National Electric Power Regulatory Authority
Islamic Republic of Pakistan

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No. NEPRA/PAR-124/5351-5353
April 2, 2018

Subject: **Determination of the Authority in the matter of Proposal for Approval of EPC Stage Tariff of Kohala Hydropower Project filed by Central Power Purchasing Agency (Guarantee) Ltd.** [Case No. NEPRA/PAR-124]

Dear Sir,

Please find enclosed herewith the subject Determination of the Authority along with Annex-I, II, III, IV-a & IV-b (45 pages) in Case No. NEPRA/PAR-124.

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

Enclosure: As above

02 04 18

(Syed Safeer Hussain)

Secretary
Ministry of Energy
'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 PROPOSAL FOR APPROVAL OF EPC STAGE TARIFF OF KOHALA HYDROPOWER PROJECT FILED BY CENTRAL POWER PURCHASING AGENCY (GUARANTEE) LIMITED

1. On 10th of October, 2017, Central Power Purchasing Agency (Guarantee) Limited (the "CPPA(G)") filed a tariff proposal (the "proposal") for import of 1124 MW electric power from Kohala Hydropower project (KHCL) in accordance with Regulation (1) of NEPRA (Import of Electric Power) Regulations, 2017 ("Regulations"). In the said proposal, Kohala Hydropower Company (Pvt.) Limited (KHCL) has requested CPPA(G) for sale of its electric power @ US cents 9.5585/kWh (Rs. 10.0220/kWh) for a period of 30 years on Build-Own-Operate-Transfer (BOOT) basis.

2. The proposal so submitted by CPPA (G) was considered and it was observed that certain requisite information is missing for which a pre-admission hearing dated 7.11.2017 was conducted wherein both CPPA(G) and the KHCL were invited for explanation.

3. During the hearing the Authority sought clarification from KHCL regarding the missing information pertaining to updated feasibility study, details of interconnection arrangements, the estimated energy production of the project and demand which is going to be met through the proposed import of power, and Affidavit/ resolution from the Board of Directors of the project Company. KHCL informed that all requisite information is being submitted for consideration of the Authority. Based on the information submitted after the pre-admission hearing, the proposal submitted by CPPA(G) was admitted.

4 SALIENT FEATURES OF THE TARIFF PROPOSAL

4.1 Following are the key features of the tariff proposal submitted by CPPA(G):-

Project Company	Kohala Hydro Company (Private) Limited
Sponsors	China Three Gorges South Asia Investment Limited (CSAIL)
Project Location	Dam Site: Siran Village; Power Plant: Barsala, District Muzafarabad, AJK
Concession Period	30 Years
Construction Period	78 Months
Power Purchaser	Central Power Purchasing Agency (Guarantee) Limited
Project Type	Run of the river
Project Basis	BOOT
Turbine Type	Vertical Francis
Plant Capacity	1,124 MW
Annual Generation	5,149 GWh
Plant Capacity Factor	52.82%
Project Cost	US$ Million
EPC Cost	1,793.50
Reimbursement of WAPDA Cost	8.06
Engineering & Supervisions	56.89
Environmental and Ecology	5.76
Land Acquisition & Resettlement	51.92
Project Development Cost	77.88
Insurance during Construction	53.8

Legal Fees & charges	12.57
Duties and Taxes	28.51
O&M Mobilization	14.15
Financial Fees and Charges	44.16
Sinosure Fee	191.91
Interest During Construction	421.05
Total Project Cost	2,760.17
Debt: Equity Ratio	70:30
Levelized Tariff	US Cents 9.5585/kWh

5 PROCEEDINGS:

5.1 In terms of regulation 3 of NEPRA Import of Power Regulations, 2017, once a request filed by the buyer for determination of rates for import of electric power as per proposal submitted by the seller is admitted, the procedure provided under NEPRA Tariff (Standards & Procedure) Rules, 1998 would be applicable. Accordingly, the salient features of the tariff proposal were advertised in the national newspapers seeking filing of intervention request or comments by any interested or affected party. It was also decided by the Authority to conduct a hearing into the matter for which issues were also framed to be considered during the hearing. The list of issues framed for the hearing were published on the NEPRA website. Notices of admission/hearing were published in the national newspapers on 16th and 17thDecember, 2017 inviting filing of intervention request or comments; beside separate letters sent to the stake holders/interested/affected parties. In reply neither any intervention request nor comments were filed by any person.

5.2 The hearing into the matter was initially scheduled for December 28, 2017, however, the legal counsel of CPPA(G) vide letter dated 27-12-2017 requested the Authority for adjournment of the hearing. The Authority, considering the importance of the CPPA(G) as a key stakeholder in this process, acceded to the said request and announced to reschedule the hearing for December 29, 2017. The hearing was held on December 29, 2017 in Islamabad, and was attended by representatives of the project Company and the CPPA(G). Other stakeholders present at the hearing included, Private Power Infrastructure Board (PPIB), Water and Power Development Authority (WAPDA), National Transmission Dispatch Company (NTDC), Azad Pattan Power Private Limited (APPL), and Riali Hydropower Company Limited (RHCL).

5.3 Subsequent to the hearing the CPPA(G) submitted written comments vide letter no. CTO/CPPA/DGM-V/788 dated January 09, 2018. KHCL responded to the comments of CPPA(G) vide letter No. KHCL-PKO-20180016-A dated January 30, 2018. KHCL also submitted additional information subsequently vide letter no. KHCL-PKO-20180033-A dated February 12, 2018 and letter no. KHCL-PKO-20180039-A dated February 27, 2018.

5.4 Having considered the respective submissions of the parties and after careful perusal of the record; issue wise findings of the Authority are as under:

I. Whether the change in the project design has been approved by the competent Authority/Forum?

The Authority observed that the project capacity has been enhanced from 1100 MW to 1124 MW, indicating a change in the design. KHCL was asked to provide evidence regarding approval of the change in design from the competent forum.

During the hearing KHCL informed that the project design has been approved by PPIB in June 2016. Elaborating further on the background of the change in design, KHCL stated that

the LOI was issued in January 2009 on a condition to update feasibility study conducted by WAPDA. After award of LOI the sponsor updated the feasibility study and the approval of the updated feasibility study was granted in July 2011. The feasibility stage tariff was determined in April 2015, and subsequently Letter of Support (LOS) was issued in December 2015. KHCL informed that subsequently the PPIB directed the Company to carry out the investigation to assess the impact of Kishanganga hydro power project on the water flow of Jhelum river and the project as well as the environmental flows required to cater to the water requirements of Muzaffarabad. The studies were completed and were approved by the Panel of Experts (POE) of PPIB in June 2016, including the revised design and increase in the capacity and construction period. Interconnection arrangement was approved by NTDC in March 2017 and amended LOS was issued by PPIB in March 2017 with increase in project capacity from 1100 to 1124 MW. The documentary evidence submitted by KHCL regarding the above approvals was found satisfactory by the Authority. Hence this issue stands addressed.

II. Whether the change in design caters for appropriate measures for environmental/ecological protection?

KHCL submitted that after construction of Kishanganga dam the water flow of the Jhelum river was increased and there was requirement to release the ecological flow into the Jhelum river to meet the requirements of Muzaffarabad. The ecological flow was increased from 15 cumecs to 30 cumecs and thereupon another 24MW e-flow power house was designed to gain economic value along with the environmental value of the ecological flows, and the same has been approved by POE. Further KHCL submitted that Environmental NOC has been granted to the Company in December 2016. The documentary evidence submitted by KHCL regarding the above approvals was found satisfactory by the Authority.

III. What is the justification of such a large increase (32.09%) of the EPC stage levelized tariff over the feasibility stage levelized tariff (9.5585 cents/kWh vs. 7.2365 cents/kWh) when there is a nominal increase in the EPC cost?

KHCL submitted in the hearing that the change in tariff from Feasibility Stage to EPC Stage is due to following reasons:

- Increase in Water Use Charge from PKR 0.15 to 0.425/kWh
- Change in financing mix from 100% foreign to a mix of local and foreign; local financing rate is higher as compared to foreign financing
- Decrease in Plant factor, Increase in O&M Cost
- Increase in insurance during construction
- Increase in certain project cost heads, and addition of new heads

The CPPA(G) in its comments suggested that the proposed levelized tariff of Kohala HPP (US cent 9.5585/kWh) is exorbitant compared to the following projects in the same region:

- Suki Kinari HPP 870 MW - US cent 8.81450/kWh
- Karot HPP 720 MW - US cent 7.5746/kWh

CPPA(G) suggested that Kohala EPC Stage Tariff requires major revision in all costs and assumptions. Further, according to CPPA(G) a leading consulting firm namely Fichtner

Management Consulting AG prepared a guide for International Finance Corporation (IFC) namely "33 Hydroelectric Power - A Guide for Developers and Investors" which is recommended to be used as reference for determination and estimations of costs primarily for hydropower developers and investors, where the average Levelized cost of Electricity is 5.4 US cent/kWh and the median value is 6.00 US cent/kWh. CPPA(G) suggested that tariff number should be revisited in the light of above stated IFC Guidelines.

KHCL responded that the Levelized Tariff of US cents 9.5585/kWh has already been reduced to US cents 9.1149/kWh as apprised by KHCL during the hearing. Further, KHCL stated that comparison with the tariff of Suki Kinari tariff should only be made after accounting for the fact that Suki Kinari HPP tariff excludes the Sinosure fee. KHCL further added that comparison made by CPPA(G) of a project in AJK with projects in developed economies as referred in the IFC "33 Hydroelectric Power - A Guide for Developers and Investors" is unreasonable. KHCL stated that tariff computation is a result of a number of factors e.g. costs, financing rates, returns, risks and associated insurance costs, in-country capacity of development, engineering practices and location etc. Pakistan and AJK, as an investment market, have certain inherent investment related risks which cannot be compared with developed countries.

The various elements contributing to the increase in tariff have been deliberated upon by the Authority as detailed in the following paragraphs.

IV. Whether the increase in the Project Construction Period from 6 years allowed at feasibility stage to 6.5 years claimed now is justified?

The Authority observed a construction period of 6 years was allowed to KHCL at the time of approval of feasibility stage tariff of the Project, however, the construction period has increased by 6 months at the EPC stage.

The CPPA(G) in its comments submitted that the construction period of 6.5 years proposed by the Company is longer compared to other hydro power projects under development on the same river and the same area, including Karot HPP which has a construction period of 5 years. In view of CPPA(G) the Construction Period of the Project should be reduced and construction schedule of Kohala HPP be optimized to 5.5 years, as it will reduce the Interest During Construction (IDC) and Return on Equity During Construction (ROEDC) in tariff and make the project viable.

KHCL responded that Panel of Experts (POE) approved the construction period of 6.5 years for the Project against a requested construction period of 7 years, while considering the following:

- The difficult geotechnical conditions with respect to the extensive tunnelling and other underground work in the case of the Project. The two 17.4 km long headrace tunnels to be excavated by drill and blast operation are on the critical path of the construction activities. The tunnels have a round section, a diameter of 8.5m. The headrace tunnels have Class III surrounding rocks primarily, Class IV surrounding rocks secondarily and Class II and V surrounding rocks in a few areas. According to prior geological survey and the excavation work of the 969 MW Neelum-Jhelum Hydropower Project, the Project's primary geological problems include water burst, soft rock deformation and rock burst.

- Construction of additional 24MW Ecological power house which was not envisaged in the feasibility stage tariff petition.

Further KHCL submitted that the Tender Documents were based on the PoE approval, the planned duration for the project realization is 78 months. All three Tenderers submitted construction time schedules which indicate that they can complete the project in 78 months.

Further, KHCL argued that comparison made by CPPA(G) with construction period of Karot Project on the same river is not justified as KHCL Project consists of long distance tunnels (2 x 17.4 KMs) as compared to Karot where there is no such tunnelling work involved.

The Authority considered the suggestion of CPPA(G) regarding reduction in construction period and observed that Minutes of the Meeting of the PPIB's Panel of Experts held on May 17, 2016 suggest that the Panel of Experts recognized the impact of topographical cum geological constraints, as well as additional work resulting mainly from increased dam height & construction of E-flow power house to benefit from additional flows of Kishanganga hydroelectric project; and agreed on six & half (6.5) years construction period for the Project, instead of 7 years requested by the Project Company/Sponsors. The Authority considers that KHCL's claimed construction period therefore is legitimate since it has been approved by the PoE. Reducing the construction period at this stage may reduce the tariff of the project, however, it may unfairly penalize the project sponsor, if it is unable to achieve COD within the reduced construction period as suggested by the CPPA(G). Therefore, the construction period of 6.5 years as claimed by KHCL is hereby approved.

