



# National Electric Power Regulatory Authority

## Islamic Republic of Pakistan

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E-mail: office@nepra.org.pk

No. NEPRA/TRF-50/SECL-2006/5175-77  
June 15, 2006

**Subject: Intimation of Determination of Tariff of Sapphire Electric Company Ltd. (SECL) for sale of electricity to the Central Power Purchasing Agency within NTDC (Case No. NEPRA/TRF-50/SECL-2006) 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 Annex-I & II (30 pages) in Case No. NEPRA/TRF-50/SECL-2006.


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

DA/As above.

The Secretary,  
Cabinet Division,  
Government of Pakistan  
Cabinet Secretariat,  
Islamabad



  
15.06.06.  
(Mahjoob Ahmad Mirza)

CC:

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

**ORDER OF THE AUTHORITY**  
**IN CASE NO. NEPA/TRF-50/SECL-2006**  
**TO BE NOTIFIED IN THE OFFICIAL GAZETTE**

Pursuant to Rule 6 of the NEPA Licensing (Generation) Rules 2000, Sapphire Electric Company Limited 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 specified tariff 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 30	Indexation
Capacity Charge (PKR/kW/Month)			
O&M Foreign	47.5550	47.5550	US\$ to Rupee
O&M Local	31.7034	31.7034	WPI
Cost of Working Capital *	11.2211	11.2211	NIL
Insurance	46.4833	46.4833	US\$ to Rupee
Debt Service	576.1291	-	KIBOR
Return on Equity	166.4637	166.4637	NIL
ROE during Construction	15.2037	15.2037	NIL
Total Capacity Charge	894.7593	318.6302	
* In case of plant operation on HSD cost of working capital shall be paid on 15 days inventory level basis which is Rs. 24.051 Rs./kW/month.			
A) Energy Charge on Operation on Gas Rs./kWh			
Fuel Cost Component	1.7787	1.7787	Fuel Price
Variable O&M	0.1746	0.1746	\$ to Rupee
B) Energy Charge on Operation on HSD Rs./kWh			
Fuel Cost Component	6.3325	6.3325	Fuel Price
Variable O&M	0.2520	0.2520	\$ to Rupee

- Note: i) Capacity Charge Rs./kW/month 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 30 years commencing from the date of the Commercial Operation.
- iv) Component wise tariff for operation on Gas and HSD is indicated at Annex-I & II.

The following indexations shall be applicable to reference tariff;

### One Time Adjustment

Adjustment due to variation in net capacity

The reference tariff has been determined on the basis of net capacity of 209 MW at delivery point at mean site conditions. All the tariff components except fuel cost component shall be adjusted at the time of COD based upon the IDC tests to be carried out for determination of contracted capacity. The adjustments shall be made according to the following formula:

- i) Revised Fixed O&M Foreign = 47.5550/tested IDC x 209
- ii) Revised Fixed O&M Local = 31.7034/tested IDC x 209
- iii) Insurance = 46.4833/tested IDC x 209
- iv) Debt Service = 576.1291/tested IDC x 209
- v) Return on Equity = 166.4637/tested IDC x 209
- vi) ROE during Construction = 15.2037/tested IDC x 209
- vii) Variable O&M = 0.1528/tested IDC x 209

Adjustment in Insurance Component

Insurance component of reference tariff shall be adjusted as per actual on yearly basis upon production of authentic documentary evidence by SECL according to the following formula;

$$\text{Insurance (Revised)} = \text{AIC} / \$1.943 \text{ million} \times \text{AP}$$

Where;

- AIC = Adjusted Insurance Component as per IDC Test
- AP = Actual Premium

Adjustment due to customs duties and Interest during Construction



Debt Service, Return on Equity and ROE during construction shall be adjusted at COD on account of actual variation in customs duties, drawdown and Interest During Construction with reference to the estimated figures of USD 5.037 million and USD 14.358 million respectively. SECL shall submit the relevant documents to NEPRA within 7 days of COD for adjustment of relevant tariff components.

### **Pass-Through Items**

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

### **Indexations:**

The reference tariff subject to indexation shall be applicable as follows;

Indexation applicable to O&M

The 40% of Fixed O&M part of Capacity Charge will be adjusted on account of Inflation (WPI) and 60% on account of variation in dollar/Rupee exchange rate. WPI adjustment for inflation will be made on quarterly basis, on the basis of WPI as notified by the Federal Bureau of Statistics (FBS) for the month of August, November, February & May respectively. Indexation for variation in dollar/rupee exchange rate will be made on October 1, January 1, April 1 & July 1 on the basis of revised TT & OD selling rate of US



Dollar as notified by the National Bank of Pakistan. The mode of indexation will be as under:

(a) **Fixed O&M**

$$F \text{ O\&M(RWPI)} = \text{Rs.31.7034 per kW per Month} * \text{WPI (REV)} / 117.80$$

$$F \text{ O\&M(RE)} = \text{Rs. 47.5550 per kW per Month} * \text{ER(REV)} / 60$$

Where:

F O&M(RWPI) = The revised applicable Fixed O&M Component of the Capacity Charge indexed with WPI

F O&M (RE) = The revised applicable Fixed O&M Component of the Capacity Charge indexed with Currency fluctuation

WPI(REV) = the Revised Wholesale Price Index (manufactures)

Reference WPI = 117.80 Wholesale Price Index (manufactures) of April 2006 notified by Federal Bureau of 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.

(b) **Variable O&M**

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

$$V \text{ O\&MG (RE)} = \text{Rs.0.1746 per kWh} * \text{ER(REV)} / \text{Rs.60 per \$}$$

$$V \text{ O\&MG (RE)} = \text{Rs.0.2520 per kWh} * \text{ER(REV)} / \text{Rs.60 per \$}$$

Where:

V O&MG(REV) = The revised applicable Variable O&M Component of Energy Charge indexed with currency fluctuation.

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

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



**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;

$$\Delta I = P(\text{REV}) * (\text{KIBOR}(\text{REV}) - 9.0\%) / 4$$

Where:

$\Delta I$  = the variation in interest charges applicable corresponding to variation in KIBOR.  $\Delta I$  can be positive or negative depending upon whether KIBOR REV > or < 9.0%. The interest payment obligation will be enhanced or reduced to the extent of  $\Delta I$  for each quarter under adjustment applicable on quarterly basis.

$P(\text{REV})$  = 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.

**Fuel Price Variation**

The Variable Charge part of the tariff relating to fuel cost shall be adjusted on account of the fuel price variations as and when notified by the relevant authority, which in the instant case is the Oil & Gas Regulatory Authority. In this regard, the variation in SECL's allowed rate relating to fuel cost shall be revised according to the following formula:

$$\text{FCg}(\text{Rev}) = \text{Rs.1.7787 per kWh} * \text{FP}(\text{Rev}) / \text{Rs. 266.83 per MMBTU}$$

Where:

$\text{FCg}(\text{Rev})$  = Revised fuel cost component of Variable Charge on gas



FPg (Rev) = The new price of gas as notified by the relevant Authority per MMBTU of fuel adjusted for LHV-HHV factor.

