KAROT POWER COMPANY (PVT) LTD

KPCL-011/038

Quickly by. 22 September2011

For n/a by.

AD(MR)+PA 23/9

To, The Registrar
National Electric Power Regulatory Authority
OPF Building, Shahrah-e-Jamhuriat
G-5/2, Islamabad

Subject: **Petition for Determination of Tariff for Karot Hydropower Project (720MW) Project**

Dear Sir,

I Mobashir A. Malik CEO, Karot Power Company (Private) Limited ("Company") having its head office at House # 25-B, Street # 38, F-8/1 Islamabad, being the authorized representative of the Company by virtue of the Company Resolution dated 14 July 2010 (copy attached), duly approved by the Board of the Company, hereby apply to National Electric Regulatory Authority ("NEPRA") for the determination of the Tariff.

I certify that the documents in support of the Tariff Petition are prepared and submitted in conformity with the provisions of Rule 3 of the NEPRA (Tariff Standard and Procedures) Rules, 1998 (the "Rules") for the application of the General Tariff determination and undertake to abide by the terms and provision of the rules. I further undertake and confirm that the information provided in the attached tariff petition is true and correct to the best of knowledge and belief.

It is further submitted that Tariff Petition for the subject Project was earlier submitted to NEPRA on 31st December 2011, which was processed as Case No. NEPRA/TRF-168/KPCL-2011. However, the Authority vide its Letter No. NEPRA/TRF-168/KPCL-2011/4990 dated 05 July 2011 instructed to submit a fresh tariff petition since the matter could not be decided within 4 months, due to fresh diligence by the Chinese investors. Also it was intimated that guidance of the Authority will be sought as to whether the fee earlier submitted by KPCL with that petition may be adjusted for this fresh petition of KPCL and KPCL will be informed accordingly.

Since there has been no intimation from NEPRA, the fresh petition is being submitted without any fee on the presumption that the Authority has very magnanimously allowed to adjust the earlier deposited fee by KPCL for this fresh petition.

Please acknowledge receipt.

With best regards,
For and on behalf of the Company

Mobashir A. Malik
CEO, KPCL

Registrar 5255 23-09-11

Original Received alongwith (03) Two Copies

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E-mail: kpc@kpc.com.pk - www.kpc.com.pk

TARIFF PETITION

KAROT HYDROPOWER PROJECT

KAROT POWER COMPANY (PVT) LIMITED

September 23, 2011

BEFORE
THE NATIONAL ELECTRIC POWER REGULATORY AUTHORITY (NEPRA)

TARIFF PETITION

ON BEHALF OF

KAROT POWER COMPANY (PRIVATE) LIMITED

FOR A POWER PROJECT OF 712.8 MW (NET CAPACITY)

AT

KAROT, DISTRICT RAWALPINDI, PUNJAB
(THE "PROJECT")

DATED: 23 September, 2011

KAROT POWER COMPANY (PRIVATE) LIMITED
HOUSE # 25-B, STREET 38,
F-8/1, ISLAMABAD

TABLE OF CONTENTS

1. DETAILS OF PETITIONER

Karot Power Company (Private) Limited,
HOUSE # 25-B, STREET 38,
F-8/1,ISLAMABAD
Email:kpc@kpc.com.pk
Company Registration No:0072904

i)	Mr. Sheng Zhendong (Deputy General Manager) representing M/s. China Three Gorges International Corporation	Main Sponsor
ii)	Mr. Mobashir A.Malik	Chief Executive Officer of Associated Technologies (Pvt.) Ltd.
iii)	Mr. Naeem Bari Salimi	Senior Manager of Associated Technologies (Pvt.) Ltd.
iv)	Mr. Muhammad Imran Ashraf	Manager Corporate Finance of Associated Technologies (Pvt.) Ltd.
v)	Orr, Dignam& Co.	Legal Advisor
vi)	Bridge Factor	Financial Advisor

2. GROUNDS FOR TARIFF PETITION

This Petition is made under the Regulation of Generation, Transmission and Distribution of Electric Power Act (XL of) 1997 (the "NEPRA Act"), to the National Electric Power Regulatory Authority ("NEPRA") and the Tariff Standards and Procedure Rules, 1998 (the "NEPRA Rules") made under the NEPRA Act; and other applicable laws.

In order to cater to the unique nature of hydropower plants, wherein cost uncertainty due to a long gestation period is neither in the control of the Petitioner nor the Power Purchaser, NEPRA has developed a Mechanism for Determination of Tariff for Hydropower Projects (the "Mechanism"). The Mechanism provides for determination of tariff and subsequent adjustments at different stages of development of hydropower projects. In this respect three distinct stages have been identified in the Mechanism:

i) Feasibility stage;

ii) EPC stage; and

iii) Final cost stage (which is to be no later than Commercial Operation Date ("COD")).

This Petition is intended to provide a basis for NEPRA to render a tariff determination, which is applicable to the Feasibility stage. Subsequent tariff determinations will be made in accordance with the Mechanism at a future date.

Pursuant to an application and statement of qualification submitted to Private Power and Infrastructure Board (the "PPIB") the Consortium of CWE-ATL-Malik in which CWE is the Main Sponsor on August 30, 2006, PPIB through its letter # 1(101) PPIB/2021-03/07/PRJ dated May 14, 2007 granted Associated Technologies (Pvt.) Ltd., lead applicant of the Consortium at the time (the "Sponsor"), a Letter of Interest (the "LOI").

As per the terms of the LOI, a feasibility study was required to be submitted for the development of the Project (the "Feasibility Study"). The Feasibility Study contains a detailed analysis of the technical and financial aspects of the Project which was thoroughly reviewed and unconditionally approved by the Panel of Experts / PPIB through its letter # 01/(101) PPIB/2021-03/09/PRJ dated October 13, 2009. In view of

such unconditional approval it is respectfully submitted that NEPRA base its tariff determination on the conclusions set out in the Feasibility Study.

Pursuant to the relevant provisions of the NEPRA Act, read with the provisions of the Rules and Regulations made thereunder and in accordance with the Policy for Power Generation Projects, 2002 (the "Policy"), Karot Power Company (Private) Limited (the "Project Company") submits herewith before NEPRA, for its approval, this tariff petition (the "Tariff Petition") for approval of (i) the reference generation tariff (the "Reference Generation Tariff"); (ii) the energy production estimate; (iii) the Indexations, Adjustments and Escalations; (iv) Tariff Reopeners; and (vi) other matters set out in this Tariff Petition, in each case, for the Company's power generation Project to be located at Karot, District Rawalpindi, Punjab.

NEPRA is kindly requested to process the Tariff Petition at the earliest, thereby enabling the Company to proceed further with the development process.

3. EXECUTIVE SUMMARY

Based on the assumptions contained in this Tariff Petition, please find below a summary of the project ("Project"):

<table>
<tr><td>Project Company</td><td>Karot Power Company (Private) Limited</td></tr>
<tr><td>Installed Capacity</td><td>720 MW</td></tr>
<tr><td>Project Capacity</td><td>712.8 MW</td></tr>
<tr><td>Project Location</td><td>Karot, District Rawalpindi, Province of Punjab, Pakistan</td></tr>
<tr><td>Concession Period</td><td>50 years from COD</td></tr>
<tr><td>Power Purchaser</td><td>National Transmission and Despatch Company Limited (through Central Power Purchasing Agency)</td></tr>
<tr><td>Turbines</td><td>Four Francis turbines (vertical) of 183 MW each</td></tr>
<tr><td>Energy Production Estimate</td><td>3,401 GWh (Net)</td></tr>
<tr><td>Estimated Project Capital Cost</td><td>(US$ in Million)
<table><tr><td></td><td>Amount</td></tr><tr><td>Civil Works</td><td>424.50</td></tr><tr><td>Land and Resettlement / Environment</td><td>12.50</td></tr><tr><td>Hydro Mechanical Equipment</td><td>204.65</td></tr><tr><td>Electrical Equipment</td><td>173.73</td></tr><tr><td>Contingencies</td><td>104.13</td></tr><tr><td>Engineering & Supervision</td><td>89.17</td></tr><tr><td>Project Development Cost</td><td>89.17</td></tr><tr><td>Duties & Taxes</td><td>19.78</td></tr><tr><td>Insurance During Construction</td><td>21.80</td></tr><tr><td>Legal Fees and Charges</td><td>10.90</td></tr><tr><td>Financing Charges</td><td>62.17</td></tr><tr><td>Interest During Construction</td><td>143.51</td></tr><tr><td>Sinosure Fee</td><td>68.37</td></tr><tr><td>Total Project Cost (CAPEX)</td><td>1,424.38</td></tr></table></td></tr>
<tr><td>Funding Plan</td><td>Debt 80% : Equity 20%</td></tr>
<tr><td>Equity</td><td>US$ 284.87 million</td></tr>
<tr><td>Long Term Debt</td><td>US$ 1,139.50 million</td></tr>
<tr><td>Lenders</td><td>A syndicate of international development financial institutions and local and international banks and financial institutions (including Chinese banks / financial institutions)</td></tr>
</table>

<table>
<tr><td>Terms of Long Term Debt</td><td>
<table>
<tr><td>Currency(expected)</td><td>Mix of foreign currency and Pakistan Rupees</td></tr>
<tr><td>Term</td><td>Upto 16 years (door to door)</td></tr>
<tr><td>Grace Period</td><td>Upto 48 months</td></tr>
<tr><td>Repayment Period</td><td>12 years</td></tr>
<tr><td>Debt Repayment</td><td>In equal semi-annual installments</td></tr>
<tr><td>Interest Rate</td><td>- 6 months KIBOR plus 300 bps
- 6 month LIBOR plus 475 bps</td></tr>
</table>
</td></tr>
<tr><td>Project Operation Cost</td><td>
(US$ in Million)
<table>
<tr><td>(average)</td><td>Year 1 –12</td><td>Year 13 – 50</td></tr>
<tr><td>O&M Cost</td><td>23.00</td><td>23.00</td></tr>
<tr><td>Water Use Charges</td><td>6.38</td><td>6.38</td></tr>
<tr><td>Insurance Cost</td><td>16.96</td><td>16.96</td></tr>
<tr><td>Interest on WC Facility</td><td>5.10</td><td>3.43</td></tr>
<tr><td>Financial Charges</td><td>0.48</td><td>0.00</td></tr>
<tr><td>Sinosure Fee</td><td>10.60</td><td>3.42</td></tr>
<tr><td>Total Operating Cost</td><td>62.52</td><td>53.19</td></tr>
</table>
</td></tr>
<tr><td>Levelized Tariff</td><td>US¢ 7.50per kWh (PKR 6.00 per kWh)</td></tr>
<tr><td>Concession Documents</td><td>• Power Purchase Agreement with the Power Purchaser
• Water Usage Agreement with Government of Punjab
• Implementation Agreement with the President of Pakistan through PPIB
• Government of Pakistan Guarantee</td></tr>
<tr><td>Applicable GOP Policy</td><td>• Policy for Power Generation Projects, 2002</td></tr>
<tr><td>Technical Advisors</td><td>• SMEC International (Pty) Ltd.</td></tr>
<tr><td>Financial Advisors</td><td>• Bridge Factor</td></tr>
<tr><td>Legal Counsel</td><td>• Orr, Dignam& Co.</td></tr>
<tr><td>Current Status of the Project - Major Tasks Completed</td><td>
✓ Feasibility Study
✓ Hydrological Study
✓ Topographical Study
✓ Sedimentation Study
✓ Geological Study
✓ Geotechnical Study
✓ Neotectonic Analysis
✓ Seismic Hazard Analysis
✓ Dam Design
✓ Electrical Equipment Study
✓ Power Transmission Study
✓ Transportation Study
✓ Project Capacity Study
✓ Project Layout Study
✓ Project Structure Layout
</td></tr>
</table>

4. THE PROJECT

Pakistan currently has 20.306 GW of installed capacity for electricity generation. Conventional thermal plants using oil, natural gas, and coal account for about 65.84% of Pakistan's capacity, with hydroelectricity making up 31.88% and nuclear 2.27%.

In 2008, Pakistan generated 97,451 Giga Watt Hours (GWh) (gross) of electricity while consumption was 72,586 GWh. Pakistan's total power generating capacity has increased rapidly in recent years, due largely to foreign investment. However, much of Pakistan's rural areas do not have access to electric power and about half the population is not connected to the national grid. Rotating blackouts (load shedding) have also become a part of life. In addition, transmission and distribution losses are about 25%, due to poor quality infrastructure and a significant amount of power theft.

Fiscal Year Ending on 30th June 2008		**2006**	**2007**	**2008**	**2009**	**2006**	**2007**	**2008**
		Installed Capacity (MW)				Gross Electricity Generated (GWh)		
Thermal	GENCOs	4,834	4,834	4,899	4,899	22,519	21,617	20,508
	IPPs	6,005	6,155	6,391	6,561	27,933	33,804	36,517
	KESC	1,756	1,756	1,756	1,910	9,130	7,530	8,663
	Total Thermal	*12,595*	*12,745*	*13,046*	13,370	*59,601*	*62,951*	*65,688*
Hydel	WAPDA	6,463	6,444	6,444	6,444	30,751	31,846	28,536
	IPP	30	30	30	30	104	96	131
	Total Hydel	*6,493*	*6,474*	*6,474*	6,474	*30,855*	*31,942*	*28,667*
Nuclear	KANUPP	137	137	137	137	117	161	377
	CHASNUPP	325	325	325	325	2,170	1,944	2,455
	Total Nuclear	*462*	*462*	*462*	462	*2,287*	*2,105*	*2,832*
Total Generated		**19,550**	**19,681**	**19,982**	**20,306**	**92,743**	**96,998**	**97,187**
Import of Electricity (GWh)		-	-			*149*	*176*	*264*
Total Electricity (Generated + Imported)		-	-			**92,892**	**97,174**	**97,451**

Sufficient power supply is a key to achieving sustainable economic growth. Presently, local demand for power exceeds supply by 3,000 MW (approx.) thereby adversely affecting the economic growth of the country. The electricity demand-supply gap,

[1] Source: NEPRA – Annual Report 2008-2009

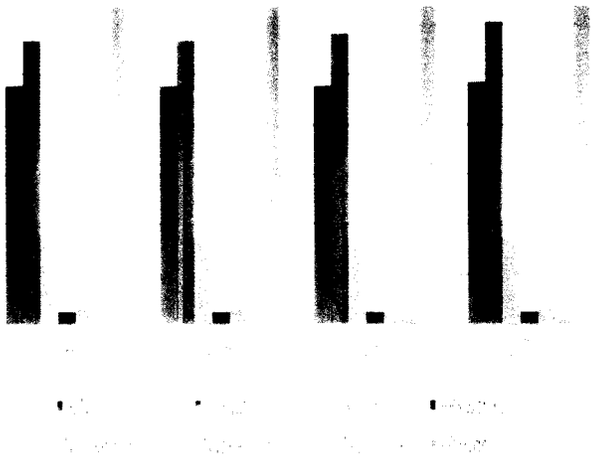
coupled with consistent growth in demand for electricity clearly indicates the fundamental need for enhancing the country's current power generation capability.

Source: [illegible]

Going forward, the demand for electricity is projected to grow by 7.6% per annum (on average as projected by NTDC).

Projected Figures	Planned Generation Capability MW	NTDC Projected Demand Growth Rate %	NTDC Projected Demand MW	Surplus/ (Deficit) MW
2011	17,367	7.86	20,873	(3,506)
2012	18,913	7.60	22,459	(3,546)
2013	21,299	7.42	24,126	(2,827)
2014	21,668	7.43	25,918	(4,250)

Pakistan faces chronic electricity shortages due to rapid growth in demand for electricity, and high system losses. Rotating power outages are common and duration of such outages has increased significantly due to the widening gap between supply and demand. Supply of electricity as compared to demand has been stagnant for

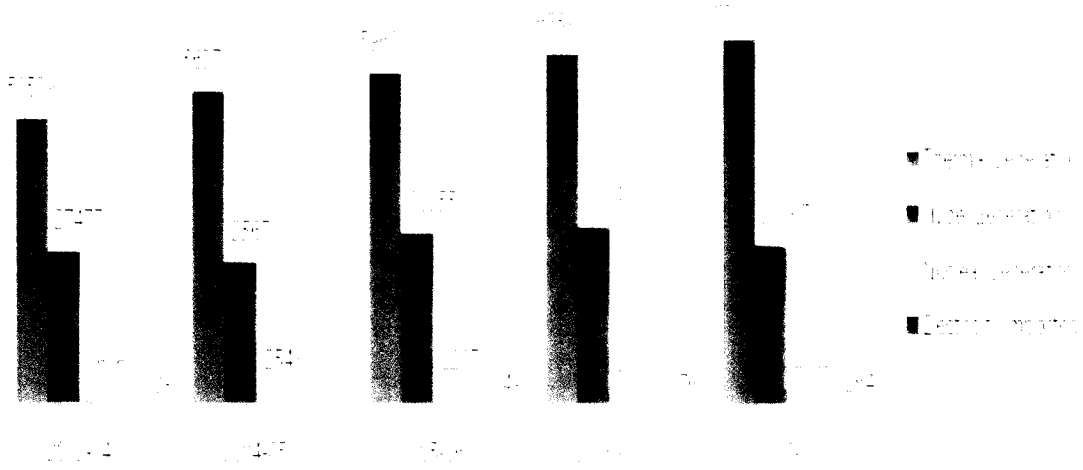


[2] Source: ADB Report on Rental Power Projects
[3] Source: NEPRA – State of Industry Report, 2009

the last decade or so since the addition of capacity through IPPs and later induction of some hydro power stations such as Ghazi Barotha. The total installed generation capacity from all government and private sources stood at 20,306 MW in fiscal years 2008-2009, as compared to 19,982 MW in 2007-2008.

Bulk of Pakistan's power generation is based on thermal resources using mainly furnace oil and natural gas as fuels; coal is almost non-existent. Total installed capacity of thermal power plants in the county as of June 30, 2009 was 13,370 MW. As per NEPRA Annual Report (2008-2009), around 67.58% of the power generated during 2007-2008 was from thermal sources; further break-up shows that natural gas contributes 36.05%, oil 31.39% and coal 0.14% towards the total electricity generated through thermal.

Pakistan has a potential of around 40,000MW of hydro power, whereas the installed hydel capacity of Pakistan as of 30th June 2009 stood at 6,474MW. The share of existing hydel power installed capacity to the total installed capacity of the country is 31.88% while this share in year 1985 was around 67%. Most of the installed hydel capacity of the country is owned by the public sector while only 30MW installed capacity is in the private sector.



The first nuclear power plant (KANUPP) of 137 MW was commissioned in 1972 at Karachi, while the second nuclear power plant (CHASNUPP-I) of 325 MW was commissioned in 2000 at Chashma. The total installed capacity of nuclear power plants, as on June 30th, 2009 was 462 MW representing a meager 2.27% of the total installed capacity.

[4] Source: NEPRA – State of Industry Report, 2009

With unstable prices and scarce supply of oil and gas across the globe, relying only on conventional thermal sources for generating electricity is becoming increasingly expensive and is almost beyond the reach of developing nations with dire consequences on the economy of the country.

The solution is to generate energy through renewable sources such as water, wind and sunlight. Of the three sources listed, hydropower is the most economical resource available in abundance in Pakistan. Furthermore, like other renewable energy sources, hydroelectric plants are immune to price increases associated with fossil fuels such as oil, natural gas and coal.

Other key advantages of electricity generation through utilization of hydropower are provided below:

- Hydroelectric plants tend to have longer lives as compared to their fuel-fired counterparts, with some plants now in service having been built 50 to 100 years ago;

- Due to the long plant life, hydropower plants are the most economical renewable energy source available;

- Hydropower generating units can start and stop quickly; this allows them to follow system loads efficiently. They can reshape water flows (through storage systems) to more closely match daily and seasonal system energy demands;

- Hydroelectric plants with reliable hydrological histories are despatchable and can be considered firm capacity. Consequently, in normal water years hydroelectric plants designed for a firm load will have a useful amount of surplus energy that may be exportable if transmission is available;

- Hydro power plants convert about 90 percent of the energy in falling water into electrical energy. This is much more efficient than fossil-fueled power plants, which lose more than half of the energy content of their fuel as waste heat and gases;

- Labour cost tends to be low since plants are generally heavily automated and have few personnel on site during normal operation;

- Hydropower plants provide a means for flood prevention and can act as a means of storage during drought.

Pakistan is endowed with a hydel potential of approximately 41,722 MW, most of which lies in Khyber Pakhtunkhwa province, Northern Areas, Azad Jammu and Kashmir and Punjab. However, an abundant hydel potential is still waiting to be harnessed.

The total installed capacity of the hydropower stations in the country is about 6,474 MW, out of which 3,698 MW is in NWFP, 1,667 MW in Punjab, 1,017 MW in AJK and 92 MW in the Northern Areas.

Based on location, hydel potential in the country can be divided into six sectorial regions namely:

- Khyber Pakhtunkhwa;
- Punjab;
- Azad Jammu & Kashmir;
- Northern Areas;
- Sindh; and
- Balochistan.

The Government of Pakistan (GOP) has clearly articulated its support for the development of renewable energy sector for power generation. Since, hydropower is the most economical and efficient source for energy production, the GOP has directed its focus on supporting development of hydropower plants by independent power producers.

In 1975, under a grant from the Canadian International Development Agency (CIDA), WAPDA started a project to prepare a ranking study of a number of cost effective hydropower projects on Jhelum and other rivers of Indus Basin with a view to meeting the long-term power needs of Pakistan. An integrated interdisciplinary team including specialists provided by Canadian Consultant (MONENCO) and WAPDA conducted the study. This study was completed in 1983 and a report citing the conclusions of the study was prepared by MONENCO and WAPDA.