Notwithstanding the above, the Authority has further decided that the sponsors should be incentivized to reduce the construction period, and the resultant reduction in the tariff should be shared between the sponsors and the Power Purchaser. Based on the aforementioned, the Authority has decided that if the project sponsor is able to reduce the construction period and achieve COD before 6.5 years, 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 6.5 years; whereas the Company will be allowed to retain the full benefit of reduction in ROEDC, i.e. the ROEDC will be calculated on 6.5 years regardless of the reduction in construction period.

V. Whether the claimed plant Capacity factor of 52.82% as against the 53.39% allowed and net annual Energy of 5,148.78 GWh as against the 5,093 GWh allowed, for negotiating power acquisition contract at the feasibility stage, is justified?

VI. Whether the estimated annual Net Energy production includes the theoretical energy production during the outage periods?

The project sponsors submitted that the original Feasibility Study was based only on main power house of 1,100MW while the revised approved feasibility study is based on 1124 MW project size with an additional 24MW E-Flow Power House. Net Capacity assumed is 1,112.8 MW, based on 1% Auxiliary Consumption.

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KHCL further clarified that the average annual energy generation of the main power house and the ecological flow power station will be 4,981 GWh and 168 Gwh respectively, as detailed below:

Months	1100 MW	24 MW	Total (GWh)
January	125	11	136
February	231	11	242
March	555	15	570
April	691	16	707
May	743	16	759
June	661	16	677
July	625	16	641
August	528	16	544
September	381	15	396
October	196	14	210
November	125	12	137
December	120	12	132
Total (GWh)	**4981**	**168**	**5149**

In addition to the above, KHCL submitted during the hearing that annual average energy is based on design potential less outage for sedimentation flushing.

The Authority considers that the capacity and generation figures are reasonable as they are based on the project design endorsed by the POE. Further, the auxiliary consumption claimed by KHCL is similar to that allowed to similar hydropower projects, and is therefore justified.

VII. Whether EPC bidding process has been conducted in a transparent manner?

The Authority observed that a consortium of Yangtze Three Gorges Technology & Economy Development Co. Ltd, & China Three Gorges Project Development Co. Ltd was selected by the project sponsors through international competitive bidding as the EPC Contractor (the "EPC Contractor").

KHCL submitted the following timelines regarding the EPC tendering process:

EPC Tendering Steps	Date
Commencement of work on tender documents	April, 2016
Publication for invitation to bid in newspaper	September 12, 2016 (Local)
	September 16, 2016 (Foreign)
Deadline for acquiring of bidding documents	September 23, 2016
Site visit with potential tenders	October 09-10,2016
Clarifications and issuance of addendum to potential tenders	September-November, 2016
Submission of tenders along with tenders security of USD 10 million	November 18,2016

Regarding the EPC selection process, the sponsor submitted that the Company has followed an international bidding process to select the EPC contractor, in compliance with requirements of IFC and World Bank guidelines. Elaborating on the various stages of the EPC selection,

KHCL stated during the hearing that invitation to the bidders was published in local and international newspapers in September 2016.

According to KHCL, five (5) parties purchased the bidding documents as detailed hereunder:

i. China Machinery Engineering Corporation, China (CMEC);
ii. China Gezhouba Company Limited (CGGC);
iii. The Consortium of Yangtze Three Gorges Technology & Economy Development Co. Ltd, (TGDC) & China Three Gorges Project Development Co. Ltd (TGPD);
iv. Power Construction Corporation China (Power China);
v. General Electric International Operational Co Inc. (GE).

This purchase of bid documents was followed by site visits and pre-conference in October 2016. The bids were submitted in November 2016.

The Authority observed that KHCL conducted evaluation of EPC bids at three (3) separate levels. Firstly, the bid evaluation was conducted in-house by the Company itself, followed by bid evaluation by the Owner's Engineer and subsequently an independent review of the EPC proposals was carried out by an Independent Engineer, Mott Macdonald. KHCL submitted all three (3) bid evaluation reports to the Authority.

According to the bid evaluation reports, the following three (3) parties eventually participated in the bidding:

i. CGGC;
ii. TGDC & TGPD;
iii. Power China.

The Authority considers that KHCL has followed a fairly detailed bidding procedure. In the bidding process three (3) large and renowned bidders participated. The bid evaluations were fairly detailed, and the lowest financial bidder has been selected after thorough due diligence by three (3) separate bid evaluations as stated above. The selected bidder, TGDC & TGPD, was ranked first in all three (3) evaluations.

In view of the above, the Authority considers that the EPC bidding process has been reasonably satisfactory.

VIII. Whether the requested firmed EPC cost of US$ 1,793.50 million is justified?

KHCL submitted that the EPC Contract value is USD 1,793.50 Million, i.e. US$ 1.6 Million per MW.

The EPC cost is split into two parts, i.e. the offshore component which comprises mainly of the E&M works, and the onshore component which comprises of the civil works and tunnelling works. KHCL argued during the hearing that the EPC cost approved at the feasibility stage was based on 2010 estimates. Moreover, an additional power house of 24MW has been included in the revised design. KHCL claimed that the resulting increase in the cost per MW by 1.6% is low when compared with the inflation indices.

During the hearing KHCL added that sales tax on EPC onshore price was not included in the Tariff Proposal. The Company has requested AJK Govt for grant of exemption of sales tax

however in case the said exemption is not granted to the Company it would request the Authority to allow the cost at COD stage on actual basis.

The CPPA(G) in its comments, while comparing the Project to Suki Kinari hydropower project, submitted that all components of the EPC cost of the Project are higher, including the cost of civil works and the cost of Electrical & Mechanical equipment. The CPPA(G) argued that the EPC cost of Kohala hydropower project is 28.75% higher and 26.72% higher compared to Karot hydropower project and Suki Kinari hydropower project respectively.

The CPPA(G) stated that the EPC cost approved at the feasibility stage on 9th April 2015 has now increased based on the following two factors:

a) 24 MW Ecological Power Station inclusion.
b) Increase in construction period from 6 years to 6.5 years.

The CPPA(G) suggested that the energy and cost for the development 24 MW Ecological Scheme should be considered and evaluated. The Authority has observed that while the EPC cost has increased, the annual energy of the project has also increased by 1.1%, due to the change in design. Further, the plant factor of the e-flow power house alone is close to 80%.

The CPPA(G) suggested that the total Project and Civil Work cost of Kohala HPP is enormously high, based on the following comparison made by the CPPA(G):

Sr. No.	Project Cost	Kohala HPP (US$ Million)	Suki Kinari HPP (US$ Million)	Karot HPP (US$ Million)
1.	Project Cost	2760.17	1711.4286	1687.43
2.	Civil Work cost	1141.25	821.1679	788.09

The Authority observed that no two hydropower projects are exactly the same in terms of design and cost; and therefore, a direct comparison of cost made by CPPA(G) is not relevant.

The CPPA(G) also made the following comparison on "Per Megawatt" basis:

Sr. No.	Per Megawatt Cost	Kohala HPP	Suki Kinari HPP
1.	EPC cost/ MW	1.595	1.51
2.	Total Project cost/ MW	2.455	1.966
3.	Civil Work cost/ MW	1.015	0.944

The CPPA(G) suggested that the above costs may be brought down to a level comparable with the costs given to the other hydropower projects.

In response KHCL submitted that for procurement of services of EPC Contractor, the Company carried out International Competitive Bidding (ICB) process in order to ensure that the most transparent, competitive, fixed prices, and time-certain, turnkey EPC offers are received by the Company for the Project. KHCL claimed that transparency and fair competition was ensured by conducting the entire bidding process in line with the requirements of International Finance Corporation (IFC) guidelines, a member of World Bank and one of the shareholders in China Three Gorges South Asia Investment Limited. Further, KHCL submitted that the per MW EPC cost for Kohala HPP is 6% higher than the per MW

EPC cost determined for Suki Kinari HPP. The EPC price for SK Hydro is based on 2012 prices whereas for KHCL the EPC cost is based on 2016 price.

KHCL argued that the Project design and EPC cost is not comparable with other projects on the same river due to: geologically separated Power house and dam site, longer tunnels, two different interconnection facilities and poor geological conditions as confirmed in Neelum-Jhelum Project. KHCL added that the turnkey EPC price of US$ 1,793 Million corresponds to 1124 MW project as a whole without any distinction being made for two different Power Houses.

Regarding the argument of CPPA(G) on the total project cost, KHCL submitted that Project cost of US$ 2,760 Million is justified when compared to Karot HPP and Suki Kinari HPP due to scope of additional EPC work in case of KHCL, stemming from a vastly different design scheme comprising of hydraulic tunnels, geographically separated sites with two Power house complexes. In addition, KHCL has a construction period of 6.5 years, Sinosure Insurance cost based on "Buyer's Credit Policy" and other project specific assumptions. KHCL stated that in case of Karot HPP, the Sinosure policy is different "Overseas Investment Insurance" (OII) where Sinosure cost is payable on annual basis, as part of Tariff, instead of upfront payment; whereas in the case of Suki Kinari HPP, the cost of Sinosure has been allowed at actual on the same rate as requested by KHCL but the same has not been included in Project Cost and resulting Tariff. As a result, not only the Project Cost is lower prima facie to the extent of Sinosure amount, but also due to resultantly lower costs under different project cost heads such as Interest during construction.

The Authority has observed that the EPC cost has not increased significantly compared to the estimates at the time of Feasibility Level Tariff, while there has been an increase in capacity by 24 MW (via addition of power house on ecological flows). The Authority noted that generally EPC cost of hydropower projects varies significantly from site to site and is dependent on a combination of many factors which includes major factors such as geological conditions, design scheme and capacity.

The EPC bid evaluation reports submitted by KHCL were perused. A Comparison of bid prices is given hereunder:

	POWERCHINA	CGGC	TGDC & TGPD
EPC Tender Price (USD Million equivalent @ EPC contract exchange rate)	2,047.519	1,961.522	1,793.498

The Authority considers that the EPC price is acceptable as it is based on International Competitive Bidding (ICB), and the lowest financial bidder has been selected as the EPC contractor. The EPC Offshore price is US$ 463.537 Million, whereas the EPC onshore price is PKR 80,608.118 Million and US$ 559.697 Million including provisional sums. After accounting for difference in exchange rate of EPC contract and the Tariff Petition, the EPC cost works out to be US$ 1,792.029 Million.

Regarding Sales Tax on Onshore EPC, the Authority has decided that a tax imposed on the project Company which is non-refundable or non-adjustable in nature, will be considered and

adjusted at COD subject to provision of documentary evidence to the satisfaction of the Authority.

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

KHCL submitted that the cost of tunnels will be adjusted according to the difference in rock classification assumed at the stage of signing of the EPC Onshore Contract and actually encountered at execution stage.

The EPC contract submitted by the KHCL was perused. The EPC contract price is subject to adjustment as per terms of the contract on account of variation in cost of tunnels encountered due to variation in classification of rock assumed in the EPC Onshore Contract and classification of rock actually encountered at construction stage. However, the total quantities of rock shall not be varied and will remain fixed as on signing of the EPC Onshore Contract, in accordance with the NEPRA 3 stage mechanism.

Additionally, a civil works cost escalation is also part of the EPC contract, whereby changes in cost shall only be adjusted in local currency portion of the EPC contract on the basis of changes of the prices of cement, fuel, reinforcement steel and labor. As per the escalation formula, 60% of the onshore price will be fixed whereas the remaining 40% will be indexed with published indices in accordance with the NEPRA 3 stage mechanism.

The Authority considers that the price adjustment/ escalation being reasonable and in accordance with the NEPRA 3 stage mechanism are justified and therefore allowed.

X. Whether non EPC cost amounting to US$ 281.04 million is justified?

KHCL claimed US$ 281.04 Million under various heads of non-EPC cost as given hereunder:

Non EPC cost	US$ Million
Engineering and Supervision Cost	56.9
Environment and Ecology Cost	5.76
Land Resettlement Cost	51.92
Project Development Cost	77.88
Insurance During Construction Cost	53.8
O&M Mobilization Cost	14.15
Reimbursement to WAPDA for original Feasibility Study	8.06
Legal fee and Charges	12.57
	281.04

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

Engineering and Supervision Cost

KHCL provided the following break-up of the claimed Engineering and Supervision cost:

Engineering and Supervision Cost	US$ Million
Owners Engineer	28.20
Special Technical Studies	6.17
Revised Feasibility Study 2016	18.76
Independent Engineer	1.00
Reopener Verifier under PPA	1.30
Technical Consultant - Approval from GoC	1.26
CSMS-Land survey	0.05
Technical Study on EIA & RAP	0.16
Total	**56.89**

The CPPA(G) in its comments suggested that Engineering & Supervision cost of US$ 56.89 million assumed for the project construction period of 6.5 years is exceedingly high. According to CPPA(G), the investigation, detail engineering and design are usually carried out by the EPC contractor in EPC mode thus the role of owner's engineer is rather limited. CPPA(G) stated that NEPRA has allowed US$ 29.2 million to Karot HPP for Engineering & Supervision cost. CPPA(G) recommended that Engineering & Supervision cost estimates should be brought in line with other hydel projects as, according to CPPA(G), Engineering & Supervision cost does not change much with the size of the project.

