

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

No. NEPA/TRF-69/GEL-2007
March 9, 2007

DETERMINATION OF THE AUTHORITY
w.r.t GUJRANWALA ENERGY LIMITED (GEL)

Petitioner

Gujranwala Energy Limited (GEL), 58, Main Gulberg, Lahore

Authority

Nasiruddin Ahmed
Member

Abdul Rahim Khan
Member

Zafar Ali Khan
Member

Saeed uz Zafar
Chairman

Background

1. Gujranwala Energy Ltd. (GEL) is a public limited company incorporated and existing under the Companies Ordinance 1984, established for setting up power plant of approximately 200 MW capacity based on reciprocating engine single fuel RFO fired technology in District Gujranwala in the Punjab province. According to GEL net generation of the proposed power plant will be 189 MW (net at site conditions). The electricity generated will be sold to Central Power Purchasing Agency (CPPA) within NTDC.

2. GEL submitted a tariff application on 15.1.2007 for approval of generation tariff. This tariff petition was admitted for consideration by the Authority on January 17, 2007 and was assigned case number NEPA/TRF-69/GEL-2007. Salient features of the petition were advertised in the newspapers on January 20, 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 GEL

Investment

4. The investment cost estimate of the Project is presented below in US dollars (“US\$”). The Engineering, Procurement and Construction (“EPC”) price is fixed at Euros 133.475 million (667.375 Euros/kW) and, converted at the reference exchange rate of 1.20 US\$/Euro, this price will be US\$ 160.170 million (800.85 US\$/kW). At this time we have assumed total EPC cost in foreign exchange.

	Project Costs	US\$ in m
1	EPC	160.170
2	Taxes & Duties	8.009
3	Emergency spare parts	2.403
4	Mobilization	2.860
5	Land purchase, fees and infrastructure	2.500
6	Development	2.940
7	Insurance	2.162
8	Admin & Utilities	1.650
9	Non EPC Construction & Other CAPEX	2.600
10	Financing Fees & Charges	3.954
	Total Capital Cost	189.248

11	Interest During Construction (IDC)	14.420
	Total Project Cost	203.668

Itemized Explanation of Investment

5. “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’s 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.

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

7. “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.

8. “Mobilization Cost” covers the expenses of GEL 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. costs of trips and courses, selection of an expatriate to carry out the operation and management.

9. “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.

10. “Development Cost” includes sponsors’ development costs and delay in start-up insurance. These include costs of Feasibility Studies, Environmental studies, Geological and Hydrological studies, Soil Investigation, and load flow and short circuit assessments, fees of engineering consultants, lawyers in Pakistan as well as from abroad, Fees for technical consultants, guarantees furnished to PPIB and fees paid to NEPRA etc.

11. “Insurance Cost” 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.

12. “Admin & Utilities” includes the cost of annual staff costs, utilities during construction, cost of Independent Engineer and other administrative expenses.

13. “Non EPC Construction” covers the cost of items, which have been excluded by EPC contractor and have to be borne by the Project Sponsors. It mainly includes Admin & Office Buildings, Residential Colonies and Procurement of telecommunication system, Power & Water

Connections, SCADA, fuel cost during testing, Whether Station and other operational, office and electric equipment.

14. "Financing Fees & Charges" includes the up-front fee, commitment fee, lenders' consultants fee, L/C charges etc. It is assumed that local funding would be available for the project, in case of foreign funding additional financing cost will be considered as pass through.

15. "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 GEL tentative COD is based on a period of 20 months corresponding to March 31, 2009. However due to the acute shortage of Power Engines around the world, the expected EOC may be further delayed until the confirmation of delivery schedule from machinery supplier.

Financial Analysis

16. 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.
- (d) Proposed 25-year tariff, based on real life-time costs. GEL 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

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

<u>US\$ in Million</u>	
Equity	50.917
Total debt	152.751
Total Project Cost	203.668
Debt Equity Ratio	75:25

Other Considerations

18. The Project would offer significant relief in the transmission system of Gujranwala, 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.

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

20. 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 GEL. The main component of the plant for eleven proven engines generators set of type 18V46 manufactured by Wartsila 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 approximately generate a net output of 189MW.

21. Based on the requirement of the Project for full load factor, a total of about 1000 tons of RFO per day will be transported by approximately 25/24 tank lorries of 40 tons each to the site. The LFO needs are difficult to estimate but no more than 3 tanks lorries of 40 tons each per month will be needed.

22. 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)

23. Although Pakistan Railways can carry out the transportation of equipment and fuel, however, truck/lorries are the most suitable means of transportation of all fuels to the plant.

ENERGY CHARGES

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

25. 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.

