



**National Electric Power Regulatory Authority**  
**Islamic Republic of Pakistan**

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No. NEPRA/TRF-309/KPCL-2015/5764-5766  
April 27, 2016

**Subject: Decision of the Authority in the matter of Motion for Leave for Review filed by Karot Power Company (Pvt.) Ltd. (KPCL) against Determination of the Authority in the matter of EPC Stage Tariff of 720 MW Karot Hydropower Project [Case # NEPRA/TRF-309/KPCL-2015]**

Dear Sir,

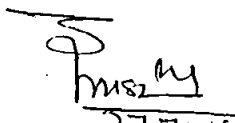
This is in continuation of this office letter No. NEPRA/TRF-309/KPCL-2015/2544-2546 dated 24.02.2016 whereby Determination of the Authority in the matter of petition filed by Karot Power Company (Pvt.) Ltd. (KPCL) for Determination of EPC-Stage Generation Tariff in respect of 720-MW Karot Hydropower Project was sent to the Federal Government for notification in the official Gazette.

2. Please find enclosed herewith the subject decision of the Authority along with Annex-I, II, III & IV (27 pages) regarding Motion for Leave for Review filed by Karot Power Company (Pvt.) Ltd. (KPCL) against Determination of the Authority in the matter of EPC Stage Tariff of 720 MW Karot Hydropower Project.

3. The Decision 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).

4. The Order of the Authority along with Annexure-I, II, III & IV of the Decision needs to be notified in the official Gazette.

Enclosure: As above

  
( Syed Safer Hussain )

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

CC:

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

Decision of the Authority in the matter of Motion For Leave For Review filed by Karot Power Company Limited (KPCL) against Determination of the Authority in the matter of EPC stage Tariff of 720-MW Karot Hydropower Project (Case No. NEPRA/TRF-309/KPCL-2015)

1. Background

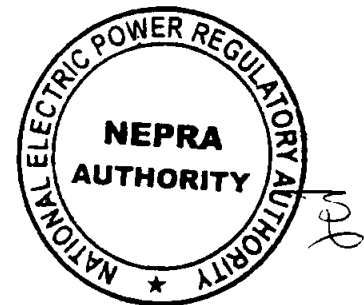
1.1 Karot Power Company Limited (hereinafter referred to as ("KPCL" or the "Petitioner") vide letter dated March 04, 2016 filed motion for leave for review (herein after referred to as the review petition") under rule 16(6) of the NEPRA Tariff (Standards and Procedure) Rules 1998 against the determination of the Authority dated February 24, 2016 in respect of petition for determination of EPC stage generation tariff of 720 MW Karot Hydropower Project.

1.2 The Authority considered the subject motion for leave for review on March 15, 2016 and decided to admit the review motion for further processing.

1.3 Pursuant to the decision of the Authority, hearing in the matter was held on April 05, 2016 (Thursday) at 11:00 a.m. at NEPRA Tower, Islamabad which was attended by the representatives of the Petitioner, the Power Purchaser, the Intervener of the case (Mr, Asim Javed), representatives of PPIB and Energy Department Government of Punjab.

1.4 The Petitioner through review motion has raised the following issues for further consideration and review of tariff/costs by the Authority.

- I) Engineering and Supervision Cost
- II) Project Development Cost,
- III) Water Use Charge, and
- IV) Rate of Return on Equity



2. Comments of the Intervener

2.1 The Intervener (Mr. Asim Javed) in his comments to the Authority, besides giving his comments against increase in various cost components sought by the Petitioner through its review petition, has objected on higher EPC Cost as per claim of the Petitioner and approved by the Authority in its determination for Karot Hydropower Project dated February 24, 2016. The Intervener inter alia stated as follows:

- EPC bidding process was not transparent
- EPC cost is exorbitant
- Intervener was invited to attend hearing held on October 20, 2015.

2.2 The Authority considers that it has approved EPC cost of the Petitioner on the basis of information provided by the Petitioner, comments of the stakeholders including the Intervener and project specific requirements of the Petitioner which were duly recorded in the earlier determination of

the Authority dated February 24, 2016.

2.3 Regarding the Intervener's submissions for non receipt of invitation letter for hearing scheduled for October 20, 2015, the Authority notes that although the Intervener did not receive the NEPRA's invitation letter for the scheduled hearing but the Authority had considered comments of the Intervener and the Petitioner's response thereto on the issues in its determination dated February 24, 2016. Nevertheless, the Authority considers that notice of hearing was also published in the national newspapers on October 02, 2016 for information of the all the stakeholders as well as general public well before the hearing date fixed for October 20, 2015. Further the Intervener had sufficient time to offer additional comments if any before finalization and issuance of determination on February 24, 2016.

2.4 In the light of above the Authority considers that it shall limit discussion on relief sought by the Petitioner in certain cost items as well as the Intervener's comments on the instant review petition under consideration of the Authority.

3. The relief sought by the Petitioner through review petition and decision of the Authority on each issue is discussed as follows.

4. **Engineering and Supervision Cost (Issue# 1)**

4.1 The Petitioner submitted that the overall cost of US\$ 29.200 million (lumpsum) allowed by the Authority under Engineering and Supervision through determination of the Authority dated February 24, 2016 is not sufficient to meet requirements of the Petitioner. The breakup of project Engineering and Supervision cost initially claimed and now proposed in the review petition is given hereunder.

Engineering & Supervision Cost	Claimed in original Petition (US\$ M)	Claimed-Review Motion (US\$ M)
Owner' Engineer	50.000	25.700
Reopener Verifier	10.000	1.800
Independent Engineer	10.000	0.900
Site Investigation & Supervision of Public Infrastructure	31.500	11.500
Environmental & Ecological Cost	13.125	12.300
Project Company's Other Engineering Consultants	15.000	10.000
Total	129.625	62.200
Claimed at 10% of EPC Cost	127.781	



4.2 The Petitioner submitted that the Authority had allowed US\$ 18.200 million for cost of Owner's Engineer and US\$ 0.500 million each for Reopener Verifier and Independent Engineer cost respectively on assessment basis in the approved overall cost of US\$ 29.200 million for project Engineering & Supervision cost. The Petitioner submitted that it has carried out competitive bidding process for selection of Owner's Engineer and therefore the revised cost of Owner's Engineer US\$ 25.700 million is

based on contracted amount with the selected Owner's Engineer, which may be allowed by the Authority.

4.3 The Petitioner in support of its claim of US\$ 25.700 million for Owner's Engineer cost submitted copies of the published advertisement inviting proposals of bidders for Owner's Engineer Services which was published on July 27, 2015 in Dawn and The News. The Petitioner has also submitted copy of request for proposal in this regard, which, as per the Petitioner, was purchased by five (5) interested parties namely;

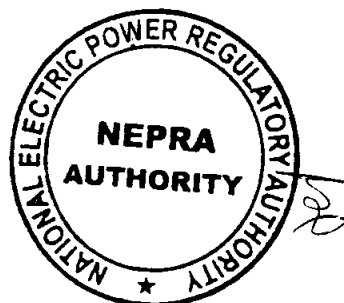
- Lahmeyer International
- Montgomery Watson Harza (MWH)
- Joint Venture of "SSS" i.e. Shangai Investigation Design and Research Institute Co. (SIDRI), Snowy Mountains Engineering Corporation International Australia (SMEC) and Shangai East China Engineering Consultants
- Fichtner
- Dar Al-Handasah Beirut Lebanon

4.4 The Petitioner further submitted that only two bids were submitted by the closing date of September 8, 2015, i.e. by JV of SSS and JV of Lahmeyer and China Water Resources Beifang Investigation, Design and Research co together named JV of LI-BIDR. Both the bidders qualified technically and after evaluation of technical and financial bids JV of SSS was selected as the lowest bidder.

4.5 The Petitioner in support also provided a copy of RFP and bid evaluation report dated November 27, 2015 and letter of acceptance issued to the selected Owner's Engineer by the Petitioner dated January 15, 2016,

4.6 While reviewing all the documents and examining the process of bidding followed by the Petitioner, the following facts have been observed.

- Bid evaluation has been done by the team of petitioner rather than an independent engineer. The lead consultant for Owner's Engineer is SMEC who also prepared the feasibility and evaluated the EPC bids .
- The basic contract price offered by the consultant (JV of SSS) amounts to US\$ 23.5 Million. The Petitioner has included cost of US\$ 2.200 million for extended scope of services of Owner's engineer in its total claim of US\$ 25.7 Million.
- The submitted copy of Owner's Engineer contract is a initialed draft. It is not finalized or signed contract and therefore can not be considered a credible documentary evidence or binding for the Petitioner.
- The Petitioner's letter of acceptance to the selected Owner's Engineer dated January 15, 2016, is conditional wherein it has been mentioned that the agreed contract price of US\$ 25.700 million for provision of services as owner's engineer will be invalid if the same is not approved by NEPRA and both parties will renegotiate the contract price based on cost approved by NEPRA.



4.7 Mr. Asim Javed (Intervener of the case) has raised concerns on transparency of the bidding process carried out by the petitioner for selection of Owner's Engineer and submitted that SMEC who conducted the feasibility study was reported by the Petitioner to have committed mistakes which necessitated further studies and updating of the initial feasibility studies. He has also commented that the evaluation of bidding documents should have been done by an independent consultant for unbiased opinion on the validity, comprehensiveness and technical strength of the competing stakeholders.

4.8 The Authority has reviewed all documents provided by the Petitioner in support of its revised claim for cost of Owner's Engineer and finds that concerns of the Authority as mentioned above and observations of the Intervener such as publication of advertisement in local newspapers only, issuance of addendum two days before closing date without providing details, selection of second lowest bidder after further negotiations without provision of details etc makes the whole process of bidding questionable. The Authority further observes that the letter of acceptance dated January 15, 2016 issued to the selected Owner's Engineer is not final and open to further negotiations between the parties which shows that the contract document is not firm and final neither it has been signed or executed up till now.

4.9 In view of the above mentioned the Authority considers that revised cost of Owner's Engineer US\$ 25.700 million based on the documentary evidence provided by the Petitioner can not be relied upon, hence not accepted by the Authority. The Authority therefore maintains its earlier decision in the matter of Owner's Engineer Cost.

