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-384/ 9285-92 November 27, 2017

Mr. Mobashir Ahmed Malik
Chief Executive Officer
Mehar Hydropower (Pvt.) Limited
142-D Block, Model Town
Lahore

Subject: **Generation Licence No. IGSPL/95/2017**
Licence Application No. LAG-384
Mehar Hydropower (Private) Limited (MHPPL)

Reference: Your letter No. nil, dated February 09, 2017.

Enclosed please find herewith Determination of the Authority in the matter of Generation Licence Application of MHPL along with Generation Licence No. IGSPL/95/2017 annexed to this determination granted by the National Electric Power Regulatory Authority to MHPPL for its 10.49 MW Hydel based Generation Facility located on Balloki-Sulemanki Link-1 Canal at RD 106+250 in Mauza Kanda Kharan, Tehsil Chunian, District Kasur, Punjab, pursuant to Section 15 of the Regulation of Generation, Transmission and Distribution of Electric Power Act (XL of 1997).

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

Enclosure: **Generation Licence (IGSPL/95/2017)**

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(Syed Safeer Hussain)

Copy to:

1. Secretary, Ministry of Energy (Power Division), 'A' Block, Pak. Secretariat, Islamabad.
2. Chief Secretary, Government of Punjab Sindh, Punjab Secretariat, Lahore
3. Managing Director, Punjab Power Development Board, Old Anarkali, 1st Floor, Central Design Building, Irrigation Secretariat, Lahore
4. Chief Executive Officer, NTDC, 414-WAPDA House, Lahore
5. Chief Operating Officer, CPPA-G, Enercon Building, Sector G-5/2, Islamabad
6. Chief Executive Officer, Lahore Electric Supply Company (LESCO), 22-A, Queens Road, Lahore
7. Secretary, Environment Protection Department, National Hockey Stadium, Gate No. 8, Opposite, LCCA Ground, Near Gaddafi Stadium, Ferozepur Road, Lahore.

National Electric Power Regulatory Authority
(NEPRA)

Determination of the Authority in the Matter of Application of Mehar Hydropower (Private) Limited for the Grant of Generation Licence

November 27, 2017
Case No. LAG-384

(A). Background

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

(ii). In order to tap the various available resources in the province for power generation, the Government of Punjab (GoPb) has formulated a policy titled "Punjab Power Generation Policy 2006" amended in 2009 (the "Punjab Power Policy"). Further, to attract private entrepreneurs in the power sector of the province, the GoPb has set up Punjab Power Development Board (PPDB) which acts as a one window facilitator. In this regard, PPDB has issued Letter of Intent (LoI) to different project developers for setting up different projects based on various resources including hydel, solar and biomass etc. One such LoI has been issued to a consortium of companies including Associated Technologies (Private) Limited (ATPL) and Xinjiang Beixin Construction Engineering Group Co. Limited (XBCEGCL) for development of an approximately 11.00 MW Hydel Power Plant on Balloki-Sulemanki Link-I Canal (BS-Link-1) in district Kasur, in the province of Punjab.

(iii). According to the terms and conditions of LoI, the sponsors of the project incorporated Special Purpose Vehicle (SPV) in the name of Mehar Hydropower (Private) Limited (MHPPL) and completed a detailed feasibility study of the project. Thereafter, MHPPL decided to approach the Authority for the grant of generation licence.

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(B). Filing of Application

(i). MHPPL submitted an application on February 13, 2017 for the grant of generation licence in terms of Section-15 of Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997 (the "NEPRA Act") read with the relevant provisions of the NEPRA Licensing (Application and Modification Procedure) Regulations, 1999 (the "Licensing Regulations").

(ii). The Registrar examined the application to confirm its compliance with the Licensing Regulations and observed that the application lacked some of the required information/documentation. Accordingly, MHPPL was directed for submitting the missing information/documentation and the same were submitted on March 03, 2017. The Authority considered the matter and found the form and content of the application in substantial compliance with Regulation-3 of the Licensing Regulations. Accordingly, the Authority admitted the application on March 22, 2017 for consideration of the grant of the generation licence as stipulated in Regulation-7 of the Licensing Regulations. The Authority approved an advertisement to invite comments of general public, interested and affected persons in the matter as stipulated in Regulation-8 of the Licensing Regulations. Accordingly, advertisement was published in one (01) Urdu and one (01) English newspapers on March 25, 2017 respectively.

(iii). In addition to the above, the Authority 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 approved list on March 27, 2017, soliciting their comments for the assistance of the Authority.

(C). Comments of Stakeholders

(i). In response to the above, the Authority received comments from four (04) stakeholders. These included Anwar Kamal Law Associates (AKLA), Alternative Energy Development Board (AEDB), Lahore Electric Supply Company Limited (LESCO) and Indus River System Authority (IRSA). The salient points of the comments offered by the said stakeholders are summarized below: -

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(a). AKLA highlighted different issues pertaining to the power sector of the country including (a). availability of surplus capacity; (b). underutilization of existing power plants; (c). payment of charges for idle capacity; (d). induction of new power plants on "Take or Pay" basis; (e). induction of Renewable Energy (RE) power plants with higher upfront tariff and must run conditions; and (f). a number of initiatives are being taken including Net metering and wheeling which will result in reduction of overall demand then why new project are being inducted. AKLA stated that instead of setting up new power plants at high cost, efforts should be made to utilize available generation capacity to its full and then go for the new projects as per the actual need. Further, efforts should be made to encourage investors to set up power plants on "Take and Pay" basis in the Competitive Power Market;

(b). AEDB supported the grant of generation licence to MHPPL;

(c). LESCO confirmed the vetting of grid interconnection study of the project. Further, LESCO also confirmed giving consent for purchasing power from the project; and

(d). IRSA commented that the project is being developed on BS-Link-1 which falls under the jurisdiction of the Irrigation Department of GoPb. In view of the said, the Authority may take up matter with the said department/Government.

(ii). The Authority examined the comments of the stakeholders and found the same supportive except to the observations of AKLA and IRSA. In view of the said, the Authority decided seeking the perspective of MHPPL on the observations of the said stakeholders. On the observations of AKLA, it was

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submitted that the offered comments were mainly directed towards the various policies of Government of Pakistan (GoP) and were of generic in nature, not relating to the project. MHPPL stated that the views of AKLA regarding surplus electric power in the country is not based on the ground realities. MHPPL highlighted that the Authority has already determined upfront tariff dated October 14, 2015 for small hydropower projects which validates the importance of implementation of small hydropower projects in the country while fully aware of demand-supply gap and plant utilization factors. About the comments of IRSA, it was submitted that PPDB at the time of grant of LoI had duly taken the Irrigation Department on board therefore, there is no need to refer the matter back to the said department of GoPb. In consideration of the said, MHPPL submitted that its application is in compliance with relevant rules and regulations therefore, merits consideration for the grant of generation licence.

(iii). The Authority considered the above submissions of MHPPL on the observations of AKLA and IRSA and decided to proceed further in the matter as stipulated in the NEPRA Licensing (Generation) Rules, 2000 (the "Generation Rules") and the Licensing Regulations.

(D). Evaluation/Findings

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

(ii). In consideration of the above, the Authority has observed that ATPL is the main sponsor of the project. ATPL is an infrastructure development company and has successfully undertaken various power sector, construction, real estate and telecommunication projects. ATPL has been involved in the development of power projects for last ten (10) years. ATPL in association with its partners has been involved in the development of the Hydel Power Plants/projects including 720 MW Karot, 545 MW Kaigah and 81 MW Malakand-III. The other partner of the consortium i.e. XBCEGCL is a large scale state-owned multi-enterprise group of China which consists of scientific

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research, design, construction, industrial installation, real estate development, building material production, trading and logistic distribution. The company was founded in 1952 and is based in Urumqi, China with branches in Beijing, Shanghai, Chengdu, Pakistan and other countries. Its projects include bridges, water control facilities, ring ways, medical universities, railways, channel in desert, overpasses, sports centres, highways, hospitals, and administration buildings. MHPPL has also provided Expression of Interest from United Bank Limited for financing the debt portion required for the development of the project. In consideration of the above, the Authority is of the considered opinion that the sponsors have reasonable financial and technical capability to develop the proposed generation facility/Hydel Power Plant.

