National Electric Power Regulatory Authority
Islamic Republic of Pakistan

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No. NEPRA/PAR-107/7754-7756
May 17, 2018

Subject: **Determination of the Authority in the matter of Tariff Proposal submitted by Central Power Purchasing Agency (Guarantee) Ltd. (CPPA-G) for Import of Electric Power from 700.7 MW Azad Pattan Hydropower Project located in AJK** [Case No. NEPRA/PAR-107]

Dear Sir,

Please find enclosed herewith the subject Determination of the Authority along with Annex-I, II, III & IV (37 pages) in Case No. NEPRA/PAR-107.

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

Enclosure: As above

17 05 18
(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.

DETERMINATION OF THE AUTHORITY IN THE MATTER OF TARIFF PROPOSAL SUBMITTED BY CENTRAL POWER PURCHASING AGENCY (CPPAG) FOR IMPORT OF ELECTRIC POWER FROM 700.7 MW AZAD PATTAN HYDROPOWER PROJECT LOCATED IN AJK.

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 CPPA-G), the buyer has filed an application before NEPRA seeking determination of rates proposed by Azad Pattan Hydro Power Project (hereinafter referred to as the Project company or APPL) for import of electric power from AJK to Pakistan.

1.2 The tariff proposal was deficient in respect of certain documents required under Regulation 3(1) (b), (f), (g), (h), (i), (j), (k), (p) and fee required under Regulation 3(2) of IEPR-2017. Accordingly, the Authority directed to hold the pre-admission hearing which was held on Nov 07, 2017 and the deficient information submitted by the project company on Nov 10, 2017 thereupon the tariff proposal was admitted.

2. SUBMISSIONS OF THE PROJECT COMPANY

2.1 The salient features of the petition are as follows:

Project Company	Azad Pattan Power (Pvt) Limited	
Sponsor	China Gezhouba Overseas Investment Company Limited and China Gezhouba Group International Engineering Company Limited	
Project Location	Muslimabad village, district Sudhnoti, Azad Jammu and Kashmir	
Concession Period (Years)	30	
Construction Period (Years)	5.75 (69 months)	
Project Type	Run of River	
Project Basis	BOOT	
Gross Capacity (MW)	700.7	
Auxiliary Consumption (MW)	7.0	
Net Capacity	693.7 MW	
Annual Net Energy Production (GWh)	3258	
Plant Capacity Factor	53.1%	
Turbines (Vertical Francis)	4 with capacity more than 100 MW	
Rated Head	64.24 m	
Design Discharge	1260 m3/s	
Project Cost	**Description**	**US$ in M**
	EPC	1,013.281
	Financing/Lenders Fees	41.978

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	Insurance on Debt / Sinosure		35.426
	Legal Costs		13.677
	Engineering Supervision		63.753
	Land Acquisition & Resettlement		12.028
	Insurance During Construction		25.332
	O&M Mobilization		6.436
	Customs Duties		17.053
	Project Development Cost		56.252
	Environment		12.948
	Interest During Construction (IDC)		218.004
	Total Project Cost		**1,516.168**
Project Financing	Project funding (Debt (75%): Equity (25%)		
	Foreign Debt (75%)		1,137.126
	Equity (25%)		379.042
	Total Project Financing		**1516.168**
Financing Terms	Loan Term	12 year plus 06 years grace period	
	Debt Repayment Installments	Semiannual	
	Markup rate	Libor 1.30%+ 4.2% spread	
Operations Cost	**Description**		**US$ in M**
	O&M (per annum)		31.22
	Water Use Charges (average)		13.19
	Insurance		10.13
	Total		**54.54**
EPC Stage Levellized Tariff	US Cent 8.1032 /kWh (Rs. 8.5083 /kWh)		
Exchange Rate	1US$ =PKR 105		

3. PROCEEDINGS:

3.1 The salient features of the tariff proposal were published in the newspapers inviting filing of replies, intervention requests or comments. The Authority also decided to conduct a hearing into the matter on January 11, 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 December 28, 2017. In response, no intervention request was filed.

3.2 The hearing was conducted on January 11, 2018 which was attended by the representatives of Central Power Purchasing Agency (Guarantee) Limited (CPPA(G), representatives from Private Power & Infrastructure Board (PPIP), representatives of the Project Company and other stakeholders.

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

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3.4 The representative of Punjab Power Development Board (PPDB) submitted that Azad Pattan Hydropower Project's requested tariff of US Cent 8.1032 /kWh should be rationalized while keeping in view the 135 MW Taunsa low head Hydropower Project tariff evaluated by NEPRA at US Cents 7.5/kWh. PPDB submitted that three companies namely Harbin Electric International Company Limited (HEIC), Power China Resource Limited (PCR-Sino Hydro) and China Energy Engineering Group Gaungxi Hydroelectric Construction Bureau Co. Ltd (GHCB-SINOTECH) calculated return on equity at 10% to 10.4% in their bid tariff and the Authority may consider this submission too in the proceedings.

3.5 Superintended Engineer (S.E) of Upper Jehlum Canal Circle Jehlum, Punjab also raised concerns over Engineering & Supervision costs which according to S.E is approximately US$ one Million per month if divided by the construction period of the project and is on much higher side because the supervision only relates to ensure the work is executed as per the approved design.

3.6 Syed Akhter Ali Shah ex-Member Planning Commission also raised his concerns over the claimed tariff of US cent 8.1032 /kWh in the wake of decreasing prices of other renewable technologies and return of 17%.

4. Arguments heard and record perused. Having considered the respective submissions of CPPA(G) and other stakeholders present in the hearing and after perusal of record, the issue-wise findings of the Authority on the subject tariff proposal are as under:-

4.1 Whether the change in the project design has been approved by the competent Authority/forum? Whether the Plant Capacity factor of 53.1% as against the 54.84% allowed and net Energy of 3,258 GWh as against the 3,064 GWh allowed, for negotiating power acquisition contract at the feasibility stage, is justified?

4.1.1 The Project Company in its tariff proposal submitted that the revised design was submitted to Panel of Experts (PoE) of PPIB for approval pursuant to which PoE engaged Associated Consultant Engineers (ACE) to review the revised design and to submit a review report to the PoE.

4.1.2 As per the Project Company, ACE after thorough review endorsed the Feasibility Report's flow series at dam site for the period of 1970-2009 as well as the Project Company's updated/ extended flow series data i.e. 2010 to 2014. The Project Company also stated that according to ACE the Azad Pattan Power Limited (APPL) has determined the re-optimized rated discharge and the rated output of the power plant as 1,260 m3/s and 700.7 MW, respectively and the same was approved by PoE. Following details in tabulated form were also submitted by the Project Company during the presentation:

	Original	Revised
Flow series data	1970-2009	1970-2014
Design Discharge ($m^{3/s}$)	1,200	1,260
Installed Capacity (MW)	640	700.7
Capacity Factor (%)	54.84%	53.1%
Annual Energy (GWh)	3,064	3,258

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4.1.3 Subsequently on December 22, 2017 PPIB approval of Revised Design/Optimized was submitted by the Project Company. The said approval indicated that the Panel of Experts (PoE) agreed to approve the revised optimized design of Azad Pattan Hydropower Project with design discharge of 1260 m3/sec, estimated annual energy of 3265.81 GWh which is higher by 8.2 GWh than the number indicated in the tariff proposal.

4.1.4 The Authority is of the view that the plant factor is just the ratio of the estimated average annual energy of a plant and the theoretical annual energy if the plant was operated at its maximum capacity throughout the year. Hence the plant factor is derived after the optimum average net annual energy (GWh) has been determined from the historical hydrological flow data available and the assumed efficiencies.

4.1.5 The Authority noted that the estimated net annual energy of 3,265.81 GWh and installed capacity of 700.7 MW is the result of an optimized project layout proposed by the EPC Contractor during the EPC stage bidding process. The proposed optimized layout, according to the Company, has been approved by the POEs of PPIB.

4.1.6 The Authority is of the view that the increase in the installed capacity and net energy of the project is the result of reduction in head losses from 4.0 m to 2.5 m due to shorter waterway from the intake to the turbines; the increase is also attributable to larger tunnels and optimized layout that allows an increase in the rated flow rate of 1260 m3/sec (from 1200 m3/sec).

4.1.7 In view of the above observations and POE's approval an estimated energy of 3265.81 GWh has been used by the Authority for tariff determination.

4.2 Whether EPC bidding process has been conducted in a transparent manner? Whether the requested firmed EPC cost of US$ 1,013.281 million is justified?

4.2.1 The Project Company in its tariff proposal submitted to CPPA-(G), submitted that as customary in limited recourse project financing, the project construction will be on a "fixed-price, time-certain" arrangement through a turnkey Engineering, Procurement and Construction ("EPC") Contract. As per the Company it initiated the standard process for international competitive bidding and selection of EPC Contractor in line with the best international practices and appointed renowned engineering firms to serve the role of independent consultant to monitor and supervise the bidding, evaluation and award process.

4.2.2 As per the information submitted with the tariff proposal by APPL, a Letter of Award (LOA) was issued to the lowest evaluated and most advantageous bid and the EPC Contracts were duly signed with the nominated bidder. A summary of the timelines in the overall EPC tendering and selection process are shown below:

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Description	Date
Advertisement to procure the Tender Documents	08 Sept 2016
Last date for purchase of Tender Documents	20 Sept 2016
Pre-Bid meeting with the potential bidders	01 Oct 2016
Last date for submission of Bids	29 Nov 2016
Evaluation of Bids	30 Nov - 14 Dec 2016
Contract negotiations	15 Dec - 26 Dec 2016
Issuance of Letter of Award	27 Dec 2016
Signing of EPC Contract	11 June 2017

4.2.3 As per the information provided by APPL to CPPA-G with tariff proposal, it engaged a consortium of Montgomery, Watson, Harza (MWH) International USA and Peter Rae Hydro Consulting Limited

(PRHC), Canada, as a consultant to render services as EPC tendering and evaluation consultant ("EPC Tendering and Evaluation Consultant"), to ensure a professional, competitive and transparent bidding process and selection.

4.2.4 As per the information provided by APPL, the services procured from the EPC Tendering and Evaluation Consultant comprised, amongst others, preparation of EPC tender documents ("Tender Documents"), technical support during the EPC tender process, independent evaluation of EPC bids ("Bids"), leading negotiation with the lowest evaluated EPC Contractor and drafting/finalization of the bankable EPC Contract.

4.2.5 As per the project company, the Tender Documents prepared by the EPC Tendering and Evaluation Consultant are compliant with International standards including the World Bank and included various relevant sections as follows:

a) bidding Procedures;
b) conditions of EPC Contract and Contract Forms;
c) project Requirements; and
d) reference information, which included Feasibility Study and geological investigation, reports of the Project.

4.2.6 The project company in the information submitted to CPPA-(G) with its tariff proposal, further submitted that Bids were solicited from eligible EPC contractors on 8th September 2016 through advertisement(s) in local newspapers i.e. Business Recorder & Jang and in leading international publications (Financial Times Middle East, UK, Asia, Europe, USA) inviting eligible interested parties to participate in the International Competitive Bidding ("ICB") process for the selection of EPC Contractor for the Project.

