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National Electric Power Regulatory Authority
Islamic Republic of Pakistan

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No. NEPRA/R/IPT-04/MPCL/1115-1117
January 23, 2019

Subject: **Approval of Rates in the matter of Tariff Proposal submitted by Central Power Purchasing Agency (Guarantee) Ltd. for Import of Power from 640 MW Mahl Hydropower Project [Case # NEPRA/IPT-04/MPCL]**

Dear Sir,

Please find enclosed herewith the subject Approval of the Authority (21 pages) in Case No. NEPRA/IPT-04/MPCL.

2. The Approval is being intimated to the Federal Government for the purpose of notification in the official gazette in accordance with the provisions of Section 31(7) of the Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997 read with Regulation 4(4) of the NEPRA (Import of Electric Power) Regulations, 2017.

Enclosure: As above

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(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.

APPROVAL OF RATES IN THE MATTER OF TARIFF PROPOSAL SUBMITTED BY CENTRAL POWER PURCHASING AGENCY (GUARANTEE) LTD FOR IMPORT OF POWER FROM 640 MW MAHL HYDROPOWER PROJECT.

1. BACKGROUND

1.1 In terms of Regulation 3 of NEPRA Import of Electric Power Regulations, 2017 (IEPR-2017), Central Power Purchasing Agency Guarantee Limited (hereinafter referred to as "the Buyer") has filed an application before NEPRA seeking determination of rates proposed by 640 MW Mahl Power Company Private Limited located in the territory of Azad Jammu & Kashmir. Salient features of the tariff proposal are as under:

Project Company	Mahl Power Company (Pvt.) Ltd.	
Sponsor	CASIL, Trans Tech	
Project Location	River Jhelum, Azad Jammu and Kashmir	
Concession Period (Years)	30	
Construction Period (Years)	6 years (72 months)	
Project Type	Run of River	
Project Basis	BOOT	
Gross Capacity (MW)	640	
Auxiliary Consumption (MW)	6.4	
Net Capacity	633.6 MW	
Annual Net Energy Production (GWh)	2904	
Plant Capacity Factor	52.33%	
Turbines (Vertical Francis)	3 with capacity more than 200 MW	
Rated Head	55 m	
Design Discharge	1,305 m3/s	
	Project Cost & Tariff	
Project Cost	**Description**	**US$ in M**
	EPC	870.80
	Engineering & Supervision	52.25
	Project Development Cost	60.96
	Land Acquisition & Resettlement & Env. Mitigation	26.70
	Custom Duties & Taxes	10.64
	Insurance During Construction	14.03
	Law Services/Legal Fees & Charges	5.70
	Sinosure Overseas Investment Insurance	53.43
	Financial Charges	24.99
	Interest During Construction	161.97
	Total Project Cost	**1,281.47**
	Project Cost MW/US$	**2.002**

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Project Financing	Debt (80%)		
	Foreign (100%)		1,025.17
	Local (0%)		
	Equity (20%)		256.3
	Total Project Financing		
Financing Terms	Description	Foreign	Local
	Loan Term	18 Years incl. 6 years grace period	
	Debt Repayment Installments	Semiannual	
	Markup rate	6 Months LIBOR 0.91+450 bps	6 Months KIBOR
Operations Cost	**Description**		**US$ in M**
	O&M (per annum)		20.35
	Water Use Charges (average)		11.78
	Insurance		11.75
	Total		43.88
Tariff Proposal	US Cent 7.1030/kWh (Rs. 7.4404 /kWh)		
Exchange Rate	1US$ =PKR 104.75		
Major Milestones Achieved	Bankable feasibility study approved by the PPIB		

2. Proceedings:

2.1 In terms of regulation 3(6) of IEPR-2017 the application was admitted on 20.03.2018 and the salient features of the tariff proposal were published in the newspapers inviting filing of replies, intervention requests or comments. It was also decided to conduct a hearing on the matter on June 07, 2018. Notices of hearing and the proposed issues to be discussed and deliberated upon during the hearing were also published in the national newspapers on May 30, 2018. In response, no intervention request or written comments were filed.

3. Hearing

3.1 The hearing on the subject matter was held on June 07, 2018 at the NEPRA Headquarters, Islamabad which was attended by the representatives of Seller, representatives of Private Power Infrastructure Board (PPIB), Managing Director of Power Development Organization Azad Jammu & Kashmir, Syed Akhtar Ali Shah (ex-Member Energy, Planning Commission), Ms.Sadia Abbasi, (representative of General Electric) and other stakeholders. However there was no representative from the Buyer.

4. Comments of the Stakeholders:

4.1 Though no written comments were received from any participants of the hearing, yet the gist of the verbal comments offered during the course of hearing by some of the stakeholders is given as under:

4.2 Ms. Sadia Abbas (representative of General Electric) commented that the cost of electromechanical equipment claimed by the seller is high.

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4.3 Syed Akhtar Ali (ex-Member Energy Planning Commission) also contested the higher electromechanical cost.

4.4 Being an important stakeholder, subsequent to the hearing, the Authority also directed the Buyer to submit written comments to the issues framed for hearing. The Buyer vide letter dated June 29-06-2018 submitted written response which is discussed in the relevant succeeding paragraphs of this document.

5. Arguments heard and record perused. Having considered the respective submissions of the Buyer and other stakeholders present in the hearing, the issue-wise findings of the Authority on the subject tariff proposal are as under:-

5.1 Whether the project design/feasibility study has been approved by the competent authority/forum? Whether the claimed plant Capacity factor of 52.33% and net annual Energy of 2,904 GWh at the feasibility stage, is justified?

5.1.1 The Seller in tariff proposal to the Buyer submitted, an approval letter of PPIB dated January 24, 2017 regarding the Feasibility Study for 640 MW Mahl Hydropower Project which states the following :

i. The civil work's costs in the Feasibility Study are estimated to be 15% to 20% higher compared to the prevailing market while the other items in the capital costs such as contingencies, engineering & supervision, and project development have a reasonable room for downwards reduction. Likewise there appears room for reduction in the Project's construction period by about six (6) months.

ii. Panel of Expert (POE) has monitored the Feasibility Study according to the requirements of Policy for Power Generation Projects, 2002 and in this regard relied on data collected and presented by Sponsors and their consultants, hence POE jointly and/ or individually will not be responsible for accuracy & reliability of data, contents and conclusion given in the Feasibility Study.

iii. The approval of this Feasibility Study as provided herein shall not absolve the Sponsors from their responsibility about accuracy, reliability, viability and cost effectiveness of technical, social, environmental, financial aspects, etc.

iv. In view of the observation of POE, the Power Purchaser and NEPRA may carry out their own due diligence before approval of the tariff.