FCd(Rev) = Rs. 6.3325 per kWh \* FP(Rev)/Rs. 34.37 per Litre (Excl. GST)

Where:

FCd (Rev) = Revised fuel cost component of Variable Charge on diesel

FPd(Rev) = The new price of diesel as notified by the relevant Authority per Litre of fuel adjusted for LHV-HHV factor.

SECL may submit a request for adjustment on account of inflation, foreign exchange variation, KIBOR variation and fuel price variation within seven days of the applicable date. The Authority will approve and announce the adjustments for immediate application within seven days of the filing of the request by SECL.

#### **Terms and Conditions of Tariff:**

- i) Gas usage will be considered the primary fuel.
- ii) All equipment installed will be new and the plant will be of standard configuration.
- iii) Dispatch criterion will be based on the Energy Charge.
- iv) Diesel oil will be used only for startups and other contingent requirements. Use of Diesel Oil shall be allowed in accordance with the GOP's fuel policy announced from time to time.
- v) General assumptions of SECL which are not covered in this determination may be dealt with in the PPA according to its standard terms.

The above tariff and terms and conditions be incorporated as the specified tariff approved by the Authority pursuant to Rule 6 of the Licencing (Generation) Rules, in a Power Purchase Agreement between SECL and CPPA.

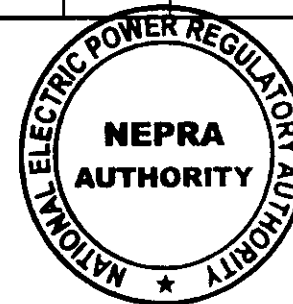


**SPECIFIED TARIFF- SAPPHIRE ELECTRIC COMPANY LIMITED**  
**PLANT OPERATION ON GAS**

Year	Energy Charge (Rs/kWh)			Capacity Charge Rs/kW per Month										Total Capacity charge		Total Tariff
	Fuel	Variable O&M	Total	Fixed O&M	Insurance	W.C	ROE DC	ROE	Withholding tax on div	Sub Total	Debt Servicing Foreign	Debt Servicing Local	Total Debt Servicing	Rs/kW/Mo	Rs/kWh	Rs/kWh
1	1.7787	0.1746	1.9533	79.2584	46.4833	11.2211	15.2037	166.4637	13.6251	332.2551	-	576.1291	576.1291	908.3842	2.0739	4.0272
2	1.7787	0.1746	1.9533	79.2584	46.4833	11.2211	15.2037	166.4637	13.6251	332.2551	-	576.1291	576.1291	908.3842	2.0739	4.0272
3	1.7787	0.1746	1.9533	79.2584	46.4833	11.2211	15.2037	166.4637	13.6251	332.2551	-	576.1291	576.1291	908.3842	2.0739	4.0272
4	1.7787	0.1746	1.9533	79.2584	46.4833	11.2211	15.2037	166.4637	13.6251	332.2551	-	576.1291	576.1291	908.3842	2.0739	4.0272
5	1.7787	0.1746	1.9533	79.2584	46.4833	11.2211	15.2037	166.4637	13.6251	332.2551	-	576.1291	576.1291	908.3842	2.0739	4.0272
6	1.7787	0.1746	1.9533	79.2584	46.4833	11.2211	15.2037	166.4637	13.6251	332.2551	-	576.1291	576.1291	908.3842	2.0739	4.0272
7	1.7787	0.1746	1.9533	79.2584	46.4833	11.2211	15.2037	166.4637	13.6251	332.2551	-	576.1291	576.1291	908.3842	2.0739	4.0272
8	1.7787	0.1746	1.9533	79.2584	46.4833	11.2211	15.2037	166.4637	13.6251	332.2551	-	576.1291	576.1291	908.3842	2.0739	4.0272
9	1.7787	0.1746	1.9533	79.2584	46.4833	11.2211	15.2037	166.4637	13.6251	332.2551	-	576.1291	576.1291	908.3842	2.0739	4.0272
10	1.7787	0.1746	1.9533	79.2584	46.4833	11.2211	15.2037	166.4637	13.6251	332.2551	-	576.1291	576.1291	908.3842	2.0739	4.0272
11	1.7787	0.1746	1.9533	79.2584	46.4833	11.2211	15.2037	166.4637	13.6251	332.2551	-	-	-	332.2551	0.7586	2.7118
12	1.7787	0.1746	1.9533	79.2584	46.4833	11.2211	15.2037	166.4637	13.6251	332.2551	-	-	-	332.2551	0.7586	2.7118
13	1.7787	0.1746	1.9533	79.2584	46.4833	11.2211	15.2037	166.4637	13.6251	332.2551	-	-	-	332.2551	0.7586	2.7118
14	1.7787	0.1746	1.9533	79.2584	46.4833	11.2211	15.2037	166.4637	13.6251	332.2551	-	-	-	332.2551	0.7586	2.7118
15	1.7787	0.1746	1.9533	79.2584	46.4833	11.2211	15.2037	166.4637	13.6251	332.2551	-	-	-	332.2551	0.7586	2.7118
16	1.7787	0.1746	1.9533	79.2584	46.4833	11.2211	15.2037	166.4637	13.6251	332.2551	-	-	-	332.2551	0.7586	2.7118
17	1.7787	0.1746	1.9533	79.2584	46.4833	11.2211	15.2037	166.4637	13.6251	332.2551	-	-	-	332.2551	0.7586	2.7118
18	1.7787	0.1746	1.9533	79.2584	46.4833	11.2211	15.2037	166.4637	13.6251	332.2551	-	-	-	332.2551	0.7586	2.7118
19	1.7787	0.1746	1.9533	79.2584	46.4833	11.2211	15.2037	166.4637	13.6251	332.2551	-	-	-	332.2551	0.7586	2.7118
20	1.7787	0.1746	1.9533	79.2584	46.4833	11.2211	15.2037	166.4637	13.6251	332.2551	-	-	-	332.2551	0.7586	2.7118
21	1.7787	0.1746	1.9533	79.2584	46.4833	11.2211	15.2037	166.4637	13.6251	332.2551	-	-	-	332.2551	0.7586	2.7118
22	1.7787	0.1746	1.9533	79.2584	46.4833	11.2211	15.2037	166.4637	13.6251	332.2551	-	-	-	332.2551	0.7586	2.7118
23	1.7787	0.1746	1.9533	79.2584	46.4833	11.2211	15.2037	166.4637	13.6251	332.2551	-	-	-	332.2551	0.7586	2.7118
24	1.7787	0.1746	1.9533	79.2584	46.4833	11.2211	15.2037	166.4637	13.6251	332.2551	-	-	-	332.2551	0.7586	2.7118
25	1.7787	0.1746	1.9533	79.2584	46.4833	11.2211	15.2037	166.4637	13.6251	332.2551	-	-	-	332.2551	0.7586	2.7118
26	1.7787	0.1746	1.9533	79.2584	46.4833	11.2211	15.2037	166.4637	13.6251	332.2551	-	-	-	332.2551	0.7586	2.7118
27	1.7787	0.1746	1.9533	79.2584	46.4833	11.2211	15.2037	166.4637	13.6251	332.2551	-	-	-	332.2551	0.7586	2.7118
28	1.7787	0.1746	1.9533	79.2584	46.4833	11.2211	15.2037	166.4637	13.6251	332.2551	-	-	-	332.2551	0.7586	2.7118
29	1.7787	0.1746	1.9533	79.2584	46.4833	11.2211	15.2037	166.4637	13.6251	332.2551	-	-	-	332.2551	0.7586	2.7118
30	1.7787	0.1746	1.9533	79.2584	46.4833	11.2211	15.2037	166.4637	13.6251	332.2551	-	-	-	332.2551	0.7586	2.7118
Levelised	1.7787	0.1746	1.9533											707.7824	1.6159	3.5692

