National Electric Power Regulatory Authority

Islamic Republic of Pakistan

Registrar

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No. NEPRA/R/TRF-67/WARDA-2007-1328-30
March 6, 2007

Subject: **Decision of the Authority regarding Generation Tariff of WARDA Power Generation (Pvt.) Ltd. (WARDA) (Case No. NEPRA/TRF-67/WARDA-2007)**
Intimation of Decision 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 decision of the Authority along with Annex-I & II (50 pages) in Case No. NEPRA/TRF-67/WARDA-2007.

2. The decision 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 95 of the decision relating to the Reference Tariff and allowed adjustments & indexation along with Annex-I & II needs to be notified in the official gazette. The Order is reproduced for the purpose of clarity and is attached herewith.

DA/as above.

06.03.07.
(Mahjoob 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-67/WARDA-2007
TO BE NOTIFIED IN THE OFFICIAL GAZETTE

Pursuant to Rule 6 of the NEPRA Licensing (Generation) Rules 2000, WARDA Power Generation (Pvt.) Ltd. (WARDA) 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 WARDA for delivery of electricity to CPPA of NTDC for procurement on behalf of Ex-WAPDA Distribution Companies:

Reference Tariff

Tariff Components	Year 1 to 10	Year 11 to 25	Indexation
Capacity Charge PKR/kW/Hour)			
O&M Foreign	0.0673	0.0673	US$ /PKR & US CPI
O&M Local	0.0673	0.0673	WPI
Cost of Working Capital	0.0900	0.0900	KIBOR
Insurance	0.0812	0. 0812	US$ /PKR
Debt Service – Foreign	0.5483	-	LIBOR
Debt Service – Local	0.2258	-	KIBOR
Return on Equity	0.3266	0.3266	NIL
ROE during Construction	0.0225	0.0225	NIL
Total Capacity Charge	**1.4290**	**0.6549**	
Energy Charge on Operation on Furnace Oil Rs./kWh			
Fuel Cost Component	4.7811	4.7811	Fuel Price
Variable O&M	0.4362	0.4362	US$ /PKR & US CPI

Note:
i) Capacity Charge Rs./kW/hour applicable to dependable capacity at the delivery point.
ii) Dispatch criterion will be Energy Charge.
iii) The above tariff is applicable for a period of 25 years commencing from the date of the Commercial Operation.
iv) Component wise tariff for operation on RFO is indicated at Annex-I.

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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$ 169.217 out of which US$150.0365 million would be in Euro and US$19.1808 million in US Dollar. 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 Euro/dollar parity values according to the following mechanism. The adjustment would be allowed for a period up to 3 months or up to financial close whichever is earlier;

$EPC_{(Adj.)}$=US$ 150.0365 Million/1.28 * $E_{(PR)}$ + US$ 19.1808 Million

Where:

$E_{(PR)}$ = Weighted Average EURO to dollar 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

$$Ins_{(Rev)} = Ins_{(Ref)} / EPC_{(Ref)} \times EPC_{(Adj.)} \times P_{(Rev)} / 61$$

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 US$
EPC(Adj.)	=	Adjusted EPC in US$

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$P_{(Rev)}$ = Rupee to Dollar parity at COD

ii) Return on Equity Adjustment Mechanism for EPC Cost Variation

$$ROE_{(Rev)} = ROE_{(Ref)} / (30\% \times US\$198.074) \times (30\% \times PC_{(Rev)}) \times P_{(Rev)} / 61$$

Where:

$ROE_{(Rev)}$ = Revised reference Return on Equity component of tariff

$ROE_{(Ref)}$ = Reference Return on Equity component of tariff as per original schedule of tariff

$PC_{(Rev.)}$ = Revised project cost after incorporating the adjustment for currency fluctuation

$P_{(Rev)}$ = Rupee to Dollar parity at COD

iii) ROEDC Adjustment Mechanism for EPC Cost Variation

$$ROEDC_{(Rev)} = 0.0900 / (US\$4.0858 Million) \times (EDC_{(Rev)}) \times P_{(Rev)} / 61$$

Where:

$ROEDC_{(Rev)}$ = Revised reference Return on Equity during Construction component of tariff

$EDC_{(Rev.)}$ = Revised Equity During Construction in million USD

$P_{(Rev)}$ = Rupee to Dollar parity at COD

Note: 4.0858 million US$ is after adjustment of present value of equity at the end of the project life because the project is on BOO basis.

iv) Debt Servicing Adjustment Mechanism for EPC Cost Variation

$$DSF_{(Rev)} = DSF_{(Ref)} / US\$103.989 Million \times (70\% \times 75\% \times PC_{(Rev)}) \times P_{(Rev)} / 61$$

$$DSL_{(Rev)} = DSL_{(Ref)} / US\$34.663 Million \times (70\% \times 25\% \times PC_{(Rev)}) \times P_{(Rev)} / 61$$

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.

$DSF_{(Rev)}$ = Revised Foreign Debt Servicing component of tariff

$DSL_{(Rev)}$ = Revised Local Debt Servicing component of tariff

$DSF_{(Ref)}$ = Reference Foreign Debt Servicing component of tariff as per original schedule of tariff

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$DSL_{(Ref)}$	=	Reference Local Debt Servicing component of tariff as per original schedule of tariff
$PC_{(Rev.)}$	=	Revised project cost after incorporating the adjustment for currency fluctuation
$P_{(Rev)}$	=	Rupee to Dollar parity at COD

II. Adjustment due to Variation in Net Capacity

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 in the relevant tariff components if IDC is established less than 196 MW net capacity at reference site conditions. The adjustments shall be made according to the following formula:

$$CC_{(Adj.)} = CC_{(Ref)} / 196MW \times CN_{(IDC)}$$

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	=	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 Site Conditions:

Ambient pressure	100 kPa
Ambient Temperature	35 °C
Altitude	200 m above sea level
Relative humidity	60%
Water Temperature to Charge air cooler	45 °C
Sum of exhaust gas back pressure and inlet pressure drop	5 kPa (not acc.to ISO 3046-1

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and inlet pressure drop	5 kPa (not acc.to ISO 3046-1

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 WARDA according to the following formula;

Insurance (Rev) = AIC/(1.35 % x US$169.217 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

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.

WARDA shall submit the relevant documents to NEPRA within 7 days of COD for adjustment of relevant tariff components.

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$ 7.847 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.

WARDA shall submit the relevant documents to NEPRA within 7 days of COD for adjustment of relevant tariff components.

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.

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VII. Pass-Through Items

i) No provision for income tax has been accounted for in the tariff. If WARDA is obligated to pay any tax on its ROE, the exact amount paid by the company may be reimbursed by CPPA to WARDA 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, WARDA may also submit to CPPA details of any tax shield savings and CPPA will deduct the amount of these savings from its payment to WARDA on account of taxation.

ii) Withholding tax 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:

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;

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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 1st July, 1st October, 1st January and 1st 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. 0.0673/kW/Hour * $WPI_{(REV)}$ /118.96

$F\ O\&M_{(FREV)}$ = Rs.0.0673/kW/Hour * US $CPI_{(REV)}$/202.41* $ER_{(REV)}$/61

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)
$WPI_{(REF)}$	=	118.96 wholesale price index (manufactures) of January 2007 notified by Federal Bureau of Statistics
US $CPI_{(REV)}$	=	the revised US CPI
US $CPI_{(REF)}$	=	202.41 US CPI for the month of January 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:

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$V\ O\&M_{(REV)}$ = Rs. 0.4362 per kWh * US $CPI_{(REV)}$/202.41 * $ER_{(REV)}$ /61

Where:

$V\ O\&M_{(REV)}$ = The revised applicable Variable O&M Component of Energy Charge indexed with US CPI and Exchange Rate variations.

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

US $CPI_{(REF)}$ = 202.41 US CPI for the month of January 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/LIBOR 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 LIBOR and KIBOR according to the following formula;

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

$\Delta I_{(F)} = P_{(FREV)} * (LIBOR_{(REV)} - 5.34\%) / 4$

Where:

$\Delta I_{(L)}$ = the variation in interest charges on local loan applicable corresponding to variation in quarterly KIBOR. Δ 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 Δ I for each quarter under adjustment applicable on quarterly

$\Delta I_{(F)}$ = the variation in interest charges on foreign loan applicable corresponding to variation in quarterly LIBOR. Δ I can be positive or negative depending upon whether $LIBOR_{(Rev)}$ > or < 5.34%. The interest payment obligation will be enhanced or reduced to the extent of Δ 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 1st installment is due after availing the grace period.

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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 per kWh * $FP_{(Rev)}$)/ Rs.23,247.07 per ton + (Rs.0.4588 per kWh * $Ft_{(Rev)}$)/Rs.2,467.50 per ton

Where:

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

$Ft_{(Rev)}$ = 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)*		
Sub-Total – 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)		
Cost of RFO excluding GST (GHV)		
Inland Freight		
Total Cost of RFO excluding GST (GHV)		

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

* This charge shall vary with market supply/demand position but shall not exceed 8% of C&F price, to be uniformly charged to all customers including WARDA.

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The fuel cost component will be adjusted after the commercial operation date, according to revision in RFO price on fortnightly basis as per above mechanism.

In case of any other arrangement laid down in the Fuel Supply Agreement (FSA) by PPIB mutually agreed by power producer and power purchaser shall be submitted to the Authority for approval.

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

IX. Terms and Conditions of Tariff:

i) The plant availability shall be 90%.

ii) All new equipment will be installed and the plant will be of standard configuration.

i) Dispatch criterion will be based on the Energy Charge.

ii) Internal consumption (including air-cooled condenser) has been assumed to be approximately 4.1 MW.

iii) Annual Unscheduled Outages (MWh) up to 500 hours x Available Capacity (MW) without any liquidated damages shall be in accordance with the 2006 standardized PPA.

iv) Scheduled Outage periods per annum shall be in accordance with the 2006 standardized PPA.

v) NTDC will be responsible for constructing the interconnection to the grid.

vi) All invoicing and payment terms are assumed to be in accordance with the 2006 standardized PPA.

vii) Tolerance in Dispatch shall be in accordance with 2006 standardized PPA.

viii) If there is any change in any assumption that may lead to change in the tariff shall be referred to NEPRA for approval.

ix) 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

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NEPRA for adjustment. The adjustment request by the IPP shall be duly verified by the power purchaser.

The above tariff and terms and conditions be incorporated in the Power Purchase Agreement between WARDA and CPPA.

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Warda Power Generation (Private) 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	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	0.4362	5.2173	0.1346	0.0900	0.0812	0.3266	0.0225	0.0262	0.3110	0.4630	1.4551	2.4251	7.6424	12.7373
2	4.7811	0.4362	5.2173	0.1346	0.0900	0.0812	0.3266	0.0225	0.0262	0.3413	0.4328	1.4551	2.4251	7.6424	12.7373
3	4.7811	0.4362	5.2173	0.1346	0.0900	0.0812	0.3266	0.0225	0.0262	0.3747	0.3994	1.4551	2.4251	7.6424	12.7373
4	4.7811	0.4362	5.2173	0.1346	0.0900	0.0812	0.3266	0.0225	0.0262	0.4115	0.3626	1.4551	2.4251	7.6424	12.7373
5	4.7811	0.4362	5.2173	0.1346	0.0900	0.0812	0.3266	0.0225	0.0262	0.4521	0.3220	1.4551	2.4251	7.6424	12.7373
6	4.7811	0.4362	5.2173	0.1346	0.0900	0.0812	0.3266	0.0225	0.0262	0.4969	0.2771	1.4551	2.4251	7.6424	12.7373
7	4.7811	0.4362	5.2173	0.1346	0.0900	0.0812	0.3266	0.0225	0.0262	0.5465	0.2276	1.4551	2.4251	7.6424	12.7373
8	4.7811	0.4362	5.2173	0.1346	0.0900	0.0812	0.3266	0.0225	0.0262	0.6013	0.1728	1.4551	2.4251	7.6424	12.7373
9	4.7811	0.4362	5.2173	0.1346	0.0900	0.0812	0.3266	0.0225	0.0262	0.6618	0.1122	1.4551	2.4251	7.6424	12.7373
10	4.7811	0.4362	5.2173	0.1346	0.0900	0.0812	0.3266	0.0225	0.0262	0.7289	0.0452	1.4551	2.4251	7.6424	12.7373
11	4.7811	0.4362	5.2173	0.1346	0.0900	0.0812	0.3266	0.0225	0.0262	-	-	0.6810	1.1350	6.3522	10.5871
12	4.7811	0.4362	5.2173	0.1346	0.0900	0.0812	0.3266	0.0225	0.0262	-	-	0.6810	1.1350	6.3522	10.5871
13	4.7811	0.4362	5.2173	0.1346	0.0900	0.0812	0.3266	0.0225	0.0262	-	-	0.6810	1.1350	6.3522	10.5871
14	4.7811	0.4362	5.2173	0.1346	0.0900	0.0812	0.3266	0.0225	0.0262	-	-	0.6810	1.1350	6.3522	10.5871
15	4.7811	0.4362	5.2173	0.1346	0.0900	0.0812	0.3266	0.0225	0.0262	-	-	0.6810	1.1350	6.3522	10.5871
16	4.7811	0.4362	5.2173	0.1346	0.0900	0.0812	0.3266	0.0225	0.0262	-	-	0.6810	1.1350	6.3522	10.5871
17	4.7811	0.4362	5.2173	0.1346	0.0900	0.0812	0.3266	0.0225	0.0262	-	-	0.6810	1.1350	6.3522	10.5871
18	4.7811	0.4362	5.2173	0.1346	0.0900	0.0812	0.3266	0.0225	0.0262	-	-	0.6810	1.1350	6.3522	10.5871
19	4.7811	0.4362	5.2173	0.1346	0.0900	0.0812	0.3266	0.0225	0.0262	-	-	0.6810	1.1350	6.3522	10.5871
20	4.7811	0.4362	5.2173	0.1346	0.0900	0.0812	0.3266	0.0225	0.0262	-	-	0.6810	1.1350	6.3522	10.5871
21	4.7811	0.4362	5.2173	0.1346	0.0900	0.0812	0.3266	0.0225	0.0262	-	-	0.6810	1.1350	6.3522	10.5871
22	4.7811	0.4362	5.2173	0.1346	0.0900	0.0812	0.3266	0.0225	0.0262	-	-	0.6810	1.1350	6.3522	10.5871
23	4.7811	0.4362	5.2173	0.1346	0.0900	0.0812	0.3266	0.0225	0.0262	-	-	0.6810	1.1350	6.3522	10.5871
24	4.7811	0.4362	5.2173	0.1346	0.0900	0.0812	0.3266	0.0225	0.0262	-	-	0.6810	1.1350	6.3522	10.5871
25	4.7811	0.4362	5.2173	0.1346	0.0900	0.0812	0.3266	0.0225	0.0262	-	-	0.6810	1.1350	6.3522	10.5871
Levelized Tariff (1-25Years)			**5.2173**	**0.1346**	**0.0900**	**0.0812**	**0.3266**	**0.0225**	**0.0262**	**0.3097**	**0.2143**	**1.2050**	**2.0083**	**7.2256**	**12.0426**

