National Electric Power Regulatory Authority

Islamic Republic of Pakistan

Registrar

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No.NEPRA/R/TRF-152/REPGL-2010/2556-2558
September 17, 2010

Subject: **Determination of the Authority in the Matter of Petition filed by Radian Energy Power Generation (Pvt.) Ltd. (REPGL) [Case # NEPRA/ TRF-152/REPGL-2010]**
Intimation of Determination of Tariff pursuant to Section 31(4) of the Regulation of Generation, Transmission and Distribution of Electric Power Act (XL of 1997)

Dear Sir,

Please find enclosed the subject Determination of the Authority along with Annexure-I, II (29 pages) in Case No. NEPRA/TRF-152/REPGL-2010.

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

3. Please note that only Order of the Authority at para 17 of the Determination relating to the reference tariff, adjustments & indexation along with Annexure-I & II needs to be notified in the official gazette.

Enclosure: As above

Registrar

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

CC:

1. Secretary, Cabinet Division, Cabinet Secretariat, Islamabad.
2. Secretary, Ministry of Finance, Islamabad.

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(NEPRA)
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No. NEPRA/TRF-152/REPGL-2010

DETERMINATION OF GENERATION TARIFF

REGARDING

RADIAN ENERGY POWER GENERATION (PVT.) LTD. (REPGL)

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
(NEPRA)

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Case No. NEPRA/TRF-152/REPGL-2010
September ______, 2010

Petitioner

Radian Energy Power Generation (Pvt) Ltd, House # 405,Street # 12, F10/2, Islamabad

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Authority

Zafar Ali Khan
Member

9/9/10

My dissenting note attached

Maqbool Ahmad Khawaja
Member

14/9

Shaukat Ali Kundi
Member

16.09.2010

Ghiasuddin Ahmed
Vice Chairman/Member

16/9.

Khalid Saeed
Chairman

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1. Introduction

1.1 Radian Energy Power Generation Company (Private) Limited (hereinafter "the Petitioner") a private limited company incorporated and existing under the Companies Ordinance, 1984 filed a Tariff Petition before National Electric Power Regulatory Authority (the "**NEPRA**" or the "**Authority**") pursuant to Rule 3 of the National Electric Power Regulatory Authority Tariff Standards and Procedure Rules, 1998 (hereinafter the Tariff Rules) on 18th March 2010 for determination of generation tariff for its Power Plant of 162.810 (Gross) and 158.031 MW (Net at mean site conditions) to be located at Shahkot-Chak Jhumra Road, Faisalabad.

1.2 The background of the Petitioner is that it is primarily owned by a large Russian company, Energoprogress, which is a limited liability company established in 1996 in accordance with the laws of the Russian Federation with the object to carry out, *inter alia*, construction of industrial buildings and is involved in the provision of basic and auxiliary process equipment for thermal and nuclear power projects.

2. Summary of the Petition

2.1 Pursuant to Rule 3(3) of the Tariff Rules, the Authority admitted the Petition on 26th March 2010. Consequent to the admission and in accordance with sub-rule (5) of rule 3 of the Tariff Rules, the Authority gave directions for service of notices to the respondents and other parties affected or interested which in the opinion of the Authority are likely to be affected or interested for filing replies or communications in opposition or in support of the Petition and for the purpose of expeditious and efficient conduct of hearing. The Notice of Admission/Hearing was also published in national newspapers on 4th April 2010. In response to the Notice of Admission published in the daily newspapers, no intervention request was filed. However comments from Central Power Purchasing Agency (CPPA) were received which were forwarded for the Petitioner's response. Although no intervention request was filed however in order to provide an opportunity of being heard, the Authority has decided to hold a public hearing on 4th April 2010.

2.2 The hearing was held on 4th April 2010 wherein the representatives of Ministries, Power Purchaser and other stakeholders participated. During the hearing the Authority noted that the project could not be considered under fast track regime because the present date of December 2010 for achieving COD for the fast track projects was not extended. In this regard the clarification was sought from PPIB/GOP. PPIB informed that PPIB Board has approved in principle the REPGL under GOP's Fast Track program. PPIB further informed that the summary has been moved through Ministry of Water & Power to ECC for extension of COD date for the fast track projects. In view thereof the Authority decided to put on hold the case of REPGL for further processing till the ECC

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decision. PPIB vide letter No. 1(102)/PPIB-1055/10/PRJ dated 9th August 2010 has communicated the ECC's decision regarding extension of the COD of REPGL till December 2012. Accordingly the REPGL case is being finalized.

2.3 Initially the Petitioner proposed a project cost of US$ 212.03 million which was subsequently revised to US$ 206.563 million. Based on the revised project cost, the capital structure of the Project is as follows:

	US$ in Million
Equity:	51.641
Total debt:	154.922
Total Project Cost:	206.563
Debt Equity Ratio:	75:25

2.4 Based on the above project cost, RFO price of PKR 49,920 per metric ton and transportation cost of Rs. 3,000 per M ton and output of 158.031 MW (net at site conditions), the Petitioner proposed the following tariff in its revised submissions:

	CPP US PKR/kWh at 60%	**Energy Charge PKR/kWh**	**Total tariff PKR/kWh**	**Total tariff USc/kWh**
Levelized Tariff	3.1150	11.0790	14.1941	16.6990
Average Tariff	2.5316	11.0790	13.6107	16.0126

2.5 The Petitioner submitted that the proposed tariff is based on the following assumptions and any change in relation thereto will require an appropriate adjustment in the proposed tariff:

i) Annual plant availability of 88% in terms of the GOP's policy. Scheduled outage allowance of 30 days per annum except in any year in which a major overhaul is required, the scheduled outage period shall be 60 days per unit.
ii) NTDC/Power Purchaser is assumed to be responsible for financing and constructing the interconnection to the grid.
iii) Any modifications or additions required by the Power Purchaser that are not considered in the Project Cost will be treated as pass-through or will result in necessary adjustment in the tariff.
iv) All fuel during plant tests after synchronization is assumed to be paid for by the Power Purchaser.
v) The levelized tariff is calculated on the basis of a notional 60% plant load factor.
vi) Tolerance of +/– 3% in dispatch is assumed during normal operation.
vii) Minimum loading of the Complex will be according to the manufacturer's technical limits to allow for combined cycle operations.
viii) Tax payable on RFO purchases have not been assumed in the tariff. The RFO price and the transportation cost shall be adjusted as per actual.

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ix) A constant ROE is assumed, which results in an IRR of 15% over 25 years.

x) No hedging cost has been assumed for exchange rate fluctuations during construction. This cost will be made part of the Project Costs as required by the lenders if required.

xi) Working capital will be financed by a separate working capital loan and is not included in the Project cost.

xii) 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.

xiii) Project contingency/debt service/maintenance reserves are not included in tariff calculations. If required by lenders, these will be adjusted accordingly in the tariff.

xiv) No corporate income tax including the minimum tax on turnover is assumed. Tax on the Company on account of sales proceeds from NTDC, general sales tax and all other taxes will result in necessary adjustment in the tariff.

xv) No withholding tax on supply of plant and equipment assumed. Only 6% withholding tax on onshore construction works assumed. Any additional tax that may be withheld by the Company in compliance of the orders of the Pakistan tax authorities in relation to its payments to the EPC contractor(s) will be added to the Project costs for necessary adjustment in the tariff.

xvi) Import duties, taxes and cess on the import of plant and equipment have been assumed for reference purposes.

xvii) 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 will be considered as pass-through under the PPA.

xviii) No tax payable on fees and other payments (including principal repayments and interest/ mark up thereon) to be made to the financiers.

xix) 100% foreign debt in US$ is assumed. If local debt and or Euro debt is procured, necessary adjustment will be sought in the tariff.