Cents

5.9487



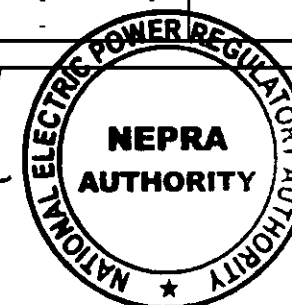


**SPECIFIED TARIFF - SAPPHIRE ELECTRIC COMPANY LIMITED**  
**PLANT OPERATION ON DIESEL**

Year	Energy Charge (Rs/kWh)			Capacity Charge Rs/kW per Month										Total Capacity charge		Total Tariff
	Fuel	Variable O&M	Total	Fixed O&M	Insurance	W.C	ROE DC	ROE	Withholding tax on div	Sub Total	Debt Servicing Foreign	Debt Servicing Foreign	Total Debt Servicing	Rs/kW/Mo	Rs/kWh	Rs/kWh
1	6.3325	0.2520	6.5845	79.2584	46.4833	24.0451	15.2037	166.4637	13.6251	345.0791	-	576.1291	576.1291	921.2083	2.1032	8.6877
2	6.3325	0.2520	6.5845	79.2584	46.4833	24.0451	15.2037	166.4637	13.6251	345.0791	-	576.1291	576.1291	921.2083	2.1032	8.6877
3	6.3325	0.2520	6.5845	79.2584	46.4833	24.0451	15.2037	166.4637	13.6251	345.0791	-	576.1291	576.1291	921.2083	2.1032	8.6877
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12	6.3325	0.2520	6.5845	79.2584	46.4833	24.0451	15.2037	166.4637	13.6251	345.0791	-	-	-	345.0791	0.7879	7.3723
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30	6.3325	0.2520	6.5845	79.2584	46.4833	24.0451	15.2037	166.4637	13.6251	345.0791	-	-	-	345.0791	0.7879	7.3723
Levelised			6.5845											720.6065	1.6452	8.2297

Cents

13.7162



**NATIONAL ELECTRIC POWER REGULATORY AUTHORITY  
NEPRA**

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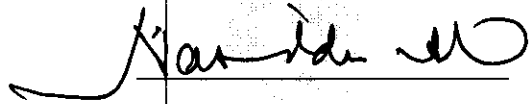
June 15, 2006  
No. NEPRA/TRF-50/SECL-2006

**Petitioner**

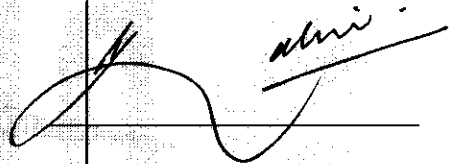
Sapphire Electric Company Limited

**Authority**

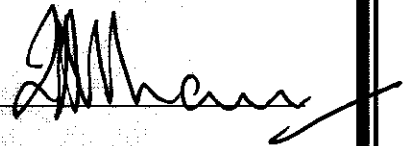
Nasiruddin Ahmed  
Member



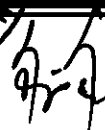
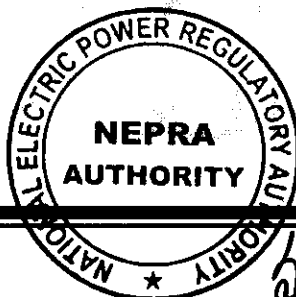
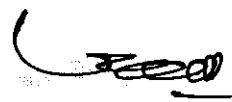
Abdul Rahim Khan  
Member



Zafar Ali Khan  
Member



Saeed uz Zafar  
Chairman



**NATIONAL ELECTRIC POWER REGULATORY AUTHORITY**

**NEPRA**

June 15, 2006

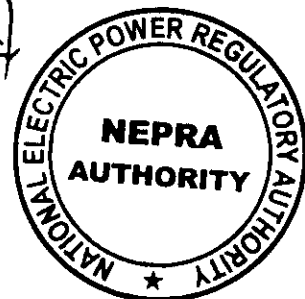
Case No. NEPRA/TRF-50/SECL-2006

**DETERMINATION**  
OF THE TARIFF PETITION AND MOTION UNDER RULE 9(19)  
OF

**SAPPHIRE ELECTRIC COMPANY LIMITED**  
**(SECL)**

FOR SALE OF ELECTRICITY TO

**CENTRAL POWER PURCHASING AGENCY**  
**(CPPA)**



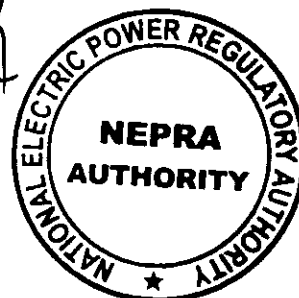
## BACKGROUND

1. Sapphire Electric Company Ltd. (SECL) is a locally incorporated specific purpose company intending to set up a 234 MW combined cycle power generation unit. The project will be located at Muridke, District Lahore. The primary fuel for the project is proposed to be natural gas and HSD as alternate fuel. The electricity generated will be sold to CPPA purchasing on behalf of Discos.
2. Having already applied for a generation license, SECL submitted a tariff application on Feb 14, 2006 for sale of power to CPPA. This tariff petition was admitted for consideration by the Authority on Feb 16, 2006 and was assigned case number NEPRA/TRF-50/SECL 2006. Salient features of the petition were advertised on 20<sup>th</sup> February 2006 in the newspapers to inform all the interested persons/stakeholders and to invite participation in the tariff-setting proceedings through their comments and/or becoming a party to the proceedings as intervenors. Invitations were also sent to the concerned Federal Government ministries, provincial governments, Chambers of Commerce and Industries, representatives of professional bodies and Experts, soliciting their views on the petition. No intervention request/comments were received.
3. A public hearing on the petition was held on March 28, 2005 at NEPRA Main Office Islamabad. This hearing was participated by the applicant, stakeholders, as well as members of general public.