4.2.7 According to APPL, seven (07) companies expressed their interest to participate in the bidding process for selection of EPC contractor for the Project and purchased tender documents:

i. China International Water and Electric Corporation
ii. Ghulam Rasool and Company (Pvt.) Limited
iii. Descon Engineering Limited
iv. Anhui Shuian Construction Group Corporation Limited
v. China Gezhouba Group Company Limited
vi. General Electric International Operations Pakistan (Pvt.) Limited
vii. Sambu Construction Co. Limited

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4.2.8 The project company in its tariff proposal stated that pre-bid meeting, presided by the EPC Tendering and Evaluation Consultant, was held on 01 October 2016 at 1400 hours (Pakistan Time) and was attended by prospective bidders. The EPC Tendering and Evaluation Consultant gave a detailed presentation, overview of the Tender Documents, discussed Project specific requirements, scope of work and responded to specific questions raised by the participants

4.2.9 As per the information provided by the project company to the CPPA-(G) with its tariff proposal, only two (2) Bids were received at the Company's office (Islamabad) on 29 November 2016 by 1500 hours, and then the digital version of both the Bids was posted to a secure network location for access by the Bid Evaluation Team. The Bid Evaluation was performed by the Joint Venture of Peter Rae Hydro Consulting Ltd. and MWH Global Ltd. The Bid Evaluation Team comprised experts in EPC project management, construction management, hydropower design, electrical and mechanical equipment procurement, financial analysis and contracts. The Team opened the bids received by the deadline date at the formal bid opening in Gananoque, Ontario, Canada at 10:00 Central Standard Time on November 29, 2016.

4.2.10 APPL stated that the two companies that submitted bids were (i) Anhui Shuian Construction Group Corporation Ltd. ("ASCG"); and (ii) JV of China Gezhouba Group Company Limited and China Gezhouba Group International Engineering Co. Ltd. ("CGGC"). It was also submitted that the financial summary and key terms of the Bids received were immediately recorded as follows:

Name	Anhui Shuian Construction Group Corporation Ltd	JV of China Gezhouba Group Company Limited & China Gezhouba International
Bid Price (PKR and US$)	US$ 698,160,065.50	US$ 722,371,083.06
	PKR 33,278,851,784.79	PKR 33,030,867,950.00
Total Bid Price (US$)	**US$ 1,015,624,571.64**	**US$1,037,469,940.70**
Bid Security	Provided	Provided
US$ 1=PKR	104.827	104.827

4.2.11 As per the information submitted by APPL to CPAA-(G) with the tariff proposal, the bid evaluation was independently performed by the Bid Evaluation Team of the EPC Tendering Consultants, in accordance with the Evaluation Criteria, without any involvement of the Company. The Bid Evaluation Team, nominated by the EPC Tendering and Evaluation Consultant, comprised experts in EPC project management, construction management, hydropower design, electrical and mechanical equipment procurement, financial analysis, and construction contracts.

4.2.12 As per the Bid Evaluation Report submitted by APPL to CPPA-(G) with tariff proposal, the Bid Evaluation was performed in accordance with the criteria presented in the instructions to Bidders. As per the report, the Process included three phases (i) Post qualification of bidders, (ii) Technical Evaluation, and (iii) Commercial Evaluation. The report further states that bidders passing the qualifications requirement were subjected to the technical evaluation and any bidder meeting the minimum technical evaluation score was subjected to the commercial evaluation. The report also states that the commercial evaluation included preparation of an Evaluated Bid Price that accounts for differences among the bidders with respect to project performance, construction schedule, time for completion and risks.

4.2.13 APPL stated that ("Bid Evaluation Team") assessed the bidders on a "pass-fail" basis for each requirement under the Pre-Qualification Requirements stated above, and both the bidders were considered qualified for the more detailed Technical and Commercial evaluation. Various clarifications were obtained from the bidders during the tender evaluation process.

4.2.14 As per the Bid Evaluation Report submitted by APPL with its tariff proposal, the commercial proposals were evaluated using criteria included in the instructions to the Bidders as follows:

Criterion	Evaluation	Max Score
a) Bid Price	The Bid Price will be evaluated to determine the Evaluated Bid Score using the criteria defined in the notes below	60
b) Reasonableness of Pricing	The pricing Structure will be reviewed. Higher marks will be awarded to Bidders with consistent pricing.	5

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c) Financial Situation	Higher marks will be awarded for stronger balance sheet, larger financial resources, and larger annual turnover.	10
d) Conditions of Contract	Lower marks will be awarded for exceptions to the Conditions of Contract.	15
e) Financial Proposals	Higher marks will be awarded for Bidders offering financing proposals/letters of interest from financial institutions.	10
Commercial Score		**100**

4.2.15 As per the Bid Evaluation Report submitted by APPL with its tariff proposal to CPPA-G, the commercial evaluation was performed by assigning score to each of the aforementioned criteria.

4.2.16 As per the Bid Evaluation Report submitted with the tariff proposal, the bid price for each bidder was checked for arithmetic errors and for conformance with the instruction to Bidders and the comparison of prices allowed for direct comparison of the bids on the basis of their nominal costs. The report further states that the two bids were very close in overall nominal amount with a difference of only of 2.1% of the contract price, which was small enough that other factors were closely examined in selection of Most Advantageous Bid. According to the Consultants, Project Schedule and execution risks for bidders were potentially more important than the small bid price difference.

4.2.17 As per the Bid Evaluation Report, an evaluated Bid Price was also determined to include the effects of differences among the bidder with respect to performance of equipment, construction cash flow, risks, and the time for completion. The report also states that the bid from CGGC implies more rapid start to the works and acceleration towards the end. The CGGC schedule finished the Commercial Operation Date about six month earlier than the completion proposed by ASCG.

4.2.18 The Bid Evaluation Report contains a table which shows the Evaluated Bid Price Comparison for this base condition using commercial terms that were included in the draft EPC contract. The report further states that the bid from CGGC is found to provide a lower Evaluated Bid Price than the ASCG with a benefit to the Project of about $ 112, 500,000.The table is as follow:

Item	ASCG	CGGC
Bid Price	1,015,406,672	1,037,253,665
Energy Yield Adjustment	0	0
Time for Completion Adjustment	364,342	-132,984,980
Cash Flow Adjustment	0	-1,007,119
Risk Adjustment	0	0
Evaluated Bid Price	**1,015,771,015**	**903,261,567**

4.2.19 The Bid Evaluation Report states that, based on the Evaluation Bid Price comparison, CGGC is considered to represent the optimum price bid for employer. This bid is assigned the maximum Bid Price evaluation in the commercial scoring. The following table shows the commercial evaluation scores assigned to two bidders.

Criterion	Max Score	ASCG	CGGC
a) Bid Price	60	53	60
b) Reasonableness of Pricing	5	5	5
c) Financial Situation	10	8	10
d) Conditions of Contract	15	5	15
e) Financing Proposals	10	0	0
Commercial score	**100**	**71**	**90**

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4.2.20 As per the Bid Evaluation report submitted by the Project Company to CPPA-(G) with its tariff proposal, the technical proposals were evaluated using the following Technical Evaluation Criteria:

Criterion	Max Score	ASCG	CGGC
f) Contractor Experience and Capability	30	16	27
g) Design Experience and capability	10	9	9
h) Construction Planning and Methods	20	13	16
i) Electrical and mechanical equipment	15	7	7
j) Construction Schedule	20	3	13
k) Health, Safety and Environment	5	3	3
Technical Score	**100**	**51**	**75**

4.2.21 The Bid Evaluation Report submitted by APPL to CPPA-(G) with its tariff proposal, stated that the Technical and Commercial evaluation scores are combined to indicate the most advantageous Bid, in accordance with the procedure in the bidding documents and the resulting scores are as follows:

Item	Max Score	ASCG	CGGC
Technical Score	100	51	75
Commercial Score	100	71	90
Combined Evaluation Score	**100**	**61**	**83**

4.2.22 As per the Bid Evaluation Report it is stated that on the basis of the completed evaluation of bids received, it is recommended that a contract to be entered with the Joint Venture of China Gezhouba Group Company Limited and China Gezhouba Group International CO. Ltd. (CGGC).

4.2.23 APPL further stated that, the Bid received from CGGC met all the qualifications, technical and commercial requirements stipulated in the Tender Documents, and was nominated as the lowest evaluated and most advantageous bid based on achieving the highest combined ranking primarily due, but not limited to, the following factors:

1. CGGC has substantial relevant experience with major hydropower projects including large hydropower projects in Pakistan, in comparison with ASCG.
2. ASCG proposed 6 years (2,192) days for achievement of COD while CGGC provided a schedule that demonstrates that COD can be achieved within 5.5 years (2009 days) from the Notice to Proceed (NTP) under the EPC Contract.
3. The schedule proposed by CGGC was realistic and consistent with the proposed construction methods statement, site infrastructure, and equipment.
4. The evaluated price of CGGC was ranked first among the two Bids evaluated, after adjustment for differences in time for completion and construction cash flows.
5. Several deviations from Conditions of the EPC Contract were requested by ASCG, which would result in a substantive reduction in the level of security available to the Company affecting the cost of project financing.

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4.2.24 The Project Company in tariff proposal submitted to CPPA-(G), submitted that with the conclusion of evaluation and recommendation of the lowest evaluated and most advantageous bid by the EPC Tendering and Evaluation Consultants, detailed negotiations and meetings were held in Beijing for finalization of the Project Requirements and the EPC Contract. After successful negotiations with EPC Contractor, the Company issued Letter of Award and signed the EPC Contract based on FIDIC Conditions of Contracts for EPC/turnkey projects with a capacity of 700.7 MW (at generator terminal) and 693.7 MW (at the metering point), after auxiliary and colony load, yielding a net energy of 3258 GWh per annum based on a net head loss of 2.5m and design flow of 1260 m3/s for a negotiated construction period of 69 months.

4.2.25 Having review the bidding process, the Authority observed that although the bidding process for selection of EPC contractor by the company was initiated before the issuance of NEPRA's Guidelines for Selection of EPC Contractors by IPPs, 2017 but the process is fairly close to guidelines.

4.2.26 The EPC contract was signed between the Azad Pattan and China Gezhouba Group Company Limtied (CGGC) on June 11, 2017. The component wise summary of the EPC contract prices is given in the following table;

S. No.	Title of EPC Component	EPC Contract Price		
		Foreign (US $ Million)	Local (PKR Million)	Total (Equiv. US$ Million)
	Onshore Works			
1.	Civil	325.05	31,649.85	626.97
2.	Hydraulic Steel Structures	11.61	189.24	13.42
3	Electrical & Mechanical Works	31.83	-	31.83
	Sub Total Onshore (A)	**368.49**	**31,839.09**	**672.22**
	Offshore Works			
4.	Hydraulic Steel Structures	83.48	-	83.48
5.	Electrical & Mechanical	257.58	-	257.58
	Sub Total Offshore Works (B)	**341.06**	-	**341.06**
	EPC Price (A+B)	**709.55**	**31,839.09**	**1,013.28**

4.2.27 The above EPC price of US$ 1,013.28 converted @104.827 USD/PKR reference exchange rate, has been compared to other approved hydropower projects on Per MW basis and found to be on lower side.