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

xxi) The proposed tariff table will be updated at Financial Close and then at COD in order to reflect the tariff according to the prevailing LIBOR and exchange rates (PKR/US$ and PKR/Euro).

xxii) The ROE, ROEDC, EPC Cost, Insurance, Custom duties and taxes, IDC and the Debt service component shall be adjusted at the COD to account for the variation in the exchange rates of Euro and US Dollar as used for the purpose of tariff calculations.

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xxiii) Cost of debt service reserve account – SBLC if required by the lenders has not been assumed in the tariff – the same shall be made part of the project costs if required by the lenders.

xxiv) The fuel cost that may be incurred due to extra start time required for the running of steam turbine has not been included – the increased fuel cost shall be charged separately at each start time as per increase of fuel consumption at specified heat rate.

2.6 The Petitioner requested the Authority to approve the Company's generation tariff together with the pertinent indexations to remain effective for a period of 25 years from the Commercial Operation Date (COD).

2.7 Based on the petition, comments from CPPA and facts and figures put before the Authority the following issues were framed by the Authority:

i) Plant Manufacturer / EPC Contractor
ii) Net Capacity
iii) EPC Cost
iv) Non-Wartsila EPC Cost
v) Non-EPC Cost
vi) Financing Fees
vii) Interest During Construction
viii) Fuel Cost
ix) Operations & Maintenance Cost Variable and Fixed
x) Insurance Cost
xi) Cost of Working Capital
xii) Return on Equity
xiii) Return on Equity During Construction
xiv) Debt Servicing

3. Plant Manufacturer/ EPC Contractor

3.1 According to the Petitioner, it carried out the requisite analysis of the best suited technology and based thereon selected the engine based RFO-fired technology. The rationale for the selection of this technology is summarized herein below:

- Well proven technology;
- Higher efficiency as compared to conventional gas turbines using RFO; and
- Convenient maintenance without interruption of the overall operations.

3.2 The Petitioner submitted that the major manufacturers/ EPC contractors for engine-based proven technology are Wärtsilä, Finland ("Wärtsilä") and MAN, Germany. Based on the quotes received from both manufacturers/ contractors and the inputs received from advisors and stakeholders, the Petitioner selected the plant and equipment which will be manufactured and supplied by Wärtsilä.

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3.3 The Petitioner further submitted that Wärtsilä is a global leader in complete lifecycle power solutions for the marine and energy markets. By emphasizing technological innovation and total efficiency, Wärtsilä maximizes the environmental and economic performance of the vessels and power plants of its customers. In 2009, Wärtsilä's net sales totaled EURO 5.3 billion with 18,000 employees. The company has operations in 160 locations in 70 countries around the world. Wärtsilä is listed on the NASDAQ, OMX Helsinki, Finland. Wärtsilä is the EPC Contractor and equipment supplier for a number of power projects in Pakistan.

3.4 CPPA submitted that the Petitioner has not based its EPC cost on firm (non-reopenable) competitive price duly signed by it with EPC contractor Wärtsilä Finland.

3.5 The Petitioner submitted that it received a firm EPC price in terms of the applicable GOP policy directive. In terms of the offer received, Wärtsilä has agreed to deliver the plant as a turnkey engineering, procurement and construction contract against a fixed lump sum price. The price is valid until 30th September 2010.

3.6 The Petitioner further submitted that the proposed Project is based on the combined cycle technology with a gross capacity of 162.831 MW at design ambient conditions of 30 °C ambient temperature, 60% relative humidity, 200 meter altitude above sea level and 24 °C wet bulb temperature. The plant configuration consists of 9 reciprocating RFO-fired 18V46CC 4-stroke diesel engine generator sets together with 9 heat recovery steam generators (HRSG) to provide steam for one 10.425 MW steam turbine. The selected reciprocating engines are designed to use single fuel, i.e. RFO.

4. Net Capacity

4.1 The Petitioner proposed a gross capacity of 162.831 MW, auxiliary consumption of 4.8 MW and a net capacity of 158.031 MW. The Petitioner was asked to provide the details of auxiliary consumption. The Petitioner provided the following details:

AUXILIARY CONSUMPTION	
EPC contractor's scope	3.65 MW
Reverse Osmosis Plant (300m3/hour) in company's scope	0.60 MW
Colony consumption including periphery security lighting	0.40 MW
Raw Water Supply (including 6 tube wells with associated equipment)	0.15 MW
Total	**4.80 MW**

4.2 The Authority did not allow load of colony consumption in the similar cases and decided not to allow 0.4 MW of colony load as auxiliary consumption. Therefore, the net output of the plant is determined as 158.431 which will be re-established at the time of COD by

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Initial Dependable Capacity (IDC) Test and adjustments in relevant tariff components will be made if the IDC Test establishes net output higher than 158.431.

5. Engineering, Procurement and Construction Contract (EPC)

5.1 The Petitioner requested €117 million or US$ 159.12 million as EPC cost (offshore and onshore), which was based on Euro/US$ exchange rate of 1/1.36. EPC Cost comprised of the following:

- Equipment Supply Contract (ESC) € 104 million
- Construction Contract (CC) € 13 million

5.2 Equipment Supply Contract (ESC)

5.2.1 The Petitioner submitted that its Equipment Supply Contract (ESC) price is € 104 million or US$ 141.44 million at the reference exchange rate of 1.36 US$ per Euro. The ESC price covers the cost of supply of all power plant equipment.

5.2.2 CPPA submitted that the cost of ESC is about 5.87% higher than already granted to similar technology power project.

5.2.3 The Authority, while assessing the reasonability of the of ESC cost, has analyzed the Producers Price Indices of Steel Mills Products, Turbines and Turbine Generator Set and Materials and Components of Construction. The Authority has also considered the increased country risk due to deteriorating security situation. In the opinion of the Authority, the petitioner's proposed ESC cost of €104 million seems reasonable. The Authority has therefore decided to allow €104 million or US$ 126.685 million at current €/US$ parity of 1.22 on account of ESC cost.

5.3 Construction Contract (CC)

5.3.1 According to the Petitioner its Construction Contract (CC) price is € 13 million or US$ 17.68 million (converted at the reference exchange rate of 1.36 US$ per Euro). The CC covers all construction services in Pakistan.

5.3.2 In order to assess the reasonability of the proposed cost of construction contract of € 13 million, the cost was compared with other similar projects as allowed by the Authority. The comparison indicates that the cost requested by the Petitioner is comparable with other projects. The Authority has therefore decided to allow US$ 15.83 million based on the current US$/€ parity of 1.22 on account of Construction Contract.

5.3.3 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 at the time of COD.

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5.4 Non- Wärtsilä EPC Cost

5.4.1 The Petitioner initially requested US$ 5.185 million on account of Non- Wärtsilä EPC cost which was subsequently revised to US$ 4.695 million. The Petitioner submitted that the non- Wärtsilä EPC cost included the cost of items payable to other contractors which were not included in Wärtsilä's scope of work. According to the Petitioner such costs included raw water supply system, piling/ excavation/ back-filing earth around, foundation/ under floor in layer gravel/leveling watering compacting, reverse osmosis water treatment system and softening plant, access road, electricity connection including 11-kV line switchgear transformer, telecommunication system including telephone, wireless, etc and standby generator and associated circuitry, connections, etc.

