National Electric Power Regulatory Authority Islamic Republic of Pakistan



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No. NEPRA/R/DG(Lic)/LAG-487/35043-50

August 25, 2021

Mr. Shahid Abdullah Chief Executive Officer Sapphire Hydro Limited 7-A/K, Main Boulevard Gulberg-II, Lahore

Subject:Grant of Generation Licence No. IGSPL/108/2021Licence Application No. LAG-487Sapphire Hydro Limited (SHL)

Reference: SHL's application vide letter No. SHL/NEPRA/0086 dated 30.09.2020.

Enclosed please find herewith Determination of the Authority in the matter of Application of "Sapphire Hydro Limited (SHL)" for the Grant of Generation Licence along with Generation Licence No. IGSPL/108/2021 annexed to this determination granted by the National Electric Power Regulatory Authority (NEPRA) to Sapphire Hydro Limited (SHL) for its 152.12 MW Sharmayi Hydel Power Project located on River Panjkora, District Upper Dir, 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: <u>As Above</u>





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.
- 7. Chief Executive Officer, Pakhtunkhwa Energy Development Organization (PEDO), Plot# 38, Sect B-2, Phase-5 Hayatabad Peshawar.

National Electric Power Regulatory Authority (NEPRA)

<u>Determination of the Authority</u> <u>in the Matter of Application of Sapphire Hydro Limited for the</u> <u>Grant of Generation Licence</u>

August , 2021 Case No. LAG-487

(A). Background

(i). Pakistan is blessed with such a topography that its province of Khyber Pakhtunkhwa offers a huge potential for the development of electric power using its water resources.

(ii). In order to harness hydropower potential in the province, the Government of Khyber Pakhtunkhwa has set up Pakhtunkhwa Energy Development Organization (PEDO). In this regard, the Provincial Government has formulated the "Khyber Pakhtunkhwa Hydropower Policy 2016" (hereafter called the "KP Hydropower Policy") to encourage and ensure exploitation of indigenous resources. In consideration of the said, PEDO has issued Letter of Intent (LoI) to different entrepreneurs/project developers as Independent Power Producers [IPP(s)] on Build-Own-Operate-Transfer (BOOT) basis. One such LoI was issued to the consortium of Sapphire Electric Company Limited (SECL/"Main Sponsor") and Sinohydro Corporation Limited, China (SHCL) for development of approximately 152.0 MW Sharmayi Hydel Power Project at Panjkora River, District Upper Dir in the province of Khyber Pakhtunkhwa. According to the terms and conditions of the LoI, the sponsors of the project carried out detailed feasibility study of the project including technical study, environmental study, financial study etc.

(iii). Further, the sponsors of the project incorporated a Special Purpose Vehicle (SPV) in the name of Sapphire Hydro Limited (SHL) and approached the Authority for the grant of generation licence.

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(B). Filing of Application

(i). SHL submitted an application on October 05, 2020 for the grant of generation licence in terms of Section-14B of Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997 (the "NEPRA Act") read with the relevant provisions of the NEPRA Licensing (Application and Modification Procedure) Regulations, 1999 (the "Licensing Regulations").

(ii). The Registrar examined the submitted application to confirm its compliance with the Licensing Regulations and observed that the application lacked some of the required information/documentation. In view of the said, the Registrar directed SHL for submitting the missing information/documentation and the same was received on October 19, 2020. Accordingly, the Authority admitted the application on November 09, 2020 for consideration of the grant of 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 newspaper on November 11, 2020.

(iii). In addition to the above, the Authority also approved a list of stakeholders for seeking their comments for its assistance 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 November 12, 2020, soliciting their comments for assistance of the Authority.