4.2.28 The Authority considers that at EPC stage where the EPC price is firmed up, the Per MW EPC cost is US$ 1.45 million with optimized plant capacity of 700.7 MW, is lower as compared to other Hydropower Projects and seems justified, and hence the EPC price of US$ 1013.280 is accepted subject to adjustment for US$/PKR exchange rate variation only for the foreign component and verification of overall EPC price at COD as per actual on the basis of verifiable documentary evidence to the satisfaction of the Authority.

4.2.29 **Other Issues In EPC Contract Prices:**

4.2.30 While reviewing the documents submitted by APPL to CPPA-(G) with its tariff proposal, it was observed that signed EPC contract between the APPL and China Gezhouba Group Company Limited also includes (i) provisional sum of US$ 12.82 million and PKR 1,191.77 million or equivalent to US$ 24.17 million (ii) Contingency of PKR 5,241.35 million or equivalent to US$ 49. 92 million. However APPL has not included these two prices in the claimed EPC price. These two issues are discussed further in the following paras:

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4.2.31 **Provisional Sum for Relocation of Roads & Bridges:**

4.2.32 The issue of cost pertaining to the provisional sum of US$ 24.17 million is actually the sum estimated by EPC contractor for the relocation of existing roads, bridges and public infrastructure. This has been discussed under the head Land Acquisition & Resettlement/Relocation of Roads & Bridges in para **4.3.5.**

4.2.33 **Contingency Cost:**

4.2.34 The Authority has noted that, the Contingency cost of US$ 49.92 million which has been shown as EPC cost (but not included in the calculation of the Tariff) is a provision for escalation in costs of four Civil Works items .i.e, Labour, steel, fuel & cement. The escalation cost is usually not included in the project cost of "Cost Plus" hydropower Projects but is allowed on the basis of actual as per NEPRA's Three Stage Tariff Mechanism for hydropower project; hence this amount is not added in EPC/Project Cost for calculating the tariff.

4.3 Whether the other Non-EPC cost amounting to US$ 284.883 is justified?

4.3.1 The Project Company in tariff proposal submitted to CPPA-(G) claimed the following non-EPC costs:

Non EPC Cost	**US$ Million**
Financing/Lenders Fees	41.978
Insurance on Debt/Sinosure	35.426
Legal Costs	13.677
Engineering Supervision	63.753
Land Acquisition & Resettlement	12.028
Insurance During Construction	25.332
O&M Mobilization	6.436
Custom Duties	17.053
Project Development Cost	56.252
Environment	12.948
Total Non- EPC	**284.883**

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4.3.2 The above sub heads have been discussed in detail hereunder:

4.3.3 Whether the claimed legal cost of US$ 13.678 million is justified?

4.3.3.1 APPL in its tariff proposal has claimed cost of US$ 13.67 Million under the head of legal costs. By further going into the details it was revealed that this cost is bifurcated into the sub heads of Lender's Legal advisor (US$ 6.07 Million), Owner's Legal Advisor (US$ 3.55 Million), Legal Advisor AJK (US$ 0.42 Million), Security Trustee (US$ 0.68 Million), Inter-creditor Agent (US$ 1.54 Million) and Sinosure legal Advisor (US$ 1.41 Million). The Project Company has stated that these costs are necessary and vital from a project finance perspective and no finance shall be available to construct the project without the company incurring these costs and requested the Authority to approve the legal costs.

4.3.3.2 The Authority has noted that APPL has not substantiated its claim with any supporting documents and the costs claimed are merely estimates; however, the Authority is aware of the fact that the Company will acquire legal services required for various legal matters and preparation of legal documents.

4.3.3.3 In order to have a reasonable estimate of the claimed legal costs based on the prevailing norms and rates regarding the actual costs of various legal advisors, Security Trustee, Inter-creditor Agent, cost of US$ 3.70 million considering reasonable and prudent at this stage has been assessed by the Authority. This cost will be subject to adjustment at the time of COD stage tariff with a maximum cap of US$ 3.70 million based on actual with the provision of verifiable documentary evidence. Further if the company pays any stamp duties or documentary registration charges, the share of the same may be adjusted at COD on actual basis on provision of documentary evidence.

4.3.4 **Engineering Supervision (E&S):**

4.3.4.1 APPL in tariff proposal submitted to CPPA-(G), has requested US$ 63.75 Million under this head with the following breakup:

S.No	Cost head	Amount US $Million
1	Owner Engineers	29.53
2	PPA Engineer	1.71
3	Re-opener Verifier	4.80
4	Lender's Technical Engineer	9.53
5	Feasibility and Other Studies	3.16
6	Other Engineering Consultants	15.02
-	**Total Engineering and Supervision Cost (Incl. 16% Sales Tax)**	**63.75**

4.3.4.2 APPL in its tariff proposal has stated that the increase in the aforementioned cost of E&S is the result of sales tax levied @ 16% through finance Act 2015, where a wide range of services rendered in Pakistan and/or AJK, inflationary impact and longer construction period as compared to other comparable hydropower project. For instance, cost of US$ 38.4 million for E&S has been allowed by the Authority to Karot HPP for a construction period of 60 months, when adjusted for 16% sales tax and 69 months construction period, works out to be US$ 51.22 Million. The company therefore requested for approval of US$ 63.75 Million under this head..

4.3.4.3 During the hearing a superintendent engineer of irrigation department of upper canal Jehlum river also raised concerns over construction Engineering Supervision costs which is approximately US$ 1.00 Million per month if divided by the construction period of the project and is on much higher side because the supervision only relates to ensure that the work is executed as per approved design.

4.3.4.4 **Owner's Engineer (OE):**

4.3.4.5 APPL in its tariff proposal stated that the Owners Engineer cost amounting to US$ 29.53 million is vital and critical for EPC type construction arrangement to ensure timely completion of the project in accordance with the technical specifications and best industry practices which would require strong team of experts and professionals for monitoring and design review.

4.3.4.6 The Authority understands that OE's scope of work includes construction monitoring, inspection and supervision in order to ensure that the Project is being constructed according to design specifications, PPA requirements, EPC contract provisions and international prudent practices. Hence, OE's role in the satisfactory completion of hydropower project is pivotal.

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4.3.4.7 The Authority observed that the Project Company has suggested US$ 29.53 million as the Owners Engineer's cost. The OE cost allowed for comparable project, i.e., Karot HPP (720 MW) is US$ 18 million, which was based on the experience gained in previous private sector hydropower projects such as New Bong Escape, Patrind and Gulpur.

4.3.4.8 The construction period, a relevant parameter of OE cost, for Azad Pattan is 69 months while that for Karot is 60 months. Hence, a pro-rata adjustment in cost due to a longer construction period gives a figure of US$ 20.7 million (inclusive of all taxes). Hence US$ 20.7 million (inclusive of all taxes) subject to adjustment at actual at COD has been approved by the Authority as a prudent cost under this head.

4.3.4.9 **PPA Engineer & Re-opener Verifier:**

4.3.4.10 APPL in its tariff proposal submitted to CPPA-(G), has stated that pursuant to Power Purchase Agreement (PPA), the Re-opener Verifier needs to be appointed and deployed at the project site during the tunneling works, to substantiate the actual geological conditions encountered and actual resultant cost variations. APPL also submitted that PPA Engineer is required to be appointed starting from 270 days prior to COD for construction supervision and to issue certification of Commercial Operations on behalf of Power Purchaser. For PPA Engineer & Re-opener Verifier, APPL claimed cost of US$ 1.71 million and US$ 4.80 million respectively.

4.3.4.11 The Authority noted that, APPL has estimated a cost of US$ 1.71 million for PPA Engineer also called the "Independent Engineer" (IE) who is usually hired 09 months before COD and his scope of work is to witness and verify commissioning and the Contract Capacity. Normally his work is not directly related to the Complex Capacity or size of units since the commissioning tests are the same for all sizes. Comparing the actual cost of IE in other recently completed hydropower generation projects, it is estimated that the cost of IE should not be more than US$ 500,000.

4.3.4.12 The Authority also noted that the cost claimed by the company for Re-opener Engineer is on higher side. The Authority is of the view that, the Job of the Re-opener Verifier is to verify the rock type in the tunneling works so that any cost escalation due to unforeseen geological conditions can be made part of the tariff. Considering the actual cost incurred on this account in a recently completed hydropower project, the estimated cost of the Re-opener Engineer should not be more than US$ 500,000.

4.3.4.13 In view of the aforementioned, the Authority decided to allow combined cost of US$ 1 million for PPA Engineer and Re-opener Engineer.

4.3.4.14 **Lender's Technical Engineer.**

4.3.4.15 APPL in its tariff proposal submitted to CPPA-(G), claimed US$ 9.53 million for Lender's Technical Engineer. The Project Company submitted that the scope of Lender's Technical Engineer includes due diligence of technical aspects of the Project including EPC contracts, Power Purchase Agreement, interconnection study, technical assumptions, environmental issues etc.; technical advisors are engaged and appointed by the Lenders, at the cost of the company during construction phase and also during the operation phase until the debt/loan has been repaid.

4.3.4.16 The Authority understands that Lender's Technical Engineer oversees the construction supervision of the project on behalf of the lenders in order to ensure that the project is being constructed according to design specifications and project schedule. However, his scope of work is much less than the scope of

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the Owner's Engineer. Its team is not always present on the site during the construction period but makes periodic (quarterly) visits to prepare reports for the lender and highlights problems/bottlenecks in implementation.

4.3.4.17 Hence the Authority is of the opinion that a prudent cost to cover the lenders' technical engineer's cost (keeping in mind the scope of the project and its construction period) should be US$ 2 million and the same is hereby allowed to the Project Company.

4.3.4.18 **Feasibility & Other Studies**

4.3.4.19 APPL in its tariff proposal, claimed US$ 3.16 million regarding the Feasibility & Other Studies. The Project Company submitted that URS Scott Wilson leading International Engineering Consultants in association with FHC Consulting Engineers prepared the bankable Feasibility Study which covered feasibility stage design including bills of quantity and cost estimation, geological surveys and investigations. The Feasibility Study was duly vetted and approved by the Panel of Experts on 20 December, 2011.

4.3.4.20 The Authority considers that the FS cost of US$ 3.16 million is reasonable as compared to the other projects of the similar size and the same is hereby allowed.

4.3.4.21 **PPIB and other Fees**

4.3.4.22 APPL in its tariff proposal submitted to CPPA-(G) has claimed an amount of US$ 1.55 million on account of various fees paid to PPIB, Load Flow Study and Tariff Petition Fees.

