



Registrar

# National Electric Power Regulatory Authority

## Islamic Republic of Pakistan

2nd Floor, OPF Building, G-5/2, Islamabad.  
Ph: 9206500, 9207200 Fax : 9210215  
E-mail: office@nepra.org.pk

No.NEPRA/R/TRF-89/LPTL-2007/6425-27  
February 28, 2008

Subject: **Determination of the Authority in the Matter of Generation Tariff of Liberty Power Tech Ltd. (Case No. NEPRA/TRF-89/LPTL-2007)**  
Intimation of Determination of Tariff pursuant to Section 31(4) of the Regulation of Generation, Transmission and Distribution of Electric Power Act (XL of 1997)


Dear Sir,

Please find enclosed the subject Determination of the Authority along with Annexure-I & II (28 pages) in Case No. NEPRA/TRF-89/LPTL-2007.

2. The Determination is being intimated to the Federal Government for the purpose of notification of the approved tariff in the official gazette pursuant to Section 31(4) of the Regulation of Generation, Transmission and Distribution of Electric Power Act (XL of 1997) and Rule 16(11) of the National Electric Power Regulatory Authority Tariff (Standards and Procedure) Rules, 1998.

3. Please note that only Order of the Authority at para 17.2 of the Determination relating to the reference tariff, adjustments & indexation along with Annexure-I & II needs to be notified in the official gazette. The Order is reproduced for the purpose of clarity and is attached herewith.

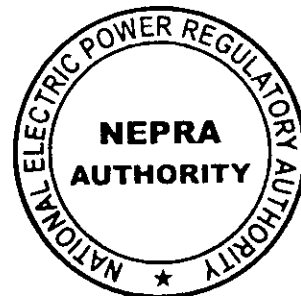
Enclosure: As above

  
( Mahjool Ahmad Mirza )

The Secretary  
Cabinet Division  
Government of Pakistan  
Cabinet Secretariat  
Islamabad

CC:

1. Secretary, Ministry of Water & Power, Islamabad.
2. Secretary, Ministry of Finance, Islamabad.





**ORDER OF THE AUTHORITY  
IN CASE NO. NEPRA/TRF-89/LPTL-2007  
TO BE NOTIFIED IN THE OFFICIAL GAZETTE**

Pursuant to Rule 6 of the NEPRA Licensing (Generation) Rules 2000 Liberty Power Tech Limited (LPTL) is allowed the tariff, Liberty Power Tech Limited (LPTL) is allowed to charge, subject to adjustment of Capacity Purchase Price on account of net dependable capacity as determined by test jointly carried out by Central Power Purchasing Agency (CPPA) and the petitioner, the following is approved as specified tariff for LPTL for delivery of electricity to CPPA of NTDC for procurement on behalf of Ex-WAPDA Distribution Companies:

**Reference Specified Tariff**

Tariff Components	Year 1 to 10	Year 11 to 25	Indexation
<b>Capacity Charge PKR/kW/Hour)</b>			
O&M Foreign	0.0864	0.0864	US\$ /PKR & US CPI
O&M Local	0.0563	0.0563	WPI
Cost of Working Capital	0.0900	0.0900	KIBOR
Insurance	0.0982	0.0982	US\$ /PKR
Debt Service – Local	1.2113	-	KIBOR
Return on Equity	0.3303	0.3303	US\$ /PKR
ROE during Construction	0.0332	0.0332	US\$ /PKR
<b>Total Capacity Charge</b>	<b>1.9057</b>	<b>0.6944</b>	
<b>Energy Charge on Operation on Furnace Oil Rs./kWh</b>			
Fuel Cost Component	4.7811	4.7811	Fuel Price
<b>Variable O&amp;M</b>			
Foreign	0.3813	0.3813	US\$ /PKR & US CPI
Local	0.1054	0.1054	WPI
Water treatment	0.0300	0.0300	WPI

Note: i) Component wise tariff for operation on RFO is indicated at Annex-I.

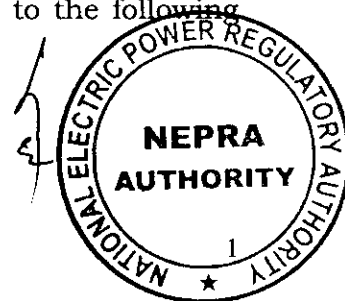
The following adjustments /indexations shall be applicable to reference tariff;

**I. Adjustment in EPC Cost (One Time)**

The Authority has assessed EPC cost as US\$ 197.961 million out of which €120.549 million (offshore) and US\$ 22.19 million (onshore to be incurred in Pak Rupees). Since the exact timing of payment to EPC contractor is not known at this point of time therefore an adjustment for relevant foreign currency fluctuation for the portion of payment in the relevant foreign currency will be made. In this regard the sponsor will be required to provide all the necessary relevant details along with documentary evidence. Based upon such information the EPC cost components in Euro or Dollar shall be established and shall be applied to the corresponding EPC cost components. The adjustment shall be only for currency fluctuation against the reference parity values according to the following mechanism;

$$EPC_{(Adj.)} = PKR\ 12,422.10\ \text{Million} / 91.5 * E_{(PR)}$$

Where:





$E_{(PR)}$  = Weighted Average PKR/EURO parity based upon timing of the payment

The tariff components i.e. Insurance, ROE, ROEDC, Principal Repayment and Interest Charges shall be adjusted according to the following formula at COD.

**i) Insurance Adjustment Mechanism for EPC Cost Variation**

$$Ins_{(Rev)} = Ins_{(Ref)} / EPC_{(Ref)} \times EPC_{(Adj.)}$$

Where:

$Ins_{(Rev)}$  = Revised reference insurance component of tariff  
 $Ins_{(Ref)}$  = Reference insurance component of tariff as per original schedule of tariff  
 $EPC_{(Ref.)}$  = Reference EPC in PKR which is Rs. 12,422.10 million.  
 $EPC_{(Adj.)}$  = Adjusted EPC in PKR

**ii) Return on Equity Adjustment Mechanism for EPC Cost Variation**

$$ROE_{(Rev)} = ROE_{(Ref)} / E_{(Ref)} * E_{(Rev)}$$

Where:

$ROE_{(Rev)}$  = Revised reference Return on Equity component of tariff in PKR  
 $ROE_{(Ref)}$  = Reference Return on Equity component of tariff as per original schedule of tariff in PKR  
 $E_{(Rev)}$  = Reference Equity in PKR (Rs. 3,762.02 million)  
 $E_{(Rev)}$  = Revised amount of Equity in PKR

**iii) ROEDC Adjustment Mechanism for EPC Cost Variation**

$$ROEDC_{(Rev)} = ROEDC_{(Ref)} / EDC_{(Ref)} * EDC_{(Rev)}$$

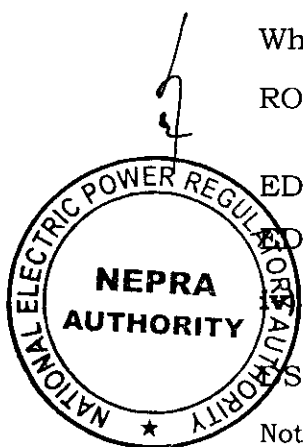
Where:

$ROEDC_{(Rev)}$  = Revised Return on Equity during Construction component of tariff in PKR  
 $EDC_{(Ref)}$  = Reference Equity During Construction in PKR  
 $EDC_{(Rev)}$  = Revised Equity During Construction in PKR

**Debt Servicing Adjustment Mechanism for EPC Cost Variation**

$$DS_{(Rev)} = DS_{(Ref)} / Debt_{(Ref)} * Debt_{(Rev)}$$

Note: The adjustment factor established as per the above formula shall be applicable to the individual components of principal and interest during the entire repayment period.





DS <sub>(Rev)</sub>	=	Revised Debt Servicing component of tariff
DS <sub>(Ref)</sub>	=	Reference Debt Servicing component of tariff as per original schedule of tariff
Debt <sub>(Ref.)</sub>	=	Revised project cost after incorporating the adjustment for currency fluctuation
Debt <sub>(Rev.)</sub>	=	Reference Debt in PKR (Rs. 11,286.04 million)

## II. Adjustment due to Variation in Net Capacity

The reference tariff has been determined on the basis of minimum net capacity of 195 MW at delivery point at mean site conditions. All the tariff components except fuel cost component shall be adjusted at the time of COD based upon the Initial Dependable Capacity (IDC) tests to be carried out for determination of contracted capacity. Adjustment shall not be made if IDC is established less than 195 MW net capacity at reference site conditions. The adjustments shall be made according to the following formula:

$$CC_{(Adj.)} = CC_{(Ref.)} \times 195MW / NC_{(IDC)}$$

Note: Above formula shall be applicable to all the individual relevant components of Capacity Charges.

Where;

CC <sub>(Adj)</sub>	=	Adjusted relevant Capacity Charge components of tariff
CC <sub>(Ref)</sub>	=	Reference relevant Capacity Charge components of tariff
NC <sub>(IDC)</sub>	=	Net Capacity at reference site conditions established at the time of IDC test

Note:- Reference capacity charge components of Tariff i.e. Revised O&M Foreign, Revised O&M Local, Insurance, Debt Servicing, Return on Equity and ROEDC to be adjusted as per IDC test.

Reference Conditions:

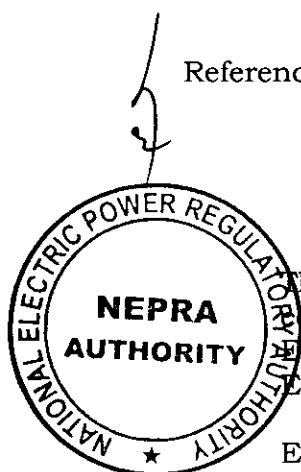
• Altitude above sea level	200 m
• Wet bulb temperature	24 °C
• Minimum ambient air temperature	5 °C
• Maximum ambient air temperature	30 °C

The manufacturer's power plant gross performance at designed ambient conditions is as follows;

Electric active power (Diesel Generating Sets)	186 274 kWe
Electrical apparent power	232 843 kVa at power factor 0.8
Electrical power (steam turbine)	14 200 kWe
	17 750 kva
Total DG-sets + turbine	200 474 kWe

## III. Adjustment in Insurance as per actual

The actual insurance cost for the minimum cover required under contractual obligations with the Power Purchaser not exceeding 1.35% of





the EPC cost will be treated as pass-through. Insurance component of reference tariff shall be adjusted as per actual on yearly basis upon production of authentic documentary evidence by LPTL according to the following formula;

$$\text{Insurance}_{(\text{Rev})} = \text{AIC} / (1.35 \% \times \text{US\$ } 2.672 \text{ Million}) * \text{AP}$$

Where;

AIC = Adjusted Insurance Component (Rs. kW/hr) as per IDC Test

AP = Actual Premium subject to maximum of 1.35% of the adjusted EPC

#### **IV. Adjustment Based on Actual Interest During Construction**

Debt Service, Return on Equity and ROE during construction shall be adjusted on account of actual variation in drawdown and Interest During Construction with reference to the estimated figures.

#### **V. Adjustment due to Custom Duties & Taxes**

Debt Service, Return on Equity and ROE during construction shall be adjusted on account of actual variation in custom duties & Taxes with reference to the estimated figures of US\$ 8.788 million. The impact of withholding tax on local services is not known at this point of time. However, these will be adjusted along with other duties and taxes as per the actual on provision of documentary evidence at COD.

#### **VI. Adjustment for variation in Dollar/Rupee parity**

Relevant reference tariff components shall be adjusted at COD on account of variation in Dollar/Rupee parity.

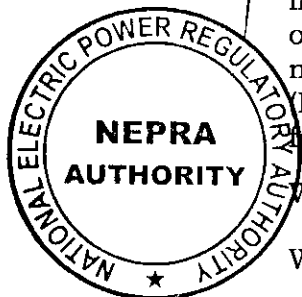
#### **VII. Pass-Through Items**

i) No provision for income tax has been accounted for in the tariff. If LPTL is obligated to pay any tax on its ROE, the exact amount paid by the company may be reimbursed by CPPA to LPTL on production of original receipts. This payment may be considered as pass-through (as Rs./kW/hour) hourly payment spread over a 12 months period in addition to the capacity purchase price proposed in the Reference Tariff. Furthermore, in such a scenario, LPTL may also submit to CPPA details of any tax shield savings and CPPA will deduct the amount of these savings from its payment to LPTL on account of taxation.

ii) Withholding tax on dividend is also a pass through item just like other taxes as indicated in the government guidelines for determination of tariff for new IPPs. In a reference tariff table withholding tax number is indicated as reference and CPPA (NTDC) shall make payment on account of withholding tax at the time of actual payment of dividend subject to maximum of 7.5% of 15% reference equity i.e. hourly payment (Rs./kW/hour) spread over a 12 month according to the following formula:

$$\text{Withholding Tax Payable} = \{[15\% * (E_{(\text{Ref})} - E_{(\text{Red})})] + \text{ROEDC}_{(\text{Ref})}\} * 7.5\%$$

Where:





$E_{(Ref)}$  = Adjusted Reference Equity at COD

$E_{(Red)}$  = Equity Redeemed

$ROEDC_{(Ref)}$  = Reference Return on Equity During Construction

- iii) In case Company does not declare a dividend in a particular year or only declares a partial dividend, then the difference in the withholding tax amount (between what is paid in that year and the total entitlement as per the Net Return on Equity) would be carried forward and accumulated so that the Company is able to recover the same in hourly payments spread over 12 months period as a pass through from the Power Purchaser in future on the basis of the total dividend pay out.