(C). Comments of Stakeholders

(i). In reply to the above, the Authority received comments from three (03) stakeholders. These included Indus River System Authority (IRSA), Central Power Purchasing Agency (Guarantee) Limited (CPPA-G) and Peshawar Electric Supply Company Limited (PESCO). The salient points of the comments offered by the said stakeholders are summarized below:-

(a). IRSA in its comments stated that it has already issued No Objection Certificate (NOC) to the company for development of Sharmayi hydel power project in district Upper Dir;



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(b). CPPA-G submitted that the notice of admission mentions that SHL intends to supply power to it whereas neither CPPA-G has been part of Panel of Experts (PoEs) constituted by PEDO for approving feasibility study of the project nor was it a part of any activity related to the project. Further, it has not issued any consent for purchasing power from the said project. The Rule-3(5) of the NEPRA Licensing (Generation) Rules, 2000 (the "Generation Rules") stipulates that the project must satisfy the 'least cost option criteria' including, inter alia, the proposed facility will result in optimal utilization of the available resources and there exists a demand for the proposed facility in view of the forecasts and requirements for additional capacity which SHL has failed to demonstrate in its application. It may be noted that PC 4 of the Grid Code requires preparation of the Indicative Generation Capacity Expansion Plan-IGCEP for optimal utilization of available resources therefore, the Authority may process the application strictly in accordance with IGCEP once the same is approved. It is also highlighted that the Authority through its determination dated July 17, 2020 pertaining to tariff petition filed by SHL remarked that role of PoE is non-satisfactory and the submitted Feasibility Study is not in accordance with the stated instructions of the Authority's approved mechanism for determination of tariff for hydel power project due to which the Authority dismissed the petition and directed the company to file the same after fulfilment of deficiencies and in the manner prescribed in law. Likewise, substantiated feasibility study required for the tariff determination is also mandatory requirement for the grant of generation licence in terms of Regulation-3(5)(h) of the Licensing Regulations . In view of the above, CPPA-G requested the Authority to consider its comments and process the application as per the applicable legal, regulatory and policy framework;



PESCO confirmed that power from the generation facility of SHL can easily be evacuated through 132 KV Golen Gol transmission line or connecting directly to 132 KV Dir grid station which is being upgraded.

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(ii). The Authority reviewed the above comments of CPPA-G and in view of the observations made, considered it appropriate to seek the perspective of SHL. On the said, it was submitted that PEDO issued Lol to develop the Sharmai Hydel Power Plant, which is one of the most economic source of energy and also environment friendly. The company intends to sell electricity to CPPA-G, being the only power purchaser of electricity in the prevailing regime however, the said issue is not pertinent at the stage of issuance of generation licence.

(iii). Regarding comment of CPPA-G for not being part of any activity of the project, SHL stated that number of letters were written to CPPA-G for different purposes. Also PEDO sent a copy of Lol dated March 20, 2017 to relevant stakeholders including CPPA-G however, no comments/reservations were raised by it. Regarding the optimal utilization of resources, it was submitted that detailed optimization was conducted with different alternatives being part of the feasibility study and conclusion was reached with the recommendation of PoEs accordingly, the Feasibility Study was approved. NTDCL prepared the IGCEP and submitted the same for consideration of the Authority and Sharmayi hydel project was included in it. However, the Authority returned the IGCEP with the directions that approval of the competent forum(s) in the federal government is required. As of date, no IGCEP has been finalized and approved by the Authority. In consideration of the said, SHL remarked that being the sponsor, it is committed to develop the project on fast track. Further, the Authority has taken the stance that till the finalization of the IGCEP, the business shall move as usual and the development of projects and issuance of generation licences will not be halted due to the delay in IGCEP on behalf of NTDC.

(iv). Further to the above, SHL submitted that it is fully aware of its responsibility to develop the project on least cost basis for which the EPC contractor would be appointed through International Competitive Bidding as envisaged in the relevant regulations. The costs of the project is comparable to the other HPPs. The Hydropower Projects are of strategic importance both economically as well as energy security. The Authority in its various determinations pertaining to the grant of licences emphasized on the importance of power generation through indigenous resources for sustainable development.

(v). About the comment of CPPA-G on the quality of the feasibility study, SHL acknowledged that the Authority raised the said issue accordingly, a meeting



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was held on September 02, 2020 at NEPRA Head Office and it was identified that comment was merely made on the basis that volumes of the Feasibility Study were submitted through different communication. The said issue has been resolved and consolidated feasibility study has been submitted through PEDO. It is pertinent to highlight that the Feasibility Study was conducted by reputed international consultant i.e. Fichtner GmbH & Co. and was in accordance with the NEPRA approved mechanism. In view of the said, the relevant consent and approvals required for the grant of generation licence have been obtained and the same have been submitted along with the application. Therefore, SHL requested the Authority that the generation licence may please be issued so that the development work on the project could be expedited.