26. 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	4.3527	0.4284	0.0756	4.8567

Fuel Component

27. 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 GEL. The main assumptions used to derive this price are:

(a)	RFO Price:	Rs. 22,140 per ton excluding transportation cost.
(b)	Thermal efficiency, iGELusive of ageing and cleaning:	45% (life-cycle net at site conditions at 100% load)
(c)	Output:	189 MW (net at site conditions)
(d)	Heat Rate:	7,584.40 BTU/kWh (LHV)
(e)	LHV of RFO	38,579 BTU/kg subject to adjustment at the time of finalization of Fuel Supply Agreement
(f)	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

28. 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”).

Foreign Variable O&M

29. 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.

30. 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

31. The capacity charge for the Project is payable on the basis of 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.

32. 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 Project Cost: US\$ 203,668,000 (including fixed turnkey EPC price of 133,475,000 Euros)
- (b) Debt-Equity Ratio: 75:25
- (c) Exchange Rates: 1 US\$ = 60.0 Rupees; 1 Euro = 1.20 US\$
- (d) Funding: Debt: 75%.
Equity: 25%.
- (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.

33. 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 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.

34. 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.

35. Any modifications or additions required by the power purchaser that are not considered in the Project shall be treated as pass-through.

36. 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 GEL for the 25 years contract period and may operate as a merchant plant. A summary of the charges is provided below:

Escalable Capacity Payment (Rs./kWh)							
Period	Fixed O&M	Insurance	Cost of WC	ROEDC	ROE	Withholding Tax	Total
Years 1–25	0.1400	0.0783	0.1111	0.0749	0.2855	0.0292	0.719

- 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.

The escalable component is based on the following parameters:

- (a) Equity Amount: US\$ 50.917 (25% of total capital cost plus equity portion of IDC)
- (b) IRR: 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 is assumed in order to finance the inventory; net accounts receivables and working capital impact of 15% sales tax. Working Capital requirement starts from the date of first fill of RFO inventory. The interest rate for this working capital loan is 6 months KIBOR (10.45%) + 2% premium = 12.45% total.
- (f) Cost of Foreign Debt: 6 months LIBOR (5%) + 3% premium
- (g) Cost of Local Debt: 6 months KIBOR (10.45%) + 3% premium
- (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:

Period	Non-Escalable Component (Pak Rs./kWh)		
	Loan Repayment	Interest Charges	Total
Year 1	0.3139	0.7010	1.0149
Year 2	0.3245	0.6904	1.0149
Year 3	0.3704	0.6445	1.0149
Year 4	0.4228	0.5921	1.0149
Year 5	0.4825	0.5323	1.0149
Year 6	0.5508	0.4641	1.0149
Year 7	0.6287	0.3862	1.0149
Year 8	0.7176	0.2972	1.0149
Year 9	0.8191	0.1958	1.0149
Year 10	0.9350	0.0799	1.0149

- 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\$ 152.751 (75% of total Project cost including IDC)
 - (b) Term of Loan: 20 months of grace period (construction) + 10 years of quarterly equal installments after the COD
 - (c) Interest Rates: Foreign: 6 months LIBOR (5%) + 3% premium
Local: 6 months KIBOR (10.45%) + 3% premium
 - (d) Currencies: Pak. Rs.
 - (e) Indexation: In case Foreign Funding in USD: Interest component would be indexed to 6 months LIBOR rate and foreign

currency exchange rate.

In case of Local Funding in PKR: Interest component would be indexed to the 6 month KIBOR rate.

ESCALATIONS AND INDEXATIONS

37. After the COD the tariff tables provided will be indexed to factors as described above and the Reference Exchange Rates being 72.00 Pak Rs./Euro 60.00 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 herein below:

Inflation Factors

37.1 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

37.2 The following components are subject to exchange rate indexation. The Reference Exchange Rates are 72.00 Pak Rs./Euro. 60.00 Pak Rs./US\$ and 1.20 US\$/Euro.

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

In case of the foreign loan, 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

37.3 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

37.4 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

37.5 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

37.6 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.

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

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

37.9 Hedging cost during construction on EPC payment will be made part of the Project cost as required by the lenders. Otherwise subject to the lenders' 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.

37.10 No contingency has been included in the Project costs.

ASSUMPTIONS

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

- Duties & Taxes on the import of plant & equipment have been assumed for reference purposes, any change therein would be pass through.
- No tax on any income of the Company including sales proceeds from NTDC, General Sales Tax and all other taxes will be treated as pass through items;
- Withholding tax on local construction services, no withholding tax of EPC/offshore contractors has been considered in tariff calculation;
- 100% local debt is assumed. If foreign debt is procured, repayment terms shall be affected.
- Internal consumption (including air-cooled condenser) has been assumed to be approximately 4 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.