### VIII. Indexations:

The following indexation shall be applicable to the reference tariff as follows;

#### a) Indexation applicable to O&M

The Fixed O&M local component of Capacity Charge will be adjusted on account of Inflation (WPI) and Fixed O&M foreign component on account of variation in US CPI and dollar/Rupee exchange rate. Quarterly adjustment for local inflation, foreign inflation and exchange rate variation will be made on 1<sup>st</sup> July, 1<sup>st</sup> October, 1<sup>st</sup> January and 1<sup>st</sup> April based on the latest available information with respect to WPI notified by the Federal Bureau of Statistics (FBS), US CPI issued by US Bureau of Labor Statistics and revised TT & OD selling rate of US Dollar notified by the National Bank of Pakistan. The mode of indexation will be as under:

##### i) Fixed O&M

$F O\&M_{(LREV)}$  = Rs. 0.0563/kW/Hour \*  $WPI_{(REV)}$  / 125.67

$F O\&M_{(FREV)}$  = Rs. 0.0864/kW/Hour \*  $US CPI_{(REV)}$  / 210.036 \*  $ER_{(REV)}$  / 62.75

Where:

$F O\&M_{(LREV)}$  = the revised applicable Fixed O&M Local Component of the Capacity Charge indexed with WPI

$F O\&M_{(FREV)}$  = the revised applicable Fixed O&M Foreign Component of the Capacity Charge indexed with US CPI and Exchange Rate variations

$WPI_{(REV)}$  = the revised wholesale Price Index (manufactures)

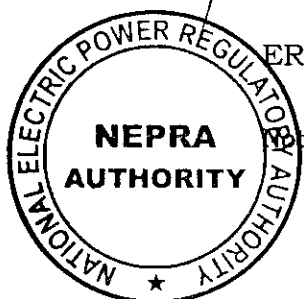
$WPI_{(REF)}$  = 125.67 wholesale price index (manufactures) of December 2007 notified by Federal Bureau of Statistics

$US CPI_{(REV)}$  = the revised US CPI

$US CPI_{(REF)}$  = 210.036 US CPI for the month of December 2007 as notified by the US Bureau of Labor Statistics

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

Note: The reference numbers indicated above shall be replaced by the revised numbers after incorporating the required adjustments at COD.



## ii) Variable O&M

The formula for indexation of variable O&M component will be as under:

$$V O\&M_{(LREV)} = \text{Rs. } 0.1054 / \text{kW/Hour} * WPI_{(REV)} / 125.67$$

$$V O\&M_{(WREV)} = \text{Rs. } 0.0300 / \text{kW/Hour} * WPI_{(REV)} / 125.67$$

$$V O\&M_{(FREV)} = \text{Rs. } 0.3813 / \text{kW/Hr} * US CPI_{(REV)} / 210.036 * ER_{(REV)} / 62.75$$

Where:

$V O\&M_{(LREV)}$  = the revised price of lubricants Variable O&M Local Component of the Capacity Charge indexed with WPI

$V O\&M_{(WREV)}$  = the revised water treatment Variable O&M Local Component of the Capacity Charge indexed with WPI

$V O\&M_{(FREV)}$  = the revised applicable Variable O&M Foreign Component of the Capacity Charge indexed with US CPI and Exchange Rate variations

$WPI_{(REV)}$  = the revised wholesale Price Index (manufactures)

$WPI_{(REF)}$  = 125.67 wholesale price index (manufactures) of December 2007 notified by Federal Bureau of Statistics

$US CPI_{(REV)}$  = the revised US CPI

$US CPI_{(REF)}$  = 210.036 US CPI for the month of December 2007 as notified by the US Bureau of Labor Statistics

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

Note: The reference Variable O&M indicated above shall be replaced with the revised number at COD after incorporating the required adjustment based upon the IDC Test.

## iii) Adjustment for KIBOR variation

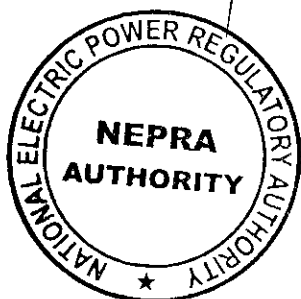
The interest part of fixed charge component will remain unchanged throughout the term except for the adjustment due to variations in interest rate as a result of variation in quarterly KIBOR according to the following formula;

$$\Delta I_{(L)} = P_{(LREV)} * (KIBOR_{(REV)} - 10.45\%) / 4$$

Where:

$\Delta I_{(L)}$  = the variation in interest charges on local loan applicable corresponding to variation in quarterly KIBOR.  $\Delta I$  can be positive or negative depending upon whether  $KIBOR_{(REV)} >$  or  $< 10.45\%$ . The interest payment obligation will be enhanced or reduced to the extent of  $\Delta I$  for each quarter under adjustment applicable on quarterly

$P_{(REV)}$  = is the outstanding principal (as indicated in the attached debt service schedule to this order) on a quarterly basis on the relevant quarterly calculations date. Period 1 shall





commence on the date on which the 1<sup>st</sup> installment is due after availing the grace period.

**iv) Fuel Price Variation**

The Variable Charge Part of the tariff relating to fuel cost shall be adjusted on account of the fuel price variations according to the mechanism given below:

$$FC_{(Rev)} = (Rs.4.3223 \text{ per kWh} * FP_{(Rev)}) / Rs.23,247.07 \text{ per ton}/40,792 \\ * CV_{(Rev)} + (Rs.0.4588 \text{ per kWh} * Ft_{(Rev)}) / Rs. 2,467.50 \text{ per ton}$$

Where:

FC (Rev) = Revised fuel cost component of Variable Charge on RFO.  
CV(Rev) = Revised Calorific Value  
Ft(Rev) = Revised Freight Charges adjusted for NHV-GHV factor  
FP (Rev) = The new price of RFO per Metric Ton adjusted for NHV/GHV factor of 1.05 as per the following mechanism;

Description	US\$/Ton	Rs./Ton
HSFO Arab Gulf Average Price for applicable Fortnight (From Platts Oilgram Report) *		
Black Premium (From OGRA)		
C & F Price – A		
Crude Handling and Incidental charges (7.282% of C&F Price)**		
<b>Sub-Total – B</b>		
EX Refinery Price – (C=A+B)		
GST (15% of EX Refinery Price		
Selling Price – D		
OMC Margin (3.5% of Selling Price)		
GST (15% on OMC Margin)		
Sub Total – E		
Market Price – (F=D+E)		
<b>Cost of RFO excluding GST (GHV)</b>		
<b>Inland Freight</b>		
<b>Total Cost of RFO excluding GST (GHV)</b>		

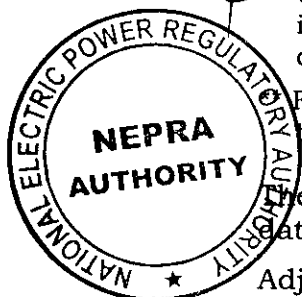
US\$ Pak Rupee Exchange Rate-NBP Selling TT/OD at the date of applicable fuel price

\* The supplier shall clearly indicate average Gross and Net calorific values of Arabian Gulf or any other source of which average reference fuel prices are used. Fuel supplier shall provide price adjustment mechanism due to variation in calorific value of the fuel being supplied to the IPP against the reference calorific values.

Fuel supplier shall provide item wise actual incidental charges prevailing at the time of receiving payment for fuel supply.

The fuel cost component will be adjusted after the commercial operation date, at the time of revision in RFO price.

Adjustment on account of local inflation, foreign inflation, foreign exchange rate variation, KIBOR variation and fuel price variation will be





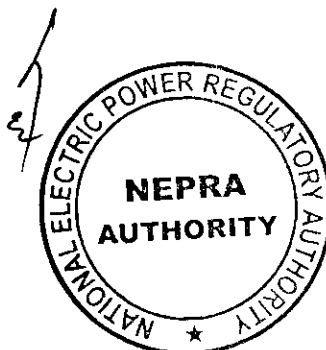


approved and announced by the Authority for immediate application within seven working days after receipt of LPTL's request for adjustment in accordance with the requisite indexation mechanism stipulated herein.

For one time adjustment of relevant tariff components at COD according to the mechanism laid down in this order, LPTL shall submit the relevant documents to NEPRA within 30 days of COD for adjustment.

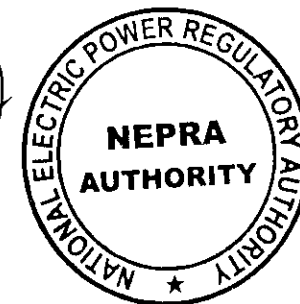
**IX. Terms and Conditions of Tariff:**

- i) Capacity Charge Rs./kW/hour applicable to dependable capacity at the delivery point.
- ii) The tariff is applicable for a period of 25 years commencing from the date of the Commercial Operation.
- iii) The plant availability shall be 88%.
- iv) All new equipment will be installed and the plant will be of standard configuration.
- v) Dispatch criterion will be based on the Energy Charge.
- vi) Internal consumption (including air-cooled condenser) has been assumed to be approximately 4.1 MW.
- vii) Scheduled Outage periods per annum shall be in accordance with the 2006 standardized PPA.
- viii) NTDC will be responsible for constructing the interconnection to the grid.
- ix) All invoicing and payment terms are assumed to be in accordance with the 2006 standardized PPA.
- x) Tolerance in Dispatch shall be in accordance with 2006 standardized PPA.
- xi) If there is any change in any assumption that may lead to change in the tariff shall be referred to NEPRA for approval.
- xii) If IPP is required by the power purchaser to deliver power above 132 kV, any additional cost to be incurred by the IPP submitted to NEPRA for adjustment. The adjustment request by the IPP shall be duly verified by the power purchaser.
- xiii) 100% of debt has been assumed to be local provided however that in the event LPTL uses a mix of foreign and local loan, the future benefits of the lower interest rates shall be passed on to the Power Purchaser.
- xiv) No corporate income tax and no minimum turnover tax have been assumed.
- xv) Working capital has been financed by a separate Working Capital facility, and is not included in the project cost.



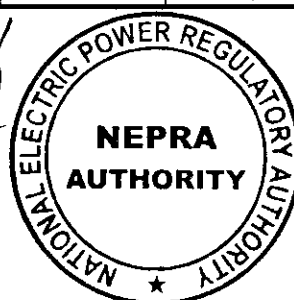
**Liberty Power Tech Limited  
Reference Tariff Table**

Year	Variable Charge (Rs./kWh)			Capacity Charge (Rs./kW/Hour)										Capacity Charge at 60% PF	Tariff	
	Fuel	Variable O&M	Total	Fixed O&M Foreign	Fixed O&M Local	Cost of Working Capital	Insurance	ROE	ROEDC	Withholding Tax @7.5%	Loan Repayment	Interest Charges	Total	Rs. per kWh	Rs. per kWh	¢ per kWh
1	4.7811	0.5167	5.2978	0.0864	0.0563	0.0900	0.0982	0.3303	0.0332	0.0273	0.3393	0.8720	1.9330	3.2216	8.5194	13.5768
2	4.7811	0.5167	5.2978	0.0864	0.0563	0.0900	0.0982	0.3303	0.0332	0.0273	0.3873	0.8240	1.9330	3.2216	8.5194	13.5768
3	4.7811	0.5167	5.2978	0.0864	0.0563	0.0900	0.0982	0.3303	0.0332	0.0273	0.4421	0.7692	1.9330	3.2216	8.5194	13.5768
4	4.7811	0.5167	5.2978	0.0864	0.0563	0.0900	0.0982	0.3303	0.0332	0.0273	0.5046	0.7067	1.9330	3.2216	8.5194	13.5768
5	4.7811	0.5167	5.2978	0.0864	0.0563	0.0900	0.0982	0.3303	0.0332	0.0273	0.5759	0.6353	1.9330	3.2216	8.5194	13.5768
6	4.7811	0.5167	5.2978	0.0864	0.0563	0.0900	0.0982	0.3303	0.0332	0.0273	0.6574	0.5539	1.9330	3.2216	8.5194	13.5768
7	4.7811	0.5167	5.2978	0.0864	0.0563	0.0900	0.0982	0.3303	0.0332	0.0273	0.7504	0.4609	1.9330	3.2216	8.5194	13.5768
8	4.7811	0.5167	5.2978	0.0864	0.0563	0.0900	0.0982	0.3303	0.0332	0.0273	0.8565	0.3548	1.9330	3.2216	8.5194	13.5768
9	4.7811	0.5167	5.2978	0.0864	0.0563	0.0900	0.0982	0.3303	0.0332	0.0273	0.9777	0.2336	1.9330	3.2216	8.5194	13.5768
10	4.7811	0.5167	5.2978	0.0864	0.0563	0.0900	0.0982	0.3303	0.0332	0.0273	1.1159	0.0954	1.9330	3.2216	8.5194	13.5768
11	4.7811	0.5167	5.2978	0.0864	0.0563	0.0900	0.0982	0.3303	0.0332	0.0273	-	-	0.7217	1.2028	6.5006	10.3595
12	4.7811	0.5167	5.2978	0.0864	0.0563	0.0900	0.0982	0.3303	0.0332	0.0273	-	-	0.7217	1.2028	6.5006	10.3595
13	4.7811	0.5167	5.2978	0.0864	0.0563	0.0900	0.0982	0.3303	0.0332	0.0273	-	-	0.7217	1.2028	6.5006	10.3595
14	4.7811	0.5167	5.2978	0.0864	0.0563	0.0900	0.0982	0.3303	0.0332	0.0273	-	-	0.7217	1.2028	6.5006	10.3595
15	4.7811	0.5167	5.2978	0.0864	0.0563	0.0900	0.0982	0.3303	0.0332	0.0273	-	-	0.7217	1.2028	6.5006	10.3595
16	4.7811	0.5167	5.2978	0.0864	0.0563	0.0900	0.0982	0.3303	0.0332	0.0273	-	-	0.7217	1.2028	6.5006	10.3595
17	4.7811	0.5167	5.2978	0.0864	0.0563	0.0900	0.0982	0.3303	0.0332	0.0273	-	-	0.7217	1.2028	6.5006	10.3595
18	4.7811	0.5167	5.2978	0.0864	0.0563	0.0900	0.0982	0.3303	0.0332	0.0273	-	-	0.7217	1.2028	6.5006	10.3595
19	4.7811	0.5167	5.2978	0.0864	0.0563	0.0900	0.0982	0.3303	0.0332	0.0273	-	-	0.7217	1.2028	6.5006	10.3595
20	4.7811	0.5167	5.2978	0.0864	0.0563	0.0900	0.0982	0.3303	0.0332	0.0273	-	-	0.7217	1.2028	6.5006	10.3595
21	4.7811	0.5167	5.2978	0.0864	0.0563	0.0900	0.0982	0.3303	0.0332	0.0273	-	-	0.7217	1.2028	6.5006	10.3595
22	4.7811	0.5167	5.2978	0.0864	0.0563	0.0900	0.0982	0.3303	0.0332	0.0273	-	-	0.7217	1.2028	6.5006	10.3595
23	4.7811	0.5167	5.2978	0.0864	0.0563	0.0900	0.0982	0.3303	0.0332	0.0273	-	-	0.7217	1.2028	6.5006	10.3595
24	4.7811	0.5167	5.2978	0.0864	0.0563	0.0900	0.0982	0.3303	0.0332	0.0273	-	-	0.7217	1.2028	6.5006	10.3595
25	4.7811	0.5167	5.2978	0.0864	0.0563	0.0900	0.0982	0.3303	0.0332	0.0273	-	-	0.7217	1.2028	6.5006	10.3595
<b>Levelized Tariff (1-25Years)</b>			<b>5.2978</b>	<b>0.0864</b>	<b>0.0563</b>	<b>0.0900</b>	<b>0.0982</b>	<b>0.3303</b>	<b>0.0332</b>	<b>0.0273</b>	<b>0.4036</b>	<b>0.4164</b>	<b>1.5417</b>	<b>2.5694</b>	<b>7.8672</b>	<b>12.5374</b>