5.4.2 CPPA submitted that the amount of US$ 5.185 million requested by the Petitioner is on the higher side as compared to LPTL i.e. US$ 3.244 million. According to CPPA as per documents attached with the Petition, the cost of sludge disposal system amounting US$ 0.45 million is already included in EPC cost. CPPA further submitted that there should be no duplication between scope of work of EPC and Non-EPC costs.

5.4.3 In response to the Power Purchaser's Comments, the petitioner requested to remove the cost of following two items from the Non-Wärtsilä EPC Cost since Wärtsilä has now agreed to provide them under EPC Contract:

Switchyard fencing/Surface Covering	USD	40,000
Sludge Disposal System	USD	450,000

5.4.4 The Petitioner was asked to substantiate its claim with proper documentary evidence and backup calculations. The Petitioner failed to provide relevant evidence in support of most of the items such as raw water supply system, piling/ excavation/ back-filing earth around, foundation/ under floor in layer gravel/leveling watering compacting, access road, electricity connection including 11-kV line switchgear transformer, telecommunication system including telephone, wireless, etc and standby generator and associated circuitry, connections, etc. In the absence of documentary evidence, the Authority analyzed the information available in other similar projects, and based on that verifiable informationdecided to allow US$ 2.246 million as Non- Wärtsilä EPC cost.

6. Non-EPC Costs

6.1 Staff Housing Colony Cost

6.1.1 The Petitioner submitted that in order to ensure plant reliability for the off-taker, it plans to develop a housing colony through a local contractor under the supervision of its own staff which will require US$ 2.31 million. In this regard the Petitioner requested Rs. 145.4 million based on 56,800 Sft @ of Rs. 2,560/Sft. The Petitioner also requested Rs. 50.9 million for external services – roads, landscaping, sewerage, water, electric works. While justifying the staff colony the Petitioner submitted that the site is located 5-km away from

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the Liberty Tech Power Project site therefore it is essential to have a housing colony at Site in order to maintain the key personnel (including expatriates) on the Site.

6.1.2 CPPA stated that the amount requested by the Petitioner on staff housing colony costs is justified and may be allowed. However, details of item-wise cost may be obtained from the Petitioner to avoid any duplication of costs.

6.1.3 The Petitioner's request has been evaluated based on the benchmarks established in other comparable projects. The Authority observed that the construction rate of Rs. 2,560/Sft is on the higher side which needed to be rationalized. Accordingly the Authority has decided to allow Rs. 2,000/Sft for category A and Rs. 1,700/Sft for category B construction. The residences of top and middle management are considered as category A and the remaining construction as category B. The Authority has also decided to allow 25% of the construction cost as external services. The Authority in the instant case has assessed and allowed US$ 1.579 million on account of staff housing colony and external services. The residential colony will be subject to verification at the time of COD with respect to category, covered area and cost. The maximum limit of cost allowed for residential colony is US$ 1.579 million and revision of cost will not be allowed if the cost is established higher than the maximum limit.

6.2 Land acquisition and land development cost, etc.

6.2.1 The Petitioner requested to allow US$ 2.25 million on account of Land acquisition and land development costs, etc., which covers, *inter alia*, the purchase of land, including transfer fees, Geo-tech and hydrological studies, environment impact assessment studies, the cost of land filling of the site and the construction of the boundary wall, guard rooms, security towers, security system, gates and lights. The Petitioner submitted a sale purchase agreement of 25 acres of land @ Rs. 3.5 million/acre.

6.2.2 CPPA in its comments objected to the cost of land of Rs. 3.5 million/acre as indicated by the Petitioner. According to CPPA this was on the higher side, which in its opinion was between Rs. 2.5-2.8 million/acre in the near vicinity.

6.2.3 Based on the comments offered by the Power Purchaser, the Authority in order to assess the reasonability decided to compare the cost requested by the Petitioner with the cost allowed to other similar project located in the same vicinity. The Authority observed that the cost requested by the Petitioner is on the higher side which needs to be rationalized. Based on the information available in other similar projects, Power Purchaser's comments, and taking into account the inflationary impact, the Authority considers that Rs. 2.5 million/acre is sufficient for cost of land. Accordingly, US$ 1.411 million has been assessed and the same has been allowed under this head including transfer fee, Geo-tech and hydrological studies, environment impact assessment studies, the cost of land filling of the site and the construction of the boundary wall, guard rooms, security towers, security system, gates and lights.

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6.3 Taxes, Duties and Cess

6.3.1 The Petitioner submitted that the project cost included US$ 9.55 million as customs duties and import taxes @ 6% of the ESC price and withholding tax @ 6% of the construction contract. The Petitioner further submitted that any duties, taxes or cess in excess of the assumed numbers would be added in the Project cost for necessary adjustment in the tariff or treated as "pass-through" items under the PPA.

6.3.2 CPPA submitted that the cost requested by the Petitioner on taxes, duties and cess is on higher side considering the significant local component like civil works and other activities involved in the project.

6.3.3 Based on the revised EPC cost, taxes, duties and cess being pass-through item has been assessed as US$ 8.55 million and the same has been allowed, subject to adjustment as per actual based on the verifiable documentary evidence at the time of COD.

6.4 Sponsors Development Cost

6.4.1 The Petitioner requested to allow US$ 3.98 million on account of Sponsor Development costs which included PPIB legal fee, bank guarantees to PPIB and NTDC, NEPRA cost, NTDC (load flow study) cost, Legal Consultants Fee and out of pocket expenses, Financial Consultant, Bankable feasibility study, Owner's Engineer, Company incorporation expenses – Incorporation and other costs, etc, Office equipment (furniture and IT equipment, etc), Head Office Cost, Company vehicle expenses, boarding and lodging, miscellaneous overheads during development including the sponsor expenses and ground-breaking and Insurance Advisor.

6.4.2 CPPA submitted that the Petitioner has requested development cost of US$ 3.985 million in its petition whereas in case of Liberty Power Tech Limited (LPTL) it is US$ 1.964 million. CPPA further submitted that the cost of financial consultant amounting to US$ 0.25 million and insurance advisor cost amounting to US$ 0.20 should be excluded from Sponsor Development Cost as they are part of financing fees.

6.4.3 The cost of financial consultant and insurance advisor being part of the financing fees is considered under the relevant head. It was observed that the requested cost of head office expenses of US$ 1.7 million was not only substantially high when compared with other comparable projects but was without any material evidence. The examination of the information revealed that salaries of staff including expatriates during construction were also covered under pre-COD mobilization and other costs. The Authority observed that all other costs requested by the Petitioner are reasonable except the cost requested by the Petitioner on account of head office expense. The Authority considers that the cost is on higher side as compared to the cost allowed by the Authority to other similar projects and needs to be adjusted. The Authority considers that the amount of US$ 0.375 on account of

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head office expenses is sufficient. Accordingly US$ 2.21 million has been assessed as sponsor development cost and the same has been allowed.

