Registrar

National Electric Power Regulatory Authority
Islamic Republic of Pakistan

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No. NEPRA/R/Addl. Dir(Trf.Hydro)/TRF-497/PEDO(JHP)-2019/47545-47547
December 30, 2020

Subject: **Decision of the Authority in the matter of Tariff Petition filed by Pakhtunkhwa Energy Development Organization (PEDO) for Tariff Determination of 10.2 MW Jabori Hydropower Project** (Case No. NEPRA/TRF-497/PEDO(JHP)-2019)

Dear Sir,

Please find enclosed herewith subject Decision of the Authority along with Annex-I & II (23 Pages) in Case No. NEPRA/TRF-497/PEDO(JHP)-2019.

2. The Decision is being intimated to the Federal Government for the purpose of notification in the official Gazette pursuant to Section 31 (7) of the Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997.

3. The Order along with Reference Tariff Table (Annex-I) & Debt Servicing Schedule (Annex-II) of the Decision are to be notified in the Official Gazette.

Enclosure: As above

30 12 20

(Syed Safeer Hussain)

Secretary
Ministry of Energy (Power Division)
'A' Block, Pak Secretariat
Islamabad

CC: 1. Secretary, Cabinet Division, Cabinet Secretariat, Islamabad.
2. Secretary, Ministry of Finance, 'Q' Block, Pak Secretariat, Islamabad.

DECISION OF THE AUTHORITY IN THE MATTER OF TARIFF PETITION FILED BY PAKHTUNKHWA ENERGY DEVELOPMENT ORGANIZATION (PEDO) FOR TARIFF DETERMINATION OF 10.2 MW JABORI HYDROPOWER PROJECTBACKGROUND

Pakhtunkhwa Energy Development Organization (hereinafter referred to as "PEDO" or "the Petitioner"), envisages to set up 10.2 MW run-of-the-river, high head hydro power project (hereinafter referred to as the "Project"). The Project is located on Siran River, a tributary of Indus River near Jabori village at District Mansehra of Khyber Pakhtunkhwa Province.

PEDO filed a tariff petition for determination of generation tariff for the Project pursuant to the National Electric Power Regulatory Authority (Tariff Standards and Procedures) Rules, 1998.

2 SUBMISSIONS OF THE PETITIONER

The salient features of the petition are as follows:

Project Size	10.2 MW
Project Site	Siran River, a tributary of Indus River near Jabori village at District Mansehra of Khyber Pakhtunkhwa Province
Construction Period	30 Months
Plant Factor	79.57%
Saleable Energy	62.70 GWh
Capital Structure	70% Debt and 30% Equity
Proposed Levelized Tariff	Rs. 14.4579/kWh (US cents 9.0362/kWh)
Total Project Cost	US$ 35.51 Million
Rs/US$	160

The proposed project costs are summarized below:

Project Cost	US$ Million
EPC Cost	28.30
Land	0.38
Custom Duty	0.45
Project Management Unit Cost	0.90
Management Consultants Cost	0.80
Project Cost without IDC	**30.45**
Interest during Construction (IDC)	3.135
Contingency Cost	1.541
Total Project Cost	**35.501**

According to PEDO, the proposed project cost and reference tariff is based on the following assumptions. A change in any of these assumptions will necessitate a corresponding adjustment in the reference tariff:

a. Project financing structure is based on 70:30 debt-equity ratio, although the Project has been entirely funded from PEDO's resources. 70% of the project capital cost is assumed to be arranged through sponsor loan and 30% is considered as equity.
b. The exchange rates are assumed to be 160 for PKR/USD. Exchange rates variations as per standard EPA shall be accommodated.
c. 100% of Debt has been assumed to be financed through sponsor loan provided by PEDO
d. O&M has been considered as 2.5% of capital cost minus IDC to keep the tariff as low as possible, although budget calculations indicate it should be approx.: 3.5%
e. A constant RoE of 16% per annum is assumed over 30-years.
f. Custom Duties on the import of plant and equipment (7% of 70% of foreign cost) have been assumed for reference purposes.
g. No sales tax is assumed, general sales tax, and all other taxes and any new taxes shall be treated as pass through items.
h. The construction period for the purpose of reference tariff calculations has been assumed as 30 months from the 'Notice to Proceed' to the EPC contractor. In case the completion of the project takes more than 30 months, IDC shall be adjusted based on the actual time taken for the completion of the project if caused by Force Majeure events acknowledged by Power Purchaser/Authority.
i. Withholding Tax on dividend @7.5% as required under the Income Tax Ordinance, 2001 is assumed. Any change in the rate of the withholding tax would be pass-through to the Power Purchaser.
j. No Debt Service Reserve Account (DSRA), Maintenance Reserve Account or Contingency Reserve Account or any other Reserve Account has been considered in the tariff model.
k. During construction period, the timing of debt drawdown may vary from that estimated now; as such, the actual 'Interest during construction' (IDC) will be updated at COD and the reference tariff table will be adjusted accordingly. Similarly, the adjustments for variations in the assumed benchmark interest rates etc. shall be applied.
l. No hedging cost has been assumed for exchange rate fluctuations during construction
m. Being a public sector project, no water usage charges have been considered

3 **Proceedings:**

The Tariff petition was admitted by the Authority on December 11, 2019 and the salient features of the tariff proposal were published in in daily newspapers inviting filing of replies, intervention requests or comments. It was also decided to conduct a hearing on the matter on March 11, 2020. Notices of hearing and the proposed issues to be discussed and deliberated upon during the hearing were also published in the national newspapers on February 12, 2020. In response, no intervention request was filed.

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4 **Hearing:**

The hearing in the subject matter was held on March 11, 2020 at 10:00 AM, at the NEPRA Headquarters, Islamabad which was attended by the representatives of Pakhtunkhwa Energy Development Organization (PEDO), Central Power Purchasing Agency Guaranteed Limited (CPPA-G), Pakistan Engineering Council (PEC) and other stakeholders

5 **Comments of Stakeholders:**

Ministry of Planning, Development and Reform (Energy Wing) (MPD&R)

MPD&R vide letter dated 11th March 2020 submitted that the revised PC-II of the project was approved in 2011 by ECNEC to conduct feasibility study and the Petitioner should have prepared PC-I and got it approved before going for EPC. PEDO vide letter dated July 28, 2020 replied that, the feasibility study of the Project was conducted under the Renewable Energy Development Sector Investment Program (RESDIP) Projects for which the approval was sought from ECNEC but later the Project was initiated and funded by the provincial government itself for which the PC-I was got approved by PDWP in 2012 and then revised PC-I was approved by PDWP in 2014 before the award of contract to EPC contractor in November 2014. MPD&R also submitted that there exists confusion in tariff petition regarding the debt: equity ratio, at one page its written ADP 10% and HDF 90%, whereas at other page it is 70:30, this may be clarified along with the basis of KIBOR. In response to the comments of MPD&R, PEDO submitted that, all the funds are arranged through non-banking resources i.e. ADP 20% and HDF 80%, however the maximum equity that can be considered for project funding is 30% and the same has been assumed.

Regarding the MPD&R observations on KIBOR, PEDO in response submitted that KIBOR has been considered as per the SBP rates subject to adjustment as per actual and the spread of 2.5% has been assumed as per NEPRA benchmarks, however, if the rate of 7% (current figure) is considered the Capex and tariff will come down significantly. MPD&R also objected the claimed high Capex and O&M costs and further stated that Transmission line cost should not be made part of the EPC contract. PEDO submitted that, the major components of project Capex i.e. EPC as well as Management Consultants (MC) costs have been arrived at through competitive bidding as per PEC and PPRA rules. MPD&R raised observation that annual O&M should be 1% of base cost; PEDO submitted that as per PEDO assessment the O&M budget is almost 2.4% of CAPEX or 2.9% of base cost. Upon another observation of MPD&R regarding contingencies PEDO responded that contingencies are considered 5% given the size of the Project and the nature (possibly of variations rock formation as compared to the conceived in EPC, time extension due to force majeure events etc) and the utilization of funds shall be duly justified by PEDO to the Authority upon the completion of project.