In response KHCL submitted that the costs under the head "Engineering and Supervision" vary from project to project and essentially depend on project specific parameters and dynamics.

Further, KHCL explained that tasks/activities to be performed by Owner's Engineer is spread over: a) Project Development Period, b) Project Construction Period & defect notification period and c) General requirements during the entire period. The activities include, but are not limited to;

- Procure the EPC Contractor and O&M Contractor;
- Review Environmental and Social Impact Assessment (ESIA), Resettlement Action Plan (RAP),Environment and Social Management Plan (ESMP) and obtain permit from the Environment Protection Agencies (EPA) of Pakistan & AJK;
- Review the Design and Preparatory work at site;
- Comprehensive Project design and Plan review during construction period;
- Review of variations;
- Quality Assurance and Quality Control;
- Project Supervision and Management;
- General Risk Management Plan;
- Coordination with relevant stake holders;
- Review of Network Interconnections and Technical Studies completed by EPC Contractor and Consultants; and
- O&M related tasks including review of SoPs

KHCL submitted that Owner's Engineer, Lahmeyer International GmbH, was selected after International Competitive Bidding (ICB) process which included other firms such as MWH International Inc., Mott MacDonald Limited and SMEC International.

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The Authority observed that the Owner's Engineer cost allowed for a comparable project, i.e., Karot HPP (720 MW) is US$ 18 million.

Documentary evidence submitted by KHCL in this regard including the bid evaluation report for bidding of Owner's Engineer was considered by the Authority. As per documentary evidence, the following financial proposals were submitted by the participating bidders for Owner's Engineer:

No.	Owner's Engineer Tenderers	Bid Price
1.	Fichtner GmbH & Co. KG	US$ 17,953,558
2.	Mott MacDonald Limited	US$ 23,547,352
3.	MWH International, Inc.	US$ 26,426,639
4.	Lahmeyer International GmbH	US$ 27,043,828
5.	SMEC International Ply Ltd	US$ 31,740,649

The Authority observed that despite submitting the lowest financial bid, Fichtner was disqualified on the basis of technical evaluation. Moreover, Mott MacDonald submitted the second lowest financial bid but it was placed lower in ranking due to significantly lower score assigned to it for the technical proposal. Lahmeyer International GmbH, was eventually selected despite having the 2nd last ranking for financial proposal. It appears that the basic technical criteria was fulfilled by all bidders, however, owing to the heavy weightage given to technical proposal (55% given to technical proposal 45% given to financial proposal), the ranking of proposals changed drastically. The contract between sponsor and Owner's Engineer, however, states that the Owner's Engineer proposed reduction of the overall contract price of US$ 27.04 Million to a new Contract Price of US$ 23.500 Million based on updated proposal submitted by the Owner's Engineer.

Notwithstanding the aforementioned, keeping in view the evidence of lowest financial proposal given by Fichtner for Owner's Engineer as well as cost allowed to the other hydropower projects under this head, and after making necessary adjustments while keeping in view the longer project construction period of Kohala HPP, the Owner's Engineer cost of US$ 20.7 Million has been assessed as the prudent cost under this head.

Feasibility Study, Revised Feasibility Study and Special Technical Studies

KHCL claimed a total of USD 24.93 million for revision of feasibility study and additional technical studies undertaken by the Sponsors, in addition to reimbursement to WAPDA for original Feasibility Study of US$ 8.06 Million.

KHCL stated that as required under the LOI, the cost of feasibility study of the Project has been reimbursed to WAPDA. The Authority in its decision dated April 9, 2015 regarding feasibility stage tariff of the Project had noted that no documentary evidence to ascertain the actual cost to be reimbursed to WAPDA was provided at that stage, and decided not to approve this cost. However, the same, was allowed to be considered by the Authority based on verifiable documentary evidence at the time of next stage tariff application.

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KHCL submitted documentary evidence of payment made to WAPDA regarding reimbursement of feasibility study cost. As per documentary evidence the cost of feasibility study of WAPDA is PKR 840,617,239 (US$ 8.017 Million), and the same is allowed.

Additionally, KHCL submitted that the 2010 Feasibility Study was updated, Special Studies and supplementary design work of the Project conducted as per requirement of PPIB. The Revised Feasibility Study 2016 was required to assess the impacts on capacity, energy, design modifications, cost and tariff of the Project likely to result from utilization of anticipated additional water from Neelum river into Jhelum River. The revised feasibility study, called "2016 Revised Technical Report" was approved by PoE.

KHCL further stated during the hearing that special technical studies were required due to poor geological conditions identified during the tunnelling work at Neelum Jhelum hydro power project, based on which the sponsor decided to conduct some special studies to address the following key areas:

- Geological and geotechnical conditions;
- the impact of HFT active faults;
- natural building materials reserves required for the construction;
- Other "Special Studies" (use of TBM, sedimentation model, hydraulic model, de-silting basin etc.).

The Authority noted that the cost claimed under this head (US$ 18.76 million for revised feasibility study and US$ 6.17 million for special technical studies) is exorbitant. The Authority further noted that the detailed designing is done by the EPC contractor and this cost is included in the EPC cost.

Documentary evidence indicates that during 2012-2015, further studies were carried out by the sponsor through China Water Resources Beifang Investigation, Design and Research Co. Ltd. (BIDR). These studies included the following:

- Special Report on Hydrology & Sediment
- Report on Comparison of Underground & Surface Powerhouse
- Headrace tunnel study
- Sediment Model Test Report
- Hydraulic Model Test Report
- ESIA and RAP of Kohala HPP
- Interconnection studies for the project

According to the Company, the geological survey carried out in WAPDA's Feasibility study was not adequate and the mapping was not sufficiently accurate; hence additional geological survey and accurate mapping had to be carried out. In addition, additional hydrological data was added/updated and its analysis was completed; as a result the annual run-off at dam-site and probable maximum flood figures were adjusted. More intensive geological investigation was carried out in the reservoir area and additional bore-holes were drilled at dam-site, along tunnel route and powerhouse areas.

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According to KHCL, as a result of review of Feasibility Study, the following changes were made to the design:

- Headrace and tailrace normal and minimum levels were adjusted.
- Ecological flow was increased from 15m³/sec to 22.5m³/sec
- The energy output was recalculated/ adjusted
- Desilting basin/desander was eliminated
- Ecological flow power station was added
- Dam site and axis was moved 16 m upstream
- Underground powerhouse was changed to semi-underground type powerhouse

The Authority noted that the review of WAPDA's Feasibility Study by CWE was extensive and has resulted in benefits such as elimination of desander, which has helped in reduction of project cost.

However, the Authority observed that the total cost of the review and additional technical studies, i.e., US $ 25.92 Million is exorbitant. As stated earlier, the cost of Feasibility Study conducted by WAPDA (US$ 8.06 million) was also charged to the Project. Hence, even if the review of WAPDA's Feasibility Study is considered to be a full-fledged Feasibility Study, its prudent cost should not have been more than US$ 4 million. The cost of other Technical Studies conducted by the Company should not have exceeded another US$ 4 million.

Based on the aforementioned, the Authority has decided to allow US$ 16 Million on account of Feasibility Study, Revised Feasibility Study and Special Technical Studies (US$ 8 Million for reimbursement of original feasibility study to WAPDA and US$ 4 Million each for revised feasibility study and further technical studies).

Re-opener Verifier and Independent Engineer

According to KHCL Re-opener verifier will be appointed as per the provisions of the PPA, and will be responsible to authorize variation, deliver opinion, certification and carry out estimation or valuation. The terms of reference of the Re-Opener Verifier shall include but not limited to monitoring and evaluation of any cost variations due to geological conditions limited to the tunnel area, cost escalations in the civil works associated with construction and re-settlement costs.

KHCL submitted that the cost of Independent Engineer and Re-opener Verifier, to be appointed as per the requirements under PPA is based on estimates.

The Authority noted that in case of Patrind HPP, the actual contract for the Reopener Verifier is $ 228,000. Keeping in view the actual costs incurred by other hydropower projects and after making adjustments for scope, size and period of excavation of Kohala HPP, the prudent cost of Re-opener Verifier has been assessed as US$ 500,000.

The Authority noted that Independent Engineer is usually engaged shortly before COD. Keeping in view the actual costs incurred by other hydropower projects for hiring of independent engineer and after making adjustments for the number of units to be tested at

COD (4 Units main units and 2 smaller ones for the ecological flow power house), the prudent cost of hiring independent engineer for Kohala HPP is US$ 500,000.

In view of aforementioned the Authority hereby allows a combined cost of US$ 1 Million for Independent Engineer/ Re-opener verifier.

Technical Consultant - Approval from Govt of China

As per KHCL US$ 1.2 Million was paid to a consultant in order to meet a requirement of the Chinese government that feasibility of every project is to be approved by the Government of China (GoC).

The Authority noted that the cost of such consultants falls outside the scope of Engineering and Supervision and it is a requirement of an external Govt body. Therefore, the Authority has decided to exclude this cost from Engineering and Supervision cost. The allowed Project Development cost, as discussed in subsequent paragraphs, includes this cost.

Following is a summary of Engineering & Supervision cost allowed for KHCL:

Engineering and Supervision Cost	Approved cost (US$ Million)
Owners Engineer	20.7
Special Technical Studies	4
Revised Feasibility Study 2016	4
Independent Engineer	0.5
Reopener Verifier under PPA	0.5
Technical Consultant - Approval from GoC	0
CSMS-Land survey	0.05
Technical Study on EIA & RAP	0.16
Total	**29.91**

Environment and Ecology Cost

KHCL provided the following break-up of Environment and Ecology Cost:

Environment and Ecology Cost	US $ Million
Bio Diversity Management Plan	3.85
Stake Holders Engagement Plan	1.17
Monitoring and Audit Cost	0.56
Capacity Building and Training	0.17
Total	**5.76**

The CPPA(G) suggested that the costs for developing the area of the project should be borne by the Project Company and may not be passed on to the consumer.

KHCL responded that the Environmental Social Impact Assessment (ESIA) of the Project has been approved by Environmental Protection Agency (EPA), Government of Azad Jammu

& Kashmir (GoAJ&K) which has been prepared in compliance with the Environmental Laws and Regulations of AJK and Pakistan, as well as IFCs performance Standards on Environmental and Social Sustainability. Cost proposed under this head has been allocated for environmental mitigation defined in the ESIA which include but not limited to proper treatment of water, supply, sewerage, site, protection and rehabilitation program and monitoring programs; proper action of mitigating environment impacts from the project (such as loss of community infrastructure, cultural property etc.); proper maintenance and improvement of environment status of the area during the construction phase of the project etc.

During the hearing KHCL stated that in addition to the above, as per the requirement of AJK Environment Protection Agency, the project Company is required to construct five (5) water bodies downstream of dam. KHCL stated that the cost of these dams has not been estimated at present, and therefore is not included in the project cost. KHCL requested that after the completion of study if AJK EPA requires Company to construct the water body to fulfil the requirements of NOC the same will be claimed at COD.

The Authority observed that the "Water bodies" considered by the EPA are to be constructed to prevent encroachment, provide recreational facilities, promote tourism, and to restore aesthetics of the river. Cost estimates, exact locations and or design of these water bodies have not finalized as yet and the Company is of the opinion that their construction is not viable as sedimentation and flash floods in the river would wash away these water bodies. AJK EPA, however, is of the view that a feasibility study of construction of water bodies is being carried out for Neelum Jhelum, and if found feasible such construction would have to be carried out for this project as well.

KHCL was asked to provide initial estimate of the cost of water bodies, however, KHCL replied that no initial estimates of the cost are available. Further, KHCL has already provided rationale to AJK EPA in the undertaking (endorsed by EPA) that the construction of water bodies may not be technically and financially viable. However, as per EPA this condition will be reviewed in line with the outcome of the feasibility study (expected to be completed in one year) for construction of water bodies by Neelum-Jhelum Hydro Power Project followed by independent third party study in the case of KHCL. KHCL submitted that the cost of water bodies is largely dependent on the type and scope of work which will be concluded in the feasibility study.