6.5 Pre-COD O&M Mobilization & Other Costs

6.5.1 The Petitioner requested US$ 3.005 million under Pre-COD O&M Mobilization & Other costs. According to the Petitioner it covers O&M contractor's mobilization cost, staff salaries during construction, review of construction design, civil design, structure design for foundation, electrical HT design and electrification design, traveling and boarding expenses of training of technical staff and independent engineer under PPA.

6.5.2 CPPA submitted that the requested amount of the Petitioner is higher as compared to Liberty Power Tech Ltd. (LPTL). CPPA further submitted that the cost estimates of the Petitioner on account of staff salary during construction (i.e. amounting US$ 0.81 million) and review of design amounting to US$ 0.92 million seems on higher side which may be reviewed. CPPA submitted that in this regard US$ 2.729 million granted to LPTL may be allowed to the Petitioner.

6.5.3 The Petitioner requested an amount of US$ 0.775 million for O&M contractor's mobilization cost. The Petitioner's claim in this regard however could not be substantiated from the preliminary O&M contract because mobilization cost was not finalized. In the absence of any evidence, the information available in other comparable cases was relied upon for making fair assessment in the instant case. Based on such information and considering the smaller size of the plant US$ 0.65 million for pre-COD mobilization in the instant case has been allowed.

6.5.4 The Petitioner also requested US$ 0.81 million for salaries of 26 staff members during construction phase of 18 months including expatriates. The petitioner provided the detailed breakup of the salaries of each employee. The Authority considers that the requested cost falls within the range of cost allowed in the comparable projects, therefore has been allowed as such.

6.5.5 The Petitioner also requested US$ 0.92 million for review of construction design, civil design, structure design for foundation, electrical HT design and electrification design. The Authority considers that US$ 0.58 million has already been allowed as owner's engineer who is supposed to do all the proposed work therefore the cost being duplication is not allowed.

6.5.6 The cost of training and independent engineer being reasonable is allowed as such. On the basis of assessment of individual cost items an overall amount of US$ 1.96 million has been assessed and the same has been allowed for pre-COD mobilization and other costs.

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6.6 Startup costs and utilities

6.6.1 The Petitioner requested US$ 1.5 million to cover 1,506 metric tones of RFO cost during testing, diesel cost during testing, electricity consumption during construction, water supply costs during construction and contingency for price changes for electricity and diesel. According to the Petitioner, the price of Rs. 49,920 per ton and Rs 3,000 transportation cost per ton is assumed, which would be revised for price variations at the time of actual consumption.

6.6.2 Section C3 of the preliminary EPC Contract deals with the supply of electricity during construction which is in the scope of the EPC Contractor. The Authority therefore considers that the cost of electricity consumption during construction of US$ 0.381 million and contingency for price change for electricity of US$ 0.050 million is not justified and cannot be considered as project cost.

6.6.3 CPPA submitted that the start-up expenses requested by the Petitioner are reasonable therefore may be allowed.

6.6.4 Based on the technical data RFO requirement during testing for two days works out as 1,424.6 metric tones as against the proposed 1506 metric ton. Assuming PRL / NRL Ex-Faisalabad Ex-GST price of Rs.41,977 effective 1st June 2010 and RFO requirement of 1,424.6 metric ton Rs. 59.8 million or US$ 0.699 million has been assessed as cost of RFO during testing. In addition to RFO cost US$ 0.030 million for water supply cost and US$ 0.106 million for diesel is also assessed under the head of Startup Costs and Utilities during construction. Accordingly an overall US$ 0.835 million is allowed as against the requested US$1.5 million.

6.7 Pre-COD Insurance Cost

6.7.1 The Petitioner requested US$ 2.148 million as pre-COD insurance cost. It covers the cost of insurances of the Complex during the construction phase and up-to the COD. This is estimated at 1.35% of EPC costs.

6.7.2 CPPA submitted that the Pre-COD insurance cost should be based on firm EPC costs subject to adjustment at COD on actual basis or 1.35% of EPC cost whichever is less. CPPA further submitted that the insurance cost for period of any delay in commissioning of the complex beyond COD due to reasons attributed to the Petitioner may not be allowed.

6.7.3 Based on the revised EPC cost based on current Euro-Dollar parity, pre-COD insurance cost @1.35% of EPC works out US$ 1.924 million and the same is allowed subject to adjustment as per the actual up to a maximum of 1.35% of the EPC cost at the time of COD based on verifiable documentary evidence.

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6.8 Financing Fees & Charges

6.8.1 In the light of the Authority's previous decisions, the Petitioner has assumed approximately 3% of the loan amount as financing fees and charges. According to the Petitioner, the Project is likely to be funded by the Russian financiers who would carry out their own due diligence by way of appointing various technical, legal consultants, etc. The Petitioner stated that all such consultants' fees and charges were included under this head. Foreign financiers require extensive documentation hence substantial legal and other consultants' costs would be incurred.

6.8.2 CPPA submitted that the cost requested on account of financing fee and charges should not be more than 3% of loan amount subject to adjustment on actual basis at COD.

6.8.3 In support of its claim the Petitioner did not provide details of the financing fees and charges. However it normally included up-front fee, agency fee, security trustee fee, lenders' monitoring fee, commitment fee, letters of credit charges, confirmation fees, stamp duties and registration fees, financial consultant fees and fees for insurance advisors. Based on the revised project cost, US$ 3.89 million is assessed for financing fees and charges which will be adjustable on actual basis at the time of COD up to a maximum of 3% of the total loan amount.

6.9 Interest During Construction (IDC)

6.9.1 The Petitioner requested US$ 13.25 million as interest during construction which comprised of US$ 7.09 million as interest on loan and US$ 6.16 million as return on equity during construction. Interest on loan was calculated on the basis of 0.75% LIBOR plus a premium of 4.75% whereas return on equity during construction was worked out @ 15% on equity injection.

6.9.2 CPPA submitted that the Petitioner's requested cost is based on anticipated interest rates, equity injections and the construction payment schedule and may be adjusted at the time of COD as per actual loan disbursement.

6.9.3 According to the revised project cost, US$ 5.86 million is assessed as IDC on the basis of 0.75% LIBOR plus a premium of 4.75% subject to adjustment as per actual at the time of COD based on the verifiable documentary evidence. Since the return on equity during construction is included in the IRR therefore the requested amount of US$ 6.16 million under the head of IDC is being excluded.

7. Project Cost

7.1 On the basis of discussions in the preceding paragraphs, Rupee-Dollar parity of 85.5 and Dollar-Euro parity of 1.22 as on 4th June 2010, the project cost is assessed as US$ 172.985 million comprising 75% loan amount of US$ 129.739 million and 25% equity amount of US$ 43.246 million. The summary of the project cost is given hereunder;

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Description	Euro Million	US$ Million
EPC- Offshore	104.000	126.685
EPC- Onshore	13.000	15.836
EPC- Nonwartsia		2.246
Non EPC		9.919
Taxes		8.551
Finan. Fees		3.888
IDC		5.860
Total		**172.985**

8. Fuel Cost Component

8.1 The Petitioner stated that the fuel cost component represents the fuel consumption at a guaranteed efficiency level at full load. Consequently, the efficiency risk is being borne by the Petitioner. The main assumptions pertaining to the fuel cost component are as follows:

RFO Price (without GST or any other tax):	Rs. 49,920 per ton and Rs 3,000 transportation cost per ton
Output:	158.031 MW (net at site conditions)
Heat Rate:	7,583 BTU/kWh
Thermal efficiency net:	45% (at site conditions)
Caloric Value	18,200 BTU/lb subject to adjustment at the time of finalization of Fuel Supply Agreement
Partial Loading:	Heat Rate Curves from genset manufacturer to be used for partial load heat rate calculation and payment of fuel cost

8.2 The Petitioner's calculation of fuel cost component is in line with the Authority's earlier determinations except calorific value. As per the decision of the Authority dated 4th March 2009, the benchmark average calorific value for IPP's is 18,364 BTUs per Pound. On the basis of 45% thermal efficiency, reference calorific value of 18,364 BTUs per Pound, RFO price of Rs.49,920 per ton and transportation cost of Rs. 3,000 per ton, the fuel component in the instant case works out Rs. 10.4095/kWh which will be adjusted on the basis of actual variation in fuel price and transportation charges.