Central Power Purchasing Agency (Guarantee) Limited:

The CPPA-G participated in the hearing and also submitted detailed comments vide letter dated, March 10, 2020. CPPA-G submitted that, the tariff proposed by the [illegible] stage is on higher side as compared to the recently approved cases of 7.08 MW Ri[illegible] (Rs. 8.181[illegible]h) and 8 MW

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Katai-II. The Petitioner vide letter dated April 24, 2020 responded that the higher tariff appearing in PKR is due to massive devaluation of PK versus USD and petition is of the opinion that every project is different in its cost/benefit analysis and there could be variations of cost/tariff mainly because of site conditions, infrastructure and other factors. CPPA-G stated the Seller's assumed O&M costs is exorbitant and needs to be rationalize and the WHT should not be allowed. CPPA-G also stated that the ROE of 16% is on higher side, on which the Petitioner submitted that, ROE of 16% per annum has been requested, based on the cost of financing etc. in fact, for small HPPs ROE of 20% has been allowed under the Upfront Tariff. PEDO in response to the CPPA-G's objection regarding the assumption of 6 month KIBOR with a spread of 2.5% in the wake of 6% flat rate of SBP for renewable energy, stated that SBP announced its revised scheme on June 20, 2016 whereas the Project was under implementations since 2014 and its applicability is not possible. However the Authority may decide to amortize the loan over the entire period of EPA.

Punjab Power Development Board:

PPDB vide letter dated March 09, 2020 submitted that, there is no mention of approval of Load Flow and Interconnection Study from Peshawar Electric Supply Company (PESCO) and whether Power Acquisition Consent from PESCO and CPPA-G has been obtained? PEDO vide letter dated July 23, 2020 responded that, Load Flow and Interconnection study have duly been approved and the same formed the basis for issuance of generation of license of the Project and the Project has been included under "Committed" category under IGCEP prepared by NTDC. PPDB stated that, the hydrological data was not shared, but given the current changes in hydrological cycle, i.e., pattern of precipitation due to climate change, specific importance must be given to recent hydrological data and power calculation must be conducted on daily basis, in order to get more reliable results. PEDO in response submitted that, Hydrological data has been obtained through actual site data collection as well as previously available data and further the project is based on "No Hydrological Risk" being assigned to Power Purchaser. PPDB stated that, project cost of US$ 3.54 million per MW for a high head project with head of 155 meter is too high, based on the project cost data of high head project it should be around US$ 2 million per MW, on which PEDO submitted that, EPC as well as Management Consultancy have been arrived at through Competitive bidding process under PEC guidelines and PPRA rules and apparently high per MW cost is mainly because of high KIBOR. In response to PPDB observations on the 16% return on equity and 2% auxiliary consumption claimed, PEDO submitted that ROE has been considered as per NEPRA (Benchmarks for Tariff Determination) Guidelines, 2018 and the auxiliary list has been provided. PPDB also stated that as per Power Policy 2015 the custom duty of 5% is allowed on import of plant and equipment, 7% needs to be corrected. In response PEDO submitted that, custom duty is 5% added with Sindh Cess and further taxes/duties thereupon, the estimated figure is 7% which will be subject to adjustment as per actual.

6 **Issues:**

Based on the contents of the Petition, the following issues were framed for hearing and the Authority's issues wise findings are as follows:

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Whether the project design/feasibility study and hydrology is updated and has been approved by the competent Authority/forum? Whether the auxiliary consumption of 2% is justified? Whether the outages hours of the power plant is justified? Whether the plant Capacity and annual generation claimed by the Petitioner are justified?

The Petitioner submitted that, feasibility study including updated hydrology has been approved by the competent authority of PEDO. The Petitioner during the hearing also submitted that, auxiliary consumption of 2% used in tariff petition is justified. Regarding the outage hours the petitioner submitted that this is quite reasonable given the scenario of "Take & Pay" Mechanism to be followed in the EPA.

The Authority observed that the Petitioner has not submitted approval of POE in respect of its feasibility study, however, in its submissions stated that the annual average energy of 71.1 GWh has been calculated based on discharges resulting in plant load factor of 79.57%. The Authority also observed that the Petitioner has calculated the tariff on saleable energy i.e. 62.7 GWh by excluding the outages of 36.5 days (Scheduled, Forced & others) from the annual energy generation.

The Authority is of the considered opinion that the outages period shall not be excluded from the annual energy generation of the plant and this unprecedented mechanism for calculation of annual energy may not be allowed to this project. Further the Authority also observed that 2% auxiliary consumption is also not prudent, therefore the Authority has decided to consider net annul energy of 70.7445 after deduction of 0.5% Auxiliary consumption for calculation of tariff.

Whether an approved Interconnection Study has been obtained?
Whether NOCs have been obtained from the relevant Irrigation and Environmental Protection departments?

The Petitioner submitted an approval letter dated 06-04-2017 of PESCO regarding the interconnection and has provided the approval letter dated July 26, 2018 of Environmental Protection Agency, Forestry Environment and Wildlife Department of Government of Khyber Pakhtunkhwa.

The Authority considered the approvals of the relevant departments and hence, these issues stand addressed.

Whether the construction period of 30 months claimed by the petitioner is justified?

The Petitioner has requested for approval of 30 months construction period. It may be noted that the construction period of 30 months has not been approved by POEs. Also, PC-I (revised) of the project does not discuss about the construction period of the project.

The Authority is of the view that, it may not be appropriate to specify the standard construction period as the time schedule for executing the hydro project varies substantially across the projects due to various reasons such as execution philosophy and site conditions etc. However, for comparison purposes, the Authority has compared the construction period of this project with other comparable hydropower projects and found that the construction period of 30 months for Jabori hydropower

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project is closer to the construction period of similar projects, therefore the same has been approved and all the allied adjustments at COD will be restricted to this allowed period.

The Authority also observed that as per the information, the Project has been delayed about 2 years and no satisfactory response has been provided by the petitioner for this delay. The Authority noted that as per the clause 27.1 of the submitted EPC contract regarding the Delay in Completion, it is stated that if, the contractor fails to complete the Works within Time for Completion, and the Employer shall be entitled a reduction in Contract. The Authority is keen to know the reasons of delay. Therefore, the Petitioner is directed to provide a detailed report at the time of COD tariff adjustment request, indicating the reasons for delay and to provide information about the mitigating decisions that have been made to recover the cost of delays from EPC contractor under the signed agreement if the delay is established as a result of non-performance of the EPC contractor and any reduction will be accounted at the time of COD stage tariff.

Whether the EPC cost has been arrived at through fair and transparent EPC bidding process? Whether the EPC contractor has given the details/Monthly breakdown of civil work cost (adjustable and nonadjustable portion) or excavation in tunneling works?