- Scheduled Outage periods shall be 30 Days per unit in a Year, except in any Year in which a Major Overhaul is required, in which case Scheduled Outage periods shall be 60 Days per unit.
- Actual interest during construction and Return on Equity during construction will be adjusted in tariff on actual basis at COD.
- 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.
- No letter of credit cost or advance payment to Fuel Supplier assumed.
- In case of simply cycle mode (including during startups or peaking operation), heat rate and efficiency will be different; accordingly energy component will be different;
- Withholding tax on dividends (currently at 7.5%) as required to be deducted under the Income Tax Ordinance, 2001 or any other law for the time being in force at the time of such payment is considered as pass through.
- The cost of initial fill of RFO/LFO has not been charged upfront. The working capital requirement starts at the time of first fill prior to start of commissioning.
- No working capital for bridge financing is accounted for in the tariff model; any time gap as per NTDC/Fuel supplier payment terms may result in working capital requirement. Cost of L/C for power purchase has not been included in tariff calculation.
- 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 +/- 3% 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./USD and Pak Rs./Euro).
- All fuel during plant tests after synchronization are 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.
- Freight on RFO has not been assumed in the tariff and will be finalized at the time of Fuel Supply Agreement and incorporated in the tariff accordingly.

- 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.
- In case of any unintentional errors or omissions, typographical errors, any genuine assumption overlooked, the same will be corrected/incorporated and advised to NEPRA as soon as the Company becomes aware of it.

Timeline/Completion of Project

39. GEL submitted the following timeline/completion of project:

- | | |
|----------------------------|------------------------------|
| • Tariff Determination | 15 th March, 2007 |
| • PPA | 15 th May 2007 |
| • Implementation Agreement | 15 th May 2007 |
| • FSA Agreement | 15 st June 2007 |
| • EPC Contract | 15 st June 2007 |
| • Financing Close | 31 st July 2007 |
| • Construction completion: | 31 st March 2009 |

Determination Sought:

40. 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.

Comments from Central Power Purchasing Agency (CPPA)

41. CPPA has submitted following comments:

A. The sponsors have not carried out Feasibility Study of the project being Fast Track Project. The project cost seems to be on higher side.

Following discrepancies have been found in the cost estimation of the project;

i) EPC Cost

EPC cost seems to be on higher side. The EPC cost of US\$ 160.17 million has not been bifurcated into equipment cost, civil works and erection cost.

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. Custom Duty is not payable on Erection, Civil work and local equipment.

iii) Emergency spare parts:

Emergency spare parts should not be a part of project cost because the power purchaser makes the payment of all spare parts through Variable O&M, therefore this cost of US\$2.403 million may be deleted.

iv) Mobilization

The cost of mobilization is kept to cover cost O&M contractor personnel associated with EPC Contractor before COD for training purposes. The cost of US\$ 2.86 million seems to be on higher side. It may not be more than US\$ 1.0 million.

v) Land Purchase

The cost of land of US\$ 2.5 million is on higher side. The land requirement for such like plant is between 25 to 30 acres. The rate of land in the area is approximately Rs. 2.5 million per acre. Therefore cost of land including stamp duty, registration fee, broker fees and charges should not be more than US\$ 1.5 million.

vi) Development Cost

The project being a Fast Track Project was dispensed with pre-qualification, feasibility studies and LOI, through PPIB letter of dated 29-12-2005. Therefore expenditure of US\$2.94 million should be zero under this head.

vii) Insurance Costs

The cost at of 1.35% of EPC seems to be reasonable being comparable with other project.

viii) Non-EPC Construction

The proposed cost of 2.6 million for Non-EPC construction seems to be reasonable.

ix) Admin. & Utilities

The estimated expenditure under this head of US\$ 1.65 million seems to be reasonable.

x) Financing Charges

The estimated cost of US\$ 3.954 million as the Financing seems to be reasonable but the request of Company for considering certain amount pass through in case of foreign financing may not be accepted.

xi) Interest during Construction:

The Interest During Construction (US\$ 14.42) at the rate of KIBOR+ 3% i.e.10.45% plus 3% is compatible with other projects.