(vi). The Authority reviewed/analyzed the above submissions of SHL and considered it appropriate to proceed further in the matter as stipulated in the Licensing Regulations and the Generation Rules.

(D). Evaluation/Findings

(i). The Authority has reviewed the submissions of SHL 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 said, the Authority has also considered the feasibility study of the project and Environment Impact Assessment (EIA) of the project, the KP Hydropower Policy and the provisions of the NEPRA Act and the relevant rules & regulations made thereunder.

(ii). The Authority has observed that Expressions of Interest (EOI) were invited by the PEDO through advertisements published in newspapers on April 19, 2016. Accordingly, the proposal was submitted by consortium of SHCL and SECL for development of hydel project and PEDO issued notice to proceed. In consideration of the said, PEDO issued Lol to the consortium of said companies as explained in the preceding paragraphs. SHCL is a wholly state-owned enterprise of Government of China with a registered capital of RMB Four Billion. It is strategically positioned as a clean energy conglomerate specializing in development and operation of large-scaled hydropower projects. SHCL's principal operations include power sector investment, engineering, construction, management, electricity production and provision of related technical services for hydropower projects. Currently, the company has 524 internation approaches in more than 74 countries, with total contract value of nearly





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USD 42.50 billion. Whereas, Sapphire Group is one of the largest conglomerates in the country with investment in textile, dairy and the power sector. Sapphire Group started its first production facility in Pakistan in 1971 in Textile Spinning. In the coming decades, it continued to broaden its expanse in the value chain. A decade later Sapphire further forayed into home Textiles Sewing units (2002), Finishing Plant (2003), Knit Stitching (2004) and Work Wear Apparel (2007). In 2007, Sapphire Group took the initiative of diversifying into "foods". Its dairy farm was started in 2007. The group plans to expand its production and eventually move into the value-added products as well. It successfully developed 234 MW combined-cycle power plant in 2010 which is now assisting WAPDA. Recently, it has added 150 MW to wind power generation in addition to 50 MW wind power plant already operational in 2015.

(iii). The Authority has observed that the applicant company (i.e. SHL) is a public limited company incorporated on September 07, 2017 under Section-16 of the Companies Act, 2017 (XIX of 2017) having Corporate Universal Identification No. 0111458. The registered/business office of the company is located at 7-A/K, Main Boulevard, Gulberg-II, Lahore. According to the Memorandum of Association, the principal object of the company, *inter alia*, includes, constructing, establishing, setting up, selling hydroelectric power generating projects and to perform all other acts which are necessary or incidental to business of power generation, supply & transmission of electric power. According to the submitted information, the total outlay of the project will be approximately U.S. \$ 400.778 million which will be financed through a combination of debt (U.S. \$ 320.622 million) and equity (U.S. \$ 80.156 million) in a ratio of 80:20.

(iv). The Authority has observed that the Sharmayi hydropower project was identified as part of a comprehensive study conducted by the Government of Khyber Pakhtunkhwa in collaboration with the German Agency for Technical Cooperation. Further information on design and salient features of the project was prepared by PEDO in 2016. Later on in 2017, an extensive site investigation was conducted by the SHCL which included field reconnaissance, topographical survey, hydrological and geological investigations and engineering and design studies. Based on the results of field investigations, the project was considered viable for development and the results were compiled into a Project Feasibility Study. The feasibility study of the project has been reviewed which revealed that the sponsors of projects carried out



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feasibility study through Fichtner GmbH & Co. KG, Germany. PEDO through its PoEs approved the feasibility study of the project with firm capacity of 152.12 MW.

(V). As explained above, SHL has submitted the current application for the grant of generation licence for its Sharmayi Hydel Power Project which is a 152.12 MW Run of River Project proposed to be developed on Panjkora river, district Upper Dir in the province of Khyber Pakhtunkhwa. The Hydel Power Plant consists of an Intake (Dam site), which is located about 2 km upstream from Chukiyatan along Dir-Sheringal Road on Panjkora river. The power house is located near Darora village on the confluence of Usherai Khwar and Panjkora River.