5.1.2 The Seller during the hearing also submitted that, the Annual Average Energy (Gross) of 2,934 GWh has been calculated on the basis of historical data of water discharges from 1965-2014 resulting into Plant Load Factor of 52.33% while computing, the scheduled outages (maintenance outages, sediment flushing outage, major overhaul outage) and force outages are not netted.

5.1.3 The Authority noted that, the net annual energy of 2,904 GWh and Plant Factor of 52.33% claimed by the Seller do not tally with figures given in the Feasibility Study. The Authority being cognizant of the fact that since the approval of the feasibility study is the mandate of PPIB, whereby the Panel of Experts thoroughly review and deliberate the feasibility study of the projects; sought comments on the approved annual estimated energy and plant factor.

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5.1.4 The PPIB vide letter dated August 3rd, 2018 submitted that as per the approved feasibility report total generation is 2,676 GWh/year (net generation, 2,649 GWh/year) with a plant factor of 47.7% (Gross).In view thereof, relying on PPIB's response, the Authority has decided to use the figures of the approved feasibility communicated by PPIB for calculating the tariff.

5.2 Whether the construction period of 6 years (72 months) is justified?

5.2.1 The Seller in its tariff proposal to the Buyer as well as during the hearing submitted that, the total construction period planned for Mahl HPP is 72 months, including 04 months for preparation of construction, 67 months for construction of main works and 01 month for project completion.

5.2.2 The Buyer vide its letter dated June 29, 2018 submitted that the 06 year construction period proposed by the Seller Company is long as compared to other hydropower projects under development stage on the same river and in the same area such as Karot HPP which is also being developed by the same Sponsors having construction period of 05 years. The Buyer is of the view that the construction period of the project should be reduced to 05 years as it will reduce the tariff and also make the project more viable.

5.2.3 PPIB, while conveying POE's approval of the Feasibility Study has suggested that the construction period can be shortened by 06 months.

5.2.4 On the issue of standardization of construction period, 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 project varies substantially across the projects due to various reasons such as execution philosophy and site conditions etc. Having considered the argument put forth by the Buyer and PPIB, the Authority feels that 66 months construction period as suggested by PPIB is reasonable; and therefore has decided to approve the same.

5.3 Whether the requested EPC cost of US$ 870.80 million is justified?

5.3.1 As per the tariff proposal submitted by the Seller to the Buyer, the claimed EPC cost estimates of US $ 870.80 million, i.e. 1.36 million per MW are prepared from (a) Bill of Quantities for the preparatory and permanent civil works (b) Costs of E&M (including engineering/design, cost of procurement, transportation, erection and commissioning) and (c) Contingencies. Following is the summary of EPC Costs.

Description	**US$ million**
Civil Works & Preparatory Works	591.90
Electrical & Mechanical Equipment, Erection Works	222.61
Contingency for Civil Cost and E&M Cost	56.29
Total	**870.80**

5.3.2 The Seller during the hearing submitted that consequent to POE approval of Feasibility Study, tariff proposal was submitted to the Buyer, and after detailed deliberations and negotiation with the Buyer, final proposal with reduction in EPC cost from US$ 955.52 million to US$ 870.8 was agreed.

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5.3.3 The Seller in its tariff proposal to the Buyer as well as in hearing further submitted that the EPC contractor for the project will be selected through International Competitive Bidding (ICB) process complying with NEPRA's Guideline for selection of EPC Contractor.

5.3.4 **Civil Works:**

5.3.5 The Seller in its tariff proposal to the Buyer intimated that the Civil Works include Infrastructure Works, Diversion Works, Gravity Dam, Piers and Roadway, Spillway, Intake, Penstocks and Upstream Surge Chambers, Powerhouse and Transformer Gallery, Tailrace and Draft Tube Gate Shafts, Ventilation & Chilling Plant Building and Switchgear Building, Alternate Main Access Tunnel cost provisioning related to detailed engineering design and estimated a cost of US$ 591.90 million.

5.3.6 PPIB in its letter dated January 24, 2017 regarding "Approval of Feasibility Study for 640 MW Mahl Hydropower Project "stated that the civil work's costs in the Feasibility Study are estimated to be 15% to 20% higher compared to the prevailing market.

5.3.7 The Buyer also conveyed to the Project Company that the Cost of Civil works should be reduced as per the direction of POE up to 20% of the proposed Cost.

5.3.8 The Authority, while reviewing the EPC cost noted that the Seller has reduced the civil cost mentioned in Feasibility study only by 7.7% from US$ 641.41 million to US$ 591.90 million and not as per the direction of POE as pointed by the Buyer. The Authority further observed that for the conversion of local portion of EPC cost to US$ and exchange rate of US$ 104.75 as of June 30, 2016 has been used, which does not reflect updated EPC cost.

5.3.9 The Authority is also of the view that an updated EPC cost will truly indicate the project tariff, accordingly an exchange rate of US$ 115.40 as of March 30, 2018 has been used for conversion of EPC Cost. The updated civil works cost of the Feasibility Study works out to be US$ 608.38 million.

5.3.10 In view of the observations of the Buyer and PPIB backed by POE comments, the civil works cost is considered to be on the higher side and is therefore reduced by 20%. As a result thereof US$ 486.71 million is approved, while taking into account the impact of aforementioned facts.

5.3.11 **Electromechanical & Electrical Equipment cost:**

5.3.12 The Seller has claimed total cost of US$ 222.61 million which includes US$ 178. 81 million (US$ 160.93 million foreign & US$ 17.88 million local) for the procurement of Electromechanical and Electrical equipment and US$ 43.80 million for erection and commissioning of E&M.

5.3.13 The Seller further submitted that, the cost of electromechanical equipment presented in tariff proposal includes E&M equipment transportation, erection and commissioning costs in addition to the equipment procurement cost. According to the Seller, the cost of civil works associated with installation of electromechanical equipment is also merged under this head, whereas the procurement cost of E&M equipment is US$ 178.81 million, which translates to US$ 0.279 million per MW. In the Seller's opinion the E&M costs estimates are competitive, which will be firmed up at EPC stage.

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5.3.14 The Authority understands that, generally, the cost of E&M equipment for hydro power projects varies and depends on the rated turbine flow rate, net generation head and installed capacity etc of the power plant. The Authority, while reviewing submissions of the Seller noted that no details or breakup of E&M cost has been provided by the Seller in support of its claim, however while relying on the E&M cost of approved hydro plants of similar scale, the claimed cost under this head is reasonable. Moreover, a report namely "A guide for developers and investors" prepared by IFC has also been reviewed which also validates that the proposed cost under this head is in the permissible range. Accordingly, after an adjustment of PKR to US$ exchange rate of Rs. 115.40, an amount of US $ 177.16 million under the head of E&M is being allowed to the Seller.