Tariff Summary

i) Fuel Cost

The company has assumed RFO price of Rs. 22,140 per ton but without transportation charges. The Company has not proposed any method for transportation charges. It is suggested that the fuel transportation charges may be included in the fuel cost.

ii) Efficiency

Efficiency of 45% net at site condition at 100% load for the life cycle is comparable with similar plants.

iii) Calorific Value

Company has assumed calorific value CV of RFO 38,579 BTU/kg LHV whereas NEPA determination rate CV of RFO 40,792 BTU/kg. Calorific value of 40,792 BTU/kg may be adopted.

iv) Variable O&M

The Company has proposed a V.O&M of Rs.0.05040 per KWh but details has not been provided. However the VO&M seems to be on higher side. VO&M for similar plant operating as IPP is on lower side. KEL is charging Rs. 0.32164/kWh. Japan Power is charging Rs. 0.27137 /kWh and SEPCOL is charging Rs. 0.4156/kWh.

v) Fixed O&M

The Company has proposed fixed O&M as Rs. 0.1111/kWh been proposed but no detail has been provided on which the rate is based. The cost of Working Capital is on higher side as compared to AGL.

vi) Cost of Working Capital

The Company has proposed Rs. 0.1137/kWh as the Working Capital Cost. The Company has not provided any details of Working Capital. The cost of Working Capital is on higher side as compared to AGL.

vi) Insurance

The rate of insurance of Rs. 0.783/kWh is comparable with similar project.

vii) ROE

The ROE proposed by the Company is 15% which is in line with GOP Policy.

Indexation

i) Fixed O&M

The Company has proposed European CPI on 50% part of fixed O&M and Pakistani WPI on 50% part of fixed O&M. As per GOP Policy 50% of Fixed O&M part is indexed for US CPI and Dollar/Rupee exchange rate and 50% of fixed O&M part is indexed for local inflation (WPI).

Variable O&M: The Company demanded European CPI on foreign part of Variable O&M. As per GOP Policy US CPI indexation is admissible only.

Insurance: The Company has asked for US CPI and Exchange Rate variation on Insurance cost. Whereas insurance has been fixed as 1.35% of EPC cost in Dollars (maximum) adjustable as per actual.

ROE: The Company has asked for US inflation/Pak Inflation and Pak RS/US\$ exchange rate. As per GOP Policy PAK RS/US\$ exchange variation is allowed for foreign invest only.

ASSUMPTIONS

- Availability of the plant should be 88% whereas the Company has proposed 86% Annual availability.
- Tolerance of $\pm 3\%$ in dispatch is not allowed under the methodology provided in 2006 PPA. The payment is based on performance. No minus tolerance is admissible. However upward tolerance of 1.2% is under consideration.
- Fuel cost component of the EPP will be paid by Power Purchaser for the energy delivered to NTDC system before COD not the fuel cost.
- Starts up charges are not admissible for technology.
- Freight may be considered part of fuel cost.

COMMENTS FROM SHEHRI

42. 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

43. 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>)
- Stern Review Report "Economics of Climate Change" (downloadable from
www.hm-treasury.gov.uk/independent_reviews/stern_review_economics_climate_change/stern_review_report.cfm)

44. 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.

45. 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). Non EPC Construction
 - vii). Admin & Utilities
- 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
 - i). Fuel Cost
 - ii). Variable O&M Cost
- H. Timeline/Completion of Project

46. Issue wise discussion and recommendations are given in following paragraphs:

A. Plant Capacity

47. 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 GEL Power. The proposed plant concept is based on a 200 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 189 MW subject to the following;

- (i) *GEL Power's indicated net output of 189 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.*

48. Having considered all the relevant information, the Authority has decided to adopt the petitioner's indicated gross of 200 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-rating will be restricted to 0.977 MW only through control of the following;

- By restricting the air-cooling water temperature to be within $\leq 45^{\circ}\text{C}$;
- By keeping the value of sum of exhaust gas back pressure + air inlet pressure drop to be within $\leq 500 \text{ mm H}_2\text{O}$;
- 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.

49. The Authority has further decided that the petitioner 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;

$$CC_{(Adj)} = \text{Adjusted relevant Capacity Charge components of tariff}$$

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 Temperature	30 °C
Altitude	200 m
Relative humidity	60%
Water Temperature to Charge air cooler	45 °C

B. Project Cost

i). EPC Cost

50. According to the petitioner its EPC price has been assumed as Euros 133.475 million (667.38 Euros per kW). The petitioner was asked through information direction to provide item wise currency wise breakup of EPC cost.

51. In response to information direction the petitioner vide letter dated January 31, 2007 stated that the EPC price quoted is turnkey lump sum cost and did not provide itemized breakup of cost. The petitioner in the petition has however stated that its 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).

52. In a similar case under consideration of the Authority, the petitioner has stated that the turnkey EPC cost includes engineering, supply delivery to site, 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. In the absence of detailed EPC cost breakup the Authority is constrained to rely upon the details of work to be carried out as mentioned by the petitioner in other similar case.

