



National Electric Power Regulatory Authority Islamic Republic of Pakistan

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No. NEPRA/TRF-259/PPDCL-2014/1482-1484
February 4, 2015

Subject: Determination of the Authority in the Matter of Tariff Petition filed by Punjab Power Development Company Ltd. for its Pakpattan Hydropower Project [Case # NEPRA/TRF-259/PPDCL-2014]

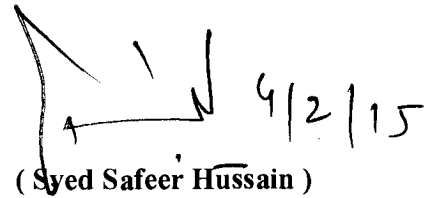
Dear Sir,

Please find enclosed herewith the subject Determination of the Authority along Annex-I & Annex-II (23 pages) in Case No. NEPRA/TRF-259/PPDCL-2014.

2. The Determination is being intimated to the Federal Government for the purpose of notification of the approved tariff in the official gazette pursuant to Section 31(4) of the Regulation of Generation, Transmission and Distribution of Electric Power Act (XL of 1997) and Rule 16(11) of the National Electric Power Regulatory Authority Tariff (Standards and Procedure) Rules, 1998.

3. Please note that Order of the Authority Determination along with Annex-I & Annex-II needs to be notified in the official Gazette.

Enclosure: As above


(Syed Safeer Hussain)

Secretary
Ministry of Water & Power
'A' Block, Pak Secretariat
Islamabad

CC:

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



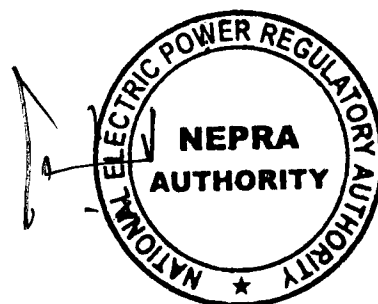
**DETERMINATION OF THE AUTHORITY IN THE MATTER OF TARIFF
PETITION FILED BY PUNJAB POWER DEVELOPMENT COMPANY LIMITED
FOR ITS PAKPATTAN HYDROPOWER PROJECT**

1. BACKGROUND

- 1.1 Punjab Power Development Company Limited (herein referred to as the "Petitioner") filed a Tariff Petition dated March 17, 2014 (hereinafter referred to as the "Petition") pursuant to Rule 3 of the National Electric Power Regulatory Authority (Tariff Standards and Procedures) Rules, 1998 (hereinafter referred to as the "tariff rules") for determination of EPC stage generation tariff for its 2.82 MW Pakpattan Hydropower project (herein referred to as the "Project") being set up at R.D. 114+634 of Pakpattan Canal about 14 km from Pakpattan City, Punjab.
- 1.2 In accordance with sub-rule 3 of rule 4 of the tariff rules, the Petition was admitted by the Authority on April 15, 2014. Consequent to the admission, notice of admission/ Hearing was published in the national newspapers on June 05, 2014, inviting thereby all the stakeholders, interested/affected persons or parties to participate in the tariff setting process through filing of comments/ Intervention Requests. Further, in accordance with sub-rule 5 of rule 4 of the tariff rules, written notices were sent to the key stakeholders and parties, which in the opinion of the Authority were likely to be interested or affected or may be of assistance to the Authority in arriving at a just and informed determination, requesting for their participation in the tariff setting process. In accordance with section 7 (5) of the Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997, the Authority also sought recommendations of the Government of Punjab on this Petition.
- 1.3 Neither any intervention request nor any comments were filed in response to the Authority's notice of admission and Hearing. The power purchaser has been identified as Multan Electric Power Company (hereinafter referred to as MEPCO), however it has been noted with concern that throughout the proceedings of the Petition, MEPCO has failed to provide any input.

2. SUBMISSIONS OF THE PETITIONER

- 2.1. The project is currently at an advanced stage of construction and is being set up under Asian Development Bank's Renewable Energy Development Sector Investment Program (hereinafter referred to as REDSIP). As per the Petitioner, the generation from the project will be injected to the nearby existing Grid of MEPCO at about 14 Km from site. It is pertinent to mention here that under this loan, the five hydropower projects which were envisaged to be constructed in Punjab are:





Name of Project	Capacity as per Feasibility
Marala Hydropower Project	7.2 MW
Pakpattan Hydropower Project	3.2 MW
Okara Hydropower Project	4.0 MW
Chianwali Hydropower Project	5.4 MW
Deg-Outfall Hydropower Project	5.0 MW
Total	24.8 MW

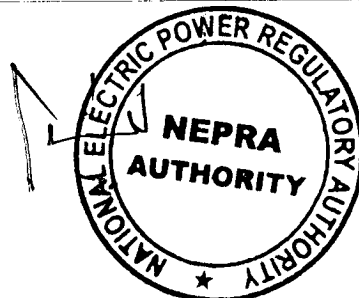
2.2. Summary of the technical and financial information provided by the petitioner regarding the Pakpattan hydropower project is as follows:

Technical Specifications

Capacity	2.82 MW
Type of Facility	Very Low Head Hydropower Project
Turbine Type	Pit Type Kaplan (Horizontal Shaft)
Number of Units	2
Per Unit Design Discharge	40 cumecs (80 cumecs Total)
Head (Rated)	4.2 meters
Plant Factor	89%
Auxiliary Consumption	1%
Net Annual Energy Generation	21.67 GWh

Financial Parameters

Cost Head	PKR Million
Civil Works	612.95
Electrical and Mechanical Works	596.88
Total EPC Cost (including escalation)	1,209.82
Duties & Taxes, Sindh Infrastructure Cess	23.09
Land, Resettlement and Compensation	86.00
Project Administration	30.25
C.D.M. (Clean Development Mechanism)	4.81
Project Management - Engineering & Supervision	19.19
Consultancy	17.10
Financial Charges	31.21
Interest During Construction	16.08
Total Project Cost	1,437.56
Debt Equity Ratio	80:20
Debt Financing	Foreign
Base Rate	6 Month LIBOR (0.80%)
Premium	0.60%
Repayment Period	20 Years
Commitment Fee	0.75%
Return on Equity (including Return on equity during construction)	17%
Construction Period	30 months
Tariff Control Period	30 Years
Proposed Levelised Tariff (1-30 Years)	Rs. 8.8076
USD/PKR Exchange Rate	102.93





3. PROCEEDINGS

- 3.1. The Hearing on the matter was held on June 19, 2014 in Islamabad. The Hearing was duly attended by representatives of the petitioner. During the Hearing, the petitioner was questioned regarding various technical and financial parameters of the project.
- 3.2. Pursuant to proceedings of the Hearing, the petitioner submitted additional information/ cost claims vide its letters No. PD-PPMU/1144/2014 dated June 25, 2014 and No. PD.PPMU/899/2014 dated September 30, 2014.

4. ISSUES

- 4.1. Based on the available information, proceedings of the case and information submitted by the petitioner, the following main issues were framed for discussion and consideration by the Authority:

- Whether the power purchaser will bear the hydrological risk?
- Whether the capacity and annual generation claimed by the petitioner are justified?
- Whether construction period claimed by the petitioner is justified?
- Whether project cost claimed by the petitioner is justified?
- Whether the terms and conditions of debt claimed by the petitioner are justified?
- Whether O&M costs claimed by the petitioner are justified?
- Whether insurance during operations claimed by the petitioner is justified?
- Whether the Return on Equity claimed by the petitioner is justified?