The Petitioner submitted that the EPC contract was awarded through competitive bidding carried in accordance with the PEC rules/regulations

As per the bid evaluation report submitted by PEDO, invitation of bids for design, procurement and construction of Jabori Hydropower Project (10.2 MW) was advertised on the 7th April 2014 in local Urdu and English newspapers i.e. Daily Mashriq, Daily Dawn and The NEWS. In response to the request of the bidders, the deadline for the submission of bids was extended from 15th May 2014 to 10th July 2014. The receipt of bids was closed at 11:00 am local time on 10th July 2014 as per scheduled. Out of twenty-three (23) firms, which purchased the bidding documents, the following six (6) firms submitted their bids.

i. Descon Jabori GRV
    - DESCON, Pakistan with 75% share
    - Zheijiang Orient Engineering Co Ltd (ZOEC), China having 25% share.

ii. AMC JV Consotrium.
    - Al.Manan Construction Company Quetta Pakistan
    - Sher Ali Contractors Islamabad Pakistan.
    - Brisk International Private Limited, Lahore Pakistan
    - Technocraft Engineering Services Islamabad
    - Addnew Hydropower Ltd Hong Kong.

iii. Habib Rafiq JV
    - Habib Rafiq (Pvt.) Limited Lahore Pakistan with 51% share
    - Sunir Company Iran with 49% share.

iv. GRC, JV
    - Ghulam Rasool & Co. Multan, Pakistan with 51% share

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- Tinjin Design & Research Institute of Electric Co.(TRIED)-China with 30% share.
- Hydro-China Zhongan Engineering Corporation-China with 19% share

v. KGL-NTF Joint Venture
- Khyber Grace (Pvt.) Limited Islamabad Pakistan with 51% share
- Insaat Ticaret Limited Sirketi (NTF) Turkey with 49% share

vi. UEC-CHCEG-CWTW, JV
- CWTW-China with 40% share
- United Engineers-Pakistan 30% share
- CHCEG-China 30% share

As per the bid evaluation report, technical bids were opened by the Bid Opening Committee in the Committee Room of PEDO, PEDO House Peshawar, at 2:00 pm on 10th July 2014.The following is the composition of the Bid Opening Committee:

i.	Mr. Naveed Mohsin	Project Director, Jabori HPP (Convener)
ii.	Mr. Muhammad Bashir Khan	Director, Finance and Administration (Member)
iii.	Mr. Noorul Bashar	Deputy Director, Jabori HPP (Member)
iv.	Asad Ali Khan	Project Coordinator, Management Consultant

As per the evaluation, only the following four (4) bidders have submitted substantially responsive bids to the bidding documents. Qualification of the Bidders and eligibility of the plants to be supplied by them generally conforms to the specifications/Employer's requirements

i. DESCON Jabori JV
ii. Habib Rafiq JV
iii. GRC JV
iv. KGL-NTF JV

Thereafter sealed price proposals of 03 bidders were opened on 08th August, 2014 at 1130 hours in the committee room of PEDO office by the Bid Opening and Evaluation Committee. The following read out prices were announced.

Name of Bidder	Read-out bids Prices PKR	Evaluated Bid Price	Ranking
GRC-JV	2,778,369,033	2,786,254,005	1
KGL-NTF JV	4,656,013,501	4,656,013,574	2
Habib Rafiq JV	5,808,707,829	5,808,707,828	3
Descon Jabori JV	6,614,982,562	6,595,585,731	4

According to PEDO, as per the bid evaluation report, all bidders confirmed to the bid documents, therefore no bidder was declared non-responsive and after arithmetic check and on the basis of financial and systematic evaluation of bids it is concluded that the the Bid of M/S GRC JV is the

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lowest evaluated and responsive bid. According to PEDO as per the bid evaluation report the Bid Opening and Evaluation Committee that the contract for Design, Procurement and Construction of Jabori (10.2 MW) Hydropower Project may be awarded to GRC-JV. PEDO then accordingly signed the EPC contract on **November 13, 2014** with M/S GRC- JV.

The Authority has noted that the price bid evaluation report dated August 2014 is detailed and illustrates the procedure adopted for selection of EPC contractor through competitive bidding process. The Authority also note that the submitted Bid Evaluation Report suggests that bid prices were checked, evaluated and adjusted for arithmetic errors, exchange rate variations, time for completion, and various price adjustment for completeness of scope, technical compliance, commercial compliance and deviations in terms of payment and completion schedules. The lowest evaluated bid price of GRC-JVs was considered reasonable as it was the lowest.

The Authority has observed the claimed EPC cost is inclusive of Provisional sum of Rs. 200 million and US$ 2.031 million of Transmission line. The Authority understands that since the project is at advance stage and it is not justified to unnecessary burden the EPC price by including the provisional cost in local portion of the EPC price and accordingly this has been excluded from the local portion of the EPC price. Further the Authority is also of the view the inclusion of Transmission line cost in the foreign portion of EPC cost is not justifiable and the same has also been excluded from the EPC price, however the issue of transmission cost has been separately discussed in the succeeding paragraphs under the relevant issue framed.

In addition to the above, the Authority has also noted that for the conversion of local portion of an EPC cost an exchange rate of Rs.98.46 has been used instead of an updated exchange rate of Rs. 160. After incorporating the aforementioned adjustments the resultant EPC cost works out to be as follows:

S No.	Title	EPC Price Million
1.	Foreign Component US$	9.52
	Less: Transmission Cost US$	(2.03)
	Total Foreign Component US$	**7.49**
2.	Local Component PKR	1,848.46
	Less: provisional sum for price adjustments	(200)
	Total Local Component PKR	1,648.46
	Total Local Component in US$ @ 160	**10.30**
	Equiv. US$ Total EPC Price	**17.80**

The Authority has noted that adjusted EPC cost of US$ 17.80 million (US$ 1.75 million/MW) is within the acceptable range as compared to other hydropower projects and has therefore approved the same. Further only the foreign portion of the EPC cost will be subject to exchange rate variation, however on the local portion no exchange rate variation will be allowed.

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Moreover, the Authority observed that, the Petitioner has not specifically mentioned the price adjustment formula anywhere in the tariff petition however, upon scrutiny, it has been observed that the mechanism for adjustment in EPC price is not in line with the price adjustment formula approved for NEPRA's 3 stage mechanism for determination of tariff for hydropower projects. The price adjustment formula given in the EPC contract of the project stipulates that 35% of the contract price will be fixed whereas, an adjustment due to variation in published statistics for labour and material cost will be applied on an abnormally large portion of the EPC price i.e. on the remaining 65% of the entire EPC price. In comparison, the price adjustment formula approved for similar size projects is different hence the following price adjustment factor shall be applied to only the local portion of Civil Works as shown hereunder:

$$Pn = 0.51 + 0.10 * (Cn/Co) + 0.09 * (Sn/So) + 0.15 * (Fn/Fo) + 0.15(Ln/Lo)$$

Where;

Pn is the adjustment factor to be applied for civil works;

Cn is the index value for the relevant month for Cement as given in the Monthly Bulletin of Statistics published by the Pakistan Bureau of Statistics;

Sn is the index value for the relevant month for Steel Bar & Sheets as given in the Monthly Bulletin of Statistics published by the Pakistan Bureau of Statistics;

Fn is the index value for the relevant month for Diesel Oil as given in the Monthly Bulletin of Statistics published by the Pakistan Bureau of Statistics;

Ln is the index value for the relevant month for Mason (Raj) as per the Wage Rates published in the Monthly Bulletin of Statistics published by the Pakistan Bureau of Statistics;

Co, So, Fo and Lo are the reference values of the price indices for Cement, Steel Bar & Sheets, Diesel Oil and Mason (Raj) respectively as available one month prior to EPC bid submission deadline which in the instant case shall be June 2014.

Whether a sum of US$ 2.03 million for transmission line is justified for inclusion in generation tariff?