4.3.4.23 The Authority hereby allows this claimed cost subject to provision of verifiable documentary evidence at COD.

4.3.4.24 **Other Engineering Consultants**

4.3.4.25 The Project Company in its tariff proposal, claimed cost of US$ 13.457 million inclusive of 16% sales tax under the head Other Engineering Consultants. The Project Company submitted that services of JV of MWH International, Inc. USA and Peter Rae Hydro Consulting Ltd (PRHC), Canada has been appointed as engineering consultant to deal with various technical matters prior to financial close which includes preparation of EPC tendering documents, evaluation of the EPC tenders, assistance during the EPC contract negotiations, selection of electro mechanical supplier, review of load flow study and any other technical matters which will continue till the appointment of the Owner's Engineer and in house technical department and technical staff. The break-up of the cost is as under:

	USD
OE Services during development phase	2,000,000
Other Consultants	5,571,000
Contingency	3,000,000
Out of pocket/reimbursable (10%)	1,194,937
Sales Tax @ 16%	1,691,360
Total	**13,457,729**

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4.3.4.26 The Authority observed that these costs seem highly inflated. The OE cost of US$ 2 million during the development phase, if required, may be covered from the OE cost of US$ 20.7 million. The cost of 5.571 million shown as cost of Other Consultants and Contingency Cost of US$ 3 million, out of pocket expenses are also excessive. Subsequent to the above-stated adjustments, the Authority has assessed US$ 29.41 million as against the claimed amount of US$ 63.75 million, which is indicated in the following table::

Sr No	Cost Head	Claimed Amount ($ million)	Recommended Amount ($ million)
1	Owner's Engineer	29.53	20.7
2	PPA Engineer	1.71	0.5
3	Reopener Verifier	4.8	0.5
4	Lender's Technical Engineer	9.53	2.0
5	PPIB & Other Fee	1.55	1.55
6	Feasibility & Other Studies	3.16	3.16
7	Other Engineering Consultants	13.47	1.0
	Total	**63.75**	**29.41**

4.3.4.27 The Authority is aware that the related cost under each item of E&S cost may be more or less than the approved one, therefore the Authority decides that instead of capping each item an overall budget of US$ 29.41 million(max) is allowed to APPL under the E&S account subject to adjustment as per actual at COD.

4.3.5 **Land Acquisition & Resettlement/Relocation of Roads & Bridges:**

4.3.5.1 The Project Company in its tariff proposal to CPPA-(G), has claimed cost of US$ 12.028 million on account of Land Acquisition & Resettlement, which is adjustable on the basis of actual at the time of COD. This amount is based on the cost allowed by the Authority in the Feasibility Stage (FS) tariff.

4.3.5.2 The Authority noted that the estimated cost of US$ 24.17 million for relocation of existing roads, bridges and public infrastructure is very high as compared to the feasibility stage estimated cost of US$ 7.5 million for the same work. However, the cost of US$ 12.028 million determined at the FS tariff for Land Acquisition & Resettlement had included the estimated cost of US$ 7.5 million for relocations of roads, bridges and infrastructure. In the instant EPC stage tariff proposal, APPL has excluded the cost of relocation from the head of Land Acquisition and Resettlement and has kept a provisional sum of US$ 24.17 million for such work in the EPC contract, while excluding it from EPC cost use for tariff calculation.

4.3.5.3 Hence, the Authority has decided to allow a sum of US$ 12.028 million for Land Acquisition & Resettlement inclusive of the cost for relocation of roads, bridges and infrastructure. Out of this amount cost for relocation of roads, bridges and infrastructure shall be capped at a maximum of US$ 7.5 million upon the submission of verifiable documentary evidence at COD. The rest of the amount pertaining to Land Acquisition & Resettlement shall be adjusted at actual in line with NEPRA's Three Stage Tariff Mechanism for Hydropower Projects at COD.

4.3.6 **Insurance During Construction:**

4.3.6.1 The Project Company in its tariff proposal submitted to CPPA-(G), has claimed an estimated amount of US$ 25.332 million representing 2.50% of the EPC price with a request of an adjustment in the

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insurance cost during construction phase at actual subject to maximum cap of 2.75% of the EPC price at COD. As per the information provided by the Project Company the insurance to be procured largely depends upon different parameter to be set by the project lenders e.g. sum insured, deductibles for each insurance head, amount for revenue loss due to delay in start-up and terrorism/third party insurance requirement etc. It has been submitted that the insurance market is dynamic and very sensitive to prevailing events, accordingly when the insurance is placed over a year from the present time, the basis of the quote may be different from now. It may be noted that the Authority has allowed 2.5% for Karot HPP with a construction period of five years. APPL submitted that insurance cost has been estimated keeping in view the current market sensitivity to the risks involved and 69 months project construction period which would cover the following risks associated with construction:

- 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
- Generic Insurance for company's staff health and medication.

4.3.6.2 The Authority considered the submissions of APPL. Keeping in view the current market dynamics and assessment made for similar power generation projects, it has been observed that the insurance during construction ranges from 0.50% to 2% of EPC cost depending on the type of technology and construction period. In view of the fact that for large Hydropower Project the riskier technology coupled with the longer construction period, the Authority has decided to allow insurance during construction at a maximum of 2% of the approved EPC cost to Azad Pattan Hydropower Project at this stage subject to adjustment at actual based on the authentic documentary evidence at COD.

4.3.7 **O & M Mobilization:**

4.3.7.1 APPL in tariff proposal to CPPA-(G), has claimed US$ 6.44 million under this head which would be mobilized 12 months prior to COD and is based on firm estimates and indications from potential O&M contractor. As per APPL submissions, the O&M operator is an important stakeholder of the project responsible for smooth and efficient operation of the plant for many years and services to be rendered by the operator will essentially include, amongst other, the operational design review, development of O&M manuals, witnessing of testing and commissioning and operation of the complex during the sectional completion.

4.3.7.2 The Authority noted that the claimed O&M Mobilization cost of US$ 6.44 million, suggesting the O$M operator would be mobilized 12 months prior to COD is on higher side. In Authority's opinion, mobilization of the O&M contractor, 09 months prior to COD is more than sufficient instead of suggested 12 months. The remuneration and other costs claimed by the company are also on higher side which needs to be rationalized. Having rationalized the claimed amount off US$ 6.44 million, an amount of US$ 3.0 million is being assessed by the Authority, considering the same sufficient to cover this cost and is hereby allowed as a maximum cap subject to adjustment at actual.

4.3.8 **Project Development:**

4.3.8.1 The Project Company in tariff proposal to the CPPA-(G), has requested to approve US$ 56.25 Million under the Project Development head with the following breakup:

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S.No:	Project Development /Mgt Cost	US$ Million
1	Owner's Administration	29.74
2	Owner's Advisors/Consultants	11.91
	Sub-total	**41.65**
3	Security Management	3.00
4	Chinese expats	11.60
	Total	**56.25**

4.3.8.2 The Project Company in its tariff proposal, further submitted that costs provided are based on the estimates based on industry practices and budgetary quotes (wherever available and shall be firmed up at the time of actual procurement services/supplies.

4.3.8.3 The Authority considered the submissions of the project company and observed that the claimed cost is on higher side which needs to be rationalized. The Authority considers that the cost of US$ 11.60 million requested separately as Chinese expats is covered under owner's administration cost; therefore is being disallowed. The remaining cost items rationalized at par with other comparable hydropower and therefore allowed a cost of US$ 40. 84 million under the project development head.

4.3.9 **Environmental Cost:**

4.3.9.1 In the tariff proposal, there is a request for US$ 12.948 million for environmental costs. The cost is essentially required to meet the company's legal obligations under various environmental laws enforceable in Pakistan and AJ&K, as well as to meet the requirements of the environmental performance standards, which are obligatory and mandatory for financing of hydropower projects. The Project Company also submitted a detailed report titled, "Environmental & Social Impact Assessment" dated December 13, 2017 carried out by Haigler Bailey for Azad Pattan Hydropower Project.

4.3.9.2 The following breakup of the Environmental costs is also provided by the Project Company:

Break up of Environment Cost

	Particulars	Amount USD
	Cost as per ESIA	9,691,870
Add:		
	Lender's Environemnt Monitoring	1,023,530
	ESIA update, BAP & RAP	198,824
	Already incurred Cost	80,000
	UNFCC Registration charges	477,000
	Developing, Validation & Registration of Project for WCD compliance	544,706
	Personal protective equipment	675,000
	Local administration and law enforcing agencies Cost & regulatory fee	257,542
	Total Cost	**12,948,472**

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4.3.9.3 The Authority has noted that cost of US$ 9.69 million is duly supported by the ESIA report prepared by Haigler Bailey for Azad Pattan Hydropower Project. As per the EISA report, this cost will be utilized for Biodiversity Management Plan, Implementation of Stakeholder Engagement Plan, Salaries and Benefits, EHS Training, Laboratory Fees and out of Pocket Expenses, External Monitoring Environment Management etc. The rest of the cost of US$ 3.26 was neither supported by any supporting documents nor included in Haigler Baily report. However the report included an operational phase annual cost of US$ 0.98 million which the company has claimed in its annual O&M cost which is covered in the overall per annum O&M cost allowed to the company.

4.3.9.4 In the view of the aforementioned, the Authority has decided to approve the cost of US$ 9.69 million which will be adjusted at COD upon the provision of verifiable documentary evidence to the satisfaction of the Authority.

4.3.10 Summary of the Non-EPC cost approved vis-a-vias the requested cost is given in the following table:

	Requested Non EPC Stage	Approved Non EPC Stage
NON EPC COSTS	**US$ million**	**US$ million**
Legal Cost	13.68	3.70
Engineering & Supervision	63.75	29.41
Land Acquisition & Resettlement	12.03	12.03
Insurance during Construction	25.33	20.26
O&M Mobilization	6.44	3.00
Project Development Cost	56.25	40.84
Environment	12.95	9.69
Total Non EPC	**190.43**	**118.93**

4.4 Financing/Lending Fees:

4.4.1 In its tariff proposal submitted to CPPA(G), the Project Company has claimed US$ 41,977,819 under the head Financing/Lender Fee, with the following breakup:

Description	US$
Management Fee	12,634,729
Commitment Fee	29,343,090
Total	**41,977,819**
Percentage of Total Debt	**3.69%**

4.4.2 The Project Company in the tariff proposal as well as in the hearing submitted that claimed amount with higher percentage of 3.69% as against the NEPRA determined cap of 3% threshold is due to the reasons that: (i) The impact of withholding tax which is 10% in the instant case has been taken into account pursuant to prevailing tax laws and bilateral tax treaties between Government of Pakistan and China. (II) Longer loan tenure, risk perception of the country and project has direct bearing on the lender's fee. (III) The lender's fee like all other costs is subject to inflationary pressure. The Project Company further stated that since 75% of the total project cost shall be financed through debt raised from Chinese financier, so the financier would charge standard fee as per their internal policies and regulations which generally comprises of working fees, front end fee, arrangement fees, monitoring fees and commitment fees.

4.4.3 Based on the reason stated, the project company has estimated an amount of US$ 41.98 Million comprising of Management fee of 12.63 Million@1% of the total loan amount and Commitment fee of US$ 29.34 Million@0 .8% p.a. on the undrawn loan amount. The rates specified have been grossed up for 10% withholding tax.

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4.4.4 The Authority observed that APPL has not calculated the financial charges as per NEPRA benchmark of 3% cap on Capex loan (excluding the impact of IDC and Financial charges) as adopted for all IPPs and other Hydropower plants which is quite sufficient to meet all the debt related financial charges.

4.4.5 Based on the current market condition, the Authority has approved the benchmark of 2.5% for other power generation projects. The Authority has therefore decided to approve an amount of US$ 21.67 million subject to adjustment on COD as per actual up to 2.5% of Debt on this account.