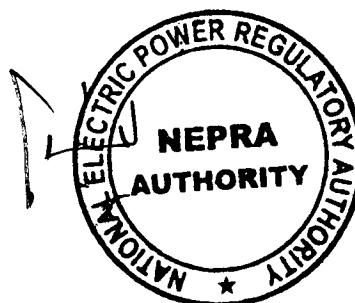
4.2. **Whether the power purchaser will bear the hydrological risk?**

4.2.1. The Petitioner has proposed that hydrological risk shall be borne by the power purchaser. The Power Purchaser has not provided any input on this matter. As per the policy, the risk of hydrology is the responsibility of the power purchaser.

4.2.2. The Authority's tariff determinations for comparable hydropower projects stipulate that the hydrological risk is to be borne by the power purchaser. The Authority after due consideration has decided that in the instant case, the power purchaser will bear hydrological risk of the project. The Power Purchaser is directed to carry out proper due diligence of the historical average monthly hydrology and the same should be incorporated along with the monthly benchmark energy in the Power Purchase Agreement (PPA), as elaborated in paragraph 4.3.3.

4.3. **Whether the capacity and annual generation claimed by the petitioner are justified?**

4.3.1. The Petitioner has claimed gross annual energy of 21.89 GWh and net annual energy of 21.67 GWh based on auxiliary consumption of 1%. Installed capacity and annual energy figures claimed in the Tariff Petition vis-à-vis feasibility study, tender documents and detailed design report/EPC contract of the project are tabulated hereunder for clarity:





	Feasibility Level Design	Tender Level Design	Detailed Design Report/EPC Contract	Tariff Petition
Capacity (MW)	3.20	2.82	2.82	2.82
Gross Annual Energy (GWh)	22.70	21.89	20.86	21.89
Plant Factor	80.98%	88.61%	84.38%	88.61%

4.3.2. The Authority has noted that contrary to the installed capacity of 3.20 MW suggested in the feasibility study, the project has been contracted at 2.82 MW installed capacity, with an improvement in the plant factor from 80.98% in the feasibility study to 84.38% as per detailed design report.

4.3.3. Further, the Authority has also noted that the Petitioner has claimed the energy generation figures of its tender level design, which are slightly higher than the energy figures as per the detailed design report. Keeping in view all the documentary evidences provided by the petitioner, the Authority has decided to allow net annual generation of 21.671 GWh based on 1% auxiliary consumption and installed capacity of 2.82 MW as proposed by the petitioner, which is also favourable from the consumers' perspective.

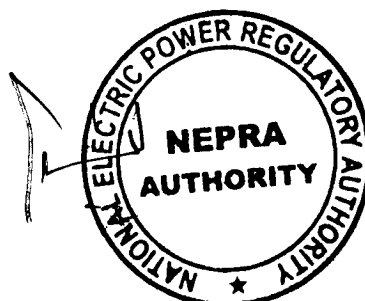
4.4. Whether construction period claimed by the petitioner is justified?

4.4.1. The Petitioner has requested for approval of 30 months construction period. The Authority has observed that the EPC contract provided by the Petitioner specifies the time period for completion of the project as 885 days.

4.4.2. The Authority earlier in a similar project had allowed 30 months construction period. Therefore, the Authority hereby allows the petitioner maximum project construction period of 30 months. The petitioner is directed to submit detail of 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, for adjustment in the project cost, along with its application for allowing tariff adjustments at the COD. Further, the construction start date should be negotiated by the petitioner with the power purchaser and should be incorporated in the Power Purchase Agreement. The petitioner will be allowed adjustments at the COD for maximum project construction period of 30 months starting from the construction start date stipulated in the Power Purchase Agreement.

4.5. Whether project cost claimed by the petitioner is justified?

4.5.1. The Petitioner has claimed the following project costs:



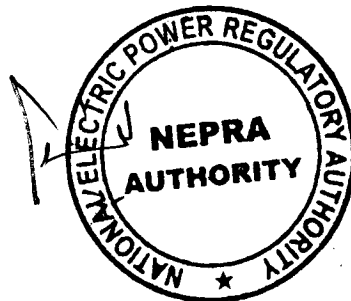


Sn	Description	Local Cost (Rs. Mill)	Foreign Cost (Equivalent Rs. Mill)	Total Equivalent Project Cost (Rs. Mill)
1	Civil Works including Employers Facilities and Design Services	107.29	505.66	612.95
2	Electrical and Mechanical Works including Design Services, Transportation, Testing and Commissioning	24.34	572.54	596.88
3	Total Bid Price	131.63	1,078.19	1,209.82
4	Duties & Taxes (5% of Imported Items only)	20.33	-	20.33
5	Sind Infrastructure Cess @ 0.68% of Imported Items	2.76	-	2.76
6	Land, Resettlement and Compensation	86.00	-	86.00
7	Project Administration, Audit & Account @ 2.5% of EPC Cost	30.25	-	30.25
8	C.D.M (Clean Development Mechanism)	4.81	-	4.81
9	Project Management - Engineering & Supervision	19.19	-	19.19
10	Consultancy	11.97	5.13	17.10
11	Capital Cost	306.95	1,083.32	1,390.27
12	Financing Charges	-	31.21	31.21
13	Interest During Construction	-	16.08	16.08
14	Project Cost	306.95	1,130.61	1,437.56

4.5.2. The project costs claimed by the Petitioner are discussed head-wise below

4.5.3. EPC Cost

4.5.3.1. The Authority has noted that as per documentary evidences provided by the petitioner, International Competitive Bidding (ICB) mode has been adopted for the execution of the project; and Joint Venture of Sinotec Co. Ltd., Hunan Sunny Hydropower Equipment Corporation and SKAFS International (Pvt.) Ltd. (SINOTEC-SHPE-SKAFS JV) has been appointed as Contractor for providing construction and development services on EPC / turnkey basis for the project. As per the contractual documents, the ICB process began with Bid Submission & Opening of Technical Bid on November 08, 2010, followed by Price Bid Opening on March 07, 2011. The Letter of Acceptance / Notification of Award of contract was given by the petitioner on August 29, 2011, whereas after fulfilment of all necessary conditions including submission of Performance Guarantee by EPC contractor (September 10, 2011), Signing of Contract Agreement (September 24, 2011) and submission of Advance Payment Guarantee by EPC contractor (October 01, 2011), an Effective Date of May 28, 2012 has been stipulated in the contract. The Time for Completion of the Facilities, as per the contract, is 885 calendar days from the Effective Date.



4.5.3.2. The Petitioner has provided Technical and Price Bid evaluation reports prepared by its management consultants (Punjab Hydropower Consultants – A JV of four consultancy firms, namely Hydro Power Engineering GMBH & Co. HPE, Germany; Technical Resource Services (Pvt) Ltd.; Electra Consultants, Pakistan; and Technical Engineering and Management Consultants, Pakistan). As per the bid evaluation reports, the Asian Development Bank's Single Stage two envelope bidding procedure has been adopted for the purpose of procurement of Plant, Design, Supply and Installation of the project on EPC/ Turnkey basis. The reports suggest that a total of 8 firms submitted proposals for award of contract, out of which the following 4 firms were determined as substantially responsive to the commercial and technical terms and conditions of the tender documents:

- i. SINOTEC – SHPE - SKAFS JV
- ii. CLIC – LAC Consortium
- iii. SHUNTAI-JINLUN & Al Fajar JV
- iv. CWE-TTP JV

4.5.3.3. According to the Price Bid Evaluation report, the price bids of the abovementioned bidders were checked for errors, adjusted for exchange rate differences and after factoring in the discount offered by each of the bidders, the bid price of SINOTEC-SHPE – SKAFS JV was determined as the lowest. The Authority, after considering the fairly detailed evaluation procedure conducted under the guidelines of Asian Development Bank, has established that the EPC bidding procedure was satisfactory.