(iii). The Authority has observed that MHPPL is a private limited company incorporated on January 23, 2017 under Section-32 of the Companies Ordinance, 1984 (XLVII of 1984) having Corporate Universal Identification No. 0105145. The registered/business office of the company is located at 142 D-Block, Model Town, Lahore. The memorandum of association of the company, inter alia, includes the business of power generation as one of its business objects.

(iv). The Authority has observed that MHPPL carried out detailed feasibility study of the project through Integral Consulting Inc. The scope of the feasibility study included the site investigations, infrastructure requirements, detailed design of power house, load flow & stability studies, Initial Environmental Examination, tariff calculation (including economic/financial analysis), term of financing and project cost etc. PPDB through its Panel of Experts approved the same with revised capacity of 10.49 MW.

(v). The Authority has observed that MHPPL plans setting up a hydel based generation facility/Hydel Power Plant at right bank of BS-Link-1 at RD 106+250 in Mauza Kanda Kharan, tehsil Chunian, district Kasur in the province of Punjab. The said link canal is emanating from left bank of Balloki barrage on river Ravi. The total installed capacity of the proposed hydropower plant will be 10.49 MW consisting of four (04) Pit type horizontal Kaplan turbines (of 2.6225 MW each). The said hydropower

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plant will be run of canal, having very low head with a maximum design discharge of 425 m^3/s at variable head of up to 6.657 meters. The project will result in mean annual energy of 67.29 GWh at plant factor of 73%. The total cost of project will be around US$ 45 million with a debt to equity ratio of 80% and 20% of the project cost.

(vi). The Authority has duly considered the GIS for dispersal of electric power from the proposed generation facility/Hydel Power Plant. According to the said study, the dispersal of electric power will be made at 132 kV voltage level. The dispersal/interconnection arrangement will be consisting of a 132 kV Double Circuit (D/C) transmission line [measuring about six and half (6.5) kilometer on ACSR Lynx conductor] for making an In-Out of existing 132 kV D/C Pattoki-Chunian transmission line connecting the generation facility/Hydel Power Plant to the network of LESCO. It is pertinent to mention that LESCO has already approved the said dispersal/interconnection arrangement of the generation facility/Hydel Power Plant.

(vii). The Authority is encouraged that the proposed generation facility/Hydel Power Plant of MHPPL will be utilizing water which is RE source. However, the Authority has observed that the construction and operation of the proposed generation facility/Hydel Power Plant may cause some environmental concerns including soil pollution, water pollution and noise pollution. The Authority has observed that MHPPL carried out the required Initial Environment Examination Study and submitted the same for the consideration and approval of Environmental Protection Department, Government of Punjab (EPDGoPb). In this regard, the Authority is satisfied that EPDGoPb has issued a No Objection Certificate (NOC) for the construction of the project.

(viii). In terms of Rule-3 of the Generation Rules, the Authority may grant a generation licence to any person to engage in the generation business. In the particular case under consideration, the Authority has observed that MHPPL has provided details of location, technology, size, net capacity/energy yield, interconnection arrangements, technical limits, technical functional specifications and other details specific to the

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generation facility/Hydel Power Plant satisfying the provisions of Rule-3(2) and Rule-3(3).

(ix). The Rule-3(5) of the Generation Rules stipulates the least cost option criteria necessary for the grant of generation licence which includes (a). sustainable development or optimum utilization of the RE or non-RE resources proposed for generation of electric power; (b). the availability of indigenous fuel and other resources; (c). the comparative costs of the construction, operation and maintenance of the proposed generation facility/Hydel Power Plant 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/Hydel Power Plant and the costs of the transmission system expansion required to remove such constraints; (f). the short-term and the long-term forecasts for additional capacity requirements; (g). the tariff resulting or likely to result from the construction or operation of the proposed generation facility/Hydel Power Plant; and (h). the optimum utilization of various sites in the context of both the short-term and the long-term requirements of the electric power industry as a whole.

(x). In consideration of the above, the Authority considers that the proposed project will result in optimum utilization of the RE which was earlier untapped, resulting in pollution free electric power. The proposed generation facility/Hydel Power Plant is being developed in terms of the upfront tariff for small hydropower projects which the Authority announced through its determination No. NEPRA/UTH-01/4744-4746 dated April 02, 2015 announced a levelized upfront tariff for the future small hydropower projects of up to 25.00 MW. The said tariff works out to be Pak. Rs. 9.9960/kWh and Rs. 7.6177/kWh based on 100% local and foreign financing which is very competitive considering the fact that not only cheap electric power will be generated but it will utilize the indigenous hydel potential.

(xi). As explained in the preceding paragraphs above, the sponsors of the project carried out the GIS which concludes that the project

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will not face any constraints in transmission system. Further, being located at reasonable distance from the thick population, the project will not result in cost and right-of-way issue for the provision of transmission and interconnection facilities. The Authority has observed that LESCO has included the project in its mid and long-term forecasts for additional capacity requirements. In view of the said, the Authority is of the considered view that the project of MHPPL fulfills the eligibility criteria for grant of generation licence as stipulated in the NEPRA Act, rules and regulations and other applicable documents.

(xii). The Authority has considered the comments of the stakeholders and the rejoinder filed by MHPPL in the matter. It has been observed that AKLA and IRSA have made certain observations. Regarding the observations of AKLA which has raised the issues of (a). underutilization/availability of surplus capacity of existing power plants in the system; (b). setting up of new power plants on "Take or Pay" basis; (c). must run condition for RE based power plants; (d). higher upfront tariff for RE power plants; and (e). induction of new projects wherein the demand is likely to reduce in future due to new initiatives of net metering and wheeling.

(xiii). In consideration of the above, the Authority has observed that AKLA has been raising these issues on a consistent basis. In this regard, a comprehensive reply on the issues of (a). underutilization of plants; (b). capacity payment without taking electricity from power plants; and (c). addition of RE project having high tariff was sent to AKLA through letter no. NEPRA/SAT-I/TRF-100/7060, dated December 27, 2016. The Authority reiterates its earlier findings in the matter and in addition would like to give its findings on the observations of AKLA in the following paragraphs.

(xiv). AKLA has raised the issue of under-utilization of power plants and availability of surplus energy in the system. In this regard, the Authority has observed that AKLA has assumed the utilization of the dependable capacity for each of the power plant to the tune of 100% which is practically not possible. A power plant is required to undergo routine as well as forced outages due to which power plant cannot operate with 100%

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capacity and plant factor. Further, there are a number of other constraints which affect the plant factor of a power plant including fuel constraints, load requirements, transmission system constraints and system disturbances etc. The Authority continuously monitors the situation and also seeks clarification and reasons of underutilization from licensees, if required. In this regard, a number of advisories and legal actions had been taken in the past for the effective utilization of the available generation resources. However, it is worth mentioning that the Authority cannot indulge itself in the routine operational matters of the licensees and has directed National Power Control Center (NPCC) of National Transmission and Despatch Company Limited (NTDC) for optimal utilization of available generation capacity. Further, on a number of occasions NPCC has also confirmed that maximum generation is being obtained from all the power plants based on their availability, the fuel constraints and the load requirements.

(xv). The Authority has observed that AKLA has been very critical of allowing setting up of new power plants on "Take or Pay" basis. In this regard, the Authority would like to highlight that in order to attract investment of private parties in the power sector of the country, GoP has formulated various power policies where various incentives have been allowed to the investor. Almost all the announced power policies including currently in vogue, allow a two-part tariff structure with the option of take or pay. This has been done to make the projects bankable which is otherwise not possible due to prevailing situation of the power sector of the country. About the observations of AKLA for granting "Must Run" condition for RE based power plants, the Authority considers that in order to encourage the development of the RE projects the GoP formulated a specific policy in the name of "Policy for Development of Renewable Energy for Power Generation 2006" (hereafter called the RE Policy), in which various incentive were offered to the prospective investors for making the RE projects attractive for investment and bankability. One of the incentive of the said RE Policy was that the utilities would be obligated to buy all the offered electricity from the RE project. In view of the said, the Authority considers that the Must Run status being offered to the RE based Power Plants is completely in line with the RE Policy. In this

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regard, the Authority is of the considered opinion that the incentives given in the RE Policy has brought fruit and now the country has significant foot print in the RE sector which is considered very important in today's world.