The Authority observed that under the NEPRA 3-stage mechanism for determination of tariff for hydropower projects, adjustment of cost at actual is allowed only for resettlement and land related cost. From the communication with KHCL it seems that the cost associated with water bodies is likely to be substantial and may be financially unviable. In view of the aforementioned, the Authority cannot allow this cost as per actual as it is likely to adversely affect the consumer of electricity. The cost claimed by KHCL for Environment and Ecology Cost amounting to US$ 5.76 Million is already quite substantial, and therefore allowed as the maximum cap for this Project subject to adjustment as per actual. KHCL is directed to undertake all related works including the construction of water bodies, provided they are financially and technically viable, within the budget approved for environment and ecology.

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Land Resettlement Cost

KHCL has provided the following break-up of this cost:

Land Acquisition and Resettlement Cost	US$M
Land Acquisition	33.64
Up-lift Package/Community Investment Plan	5.7
House Compensation	5.21
Trees / Plants / Oops Compensation	4.37
Infrastructure Compensation	1.36
Administration & Monitoring Cost	0.91
Resettlement Allowances	0.56
Livelihood Restoration	0.17
Total	51.92

KHCL stated that the estimate for acquisition of land is based on the government notified rates. As per KHCL about 170 houses will be resettled along with cattle farms, poultry farms and one petrol station.

The CPPA(G) in its comments stated that at Feasibility stage the Company claimed US$ 10.23 million for acquisition of land as well as compensation for loss of houses, commercial buildings, trees, raising and replacement of bridges & roads and rerouting of utilities. The CPPA(G) contested that the cost of US$ 51.92 Million mentioned in the EPC stage tariff proposal by KHCL is extremely high and unrealistic, compared to the approved cost at feasibility stage, therefore this cost should be reduced.

In response KHCL elaborated that the total land required for the project is 9,369 Kanals and cost is based on the estimated rate per Kanal at the time of submitting the EPC stage Tariff Proposal. The cost estimate provided adequately accounts for, and is based on a reasonable estimate for, various land acquisition and resettlement related costs. However, as per Land Acquisition Act 1894 Land collector will be notifying the Land price after completion of the Land Acquisition process which may vary.

Referring to the NEPRA Mechanism for Determination of Tariff for Hydropower Projects, KHCL stated that any variation in land and resettlement cost is allowed on actual basis provided that such costs are certified by the Government of concerned Province/AJK.

The cost of Community Investment Plan (CIP) which has been allowed to other hydropower projects like Karot HPP under the head of Environment and Ecology has been included by KHCL under the head of Land resettlement cost. As in the case of Karot HPP, a detailed break-up of cost and works to be performed under CIP needs to be provided to the Authority. Under the terms of the EPA approval, the Company is bound to submit to the EPA a CSR or CIP based on the requirements of the EPA within 6-months of financial close. The Company is hereby directed to submit the finalized report within the same time frame to NEPRA. The cost claimed for CIP US$ 5.7 Million is hereby allowed as the maximum cap. The Company is directed to adhere strictly to the requirements of the CIP and works to be undertaken in this regard to be carried out strictly on need basis so that no extra burden is passed on to the consumers of electricity through tariff.

The Authority noted that although the Land Resettlement cost has increased significantly from feasibility stage, this cost is allowed as per actual requirement of the project in accordance with the Mechanism for Determination of Tariff for Hydropower Projects, and is therefore adjustable at the time of COD based on authentic documentary evidence to be provided by KHCL. Therefore, the overall cost for Land Acquisition and Resettlement of US$ 51.92 Million as claimed by the Petitioner is hereby allowed subject to the abovementioned cost cap for CIP and adjustment as per actual at the time of COD.

Project Development Cost

The following break-up of Project Development cost was provided by KHCL in its EPC stage tariff proposal:

Project Development Cost	US$ Million
Salaries, Wages & Benefits	39.79
Service Charges	8.50
L/c Bank Guarantees charges	5.59
House Rental Expenses	3.08
Office Rentals	3.46
Project Advisors	4.15
Travelling, Boarding & Lodging	2.82
Office Administration Costs	2.55
Site office Expenses	1.21
Certification Fee	1.27
Assets Acquisition Cost	1.76
Training & Development	0.58
Meeting, Conferences & Company Events	0.68
Security Cost	1.32
Cost of PR and Media Management	0.14
Bank Charges	0.24
Audit Charges	0.09
Misc. Consultancy	0.37
HSE related costs	0.28
Total	**77.88**

The CPPA(G) in its comments submitted that the cost estimate of US$ 77.88 million under the head of Project Development cost is high and unacceptable. CPPA(G) submitted that NEPRA in its tariff determination for Suki Kinari HPP and Karot HPP allowed US$ 37.437 million and US$ 44.736 million respectively under the head of Project Development cost. CPPA(G) stressed that the Project Development cost does not have a linear relationship with installed capacity, and has suggested that this cost estimate should be brought down significantly to a realistic estimate.

In response KHCL submitted that since the project development activities of the Project commenced from 2008 and LOI was issued in early 2009, the Authority would appreciate that project development stage involves efforts of various professionals, advisors. Moreover, substantial administrative costs have already been incurred and shall continue during construction till COD. KHCL conceded that the project development cost does not depend entirely on project size, and is largely dependent on the development and construction period.

KHCL acknowledged that Project Development cost does not have a linear relationship with the installed capacity of the Project; however, size viz a viz construction period of the Project does affect the cost quantum.

The Authority noted that the project development cost proposed by the Company is excessively high. The Authority had allowed US $ 44.736 million on this account to the 720 MW Karot HPP. After making adjustments for a longer construction period and larger size of Kohala HPP, the Authority has assessed US$ 53.796 Million as the prudent cost of project development for KHCL. Moreover, this cost includes the maximum Security cost payable by CPEC projects, as allowed by the Authority for this Project through a separate decision in pursuance of ECC decision dated 23rd September 2016. The security cost will be adjusted as per the actual cost paid by the Company at the time of COD.

Insurance during Construction Cost

KHCL submitted during the hearing that Insurance during Construction budget is based on 3% of EPC price. KHCL justifying its claim stated that as per the risk evaluation the project is categorized as extreme for natural disaster and the project site is located on a geological fault (Zones 3 and 4). Further, on this matter KHCL elaborated that 3% Insurance During Construction is justified since in case of some other hydropower projects NEPRA allowed Insurance During Construction rate of between 2.5 to 2.75% of the EPC, however, Kohala HPP has a longer construction period 6.5 years.

In this regard, the CPPA(G) submitted that Insurance during Construction cost claimed for Kohala HPP of US$ 53.8 million (2.99% of the EPC cost), is very high compared to the Insurance during Construction cost allowed for Karot HPP which is US$ 31.94 million (2.5% of the EPC cost) and the Insurance during Construction cost allowed for Suki Kinari HPP which is US$ 36.143 million (2.75% of the EPC cost).

CPPA(G) stated that world insurance market has been softened in recent years resulting into softer terms for placement of insurance policies and lower premiums, and requested the Authority to review this cost.

In response KHCL submitted that the construction period of the Project is 78 months, which is the primary driving factor for overall quantum of the cost associated with Insurance during Construction. KHCL stressed that the construction periods of Karot HPP and Suki Kinari HPP are shorter (60 months and 72 months respectively), which in turn translates into reduced requirement for Insurance premium payments during construction period; hence, the insurance during construction is 2.5% and 2.75% of the EPC price for Karot and Suki Kinari respectively. Furthermore, KHCL stressed that the estimates have been worked out keeping in view that uncertainty about the security and geo-political situation in the region and site specific risks like tunnelling, geographical conditions etc. The risk evaluation of the Project based on risk database of Munich Re, confirms the following:

- Natural disaster (Earthquakes, lightning, hails and flash floods) risks categorized with a rating of "Extreme"
- Evaluation confirms that the Complex Site on geological fault (Zones 3 and 4)

KHCL submitted that in view of the above, the requested insurance during construction at 3% is already an aggressive target and KHCL is facing challenges in securing insurance at this rate considering the risk profile and 78 month construction period.

The Authority considered the submissions of CPPA(G) and KHCL. Based on the market, the Authority has assessed that for power generation projects, the Insurance during construction ranges from 0.50% to 2% of the EPC cost depending on the type of technology and construction period. In view of the fact that hydropower is a riskier technology and this Project in particular has one of the longest construction periods, the Authority has decided to allow insurance during construction at a maximum cap of 2% of the approved EPC cost to KHCL. The insurance during construction is subject to adjustment at COD as per actual upon production of verifiable documentary evidence to the satisfaction of the Authority.

O&M Mobilization Cost

KHCL stressed during the hearing that the O&M mobilization and annual O&M cost for this project is based on the fact that there are two geographically separate power houses. The distance between the power house and the dam site is 70 km which also contributes to slightly higher O&M cost of this project.

The CPPA(G) suggested that the O&M Mobilization Cost of US$ 14.15 million is extremely high in comparison with Karot HPP (US$ 3.00 Million), about 78.8% higher. CPPA(G) requested the Authority to review the O&M Mobilization cost and bring it down to a reasonable value.

KHCL responded that the O&M Contractor needs to be mobilized on site at least 15 months prior to Commercial Operation Date for ensuring a seamless transition from the construction period into the operation period. KHCL stressed that its project includes two distinct power houses for which the O&M Contractor will mobilize additional resources during testing and commissioning phase. In addition to the testing and commissioning process, the O&M contractor's team will also receive trainings from the EPC/OEM, prepare O&M Standing Operating Procedures, perform taking over procedures at COD and will plan the operations as per the operating manuals for the equipment provided by EPC/OEM.

The Authority directed KHCL to submit the contract forming the basis of its claim regarding O&M mobilization, however, KHCL replied that large hydropower projects have longer gestation period, and therefore O&M contracts are generally signed after financial close of the Project. KHCL stated that to ensure a seamless transition from the construction period into the operation period the O&M contractor needs to be mobilized on site at least 15 months prior to COD based on which a quotation was obtained from O&M operator to estimate the cost.

The Authority has noted that the claim of KHCL that O&M contractor needs to be mobilized on site at least 15 months prior to COD is not realistic. The Authority has previously allowed O&M mobilization cost for similar projects such as Karot HPP for 7-9 months before COD. Based on the precedents and cost benchmarks available with the Authority, the O&M mobilization cost of US$ 3.5 Million has been assessed as reasonable and is therefore allowed.

Legal fee and Charges

The CPPA(G) in its comments stated that the legal cost of US$ 12.57 million is on higher side as compared to Karot HPP which has a legal cost of US$ 7.5 million and Suki Kinari HPP which has legal cost of US$ 3.668 million.

CPPA(G) suggested that the legal cost of the project doesn't depend upon the capacity of the plant, and therefore requested the Authority to review the figures claimed by KHCL.

KHCL responded that the Legal cost includes cost of stamp duties and registration fee for Project documents and legal advisors required for the Project.

The Authority noted that the cost associated with stamp duties and registration fee under the Stamp Act 1899 and Registration Act 1908 is estimated to be US$ 11.6 million, a major portion of the amount claimed under this head. The Authority considers that although the cost of stamp duties is an adjustable cost, it needs to be realistic. The Authority expects that KHCL is likely to incur much lesser cost for stamp duties than US$ 11.6 Million estimated by the Company. The Authority has assessed US$ 0.095 Million US$ as a realistic estimate for stamp duties. Further, the Authority considers that the remaining cost pertaining to fees of legal advisors (US$ 0.97 Million) is reasonable. Based on the aforementioned, US$ 1.065 Million is hereby allowed as Legal fee and Charges, including US$ 0.97 Million as Legal charges and US$ 0.095 Million as stamp duties. Stamp duties will be adjusted as per actual on the basis of documentary evidence at COD.

XI. Whether the claimed duties and taxes of US$ 28.51 million as against the US$ 23.51 million is justified?

KHCL was allowed US$ 23.51 million as adjustable duties and taxes at feasibility stage. KHCL submitted that Custom Duty @ 5.00% has been assumed on import of machinery, equipment, goods, spares and materials for the Project, in accordance with the Policy. Whereas, Sindh Infrastructure Development Surcharge (the "SIDS") @ 1.15% of the imports for the Project has been assumed. The chargeability of SIDS is based on (i) the weight of the imported equipment / items, (ii) the distance of the Site from the port and (iii) use of equipment in Sindh. Further, KHCL submitted that no other taxes at the import stage including the Sales Tax (presently exempted) have been assumed in the tariff proposal. Furthermore no AJK taxes have been assumed in the tariff proposal.