The Petitioner has submitted that the foreign portion of EPC price includes an amount of US$ 2.03 million for laying 132 KV transmission line of 20 km and the same may also be allowed. The Petitioner in its reply to CPPA-G vide letter dated April 29, 2020 also submitted that, the Authority in the determination of Ranolia HPP, made the judgment that cost of transmission line if paid by PEDO to PESCO or NTDC shall be reimbursed and the same mechanism may be followed in this case too.

The Authority understands that addressing the issue of interconnection especially for hydro projects is of critical importance. Unlike in thermal plants, where the choice of location of the plant depends on the load center and its proximity to the nearest interconnection— hydro power plant location is fixed and everything else revolves around it. The Authority in case of a recently approved small hydropower project of similar size (Riali HPP) approved the following:

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"The Project Sponsors proposed that the Company will submit cost details & nominal tariff to NEPRA for approval pertaining to financing & construction of Purchaser's Interconnection facilities at the time of COD of the Project. In case of PESCO/Power Purchaser refusal to carryout O&M services for Purchaser's Interconnection facilities, then the Sponsors at the time of Project COD or earlier will request the Authority for the issuance of tariff or Special Purpose Transmission License (if required) in order to carry out the aforesaid O&M services. Further, net delivered energy shall be adjusted for line losses subject to figure as allowed under the NEPRA (Interconnection for Renewable Generation Facilities) Regulations, 2015 (amended on June 07, 2018)."

For this project, the Authority has approved the same mechanism and therefore, cost of USD 2.03 million on account of cost of T/L has not been not made part of the project at this stage.

Whether the Land purchase and infrastructure development cost of US$ 0.384 million claimed by the Petitioner is justified?

The Petitioner in its tariff petition stated that an area of 267 Kanals has been acquired for an amount of Rs.61.50 million or USD 0.384 million.

The Authority observed that since 80% of the project has been completed, therefore, the cost claimed for land purchase and infrastructure development must have been incurred. The Authority understands that this cost cannot be negated as Land and its allied costs are undeniable part of hydropower project, therefore, the Authority has decided to allow the requested cost at this stage subject to adjustment at actual on COD based on verifiable documentary evidence to the satisfaction of the Authority. Accordingly the cost of PKR. 61.50 million equivalent to US$ 0.384 million at PKR to USD exchange rate of 160 has been allowed on this account.

Whether the Custom Duties of US$ 0.446 million calculated @ 7% of the 70% of foreign cost for the import of plant and equipment is justified?

The Petitioner submitted that, Customs duties are calculated based on 70% of foreign portion of EPC (not being applicable on design and services). This number is adjustable subject to provision of documentary evidence.

The Authority observed that as the EPC contract stipulates that the rates and prices quoted by the Contractor in the Schedule of Prices shall be deemed to have included (i) business taxes, income tax, super tax, customs, import duties and other taxes on income, and (ii) fees charged for services provided under the Contract. Therefore, the Petitioner's claim and its adjustment for duties and taxes at COD will not be required and accordingly the same is not allowed.

Whether the Non-EPC cost of US$ 1.697 million pertaining to Project Management Unit cost and Management Consultancy cost claimed by the Petitioner is justified?

The Petitioner claimed US$ 1.6975 million as a Non-EPC with the following break-up:

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S.No	Cost Head	Amount US$ Million	Amount PKR Million
1.	Management Consultancy Cost	0.797	127.47
2.	Project Management Unit Cost	0.900	144.02
	Total	**1.697**	**271.49**

Management Consultancy Cost:

The Petitioner stated that this covers the cost of update feasibility, bid level design, tender document, bid evaluation, contract negotiation as well as complete construction management and services during defect liability period.

The Authority has noted that PEDO has signed Management Consultancy Contract with a Joint Venture of AGES Consultant Peshawar, Pakistan, (Lead Firm), Infra-D Consultant Islamabad and Hydro Consult Engineering (Nepal). The contract stipulates the total price of PKR 98.23 million whereas a period of completion shall be 40 months. The Authority observed that this contract includes an amount of Rs. 10 million on account of provisional sum and unnecessary inclusion of such kind cost may not be justified at such an advanced stage of the project and thus the provincial sum is disallowed to the Project. Further the Authority has noted that an amount of Rs. 2.60 million as cost for Direct (Non-salary) Cost Field Office has also been excluded because as per the clause 2.9 of the EPC contract it is under the purview of the responsibility of EPC contractor.

Moreover, the Authority further observed that an amount of Rs. 14.4 million (US$ 0.09 million) for hiring an independent engineer has also been included under this head which the Authority has not allowed in other comparable projects under this head as the same should be covered under the project management unit cost. After taking into account the discussed adjustments an amount of PKR 86.27 million is allowed as a maximum cap subject to adjustment as per actual in PKR only. In case of cost being less than approved ceiling the same shall be adjusted at COD.

Project Management Unit Cost:

The Petitioner stated that, this cost covers the project establishment for the preconstruction as well as employer's cost during construction. The amount considered under this head is USD 0.900 million.

The Authority noted that the Petitioner's claimed cost are mainly estimates and are devoid of any supporting documents, and therefore, previously established cost benchmarks need to be relied upon. The estimated PMU costs claimed by the Petitioner are primarily project development cost and is on higher side as compared to previously established benchmarks for small hydropower projects executed in similar manner, i.e. EPC/Turnkey Contracts with outsourced Engineering and Administration of the project to Management Consultants.

The Authority has allowed a maximum development cost of US$ 0.22 Million for 36 MW Daral Khawar Hydropower Project of PEDO vide decision dated January 09, 2018 on the basis of cost allowed to provincial government projects in Punjab and KPK executed under Renewable Energy Development Sector Investment Program (REDSIP), which aims to develop indigenous, non-polluting,

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and renewable sources of energy to help meet Pakistan's power shortage and diversify the power sources. In view thereof, a development cost of US$ 0.22 million (PKR.35 million) is hereby allowed by the Authority for this project too with a proviso that the individual items may vary but the overall allowed cost should be the maximum cap and will not be subject to any exchange rate variation. In case of cost being less than approved ceiling the same shall be adjusted at COD.

Recapitulating the above, following is the summary of Non-EPC cost.

S.No	Cost Head	Claimed Amount PKR Million	Allowed Amount PKR Million
1.	Management Consultancy Cost	127.47	86.27
2.	Project Management Unit Cost	144.02	35.00
	Total	**271.49**	**121.27**

Whether the claimed Contingency cost of US$ 1.541 million is justified?

The Petitioner has claimed a contingency cost of US$ 1.541 million or 5% of the Capex and further stated that this needs to cover unforeseen expenses mainly resulting from delays etc.

The Authority has allowed cost of contingency for civil works and E&M equipment claimed by other hydropower projects at initial level, however the instant Project is at an advanced stage therefore, the risk of uncertainty is minimal hence this cost is disallowed to the Petitioner .

Whether the terms and conditions of debts claimed by the Petitioner are justified?

The Petitioner submitted that the project financing structure is based on 70:30 debt to equity ratio and the entire finances will be funded by Govt of KPK i.e. 20% from Annual Development Programme (ADP) and 80% from Hydel Development Fund (HDF) and also stated that 70% to be considered as loan and 30% is an equity. The Petitioner further submitted that KIBOR of 8% plus spread of 2.5% with a loan tenure of 10 years has been assumed.

CPPA-G stated that the Seller's assumed debt servicing, 06 months average of KIBOR, with spread of 2.5% is on higher side. As per the NEPRA's Benchmarks, the debt financing under the Revised SBP financing scheme for Renewable Energy, provides a flat rate of 6% for debts with a debt repayment period not exceeding 12 years. Riali-II and Kathai-II have availed debt financing under the SBP scheme @ 5.5% flat interest rate.