5.3.15 With regards to E&M Erection and Transportation cost, the Authority while analyzing the regional benchmarks noted that the costs as proposed by the Seller are on higher side and need to be rationalized. In view thereof considering other benchmarks in similar projects the Authority has assessed an amount of US$ 26.14 million in the instant case.

5.3.16 **<u>Contingency Cost:</u>**

5.3.17 The Seller claimed a total contingency cost of US$ 56.29 which includes contingency cost on Civil Works US$ 47.35 million and E&M US$ 8.94 million @ 8% & 5% respectively.

5.3.18 The Authority understands that the construction of hydropower projects is complex and uncertainty of costs particularly the underground works exists, however the Authority considers that contingency @ 5% as against the requested 8% of civil works will be a reasonable assessment. As a result thereof, the same is worked out as US$ 24.33 million against the requested amount of US$ 47.35 million. Similarly the contingency for E&M is being assessed as US$ 4.43 million @ 2.5% as against the requested amount of US$ 8.94 million.

5.3.19 In view of the above discussion regarding the EPC cost, the following is the summary of an approved EPC cost.

Description	**Approved US$ million**
Civil Works & Preparatory Works	486.71
Electrical & Mechanical Equipment,	177.16
E&M Erection & Transportation cost	26.14
Contingency for Civil Cost	28.76
Total	**718.77**

Note: The Seller shall select an EPC contractor as per the Authority's approved EPC Bidding Guidelines 2017 notified vide letter dated May 19, 2017

5.4 Whether the requested non EPC costs amounting to US$ 159.64 million pertaining to Engineering & Supervision, Project Development, Land Acquisition & Resettlement & Environment Mitigation, Insurance during Construction and Law Services/ Legal Fees & Charges is justified?

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5.4.1 The Seller in its tariff proposal has requested US$ 159.64 million under various heads as given hereunder:

Non EPC Cost	US$ million
Engineering & Supervision	52.25
Project Development	60.96
Land Acquisition & Resettlement & Environment Mitigation	26.70
Insurance During Construction	14.03
Law Services/Legal Fees & Charges	5.70
Total	**159.64**

5.5 Engineering & Supervision (E&S):

5.5.1 Under this head, the Seller in tariff proposal to the Buyer has claimed a cost of US$ 52.25 million which is 6% of the EPC cost. The cost expected to be incurred by the company includes the cost of the Feasibility Study, Owner Engineer, Independent Engineer, Reopener Verifier, Technical consultants for Government of China approval, the Seller's other engineering consultants and Company's own supervision during the construction of the project.

5.5.2 The Buyer while objecting the Seller's proposed cost suggests that the allowed cost for M/s Azad Pattan Hydropower Project on account of Engineering & Supervision cost along with construction time of 69 months may be made the basis for computing E&S cost for the instant Project.

5.5.3 Considering the cost claimed by the Seller on the higher side as compared to the cost determined by the Authority in a recent case of similar scale hydropower projects and the suggestion of the Buyer, the Authority feels that the requested cost requires to be rationalized. It is also noted that the Seller in its tariff proposal has not provided the breakup of the E&S cost of US$ 52.25 million, whereby only name of the sub heads like feasibility study, Owner Engineer, Independent Engineer, Reopener Verifier and other Technical Consultants have been mentioned in the proposal without stating each line item's cost. In the absence of relevant details, the Authority is constrained to rely upon the benchmarks available for similar projects as suggested by the Buyer.

5.5.4 In view of the above an amount of US$ 26.96 million under this head is being assessed. The individual line item under the head of E&S may vary but on overall basis the approved cost has been be capped at maximum of $ 26.96 million. In case of cost being less than the approved ceiling the same shall be adjusted.

5.6 Project Development:

5.6.1 The Seller in its tariff proposal to the Buyer as well as during the hearing submitted that, project development cost is estimated at US$ 60.96 million which is 7% of the EPC cost. According to the Seller this cost mainly includes salaries and wages, utilities, travelling and conveyance, office supplies and administration cost, rent rates and taxes, medical and insurance, fee and subscription, vehicles running and maintenance, repair and maintenance, printing stationary and periodicals, miscellaneous and other expenses.

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5.6.2 The Buyer in its comments stated that NEPRA in its latest determination of Azad Pattan Hydro has allowed a cost of US$ 40.84 million under the head of Project Development cost and the Authority's decision has been accepted, accordingly, the cost of the Seller should also be brought in line with the cost of M/s Azad Pattan Hydro Power Project keeping in view of the fact that Mahl HPP is of less capacity than Azad Pattan HPP.

5.6.3 The Authority while agreeing to the suggestion of the Buyer regarding the reduction in development cost and relying on the recently approved project development cost of hydro project of similar scale, has assessed an amount of US$ 39.06 million under the head of project development cost in the instant case. The assessed amount of US$ 39.06 million shall be the maximum cap although the individual line items of project development cost may vary. In case the overall amount under this head is established lower than the allowed ceiling, the difference in the approved cost shall be adjusted.

5.7 Land Acquisition ,Resettlement and Environment Mitigation Cost:

5.7.1 In its tariff proposal, the Seller submitted that, the cost under this head is estimated at US$ 26.70 million based on the standards prevailing in Mahl reservoir area through the investigation by the Feasibility study Consultant. The Seller further submitted that this cost will be utilized for acquisition of land, compensation for resettlement to the inhabitants of the area to be affected by the development of the Project, compensation for removal of trees, crops, cost of social welfare of the local community, income generation and community support programme and other allied costs.

5.7.2 Since the cost of US$ 21.1 million requested by the Seller pertaining to Land Acquisition & Resettlement is subject to adjustment as per actual in accordance with Hydropower Mechanism at COD. While the rest of the estimated cost of US$ 3.17 million relates to Environment Mitigation cost which is considered reasonable. However, regarding the Contingencies & Overhead charges, the Authority is of the opinion that there is no need for contingencies cost when the instant cost is to be adjusted at actual. Therefore no contingencies have been allowed under this head.

5.7.3 In view of the forgoing the Authority has assessed and approved a total cost of US$ 22.03 million adjusted @ 115.40 US$ exchange rate as of March 30, 2018 (US$ 19.15 million for Land Acquisition & Resettlement subject to adjustment as per actual & US $ 2.88 million of Environment Mitigation).