In this regard, the CPPA(G) commented that custom duty @ 5% is levied on the import of plant and equipment as per the current tax laws and also 0.95% is Sindh Infrastructure Development Surcharge. Hence an amount of US$ 28.51 million has been added to the project cost. CPPA(G) suggested that Custom Duty of Kohala HPP may be scrutinized.

In response KHCL submitted that all Custom Duties and Taxes related to the Project are requested as part of the Project cost based on actual and are subject to documentary evidence to be submitted at COD. The estimated amount is based on the prevailing rate of custom duty and Sindh Infrastructure Development Cess (SIDC).

The Authority considers that the basis for estimation of custom duties are reasonable as similar bases have been used in previous decision of the Authority. Duties and Taxes of non

refundable/ non-adjustable nature imposed on the project Company are hereby allowed subject to adjustment as per actual at COD.

Recapitulating, following is a comparison of Project costs requested vis-a-vis Project costs approved:

	Requested EPC Stage (US$ Million)	Approved EPC Stage (US$ Million)
EPC COST	1,793.498	1,792.029
NON EPC COSTS		
Reimbursement of WAPDA Cost	8.061	8.017
Engineering & Supervision	56.892	29.910
Environmental and Ecology	5.755	5.755
Land Acquisition & Resettlement	51.924	51.924
Project Development Cost	77.881	53.796
Insurance during Construction	53.805	35.841
Legal Fees & charges	12.569	12.569
O&M Mobilization	14.150	3.500
Duties and Taxes	28.508	28.510
Financing fee & Charges	44.164	37.694
Sinosure Fee	121.724	34.475
Interest During Construction	429.528	325.33
Total Project Cost	**2,698.459**	**2,407.848**

XII. Whether the claimed financing terms i.e. spread of 3.5% on KIBOR and 4.6% on LIBOR is justified?

KHCL stated during the hearing that subsequent to filing of tariff proposal with NEPRA, negotiation with lenders resulted in reduction of the local lending spread from 3.5 to 3% over KIBOR, whereas the lending spread on the foreign loan has also been reduced from 4.6% to 4.5%.

Moreover, the project Company was asked during the hearing to justify its claimed debt to equity ratio of 70:30 as against 80:20 claimed and allowed for Karot which is also being developed by the same sponsors. In response to which KHCL submitted that Karot power project was partly located in Punjab, however, the Kohala HPP is located totally in AJK, and hence the lenders of the project are not willing to provide funding for the project unless at least 30% equity is injected by the sponsors. Subsequently, KHCL submitted communication with the Chinese Development Bank to justify its claim, wherein a minimum debt equity ratio of 70:30 has been made a condition by the bank.

The Authority noted that the spread of 460 basis points over LIBOR (later on revised by KHCL to 450 basis points over LIBOR), especially while claiming Sinosure fee, is quite high. The Authority has witnessed that comparable non-CPEC projects have claimed significantly lower premiums over LIBOR in recent tariff Petitions. Therefore, there is a room for reduction in the spread. Moreover, the Authority has noted that the benefits of Sinosure based financing, anticipated in the form of lower spreads on debt need to start materializing especially for CPEC hydropower projects. Considering the market conditions, the Authority has decided that for

KHCL the interest rate on foreign debt under Sinosure cover be restricted to LIBOR +4.10%, and the interest rate on local debt is restricted to KIBOR + 2.75%.

Moreover, considering the fact that this is a very capital intensive project, and debt-equity ratio has an especially high impact on the tariff of such projects, the Authority is of the view that the debt-equity ratio of the Project needs to be optimized so that the interest of all stakeholders, including the sponsor, the banks and the power purchaser are balanced out. The Authority noted that all private sector projects implemented so far have either been funded at 80:20 or 75:25 debt equity ratio. Moreover, Kohala HPP is a CPEC project that enjoys greater Govt to Govt concessions as compared to non-CPEC projects. Therefore, the Authority has decided to allow 75:25 debt-equity ratio to Kohala HPP.

XIII. Whether the claimed return on equity and special return on equity invested during the 30 months prior to financial close is justified?

KHCL claimed return on equity at 17% IRR, whereas special Return on Equity on the amount of equity invested during 30 months prior to financial close has also been included in ROEDC.

During the hearing KHCL submitted that special ROE for a period comprising 30 months prior to financial close has been requested based on the ECC decision dated July 2009. The Authority observed that Special ROE has been allowed previously to Karot, Suki Kinari and Laraib HPP. KHCL submitted that equity has been injected into the project since 2008 and the Company has already spent an amount of about US$ 11.72 Million from its project development budget, whereas the financial close is expected sometime in 2018, however, special ROE has been claimed in view of the ECC decision which allows a maximum period of 30 months prior to financial close for calculation of Special ROE.

The Authority observed that it has previously allowed 17% return on equity IRR-based in other hydropower projects including the two other CPEC projects Suki Kinari and Karot. KHCL's request for 17% return on equity is justified and therefore allowed.

Regarding ROEDC, the Authority observed that KHCL has calculated ROEDC component of tariff on the basis of equity injected so far i.e. 30 months prior to the anticipated financial close date, as well as estimated equity to be injected during the project construction period. The GoP has allowed special return on equity in case of hydropower projects, whereby a 30 months period prior to construction start, is allowed for Internal Rate of Return (IRR) calculations subject to provision of related audited accounts. The request of KHCL to allow SROE is therefore justified. The exact amount of SROE will be determined and adjusted in the tariff at COD stage, based on audited accounts and related verifiable documentary evidence to be provided by KHCL.

XIV. Whether the Withholding Tax (WHT) on dividend is justified?

KHCL claimed that withholding tax on dividend shall be treated as pass through item. During the hearing KHCL submitted that withholding tax on dividend has not been included in the tariff calculation, and requested the Authority to allow withholding tax on dividend as pass through on actual basis, as the same was allowed to the project during the feasibility stage as well as other IPPs.

The Authority considers that the incentive of WHT as 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 dividends as pass-through item.

XV. Whether the Sinosure Fee amounting to US$ 191.91 million claimed by KHCL on debt (both local and foreign) and equity is justified?

In the tariff proposal KHCL submitted that, in order to work out an acceptable security structure, both the Foreign as well as Local currency loans will need to be secured for political and commercial risks by Sinosure which is mandatory condition under the Policy. Further, according to the requirement of the Chinese government, state-owned enterprises such as CTG, undertaking overseas investments are required to acquire overseas investment insurance from Sinosure; therefore, it is essential that the Equity investment is secured for political risks by Sinosure.

KHCL elaborated at the hearing that Sinosure on debt is based on Buyer's Credit Policy where the premium rate is 7%. Further KHCL submitted that the effective Sinosure rate comes to 8.75% after accounting for the fact that the Company that has obtained Sinosure is required to pay withholding tax at 20%.

However, during the hearing KHCL submitted that subsequent to filing of the tariff proposal, the Company was able to make certain financial improvements which will reduce the tariff of the project. KHCL submitted that the cost of Sinosure on equity will be borne by the project Company itself, and thereon withdrew its request to allow Sinosure on equity.

Further, during the hearing KHCL submitted that it has been able to convince the local banks not to require the Sinosure cover on local lending, however the amount of local lending has been reduced from US$ 290 Million to US$ 150 Million.

KHCL submitted during the hearing that since other IPPs have approached FBR to allow exemption from withholding tax on Sinosure, the same may be excluded from the tariff calculation, however, the Authority was requested to keep a provision to allow withholding tax on Sinosure in case the exemption is not granted by the FBR.

In this regard, the CPPA(G) in its comments submitted that although NEPRA has allowed Sinosure Fee to many projects funded by Chinese Banks, the exact amount and methodology for Sinosure Fee will be decided by NEPRA. CPPA(G) stated that in case of other hydel projects, NEPRA has allowed a Sinosure Fee of 7% of the total loan of the Project. The higher rate of return on equity to sponsors should cover such risks of sponsors.

The Authority observed that previously Sinosure Fee has been allowed to hydropower projects, namely Karot HPP and Suki Kinari HPP. In case of Karot, Sinosure fee was allowed as a recurring annual fee payable during the operational period as part of Tariff, instead of an upfront payment; whereas in case of Suki Kinari Sinosure was allowed @ 7% of the foreign loan amount as a one-time fee capitalized in the project cost.

The Authority has observed that the Sinosure Overseas Investment Insurance Policy fee paid as a recurring fee over the operational period has a relatively lower impact on the levelized tariff of the Project. Therefore, instead of allowing Sinosure fee as an upfront cost entirely

capitalized in the project cost based on the Buyer's Credit Policy claimed by KHCL, the Authority has decided to allow Sinosure fee as a recurring fee as part of tariff based on Overseas Investment Insurance Policy as allowed in case of Karot HPP. The Authority hereby allows Sinosure fee at a maximum rate of 0.60% of the outstanding balance of foreign Debt and interest allowed by the Authority.

XVI. Whether the claimed per annum O&M cost of US$ 41.4 million for Fixed and Variable O&M during operations is justified?

KHCL claimed O&M cost of US$ 41.4 Million, which is divided into Variable O&M as 20% of total O&M cost and Fixed O&M as 80% of total O&M cost of the Project. KHCL submitted that the Variable O&M component caters for the cost of services rendered by the O&M operator that are dependent on the operation of the Project and cost associated with replacement of parts necessitated due to regular operation / normal wear and tear thereby determinable on a kWh basis. The Variable O&M cost claimed by KHCL comprises of 70% Local and 30% foreign component; whereas the Fixed O&M cost claimed by KHCK comprises of 30% local and 70% foreign. KHCL submitted that Local portion of fixed O&M costs represents all costs expected to be incurred by the Project locally; these include costs associated with local staff, administrative expenses, corporate fees, audit fees, the O&M operator's fee chargeable in PKR, etc. Whereas a large percentage of foreign portion is claimed by KHCL due to the fact that the Company is based outside Pakistan and due to this reason, the senior management and core team employed by the Company will comprise of a large number of expatriates. Additionally, the fixed fees payable to the O&M operator (comprising of routine maintenance related costs, including but not limited to, visits by their foreign experts, import of routine replacement components, etc.) are also likely to be paid in foreign currency.

The CPPA(G) commented that the O&M cost of US$ 41.41 Million claimed by KHCL is high compared to the O&M cost allowed to Karot (US$ 25.9 Million) and Suki Kinari (US$ 23.960 Million).

KHCL elaborated during the hearing that annual O&M cost of US$ 41.41 Million is based on budgetary estimates received from reputable O&M contractors for large hydro power projects. KHCL argued that the claimed O&M cost figure is 1.5% of the total project cost which is lower than the IFC suggested number of 2.2% of the investment cost and international renewable agency number of 2 to 2.5% of the total project cost.

The Authority considers that the IFC figures quoted by KHCL are generic figures and the benefits of economies of scale with regard to O&M increase exponentially as the project capacity and energy is increased. Based on O&M cost allowed previously for similar projects such as Karot HPP, and after accounting for reservoir maintenance and the special case of two geographically separate power houses of Kohala HPP, the prudent annual O&M cost for Kohala HPP has been assessed as US$ 39.32 Million per annum as the maximum cap, and the same is hereby allowed. This amount should be enough to cover all operational costs including the annual security cost of CPEC projects as detailed in the Authority's decision in the matter of Induction of Security Cost for the CPEC Projects in the Power Tariff to Ensure Security Sustainability in pursuance of ECC decision dated 23rd September 2016. Further, the

Authority has decided that Variable O&M as 20% of total O&M (70% local and 30% foreign) and Fixed O&M as 80% of total O&M (40% local and 60% foreign) is allowed for this Project.

The O&M cost shall be adjusted at COD based on the O&M operator cost arrived at through competitive bidding.

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

KHCL submitted that the Company is required to maintain insurance covers during the entire operational period as per the terms of PPA and financing documents. KHCL requested that an annual insurance cost at a rate of 1.35% of the EPC cost which was allowed in Feasibility Stage Tariff determination may be allowed once again at the EPC stage.

In this regard, the CPPA(G) submitted that Insurance during operation cost claimed by Kohala HPP of US$ 24.21 million is very high as compared to the Insurance during Operation cost of Karot HPP which is US$ 9.587 million (0.75% of the EPC cost). CPPA(G) added that generally maximum cap of 1.35% of EPC cost for Insurance during Operation has been allowed by NEPRA upon provision of verifiable documentary evidence by the Company at the COD.