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Warda Power Generation (Private) Limited
Debt Servicing Schedule

Period	Foreign Debt					Local Debt					Foreign Debt		Local Debt		Annual	Annual	Annual Debt
	Principal Million $	Repayment Million $	Mark-Up Million $	Balance Million $	Debt Service Millin $	Principal Million $	Repayment Million $	Mark-Up Million $	Balance Million $	Debt Service Millin $	Principal Repayment Rs./kW/ hr.	Interest Rs./kW/ hr.	Principal Repayment Rs./kW/ hr.	Interest Rs./kW/ hr.	Principal Repayment Rs./kW/ hr.	Interest Rs./kW/ hr.	Servicing Rs./kW/ hr.
	103.99	1.69	2.17	102.30	3.86	34.66	0.42	1.17	34.24	1.5887							
	102.30	1.73	2.13	100.57	3.86	34.24	0.44	1.15	33.80	1.5887							
	100.57	1.76	2.10	98.81	3.86	33.80	0.45	1.14	33.35	1.5887							
	98.81	1.80	2.06	97.01	3.86	33.35	0.47	1.12	32.88	1.5887							
1	103.99	6.97	8.46	97.01	15.43	34.66	1.78	4.57	32.88	6.3549	0.2478	0.3005	0.0632	0.1625	0.3110	0.4630	0.7741
	97.01	1.84	2.02	95.18	3.86	32.88	0.48	1.11	32.40	1.5887							
	95.18	1.87	1.98	93.30	3.86	32.40	0.50	1.09	31.90	1.5887							
	93.30	1.91	1.95	91.39	3.86	31.90	0.52	1.07	31.38	1.5887							
	91.39	1.95	1.91	89.44	3.86	31.38	0.53	1.06	30.85	1.5887							
2	97.01	7.58	7.86	89.44	15.43	32.88	2.03	4.32	30.85	6.3549	0.2691	0.2792	0.0722	0.1536	0.3413	0.4328	0.7741
	89.44	1.99	1.86	87.45	3.86	30.85	0.55	1.04	30.30	1.5887							
	87.45	2.04	1.82	85.41	3.86	30.30	0.57	1.02	29.73	1.5887							
	85.41	2.08	1.78	83.33	3.86	29.73	0.59	1.00	29.14	1.5887							
	83.33	2.12	1.74	81.21	3.86	29.14	0.61	0.98	28.53	1.5887							
3	89.44	8.23	7.21	81.21	15.43	30.85	2.32	4.04	28.53	6.3549	0.2923	0.2560	0.0824	0.1434	0.3747	0.3994	0.7741
	81.21	2.17	1.69	79.05	3.86	28.53	0.63	0.96	27.90	1.5887							
	79.05	2.21	1.65	76.84	3.86	27.90	0.65	0.94	27.25	1.5887							
	76.84	2.26	1.60	74.58	3.86	27.25	0.67	0.92	26.58	1.5887							
	74.58	2.30	1.56	72.28	3.86	26.58	0.69	0.89	25.88	1.5887							
4	81.21	8.93	6.50	72.28	15.43	28.53	2.65	3.71	25.88	6.3549	0.3174	0.2309	0.0940	0.1317	0.4115	0.3626	0.7741
	72.28	2.35	1.51	69.93	3.86	25.88	0.72	0.87	25.17	1.5887							
	69.93	2.40	1.46	67.53	3.86	25.17	0.74	0.85	24.42	1.5887							
	67.53	2.45	1.41	65.08	3.86	24.42	0.77	0.82	23.66	1.5887							
	65.08	2.50	1.36	62.57	3.86	23.66	0.79	0.80	22.86	1.5887							
5	72.28	9.70	5.73	62.57	15.43	25.88	3.02	3.33	22.86	6.3549	0.3447	0.2036	0.1074	0.1184	0.4521	0.3220	0.7741
	62.57	2.55	1.30	60.02	3.86	22.86	0.82	0.77	22.04	1.5887							
	60.02	2.61	1.25	57.41	3.86	22.04	0.85	0.74	21.20	1.5887							
	57.41	2.66	1.20	54.75	3.86	21.20	0.88	0.71	20.32	1.5887							
	54.75	2.72	1.14	52.04	3.86	20.32	0.91	0.68	19.41	1.5887							
6	62.57	10.54	4.89	52.04	15.43	22.86	3.45	2.91	19.41	6.3549	0.3744	0.1739	0.1225	0.1032	0.4969	0.2771	0.7741
	52.04	2.77	1.08	49.26	3.86	19.41	0.94	0.65	18.48	1.5887							
	49.26	2.83	1.03	46.43	3.86	18.48	0.97	0.62	17.51	1.5887							
	46.43	2.89	0.97	43.54	3.86	17.51	1.00	0.59	16.51	1.5887							
	43.54	2.95	0.91	40.59	3.86	16.51	1.03	0.56	15.48	1.5887							
7	52.04	11.45	3.99	40.59	15.43	19.41	3.94	2.42	15.48	6.3549	0.4068	0.1417	0.1399	0.0859	0.5465	0.2276	0.7741
	40.59	3.01	0.85	37.58	3.86	15.48	1.07	0.52	14.41	1.5887							
	37.58	3.07	0.78	34.50	3.86	14.41	1.10	0.48	13.30	1.5887							
	34.50	3.14	0.72	31.36	3.86	13.30	1.14	0.45	12.16	1.5887							
	31.36	3.20	0.65	28.16	3.86	12.16	1.18	0.41	10.98	1.5887							
8	40.59	12.43	3.00	28.16	15.43	15.48	4.49	1.86	10.98	6.3549	0.4418	0.1067	0.1596	0.0661	0.6013	0.1728	0.7741
	28.16	3.27	0.59	24.89	3.86	10.98	1.22	0.37	9.76	1.5887							
	24.89	3.34	0.52	21.55	3.86	9.76	1.26	0.33	8.50	1.5887							
	21.55	3.41	0.45	18.14	3.86	8.50	1.30	0.29	7.20	1.5887							
	18.14	3.48	0.38	14.66	3.86	7.20	1.35	0.24	5.85	1.5887							
9	28.16	13.50	1.93	14.66	15.43	10.98	5.13	1.23	5.85	6.3549	0.4796	0.0687	0.1822	0.0435	0.6618	0.1122	0.7741
	14.66	3.55	0.31	11.11	3.86	5.85	1.39	0.20	4.46	1.5887							
	11.11	3.63	0.23	7.48	3.86	4.46	1.44	0.15	3.02	1.5887							
	7.48	3.70	0.16	3.78	3.86	3.02	1.49	0.10	1.54	1.5887							
	3.78	3.78	0.08	0.00	3.86	1.54	1.54	0.05	0.00	1.5887							
10	14.66	14.66	0.77	0.00	15.43	5.85	5.85	0.50	0.00	6.3549	0.5209	0.0274	0.2080	0.0178	0.7289	0.0452	0.7741

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No. NEPRA/TRF-67/WARDA-2007
March 5, 2007

Petitioner

WARDA Power Generation (Pvt.) Ltd.

Authority

Nasiruddin Ahmed
Member

Zafar Ali Khan
Member

Abdul Rahim Khan
Member

Lt. General (R) Saeed uz Zafar
Chairman

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Background

1. WARDA Power Generation (Pvt.) Ltd. (WARDA) is a special purpose company established for setting up power plant of approximately 200 MW capacity based on reciprocating engine single fuel RFO fired technology near Muridke, District Sheikhupura in the Punjab Province. According to WARDA net generation of the proposed power plant will be 196 MW at 132 kV Bus Bar at reference conditions at Murdike in terms of the Policy for Power Generation Projects 2002 (the "Policy"). The electricity generated will be sold to Central Power Purchasing Agency (CPPA) within NTDC.

2. WARDA submitted a tariff application on 10.1.2007 for approval of generation tariff. This tariff petition was admitted for consideration by the Authority on January 12, 2007 and was assigned case number NEPRA/TRF-67/WARDA-2007. Salient features of the petition were advertised in the newspapers on January 19, 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.

3. A public hearing on the petition was held on February 3, 2007 in Pearl Continental Hotel Lahore. This hearing was participated by the applicant, stakeholders, commentators as well as general public.

SUBMISSIONS OF WARDA

Investment

4. According to petitioner Engineering, Procurement and Construction ("EPC") price is fixed at Euros 133,475,000.00 (667.04 Euros/kW) and, converted at the reference exchange rate of 1.20 US$/Euro, this price will be US$ 160,170,000 (800.45 US$/kW). Total EPC cost has been assumed in foreign exchange. The investment cost estimate of the Project is presented below in US dollars ("US$").

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	Project Costs	US$
1	EPC Cost	160,170,000
2	Taxes & Duties	8,009,000
3	Emergency spare parts	2,403,000
4	Mobilization Costs	2,860,000
5	Land purchase, fees and infrastructure	2,190,000
6	Development costs	2,670,000
7	Insurance costs	2,161,000
8	Stamp Duties	1,450,000
9	Structure Fee (SBL)	4,120,000
	Total capital Cost	186,033,000
8	Financing Fees & Charges	3,215,000
9	Interest During Construction (IDC)	14,420,000
	Total project Cost	203,668,000

Itemized Explanation of Investment

- "EPC Cost" covers power generation sets together with all the necessary auxiliary machinery, equipment and systems including the erection and commissioning of the equipment and construction of buildings. Our stated EPC cost includes cost of the fuel tank storage that means three tanks of 10,000 m3 for RFO and one tank of 2,000 m3 for HSD, along with fuel loading, fuel unloading pumping system with all heating and piping as well as the fire containment area of about 7200 m2. This turnkey price of the power plant is based on a firm proposal but based on the above referenced exchange rate.

- "Taxes & Duties" covers all import taxes and duties as per the 2002 Power Policy said to be 5% of EPC cost.

- "Emergency spare parts" covers the costs of standard lot of spare parts aimed to reduce as much as possible the stop times for maintenance of the plant, *i.e.* instead of taking a component out and testing it, exchanging and replacing the component so that the removed component is tested and used as a spare for the next checking time. These are estimated at 1.5% of EPC costs.

- "Mobilization Costs" covers the expenses of WARDA Power and O&M Contractor personnel, *i.e.* hiring local personnel for operation and maintenance, training at manufacturer's factory on diesel engine and

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auxiliaries, etc. costs of trips and courses, selection of an expatriate to carry out the operation and management.

- "Land purchase, fees and infrastructure" covers the purchase of land, together with stamp duty and registration fees, the fees of the broker and the lawyers, as well as the cost of fill to levelize the site with the access road, and construction of the boundary wall.
- "Development Costs" includes sponsors' development costs and delay in start-up insurance. These include costs of environmental studies, geological and hydrological studies, and load flow and short circuit assessments, fees of engineering consultants, lawyers in Pakistan as well as from abroad (those of lenders), guarantees furnished to PPIB and fees paid to NEPRA.
- "Insurance Costs" covers the costs during construction of the insurance of the assets, incurred prior to the Commercial Operations Date (the "COD"). This is estimated at 1.35% of EPC costs.
- "Stamp Duties" covers the costs of the registration of the loan and is assumed to be 1% of the loan.
- "Structure Fee" includes the cost of the adviser and arranger of the lead financing institution.
- "Financing Fees & Charges" includes the up-front cost of financing the Project.
- "Interest During Construction" is calculated on the basis of anticipated interest rates, equity injections, and the construction payment schedule. It may kindly be noted that WARDA Power's COD is based on a period of 20 months corresponding to March 31, 2009.

Financial Analysis

5. The financial calculations for the Project are based on the:

   (a) Investment cost estimate, including a firm turnkey price.

   (b) Power plant operating costs (including long-term O&M contract and life-time heat rate).

   (c) Financing, taxation, depreciation and other obligations and terms regulated by the law or lending institutions.