In 1994, German Agency for Technical Co-operation (GTZ), HEPO, and WAPDA conducted studies of medium size schemes on the Jhelum River catchment basin. GTZ / WAPDA prepared and submitted a report in December 1994, titled "Comprehensive Planning of Hydropower Resources in Jhelum River Basin". In this report, a 240 MW run-of-river scheme, just downstream of Karot Bridge, was proposed.

After the restructuring of power sector in Pakistan, the Project was later taken over by PPIB and offered to private sector investors. The Sponsor was awarded the LOI by PPIB, after an international competitive selection process in March, 2007.

An international competitive bidding (ICB) process was undertaken for selection of consultants for carrying out the feasibility study for the Project. Upon completion of the ICB process, a consortium of consultants was appointed on August 21, 2007 for carrying out the feasibility study. The consortium of consultants (Consultants) comprised of:

- M/s. SMEC International (Pty) Ltd., Australia.
- M/s. Mirza Associates Engineering Services (Pvt) Ltd., Pakistan.
- M/s. Engineering General Consultants (Pvt) Ltd., Pakistan.

The Consultants commenced work keeping the two reports (one by MONENCO, Canada and the other by GTZ, Germany) done earlier as their base. MONENCO assumed a net head of 51 meters giving a rated capacity of 93 MW for an estimated discharge of 215 m^3 at a plant factor of 90%. This included construction of a 70 meter high concrete dam, downstream of the Karot Bridge, with the Project components located at the left bank.

The present detailed geological studies have revealed poor geology and unsuitable topography for the MONENCO proposed site. It was therefore, discarded as a workable option. GTZ in 1994, maintained the Project location proposed by MONENCO. The design discharge was increased to 550 m^3 with a reduced power factor of 76.7%. This changed the installed capacity to 240 MW with a net head of 51 meters.

The Consultants conducted a number of studies and analyzed all the Project components viz dam, spillway, coffer dams, diversion tunnels, intake pressure tunnels, tailrace tunnels/channels and powerhouse including their sitings.

The reservoir conservation level of 450 meters above sea level (m.a.s.l) was fixed initially, but due to cascading issues, and the results of the cascading study of the Jhelum River carried out by PPIB the Project reservoir level had to be raised to 461 m.a.s.l.

The Consultants have based their feasibility study on a reservoir conservation level of 461 m.a.s.l as recommended by PPIB with a design discharge of 1200 m^3/s increasing the estimated Project capacity from 240 MW to 712.8 MW. It is also expected that the Project shall increase the life of Mangla Dam by up to 25%.

The Consultants, from time to time, submitted reports and gave presentations on core activities of the Feasibility Study to the Panel of Experts (POE). The POE's valuable observations and comments on the technical and financial aspects of the Project were duly acknowledged, evaluated and incorporated into the final version of the Feasibility Study. It is, therefore, respectfully submitted that the Feasibility Study should form the basis of the proposed tariff determination under this Petition and that the findings and

conclusions set out in the Feasibility Study should be incorporated in the said tariff determination.

The Feasibility Study was completed and a presentation was given to the POE by the Consultants, and after incorporation of the comments received by the POE, the final Feasibility Study was submitted to PPIB.

- Design discharge — 1200 m^3/s
- Reservoir conservation Level — 461 m.a.s.l
- Max. Gross head — 79 m
- Dam height — 91 m, above foundation
- Dam type — Concrete gravity dam
- Design flood — 28,500 m^3/s
- Installed capacity (gross) — 720 MW
- Mean annual energy (gross) — 3,436 GWh
- Plant factor — 54.48%
- Auxiliary Consumption — 1 %
- Operating capacity (net) — 712.8 MW
- Mean annual energy (net) — 3,401 GWh

Spillway

- Spillway type — Overflow with radial gates
- No of gates — 8 Nos
- Gate size — 7 x 15 m
- Spillway discharging capacity — 28,500 m^3/s

Low level Sluicing Gates

- No of Gates — 6
- Gates type — Radial
- Gate size — 6.2m x 11 m each

Diversion Tunnels

- No of tunnels — 2
- Tunnel dia — 10 m
- Tunnel length — 450 m

Head Race Power Tunnels

- No of tunnels — 4
- Tunnel diameter — 10.0 m

- Tunnel length 160 m
- No of pressure shaft 4
- Diameter 7.4 m

Tail Race Tunnels

- Dia 10 m
- Length 470 m

Powerhouse

- Powerhouse type Cavern/underground
- Switchyard Open outdoor

Turbines

- No of units 4
- Type of turbines Francis
- Capacity (ISO) 183 MW, each unit

Electrical Works

- Transmission line capacity 500 KV
- Generator 4 (Turbo Units)
- Generator capacity 180 MW/200 MVA
- Generation voltage 18 KV

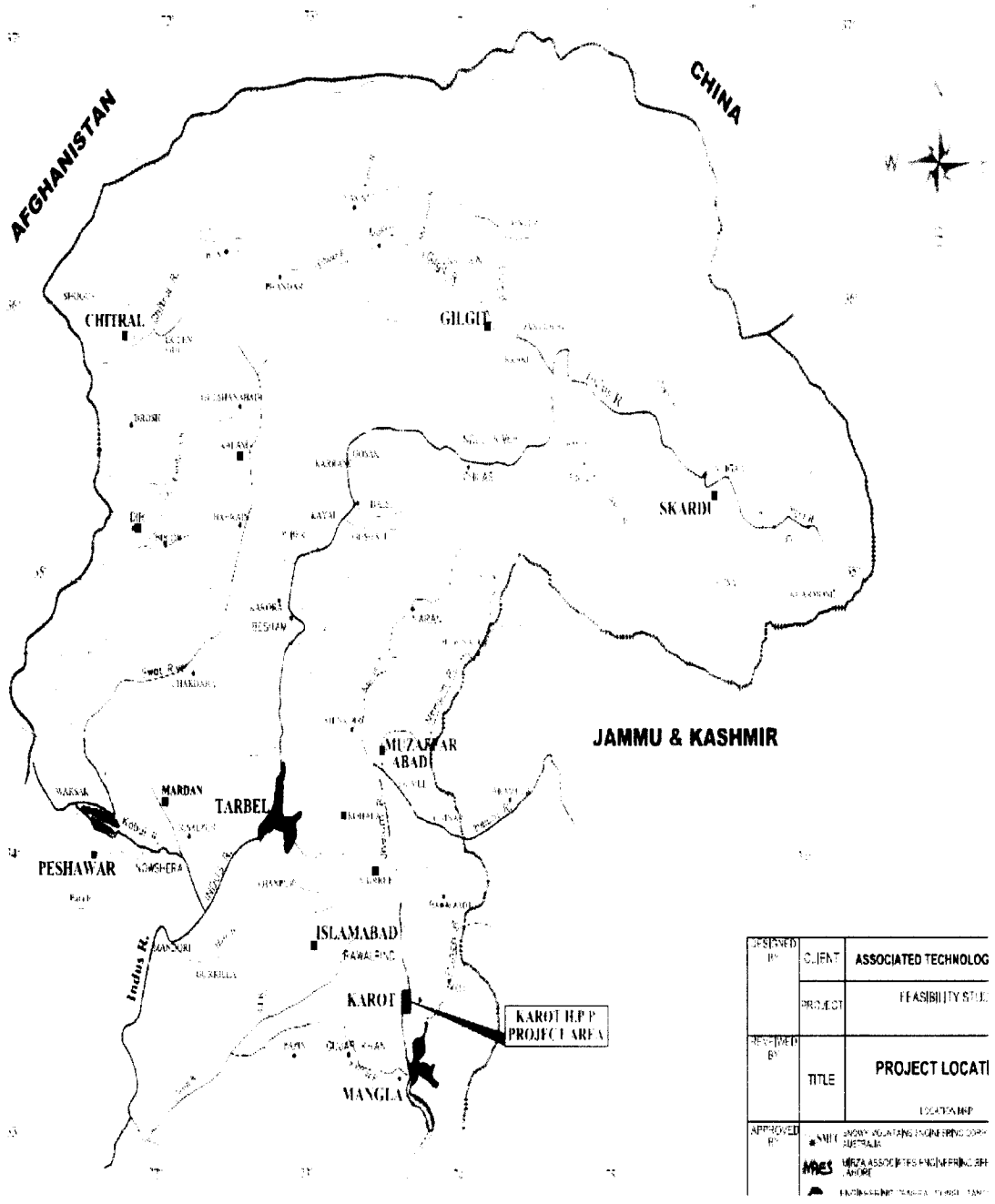
The above Project specifications and features are subject to change based on optimization.

The proposed site for the Project is located on the Jhelum River near Karot Village, some 74 kilometers upstream of Mangla. The Project site is accessible from Islamabad - Kahuta - Kotli Road. The Project area is hilly with maximum altitude of 530 m.a.s.l. Karot is a sparsely populated small village with negligible agricultural land in the Project area. The existing black topped road passes close to the Project site. The road also crosses over the powerhouse site and tunnels alignment. There is a sufficient cover available for underground powerhouse and tunnels. New approach roads will, however, be built for the construction activities.

Site Geology

To firm up the location of the Project components, detailed surface and sub-surface geological and geotechnical investigations have been carried out. Some 1,822 meters of on-shore and off-shore drilling has been done along with test pits and detailed surface

geological mapping. The geotechnical investigations have revealed layers of good sand-stone and silt-stone which can be covered with concrete for further strength. The geology at the new dam axis proposed by the Consultants is also far superior to the old axis, recommended in the previous studies by other consultants. On the basis of surface geological mapping, discontinuities have also been marked.



Geotechnical assessment has been made mainly on the basis of laboratory tests carried out on core samples obtained by drilling through sandstones, siltstones and clay stones

and visual observation of rock units, insitu, at the Project site. Strength and other parameters proposed to be adopted for the design are as under:

- Shear Parameter
  - Sandstone - C' = 16 MPa
  - Sandstone - $\varphi = 30^{o}$

- Unconfined Compressive Strength
  - Sandstone - 13 MPa
  - Siltstone and Clay stone - 15 MPa

- Tensile Strength
  - Sandstone - 6 MPa
  - Siltstone and Claystone - 5 MPa

- Uniaxial Compressive Strength
  - Sandstone - 15 MPa
  - Siltstone and Claystone - 16 Mpa

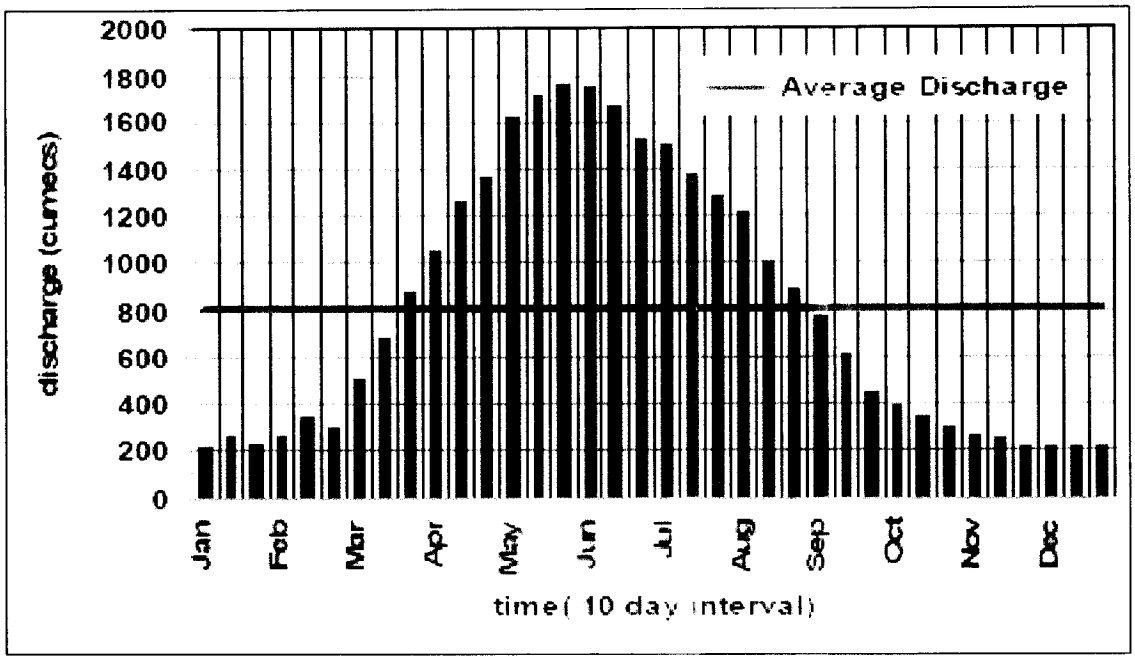
- Young's Modulus
  - Sandstone = $2x10^{3}$ MPa
  - Siltstone and Claystone = 2x104 Mpa

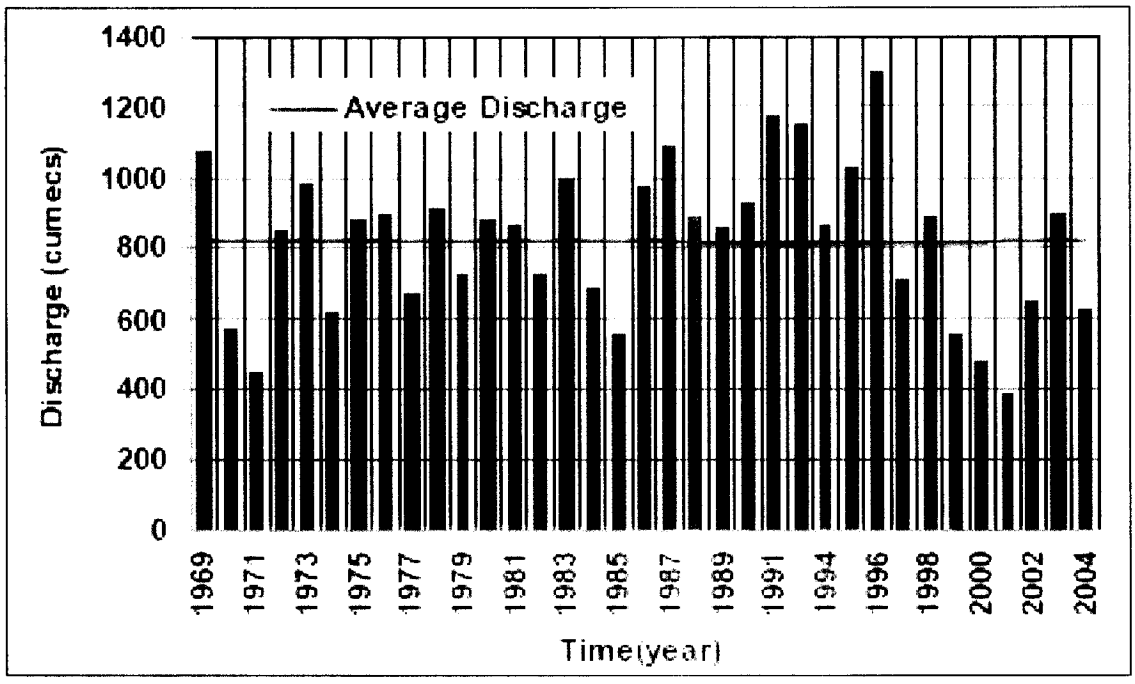
- Poisson's Ratio
  - Sandstone = 0.098
  - Siltstone and Claystone = 0.15

Detailed neo-tectonic and seismic hazard analyses have been carried out, keeping in view the 2005 earthquake. Muzafarabad and Bagh areas are in a radius of 100 kilometers from the dam as centre. The studies have revealed that there is no fault in close proximity, which can adversely impact the Project, and, therefore the site is safe from a seismic and neotectonic point of view.

For carrying out the hydrological study of the Project, large datasets were collected from various sources. Climatological and hydrological data was obtained from (i) Surface Water Hydrology Project (SWHP) of WAPDA, (ii) Pakistan Meteorological Department (PMD), and (iii) different gauging stations. The gauging stations included Domel, Balakot, Naran, Rawla kot, Bagh, Palandri, Dhudnial, Balakot, Garhi Dupatta, Muzaffarabad, Murree, Risalpur and Mangla.

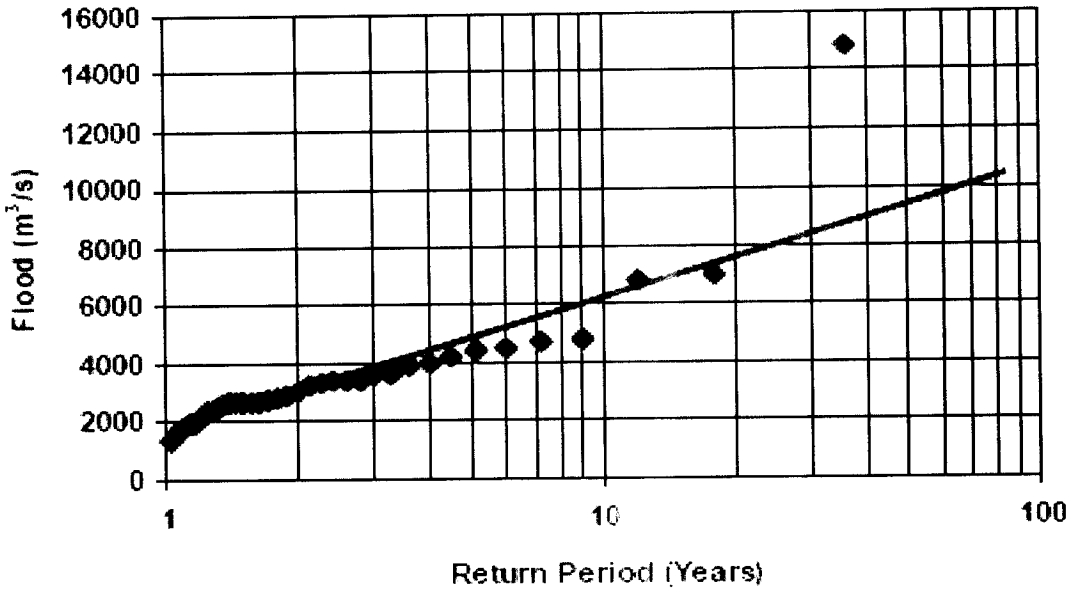
The flow study for the Project includes flow data approach to generate average daily, 10-days, monthly, annual flows, and flow duration and flow mass curves. The figure below (left) depicts the ten (10) daily average flow for the period from 1969 to 2004 (36 years) and the figure below (right) shows the average annual flows at the Project site.





For flood frequency analysis at the Project site, the generated instantaneous flood peak data of Karot gauging station was used with observed frequency by Weibull. The highest instantaneous peak occurred in 1992. From the statistical analysis it was found that this flood caused a higher outlier in the data and hence it was truncated by trial and error

procedure until outlier free dataset was achieved. The flood frequency curve so developed is provided below:



To carry out detailed sediment analyses of the watershed area, data of 14 sediment gauging stations was collected and used. However, to estimate the suspended sediment yield and total sediment inflows to the reservoir, calculations are mainly based on two sediment-gauging stations, i.e. Azad Pattan and Karot. The Jhelum River and its tributaries produce a large amount of sediment, most of which is produced under natural conditions and seismic activities.

Because of the obvious need of sediment removal, a simple flushing technique is proposed to be used whereby the flow velocities in a reservoir are increased to such an extent that deposited sediments are remobilized and transported through the outlets in the dam. Two approaches for flushing will be applied, viz, complete drawdown flushing and partial drawdown flushing. Flushing with partial drawdown is more technically feasible to be implemented for this Project to clear the live storage space and flush the sediments in a more favorable position. A look on flushing practice in the world reveals that the discharges for flushing should be of the order of double of mean annual flow. Hence, recommended minimum flushing discharge will be about 1,640 m³/s. The flow distribution during the average year show that the suitable time for flushing will be somewhere in May, when the flows are the highest.

It is pertinent to mention that hydrology forms the basis of the feasibility of a hydropower project; data given in the feasibility studies is reasonable but preliminary. Considering the significance of hydrology for the Project, this information will be reconfirmed as reconfirmation of hydrological data is in the best interest of the Project Company and the Power Purchaser. It is anticipated that prior to the achievement of financial close reconfirmation of hydrology of the Project will be completed. In case there is substantial

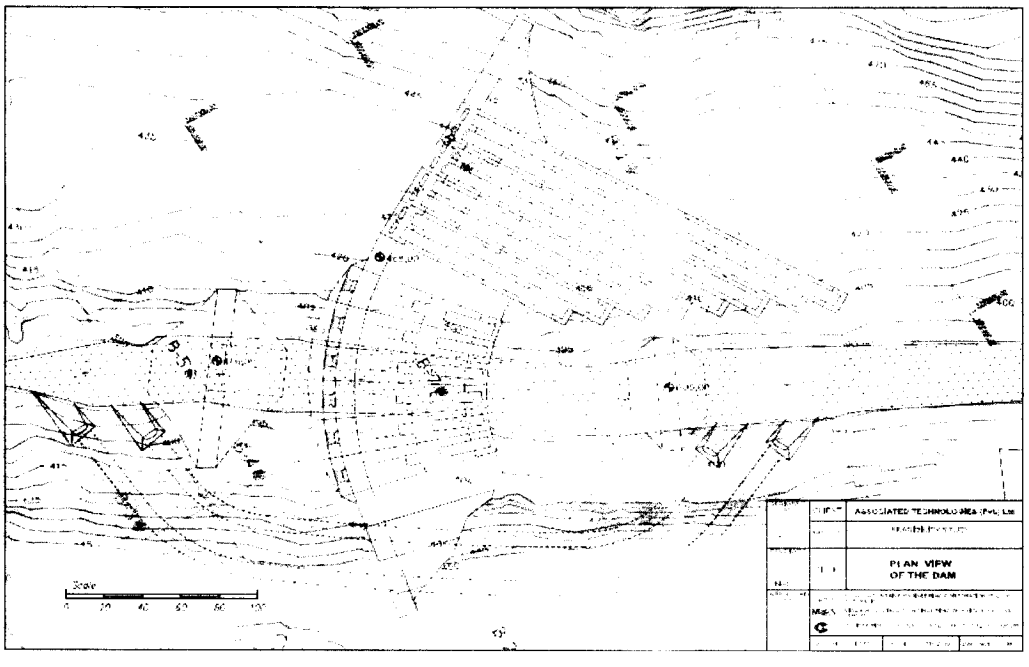
variation in the hydrology, the Project Company shall approach NEPRA for rectification / amendment of the tariff.