The Petitioner while responding to the comments of CPPA-G stated that the application of flat 6% interest rates as per SBP debt financing is misplaced. SBP announced its revised scheme on June 20, 2016 whereas, the Project was under implementations since 2014 and its applicability is not possible. However the Authority may decide to amortize the loan over the entire period of EPA.

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The Authority noted that that Hydel Developmental Fund (HDF) has been utilized for this project. The HDF is established through "The [Khyber Pakhtunkhwa] Hydel Development Fund Ordinance, 2001". The relevant extract of the Provincial ordinance is hereunder:

***Establishment of the Fund.**—(1) As soon as may be after the commencement of this Ordinance, Government shall establish a Fund to be known as the Hydel Development Fund.*

(2) Subject to the availability of resources, with particular reference to its overall liabilities, Government shall, on yearly basis, contribute to the Fund, such amount as it may determine, out of the total amount received from the Federal Government or an authority of the Federal Government on account of net profits earned by it from the generation of hydroelectricity, for the purposes of this Ordinance, and may, in cases of exigencies, contribute to the Fund from other grants received from the Federal Government or any other agency or from its own budget pertaining to the Annual Development Programme.

(3) All profits from hydel projects undertaken from the Fund shall be deposited in the Provincial Consolidated Fund at the close of each financial year:

Provided that Government shall contribute ten per cent of such profits to the Hydel Development Fund.

(4) The amount contributed to the Fund shall be exclusively utilized for the development of hydel electricity in the Province and shall be operated upon in accordance with the provisions of this Ordinance and the rules made thereunder.

The Authority opined that HDF is basically funded by NHP which the province of KPK receive from time to time from WAPDA Hydroelectric operated power plants established in the province, therefore, allowing cost of debt in the lines of commercial banking is not justified. The Authority noted that the project is under implementation since 2014, whereas the State Bank of Pakistan (SBP) announced the financing for Renewable Energy in 2016. Further it was also observed that PEDO with its own funding (coming largely from HDF) is not expected to approach SBP for lending needs nor SBP has the required sources set aside which will cover all existing and future lending needs of PEDO sponsored project including other private sector RE projects. In view of the above the application of 6% concessional lending rates of SBP may not be applicable. The issue of cost of HDF funding need to be seen from an opportunity cost point of view. It was observed that an unutilized HDF is generally invested in risk-free asset (short to long term securities). For this purpose, KIBOR is an appropriate benchmark. Therefore, the Project is being allowed cost of debt at 6 months KIBOR of 7.30 % without any spread which shall be adjusted biannually with any variation in KIBOR. Further the Authority also appreciates the Petitioner suggestions of spreading the loan over the entire 30 years of the project tariff and thus approves the same. However debt: equity ratio shall be on the basis of 80:20 capital structure.

Recapitulating the above the approved total project cost is mentioned as hereunder:

Cost Head	**Approved Cost US$ Million**
EPC Contract/Construction	17.80
Land Cost	0.38
Management Consultants Cost	0.54
Project Management Unit Cost	0.22
Project Cost with IDC	**18.94**
Interest During Construction (IDC)	1.65
Total Project Cost	**20.59**

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Whether the operating costs claimed by the Petitioner are justified?

The Petitioner in tariff petition claimed the O&M components with the following breakup:

Variable O&M Cost	Rs/kWh	0.263
Fixed O&M Cost	Rs/kWh	1.755
Total	Rs/kWh	2.018

MPD&R also submitted that Annual O&M is on higher side and should be 1% of base cost.

The Authority observed that the proposed cost for operation & maintenance of the plant is on higher side than the O&M cost allowed by NEPRA to other comparable hydropower projects. The Authority also relied upon international reports prepared for U.S's Department of Energy wherein, the O&M cost works out as $ 0.408 million p.a. or 0.04 million USD/MW and the same has been approved with bifurcation into 15% as Variable O&M (100% local) and 85% Fixed O&M (foreign and local portion in the ratio of 60% & 40% respectively) as allowed to other hydro projects.

Moreover, the Authority has also decided that the Petitioner should conduct a transparent and competitive bidding process for the selection of O&M contractor for this project with the approved cost as a ceiling. The following O&M cost has been allowed to the Petitioner.

O&M Cost Allowed			
		US$ Mln	Rs./kWh
Variable O&M (15%)	Local	0.0612	0.1384
	Local	0.1387	0.3137
Fixed O&M (85%)	Foreign	0.2080	0.4706
Total O&M Cost -Local		**0.4080**	**0.9227**

<u>Insurance during Operation:</u>

The Petitioner has claimed annual operating insurance @ 1% of EPC contact which is in line with the NEPRA (Benchmarks for Tariff Determination), Guidelines, 2018.

It was noted that there is a decline in the global insurance cost the impact of which is also seen in recent hydro power projects where the annual insurance premium paid was as low as 0.46% of the EPC cost. In view thereof the Authority has decided to allow insurance during operation @0.75% of EPC cost subject to adjustment on the basis of actual up to maximum at 1% of the EPC cost upon provision of verifiable documentary evidence by the Petitioner at the time of COD.

Whether Withholding Tax on dividend should be allowed as a pass through item?

The Petitioner requested that any withholding tax on dividends will be considered pass through.

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The Authority's approved Tariff Guidelines clearly stipulate that the withholding tax on dividends shall not be allowed as a pass- through item in any technology. Therefore, the request of the petitioner to allow WHT as a pass through component being inconsistent with the guidelines is hereby rejected.

Whether the Return on Equity (ROE) and Return on Equity during Construction (ROEDC) computed at 16% is justified?

The Petitioner has computed ROE and ROEDC @ 16% and further submitted that it is reasonable as NEPRA has been allowing IRR of up to 17-18% to HPPs. This will be also subject to dollar indexation.

The Authority noted that Cabinet Committee on Energy (CCoE) in its meeting held on August 27, 2020 reduced the return of public sector power projects for which petitions have been submitted before the Authority for revision in tariffs. The details of which are summarized below:

- RLNG 12% return with US indexation
- Nuclear 14.5% @148 exchange rate with no further US indexation
- WAPDA/GENCO, 10% return with no US indexation

The Authority is of the view that the instant project being owned by KPK government should also be treated in the same manner in terms of return and any discrimination in the level of return between federal government power plants and provincial government power plants may defeat the spirit of the decisions taken in CCoE for reduction in overall national capacity charges. In view of the above, the Authority has decided to allow a return of 10% for the Project as recently reduced for WAPDA hydroelectric with no USD indexation. The annual return component computation has been adjusted to address the time value issue of annual vs monthly return payment.

In addition to above, the Authority has also decided that that the return allowed for this project should be considered as the maximum ceiling and the return beyond the stated limited, if any, should be adjusted for which a claw back mechanism shall be prescribed at the time of COD.

7 ORDER

In pursuance of section 7(3)(a) of the Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997 read with NEPRA (Tariff Standards & Procedure) Rules, 1998, the Authority hereby determines and approves the following generation tariff along with the terms and conditions for Jabori Hydropower Project of Pakhtunkhwa Energy Development Organization (the Petitioner) for delivery of electricity to Power Purchaser:

i) Levellized tariff works out to be Rs. 5.3526/kWh (US Cents 3.3454)

ii) EPC cost of US$ 17.80 million has been approved.

iii) Non-EPC cost of Rs. 121.47 million including Managing Consultancy Cost of Rs. 86.27 million and Project Management Unit Cost of Rs. 35 million has been approved.

iv) Land and Resettlement of Rs. 61.5 Million (US$ 0.384 Million) has been assumed for calculation.

v) Debt to Equity ratio of 80:20 has been approved.