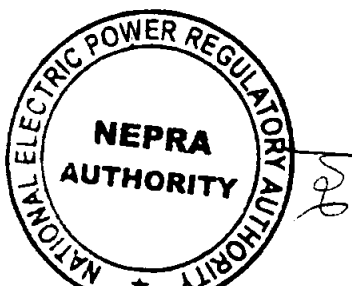
Reopener Verifier and Independent Engineer under PPA

4.10 The Petitioner has submitted that US\$ 1.8 Million and US\$ 0.9 Million has been estimated as cost of Reopener Verifier and Independent Engineer under PPA respectively, based on suggestion by some well-known international consulting and the Petitioner's own experience, current market and other ongoing projects in Pakistan. In view thereof, the Petitioner has requested the Authority to allow a minimum of USD 2.7 Million for PPA Reopener Verifier and PPA Independent Engineer, subject to provision of satisfactory payment evidence at the time of COD.

4.11 The Petitioner has not provided any further documentary evidence in support of its revised claim for the cost of reopener verifier and independent engineer. The Authority has already assessed and allowed US\$ 0.500 million for Reopener verifier and US\$ 0.500 million for Independent Engineer to the Petitioner which based on role and scope of work of these consultants is quite reasonable and therefore no further increase under these cost sub-heads is allowed by the Authority.

Site Investigation & Supervision of public infrastructure

4.12 The Petitioner has submitted that US\$ 11.5 Million may be allowed under the cost sub-head of Site Investigation & Supervision of public infrastructure, based on its Contract for Special Research and Survey of Water Diversion and Power Generation System for Karot Hydropower Project at the cost of RMB 32.5 Million in 2012 (approximate USD 5.17 Million), and Supervision of Public Infrastructures' cost



estimated around USD 6.35 Million based on corresponding BOQ in the EPC contract.

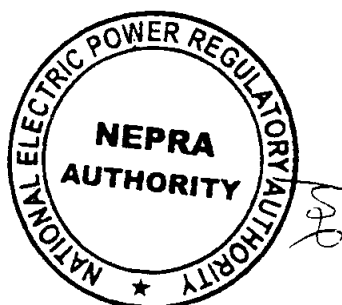
4.13 The Authority has examined the information provided by the Petitioner along with its review petition and finds that no new evidence to substantiate its claim under this head has been provided by the Petitioner. The Authority notes that it has already considered and allowed the cost of additional studies carried out by the Petitioner in its determination dated February 24, 2016 under the head of project development cost. As far as supervision of public infrastructure cost is concerned, the same is responsibility of the Owner's Engineer who is primarily responsible to supervise all EPC works including construction of roads and bridges. However, for the cost of supervision by the local Government's appointed consultants the Authority has already assessed and allowed US\$ 1.000 million in the overall cost of project Engineering & Supervision as approved in Authority's determination dated February 24, 2016. The Authority therefore does not find any justification to reconsider its earlier decision and therefore, claim of the Petitioner for its revised cost of US\$ 11.500 million is not accepted.

#### Environmental & Ecological Charges

4.14 The Petitioner submitted that this cost component comprises environmental management and monitoring costs to be incurred as per local environmental regulations and as per the stringent requirements of IFC, a shareholder of CSAIL (the sponsor) and a lender to the project. This head includes costs to be incurred during the construction phase of five years on account of biodiversity management plan, monitoring and reporting, community investment program, updating of ESIA studies etc. Based on the executed contracts, communication with environmental authorities and IFC as well as revised estimates as per IFC requirements, the original estimate has been revised to US\$ 12.300 million, which includes US\$ 1.02 million that has been incurred by the end of 2015.

4.15 Information provided by the Petitioner reveals that US\$ 5.903 million has been claimed on account of preparation and updating of various studies such as Environmental and Social Impact Assessment (ESIA) study, Consultancy services for seasonal Fish Survey and Consultancy services for Biodiversity Management Plan (BMP), Implementation of Stakeholder Engagement Plan, Capacity Building of Staff and Management and other associated costs. The Petitioner in support has provided copies of contracts to be executed with Mott MacDonald and Hagler Bailly Pakistan (Pvt) Ltd.

4.16 The Petitioner has also claimed US\$ 6.422 million on account of Community Investment Program. The Petitioner submitted that the "Community Investment Program" represents cost to be incurred as part of our corporate social responsibility within and around the Project site area. The Petitioner submitted that they have received requirements from Government of Azad Jammu and Kashmir (GoAJ&K) requesting provision of 50-bed hospital, a technical college for boys, water treatment plant and water supply scheme for affected areas, up gradation of 20 km roads for affected areas, public parks, rest house, internship program and many other requirements as per the letter received from DG Kotli dated December 23, 2015. The Petitioner submitted that they have also received similar requirements from Government of Punjab (GoPb) which together may amount to surpass US\$ 20 million.

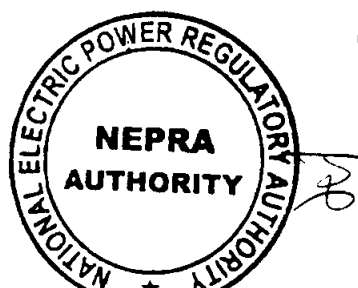


4.17 The Petitioner was asked to submit detailed cost breakup of works to be performed under the Community Investment Program. The Petitioner has provided the following cost breakup.

Description	Cost
<b>District Kotli</b>	(MIn PKR)
Poly Technic Institute	140.000
Up gradation of Basic Health Units	100.000
Up gradation of Schools	10.000
Access Roads (About 20 Km)	100.000
Drinking Water Supply Schemes	50.000
Rest House	20.000
Public Park	10.000
Community centre including indoor games	5.000
Public Library	2.000
Play ground	1.000
Road side facilities	2.000
Internship Program	2.000
<b>Sub-Total</b>	<b>442.000</b>

Description	Cost
<b>District Sudnoti AJ&amp;K</b>	(MIn PKR)
Education facilities improvement	20.000
Health facilities improvement	20.000
<b>Sub Total</b>	<b>40.000</b>
<b>District Rawalpindi Punjab</b>	
Rehabilitation of Kahuta Club	6.039
Rehabilitation of DHQ Hospital Kahuta	20.000
Up-gradation of BHU (Boer & Punjar) Government Dispensary	20.000
Rehabilitation of By-Pass road Kahuta	5.000
Up-gradation of Schools	20.000
Rest House near Karot project	10.000
Access roads around Karot project	80.000
Water supply/Filtration plant	10.000
Internship program	2.000
<b>Sub Total</b>	<b>122.000</b>
<b>Grand Total</b>	<b>655.039</b>
<b>Equivalent US\$</b>	<b>6.422</b>

4.18 The Authority understands that the Petitioner is required to fulfill its social responsibility for the benefit of community affected due to construction of Karot hydropower project. The Authority however considers that the investment program and the amount to be spent thereon for the overall benefit of the community in the affected areas should be undertaken strictly on need basis so that no extra burden is passed on to the consumers of the electricity through tariff of the Petitioner.



4.19 The Authority, after examination of all the details and documentary evidence provided by the Petitioner in support of its overall claimed cost of US\$ 12.300 million under the cost sub head of Environmental and Ecological Charges has decided to approve US\$ 11.193 million in aggregate comprising US\$ 4.771 million for the cost of additional environmental studies and implementation of BMP and US\$ 6.422 million for community investment program. The total approved cost of US\$ 11.193 million under the head of Environmental and Ecological Charges will be adjusted on the basis of actual at COD subject to the maximum ceiling of US\$ 11.193 million after verification of documentary evidence to be provided by the Petitioner.

Project Company's other engineering consultants

4.20 The Petitioner submitted that US\$ 10 Million will be required for experts, technical consultants and studies for resolving so-called critical issues during the construction phase.

4.21 The Authority considers that it has already allowed US\$ 7.200 million under this sub-head in the overall cost of Engineering and Supervision allowed to the Petitioner through its earlier determination dated February 24, 2016. Since the Petitioner has not provided any new evidence in support of its revised claim, hence not considered by the Authority.

4.22 In view of discussion in the preceding paragraphs, the overall approved cost of Engineering and Supervision works out to be US\$ 38.393 million as per the cost breakup given hereunder.

Engineering & Supervision Cost	Claimed (US\$ M)	Approved (US\$ M)
Owner's Engineer	25.700	18.000
Reopener Verifier	1.800	0.500
Independent Engineer	0.900	0.500
Site Investigation & Supervision of Public Infrastructure	11.500	1.000
Environmental and Ecological Charges	12.300	11.193
Project Company's other Engineering Consultants	10.000	7.200
<b>Total</b>	<b>62.200</b>	<b>38.393</b>

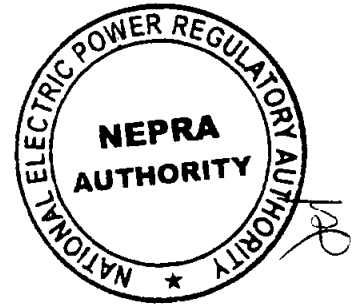
5. Project Development Cost (Issue #II)

5.1 The Petitioner submitted that the Authority has allowed a lump sum amount of US\$ 44.736 million under the cost head of Project Development Cost which is not sufficient to meet company's requirement. The Petitioner submitted that it has already spent an amount of US\$ 19.790 million which can be verified from the audited financial statements, leaving a balance of US\$ 25.136 million, which is not sufficient to cover the project development costs during the remaining pre financial close and project construction period of 5 years. The Petitioner further submitted that it has reviewed each cost sub-head of project development cost and has estimated a minimum of US\$ 72.060 million would be required under this head. The Petitioner has therefore requested for approval of US\$ 72.060 million for the Project development cost on the basis of revised cost break up as given hereunder.





Project Development Cost	(US\$ M)
Asset Acquisition cost	2.300
Transportation and Travelling	8.500
Office Costs	6.700
Resettlement Management cost	0.000
House Rental Expenses	4.900
BOD meeting & Conference	1.300
Employee Benefits	26.000
Consultant & Professional Charges	16.750
Security Protection	2.150
Financial Institution Charges	0.220
Government Review Charges	0.700
Generation License annual Fee	1.050
Registration Fee	0.650
LC Charges	0.780
Bank Guarantee Charges	0.000
<b>G. Total</b>	<b>72.000</b>



5.2 The Authority in its earlier determination of Karot has allowed an overall cost of US\$ 44.736 million based on assessment of major cost sub-heads of Project Development Cost on comparable basis with other such hydropower projects, which in the opinion of the Authority is quite reasonable for the Petitioner. Since no new evidence in support of revised cost of Project Development has been provided by the Petitioner, the Authority therefore finds no justification to reconsider its earlier decision in the matter. The request of the Petitioner for review of Project Development cost is therefore declined.