**Liberty Power Tech Limited  
Debt Servicing Schedule**

Period	Local Debt					Annual Principal Repayment Rs./kW/ hr.	Annual Interest Rs./kW/ hr.	Annual Debt Servicing Rs./kW/ hr.
	Principal Million Rs.	Repayment Million Rs.	Mark-up Million Rs.	Balance Million Rs.	Debt Service Millin Rs.			
1	11,286.06	137.79	379.49	11,148.28	517.28	0.34	0.87	1.2113
	11,148.28	142.42	374.86	11,005.86	517.28			
	11,005.86	147.21	370.07	10,858.65	517.28			
	10,858.65	152.16	365.12	10,706.49	517.28			
	11,286.06	579.57	1,489.55	10,706.49	2,069.12			
	10,706.49	157.27	360.01	10,549.22	517.28			
	10,549.22	162.56	354.72	10,386.66	517.28			
2	10,386.66	168.03	349.25	10,218.63	517.28	0.39	0.82	1.21
	10,218.63	173.68	343.60	10,044.95	517.28			
	10,706.49	661.54	1,407.58	10,044.95	2,069.12			
	10,044.95	179.52	337.76	9,865.43	517.28			
	9,865.43	185.55	331.73	9,679.87	517.28			
	9,679.87	191.79	325.49	9,488.08	517.28			
	9,488.08	198.24	319.04	9,289.84	517.28			
3	10,044.95	755.11	1,314.01	9,289.84	2,069.12	0.44	0.77	1.21
	9,289.84	204.91	312.37	9,084.93	517.28			
	9,084.93	211.80	305.48	8,873.13	517.28			
	8,873.13	218.92	298.36	8,654.21	517.28			
	8,654.21	226.28	291.00	8,427.93	517.28			
	9,289.84	861.91	1,207.21	8,427.93	2,069.12			
	8,427.93	233.89	283.39	8,194.03	517.28			
4	8,194.03	241.76	275.52	7,952.28	517.28	0.50	0.71	1.21
	7,952.28	249.88	267.40	7,702.39	517.28			
	7,702.39	258.29	258.99	7,444.11	517.28			
	8,427.93	983.82	1,085.30	7,444.11	2,069.12			
	7,444.11	266.97	250.31	7,177.13	517.28			
	7,177.13	275.95	241.33	6,901.19	517.28			
	6,901.19	285.23	232.05	6,615.96	517.28			
5	6,615.96	294.82	222.46	6,321.14	517.28	0.58	0.64	1.21
	7,444.11	1,122.97	946.15	6,321.14	2,069.12			
	6,321.14	304.73	212.55	6,016.41	517.28			
	6,016.41	314.98	202.30	5,701.43	517.28			
	5,701.43	325.57	191.71	5,375.86	517.28			
	5,375.86	336.52	180.76	5,039.34	517.28			
	6,321.14	1,281.80	787.32	5,039.34	2,069.12			
6	5,039.34	347.83	169.45	4,691.51	517.28	0.66	0.55	1.21
	4,691.51	359.53	157.75	4,331.98	517.28			
	4,331.98	371.62	145.66	3,960.37	517.28			
	3,960.37	384.11	133.17	3,576.25	517.28			
	5,039.34	1,463.09	606.03	3,576.25	2,069.12			
	3,576.25	397.03	120.25	3,179.23	517.28			
	3,179.23	410.38	106.90	2,768.85	517.28			
7	2,768.85	424.18	93.10	2,344.67	517.28	0.75	0.46	1.21
	2,344.67	438.44	78.84	1,906.23	517.28			
	3,576.25	1,670.03	399.09	1,906.23	2,069.12			
	1,906.23	453.18	64.10	1,453.05	517.28			
	1,453.05	468.42	48.86	984.62	517.28			
	984.62	484.17	33.11	500.45	517.28			
	500.45	500.45	16.83	0.00	517.28			
8	1,906.23	1,906.23	162.89	0.00	2,069.12	0.98	0.23	1.21
9						1.12	0.10	1.21
10								



**NATIONAL ELECTRIC POWER REGULATORY AUTHORITY  
(NEPRA)**

\*\*\*

*No. NEPRA/TRF-89/LPTL-2007*

*February 26, 2008*

**DETERMINATION OF THE AUTHORITY IN THE MATTER OF  
GENERATION TARIFF OF LIBERTY POWER TECH LIMITED (LPTL)**

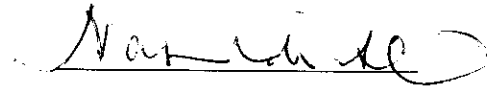
**Petitioner**

Liberty Power Tech Limited (LPTL)  
A/51-A, S.I.T.E, Karachi 75700

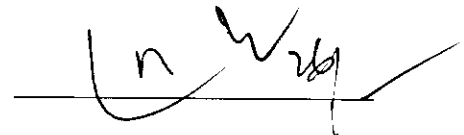
---

**Authority**

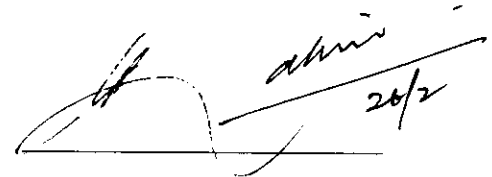
Nasiruddin Ahmed  
Member



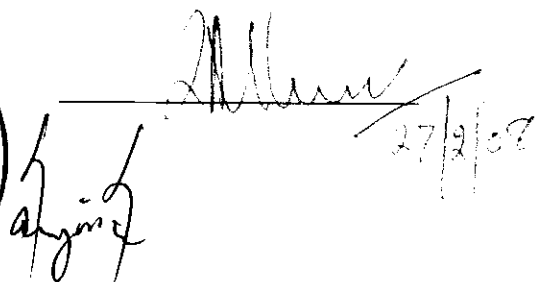
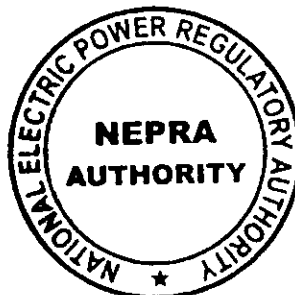
Maqbool Ahmed Khawaja  
Member



Abdul Rahim Khan  
Member



Zafar Ali Khan  
Vice Chairman



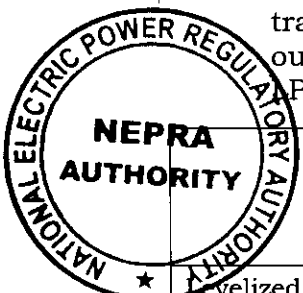


## **Background**

- 1.1 Liberty Power Tech Limited (LPTL) is a public limited company incorporated and existing under the Companies Ordinance 1984, established for setting up a power plant based on Combined Cycle/4 Stroke Diesel Engine technology of approximately 200 MW gross at ISO and 195 MW (net at site reference conditions) at 132 kV Bus Bar in terms of the Policy for Power Generation Projects 2002 (the "Policy") at Faisalabad in the Punjab Province. The electricity generated will be sold to Central Power Purchasing Agency (CPPA) within NTDC.
- 1.2 LPTL submitted a tariff application on 7<sup>th</sup> November, 2007 for approval of generation tariff. This tariff petition was admitted for consideration by the Authority on 15<sup>th</sup> November, 2007 and was assigned case number NEPRA/TRF-89/LPTL-2007. Salient features of the petition were advertised in the newspapers on 25<sup>th</sup> November, 2007 to inform all the interested persons/stakeholders and to invite participation in the tariff-setting proceedings through their comments or by becoming a party to the proceedings as interveners. Invitations were also sent to the concerned Federal & Provincial Government ministries, Chambers of Commerce and Industries, Representatives of Professional bodies and Experts, soliciting their views on the petition.
- 1.3 A public hearing on the petition was held on 4<sup>th</sup> December, 2007 at NEPRA Main Office, Islamabad. This hearing was participated by the applicant, stakeholders, commentators as well as general public.

## **2. Tariff Summary**

- 2.1 According to LPTL its proposed tariff figures appended herein below are the result of a detailed financial analysis. Technical, economical, financial, legal and fiscal aspects have been considered in the evaluation of LPTL's financial performance. The financial analysis is based on a notional 60% load factor as per the PPIB's instructions, and a 25-year PPA.
- 2.2 Based on the RFO price of Pak Rs. 24,490 per M.Ton. (Price includes fuel transportation cost of Pak Rs. 2,350 subject to adjustment as per actual), output of 195 MW (net at site conditions) and detailed financial analysis, LPTL requested the following tariff;



	Energy Purchase Price (US Cents/kWh)	Capacity Purchase Price (US Cents/kWh)	Total Tariff (US Cents/kWh)	Total Tariff (PKR/kWh)
Levelized (1-25 Yrs)	8.7588	4.0620	12.8207	7.8206
Average (1-25 Yrs)	8.7587	3.2268	11.9858	7.3113
Average (11-25 Yrs)			10.7798	6.5757
Average (1-10 Yrs)			13.7947	8.4148

## **3. Key Strength**

- 3.1 LPTL submitted that amongst various other factors, the following are the key strengths of the Project:



- 3.1.1 Firm engineering, procurement and construction price with fixed and definitive commercial operations date of December 2010; as contractually agreed with globally reputable EPC contractor – Wärtsilä. In order to lock the EPC price and the projected commercial operation date for the Project, LPTL has already made a non-refundable payment equaling Euro 3,000,000 (Euro Three Million) to Wärtsilä Finland.
- 3.1.2 Commercially finalized and in place financing structure; with commitments obtained from various local financial institutions. The proposed Islamic financing for the Project is being termed as the largest Sharia compliant project financing in Pakistan's history. Lead arrangers of the financing are extremely confident that the debt required for the financial close of the Project will be arranged from the local banking market and based on the Project's strength, the credit rating agency in Pakistan, PACRA, has given the proposed financing instrument, i.e. Sukuk, a tentative rating of AA, which will be finalized after approval of tariff by NEPRA and signing of financing documents.
- 3.1.3 Committed, entrepreneurial and reputable sponsors; being principally engaged in textile, energy and construction sectors in Pakistan with a total annual turnover of PKR 7.0 billion, Liberty Group (owned, managed and run by the Mukaty family) is one of the reputable and financially strong business groups of the country.

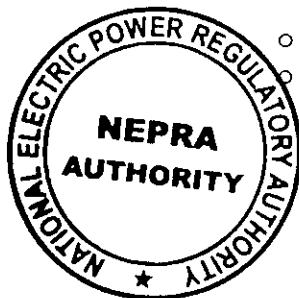
#### 4. Submissions

- 4.1 LPTL submitted that pursuant to the relevant provisions of the NEPRA Rules, read with the provisions of the NEPRA Act and the Rules and Regulations made there under; and in accordance with the Tariff Guidelines 2005 and the Power Policy 2002; and in light of the GOP approval letter pursuant to which the GOP, through PPIB approved Liberty Power Tech Limited's 200 MW (Gross at ISO) power generation project on a fast track basis in the Faisalabad area and instructed Liberty Power Tech Limited to approach NEPRA for tariff approval. Liberty Power Tech Limited accordingly submitted for NEPRA being the competent regulatory authority lawfully authorized to determine tariff for power generation companies, for its approval, a tariff petition (the "**Tariff Petition**") for approval of the reference generation tariff (the Reference Generation Tariff) for Liberty Power Tech Limited's 200 MW (Gross at ISO) power generation facility to be located at Faisalabad.