(xvi). About the observations of AKLA that new initiatives of "Net Metering and "Wheeling" will result in reduction of future demand therefore, new project may not be set up, the Authority is of the considered opinion that the said initiatives are in their stage of infancy with a very little foot print. In view of the said, the Authority is of the considered opinion that the new initiatives of "Net Metering" and "Wheeling" have still to achieve a critical mass before it actually starts impacting the demand side. About the observations of IRSA, the Authority concurs with the position of MHPPL as explained in the preceding paragraphs. In view of the above, the Authority considers that the relevant observations of AKLA and IRSA stands suitably addressed.

(E). Grant of Generation Licence

(i). The sustainable and affordable energy/electricity is a key prerequisite for socio-economic development of any country. In fact, the economic growth of any country is directly linked with the availability of safe, secure, reliable and cheaper supply of energy/electricity. The costs of producing energy vary between different energy sources and technologies. A competitive energy mix will keep overall costs as low as possible given the available resources.

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

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

(iv). As explained in the preceding paragraphs, the Authority considers that MHPPL has provided the details of location, technology, size, net capacity/energy yield, interconnection arrangements, technical details and other related information for the proposed generation facility/Hydel Power Plant. Further, the Authority has observed that sponsors of the project will be utilizing around three hundred and twenty-three (323) acres of land for setting up the generation facility/Hydel Power Plant. In this regard, the Authority directs MHPPL that the aforementioned land shall be exclusively used for the proposed generation facility/Hydel Power Plant and any other generation activity cannot be carried out on this land except with the prior approval of the Authority.

(v). The term of a generation licence under Rule-5(1) of the Generation Rules is to be commensurate with the maximum expected useful life of the units comprised in a generating facility. According to the information provided, the generation facility/Hydel Power Plant of MHPPL will achieve Commercial Operation Date (COD) on July 01, 2020 and will have a useful life of more than thirty (30) years from its COD. The applicant/MHPPL has requested that the term of the proposed generation licence may be fixed to thirty (30) years, in consistent with the term of the proposed Energy Purchase Agreement (EPA) to be signed with the power purchaser. The Authority considers that information provided by MHPPL about the useful life of generation facility/Hydel Power Plant and the subsequent request to fix the term of the generation licence is consistent with international benchmarks.

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Foregoing in view, the Authority fixes the term of the generation licence to thirty (30) years from its COD.

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

(vii). As explained in the preceding paragraphs, MHPPL has already obtained NOC from EPDGoPb. Further, the Authority directs MHPPL to ensure that its project complies with the environmental standards during the term of the generation licence. In view of the said, the Authority has included a separate article (i.e. Article-10) in the generation licence along with other terms and conditions. Further, the Authority directs MHPPL to submit a report on a bi-annual basis, confirming that operation of its project is compliant with required environmental standards as prescribed by the concerned environmental protection agency.

(viii). The Authority has observed that the proposed generation facility/Hydel Power Plant will be using RE resource for generation of electric power and may earn carbon credits. In this regard, it is pertinent to mention that the existing Kyoto Protocol governing the carbon credits cater projects coming on line by end of 2020. The project of MHPPL is expected to achieve COD by July 01, 2020 which is within the deadline of the Kyoto Protocol. In view thereof, the Authority has decided to include an article (i.e. Article-14) for carbon credits and its sharing with the power purchaser in the generation licence. The Authority directs MHPPL to adhere to the Article-14 of the generation licence in letter and spirit without any exception.

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

Authority:

Maj. (R) Haroon Rashid
(Member)

Syed Masood-ul-Hassan Naqvi
(Member)

Himayat Ullah Khan
(Member)

Saif Ullah Chattha
(Member/Vice Chairman)

Tariq Saddozai
(Chairman)

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27/11/17

National Electric Power Regulatory Authority
(NEPRA)
Islamabad – Pakistan

GENERATION LICENCE

No. IGSPL/95/2017

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

Mehar Hydropower (Private) Limited

Incorporated under Section-32 of the Companies Ordinance, 1984 (XL VII of 1984) having Corporate Universal Identification No. 0105145, dated January 23, 2017

for its Hydel Based Generation Facility Located on Balloki-Sulemanki Link-1 Canal at RD 106+250 in Mauza Kanda Kharan, Tehsil Chunian, District Kasur in the Province of Punjab

(Installed Capacity: 10.49 MW Gross ISO)

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

Given under my hand this 27th day of November Two Thousand & Seventeen and expires on 30th day of June Two Thousand & Fifty.

27/11/17

Registrar

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Article-1
Definitions

1.1 In this licence

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

(b). "AEDB" means the Alternative Energy Development Board or any other entity created for the like purpose established by the GoP to facilitate, promote and encourage development of renewable energy in the country;

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

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

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

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

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(g). "Carbon Credits" mean the amount of Carbon Dioxide (CO_2) and other greenhouse gases not produced as a result of generation of energy by the generation facility/Hydel Power Plant and other environmental air quality credits and related emissions reduction credits or benefits (economic or otherwise) related to the generation of energy by the generation facility/Hydel Power Plant, which are available or can be obtained in relation to the generation facility/Hydel Power Plant after the COD;

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

(i). "Commissioned" means the successful completion of Commissioning of the generation facility/Hydel Power Plant for continuous operation and despatch as stipulated in the EPA;

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

(k). "Commissioning Tests" means the tests to be carried out pursuant to provisions of EPA;

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

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

(n). "Energy Purchase Agreement (EPA)" means the energy purchase agreement, entered or to be entered into by and between the Power Purchaser and the Licensee, for the purchase and sale of electric

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energy generated by the generation facility/Hydel Power Plant, as may be amended by the parties thereto from time to time;

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

(p). "Grid Code" means the grid code prepared by NTDC and approved by the Authority, as it may be revised from time to time by NTDC with necessary approval by the Authority;

(q). "GoP" means the Government of Pakistan acting through the AEDB which has issued or will be issuing to the Licensee a LoS for the design, engineering, construction, insuring, commissioning, operation and maintenance of the generation facility/Hydel Power Plant;

(r). "GoPb" means the Government of the Province of Punjab acting through the PPDB which has issued letter of intent for the design, engineering, construction, insuring, commissioning, operation and maintenance of the generation facility/Hydel Power Plant;

(s). "Hydel Power Plant" means a generation facility using water flows of canal or rivers for generation of electric power;

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

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

(v). "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;

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

(x). "LESCO" means Lahore Electric Supply Company Limited or its successors or permitted assigns;

(y). "Licensee" means **Mehar Hydropower (Private) Limited** or its successors or permitted assigns;

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

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

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

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

(dd). "Punjab Policy" means the Punjab Power Generation Policy, 2006 of GoPb as amended from time to time;

(ee). "Power Purchaser" means CPPA-G which will be purchasing electric power from the Licensee either on behalf of all XW-DISCOs or any single XW-DISCO, pursuant to the EPA for procurement of electric power;

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(ff). "PPDB" means the Punjab Power Development Board or any other entity created for the like purpose established by the GoPb to facilitate, promote and encourage development of private sector participation for development of projects for electric power in the Province of Punjab;

(gg). "SCADA System" means the supervisory control and data acquisition system for gathering of data in real time from remote locations to control equipment and conditions;

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

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

Article-2
Applicability of Law

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

Article-3
Generation Facilities

3.1 The location, size (capacity in MW), technology, interconnection arrangements, technical limits, technical functional specifications and other details specific to the generation facility/Hydel Power Plant of the Licensee are set out in Schedule-I of this licence.

3.2 The net capacity/Net Delivered Energy of the generation facility/Hydel Power Plant of the Licensee is set out in Schedule-II hereto. The Licensee shall provide the final arrangement, technical and financial specifications and other specific details pertaining to its generation facility/Hydel Power Plant before its COD.

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Article-4
Term of Licence

4.1 This licence shall become effective from the date of its issuance and will have a term of thirty (30) years from the COD of the generation facility/Hydel Power Plant of the Licensee.

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

Article-5
Licence fee

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

Article-6
Tariff

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

Article-7
Competitive Trading Arrangement

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

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

Article-8
Maintenance of Records

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

Article-9
Compliance with Performance Standards

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

Article-10
Compliance with Environmental & Safety Standards

10.1 The generation facility/Hydel Power Plant of the Licensee shall comply with the environmental and safety standards as may be prescribed by the relevant competent authority from time to time.

10.2 The Licensee shall provide a certificate on a bi-annual basis, confirming that the operation of its generation facility/Hydel Power Plant is in conformity with required environmental standards as prescribed by the relevant competent authority.