#### 6. Water Use Charge (Issue # III)

6.1 The Petitioner submitted that the Authority has allowed Water Use Charge at Ps. 15/kWh as per current applicable rate. However, during negotiations of Water Use Agreement (WUA) with GoAJK and GoPunjab, both governments have not agreed to the existing rates and have requested to increase the rate provided in Power Generation Policy 2015.

6.2 The Authority considers that the rate of Ps. 42.5/kWh for Water Use Charge as provided in the GOP Power Generation Policy 2015 will be implemented after approval by the Council of Common Interests (CCI). Considering the Petitioner's requirement for timely completion and signing of security documents, the Authority has decided to modify its earlier order to include provision of Ps 42.50/kWh in case it is applicable to the Petitioner in future.

#### 7. Rate of Return on Equity (Issue # IV)

7.1 The Petitioner submitted that the Authority has approved return on equity as 17% (IRR) as against 20% (IRR) claimed in its Petition. The Petitioner has now reiterated its claim for 20% IRR and submitted that in view of the greater risks involved in development of hydropower, coupled with its long

gestation period, the Authority may consider a higher return so as to encourage the private investor to invest in the hydropower sector.

7.2 The Authority has already decided to allow 17% return on equity (IRR based) for medium to large size hydropower projects seeking tariff on cost plus basis and therefore allowed the same in the case of other such hydropower projects. The Authority does not find any justification to allow higher rate of return for Karot hydropower project. Accordingly, 17% return on Equity (IRR based) as already allowed to the Petitioner in earlier determination of the Authority is maintained.

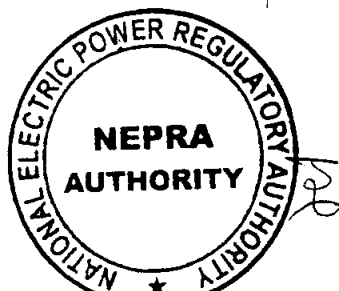
8. In view of discussion in the preceding paragraphs the overall approved project cost of the Petitioner has been revised as per the following breakup.

Cost Component	(US\$ Million)
EPC Cost	1277.780
Land Acquisition and Resettlement Cost	12.500
Insurance during Construction	31.944
Project Engineering & Supervision Cost	38.393
Project Development Cost	44.736
Legal Fee and Charges	7.500
O&M Mobilization Cost	3.000
Duties and Taxes	23.600
Financial Fee & Charges	34.547
Sinosure Fee during Construction	27.995
Interest during Construction (IDC)	196.266
Total Project Cost	1698.260

#### 9. Order

Pursuant to Rule 6 of the NEPRA Licensing (Generation) Rules, 2000 read with section 31(4) of Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997, Karot Power Company (Private) Limited (hereinafter referred to as "KPCL" or the "Company") is allowed to charge the following tariff for delivery of electricity to the Central Power Purchasing Agency (Guarantee) Limited (CPPA-G) for onward delivery to Ex-WAPDA distribution companies.

Tariff Components	Year 1-12	Year 13-30	Indexation
<b>Variable Charge (Rs/kWh)</b>			
Variable O&M - Local	0.1161	0.1161	Local CPI
Variable O&M - Foreign	0.0497	0.0497	PKR/US\$, US CPI
Water Use Charge	0.1500	0.1500	Local CPI
<b>Fixed Charge (Rs/kW/M)</b>			
Fixed O&M - Local	73.8339	73.8339	Local CPI
Fixed O&M - Foreign	172.2791	172.2791	PKR/US\$, US CPI
Insurance	113.8313	113.8313	PKR/US\$

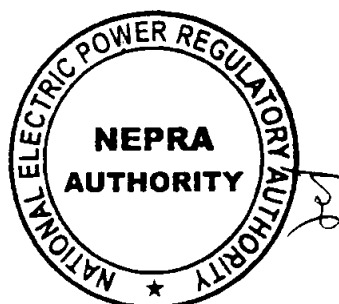


Debt Service	1844.7093	-	LIBOR, PKR/US\$
Return on Equity	685.8480	729.0403	PKR/US\$
Return on equity during construction (ROEDC)	303.0962	303.0962	PKR/US\$

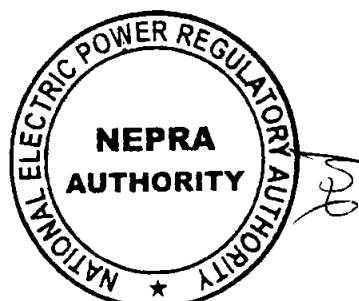
- i. The reference tariff has been calculated on the basis of net contracted capacity of 712.800 MW and net annual energy production of 3174 GWh.
- ii. In the above tariff, no adjustment for Carbon Emission Reduction receipts (CERs) has been accounted for. However, upon actual realization of CERs, the 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. Sinosure Fee on outstanding balance of Debt and interest at gross rate of 0.75% (Sinosure Fee net at 0.60% per annum plus Withholding Tax at 20%) has been allowed for each applicable year as indicated in the reference tariff table attached herewith as Annex-III.
- iv. The above tariff is applicable for a period of thirty (30) years on BOOT basis commencing from Commercial Operation Date (COD).
- v. Debt Service will be paid in the first 12 years of commercial operation of plant after COD.
- vi. Redemption of equity has been allowed after 12 years of commercial operation of the plant.
- vii. The reference PKR/Dollar rate has been assumed at 1 USD = 101.60 PKR.
- viii. The component wise tariff is indicated at Annex-III
- ix. Debt Servicing Schedule is attached as Annex-IV

**I. One Time Adjustment**

- a. The Principal repayment and the cost of debt will be adjusted at COD as per the actual borrowing composition and variation in LIBOR at the relevant date during the project construction period.
- b. Interest During Construction (IDC) will be adjusted at COD on the basis of actual debt composition, variation in PKR/US\$, debt drawdown (not exceeding the amount allowed by the Authority) and applicable 6-months LIBOR during the project construction period allowed by the Authority.
- c. In case, the spread on LIBOR is agreed at lower than 450 basis points, the benefit of such reduction in rate will be adjusted in proportion of 40% to the Petitioner and 60% to the consumer through necessary adjustment in tariff at COD.
- d. The specific items of project cost to be paid in foreign currency (i.e. US\$) will be adjusted at COD on account of actual variation in exchange rate over the reference PKR/US\$ exchange rate of Rs. 101.60 on production of verifiable documentary evidence to the satisfaction of the Authority.



- e. Custom duty and other applicable taxes at estimated amount of US\$ 23.600 million has been included in the total project cost approved for KPCL. The custom duty on imported plant and machinery and other applicable taxes, GOP levies and charges imposed on the Petitioner, which are of non-refundable nature will be adjusted on actual basis on production of verifiable documentary evidence by the Petitioner to the satisfaction of the Authority.
- f. The reference civil works cost for the local component amounting to Rs. 47954.710 million will be adjusted on account of variation in price index of four construction materials (Steel, Cement, Fuel and Labour) in accordance with the adjustment mechanism attached herewith as Annex-I.
- g. The reference cost of tunnels amounting to Rs. 13294.667 million will be adjusted due to variation in geology of actual rock type over the reference rock type for each tunnel as given in the reference tables attached herewith as Annex-II.
- h. Cost of land and resettlement will be adjusted on the basis of actual in accordance with the Hydropower Mechanism based on verifiable documentary evidence at COD.
- i. Cost of Environmental and Ecological Charges will be adjusted on the basis of actual at COD subject to the maximum ceiling of US\$ 11.193 million after verification of documentary evidence to be provided by the Petitioner.
- j. Insurance during construction will be adjusted at COD based on actual subject to the maximum of 2.50% of the adjusted and approved EPC cost upon production of verifiable documentary evidence to the satisfaction of the Authority.
- k. Financial charges will be adjusted at COD on the basis of actual subject to the maximum of 3% of the total debt allowed (excluding the impact of interest during construction, Sinosure fee and financial charges) on production of verifiable documentary evidence.
- l. Sinosure Fee on applicable debt and accrued interest thereon (IDC) during the project construction period will be adjusted at COD on the basis of actual subject to the maximum of 0.60% per annum and payments terms as approved by the Authority, on account of variation in PKR/US\$ exchange rate during the project construction period, based on documentary evidence to be provided by the Petitioner.
- m. Reference Sinosure Fee component of tariff for each year expressed in Rs/kW/Month as indicated in the reference tariff table at Annex-III will be adjusted on the basis of variation in PKR/US\$ exchange rate variation subject to maximum rate of 0.60% per annum and terms of payment as approved by the Authority at COD and the reference tariff table for each year of applicable Sinosure Fee will be revised accordingly.
- n. Return on Equity (ROE) and Return on Equity During Construction (ROEDC) will be adjusted 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) during the project construction period allowed by the Authority.
- o. The adjustment in tariff for Special return on equity for the 30 months period prior to construction start date will be allowed at COD on the basis of actual equity injection prior to the construction start date and PKR/US\$ exchange rate (within the overall equity allowed by the



Authority at COD) on the basis of verifiable documentary evidence to be provided by the Petitioner.

- p. If the Petitioner is required to make payment of Withholding Tax on Overseas Investment Insurance Fee (Sinosure Fee) on interest part of debt during the project construction period of 5 years and debt repayment period of twelve years after COD, the same shall be allowed as pass through cost in tariff based on actual upon production of verifiable documentary evidence to be provided by the Petitioner.
- q. Insurance cost for the operational period will be adjusted on the basis of actual subject to maximum at 1.35% of the EPC cost at COD on production of verifiable documentary evidence by the Petitioner.
- r. Water Use Charge (WUC) at the existing rate of Ps. 15/kWh along with annual indexation has been allowed. If the rate of WUC for hydropower projects is increased by the GOP, the same shall be taken in to account for adjustment of tariff at COD.
- s. The reference tariff table shall be revised at COD while taking in to account the above adjustments. The Petitioner shall submit its request to the Authority within 90 days of COD for necessary adjustments in tariff.

## II. Pass-Through Items

No provision for income tax has been accounted for in the tariff. If the power producer is obligated to pay any 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 on dividends is also a pass through item just like other taxes as indicated in the government Guidelines. 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% return on equity according to the following formula:

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

Where:

$E_{(Ref)}$	=	Adjusted Reference Equity at COD
$E_{(Red)}$	=	Equity Redeemed
$\text{ROEDC}_{(Ref)}$	=	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.

