse
(ii).	Size of Powerhouse	43 m x 21 m
(iii).	Turbine	Horizontal Francis
(iv).	Turbine Model	HLHF152-WJ-100
(v)	Total Installed Capacity	10.824 MW
(vi).	Number of Units	Two
(vii).	Capacity of each unit	5.412 MW
(viii).	Turbine Capacity	4.0 m^3/sec
(ix).	Generator Capacity	6.135 MVA
(x).	Gross Head	156.75 m
(xi).	Net Head	148.00 m
(xii).	Net head losses	8.75 m
(xiii).	Average annual energy	71.10 GWh
(xiv).	Plant Factor	79.57 %

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY ★ NEPRA ★ REGISTRAR

(O). Tailrace Channel

(i).	Type of Tailrace Channel	Rectangular concrete channel
(ii).	Dimension	3.5 m x 1.7 m
(iii).	Average velocity	1.7 m/sec
(iv).	Flow depth	1.38 m
(v).	Length of channel	30 m
(vi).	Free board	0.32 m

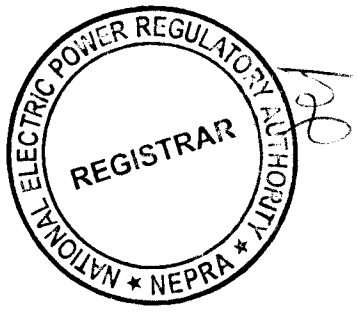
(P). Other Information

(i).	COD of the Generation Facility/Hydel Power Plant	June 30, 2020 (Expected)
(ii).	Expected Minimum Useful Life of the Generation Facility from COD	30 Years

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY ★ NEPRA ★ REGISTRAR

SCHEDULE-II

The Total Installed Gross ISO 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/Hydro Power Plant of Licensee is given in this Schedule



SCHEDULE-II

(1).	Total Installed Gross Capacity of the Generation Facility/Hydel Power Plant (2 x 5.412 MW)	10.824 MW
(2).	Total De-Rated Capacity of the Generation Facility/Hydel Power Plant at Mean Site Conditions (2 x 5.412 MW)	10.824 MW
(3).	Total De-Rated Capacity (Electrical) of the Generation Facility/Hydel Power Plant at Mean Site Conditions (2 x 5.10 MW)	10.200 MW
(4).	Auxiliary Consumption of the Generation Facility/Hydel Power Plant (2 x 0.153 MW)	00.306 MW
(5).	Net Capacity of the Generation Facility/Hydel Power Plant at Mean Site Conditions Condition (2 x 4.947 MW)	09.894 MW

Note

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

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY ★ NEPRA ★ REGISTRAR