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vi) Debt repayment period of 30 years has been taken into account for 100% local loan.

vii) The KIBOR rate of 7.30% as of September 20, 2020 has taken into account while calculating the cost of debt.

viii) Annual ROE & ROEDC of 10% has been approved.

ix) The reference tariff has been calculated on the basis of net annual benchmark energy generation of 70.745 GWh for installed capacity of 10.2 MW. An auxiliary consumption has been restricted to 0.5%.

x) The above charges will be limited to the extent of net annual energy generation of 70.745 GWh. Net annual generation supplied during a year to the Power Purchaser in excess of benchmark energy of 70.745 will be charged at 10% of the prevalent approved tariff.

xi) O&M cost of US$ 408,000 per annum has been approved.

xii) Insurance during the operation has been calculated as 0.75% of the EPC cost.

xiii) The reference US$/PKR rate has been taken as 160.

xiv) Construction period of 30 months has been approved and the same is used for the workings of ROEDC and IDC.

xv) IDC and ROEDC have been worked out using the following drawdown schedule:

Period (Months)	Draw Down (%)
06	20
12	15
18	20
24	20
30	25

xvi) In the above tariff no adjustment for carbon emission reduction receipts, has been accounted for. However, upon actual realization of carbon emission reduction receipts, the same shall be distributed between the Power Purchaser and the Petitioner in accordance with the approved mechanism given in the applicable government policy.

xvii) The above tariff is applicable for a period of thirty years commencing from the commercial operations date (COD).

xviii) The tariff is based on Take & Pay, with must run provision, accordingly single part tariff has been allowed to the Project.

xix) The component wise tariff is indicated at Annex-I.

xx) Debt Servicing Schedule is attached as Annex-II.

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I. One Time Adjustments

The following onetime adjustments shall be applicable to the reference tariff:

a. The EPC cost shall be verified and adjusted at actual considering the approved amount as the maximum limit. Applicable foreign portion of the EPC cost will be adjusted at COD on account of variation in PKR/USD parity during the constriction period, on production of authentic documentary evidence by the petitioner to the satisfaction of the Authority. The adjustment in applicable portion of the approved EPC cost shall be made only for the currency fluctuation against the reference parity values. The local portion of EPC contract will not be subject to exchange rate variation and the allowed PKR amount shall be actualized. The Lower of Actual or approved shall be taken into account at COD.

b. The local portion of Civil Works Cost only will be adjusted on account of variation in the price of construction material (Cement, Steel, Labour and Fuel) during the project construction period as per the following mechanism/formula:

$$Pn = 0.51 + 0.10 * (Cn/Co) + 0.09 * (Sn/So) + 0.15 * (Fn/Fo) + 0.15(Ln/Lo)$$

Where;

Pn is the adjustment factor to be applied for civil works;

Cn is the index value for the relevant month for Cement as given in the Monthly Bulletin of Statistics published by the Pakistan Bureau of Statistics;

Sn is the index value for the relevant month for Steel Bar & Sheets as given in the Monthly Bulletin of Statistics published by the Pakistan Bureau of Statistics;

Fn is the index value for the relevant month for Diesel Oil as given in the Monthly Bulletin of Statistics published by the Pakistan Bureau of Statistics;

Ln is the index value for the relevant month for Mason (Raj) as per the Wage Rates published in the Monthly Bulletin of Statistics published by the Pakistan Bureau of Statistics;

Co, So, Fo and Lo are the reference values of the price indices for Cement, Steel Bar & Sheets, Diesel Oil and Mason (Raj) respectively as available on June 2014 which is one month prior to the EPC bid submission deadline.

c. Any liquidated damages, penalties, etc. (by whatever name called), actually recoverable by the Petitioner from the EPC contractor(s), pertaining to the construction period allowed by the Authority, will be adjusted in the project cost at COD.

d. Land and Resettlement costs will be allowed as per actual, as against Rs. 61.5 Million (US$ 0.384 Million) allowed now, upon production of verifiable documentary evidence. The initial schedule of rates and variation in them shall be certified by the Provincial government and approved by NEPRA.

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e. Non-EPC cost of Rs. 121.12 million including Managing Consultancy Cost of Rs. 86.27 million and Project Management Unit Cost of Rs. 35 million shall be subject to verification at COD in PKR only. The lower of actual or approved shall be taken into consideration.

f. If no insurance cost has been incurred during operation phase of the power plant or the same is the part of the O&M cost, the assumed calculated tariff component shall be excluded from the tariff components at COD stage.

g. Interest During Construction (IDC) will be adjusted at COD on the basis of actual debt composition, debt drawdown of loan (not exceeding the amount allowed by the Authority) and applicable interest rate during the actual project construction period (not exceeding the construction period allowed by the Authority).

h. The return on equity (including return on equity during construction) will be adjusted at COD on the basis of actual equity injections (within the overall equity allowed by the Authority at COD), during the project construction period allowed by the Authority.

i. The reference tariff table shall be revised at COD while taking into account the above adjustments. The Petitioner shall submit its request to the Authority within 90 days of COD for necessary adjustments in tariff at the time of COD.

II. Indexations:

The following indexation shall be applicable to the reference tariff:

i) Indexation applicable to O&M

The local part of O&M cost will be adjusted on account of local inflation and O&M foreign component will be adjusted on account of variation in dollar/rupee exchange rate and US CPI. Quarterly adjustments for inflation and exchange rate variation will be made on 1st July, 1st October, 1st January and 1st April respectively on the basis of latest available information with respect to CPI - General (notified by the Pakistan Bureau of Statistics), US CPI (notified by US Bureau of Labor Statistics) and revised TT & OD selling rate of US Dollar as notified by the National Bank of Pakistan. The mode of indexations will be as follows:

$$F\ O\&M_{(LREV)} = F\ O\&M_{(LREF)} * CPI_{(REV)} / CPI_{(REF)}$$

$$F\ O\&M_{(FREV)} = F\ O\&M_{(FREF)} * US\ CPI_{(REV)} / US\ CPI_{(REF)} * ER_{(REV)} / ER_{(REF)}$$

$$V\ O\ \&\ M_{(LREV)} = V\ O\&M_{(LREF)} * CPI_{(REV)} / CPI_{(REF)}$$

Where;

$F\ O\&M_{(LREV)}$ = The revised applicable fixed O&M local component of tariff

$F\ O\&M_{(FREV)}$ = The revised applicable fixed O&M foreign component of tariff

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$V\ O\&M_{(LREV)}$	=	The revised applicable variable O&M local component of tariff
$FO\&M_{(LREF)}$	=	The reference fixed O&M local component of tariff for the relevant period
$FO\&M_{(FREF)}$	=	The reference fixed O&M foreign component of tariff for the relevant period
$VO\&M_{(LREF)}$	=	The reference variable O&M local component of tariff for the relevant period
$CPI_{(REV)}$	=	The revised Consumer Price Index (General) as notified by the Pakistan Bureau of Statistics
$CPI_{(REF)}$	=	138.32 Consumer Price Index (N-CPI) of September 2020 notified by the Pakistan Bureau of Statistics
$US\ CPI_{(REV)}$	=	The revised US CPI (all urban consumers)
$US\ CPI_{(REF)}$	=	260.280 US CPI (all urban consumers) for the month of September 2020 as notified by the US Bureau of Labor Statistics
$ER_{(REV)}$	=	The revised TT & OD selling rate of US dollar as notified by the National Bank of Pakistan
$ER_{(REF)}$	=	The reference TT & OD selling rate of US dollar as notified by the National Bank of Pakistan - Current reference 160.

ii) Adjustment of insurance component

The insurance component of the reference tariff will be adjusted as per actually incurred prudent costs, subject to the maximum ceiling of 1% of the approved EPC cost, on annual basis upon production of authentic documentary evidence by the Petitioner.

iii) Adjustment for KIBOR variation

The interest part of debt service component will remain unchanged throughout the term except for the adjustment due to variation in 6 months KIBOR, according to the following formula:

$$\Delta I = P_{(REV)} * (KIBOR_{(REV)} - 7.30\%) / 2$$

Where:

ΔI = the variation in interest charges applicable corresponding to variation in 6 months KIBOR. ΔI can be positive or negative depending upon whether 6 months $KIBOR_{(Rev)}$ per annum > or < 7.30%. The interest

NEPRA AUTHORITY NATIONAL ELECTRIC POWER REGULATORY AUTHORITY payment obligation will be enhanced or reduced to the extent of Δ I for each half year under adjustment.