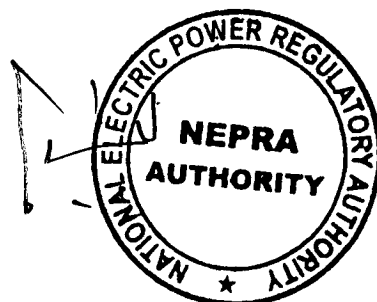
4.5.3.4. The Petitioner has claimed total EPC cost of Rs. 1,209.82 Million. The signed EPC contract stipulates that the contract price shall be the aggregate of foreign component of US\$ 10,635,542 and Local component of Rs. 131,630,360, which works out to be US\$ 11.914 million at reference exchange rate of 102.93.

4.5.3.5. The Authority has noted with concern that the per MW EPC cost of the project is significantly higher than the EPC cost approved for comparable hydropower projects. The Petitioner vide its letter no. PD-PPMU/1144/2014 dated June 25, 2014 furnished clarifications on the issue of high per MW EPC cost of the project which was raised by the Authority during the Hearing. The Petitioner submitted that the Very Low Head (VLH) technology deployed for projects in Punjab has certain limitations including:

- a) Almost all projects require a combination of falls which are 4 – 10 km apart.
- b) Due to combination of falls, re-modelling of main canals and reconstruction of existing bridges and regulators etc. are additional cost components which are otherwise not part of common HPPs.
- c) Machines need a larger diameter along with large power houses.
- d) Capacity of projects is small leading to higher per MW cost.

4.5.3.6. The Authority has noted that the largest impact on the per MW EPC cost of the project is attributable to the large-scale civil works involved with this very low head project.

4.5.3.7. Further, the Authority has noted that as per the terms of the EPC contract submitted by the Petitioner, the EPC price is fixed and the EPC contract contains no price escalation.





clauses. Therefore, no increase in EPC price will be required at the time of COD adjustment of Tariff, except for increase on account of exchange rate variation against foreign component of the EPC price. However, an abnormally high part of the EPC price, especially the civil works component of the EPC price, is payable in US Dollars. Civil works are generally deemed as a local cost due to the fact that most inputs for civil works are locally available. Based on this notion, the Authority's "Mechanism for Determination of Tariff for Hydropower Projects" also allows adjustments due to escalation in local prices of steel, cement, labor and fuel.

- 4.5.3.8. Notwithstanding the above, the Authority has noted that since the signing of the EPC contract in September 2011 until September 2014, the Pakistani Rupee's average rate of depreciation against the US Dollar has been acceptable when compared with local price inflation indices of some of the major inputs for construction of hydropower projects, as well as the average local CPI inflation rate published by the Pakistan Bureau of Statistics, as depicted in the table below:

	Inflation/ Depreciation Rates
Steel Bar and Sheets	15%
Steel Products	21%
Cement	38%
Diesel Oil	13%
Pakistan CPI	27%

USD/PKR Exchange Rate	16%
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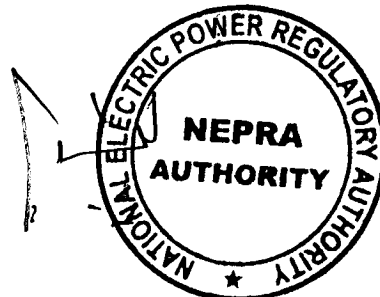
- 4.5.3.9. Based on the aforementioned, the Authority has decided to accept the pricing of a major part of civil works in US Dollars, as per the EPC contract.

4.5.4. Variation Orders

- 4.5.4.1. The Petitioner has submitted a variation order dated January, 2014 amounting to Rs. 19.753 Million, which was executed subsequent to the award of EPC contract and is related to enhancement of security measures around the project/ colony area for the security of engineers working on site. Further vide its letter dated June 25, 2014 the petitioner requested that variation/ change orders or any other justifiable expenses may be kept as re-opener at COD. The Authority has considered all documentary evidences submitted by the Petitioner in support of its claim, and has decided that any variation order falling outside the scope of the tender documents cannot be allowed. The cost of Rs. 19.753 million variation order is hence disallowed.

4.5.5. Cost of Interconnection

- 4.5.5.1. The Authority has noted that the EPC price includes the price of construction of transmission line and associated costs amounting to Rs. 8.971 Million. The total length of the 11 KV Transmission Line is 14 Km.





4.5.5.2. The power purchaser identified by the Petitioner, MEPCO has not provided its comments on the tariff petition or the interconnection arrangement of the project, despite written directions issued by the Authority.

4.5.5.3. Since the comments of power purchaser on interconnection arrangements and the associated costs are not available, the Authority is constrained to exclude Rs. 8.971 million on account of price of construction of transmission line and associated costs from the EPC contract price. The Authority has decided to allow recovery of the interconnection cost incurred by the petitioner, if any, at the COD stage, after it submits a detailed plan duly endorsed by the power purchaser and authentic verifiable documents, to the satisfaction of the Authority, that these costs have been actually incurred in a prudent manner.

4.5.6. Duties and Taxes

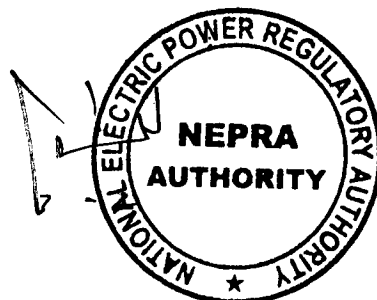
4.5.6.1. Customs Duties amounting to Rs. 20.33 Million, assumed @ 5% of the foreign cost of plant & equipment, have been claimed by the Petitioner. Additionally, Sindh Infrastructure Cess amounting to Rs. 2.76 Million @ 0.68% of imported items has been included in the cost estimates of the Project. The Authority, in similar cases, has allowed duties and taxes @ 5% of the cost of plant and machinery to be imported from abroad and has decided to allow duties and taxes to the petitioner on similar lines. Accordingly the duties and taxes allowed by the Authority work out to US \$ 0.232 million, which will be subject to adjustment on actual at COD. Adjustment of duties and taxes on actual at COD stage, will be allowed for only those duties and taxes which are imposed on the petitioner. Adjustment of taxes/duties payable on fees/charges, etc. of various third parties, not directly imposed on the petitioner, will not be allowed. The mechanism for adjustment of duties and taxes at actual on COD is detailed in paragraph (I) (b) of the order.

4.5.7. The Authority after due consideration allows US \$ 10.636 million and Rs. 122.659 million as EPC cost to the petitioner with no price escalations except for those detailed in the order. In addition, duties and taxes of US \$ 0.232 million are allowed at this stage, which will be subject to adjustment at actual on COD as detailed in paragraph (I) (b) of the order.