KHCL in response has submitted that KHCL has requested the insurance cost of 1.35% of Project cost, which is in line with the Authority's established benchmark and is consistent with its earlier determinations for Karot and Suki Kinari, despite the Project being in a geographically different area having unfavourable geology and higher natural disaster risk.

The Authority has observed that contrary to the claim of KHCL, Insurance during operations has been allowed consistently as a percentage of EPC cost to other similar projects. Based on the aforementioned, the insurance during operations @0.75% of the approved EPC cost is allowed, subject to adjustment on the basis of actual up to maximum of 1% of the EPC cost upon provision of verifiable documentary evidence by KHCL at COD.

XVIII. Carbon Credits

The CPPA(G) in its comments submitted that Kohala Hydropower Project is expected to earn carbon credit from the UNFCCC for clean energy development under the Kyoto protocol. As per the current policy and in accordance with NEPRA's decision given in tariff determinations for other hydropower projects, the carbon credits, if earned, by the project should be distributed equally between project sponsors and Power purchaser.

The Authority observed that in its decision dated April 9, 2015 regarding feasibility stage tariff of Kohala HPP, it has already decided that upon actual realization of CERs, the same shall be distributed between the Power Purchaser and the project Company in accordance with the GOP Policy for Power Generation Projects 2002 as amended from time of time. Therefore, this issue raised by CPPA(G) is already addressed.

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XIX. Use of Local Manpower

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. This not only proves more expensive, it also denies transfer of technology and expertise to Pakistan.

In view of the above, it is advised that local manpower be utilized as far as possible. The Project is advised that the ratio of local: foreign labour in the construction of the project should not be less than 80:20. Local and foreign labourers shall not be unduly discriminated against, and minimum wage limits shall be strictly observed without any deductions. Further, for staff other than labour including managerial staff, the ratio of local: foreign staff should not be less than 70:30 during construction and operation of the project.

6. ORDER:

The Authority, in exercise of its powers contained in 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 1124 MW Kohala hydropower project.

Tariff Components	Year 1-12	Year 13-30	Indexation
Variable Charge (Rs/kWh)			
Variable O&M - Local	0.1121	0.1121	Pakistan CPI
Variable O&M - Foreign	0.0480	0.0480	PKR/US$, US CPI
Water Use Charge	0.4250	0.4250	
Fixed Charge (Rs/kW/M)			
Fixed O&M - Local	98.7982	98.7982	Pakistan CPI
Fixed O&M - Foreign	148.1973	148.1973	PKR/US$, US CPI
Insurance	105.5339	105.5339	PKR/US$
Debt Service (Local)	158.2683	-	KIBOR
Debt Service (Foreign)	1,499.1351	-	LIBOR, PKR/US$
Return on Equity (ROE)	803.5328	854.1364	PKR/US$
ROE During Construction	544.5520	544.5520	PKR/US$

i. The reference tariff has been calculated on the basis of net contracted capacity of 1,112.760 MW and net annual energy production of 5,149 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 operation 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) is given in the tariff table attached herewith as Annex-III.

vii. The reference PKR/Dollar rate has been assumed at 1 USD = 104.85 PKR.

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

ix. Debt Servicing Schedules are attached as Annex-IV a & b.

I. One-Time Adjustments

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

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. 104.85 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$ 28.510 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 not be varied and remained fixed as on signing of the Contract.

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

h. 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.

i. Financial charges will be adjusted at COD on the basis of actual subject to the maximum of 2.5% of the total debt allowed (excluding the impact of interest during construction, Sinosure fees and financial charges) on production of authentic documentary evidence.

j. Return on Equity (ROE) and Return on Equity During Construction (ROEDC) will be calculated at COD on the basis of actual equity injections and PKR/US$ exchange rate variation (within the overall equity allowed by the Authority at COD) over the construction period of 6.5 years allowed by the Authority.

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k. 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 verifiable documentary evidence to be provided by KHCL.

l. The amount of Sinosure Fee in project cost based on applicable foreign debt for the project construction period (6.5 years) 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.

m. The reference tariff table shall be revised at COD while taking in to account the above adjustments. KHCL 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:

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

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:

i) Indexation applicable to O&M

The Variable O&M cost is based on 70% local and 30% foreign expense. 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 104.85

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.
$CPI_{(REV)}$ = 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 104.85

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 KHCL, 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;

Δ I = the variation in interest charges applicable corresponding to variation in six-month LIBOR. Δ I 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 Δ I for each period under adjustment applicable on bi-annual basis.

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

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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. ΔI 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 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-II) 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 KHCL'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.

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:

KHCL 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.

AUTHORITY

28.3.18.
(Himayat Ullah Khan)
Member

(Syed Masood-ul-Hassan Naqvi) 28/3
Member

(Saif Ullah Chatha)
Vice Chairman
28.3.2018

(Brig (R) Tariq Saddozai)
Chairman

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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

Table -1

Month after Notice	Amounts (PKR)					Coefficients				
	Fixed	Labor (Z)	Steel (W)	Fuel (Y)	Cement (V)	Fixed	Labor	Steel	Fuel	Cement
	PKR	PKR	PKR	PKR	PKR	a	b	c	d	e
1	331,068,507.86	77,249,318.50	66,213,701.57	44,142,467.71	33,106,850.79	0.6	0.14	0.12	0.08	0.06
2	428,701,453.73	100,030,339.20	85,740,290.75	57,160,193.83	42,870,145.37	0.6	0.14	0.12	0.08	0.06
3	563,752,292.24	131,542,201.52	112,750,458.45	75,166,972.30	56,375,229.22	0.6	0.14	0.12	0.08	0.06
4	987,456,257.27	230,406,460.03	197,491,251.45	131,660,834.30	98,745,625.73	0.6	0.14	0.12	0.08	0.06
5	772,750,650.60	180,308,485.14	154,550,130.12	103,033,420.08	77,275,065.06	0.6	0.14	0.12	0.08	0.06
6	812,707,426.34	189,631,732.81	162,541,485.27	108,360,990.18	81,270,742.63	0.6	0.14	0.12	0.08	0.06
7	844,215,040.38	196,983,509.42	168,843,008.08	112,562,005.38	84,421,504.04	0.6	0.14	0.12	0.08	0.06
8	746,594,644.69	174,205,417.09	149,318,928.94	99,545,952.63	74,659,464.47	0.6	0.14	0.12	0.08	0.06
9	703,758,191.48	164,210,244.68	140,751,638.30	93,834,425.53	70,375,819.15	0.6	0.14	0.12	0.08	0.06
10	907,821,143.97	211,824,933.59	181,564,228.79	121,042,819.20	90,782,114.40	0.6	0.14	0.12	0.08	0.06
11	917,822,680.04	214,158,625.34	183,564,536.01	122,376,357.34	91,782,268.00	0.6	0.14	0.12	0.08	0.06
12	1,062,734,018.14	247,971,270.90	212,546,803.63	141,697,869.09	106,273,401.81	0.6	0.14	0.12	0.08	0.06
13	921,407,248.08	214,995,024.55	184,281,449.62	122,854,299.74	92,140,724.81	0.6	0.14	0.12	0.08	0.06
14	709,095,539.55	165,455,625.90	141,819,107.91	94,546,071.94	70,909,553.96	0.6	0.14	0.12	0.08	0.06
15	633,323,173.31	147,775,407.10	126,664,634.66	84,443,089.77	63,332,317.33	0.6	0.14	0.12	0.08	0.06
16	944,233,126.16	220,321,062.77	188,846,625.23	125,897,750.15	94,423,312.62	0.6	0.14	0.12	0.08	0.06
17	551,295,272.34	128,635,563.55	110,259,054.47	73,506,036.31	55,129,527.23	0.6	0.14	0.12	0.08	0.06
18	502,575,645.47	117,267,650.61	100,515,129.09	67,010,086.06	50,257,564.55	0.6	0.14	0.12	0.08	0.06
19	500,926,773.71	116,882,913.87	100,185,354.74	66,790,236.49	50,092,677.37	0.6	0.14	0.12	0.08	0.06
20	508,016,636.58	118,537,215.20	101,603,327.32	67,735,551.54	50,801,663.66	0.6	0.14	0.12	0.08	0.06
21	431,995,261.87	100,798,894.44	86,399,052.37	57,599,368.25	43,199,526.19	0.6	0.14	0.12	0.08	0.06
22	555,946,528.92	129,720,856.75	111,189,305.78	74,126,203.86	55,594,652.89	0.6	0.14	0.12	0.08	0.06
23	633,638,819.80	147,849,057.95	126,727,763.96	84,485,175.97	63,363,881.98	0.6	0.14	0.12	0.08	0.06
24	536,262,833.64	125,127,994.51	107,252,566.73	71,501,711.15	53,626,283.36	0.6	0.14	0.12	0.08	0.06
25	957,594,585.20	223,438,736.55	191,518,917.04	127,679,278.03	95,759,458.52	0.6	0.14	0.12	0.08	0.06

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26	852,955,207.76	199,022,881.81	170,591,041.55	113,727,361.04	85,295,520.78	0.6	0.14	0.12	0.08	0.06
27	819,426,999.23	191,199,633.15	163,885,399.85	109,256,933.23	81,942,699.92	0.6	0.14	0.12	0.08	0.06
28	747,949,502.97	174,521,550.69	149,589,900.59	99,726,600.40	74,794,950.30	0.6	0.14	0.12	0.08	0.06
29	749,512,871.28	174,886,336.63	149,902,574.26	99,935,049.50	74,951,287.13	0.6	0.14	0.12	0.08	0.06
30	658,083,084.21	153,552,719.65	131,616,616.84	87,744,411.23	65,808,308.42	0.6	0.14	0.12	0.08	0.06
31	578,307,135.65	134,938,331.65	115,661,427.13	77,107,618.09	57,830,713.57	0.6	0.14	0.12	0.08	0.06
32	559,767,322.65	130,612,375.28	111,953,464.53	74,635,643.02	55,976,732.26	0.6	0.14	0.12	0.08	0.06
33	560,607,191.70	130,808,344.73	112,121,438.34	74,747,625.56	56,060,719.17	0.6	0.14	0.12	0.08	0.06
34	946,491,551.48	220,848,028.68	189,298,310.30	126,198,873.53	94,649,155.15	0.6	0.14	0.12	0.08	0.06
35	909,165,916.42	212,138,713.83	181,833,183.28	121,222,122.19	90,916,591.64	0.6	0.14	0.12	0.08	0.06
36	928,628,752.19	216,680,042.18	185,725,750.44	123,817,166.96	92,862,875.22	0.6	0.14	0.12	0.08	0.06
37	1,162,080,592.35	271,152,138.22	232,416,118.47	154,944,078.98	116,208,059.24	0.6	0.14	0.12	0.08	0.06
38	717,340,347.84	167,379,414.50	143,468,069.57	95,645,379.71	71,734,034.78	0.6	0.14	0.12	0.08	0.06
39	566,084,412.30	132,086,362.87	113,216,882.46	75,477,921.64	56,608,441.23	0.6	0.14	0.12	0.08	0.06
40	643,968,574.21	150,259,333.98	128,793,714.84	85,862,476.56	64,396,857.42	0.6	0.14	0.12	0.08	0.06
41	583,287,240.21	136,100,356.05	116,657,448.04	77,771,632.03	58,328,724.02	0.6	0.14	0.12	0.08	0.06
42	584,381,769.91	136,355,746.31	116,876,353.98	77,917,569.32	58,438,176.99	0.6	0.14	0.12	0.08	0.06
43	663,617,834.22	154,844,161.32	132,723,566.84	88,482,377.90	66,361,783.42	0.6	0.14	0.12	0.08	0.06
44	590,214,371.79	137,716,686.75	118,042,874.36	78,695,249.57	59,021,437.18	0.6	0.14	0.12	0.08	0.06
45	672,581,618.82	156,935,711.06	134,516,323.76	89,677,549.18	67,258,161.88	0.6	0.14	0.12	0.08	0.06
46	664,598,019.88	155,072,871.31	132,919,603.98	88,613,069.32	66,459,801.99	0.6	0.14	0.12	0.08	0.06
47	674,378,832.21	157,355,060.85	134,875,766.44	89,917,177.63	67,437,883.22	0.6	0.14	0.12	0.08	0.06
48	713,334,868.03	166,444,802.54	142,666,973.61	95,111,315.74	71,333,486.80	0.6	0.14	0.12	0.08	0.06
49	878,054,372.66	204,879,353.62	175,610,874.53	117,073,916.36	87,805,437.27	0.6	0.14	0.12	0.08	0.06
50	481,155,799.70	112,269,686.60	96,231,159.94	64,154,106.63	48,115,579.97	0.6	0.14	0.12	0.08	0.06
51	477,685,007.48	111,459,835.08	95,537,001.50	63,691,334.33	47,768,500.75	0.6	0.14	0.12	0.08	0.06
52	540,785,368.00	126,183,252.53	108,157,073.60	72,104,715.73	54,078,536.80	0.6	0.14	0.12	0.08	0.06
53	422,296,216.77	98,535,783.91	84,459,243.35	56,306,162.24	42,229,621.68	0.6	0.14	0.12	0.08	0.06
54	285,160,622.36	66,537,478.55	57,032,124.47	38,021,416.31	28,516,062.24	0.6	0.14	0.12	0.08	0.06
55	305,033,218.55	71,174,417.66	61,006,643.71	40,671,095.81	30,503,321.85	0.6	0.14	0.12	0.08	0.06
56	294,227,585.35	68,653,103.25	58,845,517.07	39,230,344.71	29,422,758.54	0.6	0.14	0.12	0.08	0.06