The data beyond 2004 has been collected and is being compiled, whereas the latest data is being collected through the metering station established by the Project Company at the site along with obtaining the latest data from the existing station manned by WAPDA and its related Project, near the site of Karot Hydropower Project. This data will be analyzed and applied for a realistic optimization during the detailed design stage.

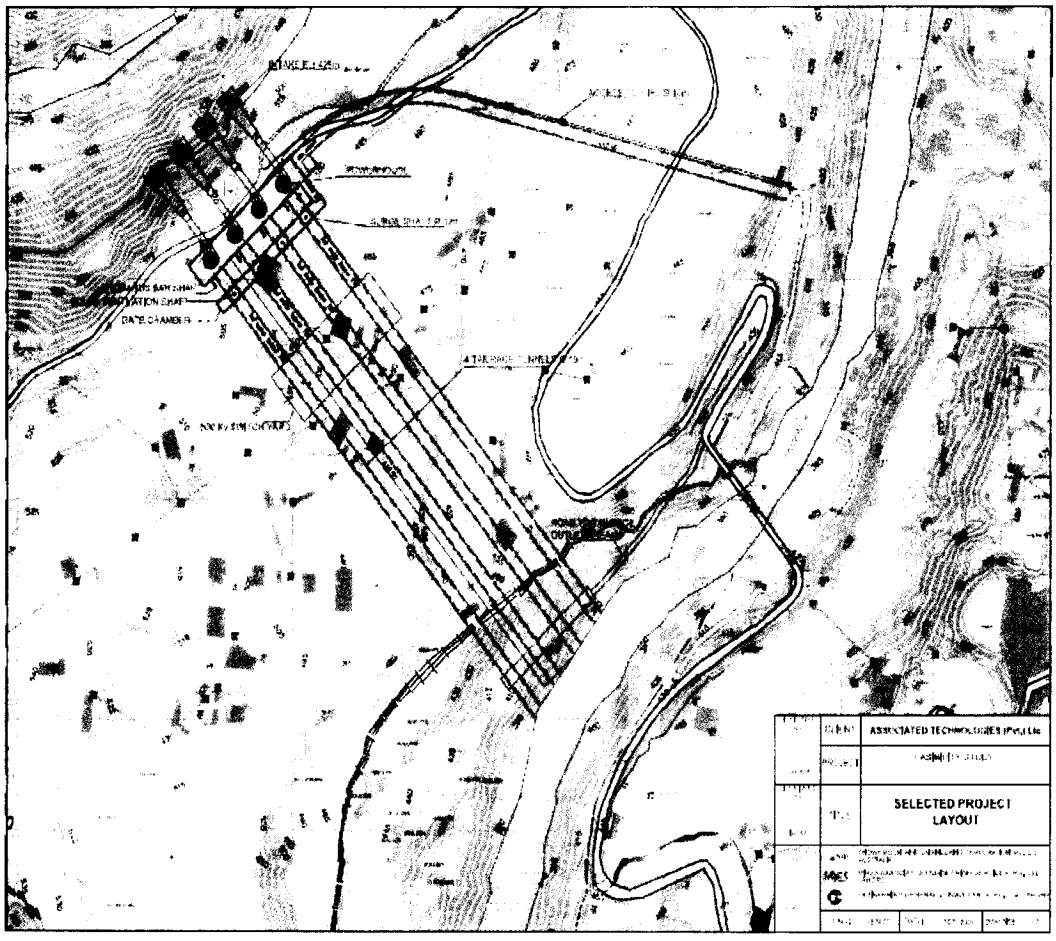
The Project reservoir will be spread over 27.0 kilometers along the Jhelum River Valley, upstream of the dam axis. The Jhelum River over the entire length of the reservoir has a narrow valley with steep side slopes. The average river gradient in the reservoir area is 3.0 meters per kilometer. The valley width at the reservoir conservation level of 461 m.a.s.l varies from 50 to 300 meters. The reservoir volume is about 0.0165% of the total annual inflow volume and it will be used to trap sediments and divert silt free flows to the power /headrace tunnels and turbines.

To generate power during peak hours of low flow months, Jhelum River inflows will be stored in top 3 meters of reservoir and 16.3 million m^3 would be available for 4 hour peaking. The daily reservoir regulation, up to 3 meters spread over, from October to May would require detailed study about rim stability of the reservoir. As no morainic deposits exist in the reservoir area, reservoir will, therefore, act as a stable structure.

The dam will be located about 1.7 kilometers upstream of Karot Bridge on the Jhelum River with its axis oriented at about 135° to the north. The powerhouse is planned to be located about 600 meters downstream of the Karot Bridge.



The intake for power/ headrace tunnels has been located on the right bank of Jhelum River about 225 meters upstream of the dam. The intake structure has been sized for the design discharge of 1,200 m^3/s.



An underground powerhouse has been selected and proposed for 4 vertical Francis units. Powerhouse has been oriented with longitudinal axis north 30° east. Powerhouse cavern would be 25 m wide and 135 m long excluding the service bay area.

Based on the outcome of the hydropower planning studies, the turbine parameters,listed below, have been selected for the layout of the power station and costing of themechanical equipment.

- Number of turbines: 4
- Rated output: 183 MW (ISO)
- Rated head: 67 m

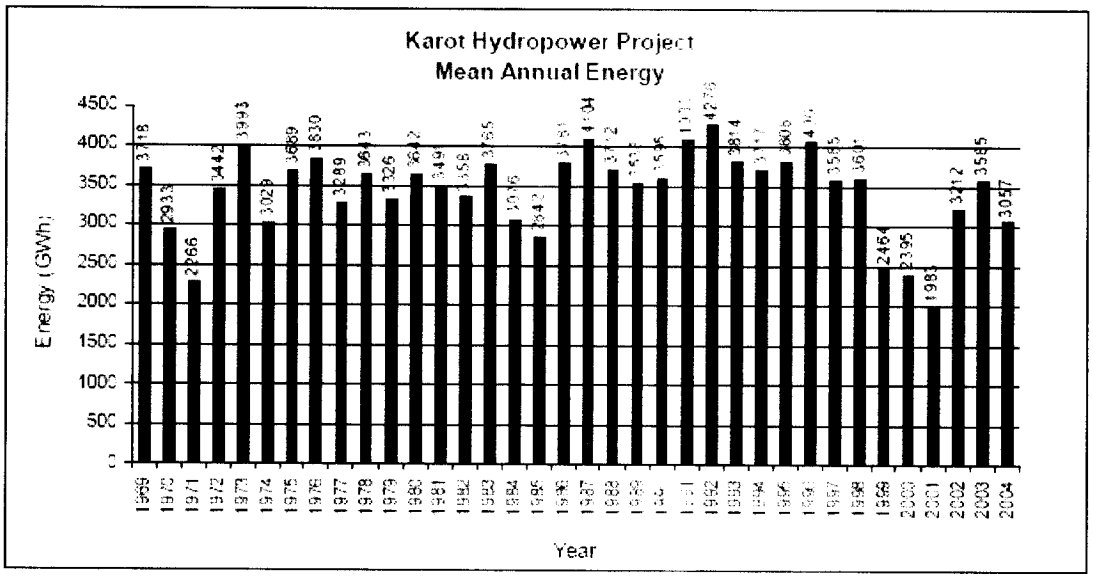
- Design Head: 69 m
- Maximum net head: 74.6 m (one unit operating)
- Minimum net head: 63.9 m

The turbine net head will vary from 63.9 meters to 74.6 meters. For this head range, aFrancis Type Turbine is considered the most suitable. This head range is on the upperlimit of axial flow type turbines. Moreover, a Francis Type Turbine has the followingadvantages over an axial flow type turbine:

- Higher setting for a given turbine size;
- Lower overspeed/synchronous speed ratios;
- Less expensive turbine.

Power and energy have been estimated using 10 daily mean flows for the hydrological record of Jhelum River available from year 1969 to 2004, Azad Pattan and Kohala. For each year, power and energy during 4 hour daily peak and 20 off-peak hours have been estimated and are presented as part of the Feasibility Study.

Based on the annual energy variation over a 36-year period (presented in figure below) the mean annual energy for the Project has been estimated to equal **3,436 GWh** (gross) with a plant factor of **54.48%**. After taking into account the auxiliary consumption (**1%**) the net energy production for the Project is estimated to be **3,401.8 GWh**.



Under the Feasibility Study, the Consultants have put forward a proposed Project implementation / contract structure which is based on their assessment of the most economic solution and which is based on multiple contracts for different aspects of the Project. The Project development structure will need to meet with the criteria set forward by Project lenders as being most suitable for the Project in terms of (a) the most cost efficient solution available and (b) risk and responsibility for the entire Project. In the event that there is any change in the recommended Project execution structure with a tariff implication then an appropriate adjustment will be requested from NEPRA at the next stage of tariff determination.

Based on the assumptions contained in this Tariff Petition and in light of the proposed discussion contained in Section 5 (*Project Cost & Investment*), the proposed Project cost is USD 1,424,382,484 /- (United States Dollars One Billion FourHundred Twenty FourMillion Three Hundred Eighty TwoThousand Four Hundred and Eighty FourOnly) (the Project Cost).

The planned financing of the Project is based on the following Debt and Equity ratio which is subject to revision based on the finalization of the term sheet with the Project lenders:

(a) 80% debt (the Debt); and

(b) 20% equity (the Equity).

China International Water & Electric Corp. (**CWE**) is a fully owned subsidiary of China Three Gorges Corporation (**CTGPC**). CTGPC has recently incorporated China Three Gorges International Corporation (**CTGI**), for the core purpose of handling CTGPCs overseas investments. Prior to incorporation of CTGI, CTGPCs investments were made directly through CWE; due to the internal restructuring of CTGPCs investment business, the Main Sponsor of the proposed project will be changed from CWE to CTGI.

CTGPC
(100% owner of)

CWE

CTGI

Engineering, Procurement and Construction Business

China Three Gorges Corporation

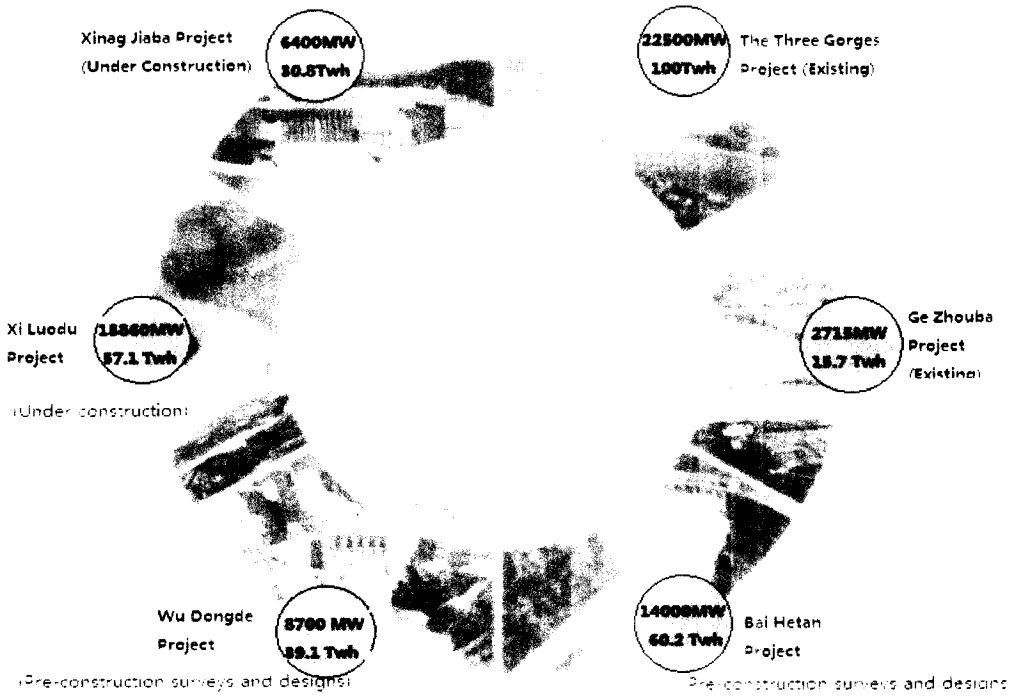
Investment Business

As part of the initiative to build the Three Gorges Project and develop the Yangtze River, the China Three Gorges Project Corporation was founded on September 27, 1993 with the approval of the State Council. On September 27, 2009, the Corporation changed to the name "China Three Gorges Corporation" (with the original acronym CTGPC retained). CTGPC is a wholly state-owned enterprise with registered capital of RMB 111.598 billon. As at December 31, 2009, CTGPC had total assets of RMB 280.98 billion and a state-owned equity of RMB 169.85 billion. It employs a workforce of 11,403 people, including 11,909 in active duty, comprising of 3,698 employees with a bachelor's degree or higher academic attainment, 2 members of the Chinese Academy of Engineering, 71 experts receiving special government subsidies, and 2 "national-class experts with outstanding contributions". CTGPC is strategically positioned to become a clean energy conglomerate specializing in large-scaled hydropower development and operation. CTGPC's principal operations include hydropower project engineering, construction and management, electricity production, and provision of related technical services.

CTGPC manages the construction and operation of the Three Gorges Project. The construction of the Three Gorges Project was officially launched on December 14, 1994, followed by successful river closure on November 8, 1997. The project's initial water storage, navigation and power generation targets were fulfilled in 2003. In 2009, except for the ship lift, whose construction was postponed with Central Government's approval, all construction tasks set in the initial design were completed on schedule, and the project passed the final inspection before water storage reached the 175-meter level. This particular year marked the project's transition from construction to operation, ushering in the delivery of comprehensive benefits in flood and drought control, power generation, navigation, and water supply.

At present, CTGPC owns and operates two mega hydropower stations, namely the Three Gorges hydropower project, and the Gezhoubahydropower project; the total installed capacity and annual power generation of thesehydropower projects is: 22,500MW& 100 TWh, and 2,715MW & 15.7 TWh, respectively.

The Central Government has authorized CTGPC to develop the hydroelectric resources in the mainstream and tributaries of the upper reaches of the Yangtze River and to build four massive hydropower plants at Xiluodu, Xiangjiaba, Wudongde, and Baihetan. The construction of the hydropower plants at Xiluodu and Xiangjiaba began in 2005 and 2006, respectively; these projects are expected to become operational in 2013 and 2012, respectively. Pre-construction surveys and designs are currently underway for the two hydropower plants at Wudongde and Baihetan. The four hydropower plants will have a combined total installed capacity of 42,960 MW and will produce 187.2TWh of electricity per year.



Throughout hydropower development and operation, CTGPC is aligned with the "Scientific Outlook on Development" and dedicated to "building a first-class hydropower plant to stimulate the growth of the local economy, improve the local environment, and benefit resettled residents". CTGPC is committed to achieving a balance and unity of social, economic and ecological interests.

The Board of Directors of CTGPC was established in January 2010. Mr. Cao Guangjing was appointed as board chairman and CPC committee secretary and Mr. Chen Fei as board director, president and CPC committee member. It has three committees, i.e. Science and Technology Committee, Investment Committee and Budget Committee, to provide counseling services for CTGPC's technical and economic decision making. It also has Presidential Working Department, Plan and Development Department, Asset and Finance Department, Human Resources Department, Technology and Environmental Protection Department, Safety Production Department, Preparatory Office of Jinshajiang River Development Co., Ltd., Resettlement Management Bureau, International Cooperation Department, Auditing Office, Discipline Inspection Office, CPC-Mass Work Department, Working Committee Office, News Center, Information Center, Beijing Representative Office and other functional organizations. It has four engineering and construction management departments, i.e. Construction & Operation Administrative Bureau of Three Gorges Complex, Xiluodu Project Construction Department, Xiangjiaba Project Construction Department and Electrical and Mechanical Engineering Department, as well as Baihetan Project Construction Preparatory Department and Chongqing Xiaonanhai Hydropower Station Preparatory Department.

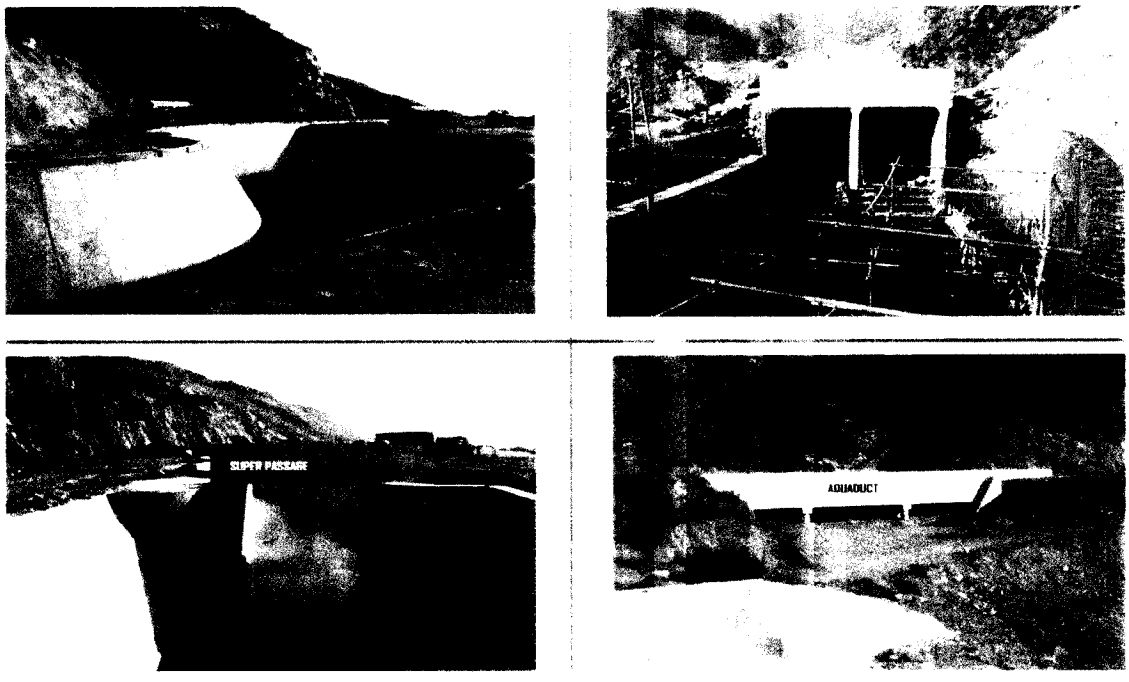
CTGPC has 11 wholly-owned and majority-stake subsidiaries. As a public company, China Yangtze Power Co., Ltd (CYP) is the primary subsidiary of CTGPC in charge of electricity generation and management. CYP has 26 generation sets that have been launched into operation in Gezhouba Power Station and TGP. China Three Gorges New Energy Co., Ltd mainly specializes in on-land wind power developments. Yangtze New Energy Development Co., Ltd mainly specializes in development of wind power on the eastern coast of China. Inner Mongolia Hohhot Pumped Storage Power Station Co., Ltd mainly engages in the construction and operation of Hohhot Pumped Storage Power Station. China International Water & Electric Corporation is CTGPC's platform for international cooperation. Yangtze Three Gorges Technological & Economic Development Co., Ltd. mainly engages in project management, counseling and supervision work. Three Gorges Financial Co., Ltd. is a non-banking financial institution that provides services exclusively to CTGPC and its affiliates. Yangtze Three Gorges Investment Development Co., Ltd. mainly specializes in investments and management. Three Gorges Tourism Development Co., Ltd mainly specializes in tourism development and hotels management. Yichang Three Gorges Engineering Duoneng Company mainly specializes in asset disposal. Yangtze Three Gorges Land General Electric Co., Ltd. mainly specializes in developing total solutions of control equipment.

With an aim to publicize the TGP and hydropower development efforts, CTGPC has sponsored and released China TGP Journal, monthly magazine China Three Gorges, China Three Gorges Construction Annual and the official website of CTGPC.

Associated Technologies (Private) Limited was incorporated in October 1987 under the Companies Ordinance 1984. The Sponsor's core area of expertise lies in civil construction and development of infrastructure projects. Since inception, the Sponsor has progressively moved towards diversification and has achieved proficiency in large scale

manufacturing of power transmission and telecom structures and installation and construction of base station towers. A separate division within the Sponsor has been assigned the responsibility of providing / developing irrigation system solutions.

Over the years theSponsor's civil operations have included construction ofbuildings and roads,infrastructure development andpre-fabrication of various structures. Through efficient utilization of its over 300 personnel, the Sponsor is able to provide cost effective solutions, fully customized to the individual client's needs,latest technical and material resources, while ensuring strict adherence to international quality standards.



The Sponsor has also successfully integrated into renewable energy development and have completed construction of Malakand-III Hydropower Project which was commissioned in 2009 and is now providing electrical power to the National Grid. Sponsor's scope of work for the project included planning, design and construction of housing colony on an areaof 110,000 sq.ft. on behalf of SarhadHydel Development Organization. The Sponsor's scope also included construction of headrace channel, concrete lining, cross drainage &structures, culverts & bridges.