4.5.8. Land Resettlement and Compensation

4.5.8.1. The Petitioner has claimed land and resettlement cost amounting to Rs. 86.00 million. The following breakup regarding the cost of land has been provided by the Petitioner:

Land	Rs. 71.84 Million
Crop Compensation	Rs. 3.50 Million
Trees Compensation	Rs. 1.03 Million
Third Party/External Monitoring & Evaluation of Land Acquisition and Resettlement	Rs. 1.00 Million
Special Security Measures	Rs. 7.73 Million
Total	Rs. 85.07 Million Say Rs. 86 Million





4.5.8.2. As per the Short Land Acquisition and Resettlement Plan (SLARP) dated October 17, 2011 a total of 59.02 acres of irrigated farmland is being acquired, out of which 52.0125 acres of land belong to private land owners, 3.31 acres are Auqaf land and 3.4 acres are possessed by the Punjab Irrigation Department. The Authority has noted that the estimated total cost of compensation/relocation and impact mitigation in the SLARP report amounts to Rs. 87.54 million excluding contingencies. The Authority considers that the estimated amount of Rs. 87.54 million presented in the SLARP report, despite being higher than the claimed amount, should be relied upon as it comes from a proper study, and the same is hereby allowed in the instant case subject to adjustment as detailed in paragraph I (d) of the order.

4.5.9. Project Administration, Audit & Account (Project Development)

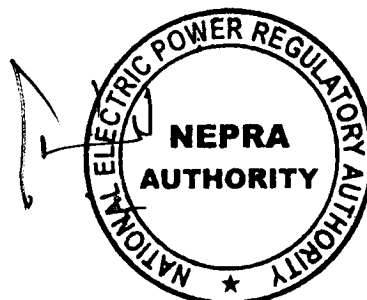
4.5.9.1. The Petitioner has claimed Project Administration, Audit & Account cost of Rs. 30.25 million. The Authority has noted that this cost is mainly the project development cost of the Petitioner which comprises of expenditures incurred during construction phase on account of salaries of officers and staff, rents, purchase of office equipment and fixtures, and various fees. In view of costs allowed to similar hydropower projects under this head the Authority hereby allows Project development cost of US\$ 0.175 million (Rs. 18.013 Million).

4.5.10. Carbon Credits Consultancy cost

4.5.10.1. The Petitioner has provided Consultancy Services Agreement dated April 23, 2014 signed between the petitioner and the consultant for Capacity Building and CDM Registration of five Hydropower Projects. As per the agreement, the consultant has been hired for the purpose of assisting the Government of Punjab in CDM pre-registration and pre-implementation process for five of its hydro power projects (24.8MW in total) being financed through the REDSIP program and to provide CDM trainings for the Government of Punjab to accumulate experiences on overall CDM process for its institutional capacity building.

4.5.10.2. The Authority considers that the Govt. of Punjab has taken a positive step in attempting to register its projects under the CDM, and these will be one of the first projects to cover some groundwork with regard to claiming carbon credits. The petitioner is directed to submit a progress report on the CDM registration of the project, along with its request for allowing tariff adjustments at COD.

4.5.10.3. Moreover, the Authority considers that the lump sum price of Rs. 6,356,906 as per the Consultancy contract is reasonable, considering the fact that the contract covers five hydropower projects. Further, since the scope of work of the consultant for CDM remains constant, regardless of the capacity of each project, the Authority has decided that the cost be split up evenly over the five projects, namely Marala HPP, Pakpattan HPP, Okara HPP, Chianwali HPP and Deg-Outfall HPP. Accordingly, the cost for consultancy of CDM for each project works out to be Rs. 1.271 million and is hereby allowed.



4.5.11. Management Consultancy cost

4.5.11.1. The Petitioner initially claimed a Project Management - Engineering & Supervision cost of Rs. 19.19 million, whereas a cost of Consultancy amounting to Rs. 17.10 million was also claimed separately. However, the Petitioner vide its letter dated June 25, 2014 has clarified that both of the aforementioned costs are in fact related to the management consultancy contract, but were inadvertently split up in the Tariff Petition. The sum of the split up cost, as claimed by the Petitioner works out to be Rs. 36.29 Million.

4.5.11.2. In support of its claim the petitioner has provided copy of its contract with consultants M/s Punjab Hydropower Consultants, a Joint Venture of four consultancy firms, namely Hydro Power Engineering GMBH & Co. HPE, Germany; Technical Resource Services (Pvt) Ltd.; Electra Consultants, Pakistan; and Technical Engineering and Management Consultants, Pakistan. The Authority has noted that the scope of services of the Management consultant primarily involves construction management and engineering related services for all five hydropower project being constructed under the REDSIP loan in Punjab, including Pakpattan HPP.

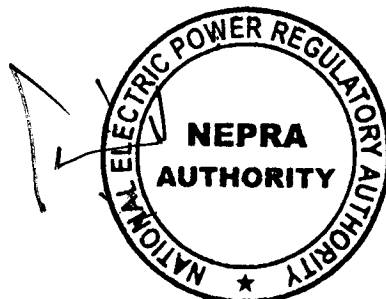
4.5.11.3. Further, the maximum price payable under the contract is US\$ 0.438 Million for foreign component and Rs. 103.530 Million for local component. The Authority considers that given the scope of the Management Consultancy contract, the price negotiated by the Petitioner for Management Consultancy services falls within acceptable limits, and therefore the same is allowed to the Petitioner. However, since the contract covers five hydropower projects, this cost is to be spread over the five hydropower projects on logical grounds.

4.5.11.4. The Authority has decided to split the management consultancy contract price between all five projects based on their respective feasibility stage capacities (as detailed in paragraph 2.1 of this determination). The maximum ceiling for cost of management consultancy allowed for Pakpattan hydropower project prorated on the basis of feasibility design capacity is US\$ 0.057 Million in foreign component and Rs. 13.359 Million in local component.

4.5.11.5. Moreover, the Petitioner has also submitted variation order for consultancy services agreement amounting to Rs. 51.769 million local component and US\$ 0.170 foreign component. The Authority has noted that this variation order was necessitated due to delay in contract award of Chianwali HPP and Deg-Outfall HPP by nine (9) months. The Authority considers that since the variation order is attributable to other hydropower projects, the additional cost of management consultancy contract variation order cannot be considered in case of Pakpattan hydropower project, and hence this cost is disallowed in this case.

4.5.12. Financing Charges

4.5.12.1. The Petitioner has claimed financial charges amounting to Rs. 31.21 Million based on 2.58% of the total EPC cost. The Petitioner has submitted that this cost involves the cost of letter of credit (LC) and commitment charges stipulated in the loan agreement.





4.5.12.2. Based on the documentary evidence submitted by the petitioner, the Authority has assessed US\$ 0.068 million as financial charges. The Authority has further decided that these financial charges will be subject to adjustment at COD on the basis of actual expense, up to a maximum of 3% of the allowed debt (excluding the impact of interest during construction and financial charges), on production of authentic documentary evidence.

4.5.13. Interest During Construction

4.5.13.1. The petitioner has claimed interest during construction (hereinafter referred to as "IDC") amounting to Rs. 16.08 Million (equivalent to US\$ 0.156 Million), based on 30 months construction period and interest rate of six months LIBOR (0.80%) plus 0.6% spread. The information and documentary evidences provided by the petitioner have been scrutinized and found to be acceptable. The terms and conditions allowed by the Authority pertaining to the construction period and interest rate on debt are detailed in other parts of this determination. Based on the financing and other terms/conditions allowed to the petitioner, the Authority has assessed IDC as US\$ 0.124 million. The IDC will be adjusted at COD on the basis of actual debt draw downs (within the overall debt allowed by the Authority at COD), actual JPY/PKR exchange rate variation and actual interest rates not exceeding the limit of 6 months LIBOR plus 0.60%, during the project construction period allowed by the Authority.