4.5 Whether the Sinosure Fee amounting to US$ 35.43 million claimed by the Project Company on foreign debt is justified?

4.5.1 The Project Company in its tariff proposal has claimed an amount of US$ 35.43 Million under the head of Sinosure fee on debt amount only. The project company in its tariff proposal further stated that as per the requirement of the Chinese government, it is mandatory for state-owned enterprises such as CGGC, undertaking overseas investments to acquire overseas investment insurance from Sinosure for their equity investments and for the loans arranged from Chinese Banks. The Company stated that the Sinosure rate is 0.6% and by including the impact of 20% withholding tax payable on Sinosure payment the gross rate of 0.75% has assumed. This rate shall apply for loan drawn during the construction period as well as the loan repayment period during the operations of the project.

4.5.2 In tariff proposal submitted to CPPA-(G), by the Project Company has requested to allow aforementioned amount subject to adjustment at COD based on:

i. NEPRA approved foreign Debt and its related IDC at COD;
ii. Actual drawdown of Foreign Debt during the construction period;
iii. Any change in sinosure premium rate beyond 0.6% per annum;
iv. Any variation in interest margin beyond 4.2% per annum;
v. Any change in withholding tax rate of 20% assumed on Sinosure payments; and
vi. Variation in US$/PKR parity

4.5.3 The Authority observed that this amounts is the result of clubbing the premium on Insured loan amount@ 0.75% (gross up @20% for withholding tax) amounting to US$ 32.36 Million and premium on Commitment amount @ 0.11% resulting to US$ 3.06 Million.

4.5.4 It is important to note that the Authority had allowed Sinosure fee @0.75 (Inclusive of 20% withholding tax rate) to other comparable hydropower projects, and the same can be allowed in the instant case. During the hearing the Company submitted that they are working on getting exemption of withholding tax on Sinosure premium. Further the Authority has recently approved Sinosure fee for another comparable project @ 0.6% of the outstanding debt and interest thereon subject to adjustment on actual at COD as recurring annual fee payable.

4.5.5 In view thereof Sinosure fee has been assessed @0.6% of the assessed loan plus interest thereon subject to adjustment at COD with a maximum cap of lower of actual or 0.6% of the outstanding debt plus interest based on verifiable documents and is therefore approved by the Authority.

4.5.6 Moreover, in case, the withholding tax remains applicable to the Project Company under the prevalent Tax Laws, the same will be adjusted at COD by grossing up with the applicable rate, If it is established by

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the Project Company that it has exhausted every remedy available for its wavier under Tax treaty 1989 or any other applicable law.

4.6 Custom Duties:

4.6.1 In its tariff proposal, the Project Company has claimed an amount of US$ 17.05 million for payment of 5% custom duties on import of plant and equipment with an EPC offshore cost of US$ 341.06 million.

4.6.2 The Authority understands that ,the cost of Custom duty and taxes to be paid by the Project Company for import of plant and equipment not manufactured locally, which are of non-refundable nature are considered to be pass through costs and adjusted on the basis of actual at COD.

4.6.3 Accordingly, in line with decisions of the Authority in other such projects, the estimated amount of custom duty and taxes as proposed by the Project Company (US$ 17.05 million) is hereby allowed at this stage subject to adjustment on the basis of actual at COD upon provision of verifiable documentary evidence.

4.7 Whether the claimed per annum O&M cost of US$ 31.22 million for Fixed and Variable O&M during operations is justified?

4.7.1 In its tariff proposal submitted to CPPA-(G), the Project Company requested the proposed cost of US$ 31.22 million based on the estimated O&M cost of US$ 45/KW/annum which is 2.06% of the project cost. The project company in its petition as well as during the hearing submitted that this cost includes Owner's Cost, O&M contractor, Annual Environmental Cost and site Security etc. The company further submitted that the O&M cost allowed to Karot Hydropower project was based on the recommendations of experts and upon further verification from study conducted by an International Consultant (Fitchner) "A Guide for Developers & Investors" issued in 2013 wherein an average cost of US$ 33.2/kW/year was stated as the benchmark/reference by the Authority. Furthermore the study also suggested, "However, these figures do not include major electromechanical equipment replacement, which would raise average O&M costs to US$ 45/kW/year for large HPP; US$ 52/kW/year for small HPP". The Project Company stated it has proposed US$45/kW/year for the total O&M cost based on the recommendations in the said publication with the following breakup.

Operation O & M		**US$ Million**
Variable		4.01
Fixed	Foreign-60%	16.32
	Local-40%	10.88
Total Annual O&M		**31.22**

4.7.2 The Authority observed that, the argument given by the Company in support of the claimed annual O&M cost is not convincing. The figure of US $ 45/kW/year quoted by the Company is based on IEA assumptions and not on Fitchener's review of average O&M cost of US $ 33.2/kW/year, which provides a more refined benchmark for estimating the O&M costs of hydropower plants, and was used to determine the annual O&M cost for Karot and Kohala HPP in the Authority's Tariff Determination.

4.7.3 Based on an average O&M cost of US $ 33.2/kW/year, an annual O&M Cost of US $ 23.03 million along with US$ 2 million for the maintenance of reservoirs and civil structure totaling US$ 25.03 million is hereby allowed to the Company as a maximum cap. Moreover the Authority also decided in principal

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that the project company should conduct a transparent and competitive bidding process for hiring O&M contractor, similar in line with the Authority's approved guideline for selection of EPC contractor.

4.7.4 The break-up of the O&M cost Claimed Vs Approved is as under::

O&M Cost Claimed vs. Approved					
		Claimed		Approved	
		US$ Mln	Rs. /kWh	US$ Mln	Rs. /kWh
Variable O&M – Local		4.01	0.1293	3.22	0.1032
Fixed O & M	Foreign 60%	16.32	0.5260	13.09	0.4201
	Local 40%	10.88	0.3507	8.73	0.2801
Total O&M Cost - Local & Foreign		**31.22**	**1.006**	**25.03**	**0.8034**

4.8 Whether the claimed Insurance cost per annum for the operation period based at 1% of the EPC cost justified?

4.8.1 In its tariff proposal, the Project Company claimed an estimated amount of US$ 10.133 million (1% of base EPC cost of US$ 1,013.281 million). As per the information provided by the Project Company in the petition as well as during the hearing, the insurance cost consists of 'Operations all risk', 'Business Interruption', 'Terrorism' and "Third party liability risk' on account of insurance for the project during its operation phase ,which will be as per the terms of financing documents and Power Purchase Agreement. The Project Company further submitted that as COD of the project will occur on or about 2023, the operating insurance cost will be based on the conditions then prevailing and will be re-ascertained subject to cap of 1.35% of the final approved EPC cost by NEPRA at COD.

4.8.2 The Authority is aware of the fact that as per 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 the annual insurance component of the hydropower projects during operation, wherein the total insurance premium paid was lower and was in the range of 0.75% to 0.48% of the EPC cost.

4.8.3 Based on the aforementioned the Authority has decided to allow insurance during operation @0.75% EPC cost of US$ 1,013.28 million 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 Project Company.

4.9 Whether the claimed financing terms i.e. spread of 4.2% on LIBOR is justified?

4.9.1 In its tariff proposal submitted to CPPA-(G), the Project Company submitted that in the feasibility study in 2011, the company proposed that the project be financed in a Debt to Equity ratio of 75:25, with 80% foreign debt and 20% local debt. However as 100% foreign debt is available at competitive rates and the Company is choosing this option. The Project Company further submitted that the Company nonetheless retains the right to opt for an element of local financing with the requisite tariff adjustments at a COD stage, if this is considered necessary.

4.9.2 During the hearing APPL, while justifying the claimed financing terms submitted that Company managed to arrange financing for the Project at 4.2% over LIBOR after provision of Sponsor's completion guarantees and other Sponsor support. The following details regarding the financing terms for foreign loan/debt were submitted:

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Financing Terms	Foreign
Lender	China Construction Bank
Loan Term	18 years Incl. 06 year grace period
Debt Repayment Installments	Semiannual
Mark-Up Rate	Libor+4.2%
WHT on Debt Interest	10%

4.9.3 The Authority observed that, the Company has proposed the already approved capital structure, with a submission that 100% foreign loan option will be exercised due to its availability at a competitive rates and the Libor spread has been reduced to 4.2% as against the approved 4.75% and no local loan amount has been taken into account as opposed to feasibility stage tariff decision.

4.9.4 The Authority also noted that, the Company in its tariff proposal has also claimed Sinsoure fee as risk coverage for its Debt and therefore should have further reduced the Libor spread from the claimed spread of 4.2%. Considering the prevailing market condition as well as the Sinosure coverage, the Authority has decided to restrict the spread on foreign debt at LIBOR+4.10%.

4.9.5 The Authority is also of the view that the capital structure is in line with other comparable hydropower projects. The utilization of merely 20% local loan will not affect the tariff to a larger extent despite the fact that Kibor applicable rate would be higher as compared to Libor rate. In view thereof, the Authority has also decided to approve, the proposed capital structure with 100% foreign loan with the right to opt for an element of local financing up to 20%-of the loan with interest rate of KIBOR+2.75% (max) subject to the requisite tariff adjustments at COD stage.

4.9.6 According to section 153 of the Income Tax Ordinance profit/interest on debt is taxable@ 10% on gross yield paid and the Company has therefore grossed up Libor rate @10% on account of withholding tax to be deducted by FBR which was also allowed by the Authority to other Hydropower Project in its EPC stage tariff decision. However APPL during hearing submitted that it is working to avail exemption from FBR which will have a favorable impact on tariff.

4.9.7 In view of the above, the Authority has decided not to consider withholding tax@10% on interest income at this stage. The Authority however expects that the company shall strive its best to exhaust every possible option available under Income Tax law/ Tax treaty 1989 or any other provision of law to waive off the same rather than to claim it as a pass through item. In case the company is not allowed any wavier after having exhausted all options to the satisfaction of the Authority, then the same may be allowed as a pass through cost at COD stage.

4.10 Whether the claimed one-time adjustment in the price of tunnel due to the change in rock classification is justified?

4.10.1 In its tariff proposal, the Project Company during the hearing as well as in its subsequent correspondence submitted that the reference tunnel cost shall be adjusted for variations in cost due to geological conditions related to tunneling as verified by Re-Opener Verifier, appointed pursuant to the terms of the Power Purchase Agreement and NEPRA Mechanism for determination of Tariff for Hydropower Project.

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4.10.2 The claimed one-time adjustment in the price of tunneling due to change in rock-classification being in line with NEPRA's Mechanism for Tariff Adjustment for Hydropower Projects is accepted subject to provision of authentic documentary evidence at the time of COD.

4.11 Whether the claimed special return on equity invested during the 30 months prior to construction is justified?

4.11.1 In its tariff proposal submitted to CPPA-(G), the Project Company has requested to allow special return on Equity injection for a period of 30 months prior to financial close which is based on the ECC decision dated28.07. 2009 as has been allowed by the Authority in the past for other hydropower projects. The company through subsequent correspondence further stated that large hydropower projects in Pakistan have a gestation period of 12-15 years and to provide a small compensation to equity investors for the very long period before they see any return on their investment, GoP vide its ECC decision dated 18 July, 2009 decided to allow an additional Special ROE for the 30 months before construction. Further stated that as far as the project is concerned this was a key determinant for the sponsors in calculating their equity return and sought the requisite Government approval before committing their investment decision.