## SUBMISSIONS OF SECL

4. SECL submitted that the proposed generation plant would consist of a combined cycle power plant with an installed capacity of 234 MW gross at ISO conditions. The combined cycle power plant will comprise of two Gas Turbines, two Heat Recovery Steam Generators (HRSG), and a Steam Turbine. SECL and NTDC have already

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agreed on a reference tariff. The estimated total Capital Cost of the project is proposed to be US\$ 181 million (Capital Expenditure \$167.5 million and IDC \$14.020)

5. SECL has requested a two-part tariff consisting of Capacity Purchase Price (CPP) and Energy Purchase Price (EPP) for 30 years. The capacity payments for the first ten year period are proposed to be Rs. 888.23/kW/month followed by capacity payments of Rs. 324.62/kW/month during the remaining period of year 11 to 30. The energy component is uniform for both the periods at Rs. 1.525/kWh. Key cost recovery components include:

- Fuel Cost
- O&M Costs
- Debt Servicing Liability
- Return on Equity

#### Structure of Reference Tariff

6. The structure of Reference Tariff has been proposed to comprise of the following components:
- (i) Capacity Purchase Price (CPP) consisting of two parts:
    - Escalable Component
    - Non-Escalable Component
  - ii) Energy Purchase Price (EPP) consisting of two parts:
    - Fuel Cost;
    - Variable O&M
  - iii) Pass-Through Items

SECL has stated that they have agreed on a reference tariff with NTDC as indicated in the following table.



Description	Energy Price Rs./kWh			CPP Rs./kWh	Total Rs./kWh
	Fuel	Var O&M	Total		
Average Years 1-10	1.525	0.224	1.749	1.998	3.777
Average Years 11-30	1.525	0.224	1.749	0.747	2.49
Average Years 1-30	1.525	0.224	1.749	1.17	2.919
Levelized Tariff	1.525	0.224	1.749	1.58	3.329

Pass-through Items:

7. Following items have been identified as pass-through in the petition:
- Variation in Fuel Price
  - Variation in KIBOR
  - Taxes, levies, government charges etc.

Indexation:

8. SECL has assumed Indexations on the basis of Power Policy 2002 in reference tariff.

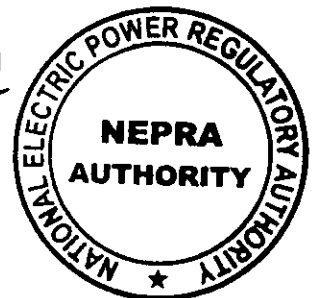
**Determination Sought**

9. Based on its submissions, SECL has sought approval of the reference tariff agreed with NTDC subject to proposed assumptions and Indexations.

**MOTION UNDER RULE 9(19)**

10. Sapphire Electric Company Limited filed a motion under rule 9(19) of NEPRA Tariff Standards and Procedures Rules 1998 vide No. N1-050606-1 dated June 05, 2006 which was admitted for consideration by the Authority in Regulatory Meeting No.06-162 held on June 07, 2006 and hearing was scheduled for June 12. Notice of hearing was issued to all the stakeholders who were invited to the hearing of the original petition. A hearing on the

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motion was held on June 12, 2006 at NEPRA Main office which was attended by representatives of NTDC, PPIB and NEPRA professionals.

**Main issues of the motion.**

- a) Reduction in Thermal Efficiency and reduction in Capital Cost:
- b) Inclusion of degradation of plant output and heat rate in the PPA.

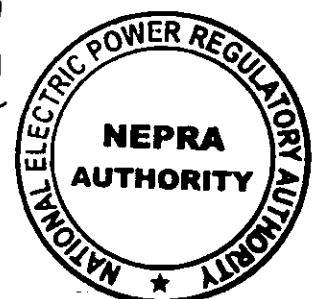
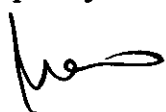
**Thermal Efficiency and Capital Cost:**

11. Sapphire requested for reduction of thermal efficiency on Gas from 51.69% to 51.2% and on HSD from 48.80% to 47.73% and for reduction of the EPC cost to \$143.9 million from \$144.5 million for the revised efficiencies thus requesting for a reduction of \$0.6 million in EPC cost. During the hearing of the motion, Sapphire explained that the reason for their request to the Authority was that none of the 4 EPC contractors they have approached for the plant can guarantee the efficiency of 51.69% on gas. Out of 4 contractors only one contractor has guaranteed the efficiency of 51.2%, two have guaranteed 51.00% and 51.08% while one contractor has guaranteed 51.33%. They explained that their difficulty was partly due to the reason that these latest technology turbines have no historical performance record in Pakistan and very few are in place elsewhere in the world. They submitted that a few EPC contractors were ready to attempt for 51.7% efficiency but without any guarantee and with a minimum up charge of \$6 million and additional O&M cost of 3% to 5%. NTDC representative agreed with the reduction in efficiencies and submitted before the Authority that the original EPC cost agreed with Sapphire included a provision of \$1.72 million for the additional efficiency and the EPC cost should be reduced to \$142.78 million instead of \$143.9 million. Sapphire vide its letter No. N1-1-120606 dated June 12, 2006 submitted the



cost and benefit analysis of the proposed change and comments on NTDC's submission. It stated submitted that the present value of fuel cost savings at 90% plant factor works out to be \$6.9 million over the life of the plant (for 9 months operation on gas the savings would be \$5.2 million) and has submitted that based on their negotiations with EPC contractors, they will have to invest \$ 6 million on achieving the higher efficiency and would incur higher O&M cost of \$3.136 million over the life of the plant. They submitted that they have not agreed with NTDC on the incremental cost of \$1.72 million for the higher efficiency as the cost of additional equipment required is considerably more, but have agreed on the total price package and can accept the reduction of \$1.72 million only if the tariff agreed with NTDC is approved without any changes.

12. The Authority is of the view that 0.5% differential in thermal efficiency translate into approx. \$ 0.5 million per annum on current prices which will increase with rise in fuel prices and is worth an investment prudently incurred on the additional cooling and other equipment. However keeping in view the difficulties faced by the petitioner and their exposure to increased operational risk with consequential financial loss, the Authority is accepting the motion and allowing the adjustment in efficiencies. As regards the cost adjustment, the EPC cost of \$144.5 million was agreed with NTDC in December 2005. After reduction of \$1.72 million for the efficiency adjustment the EPC cost comes to \$ 142.78 million. According to inflationdata.com, the US CPI in December 2005 was 196.8 which rose to 201.5 in April 2006 thus recording an increase of 2.1%. If US CPI is applied, the adjusted EPC cost works out to \$146.21 million as of April 2006. Therefore the requested EPC cost of \$143.9 seems reasonable and is allowed subject to the condition that the base reference date for indexation of various components of the capacity charge of the reference tariff shall be taken as April 2006.