$P_{(REV)}$ = is the outstanding principal (as indicated in the attached debt service schedule to this order at Annex-II) on a bi-annual basis at the relevant calculations date.

III. Terms and Conditions of Tariff:

Design & Manufacturing Standards:

Hydro power generation system shall be designed, manufactured and tested in accordance with the latest IEC standards or other equivalent standards. All plant and equipment shall be new.

Emissions Trading/ Carbon Credits:

The Petitioner shall process and obtain emissions/carbon credits expeditiously and credit the proceeds to the Power Purchaser as per the applicable government policy and the terms and conditions agreed between the Petitioner and the Power Purchaser.

Power Curve of the Hydel Power Complex:

The power curve of the Hydel Power plant shall be verified by the Power Purchaser, as part of the Commissioning tests according to the latest IEC standards and shall be used to measure the performance of the hydel generating units.

Others:

i. The Authority has allowed/approved only those cost(s), terms term(s), condition(s), provision(s), etc. which have been specifically approved in this tariff determination. Any cost(s), term(s), condition(s), provision(s), etc. contained in the tariff petition or any other document which are not specifically allowed/approved in this tariff determination, should not be implied to be approved, if not adjudicated upon in this tariff determination.

ii. The above tariff and terms and conditions shall be incorporated as the specified tariff approved by the Authority pursuant to Rule 6 of the National Electric Power Regulatory Authority Licensing (Generation) Rules, 2000 in the power purchase agreement between the Petitioner and the Power Purchaser. General assumptions, which are not covered in this determination, may be dealt with as per the standard terms of the EPA.

iii. In case the company earns annual profit in excess of the approved return on equity (including ROEDC), then that extra amount shall be shared between the power producer and consumers through claw back mechanism to be decided by the Authority.

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iv. Pre COD sale of electricity is allowed to the project company, subject to the terms and conditions of EPA, at the applicable tariff excluding debt servicing and return on equity components. However, pre COD sale will not alter the required commercial operations date stipulated by the EPA in any manner.

v. In case the company is obligated to pay any tax on its income from generation of electricity, or any duties and/or faxes, not being of refundable nature, are imposed on the company, the exact amount paid by the company on these accounts shall be reimbursed on production of original receipts. This payment shall be considered as a pass-through payment. However, withholding tax on dividend shall not be a pass through item.

vi. Hydrological Risk shall be borne by the Power Producer.

8 The order along with reference tariff table and debt service schedule as attached thereto are recommended for notification by the Federal Government in the official gazette in accordance with Section 31(7) of the Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997.

AUTHORITY

Engr. Rafique Ahmed Shaikh Member	Engr. Bahadur Shah Member
Rehmatullah Baloch Member	Saif Ullah Chattha Vice Chairman

Tauseef H.Farooqi
Chairman

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JABORI HYDROPOWER PROJECT
REFERENCE TARIFF TABLE

Annex-I

Year	*Variable O&M*	*Fixed O&M*		*Insurance*	*ROEDC*	*ROE*	*Debt Servicing*		*Total*
	Local	*Foreign*	*Local*				*Principal*	*Interest*	
	PKR/kWh								*PKR/kWh*
1	0.1384	0.4706	0.3137	0.3019	0.1587	0.8913	0.3647	2.7133	5.3526
2	0.1384	0.4706	0.3137	0.3019	0.1587	0.8913	0.3918	2.6862	5.3526
3	0.1384	0.4706	0.3137	0.3019	0.1587	0.8913	0.4210	2.6570	5.3526
4	0.1384	0.4706	0.3137	0.3019	0.1587	0.8913	0.4523	2.6258	5.3526
5	0.1384	0.4706	0.3137	0.3019	0.1587	0.8913	0.4859	2.5921	5.3526
6	0.1384	0.4706	0.3137	0.3019	0.1587	0.8913	0.5220	2.5560	5.3526
7	0.1384	0.4706	0.3137	0.3019	0.1587	0.8913	0.5608	2.5172	5.3526
8	0.1384	0.4706	0.3137	0.3019	0.1587	0.8913	0.6025	2.4755	5.3526
9	0.1384	0.4706	0.3137	0.3019	0.1587	0.8913	0.6473	2.4308	5.3526
10	0.1384	0.4706	0.3137	0.3019	0.1587	0.8913	0.6954	2.3826	5.3526
11	0.1384	0.4706	0.3137	0.3019	0.1587	0.8913	0.7471	2.3310	5.3526
12	0.1384	0.4706	0.3137	0.3019	0.1587	0.8913	0.8026	2.2754	5.3526
13	0.1384	0.4706	0.3137	0.3019	0.1587	0.8913	0.8622	2.2158	5.3526
14	0.1384	0.4706	0.3137	0.3019	0.1587	0.8913	0.9263	2.1517	5.3526
15	0.1384	0.4706	0.3137	0.3019	0.1587	0.8913	0.9952	2.0828	5.3526
16	0.1384	0.4706	0.3137	0.3019	0.1587	0.8913	1.0692	2.0088	5.3526
17	0.1384	0.4706	0.3137	0.3019	0.1587	0.8913	1.1486	1.9294	5.3526
18	0.1384	0.4706	0.3137	0.3019	0.1587	0.8913	1.2340	1.8440	5.3526
19	0.1384	0.4706	0.3137	0.3019	0.1587	0.8913	1.3257	1.7523	5.3526
20	0.1384	0.4706	0.3137	0.3019	0.1587	0.8913	1.4243	1.6537	5.3526
21	0.1384	0.4706	0.3137	0.3019	0.1587	0.8913	1.5302	1.5478	5.3526
22	0.1384	0.4706	0.3137	0.3019	0.1587	0.8913	1.6439	1.4341	5.3526
23	0.1384	0.4706	0.3137	0.3019	0.1587	0.8913	1.7661	1.3119	5.3526
24	0.1384	0.4706	0.3137	0.3019	0.1587	0.8913	1.8974	1.1806	5.3526
25	0.1384	0.4706	0.3137	0.3019	0.1587	0.8913	2.0384	1.0396	5.3526
26	0.1384	0.4706	0.3137	0.3019	0.1587	0.8913	2.1899	0.8881	5.3526
27	0.1384	0.4706	0.3137	0.3019	0.1587	0.8913	2.3527	0.7253	5.3526
28	0.1384	0.4706	0.3137	0.3019	0.1587	0.8913	2.5276	0.5504	5.3526
29	0.1384	0.4706	0.3137	0.3019	0.1587	0.8913	2.7155	0.3625	5.3526
30	0.1384	0.4706	0.3137	0.3019	0.1587	0.8913	2.9173	0.1607	5.3526
Levelized Tariff	**0.1384**	**0.4706**	**0.3137**	**0.3019**	**0.1587**	**0.8913**	**0.7650**	**2.3130**	**5.3526**