9. Variable O&M

9.1 The Petitioner requested Rs.0.5783/kWh as variable O&M comprising of Rs.0.5283/kWh within Wärtsilä scope and Rs.0.050/kWh within its scope. The Petitioner in support of its claim provided a preliminary O&M agreement, which indicates that Wärtsilä will charge € 4.15 per megawatt hour as variable O&M during 1st 10 years. In the agreement an

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indicative figure of € 4.57 per megawatt hour for 25 years has also been provided. The Petitioner has based its calculation on the indicative figure of € 4.57 per megawatt hour for 25 years, which is not justified because it is just indicative. CPPA submitted that the Petitioner's requested variable O&M seems on higher side as compared to LPTL which is a similar project in the same vicinity.

9.2 In view thereof the O&M of € 4.15/MWh, which has been agreed, is considered more relevant for tariff calculation. Based on the exchange rate of Rs.104.15/Euro the variable O& M cost payable to Wärtsilä works out Rs. 0.4322/kWh, which also includes local cost of Rs. 0.1380/kWh for lubricants. The variable O&M cost when compared with other comparable projects is considered reasonable therefore is recommended to be accepted as such. In future the local O&M including lubricants Rs.0.1380/kWh will be indexed according to change in WPI (Manufactures) local and foreign variable O&M of Rs.0.2942 will be indexed by change in exchange rate and US CPI as issued by BLS USA.

9.3 The Petitioner also requested 5 Paisa as the variable O&M, which according to it is not covered in the scope of the O&M contractor during the operational phase for maintenance of water supply system and Reverse Osmosis plant including chemicals. The Petitioner did not provide any evidence in support of its claim. In the absence of any such evidence cost allowed in the other similar project located in the same vicinity is considered relevant in the instant case. Based on the available information Rs. 0.03/kWh has been assessed and the same has been allowed. In future this cost will be adjusted with Wholesale Price Index (WPI) (Manufactures).

10. Fixed O&M

10.1 The Petitioner requested Rs.0.2605/kW/hr as fixed O&M comprising of Rs. 0.1478/kW/hour foreign component and Rs. 0.1127/kW/hour local component. According to the Preliminary O&M Agreement, Wärtsilä will charge fixed monthly fee of Rs. 17.7 million for operation and maintenance of the power plant. The petitioner also requested Rs. 0.1049/kW/hour in addition to the aforementioned fixed monthly fee payable to Wärtsilä. The Petitioner's request was to cover its establishment costs, office equipment, communication, housing and security for expatriates and company's site office costs. In bifurcating costs into foreign and local components an inconsistency on the part of the Petitioner has been observed. As per the documentary evidence all of the fixed O&M costs including the Wärtsilä fee are to be paid in Pak Rupees except to the extent of expatriates' salaries which is a very small portion.

10.2 CPPA submitted that the foreign fixed O&M seems on higher side. CPPA recommended that it should be at par with projects of the similar technology.

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10.3 In order to make fair assessment of fixed O&M cost in the instant case, the cost requested by the Petitioner has been compared with other comparable projects. It is observed that the fixed O&M cost of Rs.0.2605/kW/hr was higher as compared to other similar projects. The Petitioner was asked to provide evidence in support of its claim. The Petitioner could only justify to the extent of Rs. 17.70 million or Rs. 0.1529 /kW/hour payable to Wärtsilä as fixed monthly fee for operation and maintenance of the power plant. The Petitioner however, could not substantiate its claim of Rs. 0.1049/kW/hour as fixed O&M in its scope of work. The indexed O&M cost allowed to LPTL as of March 2010 is Rs.0.1945/kW/Hour. If the same ceiling of Rs.0.1945/kW/hr is considered relevant in this case then Rs. 0.0416 or US$ 0.673 million per annum can be allowed as fixed O&M cost within the Petitioner's scope. Therefore Rs. 0.1945/kW/hr is allowed as Fixed O&M cost in the instant case. In future the entire fixed O&M cost of Rs.0.1945/kW/hr will be indexed with local WPI (manufactures).

11. Cost of Insurance

11.1 The Petitioner requested to allow US$ 1.5 million or Rs. 0.0921/kW/hour on account of cost of insurance.

11.2 The Petitioner's request is in line within the limit of 1.35% of the EPC cost allowed by the Authority in other projects. After adjusting the exchange rate variation the insurance component works out Rs. 0.0924/kW/hour and the same has been allowed.

12. Cost of Working Capital

12.1 The Petitioner requested Rs. 0.1170/kW/hour as cost of working capital for 30 days fuel inventory, 15 days advance payment and 30 days receivables at 60% load factor and GST. The assumed fuel price including transportation is Rs. 52,920 per metric ton.

12.2 CPPA submitted that the cost of working capital may be allowed only for fuel inventory of 30 days at full load. Other costs on account of working capital may not be allowed. CPPA further submitted that 6 months LIBOR of 5% has been taken whereas current rate of 6 months LIBOR is 0.47%. CPPA further submitted that the spread of 4.75% also seems on higher side and it should not be more than 3% as allowed by NEPRA for other thermal projects.

12.3 The Authority observed that CPPA's comments with respect to six month LIBOR of 5% were based on the Petitioner's original submission which was subsequently revised to 0.75%. The Authority therefore considers that the proposed LIBOR of 0.75% although is on the higher side as indicated by the CPPA but this is subject to adjustment on the basis of actual at the time of COD. The Authority has therefore decided to adopt 0.75% LIBOR in the instant case for assessment of cost of working capital. The Authority has also carefully examined the CPPA's objections with respect to the spreads of 4.75%. The

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Authority considers that the CPPA's objection in this regard is not valid keeping in view the funds availability in local as well as international financial market. The Authority considers that it is not possible at this point of time to assess the reasonableness of spread which is an indicator of the financial market behaviour. The Authority in the case of Uch-Power has accepted the spread in the similar range for foreign financing. The Authority has therefore decided to accept the spread of 4.75% subject to adjustment as per actual at the time of COD based on the documentary evidence.

12.4 The Authority in the similar cases allowed 30 days fuel inventory, receivables at 60% load factor and GST. The same is allowed in the instant case. The interest cost on working capital at 5.5% (LIBOR 0.75% + 4.75% premium) interest rate works out as Rs. 0.0881/kW/hour. There will be one time adjustment at COD in the working capital based on the actual fuel price prevailing at the time of first fill of fuel and actual interest rate. After COD the revised cost of working capital will be adjusted only for variation in 6 months LIBOR.