**Degradation of plant output and heat rate.**

13. The Authority directs that the issue should be addressed at the time of signing PPA with the Power Purchaser.

**MAIN ISSUES OF THE TARIFF PETITION AND MOTION UNDER RULE 9(19)**

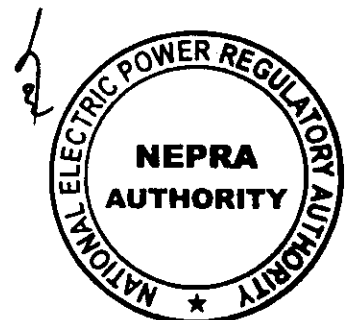
14. The following main issues have emerged from the contents of the tariff petition and proceedings in the case:

- Procurement of power by NTDC from private GENCO's.
- Availability of gas and Choice of Alternate fuel
- Net output of the plant
- Project Cost
- Fuel Cost
- O&M Expenses
- Cost of Capital
- Unresolved Issues with NTDC

**PROCUREMENT OF POWER BY NTDC FROM PRIVATE GENERATING COMPANIES**

15. The Authority considers that the prudence of power procurement ensures a wholesome balance between the interest of the consumers as well as the service providers and other stakeholders. In this context NEPRA has issued the Interim Power Procurement (Procedures and Standards) Regulations, 2005 (Power Procurement Regulations) which requires NTDC to establish prudence of power procurement on behalf of DISCOs. In the instant case, NTDC has negotiated the reference tariff with SECL pursuant to the permission granted to it by the Authority under the aforesaid

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regulations vide letter No. 1687-88 dated 26-10-2005. The Authority examined the instant power procurement from SECL under the the following heads as well:-

Technology

16. SECL has proposed to install a combined cycle plant based on gas usage with Diesel as alternate fuel. The proposed plant is GE 206 FA+. The tariff requested is based on 9 months usage of gas and 3 months usage of Diesel. In view of the assurances by PPIB and GOP in the earlier case of Orient being applicable in the instant case as well; that gas will be available for the life of the plant for at least 9 months in a year, the technology proposed is accepted.

(b) Quantum

17. The proposed plant will have a capacity of 234 MW (ISO rating). In view of load growth expected as a result of economic growth and the scarcity of gas in the country, the proposed size is allowed, though plant of a bigger size would have been more economical.

(c) Location

18. The location of the plant is proposed to be near Muridke which is within the load demand area of LESCO, FESCO and GEPCO where capacity additions are required. Therefore the location is appropriate and is accepted in view of the demand projections of these Discos provided by NTDC.

(d) Timing of Induction.

19. We have been informed by NTDC that approximately 1663 MW of power generating capacity needs to be augmented if peak demand in 2007 is to be met without recourse to load shedding. However area wise peak demand requirement and the transmission system configuration have to be examined to ensure that power from SECL

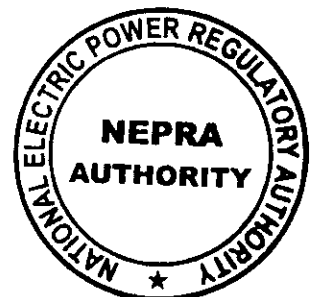


is made available to meet area wise peak demand as close to the time of occurrence of demand as possible

20. We have been informed by NTDC that the load demand in winter peak of January 2007 requires additional power mainly in the area of FESCO, LESCO and GEPCO to the tune of about 1700 MW and no transmission constraints have been identified for handling the power from Sapphire. Therefore the Authority is convinced that Power generated from Sapphire Power can be effectively utilized to meet the demand in the aforesaid area.

**Availability of Gas and Choice of Alternate fuel.**

21. SECL has proposed to install a combined cycle steam and gas STAG plant. The question of assured availability of gas throughout the life of the project on annual basis was examined. It was revealed that there is no formal fuel supply agreement between the fuel supplier and SECL.
22. In this context, SNGPL vide their letter dated 7.02.2006 addressed to SECL informed that gas availability is confirmed on 9 months in a year basis (March to November) upto 2009-10. The matter was referred to the Secretary, Ministry of Water & Power in another case of Orient by the Authority vide its communication of 25<sup>th</sup> March 2005 in which the Ministry of Water & Power was apprised of the significance of the adverse impact on consumer end tariff in case of non availability of gas and use of diesel as an alternate fuel.
23. In response, the Ministry of Water & Power vide PPIB letter No. 1(102)PPIB-1003/05/PRJ dated 27.4.2005 informed that the approval for new power projects until 2010 is based on existing gas supply contracts, most of which are expiring between 2011-2014; however, in all likelihood new supply contracts will be made on the basis of imported gas or new discoveries. PPIB further informed



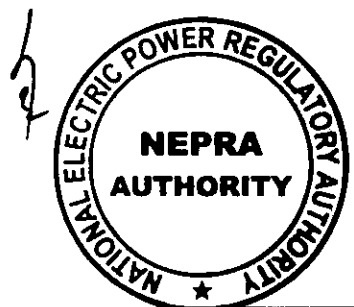
that the GoP is guaranteeing the supply of gas only until 2010, however it does not mean that supplies will be suddenly cut off after 2010 and it is expected that gas will continue to be supplied to new power projects beyond 2010 may be for a period of less than 9 months in a year. Once gas imports start, as projected in 2011 supply for full 12 months is expected for the long term.

24. The Authority is aware that the non-availability of gas is mainly expected to occur in or around the winter months. Therefore if alternate fuel usage is not allowed the capacity addition would become redundant. As such to avail the optimum benefit of additional investments diesel usage is allowed as per GoP Fuel Policy.
25. Looking at the problem from the overall power acquisition mix, the present case of power acquisition constitutes about 5% of the generation capacity addition expected to be inducted through the private sector between now and the year 2012 and the plant is justifiable with restricted diesel usage.

**Net output of the plant:**

26. Sapphire has submitted that the proposed plant GE 206FA+ would have gross ISO capacity of 234 MW and net on site capacity of 209 MW after 11% adjustment for mean site conditions and auxiliary load. According to GTW Handbook 2005 edition, the output on ISO conditions of 206FA+ is 237.9 MW. The Authority has recently approved tariff for Orient who had proposed a different type of 206FA+ plant with 225 MW gross ISO capacity and 209 MW net on site with 7% adjustment for site conditions and auxiliary load. The Authority is of the view that the net output of the standard configuration of the 206FA+ should be around 220 MW as the site conditions of the Orient plant and Sapphire plant do not vary materially. The petitioner was requested to explain the discrepancy,

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who has explained that the net output has been worked out by Fichtner in the feasibility study and is the result of a computer program.

27. The Authority is of the view that the output is an important factor in tariff calculations and serves as a denominator in working out the per kW and per kWh cost, as such the discrepancy cannot be ignored. It is directed that the applicant should arrange for test of dependable capacity on COD by an independent engineer to be witnessed by the representatives of NTDC and NEPRA; the reference tariff table will be amended for the output established by the test at the time of COD.