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Jabori Hydropower Project
Debt Servicing Schedule

Period	Opening Balance US$	Mark-UP US$	Principal Repayment US$	Debt Service Million US$	Annual Principal Repayment-Rs./kWh	Annual Interest Rs./kWh	Annual Debt Servicing Rs./kWh
	16,473,864	601,296.04	79,188	680,484			
	16,394,676	598,405.68	82,078	680,484	0.3647	2.7133	3.0780
1	16,473,864	1,199,702	161,266	1,360,968	0.3647	2.7133	3.0780
	16,312,598	595,409.81	85,074	680,484			
	16,227,523	592,304.60	88,179	680,484	0.3918	2.6862	3.0780
2	16,312,598	1,187,714	173,254	1,360,968	0.3918	2.6862	3.0780
	16,139,344	589,086.05	91,398	680,484			
	16,047,946	585,750.03	94,734	680,484	0.4210	2.6570	3.0780
3	16,139,344	1,174,836	186,132	1,360,968	0.4210	2.6570	3.0780
	15,953,212	582,292.23	98,192	680,484			
	15,855,020	578,708.23	101,776	680,484	0.4523	2.6258	3.0780
4	15,953,212	1,161,000	199,968	1,360,968	0.4523	2.6258	3.0780
	15,753,244	574,993.41	105,491	680,484			
	15,647,753	571,143.00	109,341	680,484	0.4859	2.5921	3.0780
5	15,753,244	1,146,136	214,832	1,360,968	0.4859	2.5921	3.0780
	15,538,412	567,152.05	113,332	680,484			
	15,425,080	563,015.43	117,469	680,484	0.5220	2.5560	3.0780
6	15,538,412	1,130,167	230,801	1,360,968	0.5220	2.5560	3.0780
	15,307,612	558,727.83	121,756	680,484			
	15,185,855	554,283.73	126,200	680,484	0.5608	2.5172	3.0780
7	15,307,612	1,113,012	247,957	1,360,968	0.5608	2.5172	3.0780
	15,059,655	549,677.41	130,807	680,484			
	14,928,848	544,902.97	135,581	680,484	0.6025	2.4755	3.0780
8	15,059,655	1,094,580	266,388	1,360,968	0.6025	2.4755	3.0780
	14,793,267	539,954.26	140,530	680,484			
	14,652,738	534,824.92	145,659	680,484	0.6473	2.4308	3.0780
9	14,793,267	1,074,779	286,189	1,360,968	0.6473	2.4308	3.0780
	14,507,078	529,508.36	150,976	680,484			
	14,356,103	523,997.75	156,486	680,484	0.6954	2.3826	3.0780
10	14,507,078	1,053,506	307,462	1,360,968	0.6954	2.3826	3.0780
	14,199,616	518,286.00	162,198	680,484			
	14,037,418	512,365.77	168,118	680,484	0.7471	2.3310	3.0780
11	14,199,616	1,030,652	330,316	1,360,968	0.7471	2.3310	3.0780
	13,869,300	506,229.45	174,255	680,484			
	13,695,045	499,869.15	180,615	680,484	0.8026	2.2754	3.0780
12	13,869,300	1,006,099	354,870	1,360,968	0.8026	2.2754	3.0780
	13,514,430	493,276.71	187,207	680,484			
	13,327,223	486,443.64	194,040	680,484	0.8622	2.2158	3.0780
13	13,514,430	979,720	381,248	1,360,968	0.8622	2.2158	3.0780
	13,133,183	479,361.16	201,123	680,484			
	12,932,060	472,020.18	208,464	680,484	0.9263	2.1517	3.0780
14	13,133,183	951,381	409,587	1,360,968	0.9263	2.1517	3.0780
	12,723,596	464,411.25	216,073	680,484			
	12,507,523	456,524.59	223,959	680,484	0.9952	2.0828	3.0780
15	12,723,596	920,936	440,032	1,360,968	0.9952	2.0828	3.0780
	12,283,563	448,350.07	232,134	680,484			
	12,051,429	439,877.18	240,607	680,484	1.0692	2.0088	3.0780
16	12,283,563	888,227	472,741	1,360,968	1.0692	2.0088	3.0780
	11,810,823	431,095.02	249,389	680,484			
	11,561,434	421,992.32	258,492	680,484	1.1486	1.9294	3.0780
17	11,810,823	853,087	507,881	1,360,968	1.1486	1.9294	3.0780
	11,302,942	412,557.37	267,927	680,484			
	11,035,015	402,778.05	277,706	680,484	1.2340	1.8440	3.0780
18	11,302,942	815,335	545,633	1,360,968	1.2340	1.8440	3.0780
	10,757,309	392,641.78	287,842	680,484			
	10,469,467	382,135.54	298,349	680,484	1.3257	1.7523	3.0780
19	10,757,309	774,777	586,191	1,360,968	1.3257	1.7523	3.0780
	10,171,118	371,245.81	309,238	680,484			
	9,861,880	359,958.62	320,525	680,484	1.4243	1.6537	3.0780
20	10,171,118	731,204	629,764	1,360,968	1.4243	1.6537	3.0780
	9,541,354	348,259.44	332,225	680,484			
	9,209,130	336,133.24	344,351	680,484	1.5302	1.5478	3.0780
21	9,541,354	684,393	676,575	1,360,968	1.5302	1.5478	3.0780
	8,864,779	323,564.43	356,920	680,484			
	8,507,859	310,536.87	369,947	680,484	1.6439	1.4341	3.0780
22	8,864,779	634,101	726,867	1,360,968	1.6439	1.4341	3.0780
	8,137,912	297,033.79	383,450	680,484			
	7,754,462	283,037.86	397,446	680,484	1.7661	1.3119	3.0780
23	8,137,912	580,072	780,897	1,360,968	1.7661	1.3119	3.0780
	7,357,016	268,531.07	411,953	680,484			
	6,945,063	253,494.79	426,989	680,484	1.8974	1.1806	3.0780
24	7,357,016	522,026	838,942	1,360,968	1.8974	1.1806	3.0780
	6,518,073	237,909.68	442,574	680,484			
	6,075,499	221,755.71	458,728	680,484	2.0384	1.0396	3.0780
25	6,518,073	459,665	901,303	1,360,968	2.0384	1.0396	3.0780
	5,616,771	205,012.13	475,472	680,484			
	5,141,299	187,657.40	492,827	680,484	2.1899	0.8881	3.0780
26	5,616,771	392,670	968,299	1,360,968	2.1899	0.8881	3.0780
	4,648,472	169,669.23	510,815	680,484			
	4,137,657	151,024.48	529,460	680,484	2.3527	0.7253	3.0780
27	4,648,472	320,694	1,040,274	1,360,968	2.3527	0.7253	3.0780
	3,608,197	131,699.21	548,785	680,484			
	3,059,413	111,668.56	568,816	680,484	2.5276	0.5504	3.0780
28	3,608,197	243,368	1,117,600	1,360,968	2.5276	0.5504	3.0780
	2,490,597	90,906.79	589,577	680,484			
	1,901,020	69,387.22	611,097	680,484	2.7155	0.3625	3.0780
29	2,490,597	160,294	1,200,674	1,360,968	2.7155	0.3625	3.0780
	1,289,923	47,082.19	633,402	680,484			
	656,521	23,963.02	656,521	680,484	2.9173	0.1607	3.0780
30	1,289,923	71,045	1,289,923	1,360,968	2.9173	0.1607	3.0780

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