5.8 Insurance During Construction:

5.8.1 The Seller in tariff proposal to the Buyer submitted that, Insurance during construction is estimated at US$ 14.03 million which is 1.6% of the EPC cost. According to the Seller this cost will cover the insurance cost of the project's assets during the construction period which as per the requirement of PPA the company is required to maintain the following insurances:

- Construction All Risk Insurance (CAR)
- CAR Delay in Start-up Insurance;
- Terrorism Insurance;
- Marine and Inland Transit Insurance;
- Marine Delay in Start-up Insurance; and
- Comprehensive General/Third Party Liabilities Insurance

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5.8.2 The Authority noted that the insurance during construction proposed @ 1.6% of EPC cost by the Seller is reasonable and accordingly an amount of US$ 11.50 million calculated @ 1.6% of the approved EPC cost (US$ 718.77 million) is approved.

5.9 Law Services/Legal Fee & Charges:

5.9.1 The Seller in its tariff proposal to the Buyer submitted that the cost of US$ 5.70 million is estimated based on approximately 0.6% of the EPC cost to cover the legal fee and charges associated with engagement of international and domestic law firms for advice on all legal aspects of the project and Stamp duty and registration fee in respect of project documents.

5.9.2 The Authority noted that the Seller's claim is on higher and the costs claimed are merely estimates; however, the Authority is aware that the Seller will acquire legal services for various legal matters and preparation of legal documents etc. Based on Market norms/rates of actual costs of recently completed project, while also relying on the legal cost recently allowed to other similar hydro projects, the Authority considers that an amount of US$ 3.70 million would be sufficient to cover the legal related cost. The approved cost of $3.70 million shall be subject to adjustment at actual with a maximum cap of US$ 3.70 million based on provision of verifiable documentary evidence.

5.9.3 Following is a summary of Non-EPC cost allowed to the Seller:

NON EPC COSTS	Approved Cost US$ million
Engineering & Supervision	26.96
Project Development	39.06
Land Acquisition & Resettlement & Environment	22.03
Insurance during Construction	11.50
Legal Charges	3.70
Total Non EPC	**103.25**

5.10 Whether the Sinosure Fee amounting to US$ 53.43 million claimed on foreign debt and equity is justified?

5.10.1 The Seller in its tariff proposal claimed US$ 53.43 million as a Sinosure Premium based on Sinosure Policy for Overseas Investment Insurance (OII). The Seller submitted that Sinosure is China's official export credit insurance agency, offering export credit insurance and overseas investment insurance. During the hearing the Seller also elaborated that as per the requirement of the Chinese government, Chinese banks providing loan to overseas projects as well as Chinese state-owned enterprises are required to obtain Sinosure coverage. The Seller also submitted that claimed Sinosure fee only covers the debt portion of the project.

5.10.2 The Authority noted that the Seller's claimed amount of US$ 53.43 million is the result of clubbing the premium on Insured loan amount @ 1.25% and commitment fee on Sinosure cost @ 12%. In the opinion of the Authority the claimed cost is on higher side as compared to the other comparable hydro power projects. In the recently approved projects the Authority has allowed Sinosure fee @ 0.6% of the assessed loan plus interest thereon based on the Overseas Investment Insurance Policy. In view thereof the Sinosure fee has been assessed @ 0.6% of the outstanding loan plus interest thereon subject to

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adjustment with a maximum cap of lower of actual or 0.6% on the basis of verifiable documentary evidence.

5.11 Whether the Financial Charges amounting to US$ 24.99 million claimed is justified?

5.11.1 The Seller in its tariff proposal claimed the proposed financial charge of US$ 24.99 million@ 3% of the total loan (excluding Sinosure Premium, Financial Charges and IDC).

5.11.2 The Authority has recently notified (Benchmarks for Tariff Determination) Guidelines 2018 dated June 19, 2018, wherein as per para 8(2) *In case of hydropower projects with capacity up to 50 MW and construction period exceeding 3 years, or power projects with new technologies, a financing fee not exceeding 2.5% of debt shall be approved.* and as per para *8(3) In case of power projects other than those specified in sub-clause (2), a financing fee not exceeding 2.00% of debt shall be approved.*

5.11.3 In view thereof financial charges calculated @ 2% of the assessed Capex Loan has been approved by the Authority which shall be adjusted at actual provided the actual financial charges etc are less than 2% of the assessed Capex loan. Any upward adjustment shall not be allowed.

5.12 Whether the proposed terms of debt financing i.e. spread of 4.5% and Interest during Construction (IDC) is justified?

5.12.1 The Seller in tariff proposal submitted that, the proposed project financing with 80:20 debt equity ratio is based on the assumption that the Project will be 100% financed through foreign loan, however, financing plan will be finalized at a later stage and may include local as well as foreign loan. The following details regarding the proposed financing terms were submitted:

Description	US$
Financing	US$ 1,025.18 million
Construction Period	06 years
Repayment Period	12 Years from COD
Libor	0.91%
Spread	4.5%
Repayment	Semi Annual

5.12.2 With regards to IDC, the Seller in its tariff proposal submitted that an amount of US$ 161.97 million has been computed based on the aforementioned assumptions.

5.12.3 The Authority considered the submissions of the Seller and noted that the debt to equity ratio of 80:20 is within the acceptable range as provided in the NEPRA (Benchmark for Tariff Determination) Guidelines, 2018 (Tariff Guidelines) for hydropower projects, therefore the same is accepted. However, the claimed spread of 4.5% on LIBOR is on higher side when compared to the other comparable projects and also considering the fact that the Seller will also be claiming Sinosure fee as risk coverage for its debt portion. The Tariff Guidelines states that in case of power projects with export credit insurance, the approved LIBOR spread ceiling of 4.60% shall be reduced by 50 basis points.

5.12.4 In view thereof the Authority has decided to restrict the spread on foreign debt at LIBOR+4.10% and if local loan is obtained then the spread shall be capped at 2.75% over KIBOR. Accordingly, for the

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calculation of IDC, the Authority has assumed equally phasing of debt based on 66 months construction period at spread of 4.10% and an updated 06 month base LIBOR rate of 2.45%. 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 6-months LIBOR/KIBOR during the actual project construction period (not exceeding the construction period allowed by the Authority). In case of any savings resulting from reduction in construction period shall also be adjusted in tariff. The increase in IDC due to delay in construction shall however, not be allowed.

5.13 <u>Custom Duties & Sindh Infrastructure Cess:</u>

5.13.1 The Seller has claimed custom duties and Sindh Cess duties amounting to US$ 10.64 million on the import of plant and equipment subject to adjustment as per actual payment at COD.

5.13.2 The Authority observed that 5.95% (5% import duty & 0.95 Sind Cess) has been calculated on both the foreign and local portion of the EPC cost by the Seller instead of applying it on foreign portion of the plant and equipment. In view thereof, the Authority has assessed an amount of US$ 9.58 million as custom duty and Sind Cess and the same is approved which shall be subject to adjustment as per actual upon the provision of verifiable documentary evidence to the satisfaction of the Authority.