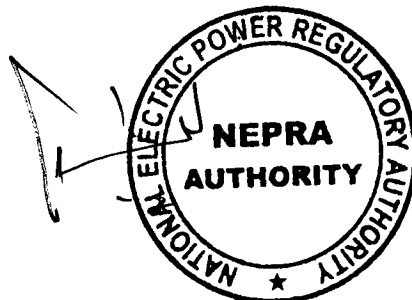
4.5.13.2. Recapitulating, the approved project cost under various cost heads is given hereunder:

	Equivalent Total (US\$ Million)
EPC Cost	11.827
Duties & Taxes	0.232
Land, Resettlement and Compensation	0.850
Project Administration	0.175
C.D.M. Consultancy	0.012
Management Consultancy	0.187
Financial Charges	0.068
Interest During Construction	0.124
Total Project Cost	13.476

4.6. Whether the terms and conditions of debt claimed by the petitioner are justified?

4.6.1. The petitioner has requested for allowing the following terms for its 100% foreign debt:

Debt as % of project cost	80%
Debt Servicing	Bi-annual
Premium	6-month LIBOR + 0.60%
Debt repayment period	20 Years plus 5 Years Grace Period





4.6.2. The Authority has noted that the Petitioner's loan is denominated in Japanese Yen. After due consideration, the Authority has decided to allow the indexation of debt component with JPY/PKR exchange rate parity.

4.6.3. The Authority has also considered terms of debt claimed by the petitioner as detailed above and has noted that these terms compare favorably with the debt terms allowed to some other hydropower projects. The Authority has therefore decided to allow the debt terms detailed at paragraph 4.6.1 above to the petitioner.

4.7. Whether O&M costs claimed by the petitioner are justified?

4.7.1. The Petitioner has claimed the following variable and fixed O&M costs:

	Foreign (Equivalent Rs. Million)	Local (Rs. Million)	Total (Rs. Million)
Fixed O&M costs	6.385	25.541	31.926
Variable O&M costs	-	10.642	10.642
Total O&M	6.385	36.183	42.568

4.7.2. The petitioner has submitted that fixed O&M costs represent the fixed costs incidental to plant Operation and Maintenance, covering management fee, remuneration to the personnel, rent, utilities, and fee for maintaining consents, local taxes and cost of expatriate services to be engaged for O&M of the plant.

4.7.3. Moreover, the petitioner has submitted that variable O&M costs primarily includes cost of the services of operation and maintenance on a kWh basis for the day to day management of the hydropower plant, covering the replacement of spare parts on completion of their service life; replacement on account of premature failure of the parts; the cost of maintenance of unforeseen/un-scheduled outages; as well as Consumption of lubricants, chemicals, etc.

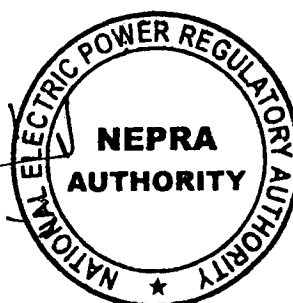
4.7.4. The Authority considers that the O&M costs claimed by the Petitioner, being 3.10% of the allowed project cost less Interest During Construction, are excessively high compared to O&M costs allowed to similar hydropower projects. After due consideration, the Authority has assessed total O&M cost as US\$ 0.240 Million (Rs. 24.737 Million), i.e. 1.8% of approved project cost less IDC.

4.7.5. The breakup of allowed O&M cost of the Petitioner is given hereunder:

	Foreign (US\$ Million)	Local (Rs. Million)	Total (Rs. Million)
Fixed O&M costs	0.036	14.842	18.553
Variable O&M costs	-	6.184	6.184
Total O&M	0.036	21.026	24.737

4.8. Whether insurance during operations claimed by the petitioner is justified?

4.8.1. The petitioner has claimed cost of insurance during operations on the basis of 1.35% of the claimed EPC cost.





4.8.2. The Authority has decided to allow to the petitioner, insurance during operations up to 1.35% of the allowed EPC cost, in accordance with the established benchmark. In case of insurance denominated in US \$, insurance cost component of tariff will be adjusted on account of US\$/PKR exchange rate variation on annual basis. Further, insurance component of the reference tariff will be adjusted as per actually incurred prudent costs, subject to maximum of 1.35% of the EPC cost, on annual basis upon production of authentic documentary evidence by the petitioner.

4.9. Whether return on equity claimed by the petitioner is justified?

4.9.1. The Petitioner has requested for allowing 17% return (IRR based) on invested equity, which is in line with return already being allowed to hydropower generation sector by the Authority.

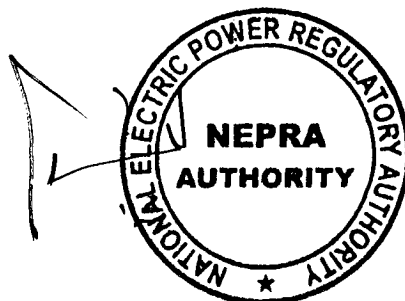
4.9.2. Further, the Petitioner has assumed Redemption of Equity in its tariff calculations. The Authority observed that this project is being developed in the public sector and therefore it does not need to be transferred to anyone at the end of the tariff control period. In view thereof, the Authority finds no justification to allow redemption of equity to the petitioner.

4.9.3. The Authority has assessed return on equity after COD (hereinafter referred to as "ROE") and return on equity during construction (hereinafter referred to as "ROEDC") on the basis of terms and conditions allowed to the petitioner, as detailed in this determination and equity draw down schedule claimed by the petitioner. The return on equity 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.

ORDER

Pursuant to Rule 6 of the National Electric Power Regulatory Authority Licensing (Generation) Rules, 2000, read with Section 31(4) of the Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997, Punjab Power Development Company Limited (the Petitioner) is allowed to charge, for its Pakpattan Hydropower Project, the following specified/approved tariff for delivery of electricity to the power purchaser:

Tariff Components	Years 1-20 Rs./kWh	Years 21-30 Rs./kWh	Indexation
Fixed charges			
Fixed O & M			
- Local	0.6849	0.6849	CPI - General
- Foreign	0.1712	0.1712	US\$/PKR & US CPI
Insurance	0.7584	0.7584	US\$/PKR
Debt service	2.7726	-	JPY/PKR & LIBOR
Return on equity	2.1762	2.1762	US\$/PKR
Return on equity during construction	0.4579	0.4579	US\$/PKR





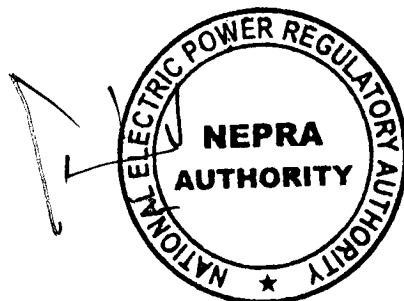
Variable charges			
Variable O & M - Local	0.2854	0.2854	CPI - General
Water Use Charge	0.1500	0.1500	CPI - General
Total	7.4566	4.6840	

- i) The reference tariff has been calculated on the basis of net annual benchmark energy generation of 21.671 GWh for installed capacity of 2.82 MW.
- ii) The above charges will be limited to the extent of net annual energy generation of 21.671 GWh. Net annual generation supplied during a year to the power purchaser in excess of benchmark energy of 21.671 GWh, will be charged at 10% of the prevalent approved tariff.
- iii) 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.
- iv) The reference US\$/PKR rate has been taken as 102.93.
- v) The above tariff is applicable for a period of thirty years commencing from the commercial operations date (COD).
- vi) The component wise tariff is indicated at Annex-I.
- vii) Debt Servicing Schedule is attached as Annex-II.