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57	315,736,109.51	73,671,758.89	63,147,221.90	42,098,147.93	31,573,610.95	0.6	0.14	0.12	0.08	0.06
58	315,746,717.85	73,674,234.16	63,149,343.57	42,099,562.38	31,574,671.78	0.6	0.14	0.12	0.08	0.06
59	245,533,609.84	57,291,175.63	49,106,721.97	32,737,814.65	24,553,360.98	0.6	0.14	0.12	0.08	0.06
60	333,896,562.40	77,909,197.89	66,779,312.48	44,519,541.65	33,389,656.24	0.6	0.14	0.12	0.08	0.06
61	561,243,772.17	130,956,880.17	112,248,754.43	74,832,502.96	56,124,377.22	0.6	0.14	0.12	0.08	0.06
62	250,799,344.22	58,519,846.98	50,159,868.84	33,439,912.56	25,079,934.42	0.6	0.14	0.12	0.08	0.06
63	241,097,097.03	56,255,989.31	48,219,419.41	32,146,279.60	24,109,709.70	0.6	0.14	0.12	0.08	0.06
64	198,959,493.62	46,423,881.85	39,791,898.72	26,527,932.48	19,895,949.36	0.6	0.14	0.12	0.08	0.06
65	186,823,039.27	43,592,042.50	37,364,607.85	24,909,738.57	18,682,303.93	0.6	0.14	0.12	0.08	0.06
66	201,089,872.06	46,920,970.15	40,217,974.41	26,811,982.94	20,108,987.21	0.6	0.14	0.12	0.08	0.06
67	135,405,235.01	31,594,554.84	27,081,047.00	18,054,031.33	13,540,523.50	0.6	0.14	0.12	0.08	0.06
68	158,572,816.88	37,000,323.94	31,714,563.38	21,143,042.25	15,857,281.69	0.6	0.14	0.12	0.08	0.06
69	163,449,280.09	38,138,165.35	32,689,856.02	21,793,237.35	16,344,928.01	0.6	0.14	0.12	0.08	0.06
70	127,693,391.95	29,795,124.79	25,538,678.39	17,025,785.59	12,769,339.20	0.6	0.14	0.12	0.08	0.06
71	82,155,719.36	19,169,667.85	16,431,143.87	10,954,095.91	8,215,571.94	0.6	0.14	0.12	0.08	0.06
72	266,145,059.94	62,100,513.99	53,229,011.99	35,486,007.99	26,614,505.99	0.6	0.14	0.12	0.08	0.06
73	344,731,986.83	80,437,463.59	68,946,397.37	45,964,264.91	34,473,198.68	0.6	0.14	0.12	0.08	0.06
74	149,063,373.12	34,781,453.73	29,812,674.62	19,875,116.42	14,906,337.31	0.6	0.14	0.12	0.08	0.06
75	74,538,144.29	17,392,233.67	14,907,628.86	9,938,419.24	7,453,814.43	0.6	0.14	0.12	0.08	0.06
76	117,362,477.31	27,384,578.04	23,472,495.46	15,648,330.31	11,736,247.73	0.6	0.14	0.12	0.08	0.06
77	61,924,339.04	14,449,012.44	12,384,867.81	8,256,578.54	6,192,433.90	0.6	0.14	0.12	0.08	0.06
78	1,112,847,098.17	259,664,435.59	222,569,516.22	148,379,677.48	111,284,758.11	0.6	0.14	0.12	0.08	0.06
	43,341,670,499.51	10,113,056,562.56	8,668,334,196.48	5,778,889,464.32	4,334,167,098.25					

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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

Hydraulic Tunnel - Classification of Underground Conditions				
No.	Q-value	Length Assumed (m)	Unit Rate PKR/ meter Length	Cost of Construction PKR
1	Q>10	1044.18	818495.42	854660474.89
2	10>Q>4	1392.25	878177.38	1222639290.47
3	4>Q>1	6961.23	910801.09	6340297676.51
4	1>Q>0.1	11486.03	987790.65	11345795842.18
5	0.1 > Q > 0.01	12182.16	1442543.73	17573292695.36
6	Q <0.01	1740.31	2885873.61	5022308936.80
Total		34806.16		42358994916.21

Surge Chamber - Classification of Underground Conditions				
No.	Q-value	Length Assumed (m)	Unit Rate PKR/ meter Length	Cost of Construction PKR
1	Q>10		3698908.76	
2	10>Q>4		3813308.00	
3	4>Q>1	156.60	3931245.36	615633023.10
4	1>Q>0.1	130.50	4345060.66	567030416.01
5	0.1 >Q>0.01	208.80	6599669.18	1378010925.56
6	Q <0.01	26.10	7718987.64	201465577.36
Total		522.00		2762139942.03

Penstock- Classification of Underground Conditions				
No.	Q-value	Length Assumed (m)	Unit Rate PKR/ meter Length	Cost of Construction PKR
1	Q>10	40.72	711893.02	28990561.90
2	10>Q>4	61.08	733910.33	44830765.83
3	4>Q > 1	407.23	756608.59	308115229.06
4	1>Q>0.1	610.85	822977.76	502714321.10
5	0.1 >Q>0.01	712.66	934663.00	666093196.97
6	Q <0.01	203.62	1211287.79	246637574.38
Total		2036.16		1797381649.25

1#Adit - Classification of Underground Conditions				
No.	Q-value	Length Assumed (m)	Unit Rate PKR/ meter Length	Cost of Construction PKR
1	Q>10		326218.11	
2	10>Q>4		336307.33	
3	4>Q> 1	66.60	346708.59	23090792.06
4	1>Q>0.1	83.25	383204.23	31901752.18
5	0.1 >Q>0.01	149.85	1545257.83	231556885.12
6	Q <0.01	33.30	1962916.70	65365126.10
Total		333.00		351914555.46

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2#Adit - Classification of Underground Conditions				
No.	G-value	Length Assumed (m)	Unit Rate PKR/ meter Length	Cost of Construction PKR
1	Q>10	34.32	275229.02	9445859.97
2	10>Q>4	68.64	304200.50	20880322.04
3	4>Q>1	377.52	377105.80	142364983.16
4	1>Q>0.1	320.32	416801.15	133509744.97
5	0.1 >Q>0.01	251.68	1671235.20	420616474.23
6	Q <0.01	91.52	2128751.39	194823327.55
Total		1144.00		921640711.93

3#Adit- Classification of Underground Conditions				
No.	Q-value	Length Assumed (m)	Unit Rate PKR/ meter Length	Cost of Construction PKR
1	Q>10	42.92	279024.49	11975731.27
2	10>Q >4	64.38	308395.49	19854501.85
3	4>Q> 1	300.44	383249.06	115143348.97
4	1>Q>0.1	268.25	423591.07	113628304.91
5	0.1 >Q>0.01	321.90	1261424.03	406052396.50
6	Q <0.01	75.11	2165903.05	162680977.80
Total		1073.00		829335261.29

4#Adit - Classification of Underground Conditions				
No.	Q-value	Length Assumed (m)	Unit Rate PKR/ meter Length	Cost of Construction PKR
1	Q >10	53.91	290020.63	15635012.14
2	10>Q>4	65.89	320549.12	21120981.31
3	4>Q> 1	149.75	398538.94	59681206.30
4	1>Q>0.1	119.80	440490.41	52770750.83
5	0.1 >Q>0.01	179.70	1313477.26	236031863.98
6	Q <0.01	29.95	2255336.65	67547332.67
		599.00		452787147.24

5#Adit - Classification of Underground Conditions				
No.	Q-value	Length Assumed (m)	Unit Rate PKR/ meter Length	Cost of Construction PKR
1	Q>10		331529.09	
2	10>Q>4		366426.89	
3	4>Q> 1	107.10	466070.69	49916170.67
4	1>Q>0.1	91.80	515130.76	47289003.79
5	0.1 >Q>0.01	91.80	2204831.78	202403557.40
6	Q <0.01	15.30	2744681.29	41993623.81
Total		306.00		341602355.68

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5-1#Adit - Classification of Underground Conditions				
No.	Q-value	Length Assumed (m)	Unit Rate PKR/ meter Length	Cost of Construction PKR
1	Q>10		331529.09	
2	10>Q>4		366426.89	
3	4>Q > 1	18.55	466070.69	864561126
4	1>Q>0.1	15.90	515130.76	8190579.09
5	0.1 >Q>0.01	15.90	2204831.78	35056825.30
6	Q <0.01	2.65	2744681.29	7273405.43
Total		53.00		59166421.08

6#Adit - Classification of Underground Conditions				
No.	Q-value	Length Assumed (m)	Unit Rate PKR/ meter Length	Cost of Construction PKR
1	Q>10		445549.86	
2	10>Q>4		459329.76	
3	4>Q> 1	93.10	473535.83	44086185.93
4	1>Q>0.1	79.80	523381.71	41765860.36
5	0.1 >Q>0.01	79.80	2451250.49	195609788.91
6	Q <0.01	13.30	3031995.09	40325534.74
Total		266.00		321787369.94

6-1#Adit - Classification of Underground Conditions				
No.	Q-value	Length Assumed (m)	Unit Rate PKR/ meter Length	Cost of Construction PKR
1	Q>10		445549.86	
2	10>Q>4		459329.76	
3	4>Q>1	40.95	473535.83	19391292.31
4	1>Q>0.1	35.10	523381.71	18370697.98
5	0.1 > Q > 0.01	35.10	2451250.49	86038892.12
6	Q <0.01	5.85	3031995.09	17737171.30
Total		117.00		141538053.69

7#Adit - Classification of Underground Conditions				
No.	Q-value	Length Assumed (m)	Unit Rate PKR/ meter Length	Cost of Construction PKR
1	Q >10		302434.51	
2	10>Q>4		311788.15	
3	4>Q>1	40.65	321431.08	13066173.54
4	1>Q>0.1	40.65	355265.93	14441560.22
5	0.1 >Q>0.01	176.15	1089893.36	191984716.13
6	Q <0.01	13.55	1870736.28	25348476.63
Total		271.00		244840926.52

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8#Adit - Classification of Underground Conditions				
No.	Q-value	Length Assumed (m)	Unit Rate PKR/ meter Length	Cost of Construction PKR
1	Q>10		349932.44	
2	10>Q>4		360755.09	
3	4>Q>1	121.85	371912.47	45317534.30
4	1>Q>0.1	121.85	411061.15	50087801.07
5	0.1 >Q>0.01	219.33	1251014.53	274385016.46
6	Q <0.01	24.37	2127569.85	51848877.24
Total		487.40		421639229.07

8-1#Adit - Classification of Underground Conditions				
No.	Q-value	Length Assumed (m)	Unit Rate PKR/ meter Length	Cost of Construction PKR
1	Q>10		349744.54	
2	10>Q>4		360561.38	
3	4>Q> 1	36.03	371712.77	13390952.42
4	1>Q>0.1	36.03	410840.43	14800526.36
5	0.1 >Q>0.01	64.85	1251039.96	81123686 34
6	Q <0.01	7.21	2125916.53	15317228.61
Total		144.10		124632393.73

Tailrace - Classification of Underground Conditions				
No.	Q-value	Length Assumed (m)	Unit Rate PKR/ meter Length	Cost of Construction PKR
1	Q>10		1463034.70	
2	10>Q>4		1508283.20	
3	4>Q>1	14.80	1554931.13	23013993.91
4	1>Q>0.1	59.20	1657229.24	98112289.83
5	0.1 >Q>0.01	162.80	1981888.30	322644958.02
6	Q <0.01	59.20	2592747.23	153490635.92
Total		296.00		597261877.69