4.11.2 The Authority is aware of the fact that in para I(iii) of the ECC decision dated 28.07.2009 wherein as per para I(iii) of the mentioned 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.* "

4.11.3 In pursuance of the above, the Authority has already allowed this return to other hydropower projects (Laraib, Karot, Suki Kinari & Kohala). The request to allow SROE being in line with the ECC's decision is accepted, however, the exact amount of SROE will be determined and adjusted in the tariff at COD stage, based on provision of audited accounts and related verifiable documentary evidence by the project company.

4.12 Whether the WHT on dividend is justified?

4.12.1 The Project Company submitted during the hearing that as the Authority has already allowed the withholding tax on dividend during the feasibility stage tariff as allowed to other comparable hydropower projects, even though no withholding tax on dividend has been included in the EPC stage tariff, but requested the Authority to allow payment of withholding tax on dividend as pass through at the time of actual payment of dividend.

4.12.2 The Authority considers that the incentive of WHT as a pass through has already been granted to the project in the feasibility stage tariff therefore, in order to maintain consistency, the Authority hereby allows WHT on dividend as a pass through item.

4.13 Does the net estimated annual energy of 3258 GWh exclude the estimated annual energy lost in outages?

4.13.1 The Project Company during the hearing submitted that Outages have not been excluded in computation of estimated annual energy as this is an allowance that may not be consumed as for hydropower projects the maintenance is generally conducted during low flows resulting into virtually no loss in annual energy.

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4.13.2 The Authority considers that the estimated annual energy has been calculated by the company in the same manner as in other previous hydropower projects. However, as the energy lost during outages has not been excluded from the estimated annual energy figure, the actual energy delivered even in an average year may be less than the estimated figure (if the allowed outage allowance is availed). The question was framed in order to highlight the importance of delivery of actual energy as close to the estimated energy as possible during operation. Since the estimated annual energy of all previous hydropower projects has been calculated in the same manner, it was decided to accept the annual energy figure.

4.14 What is the justification for the large increase in EPC stage levelized tariff (US cents 8.1032/kWh) from the feasibility Stage levelized tariff of US cent 6.1893/kWh when the EPC cost has decreased from US $ 1.54/MW to US $ 1.45/MW?

4.14.1 The Project Company submitted that the figure of US$ 1.5m/MW is based on the EPC cost of US$ 987.33 million approved by PoE in the Feasibility study and not the FS Tariff cost. The tariff claimed under the approved feasibility study was US Cents 7.7396/kWh (as against US cents 6.1893/kWh in the FS Tariff Determination). The tariff of US Cents 6.1893/kWh corresponds to EPC cost of US$ 806 million (US$ 1.26 Million/MW) as determined by NEPRA in FS tariff determination. Further submitted that the EPC cost proposed in the approved feasibility study in 2011 was US$ 987.33 million based on a capacity of 640 MW whereas the final EPC price arising from bidding process is US$ 1,013.280 million for a capacity of 701. MW thus the EPC cost has not increased in real terms over 6 years rather it has substantially fallen.

4.14.2 The Company further stated that increase in water usage charges, sinosure fee (not included in FS Tariff), Environment cost (from US$ 0.472 million to US$12.948 million), cost of Chinese expats and increase in computational costs e.g. custom duties, insurance etc., has resulted in slight increase in EPC cost.

4.14.3 The Authority noted that the, project company's submission with regard to feasibility stage approved tariff and requested tariff, the enhancement of water usage charges, inclusion of sinosure fee, enhancement of Environmental cost are valid, however, certain Non EPC & other costs claimed by the Project Company has been assessed and rationalized, which has reduced the claimed levellized tariff to US Cents 7.1167/kWh.(Excluding the impact of Special Return on Equity and Withholding Tax on Dividend). After taking into account the impact of Special Return on Equity and Withholding Tax on Dividend the same will translate into US Cents 7.5972/kWh.

4.15 48.07% of the civil works cost has been shown as "Fixed Cost" in the material cost escalation table which excludes the costs of cement, steel, fuel and labour. The breakup of the fixed cost of civil works may be provided along with its justification.

4.15.1 The Project Company during the hearing submitted that, EPC onshore contract is divided into fixed and esclable portion. The esclable portion of the Onshore Contract price provides adjustment in costs on the basis of "rise and fall" of the prices of cement, fuel, reinforcement steel and labor and the non-esclable part is not subject to any adjustments. APPL further submitted that the above adjustments are in line with the NEPRA Mechanism for Determination of Tariff for Hydro Power Projects and the same has been allowed to other Hydro Power Projects and therefore allowed as per the request of the Project Company.

4.15.2 The breakup of the fixed cost of civil works was provided by the company. The adjustment of four civil works items were found to be in line with NEPRA's Three Stage Tariff Mechanism for hydropower projects by the Authority.

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4.16 Water Usage Charge:

4.16.1 In its tariff proposal, the Project Company has included water usage charge at 0.425 PKR/kWh without any indexation currently applicable as per the prevailing rate approved by the ECC dated July 1, 2016 which shall be payable to the Government of AJ&K.

4.16.2 The Authority understands that WUC being an obligatory payment to be incurred by the project company is justified and the same is approved by the Authority.

4.17 Return on Equity:

4.17.1 The representative of Punjab Power Development Board stated that the return on Equity at 10% to 10.4% was used by Chinese companies in their bidding tariff for 135 MW Taunsa Hydropower Projects, which is a true reflection of market and is an advantage of a bidding process whereby the bidding companies voluntarily reduced rate of return in order to gain a competitive advantage. Keeping in view the improved market scenario a study on the rationalization of Internal Rate of Return for Power Generation has been carried out by the Authority which also indicates the same trend of declining returns in current financial/capital market.

4.17.2 The Authority has observed that the feasibility stage tariff determination request for Azad Pattan Hydropower Project was submitted by NTDC on October 23, 2012 (after approval of the feasibility study in December, 2011 by PPIB) based on the then prevailing financial/capital market situation. Whereby the Authority had allowed a rate of 17% to Azad Pattan Hydropower Project at par with other comparable Hydropower Project. The Authority considers that it will not be fair to reduce the return at this stage on the same analogy as was done in other similar projects. In view thereof return on equity at 17% (IRR based) is allowed in the instant case.

4.18 Use of Local Manpower:

4.18.1 The Authority has observed that during the construction and operation phase, the IPPs use foreign consultants, experts and even labour instead of maximizing local manpower/ experts which are readily available in Pakistan especially in hydropower sector. As a result thereof, it not only increases the project cost but also prevent transfer of technology and development of local expertise.

4.18.2 In view of the above, it is directed that local manpower be utilized as far as possible during the implementation and operation of the project. In specific terms, at least 80% of the labour force employed during the construction of the project shall be local, and local labour shall not be discriminated against in terms of wages and facilities provided as compared to foreign labour. For other categories of staff (including managerial staff) employed by the company for the project (including third party hiring) during construction and operation of the project, at least 70% shall consists of Pakistan nationals. The Authority shall ensure the compliance of these directions by monitoring of project progress reports and site visits. The Project Company shall also be required to conduct audit of its expense every Financial Year (FY). In its Financial Statements (FS) detailed disclosure w.r.t local & foreign staff/labour both internal as well as external employees hired through third party contract including the amount paid to them in each category/type of employees shall be provided.

4.18.3 The Authority further directs that local materials and locally manufactured equipment may be used in the construction of the projects as far as possible, without compromising on the quality of the project.

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4.19 Incentive to Reduce Construction Period:

4.19.1 The Authority has further decided for the sponsors to reduce the construction period, through provision of a sharing mechanism between the sponsors and the Power Purchaser of any savings due to reduction of construction period. Based on the aforementioned, the Authority has decided that if the project sponsor is able to reduce the construction period and achieve COD before 69 months, the full benefit of reduction in IDC will be passed on to the power purchaser by adjusting the IDC on the actual construction period below 69 months; whereas the Company will be allowed to retain the full benefit of reduction in ROEDC, i.e. the ROEDC will be calculated on 69 months regardless of the reduction in construction period.

5. ORDER:

5.1 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 Central Power Purchasing Agency (CPPA-G) from 700.7 MW Azad Pattan hydropower project:

Tariff Components	Year 1-12	Year 13-30	Indexation
Variable Charge (Rs/kWh)			
Variable O&M – Local	0.1032	0.1032	Pakistan CPI
Water Use Charge	0.4250	0.4250	
Fixed Charge (Rs/kW/M)			
Fixed O&M – Local	109.8811	109.8811	Pakistan CPI
Fixed O&M – Foreign	164.8217	164.8217	PKR/US$, US CPI
Insurance	95.6998	95.6998	PKR/US$
Debt Service (Local)			KIBOR
Debt Service (Foreign)	1475.0508		LIBOR, PKR/US$
Return on Equity (ROE)	726.3460	772.0886	PKR/US$
ROE During Construction	493.8790	493.8790	PKR/US$

i. The reference tariff has been calculated on the basis of net contracted capacity of 693.70 MW and net annual energy production of 3,265.81 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 Power Purchaser and KPCL 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.

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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-III.

vii. The reference PKR/Dollar rate has been assumed at 1 USD = 104.827 PKR.

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

ix. Debt Servicing Schedule is attached as Annex-IV

I. <u>One-Time Adjustments</u>

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.

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. 104.827 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$ 17.05 million, upon production of verifiable documentary evidence to the satisfaction of the Authority.

e. Civil Works Cost will be adjusted on account of variation in the price of construction material (Cement, Steel, Labour and Fuel) during the project construction period based on mechanism attached herewith as Annex-I.

f. The prices of tunnels will be adjusted due to variation in rock type/classification in accordance with the mechanism attached herewith as Annex-II. However, the total quantities shall remain fixed.

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

h. Withholding tax on Debt & Sinosure if applicable will be adjusted at COD based on documentary evidence.

i. 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.

j. Financial charges will be adjusted at COD on the basis of actual subject to the maximum of 2.5% of the total debt allowed on production of authentic documentary evidence.

k. 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

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overall equity allowed by the Authority at COD) over the construction period of 69 months allowed by the Authority.

l. 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 APPL.

m. The amount of Sinosure Fee in project cost based on applicable foreign debt for the project construction period (69 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.

n. The reference tariff table shall be revised at COD while taking in to account the above adjustments. APPL 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 the power producer is obligated to pay any such tax, the exact amount paid by the power producer (the Company) shall be reimbursed by the Power Purchaser to the Company on production of original receipts. This payment should be considered as pass-through payment (Rs/kW/M) spread over a twelve (12) months period in addition to fixed charges in the Reference Tariff.

Withholding tax shall be paid @ 7.5% of the return on equity (including return on equity during construction). The Power Purchaser shall make payment on account of withholding tax at the time of actual payment of dividend subject to maximum of 7.5% of 17% equity according to the following formula:

Withholding Tax Payable = $[\{17\% * (E_{(Ref)} - E_{(Red)})\} + ROEDC_{(Ref)}] \times 7.5\%$
Where:

$E_{(Ref)}$	=	Adjusted Reference Equity at COD
$E_{(Red)}$	=	Equity Redeemed
$ROEDC_{(Ref)}$	=	Adjusted Reference Return on Equity during Construction

In case the Company does not declare a dividend in any particular year or only declares a partial dividend, then the difference in the withholding tax amount (between what has been paid in that year and the total entitlement as per the Net Return on Equity) would be carried forward and accumulated so that the Company is able to recover the same as a pass through item from the Power Purchaser in future on the basis of the total dividend payout.