I. One Time Adjustments

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

- a. The specific items of project cost to be paid in foreign currency (i.e. US\$ or JPY) will be adjusted at COD on account of actual variation in exchange rate over the reference US\$/PKR exchange rate of Rs. 102.93 and reference JPY/PKR exchange rate of 0.99 on production of verifiable documentary evidence by the Petitioner. For all project costs payable in PKR, the amounts allowed in US\$ will be converted into PKR using the reference US\$/PKR exchange rate of Rs.102.93.
- b. Duties and/or taxes, not being of refundable nature, imposed on the petitioner up to the commencement of its commercial operations will be subject to adjustment at actual on COD, as against US \$ 0.232 million allowed now, upon production of verifiable documentary evidence to the satisfaction of the Authority.



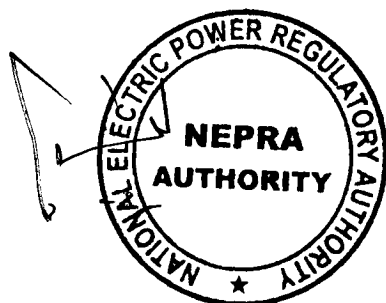


- c. Adjustment of the interconnection cost to be borne by the petitioner, if any, will be allowed at COD upon submission of a detailed plan duly endorsed by the power purchaser and authentic verifiable documents, to the satisfaction of the Authority.
- d. Land and Resettlement costs will be allowed as per actual, as against US\$ 0.850 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.
- e. Financial charges will be adjusted at COD on the basis of actual expense, up to a maximum ceiling of 3% of the total debt allowed (excluding the impact of interest during construction and financial charges), on production of authentic documentary evidence.
- f. The interest during construction will be adjusted at COD on the basis of actual debt draw downs (within the overall debt allowed by the Authority at COD), actual JPY/PKR exchange rate variation for foreign loan denominated in Japanese Yen and actual interest rates not exceeding the limit of 6 months LIBOR plus 0.60%, during the project construction period allowed by the Authority.
- g. 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.
- h. The return on equity (including return on equity during construction) will be adjusted at COD on the basis of US\$/PKR exchange rate variation.
- i. 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.
- j. 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.

II. Pass-Through Items

No provision for income tax has been accounted for in the tariff. If any tax is imposed on the petitioner, the exact amount paid by the petitioner shall be reimbursed by the power purchaser to the petitioner on production of original receipts. This payment will be considered as a pass-through payment spread over a 12 months period. Furthermore, in such a scenario, the petitioner shall also submit to the power purchaser details of any tax shield savings and the power purchaser shall deduct the amount of these savings from its payment to the petitioner on account of taxation.

Withholding tax on dividends is also a pass through item just like other taxes as indicated in the government guidelines for determination of tariff for new IPPs. The power purchaser shall make payment on account of withholding tax at the time of actual payment of





dividend, on production of original receipts, subject to maximum of 7.5% of 17% return on equity according to the following formula:

$$\text{Withholding tax payable} = \{17\% * (E_{(Ref)} - E_{(Red)})\} + ROEDC_{(Ref)} \times 7.5\%$$

Where:

$$E_{(Ref)} = \text{Adjusted reference equity at COD}$$

$$E_{(Red)} = \text{Equity redeemed}$$

$$ROEDC_{(Ref)} = \text{Adjusted reference return on equity during construction}$$

In case the petitioner does not declare a dividend in a particular year or only declares a partial dividend, then the difference in the withholding tax amount (between what is paid in that year and the total entitlement as per the net return on equity) would be carried forward and accumulated so that the petitioner is able to recover the same as a pass through from the power purchaser in future on the basis of the total dividend payout.

III. Hydrological Risk

The power purchaser will be required to bear hydrological risk only to the extent of 21.671 GWh net annual energy generation. Payment on account of hydrological risk shall be made by the power purchaser, on the basis of benchmark monthly energy generation, based on the average historic hydrology for that particular month.

IV. Indexations:

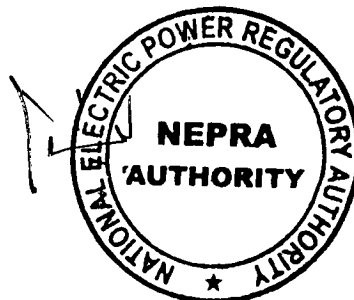
The following indexation shall be applicable to the reference tariff:

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:

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

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





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

Where;

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

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

$V O \& M_{(L,REV)}$ = The revised applicable variable O&M local component of tariff

$FO \& M_{(I,REF)}$ = The reference fixed O&M local component of tariff for the relevant period

$FO \& M_{(F,REF)}$ = The reference fixed O&M foreign component of tariff for the relevant period

$VO \& M_{(L,REF)}$ = The reference variable O&M local component of tariff for the relevant period

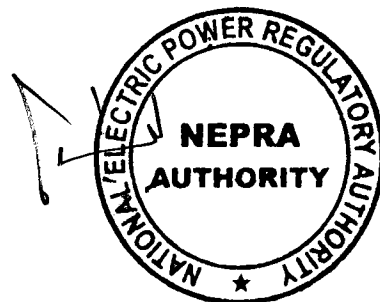
$CPI_{(REV)}$ = The revised Consumer Price Index (General) as notified by the Pakistan Bureau of Statistics

$CPI_{(REF)}$ = 190.82 Consumer Price Index (General) of March 2014 notified by the Pakistan Bureau of Statistics

$US CPI_{(REV)}$ = The revised US CPI (all urban consumers)

$US CPI_{(REF)}$ = 236.293 US CPI (all urban consumers) for the month of March 2014 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 102.93

ii) Water Use Charges

Water Use Charges will be paid on units delivered basis and will be indexed with Consumer Price Index (CPI) annually. The indexed component of water use charges shall not exceed the actual expense. The first such adjustment shall be due after one year of COD, according to the following formula:

$$WUC_{(REV)} = Rs. 0.1500 * CPI_{(REV)} / CPI_{(REF)}$$

Where;

$WUC_{(REV)}$ = The revised Water Use Charge component indexed with Consumer Price Index (CPI)

$CPI_{(REV)}$ = The revised Consumer Price Index (General) as notified by the Pakistan Bureau of Statistics

$CPI_{(REF)}$ = Reference Consumer Price Index (General) of the latest available month preceding the date of COD as notified by the Pakistan Bureau of Statistics

iii) Adjustment of insurance component

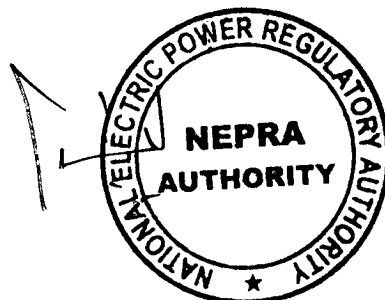
In case of insurance denominated in US \$, insurance cost component of tariff will be adjusted on account of USS/PKR exchange rate variation on actual basis. Further, insurance component of the reference tariff will be adjusted as per actually incurred prudent costs, subject to the maximum ceiling of 1.35% of the approved EPC cost, on annual basis upon production of authentic documentary evidence by the petitioner.

iv) Return on equity

The return on equity component of tariff including return on equity during construction will be adjusted on the basis of revised TT & OD selling rate of US Dollar as notified by the National Bank of Pakistan according to the following formula:

$$ROE_{(REV)} = ROE_{(REF)} * ER_{(REV)} / ER_{(REF)}$$

$$ROEDC_{(REV)} = ROEDC_{(REF)} * ER_{(REV)} / ER_{(REF)}$$





Where:

$ROE_{(REV)}$ = Revised return on equity component of tariff expressed in Rs/kWh.