(vi). The basic features of the project area which comprises of: (a). Sharmai reservoir with a capacity of about 32.2 million m³, formed by a 45m high retention concrete dam; (b). a diversion tunnel at the right abutment; (c). a gated spillway at the right abutment; (d). stilling basin structure at the Panjkora riverbed; (e). 7.8 km - pressure headrace tunnel with a surge shaft, pressure shaft and an underground powerhouse cavern; (f). underground powerhouse, housing three (03) vertical Francis turbines; and (g). underground Tailrace tunnel.

(vii). The flows will then be carried through a rectangular connecting channel to the sand trap. The sand trap structure has been proposed and will be a reinforced concrete structure. The total length of sand trap will be 112.64 m; including 26.54 m long transition from the connecting cannel end. The width of combined structure is 25.30 m while its depth varies between 8.55 m and 11.5 m. The flows will resume through a rectangular connecting channel to headrace tunnel. The headrace tunnel is designed as a horseshoe shaped free flow conduit of 3.5 m diameter. It is approx. 4.5 km long and has a slope of 1 in 1000.

(viii). The total installed capacity of the Hydel Power Plant is 152.12 MW consisting of three (03) Vertical Francis type turbines (3 x 50.7 MW). The said capacity of the project has been optimized keeping in view the design discharge of 90 m³/s (3178.3 Cusecs). The Hydel Power Plant is a medium head (gross head of 200.8 m and net head 195.8 meter) run of river project with mean annual energy of approximately 696.81 GWh at plant factor of 52.29%.



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(ix). The Authority has observed that SHL carried out the initial GIS for dispersal of electric power from the proposed generation facility/Hydel Power Plant. According to the said study, the dispersal/interconnection arrangement consisted of a 132 KV Double Circuit (D/C) transmission line [measuring about ninety five (95) KM on twin bundled Rail conductor] connecting the generation facility/Hydel Power Plant to 220/132 KV Chakdara grid station. In this regard, PESCO has also confirmed that power from the generation facility of SHL can easily be evacuated by connecting it directly to 220/132 KV Chakdara grid station as explained above.

(x). 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 power plants. However, the operation of the generation facility/Hydel Power Plant may cause soil pollution, water pollution and noise pollution during construction and operation. In this regard, the Authority has observed that SHL carried out the EIA study for the project and submitted the same for the consideration and approval of Environmental Protection Agency, Government of KPK (EPAGoKPK). In this regard, EPAGoKPK had already issued a No Objection Certificate (NOC) to the company for the construction of the project.

(xi). 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 SHL 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 Authority considers that 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.

(xii). 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



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Rules also stipulates the conditions pertaining to least cost option criteria which include (a). sustainable development or optimum utilization of the renewable or nonrenewable 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 considered that the proposed project will result in optimum utilization of the RE of the province of KPK which is untapped, resulting in pollution free electric power.

(xiii). 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 considers that the project of SHL fulfills the eligibility criteria for the grant of generation licence as stipulated in the NEPRA Act, rules, regulations and other applicable documents.

(E). Grant of Generation Licence

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(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 consideration of above and reasons explained in the preceding paragraphs, the Authority is of the considered opinion that for sustainable development, all indigenous power generation resources including hyde! must be developed on priority basis.



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(ii). The existing energy mix of the country is heavily skewed towards the thermal power plants, mainly operating on imported fuel. The import of fuel for electric power generation not only causes depletion of 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 resources are given priority for power generation and their development be encouraged. The Authority considers that the proposed project of SHL will not only help in diversifying the energy portfolio of the country but will also result in enhancing the energy security of the country by reducing the dependence on imported fuel but and thus help in reduction in carbon emission by generating clean electricity, thus improving the environment.

(iii). The Rule-5(1) of the Generation Rules stipulates that the term of a generation licence is to be consistent with the maximum expected useful life of the units comprised in a generating facility, except where an applicant consents to a shorter term. According to the information provided by SHL, its generation facility/Hydel Power Plant will achieve Commercial Operation Date (COD) by January 01, 2025 and will have a useful life of more than thirty (30) years from its COD. In this regard, SHL has requested that the term of the proposed generation licence may be fixed as thirty years. In consideration of the said, the Authority considers that the submissions of SHL are in line with the industry standards and norms. In view of the said and considering the fact that SHL has consented for a shorter term of thirty (30) years from COD of the project subject the Section 14-B of the NEPRA Act.