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Article-11
Power off take Point and Voltage

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

Article-12
Performance Data

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

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

Article-13
Provision of Information

In accordance with provisions of Section-44 of the Act, the Licensee shall be obligated to provide the required information in any form as desired by the Authority without any exception.

Article-14
Emissions Trading/Carbon Credits

The Licensee shall process and obtain expeditiously the Carbon Credits admissible to the generation facility/Hydel Power Plant. The Licensee shall share the said proceeds with the Power Purchaser as per the Policy.

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Article-15
Design & Manufacturing Standards

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

Article-16
Power Curve

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

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SCHEDULE-I

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

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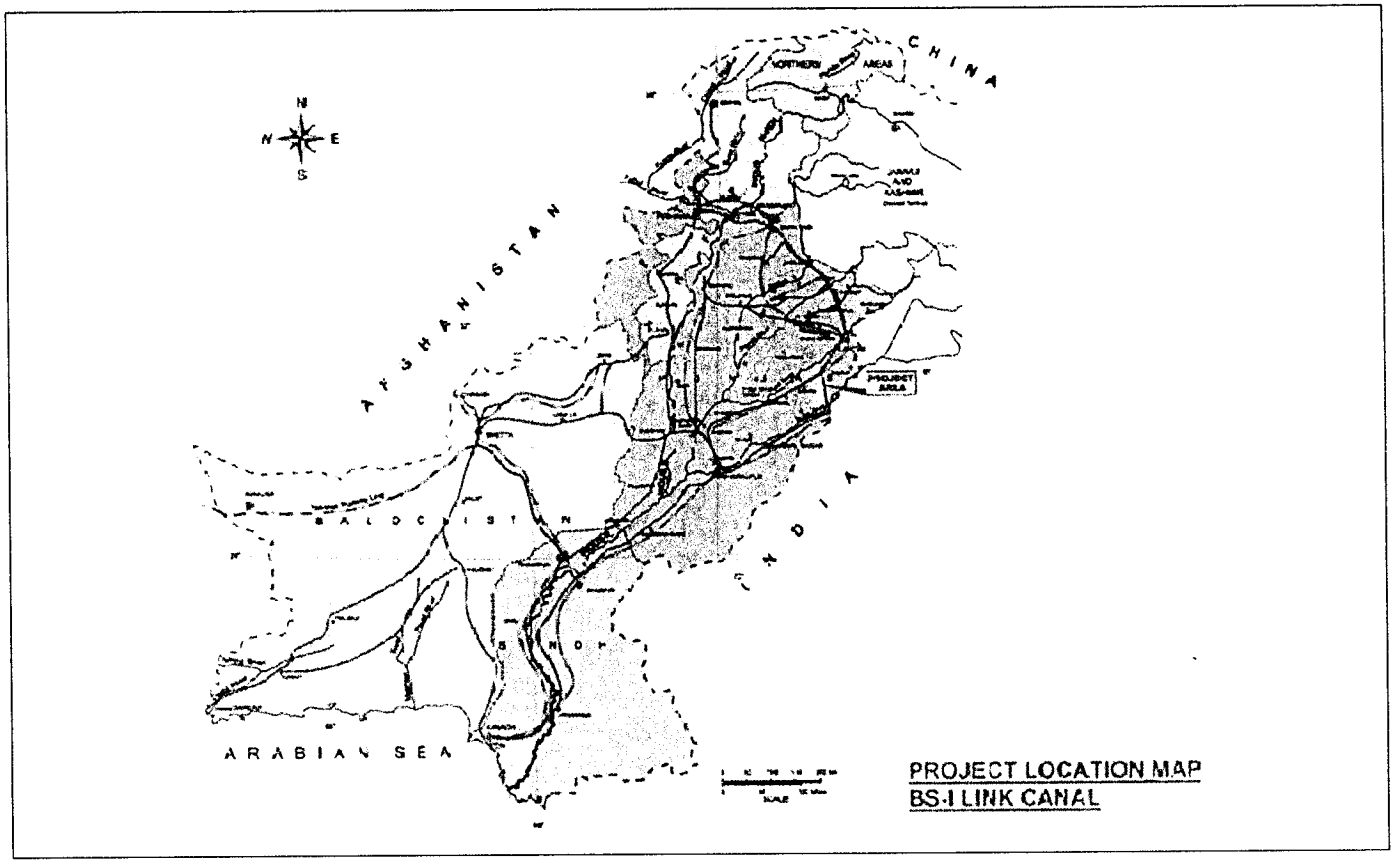
Location of the Generation Facility/Hydel Power Plant of the Licensee



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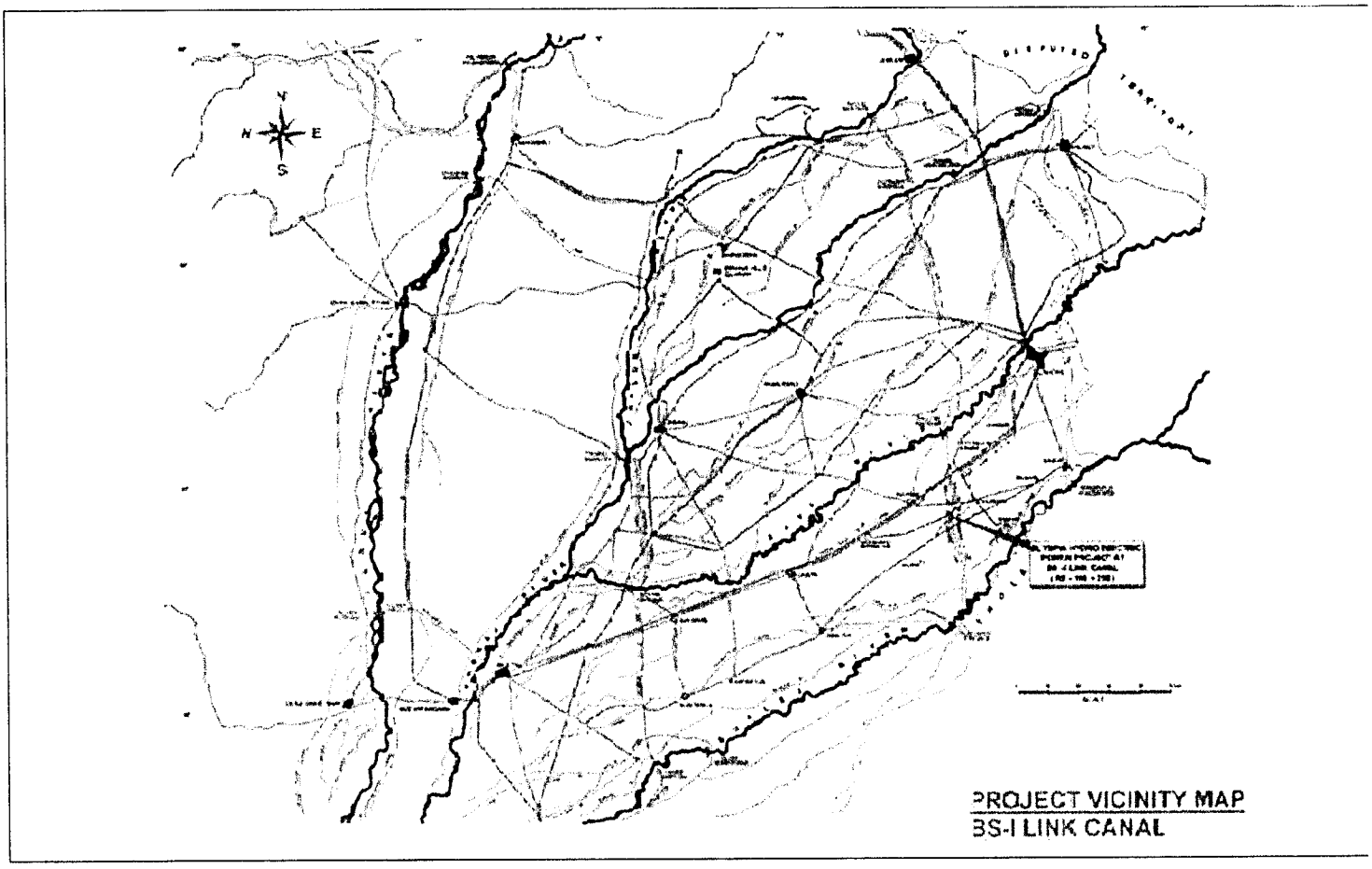
Location of the Generation Facility/Hydel Power Plant of the Licensee