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(d) Proposed 25-year tariff, based on real life-time costs. WARDA Power's model is based upon the BOO or Build-Own-Operate concept.

(e) Assumption that the Project will qualify for tax incentives as per the 2002 Power Policy, including an exemption from corporate income taxes as well as turnover and withholding tax on imports.

Capital Structure

6. The capital structure of the Project is as follows:

In US$	
Equity	61,100,000
Total debt	142,568,000
Total Capital Cost (excl IDC)	203,668,000
Debt Equity Ratio	70:30

Note: The investment costs and capital structure indicated herein shall prevail if different from those indicated in the Feasibility Study.

Other Considerations

- The Feasibility Study indicates that, during normal economic growth, the electricity demand at the national level will double in the next ten years. This means that by 2016 some 15,000 MW capacity will be needed.
- Additionally, some of the old thermal generation plants need to be replaced. In such circumstances, the need for new capacity will be in the range of 2,000 MW per year.
- The Project would offer significant relief locally in the transmission system of Lahore, as it would bypass long transmission lines and potential step-down transformer bottlenecks. There is currently no significant power generation inside this area. The plant generation would be consumed very close to the generation site, thus also reducing substantial transmission losses. The Project could be finalized and commissioned on a fast-track basis within 20 months as a power generation plant based on reciprocating engine single fuel RFO fired technology.
- A range of technologies was reviewed to utilize RFO: conventional steam plant, gas turbines and diesel engines, either in single cycle or combined cycle modes, as well as 4-stroke or 2-stroke engine configurations. Four-stroke diesel engines were selected, as the primary objective of the plant is

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to convert the available indigenous RFO into electrical energy. Engines are well proven to use this type of fuel. Gas turbine based concepts were rejected as the main gas turbine manufacturers expressed their concerns that use of RFO in gas turbines would mean considerable de-rating both in power generating capacity as well as in efficiency from the nameplate capacities due to extensive fouling.

- After thorough examination of all available technologies and engine manufacturers, it became clear that the plant configuration discussed hereinafter would offer the best and most economical performance for WARDA Power. The proposed plant concept is based on a 200.1 MW (ISO) power plant single fuel RFO diesel engines in combined cycle. The main components of the plant are eleven proven engine generators sets of type 18V46 manufactured by WÄRTSILÄ of Finland and eleven heat-recovery steam generators (HRSG) to provide steam to one condensing steam turbine and for in-house use. When all the engines and the steam turbine run in parallel, the plant will generate a net output of 196 MW.

  Note: WARDA Power's indicated net output of 196 MW is to be considered the reference net output for purposes of capacity charge calculations and adjustment formulas, accepting, however, that net contracted capacity will be established after IDC tests. WARDA Power also reserves the right to replace the afore-said WÄRTSILÄ engines with "MAN" engines of different gross and net output as well as costs that may necessitate a modification in the tariff structure.

- Based on the requirement of the Project for full load factor, a total of about 945 tons of RFO per day will be transported by approximately 24 tank lorries of 40 tons each to the site. The LFO needs are difficult to estimate but no more than 3 tank lorries of 40 tons each per month will be needed.

- The RFO shall be stored in three storage tanks within the plant with a combined capacity of 30,000 tons. This storage capacity is dimensioned for 30 days of full power operation of all the engines. The RFO from the storage tanks will be transferred into the buffer tank, with a capacity of 200 tons, and then moved to the day tank which has a capacity equal to 16 hours of full power operation of all the engines, *i.e.* 700 tons. Diesel oil shall be stored in one Diesel oil tank with a capacity of 2,000 tons.

- There is a need for transportation of RFO, Lube Oil and Diesel for plant operation and maintenance. In Pakistan, there are several operational

OMCs that are capable of supplying these fuel products. For the purpose of this study, the following companies were considered as potential suppliers.

- Pakistan State Oil
- SHELL Pakistan
- TOTAL (PARCO)

- Although Pakistan Railways can carry out the transportation of equipment and fuel, tank lorries are the most suitable means of transportation of all fuels to the plant. All the roads are wide and metalled to support fuel supplies on regular day to day basis. The Muridke-Sheikhupura road is 110 feet wide in rural areas and 65 feet wide in the vicinity of towns. Out of this whole width, about 20 feet portion is metalled and being used for vehicular transportation. The Lahore-Sheikhupura and Lahore-Gujranwala segments of the G.T. Roads are four lane carpeted roads that support all kind of heavy loads. The Sheikhupura-Gujranwala link road is similar to the Muridke-Sheikhupura Road. The motorway is three lanes one way carpeted road and can support all kinds of loads for fuel or machinery transportation. The Lahore-Multan segment of the G.T. Road is four lane carpeted road and suitable for all kind of traffic.

- The strategic location of the Project provides a unique opportunity for interconnection for power dispersal, since detailed power flow studies have been conducted by NTDC and a 10 km long double line to the 132 kV existing transmission line between Kala Shah Kaku and Attabad substations is required. No right of way issues are expected, *i.e.* the line can be built within the same time schedule as the Project itself.

- Based on a thorough analysis of the national electricity generation structure and the Project, as well as NTDC's load flow study conclusions, we are confident in stating that the Project will be one of the most competitive electricity producers using RFO.

ENERGY CHARGES

7. The tariff has a typical two-part structure with an energy charge for the energy actually dispatched and a capacity charge based on the available

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capacity. The energy charge is based on the actual kWh off-take, and consists of the fuel component and the variable O&M component.

8. The generation sets being proposed for the Project are advanced technology machines providing high thermal efficiencies. After factoring the impact of fuel cleaning, average plant aging, and a notional 60% plant load factor, this translates to approximately 45% net site efficiency, running on RFO.

9. A summary of the energy price is provided in the table below:

	Energy Purchase Price (EPP) Pak Rs./kWh			
Period	Fuel	Variable O&M (Foreign)	Variable O&M (Local)	Total
Years 1–25	4.7593	0.4284	0.0756	5.2633

Fuel Component

10. This component represents the fuel consumption at a guaranteed efficiency level for the plant based on a notional 60% capacity factor. Consequently, this tariff subsumes the efficiency risk being borne by WARDA Power. The main assumptions used to derive this price are:

(a)	RFO Price (LHV):	Rs. 23,247 per ton excluding transport (as per Annex-II of Revised Upfront Tariff for Reciprocating Engine Technology issued by NEPRA on September 14, 2006).
(b)	Thermal efficiency net:	47% (at site conditions)
(c)	Thermal efficiency, inclusive of ageing and cleaning:	45.0% (life-cycle net at site conditions)
(d)	Output:	196 MW (net at site conditions)
(e)	Heat Rate:	8,000 kJ/kWh (LHV)
(f)	LHV of RFO	39,087 kJ/kg (37,047 BTU/kg)
(g)	Partial Loading:	Heat Rate Curves from generation sets manufacturers to be used for partial load heat rate calculation and payment in case the plant load falls below 40%.

Local Variable O&M

11. This component includes the cost of lubricant consumption, which is directly related to the electricity actually generated. The rate will be indexed to the prevailing Pakistan Wholesale Price Index ("WPI").

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Foreign Variable O&M

12. This component primarily includes imported spare parts to be changed on normal scheduled maintenance and unscheduled maintenance. Also, it includes chemicals, as well as specialized technical services from manufacturer, during maintenance of the plant. The generation sets and associated equipment have manufacturer-recommended overhauling schedules that are based on actual running hours. The actual timing of the Major Overhaul depends on the actual dispatch provided to the plant. The labor for the Variable O&M is on Fixed O&M.

13. As the manufacturer is European so the spare parts will be supplied from Europe as well as the specialized technical services. Based on that, the variable O&M foreign component will be indexed to the European CPI. This tariff component will also be adjusted by variations in the US$/ Euro exchange rate through the 25 year life of the Project on an annual basis.

Capacity Charges

14. The capacity charge for the Project is payable on the basis of the contract capacity as tested at the COD, and periodically thereafter. This payment is calculated on a Pak Rs./kWh basis of capacity and, in order to calculate a unit rate in Pak Rs./kWh, a notional 60% capacity factor has been utilized. The key assumptions factored in the capacity charge are the total capital cost of the Project, the debt-equity ratio, the cost of funding and currency thereof, together with the exchange rate. The following are the assumptions used on the reference dates:

(a)	Total Capital Cost:	US$ 186,033,000 (including fixed turnkey EPC price of 133,475,000 Euros)
(b)	Debt-Equity Ratio:	70:30
(c)	Exchange Rates:	1 US$ = 60.0 Rupees; 1 Euro = 1.20 US$
(d)	Funding:	Debt: Foreign Funding 75%; and Local Funding 25%. Equity: 30% all Foreign.
(e)	Taxes:	• Customs Duty at 5% on imported machinery as per 2002 Power Policy. • Dividend Withholding Tax of 7.5%. • Customs Duty at 10% on imported spare parts. • 0% Corporate Tax Rate. • 0% Minimum Turnover Tax Rate.

- At the time of Financial Closing, the tariff figures shall be updated for the various base figures (e.g. fuel price, EPC, O&M and Insurance prices, adjusted by actual exchange rates compared to the Reference

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Exchange Rates (Pak Rs./US$ = 60.00, Pak Rs./Euro = 72.00, and US$/Euro = 1.20), and Interest During Construction adjusted by prevailing LIBOR and KIBOR, to arrive at the reference tariff table to be used in the PPA.

- At the COD, the tariff figures will be updated on the basis of actual interest incurred during construction and variations in the Reference Exchange Rates during construction.
- Any modifications or additions required by the power purchaser that are not considered in the Project shall be treated as pass-through.

The capacity charge is further broken down into two components:

Escalable Capacity Payment

- This component represents all the fixed costs of the plant and the return on equity. Since there is no recovery of the original equity capital invested, the plant remains the property of WARDA Power after the 25 year contract period and may operate as a merchant plant. A summary of the charges is provided below:

	Escalable Capacity Payment						
Period	Fixed O&M	Insurance	Cost of WC	ROEDC	ROE	Withholding Tax	Total
Years 1–25	0.1326	0.0760	0.0362	0.0234	0.3304	0.0265	0.6251

- The Fixed O&M component of the escalable capacity payment represents the fixed costs of all the staff for O&M, plant administration, security, transportation, overheads, office costs, professional fees such as audit, tax and legal, as well as some minor fixed operational costs such as environmental monitoring, that do not change with dispatch levels.
- The Insurance component consists of all-risk insurance/re-insurance for the Project, as well as business-interruption insurance (which is a lender-stipulated requirement).
- The return on equity ("ROE") component includes a return on invested equity giving an internal rate of return ("IRR") of 15% net after deduction of withholding tax.
- Additionally, this component also includes the cost impact of a working capital loan.

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The escalable component is based on the following parameters:

(a) Equity Amount:	US$ 61,100,000 (30% of total capital cost plus equity portion of IDC).
(b) IRR:	16.2 % gross and 15% after dividend withholding tax of 7.5%.
(c) Repayment of Equity:	None
(d) Currency of Funding:	Pak Rs. And US$
(e) Working Capital Loan and cost of working capital:	A working capital loan facility of approximately US$ 8,312,000 equivalent in Pak Rs. is assumed in order to finance the net accounts receivables and working capital impact of 15% sales tax. The interest rate for this working capital loan is 6 months KIBOR (10.45%) less 1% + 3% premium = 12.45% total.
(f) Cost of Foreign Debt:	6 months LIBOR (5%) + 3% premium + 2% commitment fee and L/C charges.
(g) Cost of Local Debt:	6 months KIBOR (10.45%) + 3% premium + 3% commitment fee and L/C charge.
(h) Corporate Tax Rate:	0%
(i) Minimum Turnover Tax:	0%
(j) Indexation:	Fixed O&M shall be indexed to the following: A. European CPI (50% of component) B. Pakistani WPI (50% of component) Insurance shall be indexed to the following: A. Pak Rs./US$ exchange rate B. U.S. inflation ROE shall be indexed to the following: A. Pak Rs./US$ exchange rate B. U.S. inflation/ Pakistan inflation

Non-Escalable Capacity Payment

- The following table provides a summary of the Non-Escalable Component:

	Non-Escalable Component (Pak Rs./kWh)		
Period	Loan Repayment	Interest Charges	Total
Year 1	0.3130	0.4778	0.7908
Year 2	0.3443	0.4465	0.7908
Year 3	0.3786	0.4122	0.7908
Year 4	0.4163	0.3744	0.7908
Year 5	0.4579	0.3329	0.7908
Year 6	0.5036	0.2872	0.7908
Year 7	0.5538	0.2370	0.7908
Year 8	0.6090	0.1818	0.7908
Year 9	0.6698	0.1210	0.7908
Year 10	0.7366	0.0542	0.7908
Years 11–30	0.00	0.00	0.00

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- It is apparent that there is no charge under this category after 10 years as all the debt would be repaid by the end of the 10th year. The assumptions used in calculation of the above are:

(a) Amount of Debt:	US$ 142,568,000 (70% of total Project cost + portion of IDC), being 75% foreign and 25% local
(b) Term of Loan:	20 months of grace period (construction) + six months grace + 10 years of semi-annual equal debt service after the COD
(c) Interest Rates:	Foreign: 6 months LIBOR (5%) + 3% premium. Local: 6 months KIBOR (10.45%) + 3% premium
(d) Currencies:	US$ and Pak. Rs.
(e) Indexation:	Funding in US$: interest component would be indexed to 6 month LIBOR rate and foreign currency exchange rate. Funding in PKR: interest component would be indexed to the 6 month KIBOR rate.