53. The Authority has considered the following justification given by the petitioner in support of 4% higher EPC cost as compared to that of Attock's EPC cost;

- Attock's EPC cost does not include the cost of fuel storage tanks, fuel handling facility and other infrastructure costs as their proposed site is within or adjacent to Attock Refinery Limited's existing facilities and storage facility for indigenously produced fuel oil is available within the Refinery premises;
- The continuous increase in raw material prices has led to an increase in engine auxiliary costs;

- There is an immense increase in demand for engines and other major equipment such as generators and transformers, not only in Pakistan but also globally in both the marine and power sectors;

54. According to the petitioner Attock's tariff petition was submitted in June 2006 and related to a project period of 15 months, while its tariff petition was submitted in January 2007 and relates to a project period of about 20 months. The petitioner requested that the Authority should keep in mind this variance in timelines. According to the petitioner with each passing day, the lead times from the manufacturers are increasing as demand and supply position has shifted dramatically in favour of manufacturers, thereby resulting in significant cost increases.

55. In order to assess the reasonability of the EPC cost the Authority took Attock's EPC cost as reference. The Authority observed that 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 and land etc. 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 GEL plant size 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.

56. Based upon the above analysis the Authority has decided to accept the petitioner's EPC cost of Euro 133.475 million. In a similar case the Authority accepted the break up of 88% offshore and 12% onshore EPC cost. The same breakup shall be applicable in the instant case. Using 1.28 Euro/dollar parity the offshore EPC price works out as 150.346 million US\$ and the total EPC cost of the project is equivalent to 169.5666 million US\$.

ii). Emergency Spare Parts

57. The petitioner in its petition has demanded emergency spare parts equivalent to US\$ 2.403 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 parts is already covered under O&M.

58. 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\$ 2.255 (1.5% of offshore EPC) million as cost of emergency spare parts.

iii). Mobilization Cost

59. The petitioner's request for 2.86 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 has provided the following details;

	USD
Operators O&M Mobilization	965,000
Staff Salaries during construction	349,167
Tendering & EPC Negotiation	708,333
Construction Design Review	<u>837,500</u>
Total Mobilization Cost	2,860,000

60. The petitioner has not provided any details regarding the mobilization payments to WARTSILA; therefore Authority had to rely on the information available in the similar cases.

61. The Authority while determining the mobilization cost has also considered costs indicated under Admin and Utilities by the petitioner. Having considered all the relevant information available in Authority's opinion US\$1.816 million is reasonable cost on account of Mobilization, Admin and Utilities and allows the same.

iv). Development Cost

62. The petitioner has requested development cost of US\$ 2.940 million as per following;

	USD
Bankable Feasibility study	360,000
Quarterly Lender's Reprot	564,167
Bank Guarantee to PPIB - Cost	10,000
LC required as per PPA	54,000
PPIB legal fee	100,000
NEPRA & WAPDA fees	100,000
Bank's Lawyer's fee	100,000
Bank's Insurance advisor fee	60,000
Bank's Technical advisor fee	200,000
Bank's agency fee	50,000
Bank's project monitoring fee	40,000
Banks's security trustee fee	28,333
Lawyers & bankers out of pocket expenses	50,000
Legal consultants fee	200,000
Company incorporation expenses (IPO, Listing etc.)	300,000
Office equipment (Furniture, IT equipment, etc.)	300,000
Company vehicles exps. & travelling, boarding etc.	250,000
Misc. overheads during development, sponsors exps.	<u>173,500</u>
Total Development Cost	2,940,000

63. 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.

64. The careful analysis of the above individual cost items revealed that the provision of costs for bank's insurance & technical advisory, legal, agency, monitoring and security trustee fee to the tune of US\$ 4,78,333 are part of financing fee & charges, therefore can not allowed twice. In Authority's opinion cost on account of office equipments and company vehicles, traveling & boarding are also on the higher side therefore needs to be rationalized. The Authority accordingly has assessed the development cost of US\$ 1.6975 million and the same is allowed.

v). Land Acquisition and Improvements

65. The petitioner has requested US\$ 2.5 million for purchase of 25 acres of land, fees and infrastructure. The petitioner has assumed land price of Rs.4 million per acre. In Authority's opinion the cost of land assumed by the petitioner is extraordinary high. According to the available information the prevalent market price of land in the vicinity of the proposed project site is in range of Rs. 2 – 3 million per acre. The petitioner was unable to substantiate its cost of land therefore the Authority had to rely on the available information. Accordingly the Authority has assessed cost of land including brokers fee, registration cost, leveling and embankment equal to US\$ 2.028 million.