A few of the projects completed by Sponsor are listed below:

Starting Year	Ending Year	Contract	Role
1992	1995	Contract Name: Tarbela Hydropower Expansion Project Scope: Survey, Designing, Earthwork, Access Roads, Culverts, Cutting & Filling.	Contractor

		Contract Price: Rs. 147.50 Million Employer: WAPDA Hyundai-Hidco.	
1993	1996	Contract Name: NLC Communication Project Scope: Survey, Design, Fabrication supply, Construction of foundation with earthing, Erection and Painting of Tower complete in all respect, Building works for staff & equipment. Contract Price: Rs. 60 million Employer National Logistic Cell	Contractor
1995	1998	Contract Name: Mobilink Cell Site Construction Scope: Survey, Design, Rafting and Piling, earth work, Tower fabrication & erection Contract Price: Rs. 260 million Employer: Mobilink	Contractor
1996	1997	Contract Name: SCO Rural Telecommunication Project Scope: Survey, Designing, Fabrication Supply, Construction of foundation with Earthing, Erection and building of rooms complete in all respects Contract Price: Rs. 265 million Employer Special Communication Organization (SCO)	Sub-Contractor
2002	2003	Contract Name: Northern development Project Scope: Culverts, Bridges Cutting, filling and blasting in hilly area, Road surfacing, preparation of base and sub base Contract Price: Rs 41 million Employer Northern Area Bldg. Works, Chilas	Contractor
2002	2007	Contract Name: Malakand III Hydel Power Project Scope: Earth work excavation in hard strata/rocky soil and piling, construction of headrace channel and concrete lining, cross drainage & structures, culverts & bridges, residential colony & excess road and canal construction Contract Price: 2264.68 million Employer: SarhadHydel Development Organization SHYDO.	Joint Venture Partner
2002	2006	Contract Name: SHYDO Malakand III Project Scope: Planning, designing and construction of housing colony in an area of 200 acres. Contract Price: Rs. 200 Million Employer: SHYDO	Joint Venture
2003	2005	Contract Name: Mobilink Project Scope: Design, manufacture, testing & installation of steel lattice heavy duty structure along with civil works and complete electrification. Contract Price: Rs. 517.65 Employer: Mobilink	Contractor
2004	2005	Contract Name: Ericsson/Warid Infrastructure Project Scope: Construction of 110 Nos. of BTS sites, including design, manufacture, testing & installation of steel lattice heavy duty structures along with civil works and	Sub Contractor

		complete electrification & alarm control system. Contract Price: Rs 354 million Employer Warid	
2005	2005	Contract Name: Ericsson/Warid Infrastructure Project Scope: Construction of building app. 35,000 sq feet, complete in all respects for telecome exchange. Contract Price: Rs.410 million Employer Warid	Sub Contractor
2004	2005	Contract Name: Expansion of GSM900 Network Phase III Scope: Design, manufacture, testing & installation of steel lattice heavy duty structure along civil works and complete electrification and alarm control system Contract Price: Rs 122 million Employer: Siemens Pakistan Engineering Co.	Sub Contractor
2004	2005	Contract Name: Nokia Project Scope: Design, manufacture, testing & installation of steel lattice heavy duty structure along civil works Contract Price: Rs. 140 million Employer:Nokia	Sub Contractor
2005	2006	Contract Name: Huawei/Warid Telecom Project and CDMA/WLL project. Scope: Design, manufacture, testing & installation of steel lattice heavy duty structure along civil works. Contract Price: Rs. 457 million Employer: Huawei Technologies (Pvt) Ltd.	Sub Contractor
2006	2007	Contract Name: Nokia Project. Scope: Supply of towers along with accessories. Contract Price: Rs. 260 million Employer: Nokia	Sub Contractor
2006	2007	Contract Name: Nokia Project. Scope: BTS Civil works complete in all respect Contract Price: Rs. 114 million Employer: Nokia	Sub Contractor
2006	2008	Contract Name: Wincom/ Warid Infrastructure Project Scope: Construction of BTS cell sites including Tower and all accessories. Contract Price: Rs. 60 Million Employer: Warid Technologies	Sub Contractor
2007	2008	Contract Name: Ericsson/Warid Phase 6.1 Scope: Construction of 90 Nos. of BTS sites including design, manufacture, testing & installation of steel lattice heavy duty structures along with civil works and complete electrification & alarm control system Contract Price: Rs. 250 million Employer: Warid Technologies	Sub Contractor
2007	2008	Contract Name: ZTE AFG/Etaafg GSM/Towers Scope: Supply of Towers with all accessories Contract Price: Rs. 173 Million Employer: ZTE Afganistan Ltd. Co	Contractor

2007	2007	Contract Name: Gilgit&SkarduWarid Phase 6.1 Scope: Civil Works and supply of towers complete in all respects. Contract Price: Rs. 45 million Employer Warid / Wincom	Contractor
2006	2008	Contract Name: CE/GEPCO/MMM/06-07 Scope: Supply of the 11KV Capacitor Racks of size 2400 KVAR complete with 5KA Contract Price: Rs. 52 million Employer: GEPCO (WAPDA)	Contractor
2006	2008	Contract Name: Tender No.33/2007 Scope: Supply of the 11KV capacitor Racks of Size 2400KVAR Complete with 5KA Contract Price: Rs.39 Million Employer: HESCO (WAPDA)	Contractor
2007	2008	Contract Name:CM-Pak Project Scope: Contract Price: Employer	Sub Contractor
2008	2008	Contract Name: Telenor Phase 5 Project Scope: Site acquisition & BTS Civil works complete in all respects Contract Price: Rs. 72 million Employer: Telenor Pakistan Ltd	Contractor
2007	2008	Contract Name: Pakistan Coast Guard Scope: Construction of 10 fully equipped and associated of the Pakistan Coast Guard. Contract Price: Rs. 76 million Employer KestralLogistices	Contractor

The Reference Generation Tariff for the Project, set out below, has been based on corresponding reference tariffs previously approved by NEPRA for other IPP's together with the Mechanism. It is, however, respectfully submitted that there have been very few tariff applications that have been made by the private sector for hydel projects and no such project has achieved financial close under the Policy. Accordingly, given the lack of precedence and experience in this sector, the Project Company requests a degree of flexibility to be adopted by NEPRA in reviewing the tariff structure and approving the tariff determination mechanism, including specifically, the tariff reopeners, escalations, power production based on hydrology, and financing proportions.

Based on this premise, the tariff for the Project consists of the following:

a) the Energy Purchase Price (EPP); and

b) the Capacity Purchase Price (CPP).

The above are further broken down into the components detailed hereunder:

- Energy Purchase Price:
    - Water Use Charges; and
    - Variable Operation and Maintenance.
- Capacity Purchase Price:
    - Fixed Operation and Maintenance;
    - Insurance;
    - Debt – Principal and Interest;
    - Return on Equity and Return on Equity During Construction;
    - Withholding Tax on ROE and ROE-DC; and
    - Equity Redemption.

With regards to hydropower projects, the Policy states that:

"The CPP in case of hydel projects will be approximately 60% to 66% of the levelized tariff, because of the relatively low EPP."

and

"The Power Purchase will bear the risk of availability of water for hydel projects with capacity above 50 MW by making fixed monthly CPPs between 60%-66% of the total levelized tariff to the project company in accordance with the monthly average hydrology"

We concur with the Policy to the extent that the CPP as a percentage of the total tariff for hydropower projects is significantly higher than that for thermal power projects due to the non-existence of fuel charges. However, the ratio specified in the Policy does not reflect the actual tariff mix of hydropower projects where the CPP is approximately 95% of the total tariff and EPP is approximately 5%.

We would therefore request NEPRA to determine the fixed cost of the Project on monthly fixed charges to be expressed in PKR / kW / Month in accordance with the Policy. However, as the percentage stated in the Policy results in an **"anomalous position"** (as rightly stated by NEPRA in its recent determinations for other hydropower projects) due to which during the lean water months the CPP due to the Project based on average monthly hydrology will not ensure full recovery of fixed costs on month to month basis (and will result in inability of the Project to service its debt obligations). It is therefore, requested that (a) the tariff approved by NEPRA be expressed in terms of PKR / kW / Month and; (b) the percentage (95% CPP and 5% EPP) requested by the Project Company in its Reference Generation Tariff should be maintained / allowed on the basis of annual average hydrology.

5. PROJECT COST & INVESTMENT

The current total Project Costis based on the Feasibility Study.The reference exchange rate used to convert the relevant costs into United States Dollars is USD 1 = PKR 80 (in accordance with the rate used in the Feasibility Study).

For NEPRA's benefit and approval, a summary of the Project Cost is given below:

SR. NO.	INVESTMENT / COST	USD IN MILLIONS
1.	CIVIL WORKS	424.50
2.	LAND AND RESETTLEMENT / ENVIRONMENT	12.50
3.	HYDRO MECHANICAL EQUIPMENT	204.65
4.	ELECTRICAL EQUIPMENT	173.73
5.	CONTINGENCIES – CIVIL WORKS	104.13
6.	ENGINEERING & SUPERVISION	89.17
7.	PROJECT DEVELOPMENT COST	89.17
8.	DUTIES & TAXES	19.78
9.	INSURANCE DURING CONSTRUCTION	21.80
10.	LEGAL FEES AND CHARGES	10.90
11.	FINANCING CHARGES	62.17
12.	INTEREST DURING CONSTRUCTION	143.51
13.	SINOSURE FEE	68.37
	TOTAL PROJECT COST	**1,424.38**

The initial concept and basic design of the Project set out in the Feasibility Study was developed by the Consultants based on preliminary studies including hydrological, sedimentation, seismic, neo-tectonic, and topographical and geo-technical studies. Initial cost estimates were derived from the basic design of the Project. The said preliminary studies, initial concepts / design and the associated cost estimates form part of Feasibility Study which has been scrutinized / approved by POE and PPIB.

In the next phase of the Project development, the said preliminary studies shall be confirmed and if required, further studies may be undertaken. Based on the confirmatory studies the initial concept / design will be further developed resulting in the finalization of the Project tender documents (which may include BOQ's). This final design, along with said tender documents will be circulated to the potential bidders for the EPC contract and form the basis of the final EPC contract price, which may be different from the initial estimates contained herein.

Considering the infancy of private sector hydropower generation in Pakistan, we request NEPRA to allow for an appropriate adjustment mechanism for evolving Project Cost at subsequent stages of tariff determination.

As per the Feasibility Study, the Civil Works cost includes:

SR. NO.	COST	USD IN MILLIONS
1.	PRELIMINARY WORKS	52.91
2.	MOBILIZATION / DEMOBILIZATION COST	10.00
3.	TEMPORARY ROADS AND PASSAGES	5.00
4.	DIVERSION WORKS	24.00
5.	CONCRETE GRAVITY DAM	131.68
6.	SPILLWAYS	64.85
7.	POWER TUNNELS	32.62
8.	SURGE SHAFT & CHAMBERS	14.75
9.	PRESSURE SHAFT	20.55
10.	POWER HOUSE	28.98
11.	TAIL RACE AND OUTLET STRUCTURE	11.35
12.	GENERAL	27.81
	TOTAL CIVIL WORKS COST	**424.50**

Detailed break-up of each cost head is provided below:

Preliminary Works

These costs include estimates for carrying out the preliminary civil works, such as construction and upgradation of access roads,bridges, relocation of existing road and the cost associated with development of camps and allied facilities for the EPC and O&M staff.

Sr. No.	Description	Unit	Qty	Unit Price (US$)			Amount (US$ in '000)		
				FC[5]	LC[6]	Total	FC	LC	Total
1.1	**Access Road & Bridges**								
1.1.1	Access road to left bank Dam Area	m	1,800	-	304	304	-	547	547
1.1.2	Access road to P/house Area	m	800	21	409	430	17	327	344
1.1.3	Access road to Surge Area	m	250	16	304	320	4	76	80
1.1.4	Upgradation of access road to Karot site	m	10,000	12	238	250	120	2,380	2,500
1.1.5	Relocation of road in reservoir area	m	10,000	21	409	430	210	4,090	4,300
1.1.6	Bridge on nullah on left bank of dam	m	40	3,150	1,350	4,500	126	54	180
1.1.7	Bridge on nullah on right bank of P/H	m	50	3,150	1,350	4,500	158	68	225
1.1.8	Bridge on Jhelum river Azad Pattan area	m	100	4,900	2,100	7,000	490	210	700
1.1.9	Bridge on Jhelum river P/H area	m	100	4,900	2,100	7,000	490	210	700
1.1.10	Bridge on nullahs, streams access rds.	m	150	3,150	1,350	4,500	473	203	675
1.1.11	Miscellaneous	%	5%				104	408	513
	Sub-total 1.1						**2,191**	**8,573**	**10,764**
1.2	**Camps and Other Facilities**								
1.2.1	Permanent Infrastructure	m^2	50,000	4	36	40	200	1,800	2,000
1.2.2	Depot Area	m^2	100,000	2	18	20	200	1,800	2,000
1.2.3	Utilities & Public Health Facilities	LS					7,008	28,032	35,040
1.2.4	Telecommunication and Misc.	LS					50	450	500
1.2.5	Miscellaneous	%	5%				373	2,229	2,602
	Sub-total 1.2						**7,831**	**34,311**	**42,142**
	Total						**10,022**	**42,884**	**52,906**

[5] FC – Foreign Component
[6] LC – Local Component

Diversion Works

During the construction period, the river/water flow shall be diverted using diversion tunnels. Cofferdams shall be used for channeling the water into the diversion tunnels and away from the construction area. The cost for building the cofferdams, the diversion tunnels and other allied activities such as grout curtains, excavation, shotcrete, rock bolts, and structural concrete for reinforcement etc. are also covered under this head.

Sr. No.	Description	Unit	Qty	Unit Price (US$)			Amount (US$ in '000)		
				FC	LC	Total	FC	LC	Total
2.1	**Coffer Dams**								
2.1.1	Upstream Cofferdam	m^3	150,000	7	11	18	1,080	1,620	2,700
2.1.2	DownStreamCofferdam	m^3	96,250	7	11	18	693	1,040	1,733
2.1.3	Grout Curtain	m^3	5,000	80	120	200	400	600	1,000
2.1.4	Miscellaneous	%	5%				109	163	272
	Sub Total 2.1						**2,282**	**3,422**	**5,704**
2.2	**Diversion Tunnels**								
2.2.1	Stripping	m^3	4,500	1	3	4	5	12	17
2.2.2	Excavation, Open Cut Rock	m^3	25,339	6	4	10	152	101	253
2.2.3	Excavation, Tunnel, all classes	m^3	133,988	50	30	80	6,699	4,020	10,719
2.2.4	Shotcrete, 10 cm	m^3	11,856	18	22	40	213	261	474
2.2.5	Rock Bolts, dia 25mm, l = 4.0 m	m^3	72,533	5	20	25	363	1,451	1,813
2.2.6	Structural Concrete	m^3	22,431	50	100	150	1,122	2,243	3,365
2.2.7	Reinforcement	m^3	704	250	1,250	1,500	176	880	1,056
2.2.8	Miscellaneous	%	5%				429	443	872
	Sub Total 2.2						**9,002**	**9,297**	**18,299**
	Sub Total 2						**11,284**	**12,720**	**24,003**

Concrete Gravity Dam

The cost of construction of a concrete gravity dam is a function of the height of the dam. However, the cost – height relationship is not proportional rather it is exponential, meaning that the increase in height on a per meter basis does not imply a uniform increase in cost.

Details of the cost associated with building a conventional concrete gravity dam at the proposed height of 91 meters above foundation height, inclusive of the sluices for flushing of sediment, is provide below.

Sr. No.	Description	Unit	Qty	Unit Price (US$)			Amount (US$ in '000)		
				FC	LC	Total	FC	LC	Total
3.1	**Dam Body**								
3.1.1	Excavation, common	m^3	480,000	1	3	4	480	1,440	1,920
3.1.2	Excavation, rock	m^3	112,000	3	7	10	336	784	1,120
3.1.3	Clean rock foundation	m^2	15,600	10	15	25	156	234	390
3.1.4	Grout Curtain	m^3	32,000	80	120	200	2,560	3,840	6,400
3.1.5	Level concrete	m^3	3,840	20	40	60	77	154	230
3.1.6	Structural Concrete	m^3	505,000	50	130	180	25,250	65,650	90,900
3.1.7	Drainage galleries	m	480	30	70	100	14	34	48
3.1.8	Drainage curtain	m^2	19,500	5	7	12	98	137	234
3.1.9	Joints and waterstops	LS				0	1,500	3,000	4,500
3.1.10	Diaphragm wall, concrete	m^2	8,000	72	108	180	576	864	1,440
3.1.11	Drainage holes for cut off	m	7,500	50	200	250	375	1,500	1,875
3.1.12	Drainageadit	m	250	600	1000	1600	150	250	400
3.1.13	Miscellaneous	%	5%				1,579	3,894	5,473
	Sub Total 3.1						**33,150**	**81,780**	**114,930**
3.2	**Sluicing Outlets**								
3.2.1	Concrete Lining	m^3	20160	182	78	260	3,669	1,572	5,241
3.2.2	Reinforcement	ton	1210	250	1250	1500	303	1,512	1,815
3.2.3	Formwork, Flat	m^2	5500	32	14	46	176	77	253
3.2.4	Steel liners, Outlets	ton	600	1680	720	2400	1,008	432	1,440
3.2.5	Control Gates	ton	259	3600	2400	6000	932	622	1,554
3.2.6	Guard Gates	ton	744	4200	1800	6000	3,125	1,339	4,464
3.2.7	Formwork, Curved	m^2	7200	50	22	72	360	158	518
3.2.8	Formwork, Flat	m^2	14400	32	14	46	461	202	663
3.2.9	Miscellaneous	%	5%				502	296	797
	Sub Total 3.2						**10,535**	**6,210**	**16,745**
	Total						**43,686**	**87,990**	**131,675**

Spill Ways

Details of the cost associated with construction of spillways in accordance with the hydrological parameters detailed earlier, with maximum discharge capacity of 28,500 m^3/s is provided below.

Sr. No.	Description	Unit	Qty	Unit Price (US$)			Amount (US$ in '000)		
				FC	LC	Total	FC	LC	Total
4.1	Structural Concrete	m^3	204,000	66	150	216	13,464	30,600	44,064
4.2	Reinforcement	ton	8,160	250	1250	1500	2,040	10,200	12,240
4.3	Formwork, curved	m^2	7,070	50	22	72	354	156	509
4.4	Formwork, flat	m^2	44,980	32	14	46	1,439	630	2,069
4.5	Flood Control Gates	m^2	480	4200	1800	6000	2,016	864	2,880
4.6	Miscellaneous	%	5%				966	2,122	3,088
	Sub Total 4						**20,279**	**44,572**	**64,850**

Power Tunnels

The cost is associated with the excavation of the tunnels and includes shortcrete, rock bolts, grouting and structural concrete reinforcements needed for the power intake tunnels.

Sr. No.	Description	Unit	Qty	Unit Price (US$)			Amount (US$ in '000)		
				FC	LC	Total	FC	LC	Total
5.1	**Power Intake**								
5.1.1	Excavation, Open Cut, Soil	m^3	30,670	1	1.5	2.5	31	46	77
5.1.2	Excavation, Rock	m^3	92,010	3	7	10	276	644	920
5.1.3	Shortcrete, 10 cm	m^2	8,973	18	22	40	162	197	359
5.1.4	Rock Bolts, dia 25mm, I = 4.0 m	m	8,973	5	20	25	45	179	224
5.1.5	Structural Concrete	m^3	44,792	50	100	150	2,240	4,479	6,719
5.1.6	Reinforcement	ton	703	250	1250	1500	176	879	1,055
5.1.7	Miscellaneous	%	5%				146	321	468
	Sub-total 5.1						**3,075**	**6,746**	**9,821**
5.2	**Headrace Tunnels**								
5.2.1	Excavation Tunnels, all classes	m^3	180,930	35	20	55	6,333	3,619	9,951
5.2.2	Shortcrete, 20 cm	m^2	61,314	18	22	40	1,104	1,349	2,453
5.2.3	Rock Bolts, dia 25mm, I = 4.0 m	m	91,307	5	20	25	457	1,826	2,283
5.2.4	Consolidation Grouting	m	11,413	5	20	25	57	228	285
5.2.5	Concrete Lining	m^3	34,207	50	100	150	1,710	3,421	5,131
5.2.6	Reinforcement	ton	1,074	250	1250	1500	269	1,343	1,611
5.2.7	Miscellaneous	%	5%				496	589	1,086
	Sub-total 5.2						**10,425**	**12,374**	**22,799**
	Total						**13,500**	**19,120**	**32,620**

Surge Shaft & Chambers

Breakup of the cost for excavation, construction, concreting, and reinforcement of surge shaft and chambers is provided below.

Sr. No.	Description	Unit	Qty	Unit Price (US$)			Amount (US$ in '000)		
				FC	LC	Total	FC	LC	Total
6.1	Excavation Chamber, all classes	m^3	115,407	35	20	55	4,039	2,308	6,347
6.2	Shotcrete, 15 cm	m^2	23,279	18	22	40	419	512	931
6.3	Rock Bolts, dia 25mm, I = 6.0 m	M	54,192	5	20	25	271	1,084	1,355
6.4	Consolidation Grouting	M	6,348	20	10	30	127	63	190
6.5	Concrete Lining, Chamber	m^3	21,752	65	120	185	1,414	2,610	4,024
6.6	Reinforcement	Ton	801	250	1250	1500	200	1,001	1,202
6.7	Miscellaneous	%	5%				324	379	702
	Sub Total 6						**6,794**	**7,958**	**14,752**

Pressure Shaft

Breakup of the cost for excavation, construction, lining, grouting, concreting, and reinforcement of pressure shaft is provided below.