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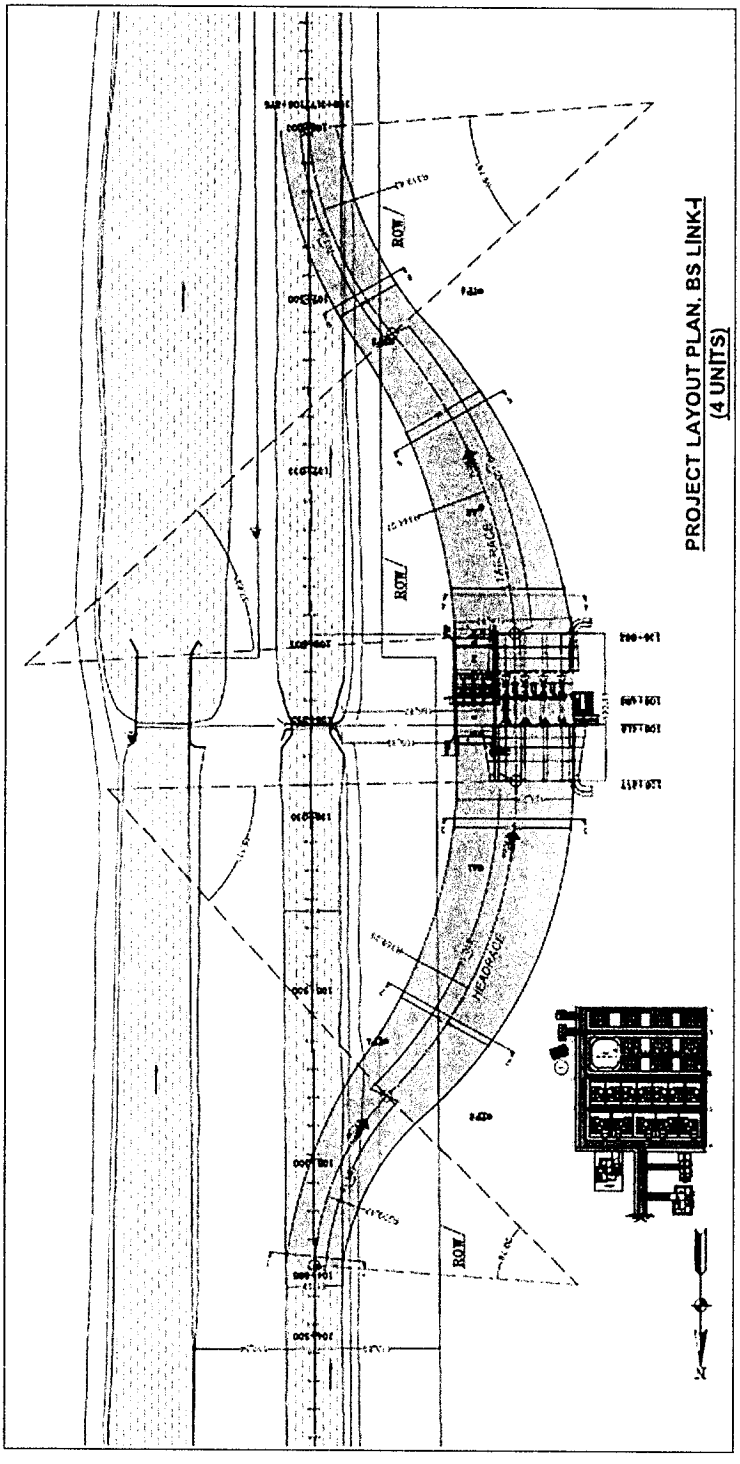
Layout of the Generation Facility/Hydel Power Plant of the Licensee



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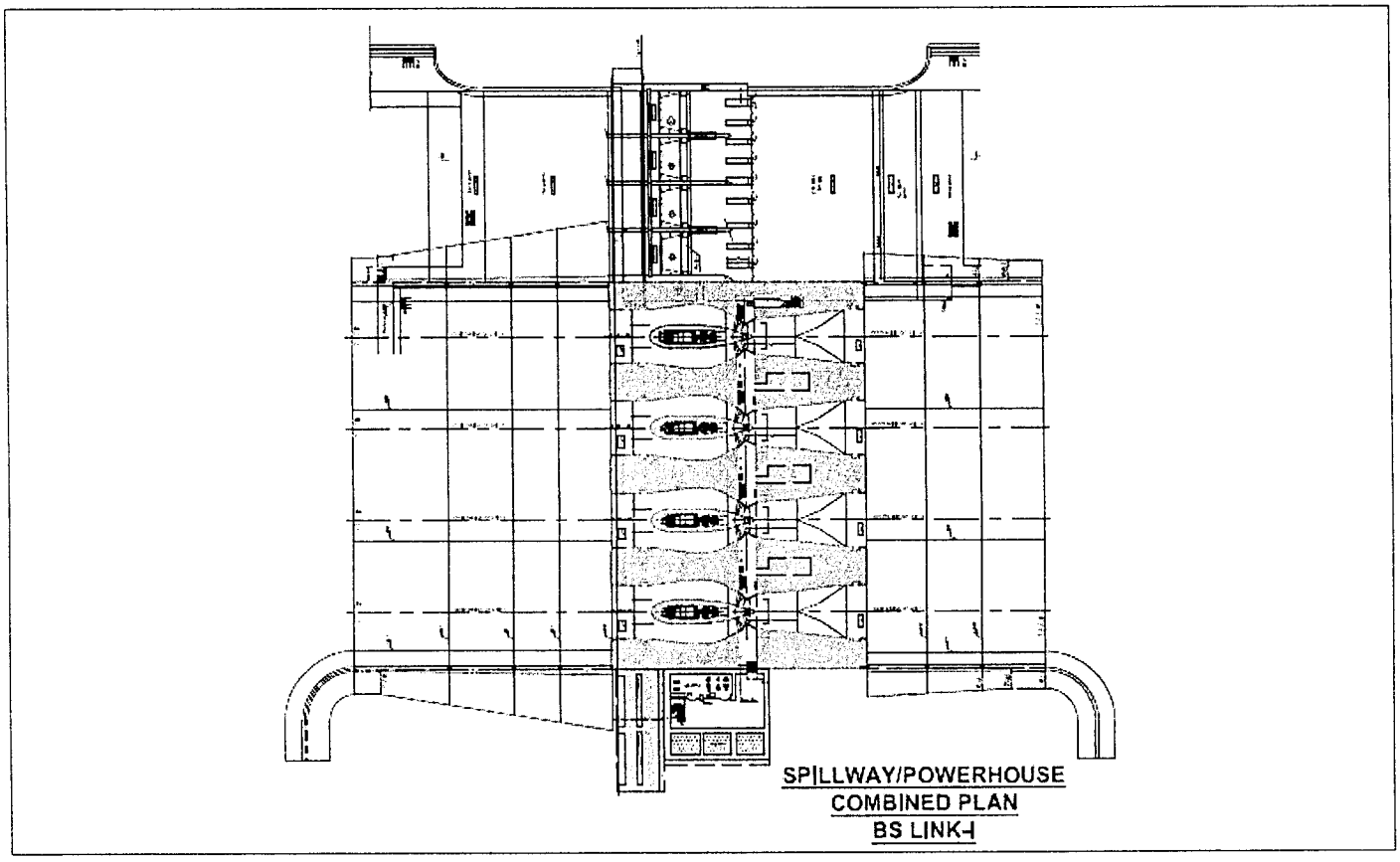
Combined Powerhouse & Spillway Layout of the Generation Facility/Hydel Power Plant of the Licensee