Non EPC Construction

66. The petitioner has requested US\$2.6 million as per the following details;

Admin Office Building with Electrical Installatios, etc.	800,000
Residential Colony with Electrical Installations, etc.	1,500,000
Other constructions, Permits, Connections etc.	<u>300,000</u>
Total	2,600,000

67. The Authority has evaluated above individual cost components of non EPC cost and has observed that admin office building is in the scope of EPC contractor therefore cannot be allowed as separate items again. As regards the cost of residential colony, the Authority considers that the advantage of the proposed project location is that there are big cities and towns in the vicinity of the project and the proposed residential colony will not be required. However in order to provide residential facility for skilled worker the petitioner would have to incur some cost. According to the information regarding detail scope of work of EPC contractor it is observed that the petitioner has to provide stand by generator for which the petitioner has not provided cost of rent and diesel etc. The Authority considers that an amount of US\$ 0.75 million would be reasonable to cater for aforementioned costs and decided to allow the same.

Admin & Utilities

68. The petitioner has requested for Admin and Utilities US\$ 1.65 million which includes US\$ 1.275 million as cost of Independent Engineer (Owner's Engineer) and US\$ 0.0375 million as Utilities expenses. The petitioner further explained that the appointment of Independent Engineer's

was lenders requirement. In Authority's opinion the provision of such a huge cost for Independent Engineer provided by the petitioner is not fully justified. However, the Authority agrees that in order to oversee the EPC contractor's work services of Independent Engineer would be required. The Authority therefore decided to allow some cost on this account. The Authority also considers that the utilities expenses estimated by the petitioner are on the higher side. On the basis of above mentioned analysis the Authority has assessed US\$ 0.70 million to cater for the expenses of the Independent Engineer and Admin & Utilities.

C. Project Financing

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

Equity	US\$ 50.960
Total debt	US\$ 152.881
Total Capital Cost (excl IDC)	US\$ 203.841
Debt Equity Ratio	75:25

70. As per the information provided by the petitioner the total project cost is inclusive of IDC of US\$ 14.644 million.

71. Based upon the analysis of different project cost items the project cost of the petitioner has been revised to US\$ 203.95 million and the corresponding Debt: Equity breakup of US\$ 152.962 million debt and US\$ 50.987 million equity.

D. Financing Fees

72. The petitioner has requested financing fee and charges to the tune of US\$3.724 million. For the purpose of assessment of financing fees and charges the Authority in earlier decisions in different cases has established a level of 2.5% of loan amount excluding IDC as financing fees and charges. Assuming the same level in the instant case the Authority has assessed US\$ 3.64 for revised amount of debt US\$ 137.63 million (excluding IDC and Financing Fees & Charges) subject to the adjustment at COD as per the actual with the maximum ceiling of 3%.

E. Interest During Construction

73. The amount of interest during construction of US\$ 14.644 million requested by the petitioner is based upon its estimated project cost of US\$203.4854 million and estimated debt disbursement. The petitioner has assumed a construction period of 18 months. Based upon the expected loan disbursement schedule as provided by the petitioner the Authority has assessed US\$11.69 million subject to the adjustment at COD as per actual disbursements.

F. Capacity Charge

i) Fixed O&M

74. The petitioner requested for fixed O&M of US\$ 3.863 million per annum or Rs. 0.1400 per kW per hour assuming the rupee/dollar parity of 60. In Authority's opinion the petitioner's

proposed O&M cost is on the higher side particularly costs provided for staff salaries and wages and office overhead environment costs. The Authority in other similar case has allowed the fixed O&M cost of US\$ 3.788 million. The Authority has therefore decided to allow US\$3.788 million as fixed O&M costs. For conversion from dollar to rupees, the parity rate of 61 rupees to a dollar is adopted in order to make the tariff more realistic. Accordingly the adjusted fixed O&M cost at this rupee/dollar parity has been assessed as Rs. 0.1346 per kW per hour.

ii) Insurance

75. The petitioner has requested insurance @ 1.35% of EPC cost. The request being inline with the cases already determined by the Authority therefore decided to accept the same subject to the adjustment as per actual at COD with the maximum cap of 1.35%.

iii) Cost of Working Capital

76. The petitioner requested financing cost of working capital to the tune of US\$ 3.073 million on the basis of following working capital requirement;

	USD
Fuel Cost Receivables at 100% load for 30 days	9,894,000
RFO Advance payment 15 days 60% PF (incl. S. tax)	3,413,000
Inventory 30 days	9,894,000
Sales tax on fuel cost receivables	<u>1,484,100</u>
Total Working Capital Requirement	24,685,100

Cost of the loan @ 12.45% (KIBOR 10.45% + 200 points spread)

(This total corresponds to the tariff components of Rupees 0.1114 kW/hr. or approximately US\$ 3.073 million)

77. 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 inventory is inline with the PPA requirement. Based upon the reference fuel price of Rs. 22,140 + Freight Rs. 2,350 per M/Ton the Authority has assessed fuel stock requirement at 100% load factor as US\$11.021 million.