(iv). 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 Authority had admitted the said petition however, the same has been returned as the Authority has decided to entertain the tariff petitions of those companies which hold valid generation licence. The Authority considers appropriate to direct SHL to charge the power purchaser/CPPA-G only such tariff which has been determined, approved or specified by it. In view of the said, the Authority decides to include a specific article in the generation licence. Further, the Authority directs SHL to adhere to the said in letter and spirit without any exception.

(v). About the compliance with the environmental standards, as discussed in the preceptagraphs, SHL has provided the NOC from EPAGoKPK 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 SHL to comply with relevant environmental standards at all times. Further, the Authority directs SHL to submit a report on a biannual basis, confirming that operation of its generation facility is compliant with the required environmental standards as prescribed by the concerned environmental protection agency. As the proposed generation facility/Hydel Power Plant of SHL will be using hydel source for generation of power, therefore the project may qualify for the Carbon Credits. In this regard, an article for carbon credits and sharing its proceeds with the power purchaser has been included in the generation licence and SHL is directed to adhere to the same.

(vi). In view of the above, the Authority hereby approves the grant of Generation Licence to SHL 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.

<u>Authority</u>

Engr. Maqsood Anwar Khan (Member)

Rehmatullah Baloch (Member)

Mayhroa 108121

Engr. Rafique Ahmed Shaikh (Member)



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National Electric Power Regulatory Authority (NEPRA) Islamabad – Pakistan

GENERATION LICENCE

No. IGSPL/108/2021

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:

SAPPHIRE HYDRO LIMITED

Incorporated Under Section-16 of the Companies Act, 2017 (XIX of 2017) Having Corporate Universal Identification No. 0111458, dated September 07, 2017

for its Hydel Based Generation Facility/Sharmayi Hydel Power Project Located on River Panjkora, District Upper Dir in the Province of Khyber Pakhtunkhwa

(Total Installed Capacity: 152.12 MW Gross)

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

Given under my hand this on 25^{th} day of <u>August Two</u> <u>Thousand & Twenty One</u> and expires on <u>31th</u> day of <u>December Two Thousand & Fifty Four</u>.

90 21 Registrar



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Article-1 Definitions

1.1 In this licence

- (a). "Act" means the Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997 as amended or replaced from time to time;
- (b). "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, 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;
- (f). "Carbon Credits" mean the amount of Carbon Dioxide (CO₂) 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



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

- (g). "Commercial Code" means commercial code prepared by CPPA-G under 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;
- "Commissioning" means the undertaking of the Commissioning Tests of the generation facility/Hydel Power Plant as stipulated in the PPA;
- (j). "CPPA-G" means Central Power Purchasing Agency (Guarantee) Limited or any other entity created for the like purpose;
- (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;
- (I). "Generation Rules" mean the National Electric Power Regulatory Authority Licensing (Generation) Rules, 2000 as amended or replaced from time to time;
- (m). "Grid Code" means the grid code prepared and revised from time to time by NTDC with necessary approval of the Authority;
- (n). "GoP" means the Government of Pakistan acting through the PPIB 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;





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- (0). "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). "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;
- (s). "Letter of Support (LoS)" means the letter of support issued or to be issued by the GoP through the PPIB to the Licensee;
- (t). "Licensee" means Sapphire Hydro Limited or its successors or permitted assigns;
- (u). "Licensing Regulations" mean the National Electric Power Regulatory Authority Licensing (Application & Modification Procedure) Regulations, 1999 as amended or replaced from time to time;
- (v). "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;
- (w). "NTDC" means National Transmission and Despatch Company Limited or its successors or permitted assigns;
- (X). PEDO" means Pakhtunkhwa Energy Development Organization or any other entity created for the like purpose established by the Govt.

ERREST ber Pakhtunkhwa to facilitate, promote and encourage REGISTRAR ជ

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development of private sector participation for development of projects for electric power in the province of Khyber Pakhtunkhwa;

- (y). "PESCO" means Peshawar Electric Supply Company Limited or its successors or permitted assigns;
- (z). "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 PPA for procurement of electric energy;
- (aa). "Power Purchase Agreement (PPA)" means the power 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;
- (bb). "PPIB" means the Private Power and Infrastructure 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;
- (cc). "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;
- (dd). "XW-DISCO" means an Ex-WAPDA distribution company engaged in the distribution of electric power.