**Project Cost:**

28. The project cost has been requested at \$ 181.520 million comprising of plant cost of \$167.5 million (including EPC cost of \$144.5 million) and IDC of \$14.020 million. Custom duty on import of plant and equipment has not been included. Spares of \$4.580 million have been excluded from the project cost and included in working capital cost. The feasibility report of Fichtner has estimated the plant cost at \$167.214 million including stock of spares. The Authority has assessed the capital cost at \$166.157 inclusive of spares after adjustment of EPC cost under motion under rule 9(19) and is allowed. Custom duty amounting to \$ 5.037 million is being added @ 5% of the cost of imported equipment. This will be subject to adjustment on actual on the COD of the project alongside the adjustment of IDC. With the acceptance of motion under rule 9(19), the project cost is summarized below:

	<u>\$ Million</u>	
EPC	143.900	FX adjustment on 70% for imported equipment on cod
Cutom Duty	5.037	subject to adjustment on actual
Other (incl spares)	22.257	
IDC	<u>14.358</u>	subject to adjustment on actual
	<u>185.552</u>	



### Fuel Cost

29. The fuel cost was calculated by SECL on the basis of efficiencies at site conditions on the following reference values:

#### Natural Gas

Efficiency of Combined Cycle Plant (Full Load)	51.69%	
Reference Price	208.56	Rs./MMBTU
Heat Rate	6,603	BTU/kWh
Fuel component on Gas	1.525	Rs./kWh

#### Diesel

Efficiency of Combined Cycle Plant (Full Load)	48.8%	
Reference Price	31.70	Rs./Litre
Heat Rate	6994	BTU./kWh
Fuel component on Diesel	6.436	Rs./kWh

Upon acceptance of motion under Rule 9(19) of NEPRA Tariff Standards and Procedures Rule 1998, the efficiency on gas is revised to 51.2%. However for HSD, the efficiency is revised to 48.5% as allowed to Orient for a similar power plant. The fuel cost is allowed at updated reference values. As regards degradation of plant for efficiency and output over time, the same should be addressed in the PPA with the power purchaser.

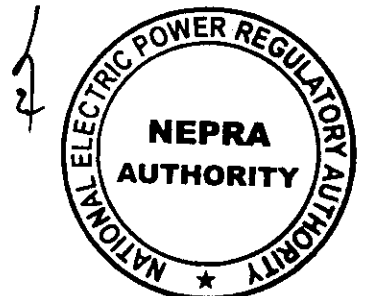
### O&M Costs

30. The applicant has proposed to recover the O&M Costs for 209MW of net output as under:

Variable O&M	Rs.0.224/kWh
Fixed O&M	Rs.66.39/kW/Month
Insurance	Rs.46.67/kW/Month
Working Capital	Rs.26.26/kW/Month

31. Insurance cost has been requested @1.35% of EPC cost per annum over the life of the plant. During the hearing it was submitted that the insurance cost in Pakistan has risen recently due to earthquake and natural calamities. The Authority is aware that the actual insurance cost would vary from year to year depending on the fluctuations in insurance premium rates as such insurance is

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allowed as pass through item and 1.35% of the EPC cost is being included as insurance cost for tariff calculations. However, the actual insurance cost for the minimum cover required under contractual obligations with the power purchaser not exceeding 1.35% of EPC cost will be treated as pass through and this component of CPP will be paid subject to adjustment on the following formula:

$\text{Rs.}46.4833/1.35\% \text{ of } 143.9 \times \text{Revised percentage of } 143.9$

32. Working capital cost has been requested for 15 days of Diesel storage at 60% plant factor and inventory of spares. During the hearing, it was discussed that 15 days storage was on the higher side and with better supply chain management; the storage requirement could be reduced to a week. The applicant contended that 15 days storage was a requirement of the proposed PPA. According to the new standardized PPA Section 5.14(b), the petitioner has to maintain on the site an inventory of back up fuel for 7 days on full load during operation on gas and for 15 days at full load during non-firm gas delivery period, which is allowed in the instant case. However, spares are being excluded from the working capital as these have been provided in the capital cost of the project in the feasibility report of Fichtner.
33. The applicant has requested for O&M cost of \$ 6.876 million per annum to be recovered as variable cost of Rs. 0.224/kWh (\$4.10 million) and fixed O&M cost of Rs. 66.39/kW/month (\$2.78 million) in addition to working capital cost of Rs.26.26/kW/month (\$1.10 million). The variable cost represents the cost of consumables and periodic maintenance and inspections. In a similar petition of Saif Power, variable cost for 48,000 operating hours for net capacity of 209 MW has been estimated at \$ 29.5 million which includes \$3.653 million for consumables. The variable charge per kWh comes to Rs.0.1528/kWh and consumables come to Rs.0.0218/kWh which

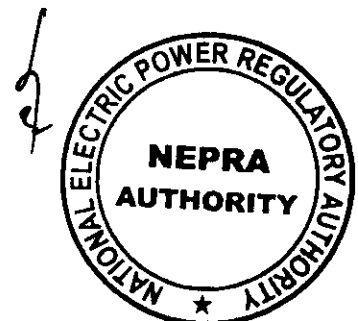


are being allowed in the instant case as well for operation on gas. For operation on HSD, variable cost @ Rs. 0.2520/kWh is being allowed to cover the extra maintenance required in that case. For fixed O&M, \$3.313 million per annum is considered reasonable which is allowed @ Rs. 79.2584/kW/month. For financing cost of working capital, Rs.11.2211/kW/month is allowed for 7 days of diesel storage inclusive of GST during operation on gas and Rs.24.0451 for 15 days of diesel storage during non-firm gas delivery period, as required in the PPA.

**Cost of Capital:**

34. Debt service cost has been requested on KIBOR+300 basis points with variations in KIBOR to be pass through which is allowed.
35. Return on Equity has been computed to allow 15% IRR on equity investment by including a component of ROE during construction of Rs.15.2037/kW/month based on equity draw down assumption of 50:50 during the first and second year of construction. The ROE DC will be adjusted for actual draw down on COD along side IDC. Withholding tax on dividend @7.5% of the return (Rs.13.6251/kW/month) has been included in pursuance of Guidelines for determination of Tariff for IPP's issued by the Federal Government in November 2005. As regards the payment of withholding tax it is a pass-through item just like other taxes as indicated in the Government Guidelines for Determination of Tariff for New IPP's subject to maximum of Rs.13.6251/kW/month on cumulative basis. In case the dividend is declared for an accumulated period, withholding tax shall be worked out for the same period for which the dividend is declared.