78. The Authority has considered the request of the petitioner for allowing advance for fuel (15 days). The Authority has been informed that the 30 days requirement of fuel inventory is worked out by taking closing stock of fuel inventory plus orders placed to the supplier for fuel delivery. The Authority considers that the petitioner would not be required to raise working capital for advance payments to the fuel supplier. The Authority has therefore decided to disallow the proposed provision of 15 days advance for fuel.

79. The petitioner has requested receivables – Variable 100% for 30 days (100% load factor). The Authority has been informed that under the PPA terms 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. Since the petitioner's request is legitimate therefore the Authority has decided to accept the same.

80. The petitioner's request regarding provision of 15% sales tax on inventory and receivables is justified therefore the Authority has decided to allow the same in the working capital requirement. Based upon the assessed requirement of US\$20.278 million at Rupee/dollar parity of 61, the financing cost @ 12.45% (KIBOR 10.45% + 200 points spread) has been assessed as US\$ 2.525 million or Rs. 0.0900 per kW per hour. This cost shall be adjusted according to the actual prices prevalent at the time of first fill at COD according to the following formula;

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

Where;

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

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

iv) Return on Equity (ROE)

81. The petitioner has requested Rs. 0.2857 on the basis of equity of US\$50.96 to achieve net 15% IRR on its equity investment. The Authority has assessed equity of US\$50.871 million on the basis of revised project cost and reference rupee/dollar parity. Based upon the revised equity the ROE of Rs.0.2802 per kW per hour has been determined. The petitioner's request for allowing inflation/indexation to the ROE cannot be accepted because GoP policy does not allow any indexation on the local equity. However, in case of foreign equity only rupee/dollar exchange variation is allowed and no other indexation on account of inflation is permissible.

v) Return on Equity During Construction (ROEDC)

82. The petitioner has requested ROEDC of Rs. 0.0666 per kW per hour. The Authority has assessed ROEDC as Rs. 0.0491 per kW per hour which will be adjusted on the basis of actual equity injection during 18 months construction period.

vi) Debt Servicing

83. The petitioner requested debt service of Rs. 1.0157 per kW per hour on the basis of debt of US\$ 152.881. The Authority has assessed overall debt amount of US\$152.614 million and tariff component of Rs. 0.9963 per kW per hour. The Authority has assumed interest in the instant case as 13.45% (10.45% KIBOR +300 basis points). The petitioner will be allowed adjustment on account of variation in KIBOR on quarterly basis.

G. Energy Charge

i) Fuel Cost

84. The petitioner has requested fuel cost of Rs. 4.3624 per kWh (excluding freight) on the basis of following reference numbers;

(a)	RFO Price:	Rs. 22,140 per ton excluding transport
(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:	213.60 MW (net at site conditions)
(e)	Heat Rate:	7,584 BTU/kWh (LHV)
(f)	LHV of RFO	38,481 BTU/kg subject to adjustment at the time of finalization of Fuel Supply Agreement (FSA)
(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%.

85. 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.

86. The Authority in the case of Attock has already prescribed a 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
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

87. 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 GEL.

ii) Variable O&M Cost

88. The petitioner has requested for variable O&M of Rs. 0.5040 per kWh. In Authority's opinion the petitioner's demand 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 31st, 2007 stated that its variable O&M of Rs. 0.5040 per kWh translates into US\$8.344 million per annum. According to the petitioner this included lubricants, repair and maintenance, other O&M consumables/water treatment, major overhauling spares and import duty on spare parts.

89. 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 on the lower side. KEL is charging Rs. 0.32164/kWh. Japan Power is charging Rs. 0.27137/kWh and SEPCOL is charging

Rs. 0.4156/kWh. CPPA has also submitted written comments vide letter no. COO/CPA/CE-II/335 dated 8.2.2007.

90. The Authority observed that the variable O&M has not been supported with documentary evidence therefore cannot be accepted as such. Alternatively for assessment of reasonable level of variable O&M cost the Authority considers that the Attock's case can be considered as reference. In the case of Attock the Authority has 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.0.3377 at a parity of 72 Rupee/Euro and the same is being allowed. In a similar case the Authority has allowed cost of lubricants as €1.2676 per MW which translates into Rs. 0.0928 per kWh with a conversion of Euro/Dollar parity of 1.20 and Rupee/Dollar parity of 61. The same is being allowed in the instant case. According to the available information, WARTSILLA guarantees 90% engine availability. In case the plant availability is less than 90% then this O&M cost shall accordingly be adjusted.