#### 5. ISSUES

- 5.1 The issues arrive out of the petition and submissions are as follows:

- Plant Capacity
- Project Cost
  - EPC Cost
  - Non-Wartsila EPC Cost





- Staff Housing Colony Cost
- Land Acquisition and Land Development Cost
- Taxes and Custom Duties
- Sponsor Development Cost
- Emergency and Safety Spare Parts
- Pre-COD O&M Mobilization Cost
- Start-up Expenses and Utilities
- Pre-COD Insurance Cost
- Independent Engineer Cost
- Financing Charges
- Interest During Construction
- Capacity Charge
  - Fixed O&M
  - Insurance
  - Cost of Working Capital
  - Return on Equity
  - Return on Equity During Construction
  - Debt Servicing
- Energy Charge
  - Cost
  - Variable O&M Cost
- H. Timeline/Completion of Project

5.2 Issue wise discussion and decisions of the Authority are given in following paragraphs:

## 6. Plant Capacity

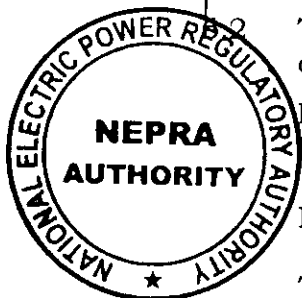
6.1 The petitioner' based its petition on plant configuration of 11 WÄRTSILÄ 4-stroke 18V46 Diesel engines and 1 Steam Turbine with a Gross Capacity of 200 MW at ISO conditions. The equipment is designed to operate within the following ambient conditions:

- *Altitude above sea level* 200 m
- *Wet bulb temperature* 24 °C
- *Minimum ambient air temperature* 5 °C
- *Maximum ambient air temperature* 30 °C

The manufacturer's power plant gross performance at designed ambient conditions is as follows;

Electric active power (Diesel Generating Sets)	186 274 kWe
Electrical apparent power	232 843 kVa at power factor 0.8
Electrical power (steam turbine)	14 200 kWe
	17 750 kva
Total DG-sets + turbine	200 474 kWe

6.3 According to the documentary evidence (WÄRTSILÄ literature) its auxiliary consumption (including air-cooled condenser) of the equipment included in WÄRTSILÄ's scope of supply would be 4.1 MWe. The manufacturer's plant net performance at design ambient conditions is 196374 kWe.



2

6



- 6.4 Having considered all the relevant information, the Authority has decided to accept the indicated gross and net capacity at reference site conditions as per above detail. The Authority further decides that all the tariff components except fuel cost component should be adjusted at the time of Commercial Operation Date (COD) based upon the Initial Dependable Capacity (IDC) tests to be carried out for determination of contracted capacity in the presence of representatives of Power Purchaser and Power Producer. No adjustment should be made if net capacity at reference site conditions is established less than 195 MW at IDC test. In case of higher net capacity the adjustments shall be made according to the following formula:

$$CC_{(Adj.)} = CC_{(Ref)} \times 195MW / NC_{(IDC)}$$

Note: Above formula shall be applicable to all the individual relevant components of Capacity Charges.

Where;

- $CC_{(Adj)}$  = Adjusted relevant Capacity Charge components of tariff  
 $CC_{(Ref)}$  = Reference relevant Capacity Charge components of tariff  
 $NC_{(IDC)}$  = Net Capacity at reference site conditions established at the time of IDC test

Note:- Reference capacity charge components of Tariff i.e. Revised O&M Foreign, Revised O&M Local, Insurance, Debt Servicing, Return on Equity and ROEDC to be adjusted as per IDC test.

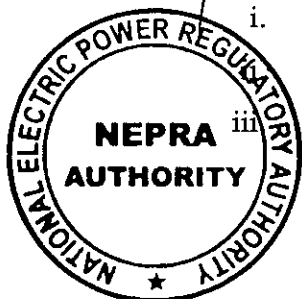
## 7. PROJECT COST

### 7.1 EPC Cost

- 7.1.1 The petitioner stated that its firm EPC price payable in Euro to Wärtsilä Finland in respect of the Engineering and Procurement of equipment and materials for the project is € 120.5424 million. According to LPTL its onshore EPC cost payable in Pakistani rupees in respect of the construction, testing and commissioning of the facility will be US\$ 22.19076 million. LPTL further stated that its entire EPC Wärtsilä cost (offshore and onshore) was calculated to be US\$ 176.485 million based on the Euro/Dollar reference exchange rate of 1.28. The petitioner in support thereof provided documentary evidence according to which all the quoted prices were fixed and firm for delivery of equipment. In order to lock the EPC price and the projected commercial operations date of December 2010, the petitioner has already made a non-refundable payment of € 3 million to Wärtsilä Finland.

- 7.1.2 The EPC price in the instant case is about 2.16% higher as compared to other similar projects with same EPC contractor. According to LPTL the main reasons for this increase are;

- i. Increase in global prices of various metals, copper, and steel,
- ii. Increase in global appetite for power generation,
- iii. Specific requirement of the Power Purchaser to include the procurement of equipment & materials and the construction of grid







station with four bays for 132 kV instead of grid station with two bays requirement in other IPPs.

- 7.1.3 Reasons (i) and (ii) adequately justify the increase in EPC price. In view of continuous increasing trend in equipment prices in the international market LPTL's EPC price being reasonable is accepted. The Authority therefore decided to accept LPTL's EPC price of € 120.5424 million (offshore) and US\$ 22.19076 million (onshore).

## **7.2 Non-Wärtsilä EPC Cost**

- 7.2.1 LPTL requested for US\$ 3.399 million to cover the following costs, which were not included in Wärtsilä's scope;

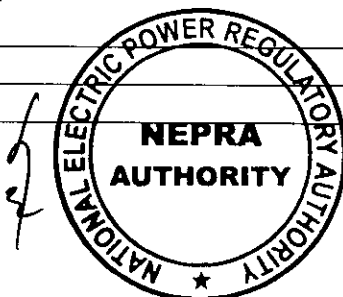
- i. Structural Excavation for power plant foundation 4 meter depth 85000 m<sup>3</sup>
- ii. Back Filling earth around foundation/under floor in layer Gravel/ Leveling / Watering / Compacting 42,500 m<sup>3</sup>
- iii. Reverse Osmosis Plant for Raw Water Treatment
- iv. Raw Water Supply System includes Tube Wells & Deep Well Pumps (KSB)
- v. Pipe Lines from tube wells to Tank
- vi. Pipe Line from tanks to Power
- vii. Sludge Disposal System, Tanks, Pumps, Pipes, Safety Equipment
- viii. Fences Around Switch Yard
- ix. Special Gravel Surface Covering Switchyard
- x. Sewerage Drain System from Plant to Near Nala
- xi. Telecommunication System of SCADA/Telephone/Wireless
- xii. Power Supply System for Auxiliary Load of 1250 kW
- xiii. Standby Power Supply System

- 7.2.2 The examination of the information provided by LPTL revealed that the sludge disposal system, tanks, pumps pipes, safety equipment was already covered in the EPC scope therefore the same is disallowed. All the other costs have been duly supported with sufficient documentary evidence therefore are allowed as such. Accordingly US\$ 3.244 million is allowed on account of Non-Wartsila EPC cost.

## **7.3 Staff Housing Colony Cost**

- 7.3.1 LPTL requested for US\$ 1.93 million on account of civil works of colony, admin/time office. Item wise breakup of the proposed civil works is indicated as under;

S#	Description	US\$ in Million
1	Residence for Skilled Worker (20 Flat one Room)	0.1606
2	Senior Staff/Engineers. Homes Two Bed Room, 20 + 20 = 40 Person	1.2443
3	Senior Staff Executive Banglous	0.2705
4	Admin Block, Canteen/ Kitchen 50 ft x 100 ft with 10 ft Height	0.1803
5	Time Office/Waiting Room	0.0743
<b>Total</b>		<b>1.9300</b>



7.3.2 LPTL justified the cost of staff housing colony on the following grounds;

- i) The facility is proposed to be located on the Site, which is about 50 kilometers from main Faisalabad city. In absence of any appropriate living arrangements urban or rural centers in close proximity to the site for the Facility's staff and personnel, the housing colony is an essential requirement for the project.
- ii) Based on LPTL's research of the industries in the area surrounding the site, it has been observed that majority of the respective staff and personnel working in such industries have been provided housing facilities within respective parameters of such industries. Considering provision of housing colonies on site is a practice being followed by the most of the industrial units surrounding the site.

7.3.3 The justification given by the LPTL for allowing staff housing colony cost does have merit for consideration. The review of the information provided in support of above mentioned costs revealed that the admin block, canteen, kitchen and time office/waiting room were included in the scope of EPC contract therefore are not being considered. All the cost items except admin block, kitchen, time office/waiting room under staff housing colony cost to the tune of US\$ 1.6754 million, which were duly supported with sufficient documentary evidence (except for admin block, kitchen, time office/waiting room) are being allowed.

**7.4 Land Acquisition and Land Development Cost**

7.4.1 The petitioner requested US\$ 2.4253 million for purchase of 25 acres of land, boundary walls, filling of land (2ft) Road inside and outside along walls, soil testing topographical test, environment study cost/permit, fee/stamp duty brokerage etc., electrical fitting at walls/roads/cables etc., fences fixing at walls, electrical security system at walls and guard room/security tower at boundary walls and infrastructure. The working is based on land price of Rs. 1.75 million per acre.

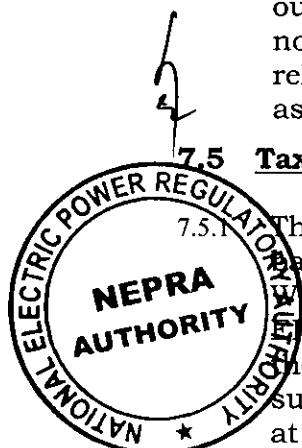
7.4.2 The examination of the information provided by the petitioner revealed that some costs like filling of 25 acres of land (2 ft), road inside and outside the boundary wall and cost of construction of boundary wall were not fully justified and needed to be revised. Having considered all the relevant evidence and based on the item wise analysis, the Authority has assessed US\$ 1.6507 million as cost for land/land infrastructure.

**7.5 Taxes and Custom Duties**

7.5.1 The petitioner estimated US\$ 9.046 million as Custom Duties & Taxes based on 5% of the offshore Wärtsilä EPC cost and 6% of the onshore Wärtsilä EPC cost. The same assumption is being applied to the adjusted EPC after incorporating the impact of exchange rate variation. Accordingly the assessed amount of US\$ 8.788 million is allowed in the instant case subject to adjustment as per actual on provision of documentary evidence at COD.

**7.6 Sponsor Development Cost**

7.6.1 The petitioner requested development cost of US\$ 3.1592 million in its petition. Following breakdown of cost was provided by the petitioner:





	US\$ in Million
PPIB Processing Fee	0.1000
NEPRA Petition, License Fee	0.0795
WAPDA Land Study	0.0164
Feasibility Study	0.0656
Company's Corporation Public Listing	0.2900
Office Equipment/Furniture/IT Equipment	0.0820
Company Vehicle Expenses	0.6982
Miscellaneous Overhead/Development/Sponsor Visits ISB-LHR	0.1322
Ground Breaking Ceremony	0.0300
Head Office Expenses	0.1849
Legal Consultant Fee/Bank	0.3606
Traveling/Boarding for CEO and Project Director	0.1768
Commercial and Finance Consultant	0.3000
Insurance Advisor Fee	0.1850
Technical Consultant/Bank	0.3500
Lawyer out of pocket expenses	0.0180
Bank Guarantee PPIB, CAP (5 million for 18 months)	0.0900

**Total: US\$ 3.1592**

7.6.2 LPTL supported its costs with detailed analysis and necessary documentary evidence. Having examined all the details and relevant information LPTL's development cost estimates are found reasonable. The Authority considers that some costs like legal consultant fee/bank, Commercial and Financial Consultant and Insurance Advisor Fee are part of Financing Fee therefore these are being accounted for accordingly. All the remaining costs to the tune of US\$ 1.9636 million are being allowed under the head development costs.

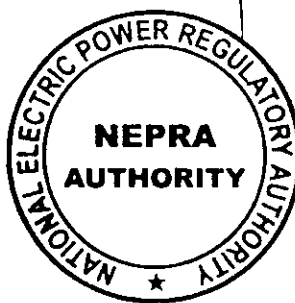
#### **7.7 Emergency and Safety Spare Parts**

7.7.1 LPTL in its petition included emergency spare parts equivalent to US\$ 2.314 million which are 1.5% of the offshore Wärtsilä EPC cost. LPTL was asked to provide evidence in support of its claim. LPTL submitted a copy of letter from Wärtsilä wherein it is clarified that "*proposed Emergency/Safety Parts are not included in the EPC price. Due to longer lead time to procure these parts, it is recommended to maintain them at site to meet emergency breakdowns. These parts will be transferred to O&M contractor/operator at the time of handing over.*" The clarification referred only EPC but did not mention about the scope of O&M contractor. LPTL was therefore advised to obtain similar clarification from the O&M contractor and submit for consideration. In response LPTL submitted a letter from Wärtsilä Pakistan according to which these parts are out of O&M scope. LPTL however did not provide the copy of O&M contract without which it was not possible to validate LPTL's claim. In absence thereof such evidence, LPTL's request for allowing Emergency Spare Parts cannot be accepted at this point of time. In case LPTL provide the copy of its O&M contract when the same is finalized the adjustment in this regard can be considered at the time of COD.

#### **7.8 Pre-COD O&M Mobilization Cost**

7.8.1 The petitioner requested US\$ 2.7293 million as mobilization cost as per details given hereunder;

O & M contractor fee pre- operations	US\$ 787,000
--------------------------------------	--------------



✓ 6 7



Staff Salary during construction	US\$ 749,901
Review of Construction Design, Civil Design, Structure Design for Foundation, Electrical HT Design and Electrification Design	US\$ 877,868
Travel & Boarding costs for technical staff training	US\$ 314,493
<b>Total mobilization Cost</b>	<b>US\$2,729,262</b>

7.8.2 The above mentioned costs have been examined in the light of documentary evidence and back up calculation provided by the LPTL. The O&M contractor's pre-operation fee is reasonable therefore is allowed as such. The review of detailed calculation of staff salaries during construction revealed that LPTL's request in this regard is reasonable therefore is accepted. LPTL in support of its request for allowing cost for Construction Design, Civil Design, Structure Design for foundation, Electrical HT Design and Electrification Design provided a letter from Muslim Constructor (Pvt.) Ltd. who has indicated a budgetary price of Rs. 53.55 million. The cost requested by LPTL on this account is comparable with the cost allowed in other similar projects therefore is allowed US\$ 0.8779 million on this account. The cost estimate in respect of travel & boarding of technical staff training being reasonable therefore is accepted as such.

7.8.3 Based upon the above overall mobilization cost works out as US\$ 2.729 million which is being allowed.

#### **7.9 Start-up Expenses and Utilities**

7.9.1 LPTL requested for US\$ 0.922 million for electricity, telephone, water supply, internet etc. during construction and cost of initial filling of fuel, diesel lubricants for start-up and testing before commissioning. The costs requested by LPTL are legitimate and reasonable therefore are being allowed as such.