$ROE_{(REF)}$ = Reference return on equity component of tariff expressed in Rs/kWh.

$ROEDC_{(REV)}$ = Revised return on equity during construction component of tariff expressed in Rs/kWh.

$ROEDC_{(REF)}$ = Reference return on equity during construction component of tariff expressed in Rs/kWh.

$ER_{(REV)}$ = 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 of 102.93

v) Adjustment for LIBOR variation

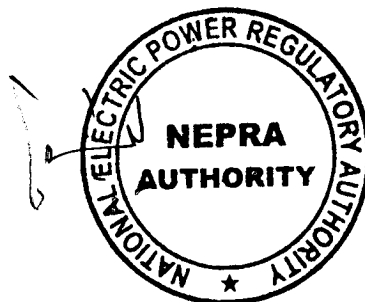
The interest part of debt service component will remain unchanged throughout the term except for the adjustment due to variation in 6 months Yen LIBOR, while spread of 0.60% on 6 months Yen LIBOR remaining the same, according to the following formula:

$$\Delta I = P_{(REV)} * (LIBOR_{(REV)} - 0.189\%) / 2$$

Where:

ΔI = the variation in interest charges applicable corresponding to variation in 6 months Yen LIBOR. ΔI can be positive or negative depending upon whether 6 months Yen LIBOR_(REV) per annum > or < 0.189%. The interest payment obligation will be enhanced or reduced to the extent of ΔI 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.





Note:

Adjustments on account of inflation, foreign exchange rate variation, LIBOR variation and actual insurance will be approved and announced by the Authority within fifteen working days after receipt of the petitioner's request for adjustment in tariff in accordance with the requisite indexation mechanism stipulated herein.

V. 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:

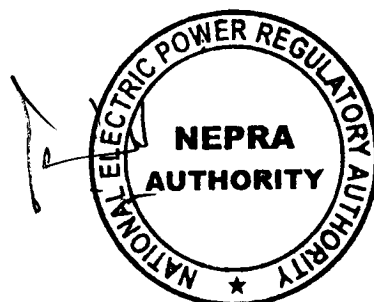
The petitioner shall process and obtain emissions/carbon credits expeditiously and credit the proceeds to the power purchaser as per the applicable government policy and the terms and conditions agreed between the petitioner and the power purchaser.

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:

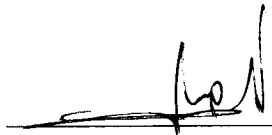
- i. The Authority has allowed/approved only those cost(s), term(s), condition(s), provision(s), etc. which have been specifically approved in this tariff determination. Any cost(s), term(s), condition(s), provision(s), etc. contained in the tariff petition or any other document which are not specifically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

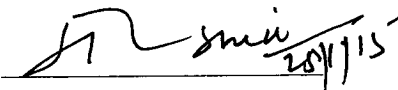


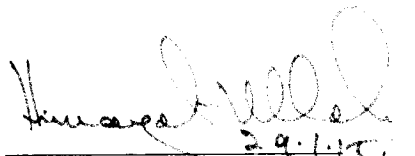


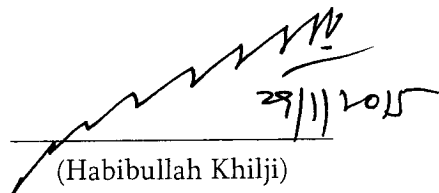
- iii. The order along with reference tariff table and debt service schedule as attached thereto are recommended for notification by the Federal Government in the official gazette in accordance with Section 31(4) of the Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997.

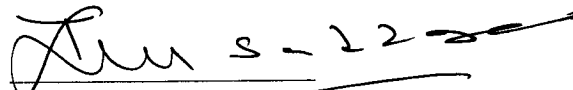
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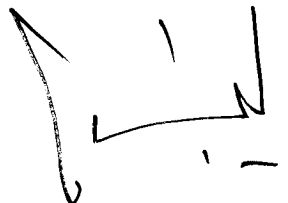