Sr. No.	Description	Unit	Qty	Unit Price (US$)			Amount (US$ in '000)		
				FC	LC	Total	FC	LC	Total
7.1	Excavation Tunnel, all classes	m^3	32,575	50	30	80	1,629	977	2,606
7.2	Steel liners, t=27 mm	Ton	2,441	1000	5000	6000	2,441	12,205	14,646
7.3	Shortcrete, 10 cm	m^2	12,963	18	22	40	233	285	519
7.4	Rock Bolts, dia 25 mm, I = 3.0 m	M	12,885	5	20	25	64	258	322
7.5	Consolidation Grouting	m	2,142	20	10	30	43	21	64
7.6	Concrete Lining	m^3	6,078	65	120	185	395	729	1,124
7.7	Reinforcement	ton	191	250	1250	1500	48	239	287
7.8	Miscellaneous	%	5%				243	736	978
	Sub Total 7						**5,096**	**15,450**	**20,546**

Power House

As per the Feasibility Study, it has been determined that an underground power house is both, financially and technically, optimal for the Project. The breakup of the costs associated with development of the power house is provided below.

Sr. No.	Description	Unit	Qty	Unit Price (US$)			Amount (US$ in '000)		
				FC	LC	Total	FC	LC	Total
8.1	Excavation, Open Cut, Soil	m^3	430	3	12	15	1	5	6
8.2	Excavation, Rock	m^3	240,844	5	25	30	1,204	6,021	7,225
8.3	Shortcrete, 20 cm	m^2	43,729	18	22	40	787	962	1,749
8.4	Rock Bolts, dia 25 mm, I = 4.0 m	m	53,335	5	20	25	267	1,067	1,333
8.5	Consolidation Grouting	m	-	20	10	30	-	-	-
8.6	Structural Concrete	m^3	57,842	65	120	185	3,760	6,941	10,701
8.7	Mass Concrete	m^3	16,896	65	120	185	1,098	2,028	3,126
8.8	Reinforcement	ton	2,311	250	1250	1500	578	2,889	3,467
8.9	Miscellaneous	%	5%				385	996	1,380
	Sub Total 8						**8,078**	**20,903**	**28,981**

Tail Race & Outlet Structure

The cost associated with excavation, construction and reinforcement of the tail race tunnels and outlet structure of the Project is detailed below.

Sr. No	Description	Unit	Qty	Unit Price (US$)			Amount (US$ in '000)		
				FC	LC	Total	FC	LC	Total
9.1	Excavation, Open Cut, Soil	m^3	56,511	3	12	15	170	678	848
9.2	Excavation, Open Cut, Rock	m^3	248,580	5	25	30	1,243	6,215	7,457
9.3	Shortcrete, 10 cm	m^2	11,502	18	22	40	207	253	460
9.4	Rock Bolts, dia 25 mm, I = 4.0 m	M	11,502	5	20	25	58	230	288
9.5	Structural Concrete	m^3	7,202	65	120	185	468	864	1,332
9.6	Reinforcement	Ton	281	250	1250	1500	70	351	422
9.7	Miscellaneous	%	5%				111	430	540
	Sub Total 9						**2,326**	**9,021**	**11,347**

General

Based on the new dam axis approved by PPIB for development of the Project the existing Azad Pattan bridge and the local grid station shall be inundated, therefore, the cost for raising the Azan Pattan bridge and relocating the grid station has been catered for under this head. Furthermore, the cost associated with works to be carried out for stablizing the slope of the resorvoir area have been accounted for under this head.

Sr. No	Description	Amount (US$ in '000)		
		FC	LC	Total
10.1	Azad Pattan Bridge Raising	1.5	4	5.5
10.2	Relocation of Existing Grid	1.81	3.50	5.31
10.3	Slope Stability in Reservoir Area		17	17
	Sub Total 10	**3.31**	**24.50**	**27.81**

The cost associated with acquisition of land, compensation for resettlement to the inhabitants of Karot affected by the development of the Project, environmental compensation for removal of trees, and other allied costs have been estimated and accounted for under this head.

Sr. No	Description	Unit	Quantity	Cost in PKR Million	Cost US$ Million
1.	Land Acquisition	Kanals	6,892	670.552	8.3819
2.	House Compensation	Sq feet	30,000	45.00	0.5625
3.	Infrastructure	No	LS	6.00	0.0750
4.	Tree Compensation	-		188.00	2.3500
5.	Crop compensation	-	LS	2.80	0.0350
6.	Soil Disposal Area rehabilitation	-	LS	10.00	0.1250
7.	Transition Allowance	No	10	0.73	0.0091
8.	Livelihood Allowance for Affectees by House	No	10	0.72	0.0090
9.	Shifting charges	No	10	0.16	0.0020
10.	Commercial Enterprises	No	15	7.50	0.0938
11.	Shifting charges	No	15	0.60	0.0075

12.	Rent for six months	No	15	0.90	0.0113
13.	Livelihood for commercial enterprise	No	15	0.90	0.0113
14.	Livelihood allowance for affected employees of commercial enterprises	No	25	1.35	0.0169
15.	Community awareness	-	LS	1.00	0.0125
16.	Monitoring and evaluation	-	LS	5.00	0.0625
17.	Capacity building /training	No	10	2.50	0.0313
18.	Contingencies @ 6%	-		56.19	0.7024
	Total			**999.902**	**12.49**

Based on the outcome of the hydropower planning studies, the turbine parameters,listed below, have been selected for the layout of the power station and costing of themechanical equipment.

- Number of turbines: 4
- Rated output: 183 MW (ISO)
- Rated head: 67 m
- Design Head: 69 m
- Maximum net head: 74.6 m (one unit operating)
- Minimum net head: 63.9 m

The turbine net head will vary from 63.9 meters to 74.6 meters. For this head range, aFrancis Type Turbine is considered the most suitable. This head range is on the upperlimit of axial flow type turbines. Moreover, a Francis Type Turbine has the followingadvantages over an axial flow type turbine:

- Higher setting for a given turbine size;
- Lower overspeed/synchronous speed ratios;
- Less expensive turbine.

The hydromechanical equipment to be procured for the Project along with the indicative pricing used for the purpose of development of the feasibility study is provided below:

Sr. No.	Description	Unit	Qty	UnitPrice(US$ in Million)			Amount (US$ in Million)		
				FC	LC	Total	FC	LC	Total
1.	Turbines	unit	4	19.00	1.00	20.00	76.00	4.00	80.00
2.	InletValve	unit	4	6.18	0.33	6.50	24.70	1.30	26.00
3.	Governor	unit	4	1.14	0.06	1.20	4.56	0.24	4.80
4.	Crane	unit	2	2.38	0.13	2.50	4.75	0.25	5.00
5.	AuxiliaryEquipmentand spareparts	unit	4	0.95	0.05	1.00	3.80	0.20	4.00

6.	SteelLiner	tons	4,849	2.98	0.53	3.50	14.43	2.55	16.97
7.	Diversiontunnelstoplogs		1	0.13	0.52	0.65	0.13	0.52	0.65
8.	Spillwaysgates		4	0.81	0.12	0.93	3.24	0.48	3.72
9.	Spillwaysstoplogs		1	0.16	0.64	0.80	0.16	0.64	0.80
10.	Powerintakegates		4	1.29	0.24	1.53	5.16	0.96	6.12
11.	Powerintakestoplogs		1	0.10	0.40	0.50	0.10	0.40	0.50
12.	Intaketrashracks	tons	407	2.00	0.30	2.30	0.81	0.12	0.94
13.	Outletgatesflushing		4	0.81	0.12	0.93	3.24	0.48	3.72
14.	Outletstoplogs		1	0.10	0.40	0.50	0.10	0.40	0.50
15.	Miscellaneous						8.79	2.01	10.80
16.	Transportation						14.50	0.98	15.48
17.	Erection & Commissioning						21.75	2.93	24.68
	Sub-total			**38.02**	**4.83**	**42.84**	**186.21**	**18.43**	**204.64**

The proposed main electrical installations for the Project will comprise of four (04) vertical shaft synchronous generators of 200 MVA each coupled to the respective Francis reaction type turbines, generator circuit breakers, generator isolated phase bus duct, single phase generator step-up transformer groups, unit auxiliary transformers, auxiliary power supply including 11 kV switchgear, control and supervisory equipment and 500 kV outdoor switchyard. The control room will be equipped with a SCADA system for control and supervision of the plant. Local computerized control units, inside the powerhouse complex, the power intake and dam buildings, will perform all local automatic functions and will be connected to the computer station by a fiber optic bus system.

Auxiliary power systems and safety installation will have adequate duplicate systems in order to provide high operational reliability and personnel safety. All equipment and systems will be in accordance with state of the art technology and proven reliability as recorded from actual service.

Salient feature of the proposed generators are:

Generator rating	200 MVA
Power Factor	0.9
Generator Rated Output	180 MW
Generator Efficiency	98.4 %
Rated Voltage	18 kV
Rated Speed	136.4 rpm
Runaway Speed	278 rpm
Frequency	50 Hz
No. of Poles	44

Breakup of the costs for the electrical equipment to be installed for the Project is provided below:

Sr. No	Description	Cost US$ Million
1.	Four Generators & Auxiliaries including Excitation equipment, HV power cables (500 kV)	56.80
2.	Generator step-up Transformers, Station Transformers and Unit Auxiliary Transformers	25.20
3.	Generator Circuit Breakers, Protection Equipment for Generators and Transformers	4.40
4.	MV and LV Switch gear include: • DG Stand by sets – Qty 2 • Generator isolated phase bus duct • DC / AC Auxiliary systems	20.40
5.	Control and Instrumentation, SCADA and Telecommunication	30.40
6.	Earthing system, Power House Air Conditioning & Ventilation System, Fire Fighting System, Tools and Other Spare Parts	2.60
7.	Transportation	12.97
8.	Erection and Commissioning	20.97
	Total	**173.74**

Based on the Consultants, experience in the development of hydropower projects, they have recommended that contingencies for unforseen conditions and requirements for changes of the civil design or technical specifications be taken into account in the Project Cost estimate. These contingencies have also been approved by POE / PPIB as part of the Feasibility Study. Further, given the size of the Project and the corresponding length of its implementation period, Project lenders will insist on contingencies to cover unexpected variations and unforseen events. In view of this, based on the Consultants' advice the following contingencies are reflected in the Project Cost estimate:

- 16% for Civil Works (excluding General Civil Works);
- 15% for Hydromechanical Equipment; and
- 10% for Electrical Equipment.

Engineering and construction supervision costs during the construction of the civil works and for the supervision of the procurement, testing, installation and commissioning of the mechanical and electrical works have been assumed to be 10% of the EPC costs comprising of Civil Works (excluding cost for General Civil Works), Hydromechanical and Electrical Equipment costs (including costs associated with transportation, erection and commissioning and contingencies related to the EPC costs).

The Project Development Cost includes the cost incurred for the purpose of Project development and includes all costs, fees and expenses incurred or to be incurred for such purpose. These costs include costs of:

- Feasibility study;
    - Hydrological study;

- Sedimentation study;
- Topographical survey of land;
- Geological and geotechnical study;
- Neotectonic and seismic hazard study;
- Project layout study;
- Dam design study;
- Hydromechanical and electrical study; and
- Transporation study.

- Costs related to the performance guarantee to be furnished to PPIB;
- Costs related to the Power Purchaser letter of credit to be furnished to the Power Purchaser pursuant to the provisions of the PPA;
- Various regulatory fees to be paid to NEPRA;
- Costs incurred during Project Company formation;
- Project Company staff salaries, allowances and other benefits;
- Project Company head office – development and running expenses during construction period;
- Travelling costs of Project Company staff;
- Cost of appropriate health, safety, and environment (HSE) arrangements;
- Cost of PR and media management;
- Cost of security arrangement for the Project;
- Costs relating to various permits for the Project;
- Project advisors, including:
  - Local and Foreign Financial Advisor;
  - Insurance Advisor;

- Audit and Tax Advisors;
- Security Advisors;
- Carbon Credit Advisors;
- Environmental consultant; and

- Cost of mobilization of the O&M operator.

The cost for Project Development has been estimated on the basis of the Consultants' past experiences for development of hydropower projects and is assumed to be 10% of the EPC cost comprising of Civil Works (excluding cost for General Civil Works), Hydro Mechanical and Electrical Equipment costs (including costs associated with transportation, erection and commissioning and contingencies related to the EPC costs). In addition to the above mentioned items, it's mandated, that the next stage optimization and detailed engineering design will be based on current Chinese State Design Code for hydropower stations.

Taxes and Customs Duty have been calculated by the Project Company in accordance with the Policy as follows:

a) Custom Duty & Sales Tax @ 5.00% (Five Percent) has been assumed on import of machinery, equipment, goods, spares and materials for the Project, in accordance with the Policy. In case a higher rate of Custom Duty is levied the same shall be charged and adjusted as per actual at COD.

   It is submitted that pursuant to SRO 575(I)/2006, in the event the contract price is greater than USD 50 million, locally produced machinery can be imported and no Custom Duty will be levied in respect thereof. Considering that the EPC Cost is anticipated to be greater than USD 50 million, no provision for payment of Customs Duty against import of locally produced machinery has been made and in the event any Custom Duty is levied on any imported machinery, equipment, goods, spares and materials that can be locally produced, such levied Custom Duty shall be charged and adjusted as per actual at COD.

b) Advance Income Tax @ 0.00% (Zero Percent) has been assumed at the time of import of machinery, equipment, goods, spares and materials for the Project.

c) Special Excise Duty @ 1.00% (One Percent) has been assumed at the time of import of machinery, equipment, goods, spares and materials for the Project. The rate of Special Exercise Duty is linked to the rate of Customs Duty charged on the imported items. If the Customs Duty is charged @ 5.00%, then the Special Exercise Duty is also charged at 1.00% (One Percent). Given the dependence of

the rate of Special Exercise Duty on the applicable rate for Customs Duty, it is requested to allow adjustment to the capital cost of the Project and the tariff, in each case, for actual Special Exercise Duty paid on imports at COD.

d) Sindh Infrastructure Development Surcharge @ 0.5% of the imports for the Project has been assumed. The chargeability of Sindh Infrastructure Development Surcharge (the SIDS) is based on the weight of the imported equipment / items and the distance of the Site from the port. Since the imported equipment is expected to be of haulage load and has to travel considerable distance from the port, an average rate of SIDS has been assumed in the Project Cost.

Insurance During Construction Cost covers the insurance cost of Project Company's assets during construction and the same are incurred prior to COD. These cost estimates have been developed based on the estimates assumed in the Feasibility Study.

The Project Company, in view of the practices set by other IPPs in Pakistan and in accordance with the requirements typically set out by the Lenders funding the Project, intends to procure the following insurances during the construction phase of the Project:

(a) Construction All Risk Insurances (CAR);

(b) CAR Delay in Start-up Insurance;

(c) Terrorism Insurance;

(d) Marine and Inland Transit Insurance;

(e) Marine - Delay-In Startup Insurances; and

(f) Comprehensive General Liability.

Legal fees and charges include all costs associated with the engagement of an international and a domestic law firm to advise on all aspects of the Project.

It is pertinent to mention here that given the long implementation period of the Project, the services of the said legal advisors shall be required throughout the development and construction periods of the Project. In particular, during the development period, legal advisors will be required to assist in connection with the negotiation and execution of EPC contracts, the IA, the PPA, the Water Use Agreement, Agreements with lenders, Project site agreements and others. During the construction period, legal advisors will be required to assist in order to ensure that the Project complies with all contracts and agreements together with all regulatory and other consents and approvals and to ensure that all legal issues are identified and appropriately rectified in a timely manner.

Furthermore, the cost for appointment of PPIB legal counsel is also included under this head.

The cost has been estimated on the basis of the Consultants past experiences in development of hydropower projects and is assumed to be 1% of the EPC cost comprising of Civil Works (excluding cost for General Civil Works), Hydromechanical and Electrical Equipment costs (including costs associated with transportation, erection and commissioning and contingencies related to the EPC costs).

Financial Charges include the costs related to the Debt and Equity financing of the Project. Such costs include the fee related to arrangement of equity, lenders' up-front fee, commitment fee and charges related to various letters of credit to be established in favor of various contracting parties; fees payable and stamp duty applicable on the financing documents; agency fee; security trustee fee; Lenders' Project monitoring fee and the fees for the Lenders' various advisors. These financial charges have been estimated based on the Consultants past experience for similar projects and are in line with the prevailing market conditions and practices applicable for project financing transactions. The break-up of the costs anticipated to be incurred under this head is provided below:

SR. NO.	COST	RATE	USD IN MILLIONS
1.	DEBT ARRANGEMENT FEE	1% - one time	10.90
2.	COMMITMENT FEE	0.5% p.a.	10.11
3.	L/C CONFIRMATION CHARGES	2.75% - one time	24.52
4.	L/C COMMISSION	0.15% p.q.	9.36
5.	LENDERS ADVISORS AND PROJECT MONITORING FEES		7.28
	TOTAL FINANCIAL CHARGES		**62.17**

NEPRA is requested to allow the charges (associated with Commitment Fee, L/C commission and other fees associated with the Lenders advisors and project monitoring costs) to be firmed up at the time of EPC stage tariff determination as these fees are dependent on various factors such as market liquidity, country risk, etc. which are beyond the control of the Project Company.

*L/C Confirmation Charges:*Due to the negative credit rating assigned to Pakistan by Standard & Poor's and Moody's and based on experiences with foreign EPC contractors on other similar transactions, it is anticipated that L/C confirmation will be a standard requirement by all potential EPC contractors. The rate for L/C confirmation being quoted on similar transactions varies between 2% – 4.5% based on the duration of the L/C. The rate used for the purpose of this Petition is 2.75%, however, the same is subject to change as the rate is dependent on the risk assessment associated with Pakistan at the time the

L/C is opened. Therefore, NEPRA is requested to allow adjustment of the same at actual at the time of COD stage tariff determination.

Sinosure is China's official export credit insurance agency, offering export credit and credit insurance. Sinosureinsures both China's overseas investments and overseas investments into China, and guarantees both investment into debt and equity.

Investment insurance is intended to provide the insured with risk guarantee when they suffer economic losses because of war, currency exchange ban, requisition, or breach of contract by the government in countries where the insured have made investments. It is designed to support and promote Chinese companies and financial organizations.

According to the requirement of the Chinese government, state-owned enterprises such as CTGPC, undertaking overseas investments are required to acquire insurance from Sinosure; similarly loans arranged from Chinese Banks(such as in the case of this Project) will need to be covered under the Sinosure insurance. Due to the current social and economic scenario prevalent in Pakistan, the current rate for arrangement of Sinosure insurance for both debt and equity investments is 1.20% per annum. The fee charged shall apply throughout the Project life i.e. during construction as well as operations phase of the Project.

The Interest During Construction (the IDC) has been calculated on the terms anticipated to be offered by international financial institutions and banks to the Project Company. For the purpose of this Tariff Petition a base rate equal to 6-month LIBOR plus a margin of 475 basis points has been assumed in line with the Feasibility Study. Actual IDC, however, shall be subject to change depending on the fluctuations in base rate (6-month LIBOR), funding requirement (draw-downs) of the Project during the construction period, changes in Project Cost including changes due to Re-Openers, Taxes and Duties, and variations in PKR / USD exchange rate.

The margin of 475 basis points is considered to be reasonable given (i) current financial situation in the international markets which are currently facing a liquidity crunch, (ii) Pakistan's security situation, due to which international lenders shall require a premium for taking on the additional risk of investing in Pakistan, and (iii) Pakistan's credit ratings which have deteriorated significantly during the past year.

Furthermore, NEPRA in its recent determination for another hydropower project, for which LIBOR based financing was arranged through international development financial institutions has already allowed a margin of 475 basis points.

A more appropriate estimation of IDC is expected at the time of submission of application for tariff determination after execution of the EPC contract for the

development of the Project at which time financing arrangements will be near completion with term sheets in place.

BASIS FOR IDC CALCULATIONS	IN PERCENTAGE
LIBOR	0.71%
SPREAD	4.75%
TOTAL INTEREST RATE	**5.46%**

The Project Cost is envisaged to be funded on the basis of a Debt: Equity ratio of 80:20, however, this shall be firmed up once the term sheet for arrangement of debt financing has been finalized; details of the term sheet shall be provided to NEPRA at the time of EPC stage tariff determination. For the purpose of this Petition, a debt: equity ratio of 80:20 has been assumed, thereby resulting in the following debt and equity injections for the Project:

	MILLION USD
DEBT	1,139.50
EQUITY	284.87
TOTAL PROJECT COST	1,424.38

As detailed under Section 5.2.11 (*Financing* Charges), it is anticipated that the equity of the Project shall be subscribed to by a number of equity investors as the amount of equity cannot be injected by a single sponsor.

The Return on Equity (**ROE**), Return on Equity during Construction (**ROE-DC**)and Equity Redemption (**ER**) has been estimated separately and the same are provided under Section 7.1 (*Reference Generation Tariff*). The ER component has been requested due to the Build-Own-Operate-Transfer (BOOT) structure of the Project.

In the past NEPRA has allowed thermal/ conventional power producers an internal rate of return (**IRR**) of 15.00%. However, since the Project is based on energy production through hydropower (renewable sources), a sector in its infancy for private investors, in Pakistan, the Project Company is proposing a return on invested Equity of 20.00% (IRR), net of 7.5% withholding tax on dividends.

Detailed basis for the Project Company's submission are provided below:

i) *Required Rate of Return for Equity Investments in Pakistan – Damodaran Model*

An internationally acceptable method for calculating the required rate of return on equity investments is employing the theories and practical approach developed by AswathDamodaran – a leading name and authority in the world in the calculation of country risk premiums.

According to Mr. Damodaran, the long-term country risk premium for a country is calculated by:

(I) estimating the default spread for the credit rating assigned (by either Standard and Poor's or Moody's) to the country over a default free government bond;

(II) the estimated default spread is multiplied with an equity market volatility factor – defined as the standard deviation of the country's equity market divided by the standard deviation of the country's bond. The resulting number is known as the country risk premium; and

(III) the return from a mature equity market is added to the country risk premium to compensate the investor for the return that could potentially be earned by making an investment in a mature equity market without taking the unnecessary additional country risk.