#### **7.10 Pre-COD Insurance Cost**

7.10.1 LPTL requested US\$ 2.383 million as insurance cost during construction. The costs have been calculated at 1.35% insurance rate of the firm EPC Wartsila cost.

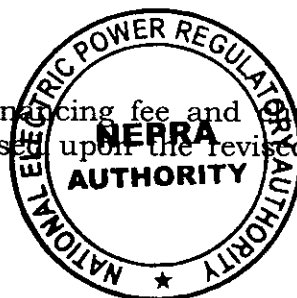
7.10.2 The cost is comparable with the other similar projects. The Pre-COD insurance cost of US\$ 2.672 million is being allowed subject to adjustment at COD on actual basis or 1.35% of EPC cost whichever is less.

#### **7.1 Independent Engineer Cost**

7.11.1 LPTL requested US\$ 0.85 million as cost of Independent Engineer which is required under the PPA term. The Authority considers that this cost is already covered under head of Pre-Cod Mobilization Cost therefore cannot be allowed separately.

#### **7.12 Financing Charges**

7.12.1 The petitioner requested financing fee and charges to the tune of US\$ 4.214 in their petition. Based upon the revised CAPEX of US\$ 219.704





this has been assessed as US\$ 4.353 million, which is allowed subject to adjustment on actual basis at COD up to maximum of 3% of the borrowing.

### **7.13 Interest During Construction**

7.13.1 The amount of interest during construction of US\$ 14.903 million requested by the petitioner is based upon its estimated Capital Expenditure (CAPEX) of US\$ 205.641 million. Based upon the assessed CAPEX of US\$ 221.608 million, 3-months KIBOR + 300 basis points (i.e. 13.45%) and proposed disbursement plan, the IDC has been assessed as US\$13.848 million to be adjusted at the time of COD as per actual loan disbursement. The COD will be the date mutually agreed between the power purchaser and the LPTL in the PPA.

### **8. Project Financing**

8.1 The petitioner's proposed capital structure of the project is indicated as follows:

Equity	US\$ 56.18
Total debt	US\$ 168.55
Total Capital Cost (Including IDC & Financing Fees)	US\$ 224.73
Debt Equity Ratio	75:25

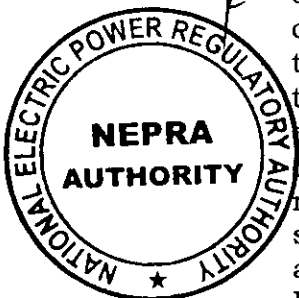
8.2 Based upon the assessment made by the Authority in the preceding paragraphs and using Euro/Dollar parity of 1.4582, the petitioner's project cost works out as US\$ 239.810 million. Accordingly maintaining the same debt-equity ratio of 75:25 the Authority has assessed debt-equity breakup as US\$ 179.858 million debt and US\$ 59.953 million equity.

### **9. CAPACITY CHARGE**

#### **9.1 Fixed O&M**

9.1.1 The petitioner requested for fixed O&M of Rs.0.1427 per kW per hour which was based on foreign fixed O&M charges of US\$ 2.352 million per year payable to the O&M contractor and local general administration cost of US\$ 1.6435 million per year. The general and administration fixed costs is intended to cover the plant administration, security, motor pool, transportation, overheads, office costs, professional fees such as audit, tax and legal as well as some minor fixed operational costs including environmental monitoring fee etc. The requested local fixed O&M cost was on the higher side and needed to be adjusted. In order to assess the reasonable local fixed O&M cost component, the information of other similar project has been examined. Based upon the examination of the available information, US\$ 1.5317 million per year is being allowed to LPTL.

9.1.2 On the basis of foreign fixed O&M cost of US\$ 2.352 million and general administration local fixed O&M cost of US\$ 1.5317 million, annual fixed O&M cost works out as US\$ 3.884 million or Rs. 0.1427 per kW per hour. The foreign component will be adjusted on account of variation in



2

6 9



Rs./US\$ parity and US CPI and local component on account of local WPI variation.

## 9.2 Insurance

- 9.2.1 The petitioner has requested insurance @ 1.35% of EPC cost. The request being in line with the cases already determined by the Authority therefore decided to allow Rs. 0.0982 per kW per hour as cost of insurance to LPTL.

## 9.3 Cost of Working Capital

- 9.3.1 The petitioner requested working capital requirement to the tune of US\$ 22.067 million in order to finance the inventory level of RFO, equivalent to 30 days generation at 100% load factor and energy payments at 60% receivable along with GST for 30 days. LPTL calculated the cost of working capital assuming 12.45% interest charges (3 month KIBOR 10.45 plus 2% spread) with no commitment fee and LC charges. LPTL requested to adjust cost of working capital component on account of fuel price variation and the quarterly changes in the three (3) month KIBOR.
- 9.3.2 LPTL request except for provision of adjustment on account of fuel price variation is reasonable therefore is being allowed. As regards the request for adjustment of cost of working capital component on account of fuel price variation there is automatic inbuilt mechanism to account for such a variation through adjustment in fuel cost component therefore this request being not justified is not accepted. The Authority has accordingly assessed working capital requirement as US\$ 19.683 million or Rs. 0.0900 per kW per hours to be adjusted according to actual prices prevalent at the time of first fill at COD according to the following formula;

$$CWC_{(Rev)} = CWC_{(Adj)} / 25,715 * FP_{(Rev)}$$

Where;

$$CWC_{(Rev)} = \text{Revised cost of working capital}$$

$$CWC_{(Adj)} = \text{Adjusted cost of working capital}$$

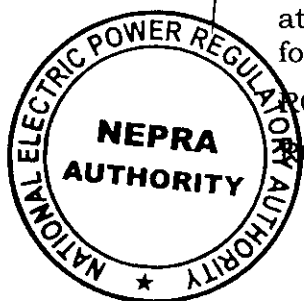
$$FP_{(Rev)} = \text{Actual fuel price at the time of first fill}$$

## 9.4 Return on Equity (ROE)

- 9.4.1 The petitioner requested Rs. 0.3104 per kW per hour as Return on Equity of US\$ 56.183 million to achieve net 15% IRR. After incorporating the adjustment on account of exchange rate variation the LPTL's equity has been assessed as US\$ 59.953 million. Based upon the assessed equity, ROE works out as Rs 0.3303 per kW per hour. The petitioner requested to allow quarterly adjustment on account of US\$/PKR exchange rate based on the revised TT&OD selling rate of USD notified by the National Bank of Pakistan (NBP). LPTL request is in line with the decision of the Economic Coordination Committee (ECC) therefore is allowed subject to adjustment at the time of COD on account of exchange rate variation according to the following formula;

$$ROE_{(Rev)} = ROE_{(Ref)} \times ER_{(Rev)} / ER_{(Ref)}$$

$$ROE_{(Rev)} = \text{The revised ROE component of the Capacity Purchase Price, quarterly indexed the USD/PKR exchange rate variation.}$$





$ROE_{(Ref)}$	=	The reference ROE component of the Capacity Purchase Price.
$ER_{(Rev)}$	=	The revised TT & OD selling rate of USD as notified by the National Bank of Pakistan
$ER_{(Ref)}$	=	The reference exchange rate of PKR 62.75 = 1 USD

#### **9.5 Return on Equity During Construction (ROE DC)**

9.5.1 The petitioner requested ROEDC of Rs. 0.0724 per kW per hour which was considered on the higher side. The Authority on the basis of available information has assessed Rs 0.0332 per kW per hour on account of ROEDC to be adjusted at the time of COD for exchange rate variation according to the following formula;

$ROEDC_{(Rev)}$	=	$ROEDC_{(Ref)} \times ER_{(Rev)} / ER_{(Ref)}$
$ROEDC_{(Rev)}$	=	The revised ROEDC component of the Capacity Purchase Price, quarterly indexed the USD/PKR exchange rate variation.
$ROEDC_{(Ref)}$	=	The reference ROEDC component of the Capacity Purchase Price.
$ER_{(Rev)}$	=	The revised TT & OD selling rate of USD as notified by the National Bank of Pakistan
$ER_{(Ref)}$	=	The reference exchange rate of PKR 62.75 = 1 USD

#### **9.6 Withholding Tax**

9.6.1 LPTL requested that withholding tax should be allowed at 7.5% or the actual applicable rate on the ROE and ROEDC subject to adjustment in US\$/PKR exchange rate variation. LPTL request is valid therefore is accepted. Withholding tax shall be adjusted accordingly on account of exchange rate variation according to the following formula;

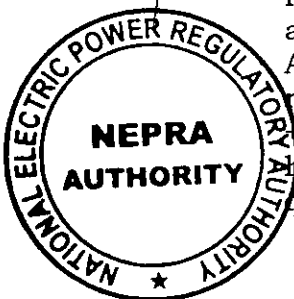
$$WT_{(Rev)} = 0.0273/62.75 * ER_{(Rev)}$$

Where;

$WT_{(Rev)}$	=	Withholding tax revised
$ER_{(Rev)}$	=	The revised TT & OD selling rate of US dollar as notified by the National Bank of Pakistan

#### **9.7 Debt Servicing**

9.7.1 The petitioner requested debt service of Rs. 1.1035 per kW per hour on the basis of debt of US\$ 168.549 (75% of project cost including IDC) and interest rate of 13.45% (KIBOR 3 months 10.45% +300 basis). Due to adjustment of exchange rate the project cost has been revised. Accordingly the debt amount has also been revised as US\$ 179.858 million. Assuming interest rate of 13.45% (3 – month KIBOR i.e. 10.45% +300 basis points) the debt service component of Rs. 1.2113 per kW per hour has been assessed subject to adjustment for variation in KIBOR on quarterly basis according to the following formula;





$$\Delta I = P_{(REV)} * (KIBOR_{(REV)} - 10.45\%) / 4$$

Where:

$\Delta I$  = the variation in interest charges applicable corresponding to variation in quarterly KIBOR.  $\Delta I$  can be positive or negative depending upon whether  $KIBOR_{(REV)} >$  or  $< 10.45\%$ . The interest payment obligation will be enhanced or reduced to the extent of  $\Delta I$  for each quarter under adjustment applicable on quarterly

$P_{(REV)}$  = is the outstanding principal (as indicated in the attached debt service schedule to this order) on a quarterly basis on the relevant quarterly calculations date. Period 1 shall commence on the date on which the 1<sup>st</sup> installment is due after availing the grace period.

## 10. ENERGY CHARGE

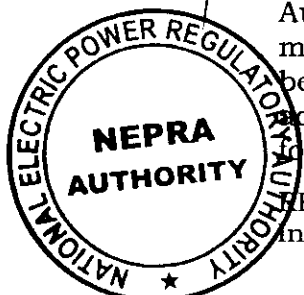
### 10.1 Fuel Cost

10.1.1 The petitioner requested fuel cost of Rs. 4.8256 per kWh (including freight of Rs. 2350) on the basis of following reference numbers;

(a)	RFO Price:	Rs. 24,490 per ton (including transportation cost of PKR 2350 subject to adjustment as per actual.) GST is not included in the RFO price and shall be pass through to the power purchaser as per actual.
(b)	Heat Rate:	8000 KJ/kWh at 100% plant capacity factor.
(c)	Output:	195 MW (net at site reference conditions)
(d)	Calorific Value of Fuel	LHV 40.60 MJ per Kg.
(e)	Thermal efficiency, inclusive of ageing and cleaning:	45.0% (life-cycle net at site conditions)

10.1.2 The Authority observed that the petitioner's assumed calorific value was lower than the minimum level prescribed by the Ministry of Petroleum and Natural Resources i.e. 18,000 BTUs per lb for local and 18,200 BTUs for imported oil.

10.1.3 In case of other similar projects a mechanism for determination of fuel cost component along with adjustment on account of fuel price variation was prescribed by the Authority. The IPPs, fuel supplier and Ministry of Petroleum and Natural Resources have certain reservations on the prescribed mechanism. In view of reservations of the stakeholders, the Authority is in the process of evolving a judicious fuel price adjustment mechanism and reference calorific values of RFO. However for the time being in order to maintain consistency the same mechanism is being adopted. For the purpose of calculation of fuel cost component the following reference values have been used;



RFO Price (HHV)  
Inland Freight

Rs. 22,140 per ton  
Rs. 2,350





<b>Total Price RFO (HHV)</b>	<b>Rs. 24,490</b>
LHV, HHV adjustment factor	1.05
<b>RFO Price (LHV)</b>	<b>Rs. 25,714 per ton</b>
Calorific Value	40,792 BTU/Kg

10.1.4 Based upon the above reference values the fuel cost component in the instant case has been assessed as Rs. 4.7811 per kWh i.e. fuel cost Rs.4.3223 and freight Rs.0.4588. The Variable Charge Part of the tariff relating to fuel cost shall be adjusted on account of the fuel price variations according to the mechanism given below:

#### **Fuel Price Variation**

The Variable Charge Part of the tariff relating to fuel cost shall be adjusted on account of the fuel price variations according to the mechanism given below:

$$FC_{(Rev)} = (Rs.4.3223 \text{ per kWh} * FP_{(Rev)}) / Rs.23,247.07 \text{ per ton} * CV_{(Rev)} / 40792 + (Rs.0.4588 \text{ per kWh} * Ft_{(Rev)}) / Rs.2,467.50 \text{ per ton}$$

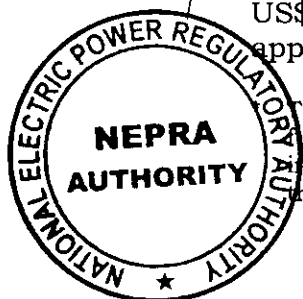
Where:

- FC<sub>(Rev)</sub> = Revised fuel cost component of Variable Charge on RFO.  
 CV<sub>(Rev)</sub> = Revised calorific value.  
 Ft<sub>(Rev)</sub> = Revised Freight Charges adjusted for NHV-GHV factor  
 FP<sub>(Rev)</sub> = The new price of RFO per Metric Ton adjusted for NHV/GHV factor of 1.05 as per the following mechanism;

Description	US\$/Ton	Rs./Ton
HSFO Arab Gulf Average Price for applicable Fortnight (From Platts Oilgram Report) * Black Premium (From OGRA)		
C & F Price – A		
Incidental charges (of C&F Price)**		
<b>Sub-Total – B</b>		
EX Refinery Price – (C=A+B)		
GST (15% of EX Refinery Price)		
Selling Price – D		
OMC Margin (3.5% of Selling Price)		
GST (15% on OMC Margin)		
Sub Total – E		
Market Price – (F=D+E)		
<b>Cost of RFO excluding GST (GHV)</b>		
<b>Inland Freight</b>		
<b>Total Cost of RFO excluding GST (GHV)</b>		

US\$ Pak Rupee Exchange Rate-NBP Selling TT/OD at the date of applicable fuel price

The fuel price adjustment request shall be supported with the actual import price of the fuel and a certificate from Hydrocarbon Institute clearly indicating the specifications including gross and net heating value of the fuel imported, which will be provided by the supplier.