ESCALATIONS AND INDEXATIONS

15. After the COD the tariff tables provided will be indexed to factors as described above and the Reference Exchange Rates being 72.0 Pak Rs./Euro 60.0 Pak Rs./US$ and 1.20 US$/Euro. On the Financial Closing date, the Reference Tariff Table will be updated by the then-prevailing indices, exchange rates and base numbers. The details are provided here below:

Inflation Factors

16. The following components are subject to inflation factors:

Variable O&M – Local:	Pakistan WPI
Variable O&M – Foreign:	European CPI

Escalable Capacity Payment:

Fixed O&M	50% European CPI and 50% Pakistan WPI
Insurance	U.S. CPI
ROE	U.S. CPI for the foreign component. and Pakistan WPI for the local component.

Currency Indexation

17. The following components are subject to exchange rate indexation. The Reference Exchange Rates are 72.0Pak Rs./Euro. 60.0 Pak Rs./US$ and 1.20 US$/Euro.

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Variable O&M – Foreign:	Pak Rs./Euro exchange rate
Escalable Capacity Payment:	
Fixed O&M	50% Pak Rs./Euro exchange rate
Insurance	Pak Rs./US$ exchange rate
ROE	Pak Rs./US$ exchange rate

Non-Escalable Capacity Payment – Foreign Loan

18. The Interest During Construction as well as the Non-Escalable Charges shall be adjusted according to the prevailing relevant interest rate (+ spread) and foreign currency exchange rate.

Interest Rate Indexation

19. The following components are subject to interest rate indexation:

Non-Escalable Capacity Payment – Foreign Loan	
Interest Charge	6 months LIBOR
Non-Escalable Capacity Payment – Local Loan	
Interest Charge	6 months KIBOR

Base Changes

20. Changes in the base price of fuel i.e. RFO shall be treated as a pass-through cost based on the guaranteed heat rate.

Pass-Through Items

21. Any taxes and levies etc. not factored in the tariff calculation shall be treated as pass-through items in the PPA.

Adjustments at Commercial Operations Date

22. The Escalable ROE Component and the Non-Escalable Components will be adjusted by the Inflation Factors and Reference Exchange Rates as defined and described in this Section 7 which prevail at the COD.

23. The Non-Escalable Component shall also be adjusted by the then prevailing 6-month KIBOR and 6-month LIBOR.

24. The Working Capital component which is included in the ROE component shall also be updated with prevailing fuel price at the COD.

consent the final local amount at the COD would be based on actual Exchange Rates used by the lenders to make payment to the EPC contractor. Actual hedging cost will be used based on forward rates received from lead banks immediately after Financial Closing.

26. No contingency has been included in the Project costs.

Timeline/Completion of Project

27. WARDA submitted the following timeline/completion of project:

• Tariff Determination	15th February, 2007
• FSA Agreement	31st March 2007
• PPA	15th April 2007
• Implementation Agreement	15th April 2007
• Financing Close	31st July 2007
• EPC Contract	31st July 2007
• First drawdown	31st August 2007
• 2nd drawdown	31st March 2008
• 3rd drawdown	31st August 2008
• 4th drawdown	31st December 2008
• Construction completion:	31st March 2009 (18 months form financial close)

ASSUMPTIONS

28. The following have been assumed while calculating the tariff. Changes in any of these assumptions will result in changes in the tariff:

- Anticipated average site conditions that have been used in calculation of the net output and heat rate are an altitude of 214 m above sea level, ambient temperature of 30°C, charge air coolant temperature of 40°C and 60% relative humidity.
- Internal consumption (including air-cooled condenser) has been assumed to be approximately 4.1 MW.
- Annual Unscheduled Outages (MWh) up to 500 hours x Available Capacity (MW) shall be without any liquidated damages. Liquidated damages for Unscheduled Outages in excess thereof, and their computation shall be in accordance with the 2006 standardized PPA.

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- Scheduled Outage periods shall be 23 Days per unit in any Year, except in any Year in which a Major Overhaul is required, in which case Scheduled Outage periods shall be 37 Days per unit.
- A constant ROE is assumed, which results in an IRR of 15% over 25 years.
- No hedging cost has been assumed for exchange rate fluctuations during construction.
- NTDC is assumed to be responsible for financing and constructing the interconnection to the grid.
- All invoicing and payment terms are assumed to be in accordance with the 2006 standardized PPA.
- The tariff is calculated on the basis of a notional 60% plant load factor.
- Tolerance of +/– 1.5% in Dispatch is assumed.
- The tariff table shall be further updated at COD of the Project in order to correct the tariff according to the prevailing KIBOR LIBOR and exchange rates (Pak Rs./US$ and Pak Rs./Euro).
- All fuel during plant tests after synchronization is assumed to be paid for by the power purchaser.
- Working capital has been financed by a separate working capital loan, and is not included in the Project cost.
- Project contingency/debt service/maintenance reserves are not included in tariff calculations. If required by lenders, these will be adjusted accordingly in the tariff.
- All other assumptions not expressly stated herein are based upon the 2006 standardized PPA. Consequently any change in any such assumption may lead to change in the tariff.

Determination Sought:

29. The National Electric Power Regulatory Authority (NEPRA) is requested to kindly grant the Tariff Determination in respect of the following:

a) Grant Tariff as requested in the Reference Tariff Tables to remain effective for a period of 25 years from the date of Commercial Operations; and

b) Approve the proposed escalations in Tariff.

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Comments from Planning and Development Division (Energy Wing)

30. Planning and Development Division (Energy Wing) has submitted following comments:

- Paragraph 3.8 of the petition provides break up of project which inter-alia includes cost of mobilization which has been defined as: "Mobilization costs covers the expenses of WARDA Power and O&M contractor personnel, i.e. hiring local personnel for operation and maintenance, training at manufacturer's factory on diesel engine and auxiliaries etc, cost of trips and courses, selection of an expatriate to carry out the operation and management." Under normal practice this type of expenditure is not capitalized rater it is included in the overall O&M cost of a project. In addition training of manpower is the responsibility of O&M contractor and the equipment suppliers and its cost is built up in the overall cost of machinery and equipment and O&M cost. Accordingly the project sponsors needs to justify this component of capital cost.
- Under the same table structure fee amounting to US$ 4.12 million in addition to financing fee and charges amounting to US$ 3.215 million has been provided. This appears to be duplication as the purpose of the two is almost same.
- At para 3.12.3 the reciprocating engine is proposed to be operated only on furnace oil. This could be due to the reason that at present gas is not available in the country. However after some time gas would be available as soon gas import project is materialized. Therefore, it suggested that an option to operate the power plant on gas be kept open so that the tariff is accordingly reduced providing relief to consumers.
- The tariff table provided in the petition shows, fuel cost as Rs. 4.7593 per kWh. However calculations made by the Energy Wing, by taking into account the cost of fuel and efficiency of the plant it comes to Rs. 4.7578 per kWh. This discrepancy needs to be removed.
- Foreign component of variable O&M cost is taken as Rs. 0.4284. It appears to be a high number and needs to be justified.

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- Fuel cost of the project is stated to be adjusted with the loading of the plant. This could be analyzed only when the heat rate curve is provided. NEPRA is requested to get heat rate curve from the sponsors and provide to the Planning Division for analysis.
- The power plant is proposed to be operated to combined cycle mode. For this purposes eleven reciprocating engines with equal number of HRSG besides one steam turbine would be installed. Sponsors should provide that for operation of steam unit how many engines will need to remain in operation. This is important as the efficiency of the plant depends on the operation steam unit.
- Labor for variable O&M is charged to fixed O&M cost. Reason has not been given.
- In paragraph 7.5 following has been stated:

  Any taxes and levies etc. not factored in the tariff calculation shall be treated as pass-through items in the PPA.This is a wrong statement and it should be written as "any taxes and duties levied after financial close would be passed through item."
- Under paragraph 7.6.3 working capital has been included in ROE, which is not a standard practice and should be handle accordingly.

Comments from Central Power Purchasing Agency (CPPA)

31. CPPA has submitted following comments:

Feasibility Study was conducted for the development of 200 NW RFO fired Engine based Combined Cycle Power Project near Lahore by the Company as per the requirement of LOI.

- The project cost estimates and other date provided in the petition do not match with that provided in the Feasibility Study. The information provided in the petition needed to be reviewed critically.
- The project cost seems to be on the higher side.
- Following discrepancies have been found in the cost estimation of the Project.

i) EPC Cost

The Sponsor has quoted toe EPC as US $160.170 and the break-up for the equipment cost and the construction has not been provided in the petition for tariff however the construction cost was assumed to be US$ 31.816 million. The EPC cost seems to be on the higher side.

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ii) Taxes and Duties

Taxes and Duties has been calculated at the rate of 5% of EPC but the same is payable only on the imported equipment. As such the Custom Duty is not payable on Erection Civil work and local equipment..

iii) Emergency spare parts:

Emergency spare parts are required for the operation and maintenance of the plant therefore this cost of US$ 2.403 million may not be included in the project Cost.

iv) Mobilization

The Company has been incorporated on April 6, 06, and the mobilization charges of US$ 2.86 million is very much on the higher side in comparison to the cost estimate in the Feasibility Study to the tune of US$ 0.705 million.

v) Land Purchase

The cost of land of US$ 2.19 million is on higher side for 53 acres land the rate/acre work out to be Rs.2.5 million seems to be on the higher side.

vi) Development Cost

The development cost has been assumed as US$ 2.67 million in the petition in comparison t the cost given in the Feasibility Study to the tune of US$ 2.350 including all allied expenditures to be incurred by the Company for various studies engineering consultancy fee for the lawyers PPIB and NEPRA this may be reviewed an cost for the delay in start up insurance should also be excluded.

vii) Insurance Costs

The cost of US$ 2.16 million seems to be reasonable being comparable with other project being 1.35% of EPC value/

viii) Stamp Duties

A huge amount of US$ 4.15 million for Stamp Duties seems to be higher side and it has already been included in the project development cost however a reasonable amount may be allowed if deemed necessary.

ix) Structure Fee

A huge amount of US$ 4.12 million has been provided for the advisor and the arranger of the lead financing institution in addition to the financing

fee and charges amounting to US$ 3.215 million which may reviewed and fair sum be allowed if deemed necessary.

x) Financing Fee & Charges

An amount of US$ 3.215 million seems to be reasonable in comparison to other similar projects.

xi) Interest during Construction

The amount of interest during construction to the tune of US$ 14.420 million seems to be on the higher side however the interest rate of KIBOR+%i.e.10.45% and LIBOR plus 3% is compatible with similar projects.

xii) Fuel Cost

The fuel cost has been assumed as Rs 23,247/- per Ton excluding the transportation charges whereas NEPRA has included the transportation charges in the up-front tariff sot the same may be reviewed accordingly.

xiii) Efficiency

Efficiency of 45% assumed for the life cycle net at site condition

xiv) Calorific Value

WARDA has assumed calorific value (VC) OF 37047 BTU/kg LHVD which is lower than the CV assumed by NERPA in Up-front tariff.

xv) Variable O&M

The Company has proposed a V.O&M of Rs.0.05040 per KWh but no details has been provided. This seems is very much on the higher side. The VO&M for similar plant operating as IPPs is around Rs.0.37/KWh.

xvi) Insurance

The rate of insurance of Rs. 0.760/kWh is compatible with similar project.

xvii) ROE

The ROE proposed by the Company is Rs.0.3304/KWh based on the equity share of 30% in comparison to the similar plants with ROE of about Rs.0.2131/KWh with the equity share of 25% this may checked and a fair amount of ROE may be allowed.

xviii) Indexation

a) The Company has demanded European CPI on fixed O&M (50%) but no expenditure in foreign currency has been shown.

b) The Company had demanded indexation of insurance for US inflation along with Exchange Rate variations.

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c) The Company has demanded indexation on ROE for Pak RS./US Exchange Rate variations along with Dollar and Rupee inflation.

ASSUMPTIONS

- Annual unscheduled outages of 500 hours and 23 days for scheduled outages have been requested by the company.
- The company has requested a tolerance of ± 1.5 % in dispatch as per the methodology provided in 2006 PPA.
- Fuel cost component of the EPP will be paid by Power Purchaser for the energy delivered to NTDC system before NTDC.
- No starts up charges are admissible.
- Freight may be considered part of fuel cost. Otherwise indexation of fuel component will be a problem.

Comments from SHEHRI

32. While being aware of the need for additional electricity generation in Pakistan, we are even more aware of the ecological degradation (whose effects will linger for decades) that is being brought about while producing the electricity we presently generate. We are also concerned that the economic interests of the consumer should not be sacrificed at the altar of expediency. SHEHRI brings the Authority attention on the following;

The Pakistan Environmental Protection Act (PEPA) 1997 mandates that 200 MW thermal power plants with grid-stations:

a) Submit Environmental Impact Assessment (EIA), a procedure that involves Public Hearings and a review by a committee of experts; construction of power plants cannot commence without EIA approval

b) Submit monthly reports on liquid and gaseous emissions to verify compliance with NEQS limits

33. We generally observe these laws in the breach, shortsightedly preferring so-called "development" to protection of the "environment". The results of such self-destructive behaviour are recorded in:

- WWF's "Living Planet Report 2006" (downloadable from < http://assets.panda.org/downloads/living_planet_report.pdf>)

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- Stern Review Report "Economics of Climate Change" (downloadable from www.hmtreasury.gov.uk/independent_reviews/stern_review_economics_climate_change/stern_review_report.cfm)

34. According to SHEHRI if tariffs are proposed to be approved by NEPRA for a 25 years period, this will frustrate the establishment of an open competitive market (scheduled for 2009 /2012) to which the Government of Pakistan is committed. The interests of the consumers will be adversely and severely affected, and the credibility of the government damaged.