Mr. Damodaran estimates Pakistan's "Default Spread"(the **DS**) to be 650 basis points (Source: Damodaran Online - http://pages.stern.nyu.edu/~adamodar/New_Home_Page/datafile/ctryprem.html).

In order to estimate the "Country Risk Premium" for Pakistan, the local "Equity Market Volatility" ("**EMV**") (as explained above) was calculated. EMV is based on the standard deviation ("**SD**") of the local equity market and internationally traded Pakistani bonds. For calculating SD of internationally traded Pakistani bonds, data for two (2) Government of Pakistan's internationally traded 10-year bonds (maturing in 2016 and 2017) has been used. Similarly, for calculating SD of local equity market, data from KSE100 index between the periods matching the term of the bonds has been used. Results of the calculations are given below:

	KSE 100		Bonds Maturing in	
	2006 to date*	**2007 to date****	**2016**	**2017**
SD	0.017442485	0.018388736	0.006328726	0.007244507
EMV (relevant SD of KSE100/SD of Bonds)			2.756081366	2.5383
Risk Premium (EMV x ADS)			17.91%	16.50%
*Total Required Rate of Return (Equity)****			22.41%	21.00%
Average Required Rate of Return			**21.71%**	

* Estimated from May 19, 2006 i.e. from the date of issuance of the GoP bonds maturing in 2016;

** Estimated from Aug 22, 2007 i.e. from the date of issuance of the GoP bonds maturing in 2017;

*** The total required rate of return (equity) is estimated by adding a mature market (equity) premium of 4.5% as determined by Mr. Damodaran (reference: extract of text from Mr. Damodaran's web-site).

The above result implies that the minimum rate of return necessary to compensate an equity investor for investing into Pakistan's equity market should be 21.71%.

In light of the above, the Project Company's request for a 20% IRR on the Equity of the Project (which has a long gestation period of 4 years and an investment horizon of 50 years (a long gestation period and investment horizon increases the risk profile of the Project)), is extremely reasonable. Any theory of financial analysis would support the Project Company's submission and the above stated proposition and therefore it is submitted before NEPRA that the IRR of at least 20% (net of 7.5% withholding tax on dividends) be allowed so as to attract equity investment in the country's hydropower sector.

ii) *Risk Profile of Hydropower Projects*

Return on Equity is a means of compensating the Sponsors for investing equity capital into a Project. It is based on two factors, (i) the cost of capital, and (ii) the perception of risks associated with the Project. Where the project is structured in a manner that passes most of risks outside the control of the sponsor to the Power Purchaser or the GOP, and where the legal, regulatory and institutional environment ensures the contractual rights of project financiers, the sponsor can accept lower equity returns, even as low as 17%. In contrast, a hydropower project is high-risk given (a) the long (3 years development period + 4 year construction period) gestation; (b) the large amount of financing required for

completion together with the fact that the civil works amount to over 60% of project costs; (c) high degree of engineering involved; (d) uncertainity of construction floods (high dependancy on weather conditions); (e) possibility of unforseen eventualities; (f) project like hydropower projects would probably not attract equity investors at all, or the investors willdemand returns higher than 25% percent a year. The actual returns on equity lie between these two extremes (i.e. between 17% to 25%), generally averaging around 21% percent a year.

Furthermore, given the high equity requirement of the Project, the risk of the slightest delay in the Project can have a detrimental impact on the Project returns; an IRR of 17% (net of taxes) is not commensurate with the risk identified and borne by the equity investors of hydropower projects.

In summary, the risks associated with development of hydropower projects are higher than those associated with other types of renewable energy projects due to the following reasons:

a) Longer construction period – wind power projects require construction period ranging between 12-18 months whereas a typical hydropower project requires a construction period of around 48 months;

b) Wind projects can be implemented using modular approach (like adding 10MW every year) this helps to reduce the project risk profile this approach cannot be adopted for development of hydropower projects;

c) Project size – as noted above, the sheer size of a hydropower project such as this increases the associated risks dramatically;

d) The economic return to the Pakisan economy is much higher by the construction of a hydropower project as compared to the coressponding economic return associated with wind power projects, as a hydropower project comparatively uses local materials and labor far more extensively. Accordingly, a higher return is in order to motivate and encourage investments in hydropower projects.

iii) *Security Issues*

Over the last three years the security situation in Pakistan has been quite unpredictable and has generally deteriorated. The security threats in the country have had an adverse impact both on the economy and on the cost of doing business in Pakistan. Most of the thermal IPPs being constructed under the Power Generation Policy 2002 have had to face the repercussions of the deteriorating security situation in one way or the other. In particular, foreign contractors and consultants have had travel advisories and restrictions prohibiting travel to Pakistan, thereby causing significant delays in project implementation. In order to

compensate for increased political risk and security issues, coupled with ongoing economic uncertainties (e.g. circular debt), an increase in the required rate of return to 20% IRR is fully justified.

The Project Company respectfully requests a special tariff component, as has been allowed to other hydropower projects in the past, against Return on Equity for the Project during the development period.The development period should commence from the date of signing of the Power Purchase Agreement.

We understand that the same has been approved for other hydropower projects through an amendment in the Policy subsequent to a decision of ECC dated July 28, 2009.

The key issues in arranging the financing of private sector hydropower projects are bankability andaffordability. Although the operating costs of hydropower projects are reasonable(when compared to other conventional fossil fuel fired power projects) and the project lifealmost thrice as long, as of conventional thermal power plants. Thereare multiple cost-related factors that make hydropower projects difficult to financeon a private basis, particularly when compared to thermal projects. The security issues and uncertainties outlined above also make conventional debt finance difficult to secure for such projects.

The debt portion of the Project's financing (US$ 1,139.50 million) need to be funded by multiple sources including international development financial institutions, multilateral/bilateral banks, export credit agencies, and foreign and local commercial banks. In particular, obtaining debt finance from international institutions is difficult and is subject to the highest standards of due diligence. In short, obtaining debt finance for this Project from these sources will require extraordinary effort.

For the purpose of the tariff petition, it has been assumed that debt finance shall be sourced through LIBOR based financing sources. However, it is reasonable to anticipate the arrangement of a portion of such debt finance through EURIBOR and KIBOR based financing sources.

6. OPERATIONS COST

The operational cost of the Project Company comprises of the operations and maintenance cost and the cost of the operational period insurances to be taken out by the Project Company. Break-up of the same is provided hereunder:

	USD IN MILLION (PER ANNUM) YEAR 1-12 (AVERAGE)	USD IN MILLION (PER ANNUM) YEAR 13-50 (AVERAGE)
FIXED O&M		
O&M COST	4.00	4.00
OWNER'S STAFF COST	5.50	5.50
OTHER FIXED COST	4.00	4.00
INSURANCE COST	16.96	16.96
INTEREST ON WC FACILITY	5.10	3.43
FINANCIAL CHARGES	0.48	0.00
SINOSURE FEE	10.60	3.42
VARIABLE O&M		
VARIABLE OPERATIONS COST	9.50	9.50
WATER USE CHARGE	6.38	6.38
TOTAL FIXED AND VARIABLE OPERATING COST	***62.52***	***53.19***

It is pertinent to mention here that the **operations cost of the Project is 1.67% of the Project cost**, which is below the operations cost allowed by NEPRA to other hydropower projects where an operations cost of up to 2% of Project cost has been allowed.

The O&M Cost includes the fixed fee payable to the O&M operator for carrying out the regular operations and maintenance services of the Project of which 50% is usually borne in local currency and the remaining 50% is paid in foreign currency. This includes the costs associated with routine and preventive maintenance services to be performed by the

O&M operator as well as the administrative costs associated with provision of the O&M services.

This includes the costs related to salaries and benefits of all staff (administrative, operational and security) employed by the Project Company at the Site, and Head Office. The security requirements for the Project have been determined keeping in view the total area of the Project site (including dam and reservoir area), recent deterioration in the security situation in Pakistan and specifically the situation that prevailed during the last year in the northern areas of Pakistan.

The Other Fixed Cost component identified above includes costs associated with:

- provision for major overhaul of the hydropower plant. Every plant needs a major overhaul. Frequency of major overhauls and its timing depends on the hydrology, sedimentation and no of hours of normal operation. The cost of major overhaul varies from 7% to 15% of the equipment cost. The estimated cost for conducting the major overhaul has been amortized over the Project life in order to ensure that adequate funding is available to perform the required maintenance activities.

- acquisition of fixed assets required for the Project and their subsequent replacement in accordance with generally accepted accounting principles (as applied in Pakistan) pertaining to depreciation of fixed assets. These assets include, but are not limited to:

    - Vehicles required at Site;
    - Tools and inspection equipment for assessment of the hydro-mechanical and electrical equipment;
    - Tools for measuring, recording, and analyzing hydrological data; and
    - Furniture and fixtures required for the offices to be maintained at Site andat the head office in Islamabad.

- various administrative costs such as:

    - rents and utilities,
    - travelling,
    - audit and other legal and technical fees.
    - phone and broadband bills including requirement for maintaining satellite connectivity to National Power Control Center in Islamabad,

- printing and stationery,
- entertainment expenses,
- generation license and other regulatory fees,
- provision for maintenance of reserve fund in accordance with the requirements of the PPA.
- agency and security trustee and other fees payable to the Lenders; and
- costs of Lenders' legal and technical advisors during the debt repayment period.

- the running and maintenance of vehicles at the Islamabad and Site offices of the Project Company. The vehicles include:

  - the vehicles required by the security personnel for securing the Site; and
  - vehicles required for office use at the Islamabad office.

The insurance cost component consists of all-risk insurance/reinsurance for the Project, as well as business-interruption insurance (which is a lender-stipulated requirement). As machinery breakdown, natural calamities (such as earthquakes), sabotage and consequential business interruption are the biggest threat to the Project and the Project Company, it is imperative that all aspects of the risk are covered adequately and no compromise is made in this respect. As is the common practice in project financing throughout the world, a comprehensive operational insurance and reinsurance arrangement is fundamental for the bankability of the Project.

The insurance expense for the Project during its operational phase is expected to be denominated in foreign currency i.e. United States Dollars. The rationale for such assumed foreign currency cost structure is as follows:

a) Pakistan's insurance & reinsurance industry does not have sufficient capacity and expertise to manage the operational risks of the Project, entirely on their own. As a result, the local industry normally retains only about 5% to 10% of the risk while 90% to 95% is reinsured abroad. Considering that the reinsurance abroad forms a major part of the insurance cost, it is submitted that NEPRA approves the Project's insurance costs in United States Dollars, as has been the practice in NEPRA's determinations for thermal IPPs;

b) Lenders financing the Project will require insurance of the Project's assets on a replacement cost basis, which will inevitably be in foreign currency. In view of the Project's EPC Cost being denominated in United States Dollars, it is expected that any replacement costs resulting from an insurable event will be incurred in United States Dollars.

The operational phase insurance costs have been calculated at 1.50% of the EPC Cost. In light of NEPRA's determinations for other IPPs, it is submitted that an insurance cost of 1.35% of the EPC Cost is not sufficient for a hydropower project due to the total area of the Project site (which includes the dam and resorvoir area) that would need to be insured. Furthermore, as the debt financing to be arranged for the Project is anticipated to be sourced majorly through foreign lenders and keeping in view the recent deterioration in local law and order situation, the Project Company would be required to maintain terrorisim insurance during the life of the Project.

Therefore, it is hereby submitted to NEPRA, to approve and allow the operational insurance costs up to 1.50% of the EPC Cost provided that such costs will be charged by the Project Company at actual and will be recoverable as the Insurance Cost component.

The Project Company, in view of the practices set by other IPPs in Pakistan and in accordance with the requirements anticipated to be set out by the lenders, proposes to procure the following insurances during the operational phase of the Project:

a) Property Damage Insurance;

b) Comprehensive Machinery Insurance;

c) Business Interruption Insurance; and

d) Terrorism Insurance.

Pursuant to the terms of the PPA to be executed between the Project Company and the Power Purchaser, the Project Company will invoice the Power Purchaser for the settlement of the amount due for capacity payment and against the energy delivered on or after the first day of the month following the month in which the energy has been delivered and thereafter on a monthly basis. The Power Purchaser is required to make the payment of the same by the thirtieth day following the day of submission of the invoice i.e. 31st day. Furthermore, the Project Company is required to collect sales tax from the Power Purchaser on behalf of the Government of Pakistan and deposit the same by the 25th day of the month to which it relates. As a result of this contractual requirement in the PPA there is a negative cash flow, which can only be met by obtaining a working capital facility. Working capital requirement associated with sales tax has been determined at the rate of 17% based on prevailing rates. However, keeping in view the changes taking place in the rate of applicable Sales Tax, it is requested that the Project be allowed a one-time indexation at the time of COD for true-up of applicable sales tax based on the prevailing rate of Sales Tax.

Furthermore, keeping in view local power sector practices, it is anticipated that the O&M operator shall require the Project to make payments for acquisition of O&M services, on

a monthly basis in advance. In this case the O&M operator shall invoice the Project on or after the first day of the month preceding the month to which the invoice relates. The proposed working capital facility will be used to make such payments.

The Project shall also be required to maintain adequate levels of stores and spares in order to ensure timely availability of long-lead items that might be required to maintain continued operation of the plant while minimizing downtime due to unforeseen outages. The proposed working capital facility will be used to purchase such stores and spares.

Additionally, the working capital facility shall also be required to sustain the administrative and payroll expenses, which shall fall due on the last day of each calendar month. As explained earlier, payment for the same shall be received within 30 days from the Power Purchaser.

Due to this mismatch in the timing of cash flows (accounts receivable and accounts payable), the Project Company will require a working capital facility to the tune of US$ 34.71 million (PKR 2,776.66 million) in order to meet its payment obligations on time.

The Project Company is confident that it will be able to obtain the working capital facility on the following terms:

	IN PERCENTAGE
BASE RATE FOR WORKING CAPITAL FACILITY – 6-MONTH KIBOR	12.40%
MARGIN OVER BASE RATE	2.50%
ALL-IN INTEREST RATE	**14.90%**

The above assumptions regarding the working capital facility rate have been used to estimate the Working Capital component of the Reference Generation Tariff.

Internationally as well as locally, infrastructure projects such as this Project are typically financed through an arrangement termed as Project Financing. The lenders for such projects determine the viability of such projects based upon the projected cash flows of the project rather than the balance sheets of the project sponsors. Usually, a project financing structure involves a number of equity investors, as well as a syndicate of banks and financial institutions that provide loans for the project. Such loans are most commonly non-recourse loans, which are secured by the project assets and paid entirely from project cash flow, rather than from the general assets or creditworthiness of the project sponsors - a decision in part supported by financial modeling. The financing is typically secured by all of the project assets, including the revenue-producing contracts.

Project lenders are given a lien on all of these assets and contracts, and are able to assume control of a project if the project company has difficulties complying with the loan terms.

Generally, a special purpose entity (the Project Company) is created for each project, thereby shielding other assets owned by a project sponsor from the detrimental effects of a project failure. As a special purpose entity, the project company has no assets other than the project. Capital contribution commitments by the owners of the project company are sometimes necessary to ensure that the project is financially sound.

The mechanism of arrangement of Project Financing, described above, is the theme behind the Policy developed by the GOP for inviting interest of the private sector towards power generation. Arrangement of conventional financing would expose the sponsors to unnecessary risks, as it would provide the lenders an opportunity to obtain recourse towards other assets of the sponsors.

The debt to be arranged by the Sponsors of the Project Companyis to be structured as a project financing transaction, under which the cash flows of the Project during the debt repayment period shall be appropriated based on a waterfall which is usually applied by lendersi.e. the monthly revenues earned by the Project shall be applied in the order of precedence specified below:

- Payment of interest and principal due for the month shall be secured by the Lenders in a Debt Payment Account;
- Payment of maintenance reserve in accordance with the PPA shall be secured by the Lenders in a Maintenance Reserve Account;
- Payments to be made for operating expenditure shall flow through the Project – the same shall be immediately paid to the relevant creditors i.e. O&M contractor, staff salaries, etc; and
- The payment against ROE and ROE-DC shall be utilized by the Lenders to fund the Debt Service Reserve Account (DSRA).

DSRA is maintained by the Lenders in Project Financing transactions as a means to secure the debt service due immediately after the next debt repayment date. The DSRA provides the Lenders with adequate time to take over the Project in case of default by the Project Company.

The two options available for funding the DSRA are provided below:

- through cash – there are two further sub-options in case this method of funding is chosen by the Lenders (i) Upfront funding – funding through equity injection by the Sponsors at the time of COD, or (ii) funding through diversion of ROE and ROE-DC cash flows into a DSRA account. In either scenario, the Sponsors of the Project are unable to avail any return on the amount retained by the Lenders to fulfill the DSRA requirement; or
- through L/C – the Sponsors provide an L/C equivalent to the amount required for funding the DSRA requirement; L/C charges are borne by the Project Company.

The Sponsors and their Financial Consultants are of the view that the Lenders may be willing to accept securing the DSRA through an L/C. The cost associated with the L/C to be provided to the Lenders for securing the DSRA has been catered for under this account.

If the cost of such L/C is not allowed to the Project Compay, the same would result in a reduction of the Sponsors IRR, which **defies the basic theme behind the Policy**, that was developed in order to attract private investment into the power sector.

In this regard, the NEPRA Rules, clearly state that the:

"tariffs should allow licensees a rate of return which promotes continued reasonable investment..."

and

"tariffs should generally be calculated by including a depreciation charge and a rate of return on the capital investment of each licensee commensurate to that earned by other investments of comparable risk"

Furthermore, NEPRA Rules clearly stipulate that the:

"tariffs should, to the extent feasible, reflect the full cost of service to consumer groups with similar service requirements"

It is therefore, respectfully submitted that the Project Company be allowed to claim the said L/C charges for fulfilling the DSRA funding requirement of the Lenders along with the costs for maintaining a working capital facility (as detailed in Section 6.6). It is pertinent to mention that NEPRA has in the past allowed projects, for which debt is anticipated to be funded through various IFI's such as US Exim Bank, IFC, ADB, ECA's, and other multilaterals and bilaterals the interest charged on working capital facility and DSRA L/C. The decision of NEPRA in the case of AES Pakistan (Pvt.) Ltd. with regards to the request by AES for arrangement of working capital facility and DSRA L/C is reproduced below:

"...The Authority has, however, in the cases of other IPPs who obtained funds from accredited IFIs and not from commercial banks allowed other financial charges such as DSRA L/C charges and agency fees, etc. The Authority, in the instant case, keeping in view the size of the project and funding required, understands that the Petitioner will have to obtain funding from IFIs such as US Exim Bank and IFC, etc. In view thereof, the Authority has decided to accept the Petitioner's request, subject to provision of verifiable documentary evidence."

Taking into account the decision taken by NEPRA in the determination awarded to AES, and the similarity between the AES project and the Project with regards to the size of

debt funding to be arranged it is reasonable for the Project Company to request for the costs to be incurred on account of interest on working capital facility and DSRA L/C to be allowed to the Project Company against provision of actual documentary evidence.

Alternatively, the Project shall be forced to fund the DSRA through cash (on an 80:20 debt: equity basis) which will result in an increase in total project cost of the Project. This increase in equity will ultimately result in a higher tariff which will be to the deteriment of consumers.

As explained in Section 5.2.12 (*Sinosure Fee*) above, it is a requirement for state-owned Chinese enterprises to obtain Sinosure insurance for all investments made overseas. Therefore, Sinosure Fee @ 1.2% per annum of the outstanding debt, immediately succeeding interest payment and equity will be payable by the Project during the life of the Project.

The Variable Operating Cost has been calculated on the average annual net energy generation of 3,401.8 GWh (based on the hydrological data available for Jhelum river) of which 50% shall be in foreign currency and the remaining 50% shall be in PKR. This component caters for the following costs to be incurred by the Project:

a) O&M of plant during a period of abnormal hydrology andsedimentation pattern; these are beyond the scope of O&M operators.Abnormal patterns of hydrology and sedimentation are dependent on abnormal pattern of monsoon.

b) The water head is being created by storage of water in the river gorge (witha height of up to 120 meters). The storage area shall be spread over 18 km upstreamof the dam. Stabilization of the storage walls of the river are a veryimportant factor and cannot be ignored. Repair and maintenance ofthe storage walls and allied civil structures will be part of the scope of work of the O&M operator.

c) costs associated with maintenance requirements that result from operation of the plant. Consumption of lubricants, chemicals, etc. is also included in this component.

The Policy states that:

"The Water Use Charge will be paid by the Generation Company to the Provincial /AJKGovernment for use of water by the power project to generate electricity. The Water Use Chargeper kWh will be fixed at the rate of Rs.0.15/kWh."

The cost of US$ 6.38 million (PKR 510.40 million) requested by the Project Company has been determined based on the Project's estimated annual energy production of 3,401 GWh. This charge shall be payable to the Government of Punjab under the Water Use Agreement to be executed between the Project and the Government of Punjab.

In order to ensure smooth operation of hydropower projects for the entire project life i.e. 50 years, it is standard practice in China to have a novation program in place whereby all electrical and mechanical equipment is replaced within 30 ~ 40 years (standard life span of electrical / mechanical equipment).

The novation cost was not considered as part of the operation & maintenance for the purpose of the Feasibility Study developed for this Project. However, based on the Main Sponsors extensive experience in development and operation & maintenance of large hydropower projects, CTGPC is certain that some of the major electrical and mechanical equipment will need to be replaced during the life of the Project.While this has not been considered as part of the Feasibility Study, the Projectwould request NEPRA to allow such costs to be treated as a pass-through under the tariff in case these are incurred.