Diversion tunnel - Classification of Underground Conditions				
No.	Q-value	Length Assumed (m)	Unit Rate PKR/ meter Length	Cost of Construction PKR
1	Q>10		1439558.64	
2	10>Q>4		1484081.07	
3	4>Q> 1	83.25	1529980.49	127370875.49
4	1>Q>0.1	86.58	1664189.30	144085509.67
5	0.1 >Q>0.01	153.18	2181712.02	334194647.85
6	Q <0.01	9.99	2910550.36	29076398.11
Total		333.00		634727431.13

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1124 MW KOHALA HPP
EPC STAGE REFERENCE TARIFF

Year	Variable O&M Local	Variable O&M Foreign	Water Use Charge	Fixed O&M Local	Fixed O&M Foreign	Insurance	Sinosure Fee	Return on Equity (ROE)	ROE During Construction	Debt Servicing (Local)	Debt Servicing (Foreign)	Total Tariff
	Rs./kWh	Rs./kWh	Rs./kWh	Rs./kW/M	Rs./kW/M	Rs./kW/M	Rs./kW/M	Rs./kW/M	Rs./kW/M	Rs./kW/M	Rs./kW/M	Rs./kWh
1	0.1121	0.0480	0.4250	98.7982	148.1973	105.5339	76.7478	803.5328	544.5520	158.2683	1,499.1351	9.4927
2	0.1121	0.0480	0.4250	98.7982	148.1973	105.5339	71.6739	803.5328	544.5520	158.2683	1,499.1351	9.4795
3	0.1121	0.0480	0.4250	98.7982	148.1973	105.5339	66.3158	803.5328	544.5520	158.2683	1,499.1351	9.4656
4	0.1121	0.0480	0.4250	98.7982	148.1973	105.5339	60.6578	803.5328	544.5520	158.2683	1,499.1351	9.4509
5	0.1121	0.0480	0.4250	98.7982	148.1973	105.5339	54.6831	803.5328	544.5520	158.2683	1,499.1351	9.4354
6	0.1121	0.0480	0.4250	98.7982	148.1973	105.5339	48.3738	803.5328	544.5520	158.2683	1,499.1351	9.4191
7	0.1121	0.0480	0.4250	98.7982	148.1973	105.5339	41.7113	803.5328	544.5520	158.2683	1,499.1351	9.4018
8	0.1121	0.0480	0.4250	98.7982	148.1973	105.5339	34.6757	803.5328	544.5520	158.2683	1,499.1351	9.3836
9	0.1121	0.0480	0.4250	98.7982	148.1973	105.5339	27.2463	803.5328	544.5520	158.2683	1,499.1351	9.3643
10	0.1121	0.0480	0.4250	98.7982	148.1973	105.5339	19.4009	803.5328	544.5520	158.2683	1,499.1351	9.3439
11	0.1121	0.0480	0.4250	98.7982	148.1973	105.5339	11.1163	803.5328	544.5520	158.2683	1,499.1351	9.3225
12	0.1121	0.0480	0.4250	98.7982	148.1973	105.5339	2.3679	803.5328	544.5520	158.2683	1,499.1351	9.2998
13	0.1121	0.0480	0.4250	98.7982	148.1973	105.5339	-	854.1364	544.5520	-	-	5.1266
14	0.1121	0.0480	0.4250	98.7982	148.1973	105.5339	-	854.1364	544.5520	-	-	5.1266
15	0.1121	0.0480	0.4250	98.7982	148.1973	105.5339	-	854.1364	544.5520	-	-	5.1266
16	0.1121	0.0480	0.4250	98.7982	148.1973	105.5339	-	854.1364	544.5520	-	-	5.1266
17	0.1121	0.0480	0.4250	98.7982	148.1973	105.5339	-	854.1364	544.5520	-	-	5.1266
18	0.1121	0.0480	0.4250	98.7982	148.1973	105.5339	-	854.1364	544.5520	-	-	5.1266
19	0.1121	0.0480	0.4250	98.7982	148.1973	105.5339	-	854.1364	544.5520	-	-	5.1266
20	0.1121	0.0480	0.4250	98.7982	148.1973	105.5339	-	854.1364	544.5520	-	-	5.1266
21	0.1121	0.0480	0.4250	98.7982	148.1973	105.5339	-	854.1364	544.5520	-	-	5.1266
22	0.1121	0.0480	0.4250	98.7982	148.1973	105.5339	-	854.1364	544.5520	-	-	5.1266
23	0.1121	0.0480	0.4250	98.7982	148.1973	105.5339	-	854.1364	544.5520	-	-	5.1266
24	0.1121	0.0480	0.4250	98.7982	148.1973	105.5339	-	854.1364	544.5520	-	-	5.1266
25	0.1121	0.0480	0.4250	98.7982	148.1973	105.5339	-	854.1364	544.5520	-	-	5.1266
26	0.1121	0.0480	0.4250	98.7982	148.1973	105.5339	-	854.1364	544.5520	-	-	5.1266
27	0.1121	0.0480	0.4250	98.7982	148.1973	105.5339	-	854.1364	544.5520	-	-	5.1266
28	0.1121	0.0480	0.4250	98.7982	148.1973	105.5339	-	854.1364	544.5520	-	-	5.1266
29	0.1121	0.0480	0.4250	98.7982	148.1973	105.5339	-	854.1364	544.5520	-	-	5.1266
30	0.1121	0.0480	0.4250	98.7982	148.1973	105.5339	-	854.1364	544.5520	-	-	5.1266
Levelized Tariff	**0.1121**	**0.0480**	**0.4250**	**98.7982**	**148.1973**	**105.5339**	**36.3625**	**817.5606**	**544.5520**	**114.3950**	**1,083.5618**	**8.2328**

**** WHT on dividends and SROE have an estimated additional impact of Rs. 0.2622/kWh and Rs. 0.1482/kWh respectively on the levelized tariff.***

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
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1124 MW KOHALA HPP
Debt Servicing Schedule

	Local Debt							
Period	Principal Million PKR	Repayment Million PKR	Mark-Up Million PKR	Balance Million PKR	Debt Service Million PKR	Annual Principal Repayment Rs./kW/M	Annual Interest Rs./kW/M	Annual Debt Servicing Rs./kW/M
	15,393.92	371.66	685.03	15,022.26	1,056.6880			
	15,022.26	388.20	668.49	14,634.06	1,056.6880			
1	15,393.92	759.86	1,353.52	14,634.06	2,113.3760	56.9047	101.3636	158.2683
	14,634.06	405.47	651.22	14,228.59	1,056.6880			
	14,228.59	423.52	633.17	13,805.08	1,056.6880			
2	14,634.06	828.99	1,284.39	13,805.08	2,113.3760	62.0820	96.1864	158.2683
	13,805.08	442.36	614.33	13,362.71	1,056.6880			
	13,362.71	462.05	594.64	12,900.67	1,056.6880			
3	13,805.08	904.41	1,208.97	12,900.67	2,113.3760	67.7302	90.5381	158.2683
	12,900.67	482.61	574.08	12,418.06	1,056.6880			
	12,418.06	504.08	552.60	11,913.97	1,056.6880			
4	12,900.67	986.69	1,126.68	11,913.97	2,113.3760	73.8923	84.3760	158.2683
	11,913.97	526.52	530.17	11,387.46	1,056.6880			
	11,387.46	549.95	506.74	10,837.51	1,056.6880			
5	11,913.97	1,076.46	1,036.91	10,837.51	2,113.3760	80.6150	77.6533	158.2683
	10,837.51	574.42	482.27	10,263.09	1,056.6880			
	10,263.09	599.98	456.71	9,663.11	1,056.6880			
6	10,837.51	1,174.40	938.98	9,663.11	2,113.3760	87.9494	70.3189	158.2683
	9,663.11	626.68	430.01	9,036.43	1,056.6880			
	9,036.43	654.57	402.12	8,381.87	1,056.6880			
7	9,663.11	1,281.25	832.13	8,381.87	2,113.3760	95.9511	62.3173	158.2683
	8,381.87	683.69	372.99	7,698.17	1,056.6880			
	7,698.17	714.12	342.57	6,984.05	1,056.6880			
8	8,381.87	1,397.81	715.56	6,984.05	2,113.3760	104.6807	53.5876	158.2683
	6,984.05	745.90	310.79	6,238.16	1,056.6880			
	6,238.16	779.09	277.60	5,459.07	1,056.6880			
9	6,984.05	1,524.99	588.39	5,459.07	2,113.3760	114.2046	44.0637	158.2683
	5,459.07	813.76	242.93	4,645.31	1,056.6880			
	4,645.31	849.97	206.72	3,795.33	1,056.6880			
10	5,459.07	1,663.73	449.64	3,795.33	2,113.3760	124.5950	33.6734	158.2683
	3,795.33	887.80	168.89	2,907.54	1,056.6880			
	2,907.54	927.30	129.39	1,980.24	1,056.6880			
11	3,795.33	1,815.10	298.28	1,980.24	2,113.3760	135.9306	22.3377	158.2683
	1,980.24	968.57	88.12	1,011.67	1,056.6880			
	1,011.67	1,011.67	45.02	-	1,056.6880			
12	1,980.24	1,980.24	133.14	-	2,113.3760	148.2976	9.9707	158.2683

1124 MW KOHALA HPP
Debt Servicing Schedule

	Foreign Debt							
Period	Principal Million US$	Repayment Million US$	Mark-Up Million US$	Balance Million US$	Debt Service Million US$	Annual Principal Repayment Rs./kW/M	Annual Interest Rs./kW/M	Annual Debt Servicing Rs./kW/M
	1,659.0672	49.6507	45.8101	1,609.4165	95.4608			
	1,609.4165	51.0217	44.4391	1,558.3948	95.4608			
1	1,659.0672	100.6724	90.2492	1,558.3948	190.9216	790.4895	708.6456	1,499.1351
	1,558.3948	52.4305	43.0303	1,505.9643	95.4608			
	1,505.9643	53.8782	41.5826	1,452.0861	95.4608			
2	1,558.3948	106.3087	84.6129	1,452.0861	190.9216	834.7461	664.3890	1,499.1351
	1,452.0861	55.3659	40.0949	1,396.7202	95.4608			
	1,396.7202	56.8946	38.5662	1,339.8256	95.4608			
3	1,452.0861	112.2605	78.6611	1,339.8256	190.9216	881.4805	617.6546	1,499.1351
	1,339.8256	58.4656	36.9952	1,281.3600	95.4608			
	1,281.3600	60.0800	35.3808	1,221.2800	95.4608			
4	1,339.8256	118.5456	72.3760	1,221.2800	190.9216	930.8313	568.3038	1,499.1351
	1,221.2800	61.7389	33.7219	1,159.5412	95.4608			
	1,159.5412	63.4436	32.0172	1,096.0975	95.4608			
5	1,221.2800	125.1825	65.7391	1,096.0975	190.9216	982.9451	516.1899	1,499.1351
	1,096.0975	65.1954	30.2654	1,030.9021	95.4608			
	1,030.9021	66.9956	28.4652	963.9065	95.4608			
6	1,096.0975	132.1910	58.7306	963.9065	190.9216	1,037.9766	461.1585	1,499.1351
	963.9065	68.8455	26.6153	895.0611	95.4608			
	895.0611	70.7464	24.7144	824.3147	95.4608			
7	963.9065	139.5919	51.3297	824.3147	190.9216	1,096.0891	403.0460	1,499.1351
	824.3147	72.6999	22.7609	751.6148	95.4608			
	751.6148	74.7073	20.7535	676.9075	95.4608			
8	824.3147	147.4071	43.5145	676.9075	190.9216	1,157.4551	341.6800	1,499.1351
	676.9075	76.7701	18.6907	600.1375	95.4608			
	600.1375	78.8898	16.5710	521.2476	95.4608			
9	676.9075	155.6599	35.2617	521.2476	190.9216	1,222.2568	276.8783	1,499.1351
	521.2476	81.0681	14.3927	440.1795	95.4608			
	440.1795	83.3066	12.1542	356.8729	95.4608			
10	521.2476	164.3747	26.5469	356.8729	190.9216	1,290.6864	208.4487	1,499.1351
	356.8729	85.6068	9.8540	271.2661	95.4608			
	271.2661	87.9706	7.4902	183.2954	95.4608			
11	356.8729	173.5775	17.3441	183.2954	190.9216	1,362.9472	136.1879	1,499.1351
	183.2954	90.3997	5.0611	92.8958	95.4608			
	92.8958	92.8958	2.5650	(0.0000)	95.4608			
12	183.2954	183.2954	7.6262	(0.0000)	190.9216	1,439.2536	59.8815	1,499.1351