III. Hydrological Risk

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

IV. Indexation

The following indexation shall be applicable to the reference tariff:

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i) Indexation applicable to O&M

The Variable O&M cost is based on 100% local. The Fixed O&M cost is based on 40% local and 60% 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 June 2017 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 June 2017.
$ER_{(REV)}$	=	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 104.827

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:

$VO\&M_{(LREV)}$	=	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.

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$CPI_{(REV)}$	=	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 June 2017 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 June 2017.
$ER_{(REV)}$	=	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 104.827

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 Azad Pattan Hydropower project, 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.

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:

$\Delta I = P_{(REV)} * (LIBOR_{(REV)} - 1.42239\%) / 2$

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 < 1.42239%. The interest payment obligation will be enhanced or reduced to the extent of ΔI 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-IV) on a semi-annual basis at the relevant calculations dates.

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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:

$\Delta I = P_{(REV)} * (KIBOR_{(REV)} - 6.15\%) / 2$

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 $_{(REV)}$ > or < 6.15%. 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.

Note: -

Adjustment on account of inflation, foreign exchange rate variation and LIBOR/KIBOR variation will be approved by the Authority within fifteen working days after receipt of APPL's request for adjustment in tariff in accordance with the requisite indexation mechanism stipulated hereinabove.

V. 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.

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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.

Emissions Trading/Carbon Credits:

The Project Company shall process and obtain emissions/carbon credits expeditiously and credit the proceeds to the Power Purchaser as per the policy issued by the Federal Government.

6. This tariff determination shall be notified in the official Gazette 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

16.5.18
(Himayat Ullah Khan)
Member

16/5/18
(Rehmatullah)
Member

16.5.2018
(Saif Ullah Chattha)
Member

16/5
(Syed Masood-ul-Hassan Naqvi)
Vice Chairman

(Brig. (R) Tariq Saddozai)
Chairman

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Annex I

One-Time Adjustment in Reference EPC Cost for Civil Works cost escalation

The cost of civil works will be adjusted due to variation in the prices/indices of a selected number of cost elements. The method is set out hereunder for adjusting the Contract Price for changes in costs for cement, fuel, reinforcement and labour obtained and utilized by the Contractor in Pakistan.

The changes in costs shall only be adjusted in local currency portion on the basis of "rise and fall" of the prices of the above specified materials and labour.

The formula by which the indexations are applied is given below:

$$Pn = Vn \times [(Cn - Co)/Co] + Wn \times [(Sn - So)/So] + Yn \times [(Fn - Fo)/Fo] + Zn \times [(Ln - Lo)/Lo]$$

$$Tfn = Tn + Pn$$

Where:

"Pn" is the adjustment factor to be applied to the estimated value of the work carried out in month "n"

"Vn", "Wn", "Yn", and "Zn" are the reference values for the relevant month "n" based on the coefficients representing the estimated proportion of each cost element – cement, reinforcing steel, fuel and labor respectively, in the works;

"Lo", "Fo", "Co", and "So" are the base cost indices or reference prices corresponding to the above cost elements;

"Ln", "Fn", "Cn", and "Sn" are the cost indices or prices corresponding to the above cost elements in month "n";

Tfn is the Total Final Amount for the relevant month n, after adding the Escalated Amount (Pn to the Total Reference Amount (Tn) as given in Table 1.

Tn is the Total Reference Amount for the relevant month "n" from Construction Start Date.

The reference indices of the specified input cost items as agreed and incorporated in the EPC contract are as under:

Cost Element	Reference Index	Remarks
Labor (L)	230.48	Applicable index of "Construction Wage Rates" of Consumer Price Index Number by Major Groups and Selected Commodities of the published in Monthly Bulletin of Statistics of November 2016 by Pakistan Bureau of Statistics (PBS)
Fuel (F)	144.34	Applicable index of "Diesel Oil" of Index Numbers of Wholesale Prices by Commodities of published in Monthly Bulletin of Statistics of November 2016 by PBS
Cement (C)	212.72	Applicable index of "Cement" of Index Numbers of Wholesale Prices by Commodities of published in Monthly Bulletin of Statistics of November 2016 by PBS
Reinforcing Steel (S)	120.20	Applicable index of "Steel Bars & Sheets" of Index Numbers of Wholesale Prices by Commodities of published in Monthly Bulletin of Statistics of November 2016 by PBS

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Material Cost Escalation Table-I

Month	Amounts (PKR)						Coefficients				
	Fixed (Z) PKR	Cement PKR	Steel (W) PKR	Fuel (Y) PKR	Labor (V) PKR	Total PKR	Fixed A	Cement b	Steel C	Fuel d	Labor e
1	567,177,594.26	185,362,180.27	148,667,312.00	165,185,902.22	113,506,312.81	1,179,899,301.56	48.07%	15.71%	12.60%	14.00%	9.62%
3	133,817,645.85	43,733,622.14	35,075,979.57	38,973,310.63	26,780,232.02	278,380,790.20	48.07%	15.71%	12.60%	14.00%	9.62%
5	1,021,133,213.81	333,721,713.94	267,657,135.30	297,396,817.00	204,354,098.54	2,124,262,978.60	48.07%	15.71%	12.60%	14.00%	9.62%
7	278,382,514.14	90,979,598.44	72,968,996.84	81,076,663.16	55,711,249.97	579,119,022.55	48.07%	15.71%	12.60%	14.00%	9.62%
9	432,334,754.71	141,293,509.39	113,322,610.97	125,914,012.19	86,520,914.09	899,385,801.35	48.07%	15.71%	12.60%	14.00%	9.62%
10	714,484,850.21	233,504,410.17	187,279,157.74	208,087,953.05	142,986,150.59	1,486,342,521.76	48.07%	15.71%	12.60%	14.00%	9.62%
13	2,366,780,616.83	773,499,552.54	620,375,198.09	689,305,775.65	473,651,540.13	4,923,612,683.24	48.07%	15.71%	12.60%	14.00%	9.62%
14	1,880,647,000.55	614,623,764.90	492,950,950.84	547,723,278.71	376,364,138.66	3,912,309,133.66	48.07%	15.71%	12.60%	14.00%	9.62%
15	222,303,827.50	72,652,239.03	58,269,777.96	64,744,197.73	44,488,513.01	462,458,555.24	48.07%	15.71%	12.60%	14.00%	9.62%
16	1,102,883,405.73	360,438,907.93	289,085,311.26	321,205,901.40	220,714,340.82	2,294,327,867.14	48.07%	15.71%	12.60%	14.00%	9.62%
21	994,308,278.83	324,954,921.17	260,625,843.84	289,584,270.93	198,985,763.31	2,068,459,078.07	48.07%	15.71%	12.60%	14.00%	9.62%
22	1,790,078,281.41	585,024,543.39	469,211,282.42	521,345,869.35	358,239,090.23	3,723,899,066.79	48.07%	15.71%	12.60%	14.00%	9.62%
24	356,688,431.24	116,571,151.55	93,494,367.25	103,882,630.28	71,382,207.38	742,018,787.68	48.07%	15.71%	12.60%	14.00%	9.62%
25	726,333,574.55	237,376,751.74	190,384,918.65	211,538,798.50	145,357,374.40	1,510,991,417.84	48.07%	15.71%	12.60%	14.00%	9.62%
26	995,591,705.43	325,374,364.31	260,962,252.72	289,958,058.58	199,242,608.82	2,071,128,989.86	48.07%	15.71%	12.60%	14.00%	9.62%
27	871,631,234.69	284,862,215.46	228,470,013.67	253,855,570.74	174,435,042.18	1,813,254,076.74	48.07%	15.71%	12.60%	14.00%	9.62%
32	448,377,707.57	146,536,588.02	117,527,753.60	130,586,392.89	89,731,507.11	932,759,949.18	48.07%	15.71%	12.60%	14.00%	9.62%
33	919,199,106.54	300,408,112.42	240,938,396.97	267,709,329.97	183,954,553.88	1,912,209,499.78	48.07%	15.71%	12.60%	14.00%	9.62%
37	335,514,970.56	109,651,345.69	87,944,427.48	97,716,030.54	67,144,872.41	697,971,646.68	48.07%	15.71%	12.60%	14.00%	9.62%

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38	847,389,170.55	276,939,543.78	222,115,738.49	246,795,264.98	169,583,603.51	1,762,823,321.31	48.07%	15.71%	12.60%	14.00%	9.62%
39	811,357,889.24	265,163,978.37	212,671,300.28	236,301,444.76	162,372,849.90	1,687,867,462.54	48.07%	15.71%	12.60%	14.00%	9.62%
40	602,329,276.63	196,850,279.50	157,881,191.71	175,423,546.34	120,541,036.84	1,253,025,331.03	48.07%	15.71%	12.60%	14.00%	9.62%
42	798,966,911.71	261,114,420.28	209,423,405.19	232,692,672.43	159,893,107.77	1,662,090,517.39	48.07%	15.71%	12.60%	14.00%	9.62%
43	685,981,726.02	224,189,159.89	179,807,983.10	199,786,647.89	137,281,968.05	1,427,047,484.96	48.07%	15.71%	12.60%	14.00%	9.62%
44	453,108,607.87	148,082,717.49	118,767,806.51	131,964,229.46	90,678,277.67	942,601,639.00	48.07%	15.71%	12.60%	14.00%	9.62%
48	222,903,949.04	72,848,367.79	58,427,080.46	64,918,978.29	44,608,612.23	463,706,987.81	48.07%	15.71%	12.60%	14.00%	9.62%
49	1,991,345,359.03	650,801,655.72	521,966,954.93	579,963,283.26	398,517,627.50	4,142,594,880.44	48.07%	15.71%	12.60%	14.00%	9.62%
50	1,129,295,024.75	369,070,622.82	296,008,265.28	328,898,072.53	225,999,961.27	2,349,271,946.63	48.07%	15.71%	12.60%	14.00%	9.62%
52	827,636,103.71	270,483,944.03	216,938,109.15	241,042,343.50	165,630,524.60	1,721,731,024.99	48.07%	15.71%	12.60%	14.00%	9.62%
54	102,878,776.87	33,622,333.78	26,966,353.00	29,962,614.44	20,588,596.49	214,018,674.58	48.07%	15.71%	12.60%	14.00%	9.62%
55	237,375,270.94	77,577,813.74	62,220,270.73	69,133,634.14	47,504,682.89	493,811,672.43	48.07%	15.71%	12.60%	14.00%	9.62%
56	104,210,621.53	34,057,600.67	27,315,453.12	30,350,503.46	20,855,131.66	216,789,310.44	48.07%	15.71%	12.60%	14.00%	9.62%
57	1,120,919,081.66	366,333,238.46	293,812,781.96	326,458,646.62	224,323,727.18	2,331,847,475.89	48.07%	15.71%	12.60%	14.00%	9.62%
63	1,168,921,143.12	382,021,035.12	306,394,974.06	340,438,860.07	233,930,130.99	2,431,706,143.37	48.07%	15.71%	12.60%	14.00%	9.62%
65	250,361,797.80	81,822,006.31	65,624,269.86	72,915,855.40	50,103,609.21	520,827,538.60	48.07%	15.71%	12.60%	14.00%	9.62%
67	1,275,982,375.38	417,010,258.31	334,457,622.84	371,619,580.93	255,355,740.61	2,654,425,578.07	48.07%	15.71%	12.60%	14.00%	9.62%
69	508,660,014.76	166,237,753.94	133,328,816.02	148,143,128.91	101,795,492.87	1,058,165,206.50	48.07%	15.71%	12.60%	14.00%	9.62%
Note	4,776,846,887.22	-	-	-	-	4,776,846,887.22	100.00%	-	-	-	-
TOTAL	**34,074,138,702.24**	**9,574,796,222.47**	**7,679,340,063.85**	**8,532,600,070.94**	**5,863,115,191.61**	**65,723,990,251.11**	**51.84%**	**14.57%**	**11.68%**	**12.98%**	**8.92%**

Note: This pertains to design cost of US$ 45,586,860 which is part of the fixed cost component of the Civil Works Cost under Construction Contract.