If the Petitioner is required to make payment of Withholding Tax on Sinosure Fee and Debt Servicing component of tariff, the same shall be treated as Pass Through cost of the Petitioner. The Power



Purchaser shall reimburse to the Petitioner the actual amount paid on account of withholding tax after verification of relevant documentary evidence.

If the Petitioner is required to make payment on account of Water Utilization Cess to IRSA on total units delivered basis at Paisa 0.50/kWh, the same shall be treated as Pass through cost of the Petitioner and shall be reimbursed by the Power Purchaser on the basis of actual payment made by the Petitioner after verification of documentary evidence.

### 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 annual Variable O&M cost is based on 70% local and 30% foreign expense. The Fixed annual O&M cost is based on 30% local and 70% foreign expense. The local part of O&M will be adjusted on account of local 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 local CPI (General) as notified by Pakistan Bureau of Statistics, US CPI notified by US Bureau of Labor Statistics (All Urban Consumers) 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

$$F O\&M_{(LREV)} = 73.8339 * CPI_{(REV)} / 199.66$$

$$F O\&M_{(FREV)} = 172.2791 * USCPI_{(REV)} / 237.031 * ER_{(REV)} / 101.60$$

Where:

$F O\&M_{(LREV)}$  = The revised applicable Fixed O&M local component of tariff indexed with local CPI.

$F O\&M_{(FREV)}$  = The revised applicable Fixed O&M foreign component of tariff indexed with US CPI and exchange rate variation.

73.8339 = The reference fixed O&M local component of tariff expressed in Rs/kW/Month.

172.2791 = The reference fixed O&M foreign component of tariff expressed in Rs/kW/Month.

$CPI_{(REV)}$  = The Revised Consumer Price Index (General) as notified by the Pakistan Bureau of Statistics for the relevant month.

199.66 = The Reference Consumer Price Index (General) of May 2015 notified by the Pakistan Bureau of Statistics.

$US CPI_{(REV)}$  = The Revised US Consumer Price Index (All Urban Consumers)



notified by the US Bureau of Labor Statistics.

- 237.031 = Reference US CPI (All Urban Consumers) notified by the US Bureau of Labor Statistics for the month of May 2015.
- $ER_{(REV)}$  = The revised TT and OD selling rate of US dollar as notified by the National Bank of Pakistan.

b. Variable O&M

$$V O\&M_{(LREV)} = 0.1161 * CPI_{(REV)} / 199.66$$

$$V O\&M_{(FREX)} = 0.0497 * USCPI_{(REV)} / 237.031 * ER_{(REV)} / 101.60$$

Where:

- $V O\&M_{(LREV)}$  = The revised applicable Variable O&M local component of tariff indexed with local CPI.
- $V O\&M_{(FREX)}$  = The revised applicable Variable O&M foreign component of tariff indexed with US CPI and exchange rate variation.
- 0.1161 = The reference variable O&M local component of tariff expressed in Rs/kWh.
- 0.0497 = The reference variable O&M foreign component of tariff expressed in Rs/kWh.
- $CPI_{(REV)}$  = The Revised Consumer Price Index (General) as notified by the Pakistan Bureau of Statistics for the relevant month.
- 199.66 = The reference Consumer Price Index (General) of May 2015 notified by the Pakistan Bureau of Statistics.
- $US CPI_{(REV)}$  = The Revised US Consumer Price Index (All Urban Consumers) notified by the US Bureau of Labor Statistics.
- 237.031 = Reference US CPI (All Urban Consumers) notified by the US Bureau of Labor Statistics for the month of May 2015.
- $ER_{(REV)}$  = The revised TT and OD selling rate of US dollar as notified by the National Bank of Pakistan.

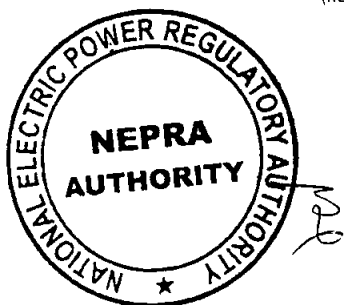
ii) Water Use Charge

Water Use Charge will be paid on units delivered basis and will be indexed with Consumer Price Index (CPI General) annually from the date of COD. The first such adjustment shall be due after one year of commercial operation date (COD), according to the formula:

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

Where;

- $WUC_{(REV)}$  = The revised Water Use Charge component of tariff indexed with Consumer Price Index (General).
- 0.1500 = The reference Water Use Charge component of tariff expressed in Rs/kWh.
- $CPI_{(REV)}$  = The Revised Consumer Price Index (General) notified by the Pakistan Bureau of Statistics for the relevant month.
- $CPI_{(REF)}$  = The reference Consumer Price Index (General) of the relevant month at COD as notified by the Pakistan Bureau of Statistics.



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 1.35% of the EPC cost on production of verifiable documentary evidence by the Petitioner, 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.
- $ER_{(REV)}$  = 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

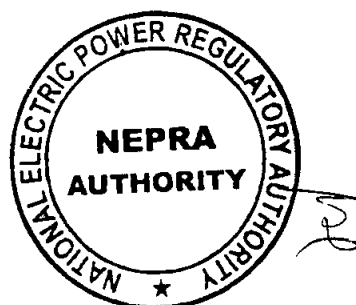
The interest part of fixed charge component will remain unchanged throughout the term except for the adjustment due to exchange rate variation and variation in 6-month LIBOR, while spread on LIBOR (4.50%) remaining the same, according to the following formula:

$$\Delta I = P_{(REV)} * (LIBOR_{(REV)} - 0.36\%) / 2$$

Where;

- $\Delta I$  = the variation in interest charges applicable corresponding to variation in six-month LIBOR.  $\Delta I$  can be positive or negative depending upon whether  $LIBOR_{(REV)} >$  or  $<$  0.36%. The interest payment obligation will be enhanced or reduced to the extent of  $\Delta I$  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-IV) on a semi-annual basis at the relevant calculations dates.

- v) The Petitioner will be allowed adjustment of reference Sinosure Fee component of tariff expressed in Rs./kW/Month on account of variation in PKR/US\$ exchange rate variation on bi-annual basis in accordance with the rate and other applicable terms as approved by the Authority at COD and the applicable Sinosure Fee component of tariff for each period will be adjusted accordingly.





vi) 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:

$$\begin{aligned} ROE_{(REV)} &= ROE_{(REF)} * ER_{(REV)}/ER_{(REF)} \\ ROEDC_{(REV)} &= ROEDC_{(REF)} * ER_{(REV)}/ER_{(REF)} \end{aligned}$$

Where;

ROE <sub>(REV)</sub>	=	Revised Return on Equity component of tariff expressed in Rs/kW/M adjusted with exchange rate variation.
ROEDC <sub>(REV)</sub>	=	Revised Return on Equity during Construction component of tariff in Rs/kW/M adjusted with exchange rate variation.
ROE <sub>(REF)</sub>	=	Reference Return on Equity component of tariff expressed in Rs/kW/M.
ROEDC <sub>(REF)</sub>	=	Reference Return on Equity during Construction component of tariff expressed in Rs/kW/M.
ER <sub>(REV)</sub>	=	Revised TT and OD selling rate of US dollar as notified by the National Bank of Pakistan.
ER <sub>(REF)</sub>	=	Reference TT and OD selling rate of US dollar.

Note: -

Adjustment on account of inflation, foreign exchange rate variation and LIBOR variation will be approved by the Authority within fifteen working days after receipt of complete information from the Petitioner through its request for adjustment in tariff in accordance with the requisite indexation mechanism stipulated hereinabove.

V. Other Terms and Conditions of TariffDesign & 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.

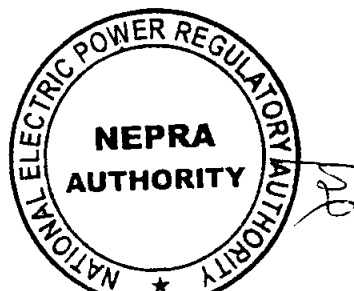
Power Curve of the Hydel Power Complex:

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:

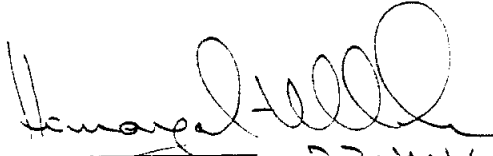
The Petitioner shall process and obtain emissions/carbon credits expeditiously and credit the proceeds to the Power Purchaser as per the policy issued by the Federal Government as amended from time to time.


The above order of the Authority, along with Annex-I,II,III and IV attached herewith, are recommended



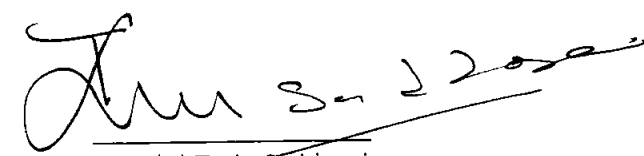
for notification by the Federal Government, in the Official Gazette, in accordance with Section 31(4) of the Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997.

Authority

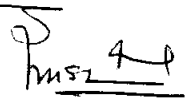
  
Himayat Ullah Khan  
Member  
27.4.16

  
Syed Masood-ul-Hassan Naqvi  
Member  
26/4

On Leave Absence  
Maj. (R) Haroon Rashid  
Member

  
Brig. (R) Tariq Sadozai  
Chairman  
26/4/16



  
27.04.16

### 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 following formula ("Cost Escalation Formula"), calculates the amount of escalation allowed in the relevant month "n" of the construction period. As per the EPC terms, such adjustment is only applicable to local currency portion of the EPC Price.

$$a) P_n = V_n * [(C_n - C_0) / C_0] + W_n * [(S_n - S_0) / S_0] + Y_n * [(F_n - F_0) / F_0] + Z_n * [(L_n - L_0) / L_0] \quad \square$$

$$b) T_{fn} = T_n + P_n \quad \square$$

Where

$P_n$  is the amount of escalation allowed in the relevant month "n" of the construction period;  $V_n$ ,  $W_n$ ,  $Y_n$  and  $Z_n$  represent the reference Rupee amount, on which the escalation shall be calculated, of Cement, Steel, Fuel and Labour respectively in the relevant month "n" of the construction period, as shown in table-1 below.