35. The following main issues have emerged from the tariff application, submissions of the commentators and proceedings in the case:

ISSUES

A. Plant Capacity
B. Project Cost
   i). EPC Cost
   ii). Emergency Spare Parts
   iii). Mobilization Cost
   iv). Development Cost
   v). Land Acquisition and Improvements
   vi). Structure Fees for Standard Bank Limited
   vii). Stamp Duties
C. Project Financing
D. Financing Fees
E. Interest During Construction
F. Capacity Charge
   i). Fixed O&M
   ii). Insurance
   iii). Cost of Working Capital
   iv). Return on Equity
   v). Return on Equity During Construction
   vi). Debt Servicing
G. Energy Charge

36. Issue wise discussion and decisions are given in following paragraphs:

A. Plant Capacity

37. According to the petitioner four-stroke diesel engines were selected, as the primary objective of the plant is to convert the available indigenous RFO into electrical energy and these Engines are well proven to use this type of fuel. While justifying the selection of aforementioned plant the petitioner has stated that the selected plant configuration would offer the best and most economical performance for WARDA Power. The proposed plant concept is based on a 200.1 MW (ISO) power plant single fuel RFO diesel engines in combined cycle. The main components of the plant are eleven proven engine generators sets of type 18V46 manufactured by WÄRTSILÄ of Finland and eleven heat-recovery steam generators (HRSG) to provide steam to one condensing steam turbine and for in-house use. When all the engines and the steam turbine run in parallel, the plant will generate a net output of 196 MW subject to the following;

(i) WARDA Power's indicated net output of 196 MW is to be considered the reference net output for purposes of capacity charge calculations and adjustment formulas, accepting, however, that net contracted capacity will be established after IDC tests.

(ii) Anticipated average site conditions that have been used in calculation of the net output and heat rate are an altitude of 214 m above sea level, ambient temperature of 30°C, charge air coolant temperature of 40°C and 60% relative humidity.

(iii) Internal consumption (including air-cooled condenser) has been assumed to be approximately 4.1 MW.

38. The Authority considered additional documentary evidence provided by the petitioner in response to information direction vide letter No. NEPRA/R/LAG-88/728 dated February 1, 2007 as per details given below;

Total Capacity/Output at ISO conditions	201.451 MW
Total Capacity/Output at Site conditions	200.474 MW
Total Auxiliary Consumption.	4.10 MW
Net Capacity/Output at ISO conditions	197.351 MW
Net Capacity/Output at Site conditions	196.374 MW

Anticipated site conditions

Ambient pressure	100 kPa
Ambient Temperature	35 °C

Altitude	200 m above sea level
Relative humidity	60%
Water Temperature to Charge air cooler	45 °C
Sum of exhaust gas back pressure and inlet pressure drop	5 kPa (not acc.to ISO 3046-1

39. Having considered all the relevant information, the Authority has decided to adopt the petitioner's indicated gross of 201.451 MW and net capacity of 196MW at reference site conditions. The petitioner will ensure that total de-rated plant capacity at 30 °C will be maintained at this value and the total de-ration will be restricted to 0.977 MW only through control of the following;

- By restricting the air-cooling water temperature to be within ≤45°C;
- By keeping the value of sum of exhaust gas back pressure + air inlet pressure drop to be within ≤ 500 mm H_2O;
- By controlling the de-rating effect for lower air pressure on account of site altitude in such a manner that the net capacity given for tariff determination is adhered to.

40. The Authority has further decided that the Company will have to manifest the same net plant capacity annually during testing of the declaration of capacity of the plant. 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 196 MW net capacity at reference site conditions. In case of higher net capacity the adjustments shall be made according to the following formula:

$$CC_{(Adj.)} = CC_{(Ref)} / CN_{(IDC)} \times 196MW$$

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 = 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.

Anticipated site conditions:

Ambient pressure	100 kPa
Ambient Temperature	35 °C

Altitude	200 m above sea level
Relative humidity	60%
Water Temperature to Charge air cooler	45 °C
Sum of exhaust gas back pressure and inlet pressure drop	5 kPa (not acc.to ISO 3046-1)

41. The petitioner's request regarding its right *"to replace the afore-said WÄRTSILÄ engines with "MAN" engines of different gross and net output as well as costs that may necessitate a modification in the tariff structure"* is not justified and is against the ECC's decision according to *which "IPPs are expected to apply for tariff to NEPRA on the basis of reasonable assurance of fixed price EPC contract while taking into account all timelines and milestones up to the Financial Closing. If any delay in meeting the milestones can be legitimately attributed to the Government, then justifiable escalation in tariff would be allowed by NEPRA".*

B. Project Cost

i). EPC Cost

42. According to the petitioner EPC cost covers power generation sets together with all the necessary auxiliary machinery, equipment and systems including the erection and commissioning of the engineering, procurement and construction (EPC) price has been assumed as Euros 133.20 million (667.04 Euros per kW). The petitioner was asked to provide item wise currency wise breakup of EPC cost through information direction (Letter No.NEPRA/TRF-67/WARDA-2007/01) dated January 22, 2007.

43. In response to information direction the petitioner vide letter dated January 30th, 2007 stated that the EPC contractor for the petitioner is foreseen to be WÄRTSILÄ from Finland and the price quoted is turnkey lump sum cost. According to the petitioner this turnkey EPC cost includes engineering, supply delivery to sight erection, commissioning and training of the power generation equipment, electrical system, switchgear, substation, buildings, engines and administration buildings, ware house and workshops and all civil works, engine tools, fuel tanks, fuel treatment system and fuel receiving system. Since WÄRTSILÄ has not given itemized breakup of cost therefore petitioner was unable to provide itemized cost breakup. The petitioner however provided currency wise estimate of the EPC cost payable to the EPC contractor would be 85% in Euros and 15% in US$.

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44. In subsequent submission dated February 7, 2007 the petitioner has stated that as a result of its negotiations with WÄRTSILÄ during November 2004 to 10th January 2007 it was able to obtain rock bottom price of 133.20 million Euros. According to the petitioner the 88% of EPC cost is offshore US$ 140,659,200 without 5% duties and taxes of US$ 7,032,960 and 12% is onshore. This is a reduction of 5.07% from their previous quotation. According to the petitioner they achieved a total discount of 5.3% over the WÄRTSILÄ starting offer and a discount of 300,000 US$ has also been offered over the EPC cost indicated in petition. The petitioner has also provided a comparison of the quotations received by WAPDA in response to 3 international competitive biddings tenders which was publicly opened on November 8, 2006 as per the following detail;

200 MW	Faisalabad	Chickoki Malian	Nandipur
Wartsila	€145,090,000	€141,978,000	€141,599,000
MAN	€159,031,078	€141,500,000	Not Quoted

45. The petitioner gave the following example to illustrate the competitiveness of its price;

	EPC Cost
Attock EPC Cost	€ 638/kW
Translated to 200 MW cost	€127,600,000
Cost of fuel tanks	€1,700,000
Total	€129,300,000
After addition of annual inflation of 1.5% between 2005-07	€133,208,095
WARDA reduced and matching cost:	€133,200,000
	($159,840,000)

46. In order to assess the reasonability of the EPC cost Attock's EPC cost was taken as reference although the cost of fuel tanks was not included in the Attock's EPC cost but Attock was allowed US$ 300,000 per annum as lease rental for usage of this facility which is already available with the refinery. This cost over the 25 year life of the project works out as 7.5 million US$. Assuming cost of land of about 1.5 million US$ the remaining cost of 6 million US$ with Euro/dollar conversion factor of 1.2 the EPC cost for Attock comparable to WARDA plant size is works out as 132.72 million US$. If the impact of inflation @ 1.5% is added, the adjusted EPC cost at par with Attock would have been €134.71 million.

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47. Using Euro/dollar parity of 1.28 on 88% offshore EPC component and Euro/dollar parity of 1.2 on 12% onshore EPC component which will be incurred in Pak Rupees, the Authority has assessed EPC cost of US$ 169.217 million.

ii). Emergency Spare Parts

48. The petitioner in its petition has demanded emergency spare parts equivalent to US$ 2.3976 million which are 1.5% of EPC cost. According to the explanation given by the petitioner "Emergency Spare Parts cover the cost of standard lot of spare parts aimed to reduce as much as possible the stop times for maintenance of the plant". CPPA in its comments as indicated above in paragraph 30 has objected the provision of cost for emergency spare parts in the project cost on the ground that the cost of such part is already covered under O&M.

49. The Authority, having considered all the arguments and comments, is of the view that disallowing cost of emergency spare parts in the instant case would not be just because this cost has been allowed to Attock. On the principle of equity and justice the Authority has decided to allow US$ 2.2505 million (1.5% of Offshore EPC) as cost of emergency spare parts.

iii). Mobilization Cost

50. The petitioner's request for 2.835 million US$ as against mobilization cost was on the higher side and needed very strong justification and evidence in support thereof. Accordingly the petitioner was asked to provide rationale/justification of this cost. The petitioner in its response dated January 30th, 2007 has stated that the mobilization cost shall be paid to the O&M contractor to mobilize at site for training, tools, hiring of labour, special tool and operations and maintenance and this cost is not adjustable against payment to O&M contractor.

51. Having considered petitioner's response as inadequate, the petitioner was advised to provide breakdown of mobilization cost. The petitioner provided the following breakdown;

Pre-commissioning payrolls, Wages and Overhead	US$610,000
Factory Training	50,000
Training at other Power Plants	50,000
Interview and hiring of personnel	25,000
Traveling and site visits	50,000
Safety equipment for operator's personnel	55,000

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Office equipment and other procurement	100,000
Workshop tools and machines	1,050,000
Vehicles	120,000
First fills of lube oil and chemicals	250,000
Freight and Transportation	130,000
Import Duty for Emergency spare parts	345,000
Total:	**US$ 2,835,000**

52. CPPA in its comments termed this cost much higher as compare to the cost estimate of US$ 0.705 as given in its Feasibility Study because the company was incorporated in April 06, 2006 therefore, the mobilization cost of US$ 2.8 million was not fully justified.

53. Planning and Development Division (Energy Wing) also objected to the provision of mobilization cost which needed to be justified by the sponsors. According to Planning Division the training of manpower is the responsibility of the O&M contractor and equipment suppliers and such costs are included in the overall cost of machinery and equipment and O&M cost.

54. The examination of above item wise breakdown provided by the petitioner revealed that the following cost items are not justified;

a) Factory training;
b) Training at other power plants;
c) Workshop tool and machines;
d) Freight and transportation; and
e) Import duty for emergency spare parts.

55. The Authority is of the view that items a, b, c and d are the responsibility of EPC and O&M contractor as per the explanation given by the petitioner vide its response dated January 30, 2007. The cost on account of import duty for emergency spare parts cannot be allowed because the cost of emergency spare parts is assumed to be included in EPC cost on which the cost of duties and taxes has already been accounted for.

56. The petitioner's has not accounted for the cost for generator and diesel at site and fuel cost during pre-synchronization test. After incorporating all the adjustments, the Authority has assessed the mobilization cost of US$ 1.81 million.

iv). Development Cost

57. The petitioner has requested development cost of US$ 2.67 million as per following breakdown;

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Environmental studies	US$ 165,000
Standard Bank limited retainer	US$ 240,000
Load flow, short circuit, etc	US$ 20,000
Consultants for Feasibility Study	US$ 400,000
Engineering	US$ 750,000
Trips	US$ 250,000
Lawyers	US$ 350,000
Office rental/furniture	US$ 100,000
PPIB Legal fee	US$ 100,000
Award guarantee (US$ 5 000/MW)	US$ 25,000
PPA Letter of Credit	US$ 200,000
Various costs	US$ 70,000
Total:	**US$ 2,670,000**

58. In CPPA's opinion the development cost requested by the petitioner is on the higher side and has recommended NEPRA to review this cost in detail.

59. The careful analysis of the above individuals cost items the Authority is of the view that provision of cost of US$ 750,000 against engineering appears to be duplication and is not justified as engineering is part of the EPC contract and should not be included in the development costs therefore the same cannot be allowed. Similarly an amount of US$240,000 as Standard Bank Limited retainer is a financing cost and should be considered under that head. The Authority therefore allowed the revised development cost of US$ 1,680,000.

v). Land Acquisition and Improvements

60. The petitioner has requested US$ 2.204 million for land purchase, fees and infrastructure. The petitioner was asked to provide documentary evidence in support of its claim. According to the information the petitioner had purchased 38 Acers of land. As per the site plan of the petitioner the land requirement for plant of 200 MW worked out as about 15 Acers. In Authority's opinion the purchase of 38 acres of land as against the requirement of only 15 acres is not justified. The Authority considers that the additional land purchased by the petitioner can be used for other business therefore the entire cost of 38 acres to be charged to the power project is not prudent. In Authority's opinion even if the petitioner is given an allowance for green, open area and expansion the 25 acres of land should be sufficient and the corresponding cost is therefore being allowed as part of the project cost. The Authority has therefore assessed US$ 1.441

million as cost of land including broker's fee, registration cost, leveling and embankment may be allowed.

vi). Structure Fees for Standard Bank Limited

61. The petitioner has requested a fee of 2.5% of the debt financing (excluding IDC) payable to Standard Bank limited for advising, arranging in consortium or otherwise, deals structuring, syndicating and lending on project finance basis. According to the petitioner the following is the scope of work with Standard Bank a contract signed in April 2006;

Phase I

- Review of documentation for the project;
- Creation of a detailed financial model, which is capable of appropriate risk scenario and sensitivity analysis;
- Initial identification of other potential funding sources for the Project;
- Familiarization with local providers of funds such as banks, private equity funds and with the process of a local stock exchange listing;
- Creation of a detailed timetable for the project;
- Analysis of the project's risks and their mitigation/allocation to various parties in accordance with their ability to absorb such risks;
- Assistance in the appointment of technical and legal advisers to the project;
- Summarize the result of Phase 1 in an information document.