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Annex-II

Adjustment in the cost of Tunnelling Works due to Geological Conditions

a. Subject to the verification of the Re-opener Verifier, cost variation due to geological conditions related to underground tunnelling works will be allowed at Commercial Operation Date.

b. The cost of the Tunnelling Work shall be allowed to vary depending on the category of rock encountered during construction of tunnels. The increase or decrease in the cost shall be subject to the baseline conditions given in Table 1 of this Annex.

Table 1 - Diversion Tunnels Geological Cost Variation

Diversion Tunnels			
Rock Class	RMR	*Price PKR per meter*	*Length of Tunnel (m)*
Very Good Rock	*>80*	*6,547,216*	*0*
Good Rock	*61-80*	*6,633,927*	*90*
Fair Rock	*41-60*	*6,782,310*	*360*
Poor Rock	*21-40*	*7,682,569*	*360*
Very Poor	*0-20*	*7,988,273*	*90*
		Total Price	*6,523,354,440*

Table 2 - Upstream Waterway Penstock Tunnels Geological Cost Variation

Upstream Waterway Penstock Tunnels			
Rock Class	**RMR**	**Price PKR per meter**	**Length of Tunnel (m)**
Very Good Rock	>80	2,015,097	0
Good Rock	61-80	2,071,956	65
Fair Rock	41-60	3,091,004	260
Poor Rock	21-40	3,356,806	260
Very Poor	0-20	3,511,503	65
		Total Price	**2,039,355,435**

Table - Downstream Waterway Tunnels Cost Variation

Downstream Waterway Tunnels			
Rock Class	RMR	*Price PKR per meter*	*Length of Tunnel (m)*
Very Good Rock	*>80*	*4,965,371*	*0*
Good Rock	*61-80*	*5,139,488*	*78*
Fair Rock	*41-60*	*5,608,324*	*312*
Poor Rock	*21-40*	*5,714,761*	*312*
Very Poor	*0-20*	*6,266,236*	*78*
		Total Price	*4,422,448,992*

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AZAD PATTAN HYDROPOWER PROJECT **Annex-III**

REFERENCE TARIFF TABLE

Period	Water Use Charge	Variable O&M	Total EPP	Fixed O&M		Insurance	ROEDC	ROE	Sinosure Fee	Debt Servicing		Total CPP	Total PKR/Kwh	Total US$ Cents/Kwh
				Foreign	Local					Principal	Interest			
1	0.4250	0.1032	0.5282	164.8217	109.8811	95.6998	493.8790	726.3460	101.3635	777.7899	697.2608	3,167.04	8.6009	8.2048
2	0.4250	0.1032	0.5282	164.8217	109.8811	95.6998	493.8790	726.3460	95.2035	821.3355	653.7152	3,160.88	8.5852	8.1899
3	0.4250	0.1032	0.5282	164.8217	109.8811	95.6998	493.8790	726.3460	88.6986	867.3191	607.7317	3,154.38	8.5686	8.1740
4	0.4250	0.1032	0.5282	164.8217	109.8811	95.6998	493.8790	726.3460	81.8295	915.8771	559.1737	3,147.51	8.5511	8.1573
5	0.4250	0.1032	0.5282	164.8217	109.8811	95.6998	493.8790	726.3460	74.5758	967.1536	507.8971	3,140.25	8.5326	8.1397
6	0.4250	0.1032	0.5282	164.8217	109.8811	95.6998	493.8790	726.3460	66.9161	1,021.3010	453.7497	3,132.59	8.5131	8.1211
7	0.4250	0.1032	0.5282	164.8217	109.8811	95.6998	493.8790	726.3460	58.8275	1,078.4799	396.5708	3,124.51	8.4925	8.1014
8	0.4250	0.1032	0.5282	164.8217	109.8811	95.6998	493.8790	726.3460	50.2860	1,138.8600	336.1907	3,115.96	8.4707	8.0806
9	0.4250	0.1032	0.5282	164.8217	109.8811	95.6998	493.8790	726.3460	41.2664	1,202.6206	272.4301	3,106.94	8.4477	8.0587
10	0.4250	0.1032	0.5282	164.8217	109.8811	95.6998	493.8790	726.3460	31.7417	1,269.9509	205.0998	3,097.42	8.4234	8.0355
11	0.4250	0.1032	0.5282	164.8217	109.8811	95.6998	493.8790	726.3460	21.6839	1,341.0508	134.0000	3,087.36	8.3978	8.0111
12	0.4250	0.1032	0.5282	164.8217	109.8811	95.6998	493.8790	726.3460	11.0629	1,416.1313	58.9195	3,076.74	8.3707	7.9853
13	0.4250	0.1032	0.5282	164.8217	109.8811	95.6998	493.8790	772.0886				1,636.37	4.6993	4.4829
14	0.4250	0.1032	0.5282	164.8217	109.8811	95.6998	493.8790	772.0886				1,636.37	4.6993	4.4829
15	0.4250	0.1032	0.5282	164.8217	109.8811	95.6998	493.8790	772.0886				1,636.37	4.6993	4.4829
16	0.4250	0.1032	0.5282	164.8217	109.8811	95.6998	493.8790	772.0886				1,636.37	4.6993	4.4829
17	0.4250	0.1032	0.5282	164.8217	109.8811	95.6998	493.8790	772.0886				1,636.37	4.6993	4.4829
18	0.4250	0.1032	0.5282	164.8217	109.8811	95.6998	493.8790	772.0886				1,636.37	4.6993	4.4829
19	0.4250	0.1032	0.5282	164.8217	109.8811	95.6998	493.8790	772.0886				1,636.37	4.6993	4.4829
20	0.4250	0.1032	0.5282	164.8217	109.8811	95.6998	493.8790	772.0886				1,636.37	4.6993	4.4829
21	0.4250	0.1032	0.5282	164.8217	109.8811	95.6998	493.8790	772.0886				1,636.37	4.6993	4.4829
22	0.4250	0.1032	0.5282	164.8217	109.8811	95.6998	493.8790	772.0886				1,636.37	4.6993	4.4829
23	0.4250	0.1032	0.5282	164.8217	109.8811	95.6998	493.8790	772.0886				1,636.37	4.6993	4.4829
24	0.4250	0.1032	0.5282	164.8217	109.8811	95.6998	493.8790	772.0886				1,636.37	4.6993	4.4829
25	0.4250	0.1032	0.5282	164.8217	109.8811	95.6998	493.8790	772.0886				1,636.37	4.6993	4.4829
26	0.4250	0.1032	0.5282	164.8217	109.8811	95.6998	493.8790	772.0886				1,636.37	4.6993	4.4829
27	0.4250	0.1032	0.5282	164.8217	109.8811	95.6998	493.8790	772.0886				1,636.37	4.6993	4.4829
28	0.4250	0.1032	0.5282	164.8217	109.8811	95.6998	493.8790	772.0886				1,636.37	4.6993	4.4829
29	0.4250	0.1032	0.5282	164.8217	109.8811	95.6998	493.8790	772.0886				1,636.37	4.6993	4.4829
30	0.4250	0.1032	0.5282	164.8217	109.8811	95.6998	493.8790	772.0886				1,636.37	4.6993	4.4829
Levelized Tariff	**0.4250**	**0.1032**	**0.5282**	**164.8217**	**109.8811**	**95.6998**	**493.8790**	**739.0262**	**50.0640**	**726.1869**	**339.9670**	**2,719.5257**	**7.4602**	**7.1167**

*Withholding Tax on Dividend and Special Return on Equity have an additional estimated impact of US Cents/kWh 0.2427 & US Cents/kWh 0.2378 respectively on the levelized tariff.

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Azad Pattan Hydropower Project **Annex-IV**

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	1,017,877,788	28,105,591	30,461,918	58,567,509	987,415,870			
2	987,415,870	27,264,478	31,303,031	58,567,509	956,112,838	777.7899	697.2608	1,475.0508
3	956,112,838	26,400,140	32,167,369	58,567,509	923,945,469			
4	923,945,469	25,511,936	33,055,573	58,567,509	890,889,897	821.3355	653.7152	1,475.0508
5	890,889,897	24,599,207	33,968,301	58,567,509	856,921,595			
6	856,921,595	23,661,276	34,906,233	58,567,509	822,015,363	867.3191	607.7317	1,475.0508
7	822,015,363	22,697,447	35,870,062	58,567,509	786,145,301			
8	786,145,301	21,707,005	36,860,504	58,567,509	749,284,797	915.8771	559.1737	1,475.0508
9	749,284,797	20,689,214	37,878,294	58,567,509	711,406,503			
10	711,406,503	19,643,321	38,924,188	58,567,509	672,482,315	967.1536	507.8971	1,475.0508
11	672,482,315	18,568,548	39,998,961	58,567,509	632,483,354			
12	632,483,354	17,464,099	41,103,410	58,567,509	591,379,944	1,021.3010	453.7497	1,475.0508
13	591,379,944	16,329,153	42,238,355	58,567,509	549,141,589			
14	549,141,589	15,162,870	43,404,639	58,567,509	505,736,950	1,078.4799	396.5708	1,475.0508
15	505,736,950	13,964,383	44,603,125	58,567,509	461,133,825			
16	461,133,825	12,732,804	45,834,705	58,567,509	415,299,120	1,138.8600	336.1907	1,475.0508
17	415,299,120	11,467,219	47,100,290	58,567,509	368,198,830			
18	368,198,830	10,166,688	48,400,821	58,567,509	319,798,009	1,202.6206	272.4301	1,475.0508
19	319,798,009	8,830,247	49,737,262	58,567,509	270,060,746			
20	270,060,746	7,456,904	51,110,605	58,567,509	218,950,141	1,269.9509	205.0998	1,475.0508
21	218,950,141	6,045,640	52,521,868	58,567,509	166,428,273			
22	166,428,273	4,595,409	53,972,100	58,567,509	112,456,173	1,341.0508	134.0000	1,475.0508
23	112,456,173	3,105,134	55,462,375	58,567,509	56,993,799			
24	56,993,799	1,573,710	56,993,799	58,567,509	(0)	1,416.1313	58.9195	1,475.0508

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