C, S, F and L are the unit price indices for Cement, Steel, Fuel and Labour, where the subscript "n" refers to the relevant month "n" and the subscript "o" refers to the base date of August 2014. The sources of indices for cement, steel, labour and fuel shall be as follows:

Cost Element	Reference Index	Remarks
Labour (L)	200.14	Applicable index of "Construction Wage Rates" of 7.4 Consumer Price Index Number by Major Groups and Selected Commodities of the published Monthly Bulletin of Statistics of August 2014 by Pakistan Bureau of Statistics (PBS)
Fuel (F)	260.69	Applicable index of "Diesel Oil" of 7.9 Index Numbers of Wholesale Prices by Commodities of published Monthly Bulletin of Statistics of August 2014 by PBS
Cement (C)	207.76	Applicable index of "Cement" of 7.9 Index Numbers of Wholesale Prices by Commodities of published Monthly Bulletin of Statistics of August 2014 by PBS
Reinforcing Steel (S)	146.08	Applicable index of "Steel Bars & Sheets" of 7.9 Index Numbers of Wholesale Prices by Commodities of published Monthly Bulletin of Statistics of August 2014 by PBS

$T_{fn}$  is the Total Final Amount for the relevant month n, after adding the Escalated Amount ( $P_n$ ) to the Total Reference Amount ( $T_n$ ) as provided in Table 1.

$T_n$  is the Total Reference Amount for the relevant month "n" from Construction Start Date as given in Table 1.

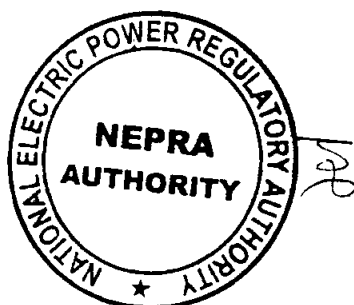
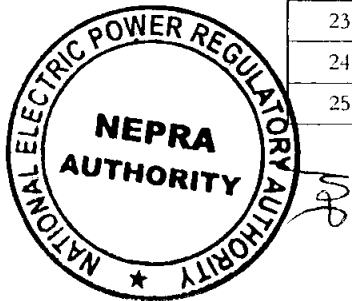
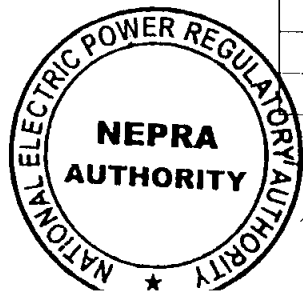


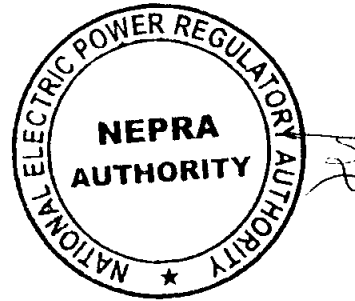
Table-1		(Exchange Rate: USD=101.60 PKR)										
Month	Amount in PKR						Coefficients					
	Fixed	Cement	Steel	Fuel	Labor	Total	Fixed	Cement	Steel	Fuel	Labor	Total
	PKR	PKR	PKR	PKR	PKR	PKR	a	b	c	d	e	
1	374,278,232	68,617,676	49,903,764	43,665,794	87,331,587	623,797,053	0.60	0.11	0.08	0.07	0.14	1.00
2	445,464,404	81,668,474	59,395,254	51,970,847	103,941,694	742,440,674	0.60	0.11	0.08	0.07	0.14	1.00
3	523,477,233	95,970,826	69,796,964	61,072,311	122,144,688	872,462,056	0.60	0.11	0.08	0.07	0.14	1.00
4	629,741,981	115,452,696	83,965,597	73,469,898	146,939,796	1,049,569,968	0.60	0.11	0.08	0.07	0.14	1.00
5	639,740,470	117,285,753	85,298,729	74,636,388	149,272,776	1,066,234,116	0.60	0.11	0.08	0.07	0.14	1.00
6	639,740,470	117,285,753	85,298,729	74,636,388	149,272,776	1,066,234,116	0.60	0.11	0.08	0.07	0.14	1.00
7	715,532,726	131,181,000	95,404,364	83,478,818	166,957,636	1,192,554,544	0.60	0.11	0.08	0.07	0.14	1.00
8	689,684,773	126,442,208	91,957,970	80,463,224	160,926,447	1,149,474,622	0.60	0.11	0.08	0.07	0.14	1.00
9	652,775,199	119,675,453	87,036,693	76,157,107	152,314,213	1,087,958,665	0.60	0.11	0.08	0.07	0.14	1.00
10	638,497,250	117,057,829	85,132,967	74,491,316	148,982,692	1,064,162,084	0.60	0.11	0.08	0.07	0.14	1.00
11	579,045,848	106,158,406	77,206,113	67,555,349	135,110,698	965,076,414	0.60	0.11	0.08	0.07	0.14	1.00
12	567,548,624	104,050,581	75,673,150	66,214,006	132,428,012	945,914,374	0.60	0.11	0.08	0.07	0.14	1.00
13	521,930,490	95,687,256	69,590,732	60,891,890	121,783,781	869,884,150	0.60	0.11	0.08	0.07	0.14	1.00
14	537,618,180	98,563,333	71,682,424	62,722,121	125,444,242	896,030,300	0.60	0.11	0.08	0.07	0.14	1.00
15	542,837,708	99,520,246	72,378,361	63,331,066	126,662,132	904,729,513	0.60	0.11	0.08	0.07	0.14	1.00
16	478,181,838	87,666,670	63,757,578	55,787,881	111,575,762	796,969,730	0.60	0.11	0.08	0.07	0.14	1.00
17	415,025,322	76,087,976	55,336,710	48,419,621	96,839,242	691,708,869	0.60	0.11	0.08	0.07	0.14	1.00
18	350,206,840	64,204,587	46,694,245	40,857,465	81,714,929	583,678,067	0.60	0.11	0.08	0.07	0.14	1.00
19	270,051,347	126,472,577	91,980,056	80,482,549	63,011,981	631,998,510	0.43	0.20	0.15	0.13	0.10	1.00
20	254,672,977	109,898,151	79,925,928	69,935,187	59,423,695	573,855,936	0.44	0.19	0.14	0.12	0.10	1.00
21	236,321,451	96,966,854	70,521,348	61,706,180	55,141,672	520,657,505	0.45	0.19	0.14	0.12	0.11	1.00
22	337,954,063	116,533,593	84,751,704	74,157,741	78,855,948	692,253,048	0.49	0.17	0.12	0.11	0.11	1.00
23	416,625,557	130,022,607	94,561,896	82,741,659	97,212,630	821,164,349	0.51	0.16	0.12	0.10	0.12	1.00
24	749,596,739	192,001,417	139,637,394	122,182,720	174,905,906	1,378,324,175	0.54	0.14	0.10	0.09	0.13	1.00
25	810,307,982	200,329,531	145,694,205	127,482,429	189,071,862	1,472,886,009	0.55	0.14	0.10	0.09	0.13	1.00



26	754,243,394	157,420,240	114,487,448	100,176,517	175,990,125	1,302,317,724	0.58	0.12	0.09	0.08	0.14	1.00
27	673,203,966	123,420,727	89,760,529	78,540,463	157,080,925	1,122,006,610	0.60	0.11	0.08	0.07	0.14	1.00
28	671,196,568	123,052,704	89,492,876	78,306,266	156,612,533	1,118,660,947	0.60	0.11	0.08	0.07	0.14	1.00
29	669,823,551	122,800,984	89,309,807	78,146,081	156,292,162	1,116,372,584	0.60	0.11	0.08	0.07	0.14	1.00
30	572,498,758	104,958,106	76,333,168	66,791,522	133,583,043	954,164,596	0.60	0.11	0.08	0.07	0.14	1.00
31	426,931,718	78,270,815	56,924,229	49,808,700	99,617,401	711,552,864	0.60	0.11	0.08	0.07	0.14	1.00
32	391,879,481	71,844,571	52,250,597	45,719,273	91,438,546	653,132,468	0.60	0.11	0.08	0.07	0.14	1.00
33	402,849,021	73,855,654	53,713,203	46,999,052	93,998,105	671,415,036	0.60	0.11	0.08	0.07	0.14	1.00
34	375,663,201	68,871,587	50,088,427	43,827,373	87,654,747	626,105,334	0.60	0.11	0.08	0.07	0.14	1.00
35	318,906,950	58,466,274	42,520,927	37,205,811	74,411,622	531,511,584	0.60	0.14	0.08	0.07	0.14	1.00
36	320,495,961	58,757,593	42,732,795	37,391,195	74,782,394	534,159,935	0.60	0.11	0.08	0.07	0.14	1.00
37	415,345,442	76,146,664	55,379,392	48,456,968	96,913,936	692,242,403	0.60	0.11	0.08	0.07	0.14	1.00
38	386,470,591	70,852,942	51,529,412	45,088,236	90,176,471	644,117,651	0.60	0.11	0.08	0.07	0.14	1.00
39	382,260,270	70,081,049	50,968,036	44,597,031	89,194,063	637,100,449	0.60	0.11	0.08	0.07	0.14	1.00
40	483,235,086	88,593,099	64,431,345	56,377,427	112,754,853	805,391,809	0.60	0.11	0.08	0.07	0.14	1.00
41	513,758,681	94,189,092	68,501,157	59,938,513	119,877,026	856,264,469	0.60	0.11	0.08	0.07	0.14	1.00
42	550,954,357	101,008,299	73,460,581	64,278,008	128,556,017	918,257,262	0.60	0.11	0.08	0.07	0.14	1.00
43	595,669,571	109,206,088	79,422,610	69,494,783	138,989,567	992,782,619	0.60	0.11	0.08	0.07	0.14	1.00
44	640,828,191	117,485,168	85,443,759	74,763,289	149,526,578	1,068,046,985	0.60	0.11	0.08	0.07	0.14	1.00
45	665,130,074	121,940,514	88,684,010	77,598,509	155,197,017	1,108,550,124	0.60	0.11	0.08	0.07	0.14	1.00
46	554,290,237	101,619,877	73,905,365	64,667,194	129,334,389	923,817,062	0.60	0.11	0.08	0.07	0.14	1.00
47	423,515,158	77,644,446	56,468,688	49,410,102	98,820,204	705,858,597	0.60	0.11	0.08	0.07	0.14	1.00
48	358,618,916	65,746,801	47,815,855	41,838,874	83,677,747	597,698,194	0.60	0.11	0.08	0.07	0.14	1.00
49	444,155,597	81,428,526	59,220,746	51,818,153	103,636,306	740,259,328	0.60	0.11	0.08	0.07	0.14	1.00
50	463,744,656	85,019,854	61,832,621	54,103,543	108,207,086	772,907,759	0.60	0.11	0.08	0.07	0.14	1.00
51	476,010,619	87,268,614	63,468,083	55,534,572	111,069,144	793,351,032	0.60	0.11	0.08	0.07	0.14	1.00
52	492,362,111	90,266,387	65,648,282	57,442,246	114,884,493	820,603,519	0.60	0.11	0.08	0.07	0.14	1.00
53	419,799,073				97,953,117	517,752,190	0.81	0.00	0.00	0.00	0.19	1.00
54	344,771,482				80,446,679	425,218,161	0.81	0.00	0.00	0.00	0.19	1.00
55	292,588,661				68,270,688	360,859,348	0.81	0.00	0.00	0.00	0.19	1.00