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



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<u>Article-2</u> <u>Applicability of Law</u>

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

<u>Article-3</u> <u>Generation Facilities</u>

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 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.

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.

<u>Article-5</u> 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.





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<u>Article-6</u> <u>Tariff</u>

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

<u>Article-7</u> <u>Competitive Trading Arrangement</u>

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

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

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

<u>Article-8</u> <u>Maintenance of Records</u>

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

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<u>Article-9</u> <u>Compliance with Performance Standards</u>

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.

<u>Article-10</u> <u>Compliance with Environmental & Safety Standards</u>

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.

<u>Article-11</u> <u>Power off take Point and Voltage</u>

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.

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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.

<u>Article-14</u> 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 relevant policy.

<u>Article-15</u> Design & Manufacturing Standards

The generation facility/Hydel Power Plant of the Licensee shall be designed, manufactured and tested according to the latest IEC, IEEE standards or any other equivalent standard in the matter. All the plant and equipment of generation facility/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 of the Licensee, as part of the Commissioning tests according to the latest IEC/IEEE standards and shall be used to measure its performance.



<u>Article-17</u> <u>Compliance with Applicable Law</u>

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

<u>Article-18</u> <u>Corporate Social Responsibility</u>

The Licensee shall provide the descriptive as well as monetary disclosure of its activities pertaining to Corporate Social Responsibility (CSR) on an annual basis.



Generation Licence Sapphire Hydro Limited Sharmayi Hydel Power Plant On Panjkora River, District Upper Dir in the Province of Khyber Pakhtunkhwa

SCHEDULE-I

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



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Generation Licence Sapphire Hydro Limited Sharmayi Hydel Power Plant On Panjkora River, District Upper Dir in the Province of Khyber Pakhtunkhwa





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Land Coordinates of the Generation Facility/Hydel Power Plant of the Licensee

	<u>Longitude</u>	<u>Latitude</u>
Intake (Dam site)	71°56'33.37"	35°10'26.28"
Powerhouse	71°59'13.21"	35°6'23.10"



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Sapphire Hydro Limited Sharmayi Hydel Power Plant On Panjkora River, District Upper Dir in the Province of Khyber Pakhtunkhwa Licence Generation





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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 of the Licensee/Sapphire Hydro Limited (SHL) shall be dispersed to the load centre of PESCO.

(2). The dispersal/interconnection arrangement will consist of a 132 KV Double Circuit (D/C) transmission line [measuring about ninety five (95) KM on twin bundled Rail conductor] connecting the generation facility/Hydel Power Plant to 220/132 KV Chakdara grid station. In this regard, PESCO has also confirmed that power from the generation facility of SHL can easily be evacuated by connecting it directly to 220/132 KV Chakdara grid station.

(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.

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Schematic Diagram for Dispersal of Electric Energy/Power from Generation Facility/Hydel Power Plant of the Licensee



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Detail of Generation Facility/Hydel Power Plant of the Licensee

(A). **General Information**

(i).	Name of the Licensee/ Company	Sapphire Hydro Limited
(ii).	Registered/Business Office of the Licensee/ Company	7-A/K, Main Boulevard, Gulberg-II, Lahore
(iii).	Location of the Generation Facility	2-KM upstream from Chukiyatan along Dir- Sheringal Road on Panjkora river, district Upper Dir in the province of Khyber Pakhtunkhwa
(iv).	Type of Generation Facility	Hydel Power Plant

(B). **Hydrology**

	(21000 Jouro)		
(viii).	Design Flood Discharge	2,180 m ³ /s	C POWER REGUL
(vii).	Peak Flood Discharge	1,416 m³/s	
(vi).	Flood Discharge (Q ₁₀₀ year)	1,300 m³/s	
(V).	Average Reservoir Inflow	71.4 m³/s	
(iv).	Mean Monthly Flows	11.6 to 189.2 m³/s	
(iii).	Full Reservoir Level (FRL)	1,260 masl	
(ii) .	Catchment area	1,874 km²	
(i).	Name of River	Panjkora River	