Phase II

- Co-ordination and comparison of financing packages provided by equipment suppliers, financial institution and through negotiation obtain the best possible package;
- Assist in the interaction with financiers and co-ordinate inter-creditor issues;
- Conduct bank syndicate meetings, road shows, site visits;
- Manage the financial, technical and legal due diligence process;
- Final approval processes; and
- Financial Close.

62. According to CPPA a huge amount of US$ 4.12 million as structure fee in addition to the financing fee and charges are not justified and needs to be reviewed for assessment of fair amount on this account. According to Planning and Development Division comments the structure fee of US$ 4.12 million in

addition to financing fee and charges of US$ 3.215 million appears to be duplication as the purpose of the two is almost the same.

63. Since this amount is exceptionally high therefore needs a very strong justification for provision. In Authority's opinion under such kind of arrangements a lower spread over LIBOR is expected; and the financing fee and charges are assessed under a package deal rather than provision under different heads. The Authority in the different determinations with respect to different IPPs has allowed 2.5% of the debt amount (excluding IDC) as the financing fees and charges subject to adjustment as per actual including spread over LIBOR (adjustment according to the GOP Tariff Guidelines and Policy) and financing arrangement fee, on the basis of documentary evidence to be provided by the petitioner at the time of financial close. The actual financing fees and charges shall not however exceed 3% of the debt amount (Excl. IDC).

vii). Stamp Duties

64. The petitioner has requested 1% of the loan amount as stamp duties separately. Since this cost is covered under financing fee and charges subject to adjustment as per actual therefore there is no justification of claiming such cost under separate head. The Authority has therefore decided to disallow the same under separate head.

C. Project Financing

65. The petitioner has proposed following capital structure of the project;

Equity	US$ 59,698,785
Total debt	US$ 139,297,165
Total Capital Cost (excl IDC)	US$ 198,995,950
Debt Equity Ratio	70:30

66. The details provided at 3.8 of the petition indicated that the total project cost is inclusive of IDC of US$ 14.42 million.

67. Based upon the analysis of different project cost items the project cost of the petitioner has been revised to US$ 198.074 million and the corresponding Debt: Equity breakup of US$ 138.6517 million debt (75% foreign and 25% local) and US$ 59.422 million equity. Since the petitioner request for allowing 70:30 debt equity ratio is inline with the prudent utility practices therefore is being accepted. Accordingly the aforementioned revised project financing is allowed.

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D. Financing Fees

68. This has already been addressed in the paragraphs 60-62 above.

E. Interest During Construction

69. The amount of interest during construction of US$ 12.057 million requested by the petitioner is based upon its estimated project cost of US$198.995 million. The petitioner has based its calculation assuming a construction period of 20 months, which in the case of Upfront Tariff and Attock has been allowed as 15 months by the Authority. The Authority is of the view that in order to incorporate unforeseen factors additional 3 months should be allowed to the petitioner. The Authority has therefore decided to allow 18 months construction period. Based upon the assessed project cost of US$198.074 and18 months construction period the Authority has assessed US$ 8.366 as IDC which will be adjusted at the time of COD as per actual disbursement.

Adjustment due to Custom Duties & Taxes

70. The petitioner estimated US$ 8.009 million as Custom Duties & Taxes. The Authority has assessed US$ 7.847 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. The petitioner shall be required to submit the relevant documents to NEPRA within 7 days of COD for adjustment of relevant tariff components.

F. Capacity Charge

i) Fixed O&M

71. The petitioner requested for fixed O&M of US$ 3.788 million per annum or Rs. 0.1326 per kW per hour assuming the rupee/dollar parity of 60. The Authority considers that the fixed O&M cost requested by the petitioner is in the range of already assessed fixed O&M for similar size of the projects; therefore is being accepted as such. In order to make the tariff more realistic the parity rate of 61 rupees to a dollar has been adopted for conversion from dollar to rupees. Accordingly the Authority has assessed the fixed O&M cost as Rs.0.1346 per kW per hour.

ii) Insurance

72. The petitioner has requested insurance @ 1.35% of EPC cost. The request being inline with the cases already determined by the Authority therefore is

accepted. The Authority has accordingly assessed Rs. 0.0812 per kW per hour as cost of insurance.

iii) Cost of Working Capital

73. The petitioner requested financing cost of working capital to the tune of US$ 1.483 million on the basis of following working capital requirement;

Fixed Cost Receivables - 30 days	$46,000
Fuel stock @60% load factor - 30 Days	6,797,000
Sales tax on fuel - 15%	1,020,000
Fuel advance payment (incl. 15% ST) - 15 days	3,908,000
LO Inventory - 30 days	123,000
HSD stock @60% load factor - 30 Days	21,000
Total	$11,915,000
Cost of the loan @ 12.45% (KIBOR 10.45% + 200 points spread)	US$ 1,483,418

(This total corresponds to the tariff components of Rupees 0.0519 kWh)

74. As per the terms of PPA the IPP is required to maintain fuel inventory level equivalent to 30 days generation at 100% load factor. The working in the instant case for working capital requirement is based upon 60% load factor which is not inline with the PPA requirement and needed to be adjusted. Accordingly fuel stock requirement at 100% load factor is worked out as US$11.021 million assuming RFO price (LHV) Rs. 25,714 per ton + 3,857 GST.

75. As per the PPA the petitioner will raise its invoice for energy payment after each 30 days and the power purchaser will make payment after next 30 days. On the average 30 days energy charge at 60% dispatch will remain in the billing cycle for which the petitioner will require additional working capital. The petitioner in the petition has not catered for this additional working capital requirement. The Authority considers that it would not be just if it is not accounted for while making working capital assessment. The Authority has not considered variable O&M in the assessment due to the reasons recorded under variable O&M. The Authority has accordingly assessed US$ 6.613 million as additional working capital. Based upon the required inventory level and receivables General Sales Tax (GST) @ 15% would also be required to be included in the working capital requirement. On this account the Authority has assessed US$ 2.645 million. After taking into consideration the additional working capital requirement, the Authority has assessed overall working capital requirement as US$ 20.279 million. For determination of cost of working capital the Authority has assumed reference Rupee/dollar parity of 61 and interest @

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12.45% (KIBOR 10.45% + 200 points spread). Based upon the assessment made by the Authority, the cost of working capital works out as Rs. 0.0900 per kW per hour. This cost shall be adjusted according to the actual prices prevalent at the time of COD according to the following formula;

$$WCC_{(adj)} = 0.0900 / 29571 * FP_{(current)}$$

Where;

$WCC_{(adj)}$ = Adjusted cost of working capital

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

76. In future the cost of working capital will be adjusted for variation in KIBOR only.

77. The petitioner's request for allowing fixed cost receivable for 30 days, fuel advance payment for 15 days, lubricants for 30 days and HSD stocks are not justified because the petitioner is paid 70% of capacity charge in advance and the actual payments of different components included in the capacity charge are made at different point of time and the additional cost requested by the petitioner would be much lower than the benefits of payments made in advance to the petitioner. The Authority has therefore decided not to accept the petitioner's request for allowing financing cost on account of fixed cost receivable for 30 days, fuel advance payment for 15 days, lubricants for 30 days and HSD stocks.

iv) Return on Equity (ROE)

78. The petitioner has requested Rs. 0.3050 on the basis of equity of US$56.4192 to achieve net 15% IRR on its equity investment. The Authority has assessed equity of US$ 59.029 million on the basis of revised project cost and reference rupee/dollar parity. Based upon the revised equity the ROE of Rs.0.3266 per kW per hour has been determined. Since the equity is foreign currency; therefore it will be subject to adjustment for variation in rupee/dollar parity. Under the Government policy only rupee/dollar exchange rate variation is allowed in case of foreign equity and no other indexation on account of inflation is permissible; therefore the petitioner's request for allowing rupee/Euro exchange rate and Euro inflation is not accepted.

v) Return on Equity During Construction (ROEDC)

79. The petitioner has requested ROEDC of Rs. 0.019 per kW per hour. The petitioner has assumed its equity during construction equivalent to 30% of IDC.

The petitioner's proposed number is based upon methodology, which is inconsistent with the Authority's earlier decisions. Although the number requested by the petitioner is lower but Authority considers that ROEDC should be determined on the basis of same principles as have been used in the Authority's earlier determinations. Accordingly in the instant case the Authority has assessed ROEDC as Rs.0.0225 per kW per hour subject to adjustment on the basis of actual equity injection during 18 months construction period.

vi) Debt Servicing

80. The petitioner requested debt service of Rs.0.7686 per kW per hour on the basis of debt of US$ 139,297,165 (75% foreign borrowing and 25% local borrowing). The Authority has assessed overall debt amount of US$138.6517 million comprising of US$103.989 million foreign portion and US$ 34.663 million local. The Authority has assumed interest in the instant case as 8.34% (5.34% LIBOR +300 basis points) on foreign borrowing and 13.45% (KIBOR 10.45% + 300 basis points) on local borrowing. The petitioner will be allowed adjustment on account of variation in quarterly LIBOR and KIBOR on quarterly basis. Accordingly the Authority has assessed Rs. 0.7741 per kW per hour as debt servicing component of tariff.

G. Energy Charge

i) Fuel Cost

81. The petitioner has requested fuel cost of Rs. 4.7593 per kWh on the basis of following reference numbers;

(a)	RFO Price (LHV):	Rs. 23,247 per ton excluding transport (as per Annex-II of Revised Upfront Tariff for Reciprocating Engine Technology issued by NEPRA on September 14, 2006).
(b)	Thermal efficiency net:	47% (at site conditions)
(c)	Thermal efficiency, inclusive of ageing and cleaning:	45.0% (life-cycle net at site conditions)
(d)	Output:	196 MW (net at site conditions)
(e)	Heat Rate:	8,000 kJ/kWh (LHV)
(f)	LHV of RFO	39,087 kJ/kg (37,047 BTU/kg)
(g)	Partial Loading:	Heat Rate Curves from generation sets manufacturers to be used for partial load heat rate calculation and payment in case the plant load falls below 40%.

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82. The Authority considers that there is an anomaly in the different assumptions for calculating fuel cost component because the petitioner's assumed calorific value is not that of the fuel of which the fuel prices have been adopted i.e. Arabian Gulf prices for RFO. The calorific value assumed by the petitioner is much lower than that for the reference fuel prices. The petitioner has submitted fuel purchase agreement according to which the applicable price for fuel shall be calculated as follows;

For local product:

- The cost of product + General Sales Tax + transportation charges + General Sales Tax on the transportation charges.
- Cost of product shall mean the ex-refinery price + the Gross Margin.
- The Gross Margin shall be 3.5% of the aggregate of the final price.

For imported Fuel

- The C&F price of import (being (i) the FOB price in Arab Gulf Mean based on international competitive tendering, (ii) Premium – including the transportation and blending costs based on international competitive tendering, and (iii) exchange conversion costs) + import incidentals + Exchange Rate Fluctuation + Adjustments + Gross Margin + General Sales Tax + inland transportation charges + General Sales Tax on transportation charges
- Where "Import Incidentals" include the letter of credit commission costs, bank charges, insurance premia, handling charges, handling charges costs of load and discharge port surveyors, testing costs and wharfage and other costs connected with the import.
- Gross Margin has the same meaning as given above.
- Adjustment mean adjustment of charges not otherwise covered (which are effected on a fortnightly basis).

83. The Authority in the case of Attock has already prescribed the mechanism for determination of fuel cost component along with adjustment on account of fuel price variation. In order to maintain consistency the Authority has decided to adopt the same mechanism. For the purpose of calculation of fuel cost component the following reference values have been used;

RFO Price (HHV) Rs. 22,140 per ton

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Inland Freight	Rs. 2,350
Total Price RFO (HHV)	**Rs. 24,490**
LHV, HHV adjustment factor	1.05
RFO Price (LHV)	**Rs. 25,714 per ton**
Calorific Value	40,792 BTU/Kg

84. Based upon the above reference values the fuel cost component in the instant case the Authority has 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:

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

Where:

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

$Ft_{(Rev)}$ = 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)*		
Sub-Total – 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)		
Cost of RFO excluding GST (GHV)		
Inland Freight		
Total Cost of RFO excluding GST (GHV)		

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

* This charge shall vary with market supply/demand position but shall not exceed 8% of C&F price, to be uniformly charged to all customers including WARDA.

ii) Variable O&M Cost

85. The petitioner requested for variable O&M of Rs. 0.3744 per kWh (Foreign) and Rs. 0.0972 per kWh (Local). In Authority's opinion the petitioner's demand

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was on the higher side; therefore, the petitioner was asked to provide breakdown of major cost components of variable O&M like lubricants, water treatment, consumables, spares for major overhauling and operators fee the variable O&M cost duly supported with detailed maintenance schedule indicating number of operating hours after which the major overhauling is required along with corresponding cost details. The petitioner was also advised to provide procedure adopted for selecting O&M contractor duly supported with evidence. In response the petitioner vide its letter dated January 30th, 2007 stated that its variable O&M variable of Rs. 0.5040 per kWh which translates into US$ 8.652 million per annum was at notional 60% capacity factor. The petitioner did not provide itemized cost breakup. According to the petitioner this included lubricants, repair and maintenance, water treatment charges, other O&M consumables, major overhauling spares, major overhauling O&M operator fee, import duty on spare parts and cost of specialist from manufacturer factory.