7. Reference Generation Tariff and Debt Schedule

Year	Water Use Charge (PKR/kwh)	Variable O&M (PKR/kWh)		Energy Charge (PKR/kWh)	Fixed O&M (PKR/kW/Month)		Insurance (PKR/kW/Month)	Return on Equity (PKR/kW/Month)	Return on Equity - DC (PKR/kW/Month)	WHT on ROE & ROE-DC (PKR/kW/Month)	Equity Redemption (PKR/kW/Month)	Sinosure Fee (PKR/kW/Month)	Debt (PKR/kW/Month)		Capacity Charge (PKR/kW/Month)	Total Tariff (PKR/kWh)
		Local	Foreign		Local	Foreign							Principal	Interest		
1	0.15	0.11	0.11	0.27	115.39	62.12	158.60	532.94	245.86	62.15	-	155.20	845.12	572.15	2,557.84	6.60
2	0.15	0.11	0.11	0.27	115.28	62.12	158.60	532.94	245.86	62.15	-	148.65	895.04	527.24	2,549.05	6.75
3	0.15	0.11	0.11	0.27	115.17	62.12	158.60	532.94	245.86	62.15	-	127.53	722.95	439.00	2,540.66	6.75
4	0.15	0.11	0.11	0.27	115.06	62.12	158.60	532.94	245.86	62.15	-	126.52	762.97	456.31	2,530.64	6.74
5	0.15	0.11	0.11	0.27	114.93	62.12	158.60	532.94	245.86	62.15	-	112.50	695.20	417.08	2,520.42	6.71
6	0.15	0.11	0.11	0.27	115.30	62.12	158.60	532.94	245.86	62.15	-	108.12	849.76	372.52	2,509.87	6.68
7	0.15	0.11	0.11	0.27	115.67	62.12	158.60	532.94	245.86	62.15	-	97.08	696.75	326.45	2,498.88	6.66
8	0.15	0.11	0.11	0.27	115.62	62.12	158.60	532.94	245.86	62.15	-	85.75	945.42	279.86	2,486.86	6.63
9	0.15	0.11	0.11	0.27	115.27	62.12	158.60	532.94	245.86	62.15	-	73.07	998.80	233.48	2,474.39	6.60
10	0.15	0.11	0.11	0.27	115.21	62.12	158.60	532.94	245.86	62.15	-	60.27	1,105.01	186.22	2,461.53	6.61
11	0.15	0.11	0.11	0.27	115.04	62.12	158.60	532.94	245.86	62.15	-	46.35	1,112.42	139.86	2,447.94	6.62
12	0.15	0.11	0.11	0.27	103.91	62.12	158.60	532.94	245.86	62.15	-	31.97	1,172.93	46.56	2,427.84	6.48
13	0.15	0.11	0.11	0.27	95.62	62.12	158.60	532.94	245.86	62.15	70.12	31.97	0.00	0.00	1,261.39	2.55
14	0.15	0.11	0.11	0.27	95.62	62.12	158.60	532.94	245.86	62.15	70.12	31.97	-	-	1,261.39	2.55
15	0.15	0.11	0.11	0.27	95.62	62.12	158.60	532.94	245.86	62.15	70.12	31.97	-	-	1,261.39	2.55
16	0.15	0.11	0.11	0.27	95.62	62.12	158.60	532.94	245.86	62.15	70.12	31.97	-	-	1,261.39	2.55
17	0.15	0.11	0.11	0.27	95.62	62.12	158.60	532.94	245.86	62.15	70.12	31.97	-	-	1,261.39	2.55
18	0.15	0.11	0.11	0.27	95.62	62.12	158.60	532.94	245.86	62.15	70.12	31.97	-	-	1,261.39	2.55
19	0.15	0.11	0.11	0.27	95.62	62.12	158.60	532.94	245.86	62.15	70.12	31.97	-	-	1,261.39	2.55
20	0.15	0.11	0.11	0.27	95.62	62.12	158.60	532.94	245.86	62.15	70.12	31.97	-	-	1,261.39	2.55
21	0.15	0.11	0.11	0.27	95.62	62.12	158.60	532.94	245.86	62.15	70.12	31.97	-	-	1,261.39	2.55
22	0.15	0.11	0.11	0.27	95.62	62.12	158.60	532.94	245.86	62.15	70.12	31.97	-	-	1,261.39	2.55
23	0.15	0.11	0.11	0.27	95.62	62.12	158.60	532.94	245.86	62.15	70.12	31.97	-	-	1,261.39	2.55
24	0.15	0.11	0.11	0.27	95.62	62.12	158.60	532.94	245.86	62.15	70.12	31.97	-	-	1,261.39	2.55
25	0.15	0.11	0.11	0.27	95.62	62.12	158.60	532.94	245.86	62.15	70.12	31.97	-	-	1,261.39	2.55
26	0.15	0.11	0.11	0.27	95.62	62.12	158.60	532.94	245.86	62.15	70.12	31.97	-	-	1,261.39	2.55
27	0.15	0.11	0.11	0.27	95.62	62.12	158.60	532.94	245.86	62.15	70.12	31.97	-	-	1,261.39	2.55
28	0.15	0.11	0.11	0.27	95.62	62.12	158.60	532.94	245.86	62.15	70.12	31.97	-	-	1,261.39	2.55
29	0.15	0.11	0.11	0.27	95.62	62.12	158.60	532.94	245.86	62.15	70.12	31.97	-	-	1,261.39	2.55
30	0.15	0.11	0.11	0.27	97.51	62.12	158.60	532.94	245.86	62.15	70.12	31.97	-	-	1,263.28	2.52
31	0.15	0.11	0.11	0.27	95.62	62.12	158.60	532.94	245.86	62.15	70.12	31.97	-	-	1,261.39	2.55
32	0.15	0.11	0.11	0.27	95.62	62.12	158.60	532.94	245.86	62.15	70.12	31.97	-	-	1,261.39	2.55
33	0.15	0.11	0.11	0.27	95.62	62.12	158.60	532.94	245.86	62.15	70.12	31.97	-	-	1,261.39	2.55
34	0.15	0.11	0.11	0.27	95.62	62.12	158.60	532.94	245.86	62.15	70.12	31.97	-	-	1,261.39	2.55
35	0.15	0.11	0.11	0.27	95.62	62.12	158.60	532.94	245.86	62.15	70.12	31.97	-	-	1,261.39	2.55
36	0.15	0.11	0.11	0.27	95.62	62.12	158.60	532.94	245.86	62.15	70.12	31.97	-	-	1,261.39	2.55
37	0.15	0.11	0.11	0.27	95.62	62.12	158.60	532.94	245.86	62.15	70.12	31.97	-	-	1,261.39	2.55
38	0.15	0.11	0.11	0.27	95.62	62.12	158.60	532.94	245.86	62.15	70.12	31.97	-	-	1,261.39	2.55
39	0.15	0.11	0.11	0.27	95.62	62.12	158.60	532.94	245.86	62.15	70.12	31.97	-	-	1,261.39	2.55
40	0.15	0.11	0.11	0.27	95.62	62.12	158.60	532.94	245.86	62.15	70.12	31.97	-	-	1,261.39	2.55
41	0.15	0.11	0.11	0.27	95.62	62.12	158.60	532.94	245.86	62.15	70.12	31.97	-	-	1,261.39	2.55
42	0.15	0.11	0.11	0.27	95.62	62.12	158.60	532.94	245.86	62.15	70.12	31.97	-	-	1,261.39	2.55
43	0.15	0.11	0.11	0.27	95.62	62.12	158.60	532.94	245.86	62.15	70.12	31.97	-	-	1,261.39	2.55
44	0.15	0.11	0.11	0.27	95.62	62.12	158.60	532.94	245.86	62.15	70.12	31.97	-	-	1,261.39	2.55
45	0.15	0.11	0.11	0.27	95.62	62.12	158.60	532.94	245.86	62.15	70.12	31.97	-	-	1,261.39	2.55
46	0.15	0.11	0.11	0.27	95.62	62.12	158.60	532.94	245.86	62.15	70.12	31.97	-	-	1,261.39	2.55
47	0.15	0.11	0.11	0.27	95.62	62.12	158.60	532.94	245.86	62.15	70.12	31.97	-	-	1,261.39	2.55
48	0.15	0.11	0.11	0.27	95.62	62.12	158.60	532.94	245.86	62.15	70.12	31.97	-	-	1,261.39	2.55
49	0.15	0.11	0.11	0.27	95.62	62.12	158.60	532.94	245.86	62.15	70.12	31.97	-	-	1,261.39	2.55
50	0.15	0.11	0.11	0.273	97.51	62.12	158.60	532.94	245.86	62.15	70.12	31.97	-	-	1,263.28	2.52
Average (1-12)	0.15	0.11	0.11	0.27	115.28	62.12	158.60	532.94	245.86	62.15	-	99.10	888.13	334.15	2,500.24	5.66
Average (1-50)	0.15	0.11	0.11	0.27	100.02	62.12	158.60	532.94	245.86	62.15	53.26	48.08	212.15	60.20	1,556.41	4.29
Levelized (1-50)	0.15	0.12	0.117	0.25	114.96	66.40	166.61	560.52	258.59	66.41	23.07	91.02	604.21	279.24	2,231.23	6.00
		US Cents / kWh								US Cents / kW / Month						US Cents / kWh
Levelized (1-50)	0.20	0.15	0.15	0.49	143.71	82.00	208.51	700.66	323.23	83.02	28.52	113.77	755.26	348.05	2,789.03	7.50

Repayment Period	Principal Repayment (PKR)	Principal Repayment Component of Tariff (PKR / kW / Month)	Interest on Outstanding Debt (PKR)	Interest on Oustanding Debt Component of Tariff (PKR / kW / Month)	Total Installment (PKR)	Debt Servicing Component of Tariff (PKR / kW / Month)
1	2,738,763,379	320.19	2,488,681,076	290.95	5,227,444,454	611.14
2	2,813,531,619	328.93	2,413,912,835	282.21	5,227,444,454	611.14
3	2,890,341,032	337.91	2,337,103,422	273.23	5,227,444,454	611.14
4	2,969,247,342	347.13	2,258,197,112	264.01	5,227,444,454	611.14
5	3,050,307,795	356.61	2,177,136,660	254.53	5,227,444,454	611.14
6	3,133,581,197	366.35	2,093,863,257	244.79	5,227,444,454	611.14
7	3,219,127,964	376.35	2,008,316,490	234.79	5,227,444,454	611.14
8	3,307,010,157	386.62	1,920,434,297	224.52	5,227,444,454	611.14
9	3,397,291,535	397.18	1,830,152,919	213.96	5,227,444,454	611.14
10	3,490,037,594	408.02	1,737,406,861	203.12	5,227,444,454	611.14
11	3,585,315,620	419.16	1,642,128,834	191.98	5,227,444,454	611.14
12	3,683,194,736	430.60	1,544,249,718	180.54	5,227,444,454	611.14
13	3,783,745,953	442.36	1,443,698,502	168.78	5,227,444,454	611.14
14	3,887,042,217	454.43	1,340,402,237	156.71	5,227,444,454	611.14
15	3,993,158,470	466.84	1,234,285,985	144.30	5,227,444,454	611.14
16	4,102,171,696	479.58	1,125,272,758	131.56	5,227,444,454	611.14
17	4,214,160,983	492.68	1,013,283,471	118.46	5,227,444,454	611.14
18	4,329,207,578	506.13	898,236,876	105.01	5,227,444,454	611.14
19	4,447,394,945	519.94	780,049,509	91.20	5,227,444,454	611.14
20	4,568,808,827	534.14	658,635,627	77.00	5,227,444,454	611.14
21	4,693,537,308	548.72	533,907,146	62.42	5,227,444,454	611.14
22	4,821,670,876	563.70	405,773,578	47.44	5,227,444,454	611.14
23	4,953,302,491	579.09	274,141,963	32.05	5,227,444,454	611.14
24	5,088,527,649	594.90	138,916,805	16.24	5,227,444,454	611.14

NEPRA is requested to allow indexation for the various Reference Generation Tariff components in the following manner.

The Reference Foreign Variable O&M Cost Component of the Variable O&M Cost shall be quarterly indexed to both:

(a) the USD/PKR exchange rate, based on the revised TT & OD selling rate of USD as notified by the National Bank of Pakistan; and

(b) US CPI (for all Urban-consumer), as issued by the US Bureau of Labor Statistics.

The applicable formula shall be as follows:

$$\mathbf{VO\&M_{(FRev)} = Relevant\ Reference\ Generation\ Tariff\ Component * (US\ CPI_{(Rev)} / US\ CPI_{(Ref)}) * (FX\ USD_{(Rev)} / FX\ USD_{(Ref)})}$$

Where:

$VO\&M_{(FRev)}$ = the revised Foreign Variable O&M Cost Component applicable for the relevant quarter

$US\ CPI_{(Rev)}$ = the revised US CPI (for all Urban-consumers) for the month prior to the month in which indexation is applicable, as issued by the US Bureau of Labor Statistics

$US\ CPI_{(Ref)}$ = the US CPI (for all Urban-consumers) for the month in which tariff is determined, as issued by the US Bureau of Labor Statistics.

$FX\ USD_{(Rev)}$ = the revised TT & OD selling rate of PKR/USD as on the date on which indexation is applicable, as notified by the National Bank of Pakistan.

$FX\ USD_{(Ref)}$ = TT & OD selling rate of PKR/USD, prevailing on the date of tariff determination as notified by the National Bank of Pakistan

The Reference Local Variable O&M Cost Component of the Variable O&M Cost shall be quarterly indexed to the WPI of manufacturing in Pakistan, as notified by the Federal Bureau of Statistics based on the following formula:

$$\mathbf{VO\&M_{(LRev)} = Relevant\ Reference\ Generation\ Tariff\ Component * (WPI_{(Rev)} / WPI_{(Ref)})}$$

Where:

$VO\&M_{(LRev)}$ = the revised Local Variable O&M Cost Component applicable for the relevant quarter

$WPI_{(Rev)}$ = the revised WPI of manufacturing in Pakistan for the month prior to the month in which indexation is applicable, as notified by the Federal Bureau of Statistics.

$WPI_{(Ref)}$ = the WPI of manufacturing in Pakistan for the month in which tariff is determined, as notified by the Federal Bureau of Statistics.

The Reference Local Fixed O&M Cost Component shall be quarterly indexed to the WPI of manufacturing in Pakistan, as notified by the Federal Bureau of Statistics based on the following formula:

$$\mathbf{LFO\&M_{(LRev)} = Relevant\ Reference\ Generation\ Tariff\ Component * (WPI_{(Rev)} / WPI_{(Ref)})}$$

Where:

$LFO\&M_{(LRev)}$ = the revised Local Fixed O&M Cost Component applicable for the relevant quarter

$WPI_{(Rev)}$ = the revised WPI of manufacturing in Pakistan for the month prior to the month in which indexation is applicable, as notified by the Federal Bureau of Statistics.

$WPI_{(Ref)}$ = the WPI of manufacturing in Pakistan for the month in which tariff is determined, as notified by the Federal Bureau of Statistics.

The Reference Foreign Fixed O&M Cost Component shall be quarterly indexed to both:

(a) the USD/PKR exchange rate, based on the revised TT & OD selling rate of USD notified by the National Bank of Pakistan; and

(b) the US CPI (for all Urban-consumers), issued by the US Bureau of Labor Statistics.

The applicable formula shall be as follows:

$$\mathbf{FO\&M_{(FRev)} = Relevant\ Reference\ Generation\ Tariff\ Component\ *\ (US\ CPI_{(Rev)}/\ US\ CPI_{(Ref)})\ *\ (FX\ USD_{(Rev)}/FX\ USD_{(Ref)})}$$

Where:

$FFO\&M_{(FRev)}$	=	the revised Foreign Fixed O&M Cost Component, applicable for the relevant quarter
$US\ CPI_{(Rev)}$	=	the revised US CPI (for all Urban-consumers) for the month prior to the month in which indexation is applicable, issued by US Bureau of Labor Statistics.
$US\ CPI_{(Ref)}$	=	the US CPI (for all Urban-consumers) for the month in which tariff is determined, as issued by US Bureau of Labor Statistics.
$FX\ USD_{(Rev)}$	=	the revised TT & OD selling rate of PKR/USD as on the date on which indexation is applicable, as notified by the National Bank of Pakistan.
$FX\ USD_{(Ref)}$	=	TT & OD selling rate of PKR/USD, as notified by the National Bank of Pakistan prevailing on the date of tariff determination.

The Reference Insurance Cost Component shall be quarterly indexed to USD/PKR exchange rate, based on the revised TT & OD selling rate of USD notified by the National Bank of Pakistan.

(a) Indexation Formula

The indexation of the Insurance Cost Component shall be based on the following formula:

$$\textbf{Insurance}_{(Rev)} = \textbf{Relevant Reference Generation Tariff Component} * (\textbf{FX USD}_{(Rev)} / \textbf{FX USD}_{(Ref)})$$

Where:

$Insurance_{(Rev)}$ = the revised Insurance Cost Component applicable for the relevant quarter

$FX\ USD_{(Rev)}$= the revised TT & OD selling rate of PKR/USD as on the date on which indexation is applicable, as notified by the National Bank of Pakistan.

$FX\ USD_{(Ref)}$ = TT & OD selling rate of PKR/USD, prevailing on the date of tariff determination as notified by the National Bank of Pakistan

In line with NEPRA's previous determinations for thermal IPPs and the wind IPPs, the ROE, ROE-DC, and ERComponent of the Reference Generation Tariff shall be quarterly indexed to the USD/PKR exchange rate, based on the revised TT & OD selling rate of USD notified by the National Bank of Pakistan.

The applicable formula shall be as follows:

$$\textbf{ROE}_{(Rev)} = \textbf{Relevant Reference Generation Tariff Component}* (\textbf{FX USD}_{(Rev)} / \textbf{FX USD}_{(Ref)})$$

$$\textbf{ROE-DC}_{(Rev)} = \textbf{Relevant Reference Generation Tariff Component}* (\textbf{FX USD}_{(Rev)} / \textbf{FX USD}_{(Ref)})$$

$$\textbf{ER}_{(Rev)} = \textbf{Relevant Reference Generation Tariff Component}* (\textbf{FX USD}_{(Rev)} / \textbf{FX USD}_{(Ref)})$$

Where:

$ROE_{(Rev)}$	=	the revised ROE component applicable for the relevant quarter
$ROE\text{-}DC_{(Rev)}$	=	the revised ROE-DC component applicable for the relevant quarter
$ER_{(Rev)}$	=	the revised ER component applicable for the relevant quarter
$FX\ USD_{(Rev)}$	=	the revised TT & OD selling rate of PKR/USD as on the date on which indexation is applicable, as notified by the National Bank of Pakistan.
$FX\ USD_{(Ref)}$	=	TT & OD selling rate of PKR/USD, prevailing on the date of tariff determination as notified by the National Bank of Pakistan

The Reference Withholding Tax Component shall be quarterly indexed to USD/PKR exchange rate, based on the revised TT & OD selling rate of USD notified by the National Bank of Pakistan.

The applicable formula shall be as follows:

$$\mathbf{WHT_{(Rev)} = Relevant\ Reference\ Generation\ Tariff\ Component * (FX\ USD_{(Rev)} / FX\ USD_{(Ref)})}$$

Where:

$WHT_{(Rev)}$ =	the revised Withholding Tax Component applicable for the relevant quarter
$FX\ USD_{(Rev)}$=	the revised TT & OD selling rate of PKR/USD as on the date on which indexation is applicable, as notified by the National Bank of Pakistan.
$FX\ USD_{(Ref)}$ =	TT & OD selling rate of PKR/USD, prevailing on the date of tariff determination as notified by the National Bank of Pakistan

The Reference Water Use Charge Cost Component shall be quarterly indexed to the WPI of manufacturing in Pakistan, as notified by the Federal Bureau of Statistics based on the following formula:

$$\mathbf{WUC_{(LRev)} = Relevant\ Reference\ Generation\ Tariff\ Component * (WPI_{(Rev)} / WPI_{(Ref)})}$$

Where:

$WUC_{(Rev)}$	=	the revised Water Use Charge Cost Component applicable for the relevant quarter
$WPI_{(Rev)}$	=	the revised WPI of manufacturing in Pakistan for the month prior to the month in which indexation is applicable, as notified by the Federal Bureau of Statistics.
$WPI_{(Ref)}$	=	the WPI of manufacturing in Pakistan for the month in which tariff is determined, as notified by the Federal Bureau of Statistics.

The Working Capital facility will be arranged through local financial institutions and on the basis of parameters set out in Section 6.5 (*Interest on Working Capital Facility*), the Reference Interest on Working Capital Component shall be semi-annually indexed to the 6 month KIBOR.

The Interest on Working Capital Component shall be indexed, based on the following formula:

$$\mathbf{I_{(Rev)} = Relevant\ Reference\ Generation\ Tariff\ Component * (KIBOR_{(Rev)} + 2.5\%) / (KIBOR_{(Ref)} + 2.5\%)}$$

Where:

$I_{(Rev)}$	=	the revised Interest on Working Capital Component, applicable for the relevant semi-annual period
$Kibor_{(Rev)}$	=	the revised 6 month KIBOR rate at the end of each 6 month period.

$Kibor_{(Ref)}$ = 6 month KIBOR rate prevailing on the date of tariff determination (12.40%)

For the purpose of this Tariff Petition, it has been assumed that 100% of the debt financing required for the Project shall be arranged from foreign financial institutions (LIBOR based). However, it is reasonable to assume that portions of the debt will be arranged through KIBOR / EURIBOR based financing sources once negotiations have been initiated with the lenders and the same shall be submitted to NEPRA for approval as part of the application for determination of tariff at EPC Stage (as per the Mechanism of tariff determination for hydropower projects).