\*\* Fuel supplier shall provide item wise actual incidental charges duly supported with documentary evidence prevailing at the time of receiving payment for fuel supply.

## 10.2 Variable O&M Cost

10.2.1 The petitioner requested for variable O&M of Rs. 0.5167 per kWh, which comprised of;

Foreign Variable O&M	Rs.0.3813 per kWh
Local Variable O&M	<u>Rs.0.1354 per kWh</u>
Total	Rs.0.5167 per kWh.

10.2.2 The petitioner's request is about 18.57% higher than the allowed Rs.0.4362 per kWh in the other similar cases. The petitioner was asked to justify the increase in the variable cost components. According to the information provided by LPTL its variable O&M cost included additional cost on account of chemicals required for water treatment due to poor quality water of Faisalabad. LPTL provided laboratory test reports in support thereof. The additional cost on this account as indicated by LPTL is Rs.0.0300 per kWh. According to the calculation provided in support thereof LPTL's per day water consumption will be 2.3 million gallon while its chemical cost / 1000 gallon will be Rs. 63.010. The request being reasonable and justified is accepted as such.

10.2.3 LPTL's proposed variable O&M other than the additional cost for water treatment works out as Rs.0.4872 per kWh, which comprised of local variable O&M of Rs.0.1054 per kWh to cover cost of lubricants, consumables; and foreign variable O&M cost of Rs.0.3813 per kWh to cover spares for major overhauling and operators fee etc. The petitioner contended that the foreign variable O&M component of other similar projects if adjusted for Euro/\$ parity of 1.45 would be Rs.0.4046 per kWh, which is higher than the requested foreign variable O&M component. Based on the petitioner's analysis and documentary evidence for allowing foreign variable O&M component of Rs.0.3813 per kWh is considered reasonable therefore is accepted.

10.2.4 The petitioner's request for allowing Rs.0.1054 per kWh as local variable O&M component (cost of lubricants) is substantiated with proper working and is reasonable therefore is allowed.

## 11. Adjustments at Commercial Operation Date (COD)

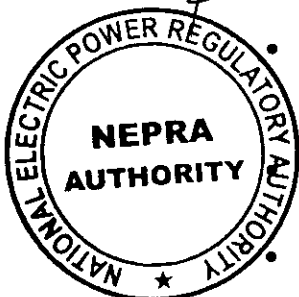
11.1 LPTL request for allowing following adjustments at the time of COD;

- The ROE, ROEDC, EPC Cost, Insurance, Custom Duties & Taxes, IDC and the Debt Service Component shall also be adjusted at COD for the reference exchange rate variation during construction;

- Assuming 100% local debt financing, the Debt Service Component shall also be adjusted by variations in the 3-months KIBOR during construction.

The Cost of Working Capital component shall also be updated with prevailing fuel price at COD and the prevailing 3-month KIBOR.

Hedging cost during construction and EPC payment will be made part of the Project Cost, if required by the Lenders. LPTL will be required





to seek prior approval from NEPRA before agreeing to such an arrangement. Otherwise, subject to the lenders' consent, the final local amount at COD would be based on actual Exchange Rates used by the banks to make payment to the EPC contractor.

- In summary, at COD, the Reference Generation Tariff will be updated on the basis of;
  - Actual interest incurred during the construction period;
  - Fuel Price variation;
  - Custom duties and taxes variation;
  - Exchange rate variations;
  - Insurances;
  - Change in KIBOR; and
  - Project cost with reference to exchange rate variations and KIBOR.

11.1.2 The Authority considered that LPTL request for allowing abovementioned adjustments at COD are reasonable therefore is being allowed.

## **12. Base Changes**

121.1 Changes in the base price of fuel (i.e. RFO), transportation charges and GST shall be treated as a pass-through cost based on the actual heat rate subject to minimum of guaranteed heat rate.

## **13. Pass-Through Items**

13.1 LPTL requested that any taxes and levies etc. not factored in the reference generation tariff calculation shall be treated as pass-through. The Authority considers that the request is reasonable therefore is being allowed.

## **14. General Assumptions**

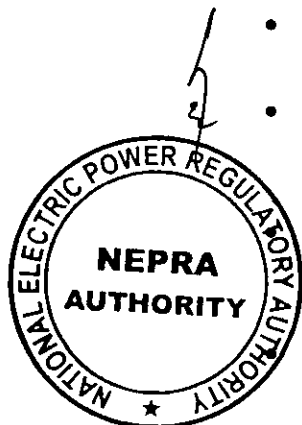
14.1 LPTL submitted that the following have been assumed while calculating the Reference Generation Tariff and changes in any of these assumptions will result in changes in the Reference Generation Tariff;

- Debt:Equity ratio is assumed to be 75:25.
- Interest rate for Debt is assumed at 13.45% (KIBOR + 3% spread).
- 100% of debt has been assumed to be local provided however that in the event LPTL uses a mix of foreign and local loan, the future benefits of the lower interest rates shall be passed on to the Power Purchaser as per GOP policy.
- Debt tenure is assumed to be grace period + 10 years quarterly repayment.
- Custom duties on imported plant equipment are assumed to be 5% in accordance with the Power Policy 2002. Any change in the custom duty shall be adjusted as per actual.

Withholding tax has been assumed at 6% on the local component of the contract. Any change in the withholding taxes shall be adjusted as per actual.

No corporate income tax and no minimum turnover tax have been assumed.

- Withholding tax of 7.5% on dividends has been assumed.



2

15

- The “Firm EPC Wärtsilä Cost” is based on construction of grid station with four bays for 132 kV. Any increase in the same proposed by the Power Purchaser shall increase the Firm EPC Wärtsilä Cost.
  - The Power Purchaser is assumed to be responsible for financing and construction of the interconnection to the grid.
  - The exchange rate has been assumed to be 61.00 for PKR/USD; 78.08 for PKR/Euro; and 1.28 for USD/Euro.
  - Working capital has been financed by a separate Working Capital facility, and is not included in the project cost.
  - Anticipated average site conditions that have been used in calculation of the net output and heat rate are an altitude 200 m above sea level, average ambient temperature of 30°C and 60% average relative humidity. If there is any change in the foregoing assumptions, the same shall have an impact on the de-rating curve.
  - Plant availability of 88% is assumed.
  - All fuel used during facility testing after synchronization is assumed to be paid by the Power Purchaser.
  - Energy Purchase Price is assumed to be paid to LPTL by the Power Purchaser during capacity testing.
  - Heat Rate curve/temperature curve for each percentage of dispatched loads will be taken into account for fuel consumption.
  - GST on fuel shall be treated as a pass-through under the PPA.
  - If Power Purchaser required the dispatched delivery in excess of 132 kV, any additional cost will be paid by the Power Purchaser to LPTL and NEPRA will adjust the additional cost in tariff.
- 14.2 The generation tariff determined by the Authority is based on the assumptions indicated above except for withholding tax on the local component of the contract, the exchange rate.

**15. Indexation/Inflation Factor**

- 15.1 The request of the petitioner for allowing Rupee/Euro exchange rate variation and European inflation on foreign portion of Fixed and Variable O&M cost is not consistent with the existing GOP policy, which does not allow such kind of indexations. Under the policy only Rupee/Dollar variation adjustment and US CPI on foreign portion of O&M cost; the same is therefore being allowed.

**16. Timeline/Completion of Project**

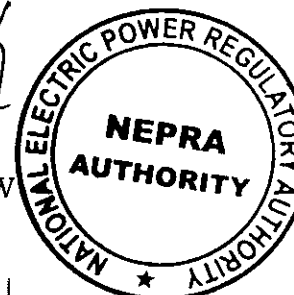
- 16.1 As per the documentary evidence timeline of COD is indicated as 31<sup>st</sup> December 2010 which is being allowed.

**17. Summary**

- 17.1 The decision of the Authority are summarized as given below;

Plant Capacity (Gross ISO) MW

200 MW





Plant Capacity (Net at reference site conditions) MW	195
Plant Availability	88%
EPC Price Offshore	Euro 120.549 million
EPC Price Onshore	US\$ 22.19 million
Non- Wärtsilä EPC Cost	US\$ 3.244 million
Non-EPC Cost	US\$ 11.613 million
Custom Duties & Taxes	US\$ 8.788 million
Financing Fees	US\$ 4.353 million
Interest During Construction	US\$ 13.848 million
Reference PKR/Euro exchange rate	91.50
Reference PKR/US\$ exchange rate	62.75
Reference Calorific Value of HSFO	40,792 BTUs/kg
HHV/LHV Adjustment Factor	1.05
Reference Fuel Price	Rs. 22,140
Reference Inland Freight	Rs. 2,350
Reference Thermal Efficiency	45%
Reference KIBOR (3-monthly)	10.45%
IRR	15%

### Reference Specified Tariff

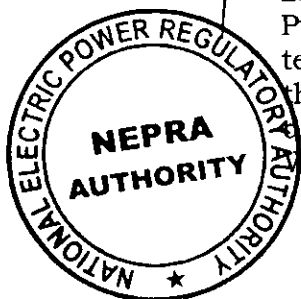
Tariff Components	Year 1 to 10	Year 11 to 25	Indexation
<b>Capacity Charge PKR/kW/Hour)</b>			
O&M Foreign	0.0864	0.0864	US\$ /PKR & US CPI
O&M Local	0.0563	0.0563	WPI
Cost of Working Capital	0.0900	0.0900	KIBOR
Insurance	0.0982	0.0982	US\$ /PKR
Debt Service – Local	1.2113	-	KIBOR
Return on Equity	0.3303	0.3303	US\$ /PKR
ROE during Construction	0.0332	0.0332	US\$ /PKR
<b>Total Capacity Charge</b>	<b>1.9057</b>	<b>0.6944</b>	
<b>Energy Charge on Operation on Furnace Oil Rs./kWh</b>			
Fuel Cost Component	4.7811	4.7811	Fuel Price
<b>Variable O&amp;M</b>			
Foreign	0.3813	0.3813	US\$ /PKR & US CPI
Local	0.1054	0.1054	WPI
Water treatment	0.0300	0.0300	WPI

Note: i) Component wise tariff for operation on RFO is indicated at Annex-I.

17.2 In view of the above the Authority hereby approves the tariff of Liberty Power Tech Limited (LPTL) as set out in the following order;

### ORDER

Pursuant to Rule 6 of the NEPRA Licensing (Generation) Rules 2000 Liberty Power Tech Limited (LPTL) is allowed the tariff, Liberty Power Tech Limited (LPTL) is allowed to charge, subject to adjustment of Capacity Purchase Price on account of net dependable capacity as determined by test jointly carried out by Central Power Purchasing Agency (CPPA) and the petitioner, the following is approved as specified tariff for LPTL for delivery of electricity to CPPA of NTDC for procurement on behalf of Ex-APDA Distribution Companies:





### Reference Specified Tariff

Tariff Components	Year 1 to 10	Year 11 to 25	Indexation
<b>Capacity Charge PKR/kW/Hour)</b>			
O&M Foreign	0.0864	0.0864	US\$ /PKR & US CPI
O&M Local	0.0563	0.0563	WPI
Cost of Working Capital	0.0900	0.0900	KIBOR
Insurance	0.0982	0.0982	US\$ /PKR
Debt Service – Local	1.2113	-	KIBOR
Return on Equity	0.3303	0.3303	US\$ /PKR
ROE during Construction	0.0332	0.0332	US\$ /PKR
<b>Total Capacity Charge</b>	<b>1.9057</b>	<b>0.6944</b>	
<b>Energy Charge on Operation on Furnace Oil Rs./kWh</b>			
Fuel Cost Component	4.7811	4.7811	Fuel Price
<b>Variable O&amp;M</b>			
Foreign	0.3813	0.3813	US\$ /PKR & US CPI
Local	0.1054	0.1054	WPI
Water treatment	0.0300	0.0300	WPI

Note: i) Component wise tariff for operation on RFO is indicated at Annex-I.

The following adjustments /indexations shall be applicable to reference tariff;

#### I. Adjustment in EPC Cost (One Time)

The Authority has assessed EPC cost as US\$ 197.961 million out of which €120.549 million (offshore) and US\$ 22.19 million (onshore to be incurred in Pak Rupees). Since the exact timing of payment to EPC contractor is not known at this point of time therefore an adjustment for relevant foreign currency fluctuation for the portion of payment in the relevant foreign currency will be made. In this regard the sponsor will be required to provide all the necessary relevant details along with documentary evidence. Based upon such information the EPC cost components in Euro or Dollar shall be established and shall be applied to the corresponding EPC cost components. The adjustment shall be only for currency fluctuation against the reference parity values according to the following mechanism;

$$EPC_{(Adj.)} = PKR 12,422.10 \text{ Million} / 91.5 * E_{(PR)}$$

Where:

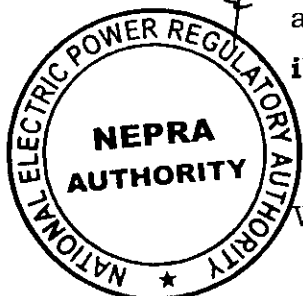
$E_{(PR)}$  = Weighted Average PKR/EURO parity based upon timing of the payment

The tariff components i.e. Insurance, ROE, ROEDC, Principal Repayment and Interest Charges shall be adjusted according to the following formula at COD.