5.14 Recapitulating the above, the approved total project cost is mentioned hereunder:

	Approved Cost
EPC COSTS	**US$ million**
Civil Works	486.71
Hydro mechanical & Electrical Equipment	177.16
E&M Erection & Transportation Cost	26.14
Contingencies	28.76
Total EPC Cost	**718.77**
Non-EPC Costs	
Engineering Supervision Cost	26.96
Project Development	39.06
Land Acquisition & Resettlement & Envir. Cost	22.03
Insurance During Construction	11.50
Law Services	3.70
Total Non-EPC Cost	**103.25**
Custom Duties & Sind Cess	9.58
Total Capex	**831.60**
Sinosure Fee	13.62
Financial Charges	13.31
Project Cost Excluding IDC	**858.53**
Interest During Construction	134.45
Total Project Cost	**992.98**

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5.15 Whether the claimed per annum O&M cost of US$ 20.35 million for Fixed and Variable O&M during operations is justified?

5.15.1 The Seller in its tariff proposal to the Buyer stated that for operation and maintenance of the Complex, it is proposing an annual figure of US$ 20.335 million, which will cover personnel cost, administrative/Management expenses, maintenance cost, replacement of parts necessitated due to regular operation/normal maintenance and other costs. The Seller further submitted that as a percentage of Project cost, the O&M cost comes out to be 1.6% of the Project cost and which according to the Seller is in line with O&M allowance for various other Projects. The following is the breakup of the claimed O&M cost:

Operation O & M		**US$ million**
Variable	Foreign-30%	1.56
	Local-70%	3.64
Fixed	Foreign-70%	10.61
	Local-30%	4.55
Total Annual O&M		**20.35**

5.15.2 The Buyer objected that the proposed cost of US$ 20.35 million is higher than the comparable hydro power projects allowed by NEPRA on the basis of 1.5% of the project cost. Since the exact requirement of per annum O&M cost can be established once all the project parameters and costs are firmed up. Therefore, initially, 1.5% of the total approved project cost may be considered on similar lines as already allowed in other comparable hydropower projects.

5.15.3 The Authority having considered the Seller's submissions and the Buyer's objection feels that O&M cost claimed by the Seller is reasonable and comparable with other similar scale hydropower projects. In view thereof, the Authority has decided to approve the same, with the proviso that the project company shall hire an O&M contractor through a transparent bidding process on the similar line as given in the Authority's approved EPC Bidding Guidelines 2017. The Authority also decided that O&M cost of US$ 20.35 million (inclusive of cost of O&M contractor, Company's own cost and taxes) shall be fixed as a maximum cap or actual whichever is lower. The following is the break of the approved O&M cost:

Operation &Maintenance Cost		Approved	
		Year 1-12	Year 13-30
Variable O&M (Rs./kWh)	Local-70%	0.1586	0.1586
	Foreign- 30%	0.0680	0.0680
Fixed O & M (Rs./kW/M)	Local 30%	68.9995	68.9995
	Foreign 70%	160.9988	160.9988

5.16 Whether the claimed Insurance cost per annum for the operation period based at 1.35% of the EPC cost justified?

5.16.1 The Seller in its tariff proposal has proposed Insurance during operation cost of US$ 11.75 million per annum @ 1.35% of the claimed EPC cost. As per the information provided, this insurance cost consists of, 'operational risk', 'Business Interruption, 'Terrorism Insurance, and 'Third party liability' which are standard insurances required by all lenders and also set out in the standardized PPA.

5.16.2 According to the recent updates a continuous decline in global insurance index has been observed which has led to reduction in the insurance premium to be paid by the insured companies to the insurer. Similar decline has been noted in annual insurance component of the hydropower projects during operation wherein the total insurance premium paid was in the range of 0.48% to 0.75% of the EPC

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cost. Further the Authority in its Tariff Guidelines has approved Insurance during operation cost up to a maximum 1% of EPC cost.

5.16.3 In view thereof the Authority has decided to allow insurance during operation @ 0.75% of the 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 Seller.

5.17 Whether the Return on Equity (ROE) and Return on Equity during Construction (ROEDC) computed at 17% is justified?

5.17.1 The Seller in its tariff proposal as well as during the hearing submitted that, for the various hydropower projects being implemented in Pakistan, the Return on Equity ("ROE") and Return on Equity during Construction ("ROEDC") have been computed at 17%.

5.17.2 In order to assess reasonable IRR based return on equity, the Authority has considered the returns offered by various hydropower sponsors in the competitive bidding carried out by Punjab Power Development Board (PPDB) and Pakhtunkhwa Energy Development Organization (PEDO). Based thereon, the Authority considers that in instant case an IRR of 15% can be considered a reasonable assessment. Hence, the same is being allowed.

5.18 Whether the WHT on dividend is justified?

5.18.1 The Seller in its tariff proposal has claimed withholding tax on dividend shall be treated as a pass through item.

5.18.2 The Buyer is of the view that withholding tax on dividends is actually paid by the company on behalf of the shareholders and not on behalf of the project company. According to the Buyer, it is obliged to reimburse only the taxes paid by the company (not the shareholders). Therefore, the payment on account of withholding tax on dividends should not be treated as pass through item.

5.18.3 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 Seller to allow WHT as a pass through component being inconsistent with the guidelines is hereby declined.

5.19 <u>Special Return on Equity (SROE):</u>

5.19.1 The Seller during the hearing submitted that, keeping in view the long project development period for hydropower projects, Special ROE on equity injection for a period comprising of 30 months prior to Financial Close may be allowed in accordance with ECC decision dated July 2009 as has been allowed by the Authority to other Hydropower Projects in the Past.

5.19.2 The Authority is aware of the fact that as in para I(iii) of the ECC decision dated 28.07.2009 wherein as per the referred para of the decision it is stated that, "*For all other hydropower projects, a 30 months period prior to construction start, may be allowed for Internal Rate of Return (IRR) calculation subject to provision of related audited accounts*".

5.19.3 In pursuance of the above, the Authority has already allowed this return to other hydropower projects, the request of the Seller is therefore justified. The exact amount of SROE will be determined and adjusted in the tariff at COD, based on audited accounts and related verifiable documentary evidence to be provided by the Seller to the satisfaction of the Authority.