91. The petitioner's request for adjustment on account of variation in Rupee/Euro parity indexed with Euro inflation is not justified. The review of the information available with the Authority revealed that the parts for major overhauling would be required after 12,000 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 proposed timeline/completion of project by the petitioner indicated at para 39 and decided to allow the same as such.

ORDER

95. Pursuant to Rule 6 of the NEPRA Licensing (Generation) Rules 2000, Gujranwala Energy Limited (GEL) 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 GEL 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	0.0813	0.0813	US\$ /PKR
Debt Service – Local	0.9963	-	KIBOR
Return on Equity	0.2802	0.2802	NIL
ROE during Construction	0.0491	0.0491	NIL
Total Capacity Charge	1.6316	0.6353	
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. Adjustment in EPC Cost (One Time)

The Authority has assessed EPC cost as US\$ 169.566 million out of which US\$ 150.346 million would be in Euro and US\$ 19.220 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;

$$EPC_{(Adj.)} = US\$ 150.346 \text{ Million} / 1.28 * E_{(PR)} + US\$ 19.220 \text{ Million}$$

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

ii) Return on Equity Adjustment Mechanism for EPC Cost Variation

$$ROE_{(Rev)} = 0.2802 / (25\% \times \text{US\$}203.95 \text{ million}) \times (25\% \times PC_{(Rev)}) \times P_{(Rev)} / 61$$

Where:

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

$$ROEDC_{(Rev)} = 0.0491 / (\text{US\$}8.93 \text{ million}) \times (EDC_{(Rev)}) \times P_{(Rev)} / 61$$

Where:

$ROEDC_c$ = 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: 8.93 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

$$DS_{(Rev)} = DS_{(Ref)} / \text{US\$} 152.962 \text{ million} \times (75\% \times PC_{(Rev)}) \times P_{(Rev)} / 61$$

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.

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

$DS_{(Ref)}$ = Reference 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 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.

Reference Site Conditions:

Ambient Temperature	30 °C
Altitude	200 m
Relative humidity	60%
Water Temperature to Charge air cooler	45 °C

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 GEL according to the following formula;

Insurance (Rev) = $AIC / (1.35 \% \times \text{US\$}169.566 \text{ Million}) * AP$

Where;

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

IV. Adjustment Based on Actual Interest During Construction

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

GEL shall submit the relevant documents to NEPA 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 & ROEDC during construction shall be adjusted on account of actual variation in customs duties & taxes with reference to the estimated figures of US \$ 7.517 million.

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

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

Where:

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

$E_{(\text{Red})}$ = Equity Redeemed

$\text{ROEDC}_{(\text{Ref})}$ = Reference Return on Equity During Construction

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

VIII. Indexations:

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

a) Indexation applicable to O&M

The Fixed O&M local component of Capacity Charge will be adjusted on account of Inflation (WPI) and Fixed O&M foreign component on account of variation in US CPI and

dollar/Rupee exchange rate. Quarterly adjustment for local inflation, foreign inflation and exchange rate variation will be made on 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

$$F O\&M_{(LREV)} = \text{Rs. } 0.0673 / \text{kW/Hour} * WPI_{(REV)} / 118.96$$

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

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:

$$V O\&M_{(LREV)} = \text{Rs. } 0.0928 / \text{kW/Hour} * WPI_{(REV)} / 118.96$$

$$V O\&M_{(FREV)} = \text{Rs. } 0.3434 / \text{kW/Hour} * US CPI_{(REV)} / 202.41 * ER_{(REV)} / 61$$

Where:

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

$V O\&M_{(REV)}$	=	the revised applicable Variable O&M Foreign Component of the Capacity Charge indexed with US CPI and Exchange Rate variations
$WPI_{(REV)}$	=	the revised wholesale Price Index (manufactures)
$WPI_{(REF)}$	=	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 Variable O&M indicated above shall be replaced with the revised number at COD after incorporating the required adjustment based upon the IDC Test.

iii) Adjustment for KIBOR variation

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

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

Where:

$\Delta I_{(L)}$ = the variation in interest charges applicable on local loan corresponding to variation in quarterly KIBOR. ΔI 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 ΔI 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:

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

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 GEL.

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.

Adjustment on account of local inflation, foreign inflation, foreign exchange rate variation, KIBOR variation and fuel price variation will be approved and announced by the Authority for immediate application within seven working days after receipt of GEL'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 GEL and CPPA.