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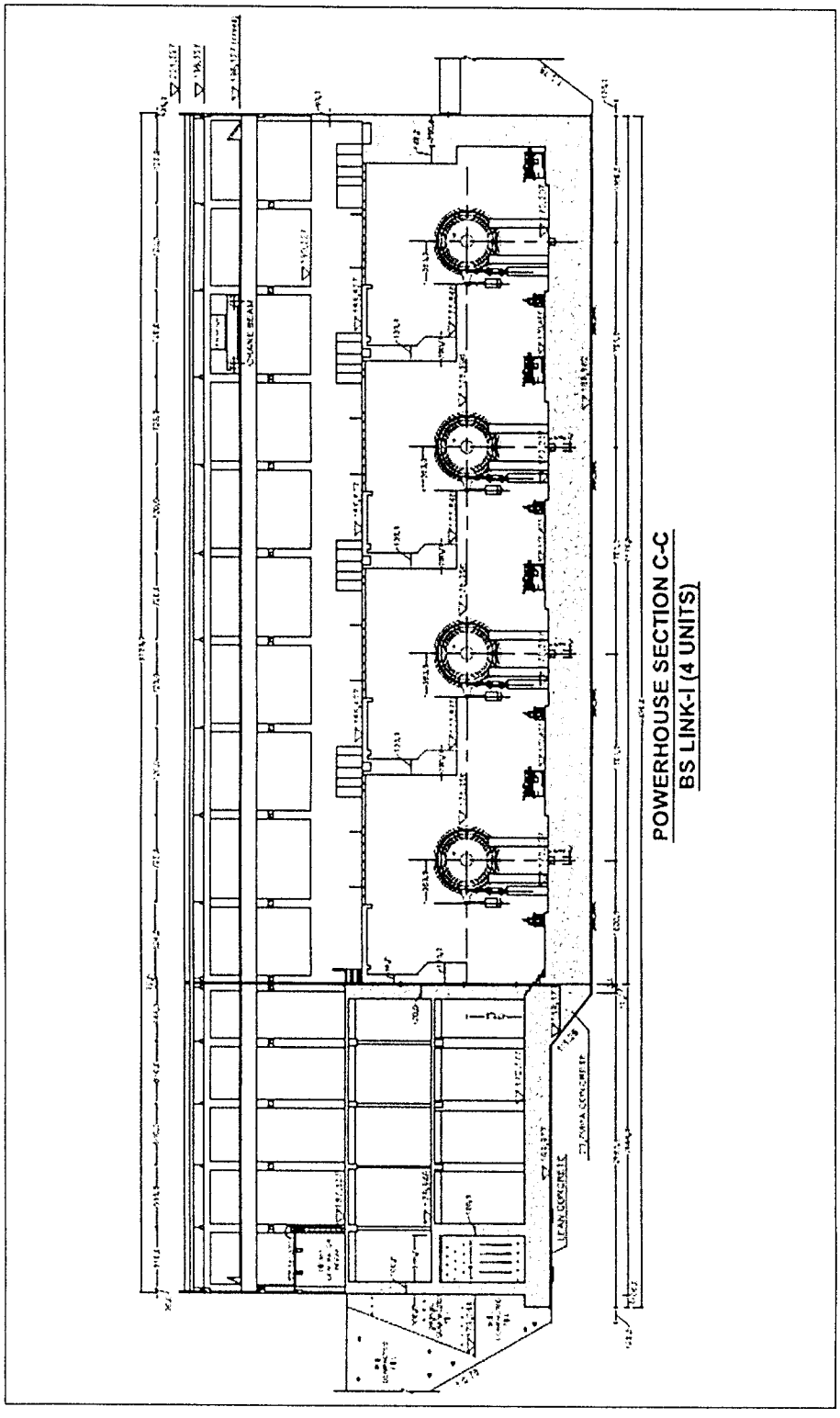
Longitudinal Section of Powerhouse of the Generation Facility/Hydel Power Plant of the Licensee



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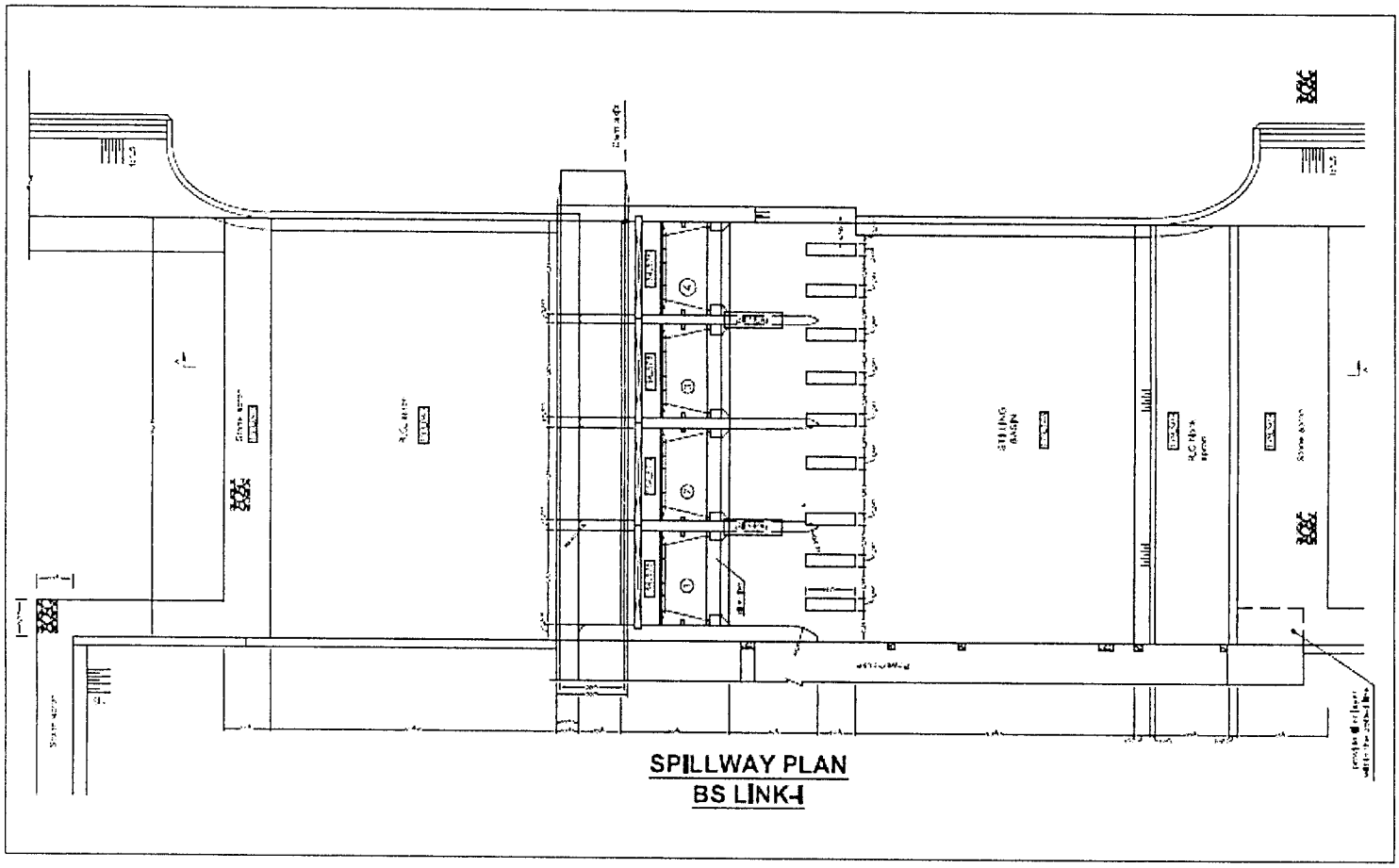
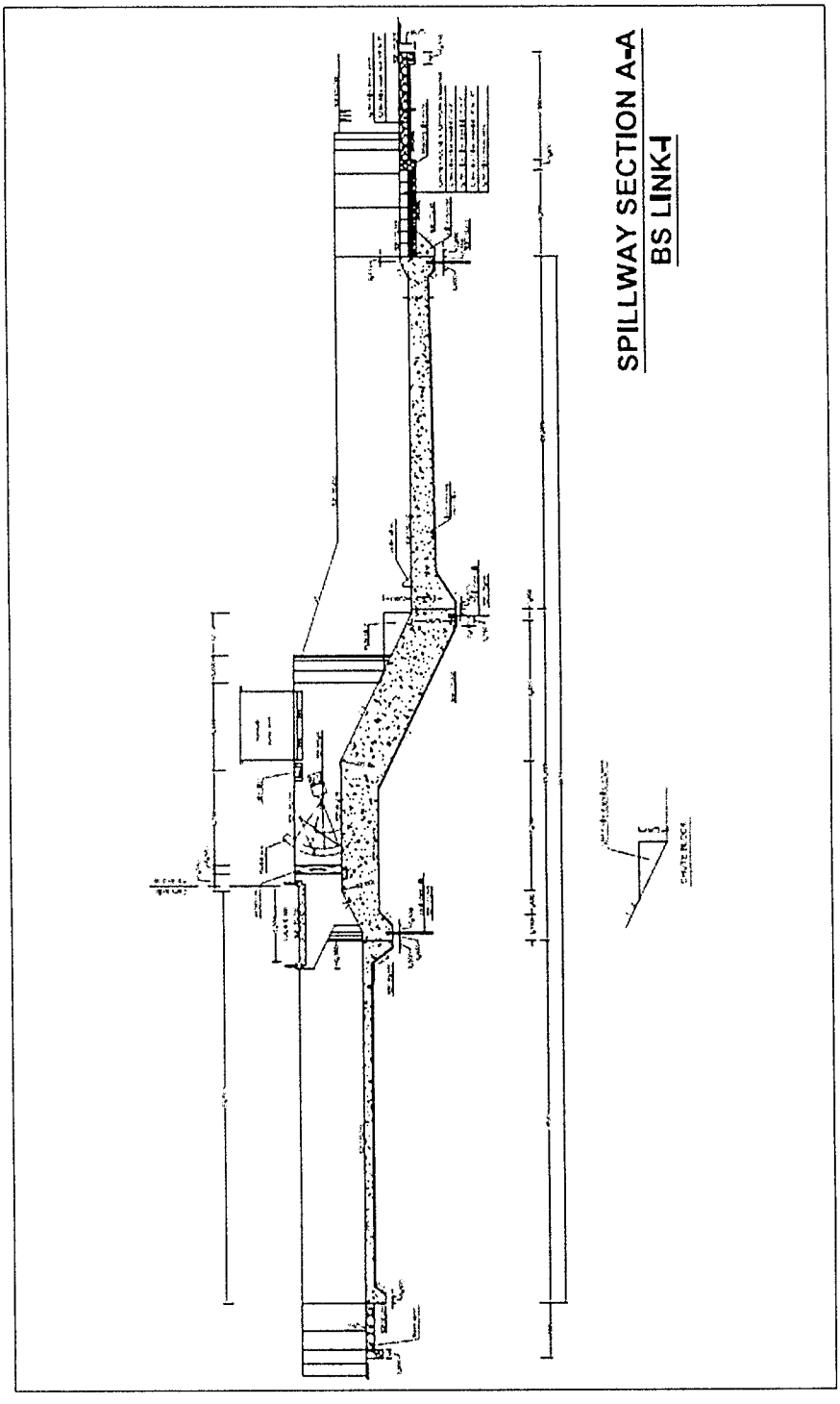
Spillway Plan of the Generation Facility/Hydel Power Plant of the Licensee