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6 ORDER:

6.1 The Authority, in exercise of its powers under Regulation 4(3) of the NEPRA (Import of Electric Power) Regulations, 2017, has decided to approve the following rates and terms and conditions for import of power by the Buyer (Central Power Purchasing Agency) from the Seller (Mahl Power Company limited):

Tariff Components	Year 1-12	Year 13-30	Indexation
Variable Charge (Rs/kWh)			
Variable O&M – Local	0.1586	0.1586	Pakistan CPI
Variable O&M- Foreign	0.0680	0.0680	PKR/US$, US CPI
Water Use Charge	0.4250	0.4250	As per GoP Policy
Fixed Charge (Rs/kW/M)			
Fixed O&M – Local	68.9995	68.9995	Pakistan CPI
Fixed O&M – Foreign	160.9988	160.9988	PKR/US$, US CPI
Insurance	81.8205	81.8205	PKR/US$(If any)
Debt Service (Local)			KIBOR
Debt Service (Foreign)	1,466.5817		LIBOR, PKR/US$
Return on Equity (ROE)	452.1140	491.8587	PKR/US$
ROE During Construction	229.8355	229.8355	PKR/US$

i. The reference tariff has been calculated on the basis of net contracted capacity of 633.60 MW and net annual energy production of 2,649 GWh.

ii. In the above tariff, no adjustment for Carbon Emission Reduction receipts (CERs) has been accounted for. However, upon actual realization of CERs, the same shall be distributed between the Buyer and the Seller in accordance with the GOP Policy for Power Generation Projects 2002 as amended from time of time.

iii. The above tariff is applicable for a period of thirty (30) years on BOOT basis commencing from Commercial Operation Date (COD).

iv. Debt service will be paid in the first 12 years of commercial operation of plant after COD.

v. Redemption of equity has been allowed after 12 years of commercial operations of the plant.

vi. Sinosure Fee on debt component of tariff for 12 years period after COD is allowed at per annum rate of 0.6% (calculated on semi-annual basis) and is given in the tariff table attached herewith as Annex-I.

vii. The reference PKR/Dollar rate has been assumed at 1 USD = 115.40 PKR.

viii. The component wise tariff is indicated at Annex-I.

ix. Debt Servicing Schedule is attached as Annex-II

I. One-Time Adjustments

a. The Principal repayment and the cost of debt will be adjusted at COD as per the actual borrowing composition and LIBOR/KIBOR at the relevant date.

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b. 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 6-months LIBOR/KIBOR during the actual project construction period (not exceeding the construction period allowed by the Authority). In case of any savings resulting from reduction in construction period shall also be adjusted in tariff. The increase in IDC due to delay in construction shall however, not be allowed.

c. The specific items of project cost to be paid in foreign currency will be adjusted at COD on account of actual variation in exchange rate over the reference PKR/US$ exchange rate of Rs. 115.40 on production of verifiable documentary evidence to the satisfaction of the Authority.

d. Duties and/or taxes, not being of refundable nature, imposed on the Company up to the commencement of its commercial operations for the import of its plant, machinery and equipment will be adjusted on actual basis at COD, as against reference allowed amount of US$ 9.58 million, upon production of verifiable documentary evidence to the satisfaction of the Authority.

e. Cost of land and resettlement will be adjusted in accordance with the Hydropower Mechanism based on authentic documentary evidence at COD.

f. Insurance during construction will be adjusted at COD based on actual subject to the maximum of 2% of the adjusted and approved EPC cost upon production of verifiable documentary evidence to the satisfaction of the Authority.

g. Financial charges will be adjusted at COD on the basis of actual subject to the maximum of 2% of the Capex loan allowed on production of authentic documentary evidence.

h. In case, the spreads on LIBOR and KIBOR are agreed at lower than 410 basis points and 275 basis points respectively, the benefit of such reduction in rate will be adjusted in proportion of 40% to the Seller and 60% to the consumer through necessary adjustment in tariff.

i. Return on Equity (ROE) and Return on Equity During Construction (ROEDC) will be calculated at COD on the basis of actual equity injections and PKR/US$ exchange rate variation (within the overall equity allowed by the Authority at COD) over the construction period of 66 months allowed by the Authority.

j. The adjustment for Special Return on Equity in tariff for the 30-month period will be allowed at COD on the basis of actual equity injections prior to the financial close date on the basis of audited accounts and verifiable documentary evidence to be provided by the Seller.

k. The amount of Sinosure Fee in project cost based on applicable foreign debt for the project construction period (66 months) and Sinosure component based on applicable foreign debt component for operational period after COD (12 years) will be adjusted at COD on the basis of variation in PKR/US$ exchange rate and based on finalized terms with insurance provider subject to the maximum rate of 0.6% per annum on production of reliable documentary evidence to the satisfaction of the Authority. The reference tariff table for each year of applicable Sinosure Fee will be revised accordingly.

l. The reference tariff table shall be revised at COD while taking in to account the above adjustments. The Seller through the Buyer shall submit its request to the Authority within 90 days of COD for necessary adjustments in tariff.

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II. Hydrological Risk

Hydrological Risk shall be borne by the Buyer in accordance with the GoP Policy for Power Generation Projects, 2002.

III. Indexation

The following indexation shall be applicable to the reference tariff:

i) Indexation applicable to O&M

The Variable O&M cost is based on 70% local and 30% foreign expenses. The Fixed O&M cost is based on 30% local and 70% foreign expense. The local part of O&M will be adjusted on account of Inflation (CPI General), whereas the foreign part of O&M will be adjusted on account of Rupee/Dollar exchange rate variation and US CPI. Quarterly adjustment for local inflation, foreign inflation and exchange rate variation will be made on 1st July, 1st October, 1st January & 1st April respectively on the basis of the latest available information with respect to WPI (or alternative index as determined by the Authority), US CPI (notified by US bureau of labor statistics) and revised TT & OD Selling rate of US Dollar (notified by the National Bank of Pakistan). The mode of indexation will be as under:

a. Fixed O&M

$F\ O\&M_{(LREV)} = FO\&M_{(LREF)} * CPI_{(REV)} / CPI_{(REF)}$
$F\ O\&M_{(FREV)} = FO\&M_{(FREF)} * USCPI_{(REV)} / USCPI_{(REV)} * ER_{(REV)} / ER_{(REF)}$
Where:

$FO\&M_{(LREV)}$ = The revised applicable Fixed O&M local component of tariff indexed with Pakistan CPI (General).
$FO\&M_{(FREV)}$ = The revised applicable Fixed O&M foreign component of tariff indexed with US CPI and exchange rate variation.
$FO\&M_{(LREF)}$ = 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.
$CPI_{(REV)}$ = The Revised Pakistan CPI (General) as notified by the Pakistan Bureau of Statistics for the relevant month.
$CPI_{(REF)}$ = The Reference Pakistan CPI (General) of March 2018 as notified by the Pakistan Bureau of Statistics.
$US\ CPI_{(REV)}$ = The Revised US Consumer Price Index (All Urban Consumers) notified by the Bureau of Labor Statistics.
$US\ CPI_{(REF)}$ = Reference US CPI (All Urban Consumers) notified by the Bureau of Labor Statistics for the month of March, 2018.
$ER_{(REV)}$ = The revised TT and OD selling rate of US dollar as notified by the National Bank of Pakistan.
$ER_{(REF)}$ = The reference TT and OD selling rate of US dollar of 115.40

b. Variable O&M

$VO\&M_{(LREV)} = VO\&M_{(LREF)} * CPI_{(REV)} / CPI_{(REF)}$
$VO\&M_{(FREV)} = VO\&M_{(FREF)} * USCPI_{(REV)} / USCPI_{(REV)} * ER_{(REV)} / ER_{(REF)}$
Where:

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$VO\&M_{(LREV)}$ = The revised applicable Variable O&M local component of indexed with Pakistan CPI (General).
$VO\&M_{(FREV)}$ = The revised applicable Variable O&M foreign component of tariff indexed with US CPI and exchange rate variation.
$VO\&M_{(LREF)}$ = The reference variable O&M local component of tariff for the relevant period.
$VO\&M_{(FREF)}$ = The reference variable O&M foreign component of tariff for the relevant period.
$CPI_{(REV)}$ = The Revised Pakistan CPI (General) as notified by the Pakistan Bureau of Statistics for the relevant month.
$CPI_{(REF)}$ = The Reference Pakistan CPI (General) of March 2018 as notified by the Pakistan Bureau of Statistics.
$US\ CPI_{(REV)}$ = The Revised US Consumer Price Index (All Urban Consumers) notified by the Bureau of Labor Statistics.
$US\ CPI_{(REF)}$ = Reference US CPI (All Urban Consumers) notified by the Bureau of Labor Statistics for the month of Mar 2018.
$ER_{(REV)}$ = The revised TT and OD selling rate of US dollar as notified by the National Bank of Pakistan.
$ER_{(REF)}$ = The reference TT and OD selling rate of US dollar of 115.40

ii) Water Use Charges

Water Use Charge will be paid on units delivered basis and revised/ indexed as per government policy.

iii) Insurance

Insurance cost component of tariff, in case insurance is denominated in foreign currency, will be adjusted on account of PKR/US$ exchange rate variation at COD and thereafter on an annual basis at actual subject to the maximum of 1% of the EPC cost on production of authentic documentary evidence by the Seller, according to the following formula:

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

Where;

$Ins_{(REV)}$ = Revised Insurance cost component of tariff adjusted with the exchange rate variation (PKR/US$)
$Ins_{(REF)}$ = Reference insurance cost component of tariff for the relevant period.
$ER_{(REV)}$ = 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.

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iv) Adjustment for LIBOR variation

The interest part of fixed charge component will remain unchanged throughout the term except for the adjustment due to exchange rate variation and variation in 6 months LIBOR, while spread of 4.10% on LIBOR remaining the same, according to the following formula:

$\Delta I = P_{(REV)} * (LIBOR_{(REV)} - 2.4524\ \%) / 2$

Where;

ΔI = the variation in interest charges applicable corresponding to variation in six-month LIBOR. ΔI can be positive or negative depending upon whether $LIBOR_{(REV)}$ >or<2.4524%. The interest payment obligation will be enhanced or reduced to the extent of Δ I for each period under adjustment applicable on bi-annual basis.

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

iv) Adjustment for KIBOR Variation

The interest part of fixed charge component will remain unchanged throughout the term except for the adjustment due to variation in 6 months KIBOR, while spread of 2.75% on KIBOR remaining the same, according to the following formula:

$\Delta I = P_{(REV)} * (KIBOR_{(REV)} - 6.61\%) / 2$

Where;

ΔI = the variation in interest charges applicable corresponding to variation in six-month KIBOR. Δ I can be positive or negative depending upon whether $KIBOR_{(REV)} > \text{or} < 6.61\%$. The interest payment obligation will be enhanced or reduced to the extent of Δ I for each period under adjustment applicable on bi-annual basis.

$P_{(REV)}$ = the outstanding principal on a semi-annual basis at the relevant calculations dates.

v) Return on Equity

Return on equity (ROE) as well as Return on Equity during Construction (ROEDC) component of tariff shall be adjusted for variation in PKR/US$ exchange rate 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/kW/M adjusted with exchange rate variation.

$ROEDC_{(REV)}$ = Revised Return on Equity during Construction component of tariff in Rs/kW/M adjusted with exchange rate variation.

$ROE_{(REF)}$ = Reference Return on Equity component of tariff expressed in Rs/kW/M for the relevant period.

$ROEDC_{(REF)}$ = Reference Return on Equity during Construction component of tariff expressed in Rs/kW/M for the relevant period.

$ER_{(REV)}$ = Revised TT and OD selling rate of US dollar as notified by the National Bank of Pakistan.

$ER_{(REF)}$ = Reference TT and OD selling rate of US dollar.

vi) Sinosure Fee

Sinosure fee component will be adjusted based on the revised principle and interest on foreign debt component.

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IV. Other Terms and Conditions of Tariff

Design & Manufacturing Standards:

Hydel 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 and of standard quality.

Power Curve of the Hydel Power Complex:

The power curve of the Hydel Power plant shall be verified by the Buyer, 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.

Emissions Trading/Carbon Credits:

The Seller shall process and obtain emissions/carbon credits expeditiously and credit the proceeds to the Buyer as per the policy issued by the Federal Government.

7 The above rates and terms and conditions approved for import of Power are to be notified in the official Gazette by the Federal Government as per Section 31(7) of the Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997 read with regulation 4(4) of the NEPRA (Import of Electric Power) Regulations, 2017.