28 01 XV
(Khawaja Muhammad Naeem)
Member

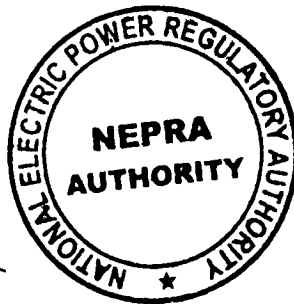

28/1/15
(Maj. (R) Haroon Rashid)
Member

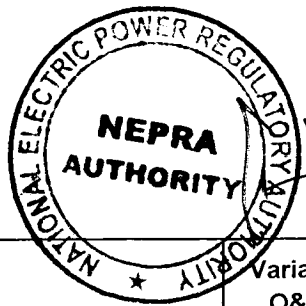

29.1.15
(Himayat Ullah Khan)
Member


29/1/15
(Habibullah Khilji)
Member


22-2-15
(Brig. (R) Tariq Sadozai)
Chairman


4-2-15





PUNJAB POWER DEVELOPMENT COMPANY LIMITED (PPDCL)
PAKPATTAN HYDROPOWER PROJECT
REFERENCE TARIFF

Year	Variable O&M Local	Water Use Charge	Fixed O&M Local	Fixed O & M Foreign	Insurance	Return on Equity (ROE)	ROE During Construction (ROEDC)	Withholding Tax @7.5%	Loan Repayment	Interest Charges	Total Tariff
	Rs./kWh	Rs./kWh	Rs./kWh	Rs./kWh	Rs./kWh	Rs./kWh	Rs./kWh	Rs./kWh	Rs./kWh	Rs./kWh	Rs./kWh
1	0.2854	0.1500	0.6849	0.1712	0.7584	2.1762	0.4579	0.1976	2.3733	0.3993	7.6541
2	0.2854	0.1500	0.6849	0.1712	0.7584	2.1762	0.4579	0.1976	2.3920	0.3806	7.6541
3	0.2854	0.1500	0.6849	0.1712	0.7584	2.1762	0.4579	0.1976	2.4109	0.3617	7.6541
4	0.2854	0.1500	0.6849	0.1712	0.7584	2.1762	0.4579	0.1976	2.4300	0.3426	7.6541
5	0.2854	0.1500	0.6849	0.1712	0.7584	2.1762	0.4579	0.1976	2.4492	0.3234	7.6541
6	0.2854	0.1500	0.6849	0.1712	0.7584	2.1762	0.4579	0.1976	2.4686	0.3040	7.6541
7	0.2854	0.1500	0.6849	0.1712	0.7584	2.1762	0.4579	0.1976	2.4881	0.2845	7.6541
8	0.2854	0.1500	0.6849	0.1712	0.7584	2.1762	0.4579	0.1976	2.5078	0.2648	7.6541
9	0.2854	0.1500	0.6849	0.1712	0.7584	2.1762	0.4579	0.1976	2.5276	0.2450	7.6541
10	0.2854	0.1500	0.6849	0.1712	0.7584	2.1762	0.4579	0.1976	2.5476	0.2250	7.6541
11	0.2854	0.1500	0.6849	0.1712	0.7584	2.1762	0.4579	0.1976	2.5677	0.2049	7.6541
12	0.2854	0.1500	0.6849	0.1712	0.7584	2.1762	0.4579	0.1976	2.5880	0.1846	7.6541
13	0.2854	0.1500	0.6849	0.1712	0.7584	2.1762	0.4579	0.1976	2.6085	0.1641	7.6541
14	0.2854	0.1500	0.6849	0.1712	0.7584	2.1762	0.4579	0.1976	2.6291	0.1435	7.6541
15	0.2854	0.1500	0.6849	0.1712	0.7584	2.1762	0.4579	0.1976	2.6499	0.1227	7.6541
16	0.2854	0.1500	0.6849	0.1712	0.7584	2.1762	0.4579	0.1976	2.6708	0.1018	7.6541
17	0.2854	0.1500	0.6849	0.1712	0.7584	2.1762	0.4579	0.1976	2.6919	0.0807	7.6541
18	0.2854	0.1500	0.6849	0.1712	0.7584	2.1762	0.4579	0.1976	2.7132	0.0594	7.6541
19	0.2854	0.1500	0.6849	0.1712	0.7584	2.1762	0.4579	0.1976	2.7347	0.0379	7.6541
20	0.2854	0.1500	0.6849	0.1712	0.7584	2.1762	0.4579	0.1976	2.7563	0.0163	7.6541
21	0.2854	0.1500	0.6849	0.1712	0.7584	2.1762	0.4579	0.1976	-	-	4.8815
22	0.2854	0.1500	0.6849	0.1712	0.7584	2.1762	0.4579	0.1976	-	-	4.8815
23	0.2854	0.1500	0.6849	0.1712	0.7584	2.1762	0.4579	0.1976	-	-	4.8815
24	0.2854	0.1500	0.6849	0.1712	0.7584	2.1762	0.4579	0.1976	-	-	4.8815
25	0.2854	0.1500	0.6849	0.1712	0.7584	2.1762	0.4579	0.1976	-	-	4.8815
26	0.2854	0.1500	0.6849	0.1712	0.7584	2.1762	0.4579	0.1976	-	-	4.8815
27	0.2854	0.1500	0.6849	0.1712	0.7584	2.1762	0.4579	0.1976	-	-	4.8815
28	0.2854	0.1500	0.6849	0.1712	0.7584	2.1762	0.4579	0.1976	-	-	4.8815
29	0.2854	0.1500	0.6849	0.1712	0.7584	2.1762	0.4579	0.1976	-	-	4.8815
30	0.2854	0.1500	0.6849	0.1712	0.7584	2.1762	0.4579	0.1976	-	-	4.8815
Levelized Tariff	0.2854	0.1500	0.6849	0.1712	0.7584	2.1762	0.4579	0.1976	2.2580	0.2460	7.3855

Levelized Tariff (1-30 years) discounted at 10% per annum = US Cents 7.1751/kWh at reference exchange rate of 1 US\$ =Rupees 102.93.

**PUNJAB POWER DEVELOPMENT COMPANY LIMITED (PPDCL)
PAKPATTAN HYDROPOWER PROJECT**

Annex-II

Debt Servicing Schedule

Period	Foreign Debt					Annual Principal Repayment Rs./Kwh	Annual Interest Rs./kWh	Annual Debt Servicing Rs./kWh
	Principal Million \$	Repayment Million \$	Mark-Up Million \$	Balance Million \$	Debt Service Millin \$			
	10.78	0.25	0.04	10.53	0.2919			
	10.53	0.25	0.04	10.28	0.2919			
1	10.78	0.50	0.08	10.28	0.5837	2.3733	0.3993	2.7726
	10.28	0.25	0.04	10.03	0.2919			
	10.03	0.25	0.04	9.78	0.2919			
2	10.28	0.50	0.08	9.78	0.5837	2.3920	0.3806	2.7726
	9.78	0.25	0.04	9.52	0.2919			
	9.52	0.25	0.04	9.27	0.2919			
3	9.78	0.51	0.08	9.27	0.5837	2.4109	0.3617	2.7726
	9.27	0.26	0.04	9.01	0.2919			
	9.01	0.26	0.04	8.76	0.2919			
4	9.27	0.51	0.07	8.76	0.5837	2.4300	0.3426	2.7726
	8.76	0.26	0.03	8.50	0.2919			
	8.50	0.26	0.03	8.24	0.2919			
5	8.76	0.52	0.07	8.24	0.5837	2.4492	0.3234	2.7726
	8.24	0.26	0.03	7.98	0.2919			
	7.98	0.26	0.03	7.72	0.2919			
6	8.24	0.52	0.06	7.72	0.5837	2.4686	0.3040	2.7726
	7.72	0.26	0.03	7.46	0.2919			
	7.46	0.26	0.03	7.20	0.2919			
7	7.72	0.52	0.06	7.20	0.5837	2.4881	0.2845	2.7726
	7.20	0.26	0.03	6.94	0.2919			
	6.94	0.26	0.03	6.67	0.2919			
8	7.20	0.53	0.06	6.67	0.5837	2.5078	0.2648	2.7726
	6.67	0.27	0.03	6.41	0.2919			
	6.41	0.27	0.03	6.14	0.2919			
9	6.67	0.53	0.05	6.14	0.5837	2.5276	0.2450	2.7726
	6.14	0.27	0.02	5.87	0.2919			
	5.87	0.27	0.02	5.60	0.2919			
10	6.14	0.54	0.05	5.60	0.5837	2.5476	0.2250	2.7726
	5.60	0.27	0.02	5.33	0.2919			
	5.33	0.27	0.02	5.06	0.2919			
11	5.60	0.54	0.04	5.06	0.5837	2.5677	0.2049	2.7726
	5.06	0.27	0.02	4.79	0.2919			
	4.79	0.27	0.02	4.52	0.2919			
12	5.06	0.54	0.04	4.52	0.5837	2.5880	0.1846	2.7726
	4.52	0.27	0.02	4.24	0.2919			
	4.24	0.28	0.02	3.97	0.2919			
13	4.52	0.55	0.03	3.97	0.5837	2.6085	0.1641	2.7726
	3.97	0.28	0.02	3.69	0.2919			
	3.69	0.28	0.01	3.41	0.2919			
14	3.97	0.55	0.03	3.41	0.5837	2.6291	0.1435	2.7726
	3.41	0.28	0.01	3.14	0.2919			
	3.14	0.28	0.01	2.86	0.2919			
15	3.41	0.56	0.03	2.86	0.5837	2.6499	0.1227	2.7726
	2.86	0.28	0.01	2.58	0.2919			
	2.58	0.28	0.01	2.29	0.2919			
16	2.86	0.56	0.02	2.29	0.5837	2.6708	0.1018	2.7726
	2.29	0.28	0.01	2.01	0.2919			
	2.01	0.28	0.01	1.73	0.2919			
17	2.29	0.57	0.02	1.73	0.5837	2.6919	0.0807	2.7726
	1.73	0.29	0.01	1.44	0.2919			
	1.44	0.29	0.01	1.16	0.2919			
18	1.73	0.57	0.01	1.16	0.5837	2.7132	0.0594	2.7726
	1.16	0.29	0.00	0.87	0.2919			
	0.87	0.29	0.00	0.58	0.2919			
19	1.16	0.58	0.00	0.58	0.5837	2.7347	0.0379	2.7726
	0.58	0.29	0.00	0.29	0.2919			
	0.29	0.29	0.00	0.00	0.2919			
20	0.58	0.58	0.00	0.00	0.5837	2.7563	0.0163	2.7726

* 1 USD = 103.11 JPY