(C). <u>Dam</u>

	· · · · · · · · · · · · · · · · · · ·		
(i).	Dam Type	Concrete Gravity	NEPRA + HIN

(ii).	Dam Crest Elevation	1265.00 masl (with 1.2 m parapet wall)
(iii).	Dam Maximum Height	45 m (to foundation)
(iv).	Dam Crest Length	150 m

(D). <u>Diversion Tunnel</u>

(i).	Diversion Tunnel - Length	500 m
(ii).	Diversion Tunnel – Inner Diameter	8.0 m
(iii).	Upstream Cofferdam Type	Rockfill with Diaphragm
(iv).	Upstream Cofferdam Crest Elevation	1245.50 masl
(V).	Downstream Cofferdam Type	Rockfill with clay carpet
(vi).	Downstream Cofferdam Crest Elevation	1231.00 masi

(E). <u>Spillway</u>

(i).	Spillway Type	Gated, Radial Gates	
(ii).	No. of Gates, Dimensions (W:H)	3, 10.5 x 15.5 m	POWER REGULAR
(iii).	Spillway Elevation	1245.00 masl	REGISTRAR AL
(iv).	Energy Dissipation Structure	Stilling Basin	THE HAT ANEDRA THE
(v).	Dimensions of Energy Dissipation Structure (L x W; bottom Elevation)	150 x 37.5m; 1211.00 masi	

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(F). <u>Bottom Outlet</u>

(i).	No. of Outlets	1; equipped with a radial gate
(ii).	Gate Dimensions (W x H)	6.5 x 7.0m

(G). <u>Desander</u>

(i).	No. of Chambers	3
(ii).	Chamber Dimensions (L x W x H)	245 x 13.5 x 25m

(H). <u>Power Tunnel</u>

(i).	No. of Power Tunnels	1
(ii).	Tunnel Length	8500 m
(iii).	Tunnel Inner Diameter	6.75 m (circular)

(I). <u>Surge Tank</u>

(i).	No. of Surge Tanks	1
(ii).	Surge Shaft inner Diameter	20 m
(iii).	Length of the Surge Tank	



(J). <u>Pressure Shaft</u>

(i).	No. of Pressure Shafts	1
(ii).	Pressure Shaft Length	180 m
(iii).	Pressure Shaft inner Diameter	6.0 m

(K). <u>Powerhouse</u>

(i).	Powerhouse Type	Cavern
(ii).	No. of Units	3
(iii).	Turbine Type	Francis
(iv).	Total Installed Turbine Discharge	90 m³/s
(V).	Installed Power	152.12 MW
(vi).	Rated Head	192.9 m
(vii).	Powerhouse Dimensions (L x W x H)	54.5 x 20 x 27 m
(viii).	Transformer Cavern Dimensions (L x W x H)	50 x 11 x 9.3 m

(L). Downstream Surge Tank

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(i).	No. of Surge Tanks	1	REGISTRAR ALT
(ii).	Surge Tank Dimensions (L x W x H)	70 x 16.7 x 29 m	OLAN * NEPRA * HIS

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(M). <u>Tailrace Tunnel</u>

(i).	Length	735 m
(ii).	Inner Diameter	6.75 m

(N). Other Information

(i).	COD of the Generation Facility/Hydel Power Plant	January 01, 2025
(ii).	Expected Minimum Useful Life of the Generation Facility from COD	30 Years

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Generation Licence Sapphire Hydro Limited Sharmayi Hydel Power Plant On Panjkora River, District Upper Dir in the Province of Khyber Pakhtunkhwa

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



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SCHEDULE-II

(1).	Total Installed Gross Capacity of the Generation Facility/Hydel Power Plant (3 x 50.707 MW Francis Turbines)	152.12 MW
(2).	Total De-Rated Capacity of the Generation Facility/Hydel Power Plant at Mean Site Conditions (3 x 50.7 MW Francis Turbines)	152.12 MW
(3).	Auxiliary Consumption of the Generation Facility/Hydel Power Plant (3 x 0.507 MW Francis Turbines)	1.5212 MW
(4).	Net Capacity of the Generation Facility/Hydel Power Plant at Mean Site Conditions Condition (3 x 50.20 MW Francis Turbines)	150.60 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 Power Purchase Agreement (PPA) or the Applicable Document(s).

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