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**Unresolved Issues with NTDC:**

36. During the hearing, Sapphire presented the following open issues which could not be resolved with NTDC and have a bearing on tariff:

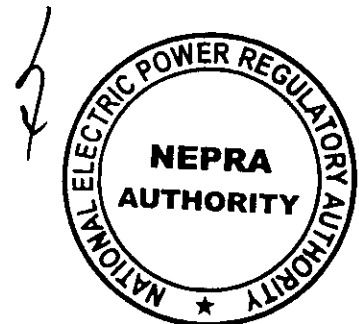
1. Hedging costs approximately 5% of EPC
2. US CPI on foreign components in addition to local CPI
3. Local indexation be allowed on CPI instead of WPI
4. Debt Service Reserve Account-US \$ 6 million
5. LC Confirmation charges on actual

37. It should be noted that US CPI is not covered under Power Policy 2002 and cannot be allowed. The local indexation was allowed on CPI in the earlier case of Orient but was revised to WPI on the reference of the PPIB in motion for reconsideration and is maintained at WPI. The Debt Service Reserve cannot be allowed in view of the fact that debt servicing cost will be paid by NTDC monthly in advance of the actual occurrence of the quarterly payment. LC Confirmation charges are already covered in the allowed EPC cost. As regards, the hedging costs requested, the operator is exposed to the risk of exchange difference between the time of ordering the equipment and that of receiving them in Pakistan. The Authority is allowing FX indexation on the foreign component of the EPC cost not exceeding 70% of the EPC cost) on actual basis.

**Reference Tariff**

38. After reviewing the evidence submitted during the proceedings and from information gained through other sources, the Authority has determined the reference tariff for SECL as indicated in the following table:

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Reference Tariff

Tariff Components	Year 1 to 10	Year 11 to 30	Indexation
Capacity Charge (PKR/kW/Month)			
O&M Foreign	47.5550	47.5550	US\$ to Rupee
O&M Local	31.7034	31.7034	WPI
Cost of Working Capital *	11.2211	11.2211	NIL
Insurance	46.4833	46.4833	US\$ to Rupee
Debt Service	576.1291	-	KIBOR
Return on Equity	166.4637	166.4637	NIL
ROE during Construction	15.2037	15.2037	NIL
Total Capacity Charge	894.7593	318.6302	
* In case of plant operation on HSD cost of working capital shall be paid on 15 days inventory level basis which is Rs. 24.0451 Rs./kW/month.			
A) Energy Charge on Operation on Gas Rs./kWh			
Fuel Cost Component	1.7787	1.7787	Fuel Price
Variable O&M	0.1746	0.1746	\$ to Rupee
B) Energy Charge on Operation on HSD Rs./kWh			
Fuel Cost Component	6.3325	6.3325	Fuel Price
Variable O&M	0.2520	0.2520	\$ to Rupee

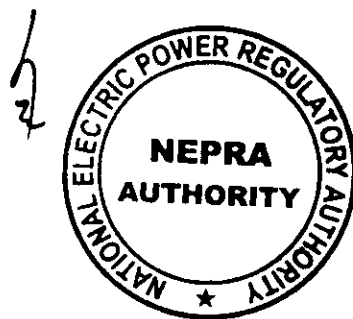
- Note:
- Capacity Charge Rs./kW/month is applicable to dependable capacity at the delivery point.
  - Dispatch criterion will be Energy Charge.
  - The above tariff is applicable for a period of 30 years commencing from the date of the Commercial Operation.

**One Time Adjustment**

Adjustment due to variation in net capacity

39. The reference tariff has been determined on the basis of net capacity of 209 MW at delivery point at mean site conditions. All the tariff components except fuel cost component shall be adjusted at the time of COD based upon the IDC tests to be carried out for

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determination of contracted capacity. The adjustments shall be made according to the following formula:

i) Revised Fixed O&M Foreign	=	47.5550/tested IDC x 209
ii) Revised Fixed O&M Local	=	31.7034/tested IDC x 209
iii) Insurance	=	46.4833/tested IDC x 209
iv) Debt Service	=	576.1291/tested IDC x 209
v) Return on Equity	=	166.4637/tested IDC x 209
vi) ROE during Construction	=	15.2037/tested IDC x 209
vii) Variable O&M	=	0.1528/tested IDC x 209

#### Adjustment in Insurance Component

Insurance component of reference tariff shall be adjusted as per actual on yearly basis upon production of authentic documentary evidence by SECL according to the following formula;

$$\text{Insurance (Revised)} = \text{AIC}/\$1.943 \text{ million} \times \text{AP}$$

Where;

AIC = Adjusted Insurance Component as per IDC Test

AP = Actual Premium

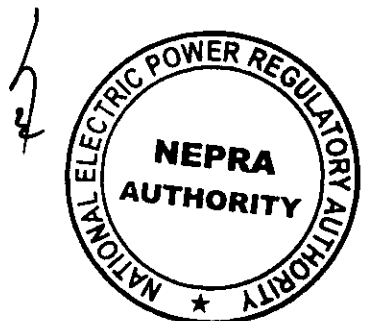
#### Adjustment due to customs duties and Interest during Construction

Debt Service, Return on-Equity and ROE during construction shall be made at COD on account of actual variation in customs duties, drawdown and Interest During Construction with reference to the estimated figures of USD 5.037 million and USD 14.358 million respectively. SECL shall submit the relevant documents to NEPRA within 7 days of COD for adjustment of relevant tariff components.

#### Pass-Through Items:

40. No provision for income tax has been accounted for in the tariff. If SECL is obligated to pay any tax on its income, the exact amount paid by the company will be paid by CPPA to SECL on production of original receipts. This payment will be considered as pass-through (as Rs./kW/month) monthly payment spread over a 12 month

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period in addition to the capacity purchase price proposed in the Reference Tariff. Furthermore, in such a scenario, SECL may also submit to CPPA details of any tax shield savings and CPPA will deduct the amount of these savings from its payment to SECL on account of taxation.

**Indexations:**

41. The reference tariff shall be applicable subject to indexation as follows:-

Indexation applicable to O&M

42. The 40% of Fixed O&M part of Capacity Charge will be adjusted on account of Inflation (WPI) and 60% on account of variation in dollar/Rupee exchange rate. WPI adjustment for inflation will be made on quarterly basis, on the basis of WPI as notified by the Federal Bureau of Statistics (FBS) for the month of August, November, February & May respectively. Indexation for variation in dollar/rupee exchange rate will be made on October 1, January 1, April 1 & July 1 on the basis of revised TT & OD selling rate of US Dollar as notified by the National Bank of Pakistan. The mode of indexation will be as under:

- (a) Fixed O&M

$$F O\&M(RWPI) = \frac{\text{Rs. } 31.7034 \text{ per kW per Month} * WPI (REV)}{117.80}$$

$$F O\&M(RE) = \text{Rs. } 47.5550 \text{ per kW per Month} * ER(REV) / 60$$

Where:

F O&M(RWPI) = The revised applicable Fixed O&M Component of the Capacity Charge indexed with WPI

F O&M (RE) = The revised applicable Fixed O&M Component of the Capacity Charge indexed with Currency fluctuation

WPI(REV) = the Revised Wholesale Price Index (manufactures)



Reference WPI = 117.80 Wholesale Price Index (manufactures) of April 2006 notified by Federal Bureau of 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.