The Interest Charges part of the Reference Debt Service Component shall be semi-annually adjusted for variations in interest rate as a result of variation in 6 months LIBOR.

The Interest Charges of the Debt Service Component shall be indexed based on the following formula:

$$\mathbf{I_{(LRev)} = Relevant\ Generation\ Tariff\ Component * (LIBOR_{(Rev)} + 4.75\%) / (LIBOR_{(Ref)} + 4.75\%)}$$

Where:

$I_{(LRev)}$ = the revised Interest Charge component applicable for the LIBOR based financing sources relevant semi-annual period

$LIBOR_{(Rev)}$ = the revised 6 month LIBOR rate at the end of each 6 months period.

$LIBOR_{(Ref)}$ = 6 month LIBOR rate prevailing on the date of tariff determination (0.71%)

It is submitted that the Project Cost and Energy Production Estimate be adjusted at COD for the following based on the assumptions detailed in Section 5 (*Project Cost & Investment*) and Section 9 (*Energy Production Estimate*), and the adjustments to the Project Cost and Energy Production Estimate be used in the computation of the tariff components.

The Reference Generation Tariff for CPP has been determined on the basis of net capacity of 712.8 MW with a design discharge of 1200 m^3/s and the design net head of 79 m. It is requested that the CPP components be adjusted at the time of COD based upon the Initial Dependable Capacity (IDC) test to be carried out for determination of Contract Capacity (as defined under the PPA).

We would request NEPRA to adjust the CPP components based on the following formula:

$$CC_{(Adj)} = CC_{(Ref)} \times 712.8\ MW / NC_{(IDC)}$$

Where:

$CC_{(Adj)}$ = Adjusted relevant CCP component of tariff

$CC_{(Ref)}$ = Reference relevant CCP component of tariff

$NC_{(Adj)}$ = Net Capacity at reference site conditions established at the time of IDC test.

The Project Company requests NEPRA to allow adjustment to the total Project Cost for the following items forming part of Project Cost:

(a) Cost of Debt – For the purpose of this Petition it has been assumed that debt shall be secured through foreign financing sources (LIBOR based). It is requested that adjustment of debt be allowed at the time of financial close as per actual borrowing composition i.e. LIBOR/KIBOR /EURIBOR as the case may be;

(b) Return on Equity during Construction based on the actual draw downs;

(c) US$ / PKR exchange rate variations during the construction period;

(d) all local Duties and Taxes paid or withheld;

(e) arrangement,commitment, and otherfees charged by the Lenders of the Project;

(f) Interest during Construction for increase in Project Cost, change in interest base rate (LIBOR/KIBOR/EURIBOR), variation in loan & equity drawdowns;

(g) adjustment due to escalation in cost of civil works including costs associated with steel, cement, labour, and fuel;

(h) adjustments due to unforeseen rock categories encountered during excavation along with adjustments due to escalation in units rates due to escalation in input costs;

(i) adjustment of costs associated with hydraulic steel structure and hydro-mechanical and electrical works (if not allowed/ adjusted at EPC stage); and

(j) adjustment of costs associated with changes in BOQ based on the detailed design and firm prices of each unit at EPC stage.

(k) adjustment due to costs associated with resettlement of habitants of the area affected by the construction of the Project.

9. ENERGY PRODUCTION ESTIMATE

Power and energy generation estimates were determined for discharge levels ranging from 600 to 1800 m^3/s in seven steps of 200 m^3/s. Based on the energy output levels estimated for different discharge levels, an optimization study was undertaken by the Project Company. As a result of the optimization study, a design discharge of 1,200 m^3/s was selected. The gross head and net head were estimated from constant reservoir level, EL461, and fluctuating tail water level; the latter estimated from the relevant flows in the Jhelum River.

It is anticipated that the reservoir would extend 27 km along the Jhelum River Valley and would be sufficient to maintain a reservoir level of 461 m at dam site, however, the water level at Azad Pattan is expected to vary between 470 m to 475 m due to flood discharge in summer months.

Power and energy outputs have been calculated for a period of thirty years using daily flow records. Based on daily results the power and energy, on the basis of 10-day periods, have been calculated. For sediment flushing, it has been assumed that the power station may have to be shut down for 5 days in the middle of May and 5 days in the middle of June or July. The impact of these shut downs has been duly considered in the energy estimation. A riparian release of 5 m^3/s from the dam provides a residual minimum flow in the Jhelum River.

For the selected design discharge and reservoir level of 461 m, the power and energy have been estimated on the basis of 10-day flows. The design capacity is computed with the following formula:

$$P = \eta \times g \times Q \times H / 1000$$

Where:

- P is Capacity (MW) estimated from 10 days discharge and corresponding head.
- Q is the 10 days discharge with maximum value of design discharge Qd (m^3/s).
- H is Gross head (m). It is the difference of elevation between operating head and tail water level.
- η is combined efficiencies of turbine, generator, transformer and that of the hydraulic system upstream of powerhouse. The efficiency of turbine varies from 88% to 92%, whereas it is taken as 98% for generator and 99% for transformer. The efficiency of hydraulic system mainly depends on upon losses in headrace. Longer headrace has more losses and vice versa.

- g is gravity acceleration = 9.81 m/s^2

The energy calculated based on daily flows for 30 years ranges between 1,983 GWh to 4,219 GWh. For the purpose of this Petition and in line with the Feasibility Study approved by NEPRA, a conservative value of 3,436 GWh has been taken.

The dam axis at 1.75 km upstream of Karot Bridge is selected for diverting design discharge of 1200 m^3/s for an underground powerhouse 225 m downstream of Karot bridge. The installed capacity is estimated as 720 MW (gross) with mean annual energy of 3,436 GWh (gross). Four headrace/tailrace tunnels feeding four Francis turbines have been proposed to utilize the optimum potential of Karot project site.

The salient features of the project are as below.

Design discharge	1200 m^3/s
Gross head	78 m
Net Head	77 m
Installed Capacity (gross)	720 MW
Mean Annual Energy (gross)	3,436 GWh
Plant factor	54.5%
Auxiliary Consumption	1%
Installed Capacity (net)	712.8 MW
Mean Annual Energy (net)	3,401.8 GWh
Dam height	91 m, above foundation
Diversion tunnel	2 Nos. (10 m dia. and 700 m length)
Design flood	28,500 m^3/s
No. and Type of units	Four Francis turbine units

10. GENERAL ASSUMPTIONS

The following have been assumed while calculating the Reference Generation Tariff and changes in any of these assumptions will result in changes in the Reference Generation Tariff.

10.1. Debt : Equity ratio is assumed to be 80:20.

10.2. Interest rate for Debt is assumed at 5.46% (6 Month LIBOR + 4.75% Spread), to be indexed semi-annually.

10.3. 100% of Debt has been assumed to be financed through foreign banks and financial institutions. The same is subject to change prior to achievement of financial close.

10.4. Any change in taxes/duties shall be adjusted as per actuals and will be paid by the Power Purchaser in terms of the PPA.

10.5. A constant ROE and ROE-DC is assumed which results in an IRR of 20% (net of 7.5% withholding tax on dividends) over 50 years. Since the Project is a BOOT type project, the Equity injected shall be redeemed equally over the remaining life of the Project after payment of debt.

10.6. No hedging cost is assumed for exchange rate fluctuations during construction and all cost overruns resulting from variations in the exchange rate during construction shall be included in the Project Cost.

10.7. NEPRA shall allow each of the line items set out under Section 8.2 (*One Time Adjustment At COD*).

10.8. The Power Purchaser is assumed to be responsible for financing and constructing the interconnection to the grid.

10.9. The exchange rats are assumed to be 80 for PKR/USD.

10.10. Project maintenance reserves included in the Reference Generation Tariff calculations are based on the requirements of the PPA. If required by Lenders, these will be adjusted accordingly in the Reference Generation Tariff.

10.11. The tariff model and calculation are based on the transportation to Project site through Rawalpindi-Kahuta-Karot Road; any change in the assumed route may increase the the Project Cost.

10.12. All assumptions not expressly stated herein are based on the Standard PPA draft available on PPIB website. Consequently any change in any such assumptions may lead to change in the Reference Generation Tariff.

10.13. The payments to Workers Welfare Fund and Workers Profit Participation Fund have not been accounted for in the Project budget and have been assumed to be reimbursed at actual by the Power Purchaser.

10.14. Any incentives given to any other Hydro IPP shall also be given to the Project Company.

11. TARIFF SUMMARY

In summation, the Project Company herewith most respectfully submits before NEPRA for its approval the matters set out in this Petition and further prays for NEPRA to kindly approve the following:

11.1. Energy production estimate of 3,401 GWh per annum for calculation of the tariff.

11.2. Funding of the Project on an 80:20 – Debt: Equity basis (to be adjusted at the time of EPC stage tariff determination based on the term sheet negotiated with the lenders at that time).

11.3. The actual tariff is a mix of the Capacity Purchase Price and Energy Purchase Price of which 95% is attributable to CPP and remaining 5% attributable to EPP.

11.4. The total Project cost for the development of the Project is subject to change due to factors specified under Section 8.3.2 (*Adjustments Due To Variation In Project Cost Components*)

11.5. LIBOR based debt financing with a base rate equal to 6-Month LIBOR plus a spread of 4.75%. The source of financing and spread is subject to change (LIBOR / KIBOR / EURIBOR or a mix of the three) as clarified under Section 5.3.2 (*Debt*).

11.6. Sharing of any CER related revenues subsequently realized, as per the Government of Pakistan policy.

11.7. ROE and ROE-DC at the rate of 20% (determined based on IRR method), reasons for which have been provided in detail in Section 5.3.1 (*Equity*) above.

11.8. Equity Redemption – in light of the Project being developed on BOOT basis.

11.9. Special Return on Equity as detailed under Section 5.3.1 (*Special Tariff for Return on Equity from signing of Power Purchase Agreement*).

11.10. Working Capital facility of US$ 34.11 million, to be adjusted at COD. Cost associated with (i) arrangement of working capital facility, and (ii) L/C for DSRA as detailed under Section 6.6 (*Interest on Working Capital Facility*) and Section 6.7 (*Letter of Credit for Debt Service Reserve Account*).

11.11. Sinosure fee during construction and operations phase at the rate of 1.2% per annum during the life of the Project as explained under Section 5.2.12 (*Sinosure Fee*) and Section 6.8 (*Sinosure Fee*).

11.12. Insurance during operations phase at the rate of 1.5% of the EPC cost reasons for which have been provided under Section 6.5 (*Insurance Cost*).

11.13. Indexations, adjustments, and reopeners for the individual tariff components, as detailed in Section 8 (*Indexations, Assumptions, Adjustments, and Reopeners*) above.

11.14. The Reference Generation Tariff provided under Section 7.1 (*Reference Generation Tariff Table*) above.

11.15. The General Assumptions, as provided in Section 10 (*General Assumptions*).

Furthermore, NEPRA is kindly requested to process the Tariff Petition at the earliest thereby enabling the Project Company to proceed further with the development process.

COPY OF KAROT POWER COMPANY (PRIVATE) LIMITED BOARDRESOLUTION

KAROT POWER COMPANY (PVT) LTD

COPY OF BOARD OF DIRECTORS RESOLUTION

"RESOLVED THAT": the Company be and is hereby authorized to file a tariff petition (including any review petitions and any motion for leave for review) for submission to National Electric Power Regulatory Authority for determination of the reference generation tariff and submitting Application for Generation License in respect of the 720 MW Karot Hydropower Project and in relation thereto, enter into and execute all required documents, make all filings and pay all applicable fees, in each case, of any nature whatsoever".

"FURTHER RESOLVED THAT": In respect of filing a tariff petition (including any review petitions and any motion for leave for review) and application for Generation for submission to National Electric Power Regulatory Authority, any of the following officials namely, Mr. Mobashir A. Malik, (Chief Executive Officer) and Mr. Naeem Bari Salimi Senior Manager (Environment Protection & Rehabilitation) of the Company be and are hereby authorized and empowered and of behalf of the Company to:

i- review, execute, submit, and deliver the tariff petition and application for Power Generation (including any review petitions and any motion for leave for review) and any related documentation required by National Electric Power Regulatory Authority for the determination for the reference generation tariff, including any contracts, documents, power of attorney, affidavits, statements, letters, forms, applications, deeds, guarantees, undertakings, approvals, memoranda, amendments, letters, communications, notices, certificates, requests, statements and any other instruments of any nature whatsoever;

ii- represent the Company in all negotiations, representations, presentations, hearings, conferences and/or meetings of any nature whatsoever with any entity (including, but in no manner limited to National Electric Power Regulatory Authority, any private parties, companies, partnerships, individuals, governmental and/or semi governmental authorities and/or any other entity of any nature whatsoever);

iii- sign and execute the necessary documentation, pay the necessary fees, appear before the National Electric Power Regulatory Authority as needed and do all acts necessary for completion and processing of the tariff petition (including any review petitions and any motion for leave for review) and procuring National Electric Power Regulatory Authority's tariff determination;

iv- appoint or nominate any one or more officers of the Company or any other person or persons, singly or jointly, in their discretion to make communicate with, make presentations to and attend the National Electric Power Regulatory Authority hearings;

v- do all such acts, matters and things as may be necessary for carrying out the purposes aforesaid and giving full effect to the above resolutions /resolution".

AND FURTHER RESOLVED THAT: Mobashir A. Malik, Chief Executive Officer of the Company be and is hereby authorized to delegate all or any of the above powers in respect of the foregoing to any other official (s) of KPC as deemed appropriate".

Specimen Signatures

Naeem Bari Salimi
Sr. Manager (Environment Protection & Rehabilitation)

Mobashir A. Malik
Chief Executive Officer

1. Mr Mobashir Ahmed Malik Director & CEO
2. M. Amer Bashir Malik Director
3. Mrs Sadia Malik, Director

Dated: 14 July 2010

Certified True Copy

PROJECT OFFICE:
House # 25-B, Street # 38, F-8/1 Islamabad.
Ph: +92-51-2850522 Fax: +92-51-2857448

HEAD OFFICE:
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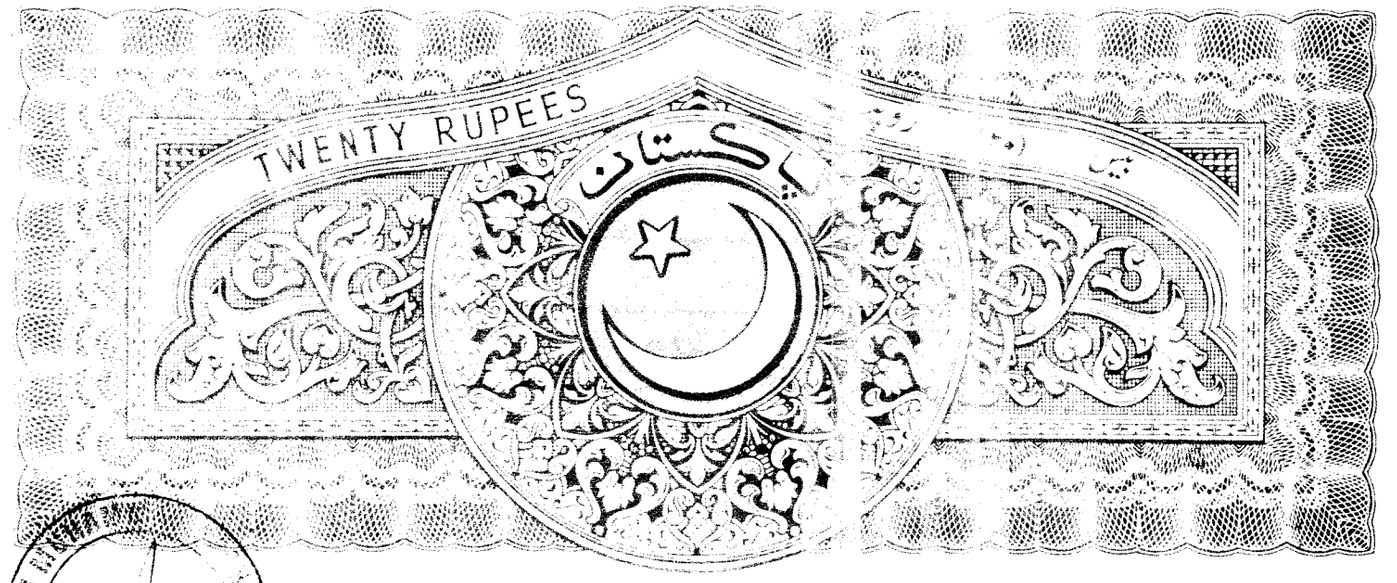
Ph: +92-42-35847194-7 Fax: +92-42-35857637
E-mail: kpc@kpc.com.pk - www.kpc.com.pk

COPY OF AFFIDAVITS

PAKISTAN 20 RS.



Advocate High Court

BEFORE THE
NATIONAL ELECTRIC POWER REGULATORY AUTHORITY

AFFIDAVIT

AFFIDAVIT OF Mr. Mobashir A. Malik, Chief Executive Officer, Authorized Representative of Karot Power Company (Private) Limited, House # 25-B, Street # 38, F8/1, Islamabad, Pakistan.

I. the above named Deponent, do herby solemnly affirm and declare that:

1. I am the authorized representative of M/s Karot Power Company (Private) Limited, House # 25-B, Street # 38, F8/1, Islamabad, Pakistan.

2. The contents of the accompany Tariff Petition No. _____ dated 23 September 2011 including all supporting documents are true and correct to the best of my knowledge and belief, and nothing material or relevant here to has been concealed or withheld therefrom.

3. I also affirm that all further documentation and information to be provided by me in connection with aforesaid Tariff Petition shall be true and correct to the best of my knowledge and belief.

Deponent

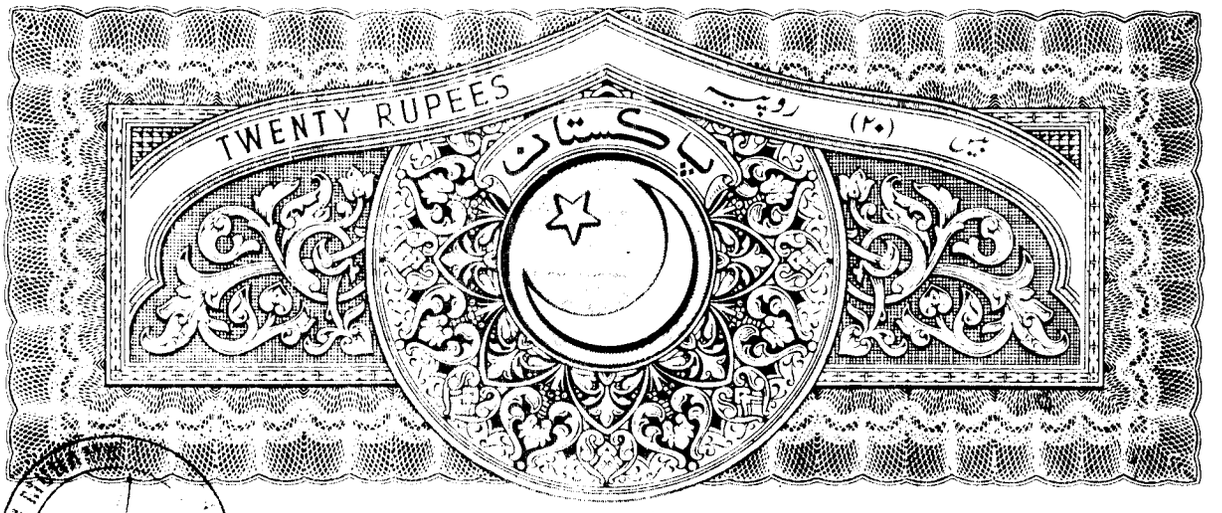
VERIFICATION

It is hereby verified on solemn affirmation at Lahore, Pakistan on this 23rd day of September 2011, that the contents of above Affidavit are true and correct to the best of my knowledge and belief, and that nothing material or relevant thereto has been concealed or withheld therefrom.

Deponent

ATTESTED
Sheikh Muhammad Asghar
Advocate High Court
NOTARY PUBLIC LAHORE

PAKISTAN 20 RS.



BEFORE THE
NATIONAL ELECTRIC POWER REGULATORY AUTHORITY

AFFIDAVIT

AFFIDAVIT OF Mr. Mobashir A. Malik, Chief Executive Officer, Authorized Representative of Karot Power Company (Private) Limited, House # 25-B, Street # 38, F8/1, Islamabad, Pakistan.

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Deponent

VERIFICATION

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Deponent

ATTESTED
Sheikh Muhammad Asghar
Advocate High Court
NOTARY PUBLIC LAHORE

COPY OF BANK DRAFTS

No. DDG/2 0106740 21/43

Demand Draft Above Rs 5,000

Allied Bank
Link Road Model Town, LHR.(0790)

21-12-2010

Rs=84240/-

On Demand pay to the order of NATIONAL ELECTRIC POWER REGULATORY AUTHORITY ISBD

the sum of Rupees Eighty Four Thousand Two Hundred Forty

only

Value received as advised

To ALLIED BANK LIMITED

AabPan ISBD (0116)

For ALLIED BANK LIMITED

Officer 5734

Manager

DO NOT WRITE BELOW THIS LINE

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PAY ORDER

SILKBANK

Silkbank Ltd. Main Branch Egerton Road
Lahore-Pakistan

NOT OVER PKR 957,040.00

A/C PAYEE ONLY

DATE 06 AUG 2010

0941114
P.O. NO.

957,040.00
AMOUNT

PAY TO THE ORDER OF NATIONAL ELECTRIC POWER REGULATORY AUTHORITY ISLAMABAD

AMOUNT NINE HUNDRED AND FIFTY SEVEN THOUSAND FOURTY ONLY

For Silkbank Limited

payable at any Silkbank Branch in Pakistan

Please do not write or stamp below this line

Authorized Signature

Authorized Signature

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