86. During the hearing CPPA showed its serious concerns over the variable O&M of 0.5040 per kWh proposed by the petitioner for which no details were provided. According to CPPA the actual variable O&M for similar plant operation operating as IPPs is around Rs. 0.32 per kWh. CPPA has also submitted written comments vide letter no. COO/CPPA/CE-II/1420 dated 9.2.2007.

87. The petitioner vide its letter dated February 7, 2007 submitted further information stating therein that they have received firm quotation from O&M contractor comprising;

i)	Foreign variable O&M(for imported portion)	€4.80 per MWh;
ii)	Local variable O&M	€ 1.35 per MWh (Rs. 97.20 per MWh for lubes only);
	Total variable O&M Fee	**€6.15 per MWh**

88. According to the petitioner they can agree to reduce total variable O&M figure of Rs. 0.4716 per kWh instead of Rs. 0.5040 per kWh if the foreign variable O&M of € 4.80 per MWh payable fully in Euros over the 25 year life of the project to the O&M contractor can be converted at today's exchange rate of Rs. 78 = 1 Euro and any variation in this parity should be annually reflected in the foreign O&M. According to the terms of operation and maintenance offer Wärtsilä guarantees 90% engine availability.

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89. As per the explanation given under fees about 6.5% of variable fee is taxes and import duties which will be re-estimated at the time of finalization of O&M agreement. The duties and taxes are only applicable to the spares imported and it cannot be applied across the board. Accordingly the figure of €1.35 per MWh for lubricants needs to be corrected because 6.5% duties and taxes are not applicable to this figure. The corrected amount for lubricants after adjusting 6.5% works out as €1.2676 per MWh which translates into Rs. 0.0928 per kWh with a conversion of Euro/Dollar parity of 1.20 and Rupee/Dollar parity of 61.

90. The Authority observed that the offer is not final and is expected to be lower than the proposed. As the proposed variable O&M fee is not firm therefore cannot be accepted as such. Alternatively for assessment of reasonable level of variable O&M cost the Attock's case can be considered as reference. In the case of Attock with similar technology and same O&M contractor, The Authority assessed the average annual variable O&M cost as US$7.6992 million that translates into €4.6909 per MWh (inclusive of duties & taxes) with Euro/Dollar conversion factor of 1.20, which in rupee term works out as Rs.0.3434 at a parity of 1.2 Euro/Dollar and Rupee/Dollar parity of 61 and the same is being allowed subject to the condition that the O&M operator shall guaranteed 90% plant availability. In case the plant availability is less than 90% then this O&M cost shall accordingly be adjusted.

91. The petitioner's request that current Rupee/Euro parity of Rs. 78 should be applied for conversion of variable O&M fee in rupee per kWh along with future adjustment for variation in Rupee/Euro parity indexed with Euro inflation is not justified. The review of the information provided by the petitioner revealed that the parts for major overhauling would be required after 12000 running hours, which means that major overhauling would be undertaken after about two years. The power purchaser would start making payment on monthly basis corresponding to the units received. There are two possible arrangements that an IPP can have; (i) the payments to O&M contractor are made on monthly basis in advance; (ii) the payments are made at the time of occurrence of major overhauling. In case the payment is made on monthly basis the payment which is made to O&M operator can earn a certain return. In Authority's opinion in the instant case if 7% per annum return on payments made in advance is assumed, it should be sufficient to cover variation in Euro/Dollar parity along with Euro inflation. In second case scenario assuming opportunity cost equivalent to cost

of working capital allowed to petitioner which presently is about 12.45% would result in a saving on this account which should be sufficient to cover the possible Euro/Dollar exchange rate variation and Euro inflationary impact.

92. From the above analysis the Authority concluded that since there is an inbuilt compensation mechanism for Euro/Dollar exchange rate variation and indexation; therefore Euro/Dollar exchange rate variation and Euro inflation cannot be allowed. The Authority has however decided to allow Rupee/Dollar exchange rate variation and US CPI according to the additional concessions/amendments in the policy for Power Generation Projects 2002 by GOP that states;

> *"the foreign component of O&M Cost (variable and fixed) would be indexed with US CPI, effective from the month of application by the IPP to NEPRA for tariff determination, if it is demonstrated by the IPP to NEPRA that the inflation indexation is not already covered in the O&M contract". It is recommended that in order to cover abnormal situation if in a particular year the combined impact of exchange rate variation and international inflation is more than the opportunity cost assessed in either of the above mentioned cases, the adjustment should be allowed to IPP to the extent of amount exceeding the opportunity cost".*

Indexation/Inflation Factor

93. The Authority has considered 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 and is of the view that under the existing GOP policy such kind of indexations are not allowed. The policy only allows Rupee/Dollar variation adjustment and US CPI on foreign portion of O&M cost; the same is therefore being allowed.

H. Timeline/Completion of Project

94. The Authority has considered the timeline/completion of project submitted by the petitioner as indicated in para 27 and decided to accept as such.

ORDER

95. Pursuant to Rule 6 of the NEPRA Licensing (Generation) Rules 2000, WARDA Power Generation (Pvt.) Ltd. (WARDA) is allowed to charge, subject to adjustment of Capacity Purchase Price on account of net

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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 WARDA for delivery of electricity to CPPA of NTDC for procurement on behalf of Ex-WAPDA Distribution Companies:

Reference Tariff

Tariff Components	Year 1 to 10	Year 11 to 25	Indexation
Capacity Charge PKR/kW/Hour)			
O&M Foreign	0.0673	0.0673	US$ /PKR & US CPI
O&M Local	0.0673	0.0673	WPI
Cost of Working Capital	0.0900	0.0900	KIBOR
Insurance	0.0812	0. 0812	US$ /PKR
Debt Service – Foreign	0.5483	-	LIBOR
Debt Service – Local	0.2258	-	KIBOR
Return on Equity	0.3266	0.3266	NIL
ROE during Construction	0.0225	0.0225	NIL
Total Capacity Charge	**1.4290**	**0.6549**	
Energy Charge on Operation on Furnace Oil Rs./kWh			
Fuel Cost Component	4.7811	4.7811	Fuel Price
Variable O&M	0.4362	0.4362	US$ /PKR & US CPI

Note: i) Capacity Charge Rs./kW/hour applicable to dependable capacity at the delivery point.

ii) Dispatch criterion will be Energy Charge.

iii) The above tariff is applicable for a period of 25 years commencing from the date of the Commercial Operation.

iv) Component wise tariff for operation on RFO is indicated at Annex-I.

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

I. <u>Adjustment in EPC Cost (One Time)</u>

The Authority has assessed EPC cost as US$ 169.217 out of which US$150.0365 million would be in Euro and US$19.1808 million in US Dollar. 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

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against the reference Euro/dollar parity values according to the following mechanism. The adjustment would be allowed for a period up to 3 months or up to financial close whichever is earlier;

$EPC_{(Adj.)}$=US$ 150.0365 Million/1.28 * $E_{(PR)}$ + US$ 19.1808 Million

Where:

$E_{(PR)}$ = Weighted Average EURO to dollar 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) <u>Insurance Adjustment Mechanism for EPC Cost Variation</u>

$$Ins_{(Rev)} = Ins_{(Ref)} / EPC_{(Ref)} \times EPC_{(Adj.)} \times P_{(Rev)} / 61$$

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 US$

EPC(Adj.) = Adjusted EPC in US$

$P_{(Rev)}$ = Rupee to Dollar parity at COD

ii) <u>Return on Equity Adjustment Mechanism for EPC Cost Variation</u>

$$ROE_{(Rev)} = ROE_{(Ref)} /(30\% \times US\$198.074) \times (30\% \times PC_{(Rev)}) \times P_{(Rev)} / 61$$

Where:

$ROE_{(Rev)}$ = Revised reference Return on Equity component of tariff

$ROE_{(Ref)}$ = Reference Return on Equity component of tariff as per original schedule of tariff

$PC_{(Rev.)}$ = Revised project cost after incorporating the adjustment for currency fluctuation

$P_{(Rev)}$ = Rupee to Dollar parity at COD

iii) <u>ROEDC Adjustment Mechanism for EPC Cost Variation</u>

$$ROEDC_{(Rev)} = 0.0900 /(US\$4.0858 Million) \times (EDC_{(Rev)}) \times P_{(Rev)} / 61$$

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Where:

$ROEDC_{(Rev)}$ = Revised reference Return on Equity during Construction component of tariff

$EDC_{(Rev.)}$ = Revised Equity During Construction in million USD

$P_{(Rev)}$ = Rupee to Dollar parity at COD

Note: 4.0858 million US$ is after adjustment of present value of equity at the end of the project life because the project is on BOO basis.

iv) Debt Servicing Adjustment Mechanism for EPC Cost Variation

$$DSF_{(Rev)} = DSF_{(Ref)} / US\$103.989 Million \times (70\% \times 75\% \times PC_{(Rev)}) \times P_{(Rev)} / 61$$

$$DSL_{(Rev)} = DSL_{(Ref)} / US\$34.663 Million \times (70\% \times 25\% \times PC_{(Rev)}) \times P_{(Rev)} / 61$$

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.

$DSF_{(Rev)}$ = Revised Foreign Debt Servicing component of tariff

$DSL_{(Rev)}$ = Revised Local Debt Servicing component of tariff

$DSF_{(Ref)}$ = Reference Foreign Debt Servicing component of tariff as per original schedule of tariff

$DSL_{(Ref)}$ = Reference Local Debt Servicing component of tariff as per original schedule of tariff

$PC_{(Rev.)}$ = Revised project cost after incorporating the adjustment for currency fluctuation

$P_{(Rev)}$ = Rupee to Dollar parity at COD

II. Adjustment due to Variation in Net Capacity

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 in the relevant tariff components if IDC is established less than 196 MW net capacity at reference site conditions. The adjustments shall be made according to the following formula:

$$CC_{(Adj.)} = CC_{(Ref)} / 196 MW \times CN_{(IDC)}$$

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

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NC = Net Capacity at reference site conditions established at the time of IDC test

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

Reference Site Conditions:

Ambient pressure	100 kPa
Ambient Temperature	35 °C
Altitude	200 m above sea level
Relative humidity	60%
Water Temperature to Charge air cooler	45 °C
Sum of exhaust gas back pressure and inlet pressure drop	5 kPa (not acc.to ISO 3046-1

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 WARDA according to the following formula;

Insurance (Rev) = AIC/(1.35 % x US$169.217 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

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.

WARDA shall submit the relevant documents to NEPRA within 7 days of COD for adjustment of relevant tariff components.

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$ 7.847 million. The impact of withholding tax on local services is not known at this point of time.

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However, these will be adjusted along with other duties and taxes as per the actual on provision of documentary evidence at COD.

WARDA shall submit the relevant documents to NEPRA within 7 days of COD for adjustment of relevant tariff components.

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 WARDA is obligated to pay any tax on its ROE, the exact amount paid by the company may be reimbursed by CPPA to WARDA 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, WARDA may also submit to CPPA details of any tax shield savings and CPPA will deduct the amount of these savings from its payment to WARDA on account of taxation.

ii) Withholding tax 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:

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

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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 1st July, 1st October, 1st January and 1st 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. 0.0673/kW/Hour * $WPI_{(REV)}$ /118.96

$F\ O\&M_{(FREV)}$ = Rs.0.0673/kW/Hour * US $CPI_{(REV)}$/202.41* $ER_{(REV)}$/61

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)

$WPI_{(REF)}$ = 118.96 wholesale price index (manufactures) of January 2007 notified by Federal Bureau of Statistics

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

US $CPI_{(REF)}$ = 202.41 US CPI for the month of January 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

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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:

$V\ O\&M_{(REV)}$ = Rs. 0.4362 per kWh * $US\ CPI_{(REV)}/202.41$ * $ER_{(REV)}/61$

Where:

$V\ O\&M_{(REV)}$ = The revised applicable Variable O&M Component of Energy Charge indexed with US CPI and Exchange Rate variations.

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

$US\ CPI_{(REF)}$ = 202.41 US CPI for the month of January 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/LIBOR 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 LIBOR and KIBOR according to the following formula;

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

$\Delta I_{(F)} = P_{(FREV)} * (LIBOR_{(REV)} - 5.34\%) / 4$

Where:

$\Delta I_{(L)}$ = the variation in interest charges on local loan applicable corresponding to variation in quarterly KIBOR. Δ 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 Δ I for each quarter under adjustment applicable on quarterly

$\Delta I_{(F)}$ = the variation in interest charges on foreign loan applicable corresponding to variation in quarterly LIBOR. Δ I can be positive or negative depending upon whether $LIBOR_{(Rev)}$ > or < 5.34%. The interest payment obligation will be enhanced or reduced to

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the extent of Δ 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 1st 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 per kWh * $FP_{(Rev)}$)/ Rs.23,247.07 per ton + (Rs.0.4588 per kWh * $Ft_{(Rev)}$)/Rs.2,467.50 per ton

Where:

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

$Ft_{(Rev)}$ = 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)*		
Sub-Total – 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)		
Cost of RFO excluding GST (GHV)		
Inland Freight		
Total Cost of RFO excluding GST (GHV)		

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

* This charge shall vary with market supply/demand position but shall not exceed 8% of C&F price, to be uniformly charged to all customers including WARDA.