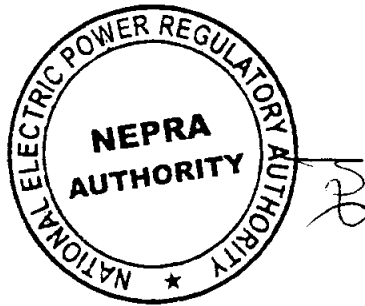
56	297,683,715				69,459,534	367,143,249	0.81	0.00	0.00	0.00	0.19	1.00
57	292,588,661				68,270,688	360,859,348	0.81	0.00	0.00	0.00	0.19	1.00
58	297,683,715				69,459,534	367,143,249	0.81	0.00	0.00	0.00	0.19	1.00
59	282,398,552				65,892,995	348,291,548	0.81	0.00	0.00	0.00	0.19	1.00
60	104,412,462				24,362,908	128,775,370	0.81	0.00	0.00	0.00	0.19	1.00
汇总	28,772,826,152	5,275,018,128	3,836,376,820	3,356,829,718	6,713,659,436	47,954,710,254	0.60	0.11	0.08	0.07	0.14	1.00



*[Handwritten mark]*

**Adjustment in the cost of Tunneling Works due to Geological Conditions**

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



A small, handwritten mark or signature consisting of a vertical line with a loop at the top and a horizontal line at the bottom.

TABLE - 1

(i) Hydraulic Tunnel 1 – Diversion Tunnel- Classification of Ground Conditions

Class	Q-value	Length Assumed (m)	Unit Rate PKR/meter length	Cost of Construction PKR
1	$Q > 10$	0	2,691,714.53	-
2	$10 > Q > 4$	0	2,990,793.92	-
3	$4 > Q > 1$	382.3	3,323,104.35	1,270,422,793.77
4	$1 > Q > 0.1$	734.9	6,714,916.72	4,934,792,297.53
5	$0.1 > Q > 0.01$	224.6	11,134,537.04	2,500,817,019.18
6	$Q < 0.01$	0	12,247,990.74	-
<b>Total</b>		<b>1,341.80</b>		<b>8,706,032,110.48</b>

(ii) Hydraulic Tunnel 2 – waterway tunnel (diameter 9.6m)- Classification of Ground Conditions

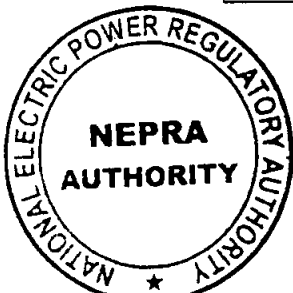
Class	Q-value	Length Assumed (m)	Unit Rate PKR/meter Length	Cost of Construction PKR
1	$Q > 10$	0	1,643,391.04	-
2	$10 > Q > 4$	0	1,825,990.05	-
3	$4 > Q > 1$	1,107.42	2,028,877.83	2,246,819,888.71
4	$1 > Q > 0.1$	0	4,236,469.05	-
5	$0.1 > Q > 0.01$	0	4,459,485.11	-
6	$Q < 0.01$	0	4,903,433.62	-
<b>Total</b>		<b>1,107.42</b>		<b>2,246,819,888.71</b>

(iii) Hydraulic Tunnel 3 – waterway tunnel (diameter 7.9m)- Classification of Ground Conditions

Class	Q-value	Length Assumed (m)	Unit Rate PKR/meter Length	Cost of Construction PKR
1	$Q > 10$	0	1,338,656.36	-
2	$10 > Q > 4$	0	1,487,395.96	-
3	$4 > Q > 1$	22.8	1,652,662.18	37,680,697.61
4	$1 > Q > 0.1$	59.8	3,398,863.41	203,252,031.80
5	$0.1 > Q > 0.01$	77.4	3,590,401.76	277,897,096.22
6	$Q < 0.01$	0	3,949,441.94	-
<b>Total</b>		<b>160</b>		<b>518,829,825.64</b>

(iv) Powerhouse Main Access Tunnel (traffic tunnel)- Classification of Ground Conditions

Class	Q-value	Length Assumed (m)	Unit Rate PKR/meter Length	Cost of Construction PKR
1	$Q > 10$	0	1,233,669.71	-





2	$10 > Q > 4$	0	1,370,744.12	-
3	$4 > Q > 1$	213.6	1,523,049.02	325,323,271.53
4	$1 > Q > 0.1$	110.8	2,620,940.66	290,400,224.68
5	$0.1 > Q > 0.01$	9.6	2,767,679.50	26,569,723.24
6	$Q < 0.01$	0	3,044,447.45	-
Total		334.0		642,293,219.45

## (v) Adit 1- Diversion tunnel Adit- Classification of Ground Condition

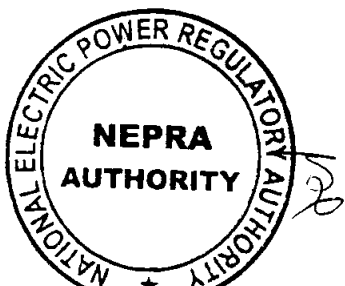
Class	Q-value	Length Assumed (m)	Unit Rate PKR/ meter Length	Cost of Construction PKR
1	$Q > 10$	0	529,564.88	-
2	$10 > Q > 4$	0	588,405.43	-
3	$4 > Q > 1$	75	653,783.81	49,033,785.60
4	$1 > Q > 0.1$	165	1,156,197.84	190,772,643.60
5	$0.1 > Q > 0.01$	60	2,083,861.72	125,031,703.20
6	$Q < 0.01$	0	2,292,247.89	-
Total		300		364,838,132.40

## (vi) Adit 2- Waterway tunnel Adit- Classification of Ground Conditions

Class	Q-value	Length Assumed (m)	Unit Rate PKR/ meter Length	Cost of Construction PKR
1	$Q > 10$	0	445,948.03	-
2	$10 > Q > 4$	0	495,497.82	-
3	$4 > Q > 1$	241.5	550,553.13	132,958,580.41
4	$1 > Q > 0.1$	34.5	1,043,308.05	35,994,127.66
5	$0.1 > Q > 0.01$	69	2,130,791.78	147,024,632.54
6	$Q < 0.01$	0	2,343,870.95	-
Total		345		315,977,340.61

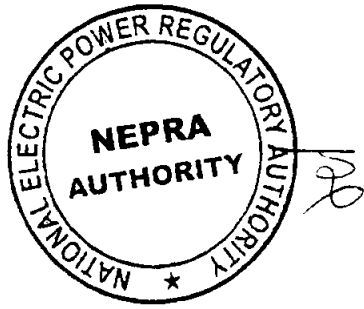
## (vii) Other tunnel 1- massif drainage tunnel- Classification of Ground Conditions

Class	Q-value	Length Assumed (m)	Unit Rate PKR/ meter Length	Cost of Construction PKR
1	$Q > 10$	0	338,499.91	-
2	$10 > Q > 4$	0	376,111.01	-
3	$4 > Q > 1$	313.3	417,901.12	130,928,420.90
4	$1 > Q > 0.1$	96.6	754,276.37	72,863,097.15
5	$0.1 > Q > 0.01$	33.3	827,963.80	27,571,194.54
6	$Q < 0.01$	0	910,760.18	-
Total		443.2		231,362,712.58



## (viii) Other tunnel 2- Spillway drainage tunnel- Classification of Ground Conditions

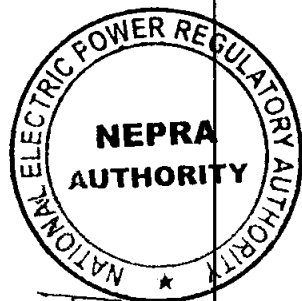
Class	Q-value	Length Assumed (m)	Unit Rate PKR/ meter Length	Cost of Construction PKR
1	$Q > 10$	0	2,005,042.46	-
2	$10 > Q > 4$	0	2,227,824.96	-
3	$4 > Q > 1$	0	2,475,361.06	173,275,274.48
4	$1 > Q > 0.1$	25	3,094,028.86	77,350,721.60
5	$0.1 > Q > 0.01$	5	3,577,539.20	17,887,696.00
6	$Q < 0.01$	0	3,935,293.12	-
Total		100		268,513,692.08