AUTHORITY

Saif Ullah Chattha
Member
15.1.2019

Rafique Ahmed Shaikh
Member

Rehmatullah Baloch
Vice Chairman
18/01/2019

23.01.19

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Annex-I

MAHL HYDROPOWER PROJECT
REFERENCE TARIFF TABLE

Period	(Rs./kWh)			(Rs./kW/Month)								Total Tariff RS./kWh
	Water Use Charge	Variable O&M		Fixed O&M		Insurance	ROEDC	ROE	Sinosure Fee	Debt Servicing		
		Foreign	Local	Foreign	Local					Principal	Interest	
1	0.4250	0.0680	0.1586	160.9988	68.9995	81.8205	229.8355	452.1140	77.0164	687.6331	778.9485	7.9343
2	0.4250	0.0680	0.1586	160.9988	68.9995	81.8205	229.8355	452.1140	72.6159	733.4277	733.1540	7.9217
3	0.4250	0.0680	0.1586	160.9988	68.9995	81.8205	229.8355	452.1140	67.9222	782.2720	684.3097	7.9082
4	0.4250	0.0680	0.1586	160.9988	68.9995	81.8205	229.8355	452.1140	62.9160	834.3692	632.2124	7.8938
5	0.4250	0.0680	0.1586	160.9988	68.9995	81.8205	229.8355	452.1140	57.5764	889.9360	576.6456	7.8785
6	0.4250	0.0680	0.1586	160.9988	68.9995	81.8205	229.8355	452.1140	51.8812	949.2034	517.3783	7.8622
7	0.4250	0.0680	0.1586	160.9988	68.9995	81.8205	229.8355	452.1140	45.8067	1,012.4178	454.1638	7.8447
8	0.4250	0.0680	0.1586	160.9988	68.9995	81.8205	229.8355	452.1140	39.3276	1,079.8422	386.7395	7.8261
9	0.4250	0.0680	0.1586	160.9988	68.9995	81.8205	229.8355	452.1140	32.4171	1,151.7568	314.8249	7.8063
10	0.4250	0.0680	0.1586	160.9988	68.9995	81.8205	229.8355	452.1140	25.0463	1,228.4608	238.1209	7.7852
11	0.4250	0.0680	0.1586	160.9988	68.9995	81.8205	229.8355	452.1140	17.1847	1,310.2730	156.3087	7.7626
12	0.4250	0.0680	0.1586	160.9988	68.9995	81.8205	229.8355	452.1140	8.7995	1,397.5337	69.0480	7.7385
13	0.4250	0.0680	0.1586	160.9988	68.9995	81.8205	229.8355	491.8587				3.6179
14	0.4250	0.0680	0.1586	160.9988	68.9995	81.8205	229.8355	491.8587				3.6179
15	0.4250	0.0680	0.1586	160.9988	68.9995	81.8205	229.8355	491.8587				3.6179
16	0.4250	0.0680	0.1586	160.9988	68.9995	81.8205	229.8355	491.8587				3.6179
17	0.4250	0.0680	0.1586	160.9988	68.9995	81.8205	229.8355	491.8587				3.6179
18	0.4250	0.0680	0.1586	160.9988	68.9995	81.8205	229.8355	491.8587				3.6179
19	0.4250	0.0680	0.1586	160.9988	68.9995	81.8205	229.8355	491.8587				3.6179
20	0.4250	0.0680	0.1586	160.9988	68.9995	81.8205	229.8355	491.8587				3.6179
21	0.4250	0.0680	0.1586	160.9988	68.9995	81.8205	229.8355	491.8587				3.6179
22	0.4250	0.0680	0.1586	160.9988	68.9995	81.8205	229.8355	491.8587				3.6179
23	0.4250	0.0680	0.1586	160.9988	68.9995	81.8205	229.8355	491.8587				3.6179
24	0.4250	0.0680	0.1586	160.9988	68.9995	81.8205	229.8355	491.8587				3.6179
25	0.4250	0.0680	0.1586	160.9988	68.9995	81.8205	229.8355	491.8587				3.6179
26	0.4250	0.0680	0.1586	160.9988	68.9995	81.8205	229.8355	491.8587				3.6179
27	0.4250	0.0680	0.1586	160.9988	68.9995	81.8205	229.8355	491.8587				3.6179
28	0.4250	0.0680	0.1586	160.9988	68.9995	81.8205	229.8355	491.8587				3.6179
29	0.4250	0.0680	0.1586	160.9988	68.9995	81.8205	229.8355	491.8587				3.6179
30	0.4250	0.0680	0.1586	160.9988	68.9995	81.8205	229.8355	491.8587				3.6179
Levelized Tariff	**0.4250**	**0.0680**	**0.1586**	**160.9988**	**68.9995**	**81.8205**	**229.8355**	**463.1315**	**38.5229**	**675.4241**	**384.6084**	**6.6886**

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Mahl Hydropower Project **Annex-II**

Debt Service Schedule for Foreign Debt (in US$)

Semi-Annual Period	Opening Balance	Interest	Principal	Debt Service	Closing Balance	Annual Principal Repayment	Annual Interest Repayment	Annual Debt Servicing
	US$	US$	US$	US$	US$	Rs. /KW/M	Rs./KW/M	Rs./KW/M
1	794,391,149	26,025,843	22,287,475	48,313,317	772,103,674			
2	772,103,674	25,295,661	23,017,657	48,313,317	749,086,017	687.6331	778.9485	1,466.5817
3	749,086,017	24,541,556	23,771,761	48,313,317	725,314,256			
4	725,314,256	23,762,746	24,550,572	48,313,317	700,763,684	733.4277	733.1540	1,466.5817
5	700,763,684	22,958,420	25,354,898	48,313,317	675,408,786			
6	675,408,786	22,127,743	26,185,575	48,313,317	649,223,211	782.2720	684.3097	1,466.5817
7	649,223,211	21,269,851	27,043,467	48,313,317	622,179,745			
8	622,179,745	20,383,853	27,929,465	48,313,317	594,250,280	834.3692	632.2124	1,466.5817
9	594,250,280	19,468,828	28,844,490	48,313,317	565,405,790			
10	565,405,790	18,523,824	29,789,493	48,313,317	535,616,297	889.9360	576.6456	1,466.5817
11	535,616,297	17,547,861	30,765,456	48,313,317	504,850,841			
12	504,850,841	16,539,923	31,773,394	48,313,317	473,077,447	949.2034	517.3783	1,466.5817
13	473,077,447	15,498,963	32,814,354	48,313,317	440,263,093			
14	440,263,093	14,423,899	33,889,418	48,313,317	406,373,675	1,012.4178	454.1638	1,466.5817
15	406,373,675	13,313,614	34,999,703	48,313,317	371,373,971			
16	371,373,971	12,166,954	36,146,363	48,313,317	335,227,608	1,079.8422	386.7395	1,466.5817
17	335,227,608	10,982,727	37,330,591	48,313,317	297,897,017			
18	297,897,017	9,759,702	38,553,615	48,313,317	259,343,402	1,151.7568	314.8249	1,466.5817
19	259,343,402	8,496,609	39,816,709	48,313,317	219,526,693			
20	219,526,693	7,192,134	41,121,184	48,313,317	178,405,509	1,228.4608	238.1209	1,466.5817
21	178,405,509	5,844,921	42,468,396	48,313,317	135,937,113			
22	135,937,113	4,453,572	43,859,746	48,313,317	92,077,367	1,310.2730	156.3087	1,466.5817
23	92,077,367	3,016,639	45,296,679	48,313,317	46,780,689			
24	46,780,689	1,532,629	46,780,689	48,313,317	(0)	1,397.5337	69.0480	1,466.5817