13. Return on Equity

13.1 The petitioner requested Rs. 0.4907/kW/hour 15% IRR based on equity of Rs. US$ 51.64 million.

13.2 Based on the revised project cost, the equity in the instant case has been assessed as US$ 43.24 million. Accordingly, the ROE has been worked out as Rs. 0.3996/kW/hour. Being a BOO project, redemption of equity is not assumed.

14. Return on Equity During Construction

14.1 The petitioner requested Rs. 0.0151/kW/hour as return on equity during construction.

14.2 The petitioner also included US$ 6.16 million as interest/return on equity during construction (ROEDC) in the project cost. The Authority in its earlier decisions did not consider ROEDC as part of the project cost. On the basis of revised equity of US$ 43.24 million, the ROEDC in the instant case has been assessed as US$ 4.87 million or 0.0464/kW/hour.

15. Debt Servicing

15.1 The Petitioner requested to allow Rs. 1.2640/kW/hr debt servicing component in order to pay the interest along with principal in 20 equal installments biannually. The amount of debt was assumed as US$ 154.92 million (75% of the total project cost) to be repaid by the end of the 10th year post COD.

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15.2 Based on the revised project cost, the debt amount has been assessed as US$ 129.74 million. Accordingly the debt servicing component of Rs. 1.0498/kW/hr has been assessed on the basis of 5.5% interest rate (6-monthly LIBOR of 0.75% plus 4.75% premium). The debt servicing component will be re-established at the time of COD on the basis of revised project cost and actual interest rate. Thereafter, the interest part of the debt servicing component will be subject to biannual adjustment due to variation in 6-monthly LIBOR. The debt servicing component will also be subject to USD/PKR parity.

16. Timeline/Completion of the Project

16.1 The Company has submitted following timeline/roadmap for completion of Project:

• IA, PPA and FSA	May 2010
• EPC Contract	June 2010
• Financial Close	September/December 2010
• Construction completion:	June 2012

16.2 The Authority has decided to accept the timeline/roadmap of the project subject to maximum of 18 month construction period after financial close.

17. ORDER

Pursuant to Rule 16 (11) of the Tariff Rules, the Petitioner (Radian Energy Power Generation Company (Private) Limited) is allowed to charge following specified tariff for delivery of electricity to the Central Power Purchasing Agency (CPPA) of the National Transmission and Dispatch Company (NTDC) for procurement on behalf of Ex-WAPDA Distribution Companies:

Specified Reference Tariff

Tariff Components	Year 1 to 10	Year 11 to 25	Indexation
Capacity Charge PKR/kW/Hour)			
Fixed O&M	0.1945	0.1945	WPI
Cost of Working Capital	0.0881	0.0881	LIBOR
Insurance	0.0924	0.0924	Actual on annual basis
Debt Service – Foreign	1.0498	----	US$/PKR & LIBOR
Return on Equity	0.3996	0.3996	US$ /PKR
ROE during Construction	0.0464	0.0464	US$ /PKR
Total Capacity Charge	**1.8708**	**0.8210**	

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Energy Charge on Operation on Furnace Oil Rs./kWh			
Fuel Cost Component	10.4095	10.4095	Fuel Price
Variable O&M			
Foreign	0.2942	0.2942	US$/PKR & US CPI
Local	0.1680	0.1680	WPI

Note:

i. The above tariff will be applicable for 25 years commencing from the date of the commercial operation.

ii. Component wise proposed tariff for operation on RFO is indicated at Annex-I and Debt Servicing Schedule is attached as Annex-II.

The following adjustments /indexations shall be applicable to the reference tariff:

I. **<u>One Time Adjustments</u>**

I(i) **<u>Adjustment in EPC Cost</u>**

The Authority has assessed Equipment Supply Contract cost of Euro 104 million and Construction Contract cost of Euro 13 million. 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 alongwith documentary evidence. The adjustment shall be only for currency fluctuation against the reference parity values. Based upon such information the relevant currency of EPC cost components shall be adjusted and applied to the corresponding EPC cost components. The relevant tariff components i.e. Insurance, ROE, ROEDC, Principal Repayment and Interest Charges shall be adjusted accordingly.

I(ii) **<u>Adjustment due to Variation in Net Capacity</u>**

The reference tariff has been determined on the basis of minimum net capacity of 158.431 MW at delivery point at mean site conditions. All the tariff components of capacity charge 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 net output is established less than 158.431 MW. The adjustments shall be made according to the following formula:

$$CC_{(Adj)} = CC_{(Ref)} \times 158.431 \text{ MW} / NC_{(IDC)}$$

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

Where;

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

I(iii) Adjustment Based on Actual Interest During Construction & Financing Fees

Debt Service, Return on Equity and ROEDC components of tariff shall be adjusted at the time of COD on account of actual variation in Interest During Construction and financing fees with reference to the estimated figures of US$ 5.86 million and US$ 3.888 million respectively. Adjustment on account of financing fees is restricted to the extent of 3% of the total financing.

I(iv) Adjustment due to Custom Duties & Withholding Taxes

Debt Service, Return on Equity and ROE during construction shall be adjusted at the time of COD on account of actual variation in custom duties & withholding Taxes with reference to the estimated figures of US$ 7.601 million and US$ 0.950 million respectively.

I(v) Adjustment for variation in Rupee/Dollar parity

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

II. 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 annually as per actual upon production of authentic documentary evidence by the Petitioner according to the following formula:

$$Insurance_{(Adj)} = AIC / P_{(Ref)} * P_{(Act)}$$

Where;

AIC	=	Adjusted Insurance Component (Rs. kW/hr) as per IDC Test
$P_{(Ref)}$	=	Reference Premium US$ 1.5 million
$P_{(Act)}$	=	Actual Premium or 1.35% of the adjusted EPC which ever is lower

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III. Pass-Through Items

"No provision for income tax, workers' profit participation fund and workers' welfare fund, any other tax, excise duty or other duty, levy, charge, surcharge or other governmental impositions, payable on the generation, sales, exploration has been accounted for in the tariff. If the Petitioner is obligated to pay any tax on the income purely generated from its operation i.e. Electricity Generation of power producer, the exact amount should be reimbursed by CPPA 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 in the Reference Tariff. Furthermore, in such a scenario, the Petitioner may also submit to CPPA details of any tax shield savings and CPPA will deduct the amount of these savings from its payment to the Petitioner on account of taxation.

Withholding tax on dividend is also a pass-through item just like other taxes as indicated in the government guidelines for determination of tariff for new IPPs. Withholding tax shall be allowed @ 7.5% (or applicable rate) of return on equity and return on equity during construction. CPPA (NTDC) shall make payment on account of withholding tax at the time of actual payment of dividend subject to maximum of 7.5% (or applicable rate) according to the following formula:

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

Where:

$E_{(Ref)}$	=	Adjusted Reference Equity at COD
$ROEDC_{(Ref)}$	=	Reference Return on Equity During Construction at COD

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 as a pass through from the Power Purchaser in future on the basis of the total dividend pay out.