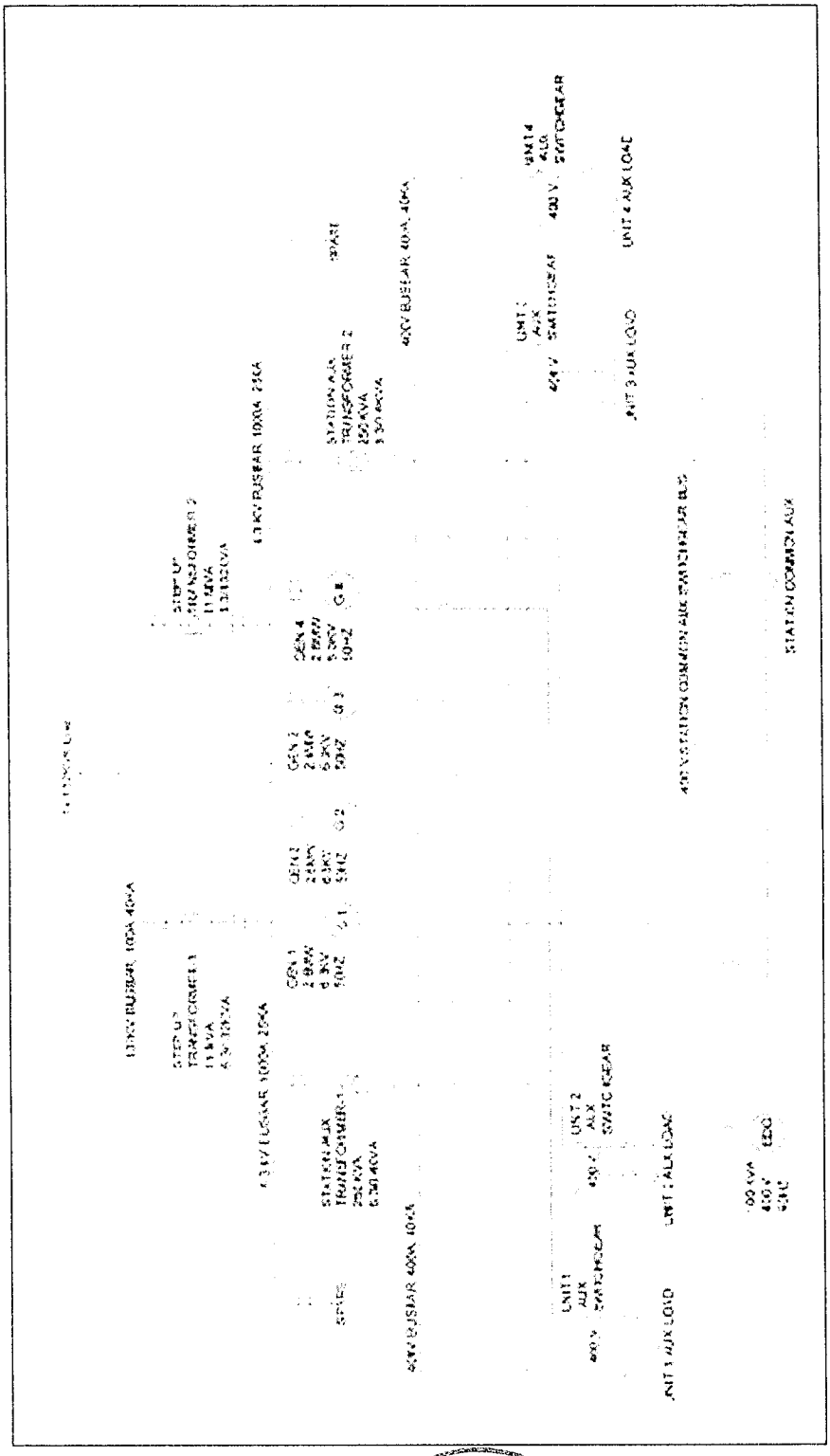


SPILLWAY PLAN
BS LINK-I

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



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



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

The power generated by the generation facility/Hydel Power Plant of Mehar Hydropower (Private) Limited (MHPPL) will be dispersed to the load center of Lahore Electric Supply Company Limited (LESCO) at 132 kV voltage level.

(2). The proposed interconnection arrangement/transmission facilities for dispersal of electric power will be consisting of a Double Circuit (D/C) 132 kV transmission line [measuring about six and half (6.5) km in length using ACSR Lynx conductor] for making an In-Out of existing 132 kV D/C Pattoki-Chunian transmission line connecting the generation facility/Hydel Power Plant to the network of LESCO.