#### i) Insurance Adjustment Mechanism for EPC Cost Variation

$$Ins_{(Rev)} = Ins_{(Ref)} / EPC_{(Ref)} * EPC_{(Adj.)}$$

Where:





$Ins_{(Rev)}$	=	Revised reference insurance component of tariff
$Ins_{(Ref)}$	=	Reference insurance component of tariff as per original schedule of tariff
$EPC_{(Ref)}$	=	Reference EPC in PKR which is Rs. 12,422.10 million.
$EPC_{(Adj.)}$	=	Adjusted EPC in PKR

**ii) Return on Equity Adjustment Mechanism for EPC Cost Variation**

$$ROE_{(Rev)} = ROE_{(Ref)} / E_{(Ref)} * E_{(Rev)}$$

Where:

$ROE_{(Rev)}$	=	Revised reference Return on Equity component of tariff in PKR
$ROE_{(Ref)}$	=	Reference Return on Equity component of tariff as per original schedule of tariff in PKR
$E_{(Rev)}$	=	Reference Equity in PKR (Rs. 3,762.02 million)
$E_{(Rev)}$	=	Revised amount of Equity in PKR

**iii) ROEDC Adjustment Mechanism for EPC Cost Variation**

$$ROEDC_{(Rev)} = ROEDC_{(Ref)} / EDC_{(Ref)} * EDC_{(Rev)}$$

Where:

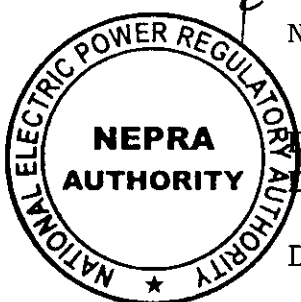
$ROEDC_{(Rev)}$	=	Revised Return on Equity during Construction component of tariff in PKR
$EDC_{(Ref)}$	=	Reference Equity During Construction in PKR
$EDC_{(Rev)}$	=	Revised Equity During Construction in PKR

**iv) Debt Servicing Adjustment Mechanism for EPC Cost Variation**

$$DS_{(Rev)} = DS_{(Ref)} / Debt_{(Ref)} * Debt_{(Rev)}$$

Note: The adjustment factor established as per the above formula shall be applicable to the individual components of principal and interest during the entire repayment period.

$DS_{(Rev)}$	=	Revised Debt Servicing component of tariff
$DS_{(Ref)}$	=	Reference Debt Servicing component of tariff as per original schedule of tariff
$Debt_{(Ref.)}$	=	Revised project cost after incorporating the adjustment for currency fluctuation
$Debt_{(Rev.)}$	=	Reference Debt in PKR (Rs. 11,286.04 million)



**II. Adjustment due to Variation in Net Capacity**

The reference tariff has been determined on the basis of minimum net capacity of 195 MW at delivery point at mean site conditions. All the tariff



components except fuel cost component shall be adjusted at the time of COD based upon the Initial Dependable Capacity (IDC) tests to be carried out for determination of contracted capacity. Adjustment shall not be made if IDC is established less than 195 MW net capacity at reference site conditions. The adjustments shall be made according to the following formula:

$$CC_{(Adj.)} = CC_{(Ref.)} \times 195 MW / NC_{(IDC)}$$

Note: Above formula shall be applicable to all the individual relevant components of Capacity Charges.

Where;

- CC<sub>(Adj.)</sub> = Adjusted relevant Capacity Charge components of tariff  
CC<sub>(Ref.)</sub> = Reference relevant Capacity Charge components of tariff  
NC<sub>(IDC)</sub> = Net Capacity at reference site conditions established at the time of IDC test

Note:- Reference capacity charge components of Tariff i.e. Revised O&M Foreign, Revised O&M Local, Insurance, Debt Servicing, Return on Equity and ROEDC to be adjusted as per IDC test.

Reference Conditions:

- *Altitude above sea level* 200 m
- *Wet bulb temperature* 24 °C
- *Minimum ambient air temperature* 5 °C
- *Maximum ambient air temperature* 30 °C

The manufacturer's power plant gross performance at designed ambient conditions is as follows;

Electric active power (Diesel Generating Sets)	186 274 kWe
Electrical apparent power	232 843 kVa at power factor 0.8
Electrical power (steam turbine)	14 200 kWe
	17 750 kva
Total DG-sets + turbine	200 474 kWe

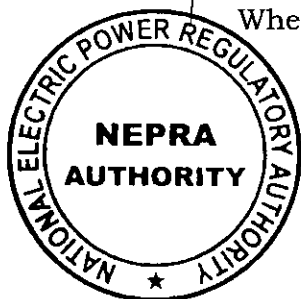
### III. Adjustment in Insurance as per actual

The actual insurance cost for the minimum cover required under contractual obligations with the Power Purchaser not exceeding 1.35% of the EPC cost will be treated as pass-through. Insurance component of reference tariff shall be adjusted as per actual on yearly basis upon production of authentic documentary evidence by LPTL according to the following formula;

$$\text{Insurance (Rev)} = AIC / (1.35 \% \times \text{US\$ } 2.672 \text{ Million}) * AP$$

Where;

- AIC = Adjusted Insurance Component (Rs. kW/hr) as per IDC Test  
AP = Actual Premium subject to maximum of 1.35% of the adjusted EPC



2

6





**IV. Adjustment Based on Actual Interest During Construction**

Debt Service, Return on Equity and ROE during construction shall be adjusted on account of actual variation in drawdown and Interest During Construction with reference to the estimated figures.

**V. Adjustment due to Custom Duties & Taxes**

Debt Service, Return on Equity and ROE during construction shall be adjusted on account of actual variation in custom duties & Taxes with reference to the estimated figures of US\$ 8.788 million. The impact of withholding tax on local services is not known at this point of time. However, these will be adjusted along with other duties and taxes as per the actual on provision of documentary evidence at COD.

**VI. Adjustment for variation in Dollar/Rupee parity**

Relevant reference tariff components shall be adjusted at COD on account of variation in Dollar/Rupee parity.

**VII. Pass-Through Items**

- i) No provision for income tax has been accounted for in the tariff. If LPTL is obligated to pay any tax on its ROE, the exact amount paid by the company may be reimbursed by CPPA to LPTL on production of original receipts. This payment may be considered as pass-through (as Rs./kW/hour) hourly payment spread over a 12 months period in addition to the capacity purchase price proposed in the Reference Tariff. Furthermore, in such a scenario, LPTL may also submit to CPPA details of any tax shield savings and CPPA will deduct the amount of these savings from its payment to LPTL on account of taxation.
- ii) Withholding tax on dividend is also a pass through item just like other taxes as indicated in the government guidelines for determination of tariff for new IPPs. In a reference tariff table withholding tax number is indicated as reference and CPPA (NTDC) shall make payment on account of withholding tax at the time of actual payment of dividend subject to maximum of 7.5% of 15% reference equity i.e. hourly payment (Rs./kW/hour) spread over a 12 month according to the following formula:

$$\text{Withholding Tax Payable} = \{[15\% * (E_{(Ref)} - E_{(Red)}) + ROEDC_{(Ref)}] * 7.5\%$$

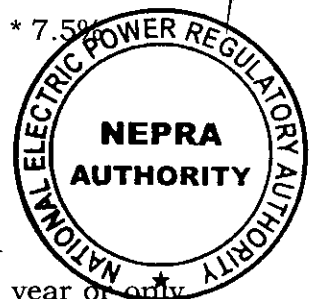
Where:

$E_{(Ref)}$  = Adjusted Reference Equity at COD

$E_{(Red)}$  = Equity Redeemed

$ROEDC_{(Ref)}$  = Reference Return on Equity During Construction

- iii) In case Company does not declare a dividend in a particular year or only declares a partial dividend, then the difference in the withholding tax amount (between what is paid in that year and the total entitlement as per the Net Return on Equity) would be carried forward and accumulated so that the Company is able to recover the same in hourly payments spread over 12 months period as a pass through from the Power Purchaser in future on the basis of the total dividend pay out.





### VIII. Indexations:

The following indexation shall be applicable to the reference tariff as follows;

#### a) Indexation applicable to O&M

The Fixed O&M local component of Capacity Charge will be adjusted on account of Inflation (WPI) and Fixed O&M foreign component on account of variation in US CPI and dollar/Rupee exchange rate. Quarterly adjustment for local inflation, foreign inflation and exchange rate variation will be made on 1<sup>st</sup> July, 1<sup>st</sup> October, 1<sup>st</sup> January and 1<sup>st</sup> April based on the latest available information with respect to WPI notified by the Federal Bureau of Statistics (FBS), US CPI issued by US Bureau of Labor Statistics and revised TT & OD selling rate of US Dollar notified by the National Bank of Pakistan. The mode of indexation will be as under:

##### i) Fixed O&M

$$F O\&M_{(LREV)} = \text{Rs. } 0.0563/\text{kW}/\text{Hour} * WPI_{(REV)} / 125.67$$

$$F O\&M_{(PREV)} = \text{Rs. } 0.0864/\text{kW}/\text{Hour} * US CPI_{(REV)} / 210.036 * ER_{(REV)} / 62.75$$

Where:

$F O\&M_{(LREV)}$  = the revised applicable Fixed O&M Local Component of the Capacity Charge indexed with WPI

$F O\&M_{(PREV)}$  = the revised applicable Fixed O&M Foreign Component of the Capacity Charge indexed with US CPI and Exchange Rate variations

$WPI_{(REV)}$  = the revised wholesale Price Index (manufactures)

$WPI_{(REF)}$  = 125.67 wholesale price index (manufactures) of December 2007 notified by Federal Bureau of Statistics

$US CPI_{(REV)}$  = the revised US CPI

$US CPI_{(REF)}$  = 210.036 US CPI for the month of December 2007 as notified by the US Bureau of Labor Statistics

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

Note: The reference numbers indicated above shall be replaced by the revised numbers after incorporating the required adjustments at COD.

##### ii) Variable O&M

The formula for indexation of variable O&M component will be as under:

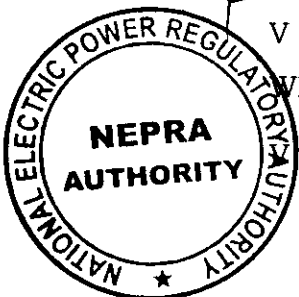
$$V O\&M_{(LREV)} = \text{Rs. } 0.1054 / \text{kW}/\text{Hour} * WPI_{(REV)} / 125.67$$

$$V O\&M_{(WREV)} = \text{Rs. } 0.0300 / \text{kW}/\text{Hour} * WPI_{(REV)} / 125.67$$

$$V O\&M_{(PREV)} = \text{Rs. } 0.3813 / \text{kW}/\text{Hr} * US CPI_{(REV)} / 210.036 * ER_{(REV)} / 62.75$$

Where:

$O\&M_{(LREV)}$  = the revised price of lubricants Variable O&M Local Component of the Capacity Charge indexed with WPI





$V O\&M_{(WREV)}$	=	the revised water treatment Variable O&M Local Component of the Capacity Charge indexed with WPI
$V O\&M_{(FREV)}$	=	the revised applicable Variable O&M Foreign Component of the Capacity Charge indexed with US CPI and Exchange Rate variations
$WPI_{(REV)}$	=	the revised wholesale Price Index (manufactures)
$WPI_{(REF)}$	=	125.67 wholesale price index (manufactures) of December 2007 notified by Federal Bureau of Statistics
$US CPI_{(REV)}$	=	the revised US CPI
$US CPI_{(REF)}$	=	210.036 US CPI for the month of December 2007 as notified by the US Bureau of Labor Statistics
$ER_{(REV)}$	=	the Revised TT & OD selling rate of US dollar as notified by the National Bank of Pakistan

Note: The reference Variable O&M indicated above shall be replaced with the revised number at COD after incorporating the required adjustment based upon the IDC Test.

### iii) Adjustment for KIBOR variation

The interest part of fixed charge component will remain unchanged throughout the term except for the adjustment due to variations in interest rate as a result of variation in quarterly KIBOR according to the following formula;

$$\Delta I_{(L)} = P_{(LREV)} * (KIBOR_{(REV)} - 10.45\%) / 4$$

Where:

$\Delta I_{(L)}$  = the variation in interest charges on local loan applicable corresponding to variation in quarterly KIBOR.  $\Delta I$  can be positive or negative depending upon whether  $KIBOR_{(REV)} >$  or  $< 10.45\%$ . The interest payment obligation will be enhanced or reduced to the extent of  $\Delta I$  for each quarter under adjustment applicable on quarterly

$P_{(REV)}$  = is the outstanding principal (as indicated in the attached debt service schedule to this order) on a quarterly basis on the relevant quarterly calculations date. Period 1 shall commence on the date on which the 1<sup>st</sup> installment is due after availing the grace period.

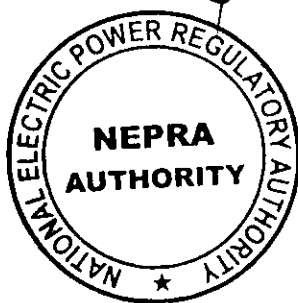
### iv) Fuel Price Variation

The Variable Charge Part of the tariff relating to fuel cost shall be adjusted on account of the fuel price variations according to the mechanism given below:

$$FC_{(REV)} = (Rs.4.3223 \text{ per kWh} * FP_{(REV)}) / Rs.23,247.07 \text{ per ton}/40,792 * CV_{(REV)} + (Rs.0.4588 \text{ per kWh} * Ft_{(REV)}) / Rs. 2,467.50 \text{ per ton}$$

Where:

$FC_{(REV)}$  = Revised fuel cost component of Variable Charge on RFO.