IV. Indexations:

The following indexation shall be applicable to the reference tariff;

IV(i) Indexation of Return on Equity (ROE)

After COD, ROE component of tariff will be quarterly indexed on account of variation in PKR/US$ parity according to the following formula:

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

Where;

$ROE_{(Rev)}$	=	Revised ROE Component of Tariff
$ROE_{(Ref)}$	=	ROE Component of Tariff established at the time of COD
$ER_{(Rev)}$	=	The revised TT & OD selling rate of US dollar as notified by the National Bank of Pakistan
$ER_{(Ref)}$	=	Reference Exchange Rate at the time of COD

IV(ii) **Indexation of Return on Equity during Construction (ROEDC)**

After COD, ROEDC Component of Tariff will be quarterly indexed on account of variation in PKR/US$ parity according to the following formula:

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

Where;

$ROEDC_{(Rev)}$	=	Revised ROEDC Component of Tariff
$ROEDC_{(Ref)}$	=	ROEDC Component of Tariff established at the time of COD
$ER_{(Rev)}$	=	The revised TT & OD selling rate of US dollar as notified by the National Bank of Pakistan
$ER_{(Ref)}$	=	Reference Exchange Rate at the time of COD

IV(iii) **Indexation applicable to O&M**

The Fixed O&M component of Capacity Charge and Local Variable O&M will be adjusted on account of Inflation (WPI) and Variable 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:

a) **Fixed O&M**

$F\ O\&M_{(REV)}$	=	Rs. 0.1945/kW/Hour $* WPI_{(REV)} / WPI_{(REF)}$

Where:

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$F\ O\&M_{(REV)}$	=	the revised applicable Fixed O&M Local Component of tariff
$WPI_{(REV)}$	=	the revised Wholesale Price Index (manufactures)
$WPI_{(REF)}$	=	the reference WPI (manufactures) of 161.77 of March 2010

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

b) <u>Variable O&M</u>

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

$$V\ O\&M_{(LREV)} = \text{Rs. } 0.1680/\text{kWh} * WPI_{(REV)} / WPI_{(REF)}$$

$$V\ O\&M_{(FREV)} = \text{Rs. } 0.2942/\text{kWh} * US\ CPI_{(REV)} / US\ CPI_{(REF)} * ER_{(REV)} / ER_{(REF)}$$

Where:

$V\ O\&M_{(LREV)}$	=	the revised applicable Variable O&M Local Component of tariff
$V\ O\&M_{(FREV)}$	=	the revised applicable Variable O&M Foreign Component of tariff
$WPI_{(REV)}$	=	the revised Wholesale Price Index (manufactures)
$WPI_{(REF)}$	=	the reference WPI (manufactures) of 161.77 of March 2010
$US\ CPI_{(REF)}$	=	the reference US CPI (All Urban Consumers) of 217.63 of March 2010
$US\ CPI_{(REV)}$	=	the revised US CPI (All Urban Consumers)
$ER_{(REV)}$	=	the Revised TT & OD selling rate of US dollar

IV(iv) <u>Adjustment for KIBOR variation</u>

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 6 months LIBOR according to the following formula;

$$\Delta I = P_{(LREV)} * (LIBOR_{(REV)} - 0.75\%) / 2$$

Where:

ΔI = the variation in interest charges on local loan applicable corresponding to variation in 6 months LIBOR. ΔI can be positive or negative depending upon whether $LIBOR_{(REV)} > \text{or} < 0.75\%$. The interest payment obligation will be enhanced or reduced to the

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

IV(v) **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. 10.4095 per kWh * $FP_{(Rev)}$ / Rs. 52,920 per ton

Where:

$FC_{(Rev)}$	=	Revised fuel cost component of Energy Charge on RFO.
$FP_{(Rev)}$	=	The new price of RFO per Metric Ton including freight.

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

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

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

i) Capacity Charge Rs./kW/hour applicable to dependable capacity at the delivery point.
ii) The tariff is applicable for a period of 25 years commencing from the date of the Commercial Operation.
iii) All new equipment will be installed and the plant will be of standard configuration.
iv) Dispatch criterion will be based on the Energy Charge.
v) Internal consumption has been assumed to be approximately 4.40 MW.
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.

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

xii) 100% of debt has been assumed to be foreign provided however that in the event the Petitioner uses local loans or a mix of foreign and local loans, the actual cost shall be passed on to the Power Purchaser.

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

xiv) Working capital has been financed by a separate Working Capital facility, and is not included in the project cost.

xv) Minimum loading of the Complex shall be according to the manufacturer's technical limits to allow for combined cycle operations.

xvi) All fuel during plant tests after synchronization of the Complex to the grid is assumed to be paid for by the Power Purchaser.

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

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Radian Energy Power Generation (Pvt.) Limited
Reference Tariff Schedule

Year	Energy Charge (PKR/kWh)				Capacity Charge (PKR/kW/Hr)									Capacity	Tariff
	Fuel	Variable O&M Local	Variable O&M-Foreign	Total	Fixed O&M	Insurance	Cost of Working Capital	Return on Equity	Return on Equity during Constructio	Withholding Tax @7.5%	Loan Repayment	Interest Charges	Total	PKR per kWh	PKR per kWh
1	10.4095	0.1680	0.2942	10.8718	0.1945	0.0924	0.0881	0.3996	0.0464	0.0335	0.6186	0.4312	1.9042	3.1737	14.0455
2	10.4095	0.1680	0.2942	10.8718	0.1945	0.0924	0.0881	0.3996	0.0464	0.0335	0.6531	0.3967	1.9042	3.1737	14.0455
3	10.4095	0.1680	0.2942	10.8718	0.1945	0.0924	0.0881	0.3996	0.0464	0.0335	0.6895	0.3603	1.9042	3.1737	14.0455
4	10.4095	0.1680	0.2942	10.8718	0.1945	0.0924	0.0881	0.3996	0.0464	0.0335	0.7279	0.3219	1.9042	3.1737	14.0455
5	10.4095	0.1680	0.2942	10.8718	0.1945	0.0924	0.0881	0.3996	0.0464	0.0335	0.7685	0.2813	1.9042	3.1737	14.0455
6	10.4095	0.1680	0.2942	10.8718	0.1945	0.0924	0.0881	0.3996	0.0464	0.0335	0.8114	0.2384	1.9042	3.1737	14.0455
7	10.4095	0.1680	0.2942	10.8718	0.1945	0.0924	0.0881	0.3996	0.0464	0.0335	0.8566	0.1932	1.9042	3.1737	14.0455
8	10.4095	0.1680	0.2942	10.8718	0.1945	0.0924	0.0881	0.3996	0.0464	0.0335	0.9044	0.1454	1.9042	3.1737	14.0455
9	10.4095	0.1680	0.2942	10.8718	0.1945	0.0924	0.0881	0.3996	0.0464	0.0335	0.9548	0.0950	1.9042	3.1737	14.0455
10	10.4095	0.1680	0.2942	10.8718	0.1945	0.0924	0.0881	0.3996	0.0464	0.0335	1.0080	0.0418	1.9042	3.1737	14.0455
11	10.4095	0.1680	0.2942	10.8718	0.1945	0.0924	0.0881	0.3996	0.0464	0.0335	-	-	0.8545	1.4241	12.2958
12	10.4095	0.1680	0.2942	10.8718	0.1945	0.0924	0.0881	0.3996	0.0464	0.0335	-	-	0.8545	1.4241	12.2958
13	10.4095	0.1680	0.2942	10.8718	0.1945	0.0924	0.0881	0.3996	0.0464	0.0335	-	-	0.8545	1.4241	12.2958
14	10.4095	0.1680	0.2942	10.8718	0.1945	0.0924	0.0881	0.3996	0.0464	0.0335	-	-	0.8545	1.4241	12.2958
15	10.4095	0.1680	0.2942	10.8718	0.1945	0.0924	0.0881	0.3996	0.0464	0.0335	-	-	0.8545	1.4241	12.2958
16	10.4095	0.1680	0.2942	10.8718	0.1945	0.0924	0.0881	0.3996	0.0464	0.0335	-	-	0.8545	1.4241	12.2958
17	10.4095	0.1680	0.2942	10.8718	0.1945	0.0924	0.0881	0.3996	0.0464	0.0335	-	-	0.8545	1.4241	12.2958
18	10.4095	0.1680	0.2942	10.8718	0.1945	0.0924	0.0881	0.3996	0.0464	0.0335	-	-	0.8545	1.4241	12.2958
19	10.4095	0.1680	0.2942	10.8718	0.1945	0.0924	0.0881	0.3996	0.0464	0.0335	-	-	0.8545	1.4241	12.2958
20	10.4095	0.1680	0.2942	10.8718	0.1945	0.0924	0.0881	0.3996	0.0464	0.0335	-	-	0.8545	1.4241	12.2958
21	10.4095	0.1680	0.2942	10.8718	0.1945	0.0924	0.0881	0.3996	0.0464	0.0335	-	-	0.8545	1.4241	12.2958
22	10.4095	0.1680	0.2942	10.8718	0.1945	0.0924	0.0881	0.3996	0.0464	0.0335	-	-	0.8545	1.4241	12.2958
23	10.4095	0.1680	0.2942	10.8718	0.1945	0.0924	0.0881	0.3996	0.0464	0.0335	-	-	0.8545	1.4241	12.2958
24	10.4095	0.1680	0.2942	10.8718	0.1945	0.0924	0.0881	0.3996	0.0464	0.0335	-	-	0.8545	1.4241	12.2958
25	10.4095	0.1680	0.2942	10.8718	0.1945	0.0924	0.0881	0.3996	0.0464	0.0335	-	-	0.8545	1.4241	12.2958
Levelized Tariff (1-25 Years)				**10.8718**	**0.1945**	**0.0924**	**0.0881**	**0.3996**	**0.0464**	**0.0335**	**0.5186**	**0.1920**	**1.5651**	**2.6085**	**13.4802**