**Karot Hydropower Project  
REFERENCE TARIFF**

Year	Variable O&M	Variable O&M	Water Use Charge	Fixed O&M	Fixed O & M	Insurance	Return on Equity	ROE During Construction	Loan Repayment	Interest Charges	Sinasure fee	Total Tariff
	Local	Foreign		Local	O & M		Foreign	Equity	Construction	Repayment		Charges
	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	0.1161	0.0497	0.1500	73.8339	172.2791	113.8313	685.8480	303.0962	986.4181	858.2912	122.4257	9.2522
2	0.1161	0.0497	0.1500	73.8339	172.2791	113.8313	685.8480	303.0962	1,040.4038	804.3055	114.7252	9.2314
3	0.1161	0.0497	0.1500	73.8339	172.2791	113.8313	685.8480	303.0962	1,097.3441	747.3652	106.6033	9.2095
4	0.1161	0.0497	0.1500	73.8339	172.2791	113.8313	685.8480	303.0962	1,157.4006	687.3087	98.0370	9.1864
5	0.1161	0.0497	0.1500	73.8339	172.2791	113.8313	685.8480	303.0962	1,220.7440	623.9653	89.0017	9.1621
6	0.1161	0.0497	0.1500	73.8339	172.2791	113.8313	685.8480	303.0962	1,287.5541	557.1552	79.4720	9.1364
7	0.1161	0.0497	0.1500	73.8339	172.2791	113.8313	685.8480	303.0962	1,358.0207	486.6887	69.4207	9.1093
8	0.1161	0.0497	0.1500	73.8339	172.2791	113.8313	685.8480	303.0962	1,432.3438	412.3656	58.8194	9.0807
9	0.1161	0.0497	0.1500	73.8339	172.2791	113.8313	685.8480	303.0962	1,510.7345	333.9748	47.6378	9.0506
10	0.1161	0.0497	0.1500	73.8339	172.2791	113.8313	685.8480	303.0962	1,593.4155	251.2938	35.8443	9.0188
11	0.1161	0.0497	0.1500	73.8339	172.2791	113.8313	685.8480	303.0962	1,680.6215	164.0878	23.4053	8.9853
12	0.1161	0.0497	0.1500	73.8339	172.2791	113.8313	685.8480	303.0962	1,772.6003	72.1091	10.2856	8.9499
13	0.1161	0.0497	0.1500	73.8339	172.2791	113.8313	729.0403	303.0962				4.0673
14	0.1161	0.0497	0.1500	73.8339	172.2791	113.8313	729.0403	303.0962				4.0673
15	0.1161	0.0497	0.1500	73.8339	172.2791	113.8313	729.0403	303.0962				4.0673
16	0.1161	0.0497	0.1500	73.8339	172.2791	113.8313	729.0403	303.0962				4.0673
17	0.1161	0.0497	0.1500	73.8339	172.2791	113.8313	729.0403	303.0962				4.0673
18	0.1161	0.0497	0.1500	73.8339	172.2791	113.8313	729.0403	303.0962				4.0673
19	0.1161	0.0497	0.1500	73.8339	172.2791	113.8313	729.0403	303.0962				4.0673
20	0.1161	0.0497	0.1500	73.8339	172.2791	113.8313	729.0403	303.0962				4.0673
21	0.1161	0.0497	0.1500	73.8339	172.2791	113.8313	729.0403	303.0962				4.0673
22	0.1161	0.0497	0.1500	73.8339	172.2791	113.8313	729.0403	303.0962				4.0673
23	0.1161	0.0497	0.1500	73.8339	172.2791	113.8313	729.0403	303.0962				4.0673
24	0.1161	0.0497	0.1500	73.8339	172.2791	113.8313	729.0403	303.0962				4.0673
25	0.1161	0.0497	0.1500	73.8339	172.2791	113.8313	729.0403	303.0962				4.0673
26	0.1161	0.0497	0.1500	73.8339	172.2791	113.8313	729.0403	303.0962				4.0673
27	0.1161	0.0497	0.1500	73.8339	172.2791	113.8313	729.0403	303.0962				4.0673
28	0.1161	0.0497	0.1500	73.8339	172.2791	113.8313	729.0403	303.0962				4.0673
29	0.1161	0.0497	0.1500	73.8339	172.2791	113.8313	729.0403	303.0962				4.0673
30	0.1161	0.0497	0.1500	73.8339	172.2791	113.8313	729.0403	303.0962				4.0673
<b>Levelized Tariff</b>	<b>0.1161</b>	<b>0.0497</b>	<b>0.1500</b>	<b>73.8339</b>	<b>172.2791</b>	<b>113.8313</b>	<b>697.8213</b>	<b>303.0962</b>	<b>915.4947</b>	<b>417.8452</b>	<b>59.6010</b>	<b>7.7370</b>

Levelized Tariff (1-30 years) discounted at 10% per annum = US Cents 7.6152/kWh at reference exchange rate of 1US\$=Rupees 101.60.