CV(Rev) = Revised Calorific Value  
Ft(Rev) = Revised Freight Charges adjusted for NHV-GHV factor  
FP (Rev) = The new price of RFO per Metric Ton adjusted for NHV/GHV factor of 1.05 as per the following mechanism;

Description	US\$/Ton	Rs./Ton
HSFO Arab Gulf Average Price for applicable Fortnight (From Platts Oilgram Report) *		
Black Premium (From OGRA)		
C & F Price – A		
Crude Handling and Incidental charges (7.282% of C&F Price)**		
<b>Sub-Total – B</b>		
EX Refinery Price – (C=A+B)		
GST (15% of EX Refinery Price)		
Selling Price – D		
OMC Margin (3.5% of Selling Price)		
GST (15% on OMC Margin)		
Sub Total – E		
Market Price – (F=D+E)		
<b>Cost of RFO excluding GST (GHV)</b>		
<b>Inland Freight</b>		
<b>Total Cost of RFO excluding GST (GHV)</b>		

US\$ Pak Rupee Exchange Rate-NBP Selling TT/OD at the date of applicable fuel price

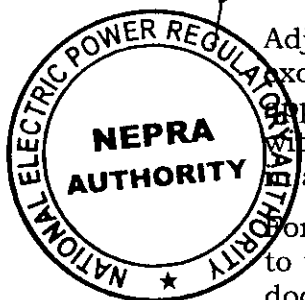
\* The supplier shall clearly indicate average Gross and Net calorific values of Arabian Gulf or any other source of which average reference fuel prices are used. Fuel supplier shall provide price adjustment mechanism due to variation in calorific value of the fuel being supplied to the IPP against the reference calorific values.

\*\* Fuel supplier shall provide item wise actual incidental charges prevailing at the time of receiving payment for fuel supply.

The fuel cost component will be adjusted after the commercial operation date, at the time of revision in RFO price.

Adjustment on account of local inflation, foreign inflation, foreign exchange rate variation, KIBOR variation and fuel price variation will be approved and announced by the Authority for immediate application within seven working days after receipt of LPTL's request for adjustment in accordance with the requisite indexation mechanism stipulated herein.

For one time adjustment of relevant tariff components at COD according to the mechanism laid down in this order, LPTL shall submit the relevant documents to NEPRA within 30 days of COD for adjustment.



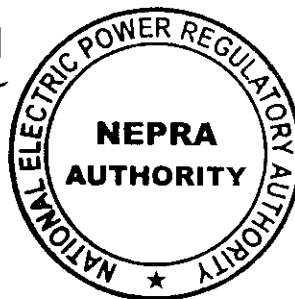
#### IX. Terms and Conditions of Tariff:

- Capacity Charge Rs./kW/hour applicable to dependable capacity at the delivery point.
- The tariff is applicable for a period of 25 years commencing from the date of the Commercial Operation.
- The plant availability shall be 88%.

2

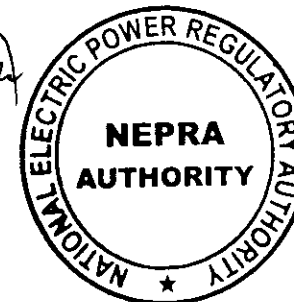


- iv) All new equipment will be installed and the plant will be of standard configuration.
- v) Dispatch criterion will be based on the Energy Charge.
- vi) Internal consumption (including air-cooled condenser) has been assumed to be approximately 4.1 MW.
- vii) Scheduled Outage periods per annum shall be in accordance with the 2006 standardized PPA.
- viii) NTDC will be responsible for constructing the interconnection to the grid.
- ix) All invoicing and payment terms are assumed to be in accordance with the 2006 standardized PPA.
- x) Tolerance in Dispatch shall be in accordance with 2006 standardized PPA.
- xi) If there is any change in any assumption that may lead to change in the tariff shall be referred to NEPRA for approval.
- xii) If IPP is required by the power purchaser to deliver power above 132 kV, any additional cost to be incurred by the IPP submitted to NEPRA for adjustment. The adjustment request by the IPP shall be duly verified by the power purchaser.
- xiii) 100% of debt has been assumed to be local provided however that in the event LPTL uses a mix of foreign and local loan, the future benefits of the lower interest rates shall be passed on to the Power Purchaser.
- xiv) No corporate income tax and no minimum turnover tax have been assumed.
- xv) Working capital has been financed by a separate Working Capital facility, and is not included in the project cost.



**Liberty Power Tech Limited  
Reference Tariff Table**

Year	Variable Charge (Rs./kWh)			Capacity Charge (Rs./kW/Hour)										Capacity Charge at 60% PF	Tariff	
	Fuel	Variable O&M	Total	Fixed O&M Foreign	Fixed O&M Local	Cost of Working Capital	Insurance	ROE	ROEDC	Withholding Tax @7.5%	Loan Repayment	Interest Charges	Total	Rs. per kWh	Rs. per kWh	¢ per kWh
1	4.7811	0.5167	5.2978	0.0864	0.0563	0.0900	0.0982	0.3303	0.0332	0.0273	0.3393	0.8720	1.9330	3.2216	8.5194	13.5768
2	4.7811	0.5167	5.2978	0.0864	0.0563	0.0900	0.0982	0.3303	0.0332	0.0273	0.3873	0.8240	1.9330	3.2216	8.5194	13.5768
3	4.7811	0.5167	5.2978	0.0864	0.0563	0.0900	0.0982	0.3303	0.0332	0.0273	0.4421	0.7692	1.9330	3.2216	8.5194	13.5768
4	4.7811	0.5167	5.2978	0.0864	0.0563	0.0900	0.0982	0.3303	0.0332	0.0273	0.5046	0.7067	1.9330	3.2216	8.5194	13.5768
5	4.7811	0.5167	5.2978	0.0864	0.0563	0.0900	0.0982	0.3303	0.0332	0.0273	0.5759	0.6353	1.9330	3.2216	8.5194	13.5768
6	4.7811	0.5167	5.2978	0.0864	0.0563	0.0900	0.0982	0.3303	0.0332	0.0273	0.6574	0.5539	1.9330	3.2216	8.5194	13.5768
7	4.7811	0.5167	5.2978	0.0864	0.0563	0.0900	0.0982	0.3303	0.0332	0.0273	0.7504	0.4609	1.9330	3.2216	8.5194	13.5768
8	4.7811	0.5167	5.2978	0.0864	0.0563	0.0900	0.0982	0.3303	0.0332	0.0273	0.8565	0.3548	1.9330	3.2216	8.5194	13.5768
9	4.7811	0.5167	5.2978	0.0864	0.0563	0.0900	0.0982	0.3303	0.0332	0.0273	0.9777	0.2336	1.9330	3.2216	8.5194	13.5768
10	4.7811	0.5167	5.2978	0.0864	0.0563	0.0900	0.0982	0.3303	0.0332	0.0273	1.1159	0.0954	1.9330	3.2216	8.5194	13.5768
11	4.7811	0.5167	5.2978	0.0864	0.0563	0.0900	0.0982	0.3303	0.0332	0.0273	-	-	0.7217	1.2028	6.5006	10.3595
12	4.7811	0.5167	5.2978	0.0864	0.0563	0.0900	0.0982	0.3303	0.0332	0.0273	-	-	0.7217	1.2028	6.5006	10.3595
13	4.7811	0.5167	5.2978	0.0864	0.0563	0.0900	0.0982	0.3303	0.0332	0.0273	-	-	0.7217	1.2028	6.5006	10.3595
14	4.7811	0.5167	5.2978	0.0864	0.0563	0.0900	0.0982	0.3303	0.0332	0.0273	-	-	0.7217	1.2028	6.5006	10.3595
15	4.7811	0.5167	5.2978	0.0864	0.0563	0.0900	0.0982	0.3303	0.0332	0.0273	-	-	0.7217	1.2028	6.5006	10.3595
16	4.7811	0.5167	5.2978	0.0864	0.0563	0.0900	0.0982	0.3303	0.0332	0.0273	-	-	0.7217	1.2028	6.5006	10.3595
17	4.7811	0.5167	5.2978	0.0864	0.0563	0.0900	0.0982	0.3303	0.0332	0.0273	-	-	0.7217	1.2028	6.5006	10.3595
18	4.7811	0.5167	5.2978	0.0864	0.0563	0.0900	0.0982	0.3303	0.0332	0.0273	-	-	0.7217	1.2028	6.5006	10.3595
19	4.7811	0.5167	5.2978	0.0864	0.0563	0.0900	0.0982	0.3303	0.0332	0.0273	-	-	0.7217	1.2028	6.5006	10.3595
20	4.7811	0.5167	5.2978	0.0864	0.0563	0.0900	0.0982	0.3303	0.0332	0.0273	-	-	0.7217	1.2028	6.5006	10.3595
21	4.7811	0.5167	5.2978	0.0864	0.0563	0.0900	0.0982	0.3303	0.0332	0.0273	-	-	0.7217	1.2028	6.5006	10.3595
22	4.7811	0.5167	5.2978	0.0864	0.0563	0.0900	0.0982	0.3303	0.0332	0.0273	-	-	0.7217	1.2028	6.5006	10.3595
23	4.7811	0.5167	5.2978	0.0864	0.0563	0.0900	0.0982	0.3303	0.0332	0.0273	-	-	0.7217	1.2028	6.5006	10.3595
24	4.7811	0.5167	5.2978	0.0864	0.0563	0.0900	0.0982	0.3303	0.0332	0.0273	-	-	0.7217	1.2028	6.5006	10.3595
25	4.7811	0.5167	5.2978	0.0864	0.0563	0.0900	0.0982	0.3303	0.0332	0.0273	-	-	0.7217	1.2028	6.5006	10.3595
<b>Levelized Tariff (1-25Years)</b>			<b>5.2978</b>	<b>0.0864</b>	<b>0.0563</b>	<b>0.0900</b>	<b>0.0982</b>	<b>0.3303</b>	<b>0.0332</b>	<b>0.0273</b>	<b>0.4036</b>	<b>0.4164</b>	<b>1.5417</b>	<b>2.5694</b>	<b>7.8672</b>	<b>12.5374</b>



**Liberty Power Tech Limited**  
**Debt Servicing Schedule**

Period	Local Debt					Annual Principal Repayment Rs./kW/ hr.	Annual Interest Rs./kW/ hr.	Annual Debt Servicing Rs./kW/ hr.
	Principal Million Rs.	Repayment Million Rs.	Mark-up Million Rs.	Balance Million Rs.	Debt Service Millin Rs.			
1	11,286.06	137.79	379.49	11,148.28	517.28	0.34	0.87	1.2113
	11,148.28	142.42	374.86	11,005.86	517.28			
	11,005.86	147.21	370.07	10,858.65	517.28			
	10,858.65	152.16	365.12	10,706.49	517.28			
	11,286.06	579.57	1,489.55	10,706.49	2,069.12			
	10,706.49	157.27	360.01	10,549.22	517.28			
	10,549.22	162.56	354.72	10,386.66	517.28			
2	10,386.66	168.03	349.25	10,218.63	517.28	0.39	0.82	1.21
	10,218.63	173.68	343.60	10,044.95	517.28			
	10,706.49	661.54	1,407.58	10,044.95	2,069.12			
	10,044.95	179.52	337.76	9,865.43	517.28			
	9,865.43	185.55	331.73	9,679.87	517.28			
	9,679.87	191.79	325.49	9,488.08	517.28			
	9,488.08	198.24	319.04	9,289.84	517.28			
3	10,044.95	755.11	1,314.01	9,289.84	2,069.12	0.44	0.77	1.21
	9,289.84	204.91	312.37	9,084.93	517.28			
	9,084.93	211.80	305.48	8,873.13	517.28			
	8,873.13	218.92	298.36	8,654.21	517.28			
	8,654.21	226.28	291.00	8,427.93	517.28			
	9,289.84	861.91	1,207.21	8,427.93	2,069.12			
	8,427.93	233.89	283.39	8,194.03	517.28			
4	8,194.03	241.76	275.52	7,952.28	517.28	0.50	0.71	1.21
	7,952.28	249.88	267.40	7,702.39	517.28			
	7,702.39	258.29	258.99	7,444.11	517.28			
	8,427.93	983.82	1,085.30	7,444.11	2,069.12			
	7,444.11	266.97	250.31	7,177.13	517.28			
	7,177.13	275.95	241.33	6,901.19	517.28			
	6,901.19	285.23	232.05	6,615.96	517.28			
5	6,615.96	294.82	222.46	6,321.14	517.28	0.58	0.64	1.21
	7,444.11	1,122.97	946.15	6,321.14	2,069.12			
	6,321.14	304.73	212.55	6,016.41	517.28			
	6,016.41	314.98	202.30	5,701.43	517.28			
	5,701.43	325.57	191.71	5,375.86	517.28			
	5,375.86	336.52	180.76	5,039.34	517.28			
	6,321.14	1,281.80	787.32	5,039.34	2,069.12			
6	5,039.34	347.83	169.45	4,691.51	517.28	0.75	0.46	1.21
	4,691.51	359.53	157.75	4,331.98	517.28			
	4,331.98	371.62	145.66	3,960.37	517.28			
	3,960.37	384.11	133.17	3,576.25	517.28			
	5,039.34	1,463.09	606.03	3,576.25	2,069.12			
	3,576.25	397.03	120.25	3,179.23	517.28			
	3,179.23	410.38	106.90	2,768.85	517.28			
7	2,768.85	424.18	93.10	2,344.67	517.28	0.86	0.35	1.21
	2,344.67	438.44	78.84	1,906.23	517.28			
	3,576.25	1,670.03	399.09	1,906.23	2,069.12			
	1,906.23	453.18	64.10	1,453.05	517.28			
	1,453.05	468.42	48.86	984.62	517.28			
	984.62	484.17	33.11	500.45	517.28			
	500.45	500.45	16.83	0.00	517.28			
8	1,906.23	1,906.23	162.89	0.00	2,069.12	0.98	0.23	1.21
9	1,906.23	1,906.23	162.89	0.00	2,069.12	1.12	0.10	1.21