Net Capacity	158.431					
Reference Exchange Rate	1 US$ =	85.50	PKR	1 Euro =	1.22	US$
Reference US CPI	217.63 for March 2010 as notified by the US Labour Bureau of Labor Statistics					
Reference WPI (Manufacturer)	161.77 for March 2010 as notified by the Federal Bureau of Statistics					
Efficiency	45.00%					
Levelized Tariff	Levelized tariff in US Cents translates in /kWh		15.7664			

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Radian Energy Power Generation (Pvt.) Limited
Debt Servicing Schedule

Period	Foreign Debt					Annual Principal Repayment Rs./kW/Hr.	Annual Interest Rs./kW/Hr.	Annual Debt Servicing Rs./kW/Hr.
	Principal Million US$	Repayment Million US$	Mark-up Million US$	Balance Million US$	Debt Service Millin US$			
	129.74	$4.95	3.57	124.79	$8.52			
	124.79	5.09	3.43	119.70	$8.52			
1	**129.74**	**10.04**	**7.00**	**119.70**	**17.04**	**0.6186**	**0.4312**	**1.0498**
	119.70	5.23	3.29	114.47	$8.52			
	114.47	5.37	3.15	109.10	$8.52			
2	**119.70**	**10.60**	**6.44**	**109.10**	**17.04**	**0.6531**	**0.3967**	**1.0498**
	109.10	5.52	3.00	103.58	8.52			
	103.58	5.67	2.85	97.91	8.52			
3	**109.10**	**11.19**	**5.85**	**97.91**	**17.04**	**0.6895**	**0.3603**	**1.0498**
	97.91	5.83	2.69	92.08	8.52			
	92.08	5.99	2.53	86.09	8.52			
4	**97.91**	**11.82**	**5.22**	**86.09**	**17.04**	**0.7279**	**0.3219**	**1.0498**
	86.09	6.15	2.37	79.94	8.52			
	79.94	6.32	2.20	73.61	8.52			
5	**86.09**	**12.47**	**4.57**	**73.61**	**17.04**	**0.7685**	**0.2813**	**1.0498**
	73.61	6.50	2.02	67.12	8.52			
	67.12	6.67	1.85	60.44	8.52			
6	**73.61**	**13.17**	**3.87**	**60.44**	**17.04**	**0.8114**	**0.2384**	**1.0498**
	60.44	6.86	1.66	53.59	8.52			
	53.59	7.05	1.47	46.54	8.52			
7	**60.44**	**13.90**	**3.14**	**46.54**	**17.04**	**0.8566**	**0.1932**	**1.0498**
	46.54	7.24	1.28	39.30	8.52			
	39.30	7.44	1.08	31.86	8.52			
8	**46.54**	**14.68**	**2.36**	**31.86**	**17.04**	**0.9044**	**0.1454**	**1.0498**
	31.86	7.64	0.88	24.22	8.52			
	24.22	7.85	0.67	16.36	8.52			
9	**31.86**	**15.50**	**1.54**	**16.36**	**17.04**	**0.9548**	**0.0950**	**1.0498**
	16.36	8.07	0.45	8.29	8.52			
	8.29	8.29	0.23	0.00	8.52			
10	**16.36**	**16.36**	**0.68**	**0.00**	**17.04**	**1.0080**	**0.0418**	**1.0498**

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
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DISSENTING NOTE OF MAQBOOL AHMAD KHAWAJA, MEMBER (S) NEPRA – ON DETERMINATION OF THE AUTHORITY IN THE MATTER OF PETITION FILED BY RADIAN ENERGY POWER GENERATION (PVT.) LTD. (REPGL) (NO.NEPRA/TRF-152/REPGL-2010)

As per sponsors' petition the equipment / machines to be installed will be reciprocating engines WARTSILA make designed for use on single fuel only i.e. RFO. During hearing of the petition on 4-4-2010, this point was raised by the undersigned that it would be better if the machines supplied are designed on dual fuel on RFO / Gas so that in case of availability of gas in future, the energy-mix will become better and ultimately over-all tariff to be charged from the consumer will be reduced.

During the course of hearing the petitioner responded to my observation and proposed that in case of availability of gas at a later stage the modifications can be made. In my view for any modification at later stage means much more expenditures will be needed in addition to stoppage of machines for a long period for carrying out these modifications. Whereas if the machines are initially designed on dual fuel, manufactured and installed there will be less cost incurred / involved when compared in long run.

The Authority as per present determination is allowing tariff on single fuel RFO for a period of 25 years whereas, in my view further generation on RFO only for period of 25 years needs to be reduced otherwise the over-all tariff will increase which may be beyond the capacity of payment of consumer. More over as we know that already a contract has been signed for gas supply through a pipeline from Iran and in next 4-5 years the position in my view shall change with reference to availability of gas.

I am of the firm opinion that as a policy we shall not accept machines on single fuel i.e. RFO for long period of 25 years rather encourage policy of installation of generating units designed on dual fuel in order to keep the generation-mix and over-all tariff to the reasonable possible limits. I, therefore, dissent from the decision of the Authority to allow tariff on RFO based single fuel designed machines for a period of 25 years to M/s Radian Energy Power Generation.

14/9/10.

MAQBOOL AHMAD KHAWAJA
MEMBER (S)

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