## Karot Hydropower Project

## Debt Servicing Schedule

Period	Foreign Debt					Annual Principal Repayment Million US\$	Annual Interest Million US\$	Annual Debt Servicing Million US\$	Annual Principal Repayment Rs./kW/M	Annual Interest Rs./kW/M	Annual Debt Servicing Rs./kW/M																																																																																																																																																																																				
	Principal Million \$	Repayment Million \$	Mark-Up Million \$	Balance Million \$	Debt Service Million \$																																																																																																																																																																																										
1	1,358.6081	40.9697	36.6824	1,317.6384	77.6521	83.0455	72.2587	155.3042	986.4181	858.2912	1,844.7093																																																																																																																																																																																				
	1,317.6384	42.0759	35.5762	1,275.5626	77.6521							2	1,275.5626	43.2119	34.4402	1,232.3507	77.6521	87.5905	67.7137	155.3042	1,040.4038	804.3055	1,844.7093	1,232.3507	44.3786	33.2735	1,187.9720	77.6521	3	1,187.9720	45.5769	32.0752	1,142.3952	77.6521	92.3843	62.9199	155.3042	1,097.3441	747.3652	1,844.7093	1,142.3952	46.8074	30.8447	1,095.5878	77.6521	4	1,095.5878	48.0712	29.5809	1,047.5165	77.6521	97.4404	57.8638	155.3042	1,157.4006	687.3087	1,844.7093	1,047.5165	49.3691	28.2829	998.1474	77.6521	5	998.1474	50.7021	26.9500	947.4453	77.6521	102.7732	52.5310	155.3042	1,220.7440	623.9653	1,844.7093	947.4453	52.0711	25.5810	895.3742	77.6521	6	895.3742	53.4770	24.1751	841.8972	77.6521	108.3979	46.9063	155.3042	1,287.5541	557.1552	1,844.7093	841.8972	54.9209	22.7312	786.9763	77.6521	7	786.9763	56.4037	21.2484	730.5726	77.6521	114.3304	40.9738	155.3042	1,358.0207	486.6887	1,844.7093	730.5726	57.9266	19.7255	672.6460	77.6521	8	672.6460	59.4907	18.1614	613.1553	77.6521	120.5876	34.7166	155.3042	1,432.3438	412.3656	1,844.7093	613.1553	61.0969	16.5552	552.0584	77.6521	9	552.0584	62.7465	14.9056	489.3119	77.6521	127.1872	28.1170	155.3042	1,510.7345	333.9748	1,844.7093	489.3119	64.4407	13.2114	424.8712	77.6521	10	424.8712	66.1806	11.4715	358.6907	77.6521	134.1480	21.1562	155.3042	1,593.4155	251.2938	1,844.7093	358.6907	67.9674	9.6846	290.7232	77.6521	11	290.7232	69.8026	7.8495	220.9206	77.6521	141.4898	13.8144	155.3042	1,680.6215	164.0878	1,844.7093	220.9206	71.6872	5.9649	149.2334	77.6521	12	149.2334	73.6228	4.0293	75.6106	77.6521	149.2334	6.0708	155.3042	1,772.6003
2	1,275.5626	43.2119	34.4402	1,232.3507	77.6521	87.5905	67.7137	155.3042	1,040.4038	804.3055	1,844.7093																																																																																																																																																																																				
	1,232.3507	44.3786	33.2735	1,187.9720	77.6521							3	1,187.9720	45.5769	32.0752	1,142.3952	77.6521	92.3843	62.9199	155.3042	1,097.3441	747.3652	1,844.7093	1,142.3952	46.8074	30.8447	1,095.5878	77.6521	4	1,095.5878	48.0712	29.5809	1,047.5165	77.6521	97.4404	57.8638	155.3042	1,157.4006	687.3087	1,844.7093	1,047.5165	49.3691	28.2829	998.1474	77.6521	5	998.1474	50.7021	26.9500	947.4453	77.6521	102.7732	52.5310	155.3042	1,220.7440	623.9653	1,844.7093	947.4453	52.0711	25.5810	895.3742	77.6521	6	895.3742	53.4770	24.1751	841.8972	77.6521	108.3979	46.9063	155.3042	1,287.5541	557.1552	1,844.7093	841.8972	54.9209	22.7312	786.9763	77.6521	7	786.9763	56.4037	21.2484	730.5726	77.6521	114.3304	40.9738	155.3042	1,358.0207	486.6887	1,844.7093	730.5726	57.9266	19.7255	672.6460	77.6521	8	672.6460	59.4907	18.1614	613.1553	77.6521	120.5876	34.7166	155.3042	1,432.3438	412.3656	1,844.7093	613.1553	61.0969	16.5552	552.0584	77.6521	9	552.0584	62.7465	14.9056	489.3119	77.6521	127.1872	28.1170	155.3042	1,510.7345	333.9748	1,844.7093	489.3119	64.4407	13.2114	424.8712	77.6521	10	424.8712	66.1806	11.4715	358.6907	77.6521	134.1480	21.1562	155.3042	1,593.4155	251.2938	1,844.7093	358.6907	67.9674	9.6846	290.7232	77.6521	11	290.7232	69.8026	7.8495	220.9206	77.6521	141.4898	13.8144	155.3042	1,680.6215	164.0878	1,844.7093	220.9206	71.6872	5.9649	149.2334	77.6521	12	149.2334	73.6228	4.0293	75.6106	77.6521	149.2334	6.0708	155.3042	1,772.6003	72.1091	1,844.7093	75.6106	75.6106	2.0415	(0.0000)	77.6521										
3	1,187.9720	45.5769	32.0752	1,142.3952	77.6521	92.3843	62.9199	155.3042	1,097.3441	747.3652	1,844.7093																																																																																																																																																																																				
	1,142.3952	46.8074	30.8447	1,095.5878	77.6521							4	1,095.5878	48.0712	29.5809	1,047.5165	77.6521	97.4404	57.8638	155.3042	1,157.4006	687.3087	1,844.7093	1,047.5165	49.3691	28.2829	998.1474	77.6521	5	998.1474	50.7021	26.9500	947.4453	77.6521	102.7732	52.5310	155.3042	1,220.7440	623.9653	1,844.7093	947.4453	52.0711	25.5810	895.3742	77.6521	6	895.3742	53.4770	24.1751	841.8972	77.6521	108.3979	46.9063	155.3042	1,287.5541	557.1552	1,844.7093	841.8972	54.9209	22.7312	786.9763	77.6521	7	786.9763	56.4037	21.2484	730.5726	77.6521	114.3304	40.9738	155.3042	1,358.0207	486.6887	1,844.7093	730.5726	57.9266	19.7255	672.6460	77.6521	8	672.6460	59.4907	18.1614	613.1553	77.6521	120.5876	34.7166	155.3042	1,432.3438	412.3656	1,844.7093	613.1553	61.0969	16.5552	552.0584	77.6521	9	552.0584	62.7465	14.9056	489.3119	77.6521	127.1872	28.1170	155.3042	1,510.7345	333.9748	1,844.7093	489.3119	64.4407	13.2114	424.8712	77.6521	10	424.8712	66.1806	11.4715	358.6907	77.6521	134.1480	21.1562	155.3042	1,593.4155	251.2938	1,844.7093	358.6907	67.9674	9.6846	290.7232	77.6521	11	290.7232	69.8026	7.8495	220.9206	77.6521	141.4898	13.8144	155.3042	1,680.6215	164.0878	1,844.7093	220.9206	71.6872	5.9649	149.2334	77.6521	12	149.2334	73.6228	4.0293	75.6106	77.6521	149.2334	6.0708	155.3042	1,772.6003	72.1091	1,844.7093	75.6106	75.6106	2.0415	(0.0000)	77.6521																											
4	1,095.5878	48.0712	29.5809	1,047.5165	77.6521	97.4404	57.8638	155.3042	1,157.4006	687.3087	1,844.7093																																																																																																																																																																																				
	1,047.5165	49.3691	28.2829	998.1474	77.6521							5	998.1474	50.7021	26.9500	947.4453	77.6521	102.7732	52.5310	155.3042	1,220.7440	623.9653	1,844.7093	947.4453	52.0711	25.5810	895.3742	77.6521	6	895.3742	53.4770	24.1751	841.8972	77.6521	108.3979	46.9063	155.3042	1,287.5541	557.1552	1,844.7093	841.8972	54.9209	22.7312	786.9763	77.6521	7	786.9763	56.4037	21.2484	730.5726	77.6521	114.3304	40.9738	155.3042	1,358.0207	486.6887	1,844.7093	730.5726	57.9266	19.7255	672.6460	77.6521	8	672.6460	59.4907	18.1614	613.1553	77.6521	120.5876	34.7166	155.3042	1,432.3438	412.3656	1,844.7093	613.1553	61.0969	16.5552	552.0584	77.6521	9	552.0584	62.7465	14.9056	489.3119	77.6521	127.1872	28.1170	155.3042	1,510.7345	333.9748	1,844.7093	489.3119	64.4407	13.2114	424.8712	77.6521	10	424.8712	66.1806	11.4715	358.6907	77.6521	134.1480	21.1562	155.3042	1,593.4155	251.2938	1,844.7093	358.6907	67.9674	9.6846	290.7232	77.6521	11	290.7232	69.8026	7.8495	220.9206	77.6521	141.4898	13.8144	155.3042	1,680.6215	164.0878	1,844.7093	220.9206	71.6872	5.9649	149.2334	77.6521	12	149.2334	73.6228	4.0293	75.6106	77.6521	149.2334	6.0708	155.3042	1,772.6003	72.1091	1,844.7093	75.6106	75.6106	2.0415	(0.0000)	77.6521																																												
5	998.1474	50.7021	26.9500	947.4453	77.6521	102.7732	52.5310	155.3042	1,220.7440	623.9653	1,844.7093																																																																																																																																																																																				
	947.4453	52.0711	25.5810	895.3742	77.6521							6	895.3742	53.4770	24.1751	841.8972	77.6521	108.3979	46.9063	155.3042	1,287.5541	557.1552	1,844.7093	841.8972	54.9209	22.7312	786.9763	77.6521	7	786.9763	56.4037	21.2484	730.5726	77.6521	114.3304	40.9738	155.3042	1,358.0207	486.6887	1,844.7093	730.5726	57.9266	19.7255	672.6460	77.6521	8	672.6460	59.4907	18.1614	613.1553	77.6521	120.5876	34.7166	155.3042	1,432.3438	412.3656	1,844.7093	613.1553	61.0969	16.5552	552.0584	77.6521	9	552.0584	62.7465	14.9056	489.3119	77.6521	127.1872	28.1170	155.3042	1,510.7345	333.9748	1,844.7093	489.3119	64.4407	13.2114	424.8712	77.6521	10	424.8712	66.1806	11.4715	358.6907	77.6521	134.1480	21.1562	155.3042	1,593.4155	251.2938	1,844.7093	358.6907	67.9674	9.6846	290.7232	77.6521	11	290.7232	69.8026	7.8495	220.9206	77.6521	141.4898	13.8144	155.3042	1,680.6215	164.0878	1,844.7093	220.9206	71.6872	5.9649	149.2334	77.6521	12	149.2334	73.6228	4.0293	75.6106	77.6521	149.2334	6.0708	155.3042	1,772.6003	72.1091	1,844.7093	75.6106	75.6106	2.0415	(0.0000)	77.6521																																																													
6	895.3742	53.4770	24.1751	841.8972	77.6521	108.3979	46.9063	155.3042	1,287.5541	557.1552	1,844.7093																																																																																																																																																																																				
	841.8972	54.9209	22.7312	786.9763	77.6521							7	786.9763	56.4037	21.2484	730.5726	77.6521	114.3304	40.9738	155.3042	1,358.0207	486.6887	1,844.7093	730.5726	57.9266	19.7255	672.6460	77.6521	8	672.6460	59.4907	18.1614	613.1553	77.6521	120.5876	34.7166	155.3042	1,432.3438	412.3656	1,844.7093	613.1553	61.0969	16.5552	552.0584	77.6521	9	552.0584	62.7465	14.9056	489.3119	77.6521	127.1872	28.1170	155.3042	1,510.7345	333.9748	1,844.7093	489.3119	64.4407	13.2114	424.8712	77.6521	10	424.8712	66.1806	11.4715	358.6907	77.6521	134.1480	21.1562	155.3042	1,593.4155	251.2938	1,844.7093	358.6907	67.9674	9.6846	290.7232	77.6521	11	290.7232	69.8026	7.8495	220.9206	77.6521	141.4898	13.8144	155.3042	1,680.6215	164.0878	1,844.7093	220.9206	71.6872	5.9649	149.2334	77.6521	12	149.2334	73.6228	4.0293	75.6106	77.6521	149.2334	6.0708	155.3042	1,772.6003	72.1091	1,844.7093	75.6106	75.6106	2.0415	(0.0000)	77.6521																																																																														
7	786.9763	56.4037	21.2484	730.5726	77.6521	114.3304	40.9738	155.3042	1,358.0207	486.6887	1,844.7093																																																																																																																																																																																				
	730.5726	57.9266	19.7255	672.6460	77.6521							8	672.6460	59.4907	18.1614	613.1553	77.6521	120.5876	34.7166	155.3042	1,432.3438	412.3656	1,844.7093	613.1553	61.0969	16.5552	552.0584	77.6521	9	552.0584	62.7465	14.9056	489.3119	77.6521	127.1872	28.1170	155.3042	1,510.7345	333.9748	1,844.7093	489.3119	64.4407	13.2114	424.8712	77.6521	10	424.8712	66.1806	11.4715	358.6907	77.6521	134.1480	21.1562	155.3042	1,593.4155	251.2938	1,844.7093	358.6907	67.9674	9.6846	290.7232	77.6521	11	290.7232	69.8026	7.8495	220.9206	77.6521	141.4898	13.8144	155.3042	1,680.6215	164.0878	1,844.7093	220.9206	71.6872	5.9649	149.2334	77.6521	12	149.2334	73.6228	4.0293	75.6106	77.6521	149.2334	6.0708	155.3042	1,772.6003	72.1091	1,844.7093	75.6106	75.6106	2.0415	(0.0000)	77.6521																																																																																															
8	672.6460	59.4907	18.1614	613.1553	77.6521	120.5876	34.7166	155.3042	1,432.3438	412.3656	1,844.7093																																																																																																																																																																																				
	613.1553	61.0969	16.5552	552.0584	77.6521							9	552.0584	62.7465	14.9056	489.3119	77.6521	127.1872	28.1170	155.3042	1,510.7345	333.9748	1,844.7093	489.3119	64.4407	13.2114	424.8712	77.6521	10	424.8712	66.1806	11.4715	358.6907	77.6521	134.1480	21.1562	155.3042	1,593.4155	251.2938	1,844.7093	358.6907	67.9674	9.6846	290.7232	77.6521	11	290.7232	69.8026	7.8495	220.9206	77.6521	141.4898	13.8144	155.3042	1,680.6215	164.0878	1,844.7093	220.9206	71.6872	5.9649	149.2334	77.6521	12	149.2334	73.6228	4.0293	75.6106	77.6521	149.2334	6.0708	155.3042	1,772.6003	72.1091	1,844.7093	75.6106	75.6106	2.0415	(0.0000)	77.6521																																																																																																																
9	552.0584	62.7465	14.9056	489.3119	77.6521	127.1872	28.1170	155.3042	1,510.7345	333.9748	1,844.7093																																																																																																																																																																																				
	489.3119	64.4407	13.2114	424.8712	77.6521							10	424.8712	66.1806	11.4715	358.6907	77.6521	134.1480	21.1562	155.3042	1,593.4155	251.2938	1,844.7093	358.6907	67.9674	9.6846	290.7232	77.6521	11	290.7232	69.8026	7.8495	220.9206	77.6521	141.4898	13.8144	155.3042	1,680.6215	164.0878	1,844.7093	220.9206	71.6872	5.9649	149.2334	77.6521	12	149.2334	73.6228	4.0293	75.6106	77.6521	149.2334	6.0708	155.3042	1,772.6003	72.1091	1,844.7093	75.6106	75.6106	2.0415	(0.0000)	77.6521																																																																																																																																	
10	424.8712	66.1806	11.4715	358.6907	77.6521	134.1480	21.1562	155.3042	1,593.4155	251.2938	1,844.7093																																																																																																																																																																																				
	358.6907	67.9674	9.6846	290.7232	77.6521							11	290.7232	69.8026	7.8495	220.9206	77.6521	141.4898	13.8144	155.3042	1,680.6215	164.0878	1,844.7093	220.9206	71.6872	5.9649	149.2334	77.6521	12	149.2334	73.6228	4.0293	75.6106	77.6521	149.2334	6.0708	155.3042	1,772.6003	72.1091	1,844.7093	75.6106	75.6106	2.0415	(0.0000)	77.6521																																																																																																																																																		
11	290.7232	69.8026	7.8495	220.9206	77.6521	141.4898	13.8144	155.3042	1,680.6215	164.0878	1,844.7093																																																																																																																																																																																				
	220.9206	71.6872	5.9649	149.2334	77.6521							12	149.2334	73.6228	4.0293	75.6106	77.6521	149.2334	6.0708	155.3042	1,772.6003	72.1091	1,844.7093	75.6106	75.6106	2.0415	(0.0000)	77.6521																																																																																																																																																																			
12	149.2334	73.6228	4.0293	75.6106	77.6521	149.2334	6.0708	155.3042	1,772.6003	72.1091	1,844.7093																																																																																																																																																																																				
	75.6106	75.6106	2.0415	(0.0000)	77.6521																																																																																																																																																																																										

Reference LIBOR = 0.36% + Spread 4.50%