The fuel cost component will be adjusted after the commercial operation date, according to revision in RFO price on fortnightly basis as per above mechanism.

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In case of any other arrangement laid down in the Fuel Supply Agreement (FSA) by PPIB mutually agreed by power producer and power purchaser shall be submitted to the Authority for approval.

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

IX. Terms and Conditions of Tariff:

i) The plant availability shall be 90%.

ii) All new equipment will be installed and the plant will be of standard configuration.

iii) Dispatch criterion will be based on the Energy Charge.

iv) Internal consumption (including air-cooled condenser) has been assumed to be approximately 4.1 MW.

v) Annual Unscheduled Outages (MWh) up to 500 hours x Available Capacity (MW) without any liquidated damages shall be in accordance with the 2006 standardized PPA.

vi) Scheduled Outage periods per annum shall be in accordance with the 2006 standardized PPA.

vii) NTDC will be responsible for constructing the interconnection to the grid.

viii) All invoicing and payment terms are assumed to be in accordance with the 2006 standardized PPA.

ix) Tolerance in Dispatch shall be in accordance with 2006 standardized PPA.

x) If there is any change in any assumption that may lead to change in the tariff shall be referred to NEPRA for approval.

xi) 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.

The above tariff and terms and conditions be incorporated in the Power Purchase Agreement between WARDA and CPPA.

Warda Power Generation (Private) 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	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	0.4362	5.2173	0.1346	0.0900	0.0812	0.3266	0.0225	0.0262	0.3110	0.4630	1.4551	2.4251	7.6424	12.7373
2	4.7811	0.4362	5.2173	0.1346	0.0900	0.0812	0.3266	0.0225	0.0262	0.3413	0.4328	1.4551	2.4251	7.6424	12.7373
3	4.7811	0.4362	5.2173	0.1346	0.0900	0.0812	0.3266	0.0225	0.0262	0.3747	0.3994	1.4551	2.4251	7.6424	12.7373
4	4.7811	0.4362	5.2173	0.1346	0.0900	0.0812	0.3266	0.0225	0.0262	0.4115	0.3626	1.4551	2.4251	7.6424	12.7373
5	4.7811	0.4362	5.2173	0.1346	0.0900	0.0812	0.3266	0.0225	0.0262	0.4521	0.3220	1.4551	2.4251	7.6424	12.7373
6	4.7811	0.4362	5.2173	0.1346	0.0900	0.0812	0.3266	0.0225	0.0262	0.4969	0.2771	1.4551	2.4251	7.6424	12.7373
7	4.7811	0.4362	5.2173	0.1346	0.0900	0.0812	0.3266	0.0225	0.0262	0.5465	0.2276	1.4551	2.4251	7.6424	12.7373
8	4.7811	0.4362	5.2173	0.1346	0.0900	0.0812	0.3266	0.0225	0.0262	0.6013	0.1728	1.4551	2.4251	7.6424	12.7373
9	4.7811	0.4362	5.2173	0.1346	0.0900	0.0812	0.3266	0.0225	0.0262	0.6618	0.1122	1.4551	2.4251	7.6424	12.7373
10	4.7811	0.4362	5.2173	0.1346	0.0900	0.0812	0.3266	0.0225	0.0262	0.7289	0.0452	1.4551	2.4251	7.6424	12.7373
11	4.7811	0.4362	5.2173	0.1346	0.0900	0.0812	0.3266	0.0225	0.0262	-	-	0.6810	1.1350	6.3522	10.5871
12	4.7811	0.4362	5.2173	0.1346	0.0900	0.0812	0.3266	0.0225	0.0262	-	-	0.6810	1.1350	6.3522	10.5871
13	4.7811	0.4362	5.2173	0.1346	0.0900	0.0812	0.3266	0.0225	0.0262	-	-	0.6810	1.1350	6.3522	10.5871
14	4.7811	0.4362	5.2173	0.1346	0.0900	0.0812	0.3266	0.0225	0.0262	-	-	0.6810	1.1350	6.3522	10.5871
15	4.7811	0.4362	5.2173	0.1346	0.0900	0.0812	0.3266	0.0225	0.0262	-	-	0.6810	1.1350	6.3522	10.5871
16	4.7811	0.4362	5.2173	0.1346	0.0900	0.0812	0.3266	0.0225	0.0262	-	-	0.6810	1.1350	6.3522	10.5871
17	4.7811	0.4362	5.2173	0.1346	0.0900	0.0812	0.3266	0.0225	0.0262	-	-	0.6810	1.1350	6.3522	10.5871
18	4.7811	0.4362	5.2173	0.1346	0.0900	0.0812	0.3266	0.0225	0.0262	-	-	0.6810	1.1350	6.3522	10.5871
19	4.7811	0.4362	5.2173	0.1346	0.0900	0.0812	0.3266	0.0225	0.0262	-	-	0.6810	1.1350	6.3522	10.5871
20	4.7811	0.4362	5.2173	0.1346	0.0900	0.0812	0.3266	0.0225	0.0262	-	-	0.6810	1.1350	6.3522	10.5871
21	4.7811	0.4362	5.2173	0.1346	0.0900	0.0812	0.3266	0.0225	0.0262	-	-	0.6810	1.1350	6.3522	10.5871
22	4.7811	0.4362	5.2173	0.1346	0.0900	0.0812	0.3266	0.0225	0.0262	-	-	0.6810	1.1350	6.3522	10.5871
23	4.7811	0.4362	5.2173	0.1346	0.0900	0.0812	0.3266	0.0225	0.0262	-	-	0.6810	1.1350	6.3522	10.5871
24	4.7811	0.4362	5.2173	0.1346	0.0900	0.0812	0.3266	0.0225	0.0262	-	-	0.6810	1.1350	6.3522	10.5871
25	4.7811	0.4362	5.2173	0.1346	0.0900	0.0812	0.3266	0.0225	0.0262	-	-	0.6810	1.1350	6.3522	10.5871
Levelized Tariff (1-25Years)			**5.2173**	**0.1346**	**0.0900**	**0.0812**	**0.3266**	**0.0225**	**0.0262**	**0.3097**	**0.2143**	**1.2050**	**2.0083**	**7.2256**	**12.0426**

Warda Power Generation (Private) Limited
Debt Servicing Schedule

Period	Foreign Debt					Local Debt					Foreign Debt		Local Debt		Annual	Annual	Annual Debt
	Principal Million $	Repayment Million $	Mark-Up Million $	Balance Million $	Debt Service Millin $	Principal Million $	Repayment Million $	Mark-Up Million $	Balance Million $	Debt Service Millin $	Principal Repayment Rs./kW/ hr.	Interest Rs./kW/ hr.	Principal Repayment Rs./kW/ hr.	Interest Rs./kW/ hr.	Principal Repayment Rs./kW/ hr.	Interest Rs./kW/ hr.	Servicing Rs./kW/ hr.
	103.99	1.69	2.17	102.30	3.86	34.66	0.42	1.17	34.24	1.5887							
	102.30	1.73	2.13	100.57	3.86	34.24	0.44	1.15	33.80	1.5887							
	100.57	1.76	2.10	98.81	3.86	33.80	0.45	1.14	33.35	1.5887							
	98.81	1.80	2.06	97.01	3.86	33.35	0.47	1.12	32.88	1.5887							
1	103.99	6.97	8.46	97.01	15.43	34.66	1.78	4.57	32.88	6.3549	0.2478	0.3005	0.0632	0.1625	0.3110	0.4630	0.7741
	97.01	1.84	2.02	95.18	3.86	32.88	0.48	1.11	32.40	1.5887							
	95.18	1.87	1.98	93.30	3.86	32.40	0.50	1.09	31.90	1.5887							
	93.30	1.91	1.95	91.39	3.86	31.90	0.52	1.07	31.38	1.5887							
	91.39	1.95	1.91	89.44	3.86	31.38	0.53	1.06	30.85	1.5887							
2	97.01	7.58	7.86	89.44	15.43	32.88	2.03	4.32	30.85	6.3549	0.2691	0.2792	0.0722	0.1536	0.3413	0.4328	0.7741
	89.44	1.99	1.86	87.45	3.86	30.85	0.55	1.04	30.30	1.5887							
	87.45	2.04	1.82	85.41	3.86	30.30	0.57	1.02	29.73	1.5887							
	85.41	2.08	1.78	83.33	3.86	29.73	0.59	1.00	29.14	1.5887							
	83.33	2.12	1.74	81.21	3.86	29.14	0.61	0.98	28.53	1.5887							
3	89.44	8.23	7.21	81.21	15.43	30.85	2.32	4.04	28.53	6.3549	0.2923	0.2560	0.0824	0.1434	0.3747	0.3994	0.7741
	81.21	2.17	1.69	79.05	3.86	28.53	0.63	0.96	27.90	1.5887							
	79.05	2.21	1.65	76.84	3.86	27.90	0.65	0.94	27.25	1.5887							
	76.84	2.26	1.60	74.58	3.86	27.25	0.67	0.92	26.58	1.5887							
	74.58	2.30	1.56	72.28	3.86	26.58	0.69	0.89	25.88	1.5887							
4	81.21	8.93	6.50	72.28	15.43	28.53	2.65	3.71	25.88	6.3549	0.3174	0.2309	0.0940	0.1317	0.4115	0.3626	0.7741
	72.28	2.35	1.51	69.93	3.86	25.88	0.72	0.87	25.17	1.5887							
	69.93	2.40	1.46	67.53	3.86	25.17	0.74	0.85	24.42	1.5887							
	67.53	2.45	1.41	65.08	3.86	24.42	0.77	0.82	23.66	1.5887							
	65.08	2.50	1.36	62.57	3.86	23.66	0.79	0.80	22.86	1.5887							
5	72.28	9.70	5.73	62.57	15.43	25.88	3.02	3.33	22.86	6.3549	0.3447	0.2036	0.1074	0.1184	0.4521	0.3220	0.7741
	62.57	2.55	1.30	60.02	3.86	22.86	0.82	0.77	22.04	1.5887							
	60.02	2.61	1.25	57.41	3.86	22.04	0.85	0.74	21.20	1.5887							
	57.41	2.66	1.20	54.75	3.86	21.20	0.88	0.71	20.32	1.5887							
	54.75	2.72	1.14	52.04	3.86	20.32	0.91	0.68	19.41	1.5887							
6	62.57	10.54	4.89	52.04	15.43	22.86	3.45	2.91	19.41	6.3549	0.3744	0.1739	0.1225	0.1032	0.4969	0.2771	0.7741
	52.04	2.77	1.08	49.26	3.86	19.41	0.94	0.65	18.48	1.5887							
	49.26	2.83	1.03	46.43	3.86	18.48	0.97	0.62	17.51	1.5887							
	46.43	2.89	0.97	43.54	3.86	17.51	1.00	0.59	16.51	1.5887							
	43.54	2.95	0.91	40.59	3.86	16.51	1.03	0.56	15.48	1.5887							
7	52.04	11.45	3.99	40.59	15.43	19.41	3.94	2.42	15.48	6.3549	0.4066	0.1417	0.1399	0.0859	0.5465	0.2276	0.7741
	40.59	3.01	0.85	37.58	3.86	15.48	1.07	0.52	14.41	1.5887							
	37.58	3.07	0.78	34.50	3.86	14.41	1.10	0.48	13.30	1.5887							
	34.50	3.14	0.72	31.36	3.86	13.30	1.14	0.45	12.16	1.5887							
	31.36	3.20	0.65	28.16	3.86	12.16	1.18	0.41	10.98	1.5887							
8	40.59	12.43	3.00	28.16	15.43	15.48	4.49	1.86	10.98	6.3549	0.4416	0.1067	0.1596	0.0661	0.6013	0.1728	0.7741
	28.16	3.27	0.59	24.89	3.86	10.98	1.22	0.37	9.76	1.5887							
	24.89	3.34	0.52	21.55	3.86	9.76	1.26	0.33	8.50	1.5887							
	21.55	3.41	0.45	18.14	3.86	8.50	1.30	0.29	7.20	1.5887							
	18.14	3.48	0.38	14.66	3.86	7.20	1.35	0.24	5.85	1.5887							
9	28.16	13.50	1.93	14.66	15.43	10.98	5.13	1.23	5.85	6.3549	0.4796	0.0687	0.1822	0.0435	0.6618	0.1122	0.7741
	14.66	3.55	0.31	11.11	3.86	5.85	1.39	0.20	4.46	1.5887							
	11.11	3.63	0.23	7.48	3.86	4.46	1.44	0.15	3.02	1.5887							
	7.48	3.70	0.16	3.78	3.86	3.02	1.49	0.10	1.54	1.5887							
	3.78	3.78	0.08	0.00	3.86	1.54	1.54	0.05	0.00	1.5887							
10	14.66	14.66	0.77	0.00	15.43	5.85	5.85	0.50	0.00	6.3549	0.5209	0.0274	0.2080	0.0178	0.7289	0.0452	0.7741