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

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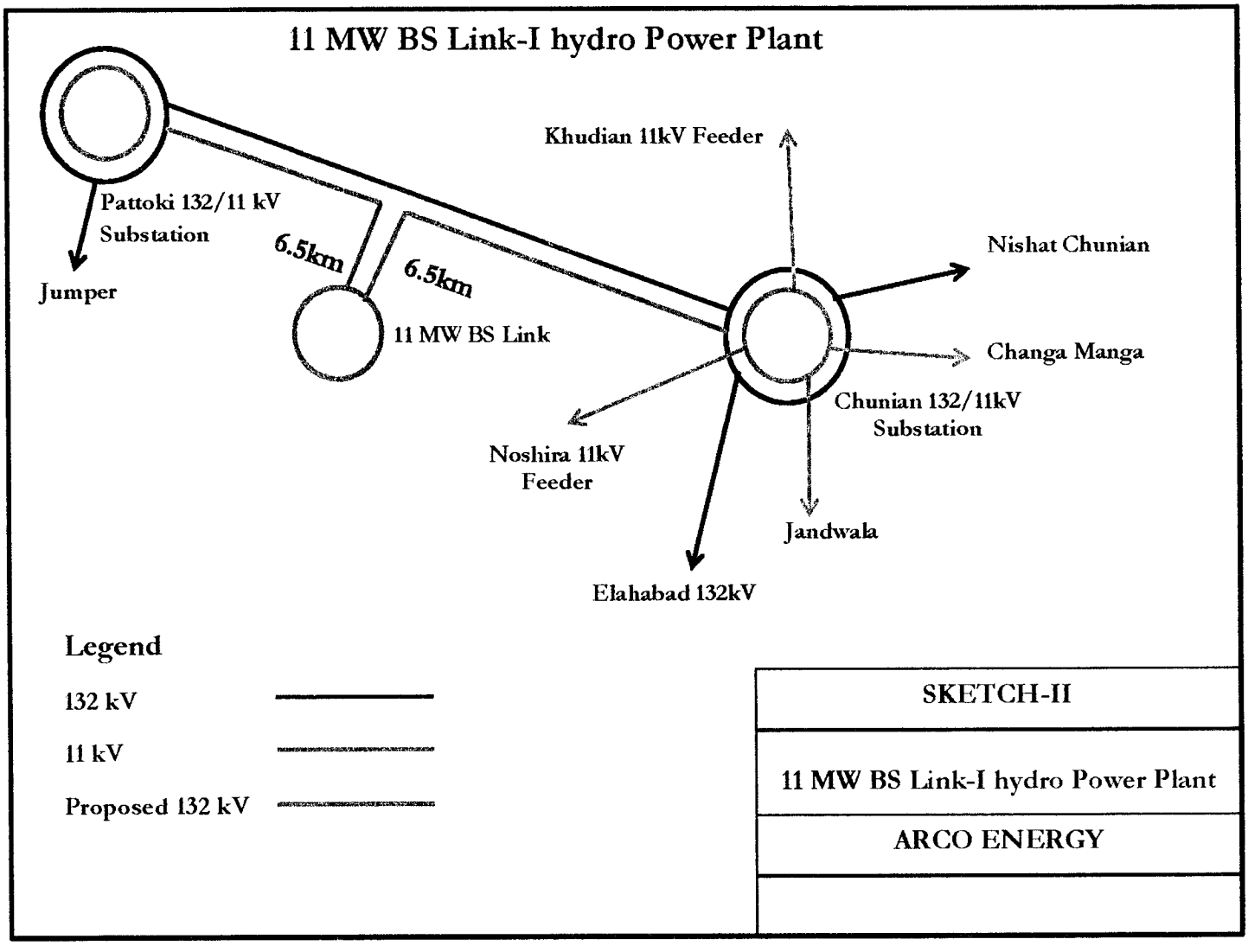
Schematic Diagram for Interconnection/Transmission Arrangement for Dispersal of Power from Generation Facility/Hydel Power Plant of the Licensee



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Details of Generation Facility/Hydel Power Plant of the Licensee

(A). General Information

(i).	Name of the Company/ Licensee	Mehar Hydropower (Private) Limited
(ii).	Registered/Business Office of the Company/Licensee	142-D Model Town, Lahore, Punjab
(iii).	Location of the Generation Facility	Balloki-Sulemanki Link-1 Canal at RD 106+250, Mauza Kanda Kharan, Tehsil Chunian, District Kasur, in the Province of Punjab
(iv).	Type of Generation Facility	Hydropower Plant

(B). Plant Configuration

(i).	Size/Installed Capacity (Gross) of the Generation Facility	10.49 MW
(ii).	Type of Storage etc.	Run of Canal Hydropower Plant
(iii).	Water Source	Balloki-Sulemanki Link-1 Canal at RD 106+250
(iv).	Type of Technology	Four (04) Pit type Horizontal Kaplan Turbines
(v).	Number of Units & Size(MW)	4 x 2.6225 MW
(vi).	Turbine Make & Model*	Andritz Hydro, Mavel, HP or Equivalent
(vii).	Expected COD of the Generation Facility	July 01, 2020

* Hydro turbines are designed and manufactured to meet the specific requirements of each site and are not available off the Shelf as per standard models.

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(viii).	Expected Life of the Generation Facility from COD	Thirty (30) Years

(C). Discharge

(i).	Mean Monthly Discharge	350 m^3/s
(ii).	Total Annual Average Discharge	1.104 x 1010 m^3
(iii).	Mean Annual Energy	67.29 GWh
(iv).	Plant Factor	73%

(D). Main Structure

(i).	Design Discharge	350 m^3/s (Through Powerhouse)
(ii).	Maximum Discharge	424.75 m^3/s (Through Spillway)

(E). Spillway

(i).	No. of Units	04
(ii).	Type	Broad crested with radial gates (Glacis Type)
(iii).	Sill Level	181.845 m.a.s.l.
(iv).	Design Pressure at Sill	6.686 meters
(v).	Height	6.686 meters

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(vi).	Width	35.589 meters

(F). Trash Racks

(i).	Height	5 meters
(ii).	Bar Distance	100 mm

(G). Stop Logs

		Width	Height
(i).	Intake	10.01 meters	2.705 meters
(ii).	Spillway	35.589 meters	5.010 meters

(H). Draft Tube

(i).	No. of Units	04
(ii).	Type	Vertically Sliding Lift
(iii).	Height	7.15 meters
(iv).	Width	10.01 meters

(I). Headrace Channel

(i).	Water Level at Entrance	188.595 m.a.s.l.

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(ii).	Canal Width	34.138 ~ 105.27 meters
(iii).	Flow Depth	5.486 meters
(iv).	Bed Slope	0.000125

(J). Power House

(i).	Powerhouse Level	201.277 m.a.s.l.
(ii).	Machine Hall Length	48.60 meters
(iii).	Machine Hall Width	88.66 meters
(iv).	Machine Hall Height	29.637 meters

(K). Tailrace Channel

(i).	Bed Level	179.740 ~ 179.807m.a.s.l.
(ii).	Canal Width	34.138~105.27 meters
(iii).	Bed Slope	0.000125

(L). Nominal Head at Maximum Power Output

(i).	Headrace Water Level	188.595 m.a.s.l.
(ii).	Max. Tailrace Water Level	185.294 m.a.s.l.

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(iii).	Min. Tailrace Water Level	181.448 m.a.s.l.
(iv).	Maximum Gross Head	7.129 meters
(v).	Minimum Gross Head	3.237 meters
(vi).	Head Loss	0.252 meters

(M). Hydro-mechanical Equipment

(i).	Type of Turbine	Horizontal Shaft Kaplan (Pit Type)
(ii).	No. of Units	04
(iii).	Rated Flow for each Unit	87.5 m^3/s
(iv).	Capacity	2.6225 MW
(v).	Rotational Speed	69.8 rpm
(vi).	Rated Head	3.55 meters

(N). Electrical Equipment Generator

(i).	Type of Generator	Synchronous Type
(ii).	No. of Units	04
(iii).	Capacity	2.8 MVA
(iv).	Power factor	0.80 lagging-0.90 leading

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(v).	Frequency	50 Hz
(vi).	Nominal Voltage	6.3 kV
(vii).	Nominal Speed	600 rpm
(viii).	Insulation class	F
(ix).	Ambient temperature	50°C
(x).	Excitation Static	110 V DC
(xi).	Connection	Y, Resistance Grounded
(xii).	Protection Class	IP 44

(O). Transformer

(i).	No. of Transformers	02
(ii).	Capacity	11 MVA each
(iii).	Low Voltage (Primary)	6.3 kV
(iv).	High Voltage (Secondary)	132 kV
(v).	Frequency	50 Hz
(vi).	Temperature rise	55°C-65°C
(vii).	Impedance	6.00% (approx.)
(viii).	Type of Tap Changer	On Load

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(ix).	Cooling	ONAN/ONAF

(P). Plant Characteristics

(i).	Generation Voltage	6.3 kV
(ii).	Frequency	50 Hz
(iii).	Power Factor	Leading 0.90 and Lagging 0.80
(iv).	Automatic Generation Control	Yes
(v).	Ramping Rate	To be provided later
(vi).	Time required to Synchronize to Grid and loading the Complex to full load.	To be provided later

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SCHEDULE-II

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

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SCHEDULE-II

(1).	Total Installed Gross Capacity of the Generation Facility (4 x 2.6225 MW Kaplan Turbines)	10.49 MW
(2).	De-Rated Capacity of the Generation Facility at Reference Site Conditions	10.49 MW
(3).	Total Auxiliary Consumption of Generation Facility	0.1049 MW
(4).	Net Capacity of Generation Facility at Reference Site Conditions	10.3851 MW

Note

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

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