(b) Variable O&M

43. The formula of indexation for Variable O & M component will be as under:

$$V O\&MG (RE) = Rs.0.1746 \text{ per kWh} * ER(REV) / Rs.60 \text{ per \$}$$

$$V O\&MG (RE) = Rs.0.2520 \text{ per kWh} * ER(REV) / Rs.60 \text{ per \$}$$

Where:

V O&MG(REV) = The revised applicable Variable O&M Component of Energy Charge indexed with currency fluctuation.

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

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

Adjustment for KIBOR variation

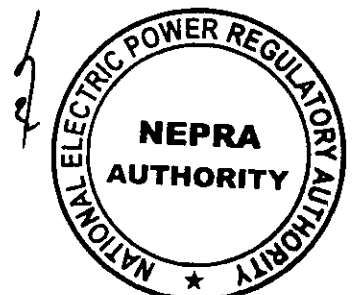
44. The interest part of fixed charge component will remain unchanged throughout the term except for the adjustment due to variations in interest rate as a result of variation in quarterly KIBOR according to the following formula;

$$\Delta I = P(REV) * (KIBOR(REV) - 9.0 \%) / 4$$

Where:

$\Delta I$  = the variation in interest charges applicable corresponding to variation in KIBOR.  $\Delta I$  can be positive or negative depending upon whether KIBOR REV > or < 9.0 %. The interest payment obligation will be enhanced or reduced to the extent of  $\Delta I$  for each quarter under adjustment applicable on quarterly basis.

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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.

#### Fuel Price Variation

45. The Variable Charge part of the tariff relating to fuel cost shall be adjusted on account of the fuel price variations as and when notified by the relevant authority, which in the instant case is the Oil & Gas Regulatory Authority. In this regard, the variation in SECL's allowed rate relating to fuel cost shall be revised according to the following formula:

$$FCg(\text{Rev}) = \text{Rs. } 1.7787 \text{ per kWh} * FP(\text{Rev}) / \text{Rs. } 266.83 \text{ per MMBTU}$$

Where:

$$FCg(\text{Rev}) = \text{Revised fuel cost component of Variable Charge on gas}$$

$$FPg(\text{Rev}) = \text{The new price of gas as notified by the relevant Authority per MMBTU of fuel adjusted for LHV-HHV factor.}$$

$$FCd(\text{Rev}) = \text{Rs. } 6.3325 \text{ per kWh} * FP(\text{Rev}) / \text{Rs. } 34.37 \text{ per Litre (Excl-GST)}$$

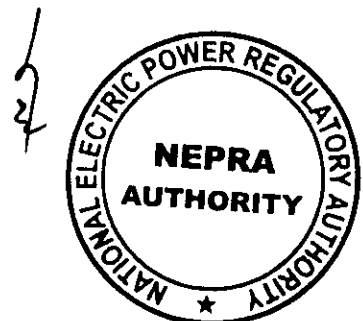
Where:

$$FCd(\text{Rev}) = \text{Revised fuel cost component of Variable Charge on diesel}$$

$$FPd(\text{Rev}) = \text{The new price of diesel as notified by the relevant Authority per Litre of fuel adjusted for LHV-HHV factor.}$$

46. SECL may submit a request for adjustment on account of inflation, foreign exchange variation, KIBOR variation and fuel price variation within seven days of the applicable date. The Authority will approve and announce the adjustments for immediate application within seven days of the filing of the request by SECL.

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## ORDER

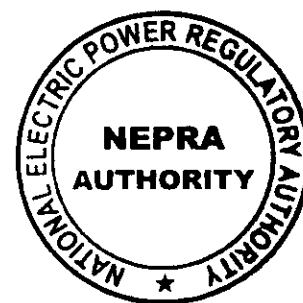
47. Pursuant to Rule 6 of the NEPRA Licensing (Generation) Rules 2000, Sapphire Electric Company Limited is allowed to charge, subject to adjustment of Capacity Purchase Price on account of net dependable capacity as determined by test jointly carried out by Central Power Purchasing Agency (CPPA) and the petitioner, the following specified tariff 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 30	Indexation
<b>Capacity Charge</b> (PKR/kW/Month)			
O&M Foreign	47.5550	47.5550	US\$ to Rupee
O&M Local	31.7034	31.7034	WPI
Cost of Working Capital *	11.2211	11.2211	NIL
Insurance	46.4833	46.4833	US\$ to Rupee
Debt Service	576.1291	-	KIBOR
Return on Equity	166.4637	166.4637	NIL
ROE during Construction	15.2037	15.2037	NIL
<b>Total Capacity Charge</b>	<b>894.7593</b>	<b>318.6302</b>	
* In case of plant operation on HSD cost of working capital shall be paid on 15 days inventory level basis which is Rs. 24.051 Rs./kW/month.			
<b>A) Energy Charge on Operation</b> on Gas Rs./kWh			
Fuel Cost Component	1.7787	1.7787	Fuel Price
Variable O&M	0.1746	0.1746	\$ to Rupee
<b>B) Energy Charge on Operation</b> on HSD Rs./kWh			
Fuel Cost Component	6.3325	6.3325	Fuel Price
Variable O&M	0.2520	0.2520	\$ to Rupee

Note: i) Capacity Charge Rs./kW/month applicable to dependable capacity at the delivery point.  
ii) Dispatch criterion will be Energy Charge.

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- iii) The above tariff is applicable for a period of 30 years commencing from the date of the Commercial Operation.
- iv) Component wise tariff for operation on Gas and HSD is indicated at Annex-I & II.

The following indexations shall be applicable to reference tariff;

### One Time Adjustment

#### Adjustment due to variation in net capacity

The reference tariff has been determined on the basis of net capacity of 209 MW at delivery point at mean site conditions. All the tariff components except fuel cost component shall be adjusted at the time of COD based upon the IDC tests to be carried out for determination of contracted capacity. The adjustments shall be made according to the following formula:

- i) Revised Fixed O&M Foreign = 47.5550/tested IDC x 209
- ii) Revised Fixed O&M Local = 31.7034/tested IDC x 209
- iii) Insurance = 46.4833/tested IDC x 209
- iv) Debt Service = 576.1291/tested IDC x 209
- v) Return on Equity = 166.4637/tested IDC x 209
- vi) ROE during Construction = 15.2037/tested IDC x 209
- vii) Variable O&M = 0.1528/tested IDC x 209

#### Adjustment in Insurance Component

Insurance component of reference tariff shall be adjusted as per actual on yearly basis upon production of authentic documentary evidence by SECL according to the following formula;

$$\text{Insurance (Revised)} = \text{AIC} / \$1.943 \text{ million} \times \text{AP}$$

Where;

AIC = Adjusted Insurance Component as per IDC Test

AP = Actual Premium

Adjustment due to customs duties and Interest during Construction

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Debt Service, Return on Equity and ROE during construction shall be adjusted at COD on account of actual variation in customs duties, drawdown and Interest During Construction with reference to the estimated figures of USD 5.037 million and USD 14.358 million respectively. SECL shall submit the relevant documents to NEPRA within 7 days of COD for adjustment of relevant tariff components.

### **Pass-Through Items**

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

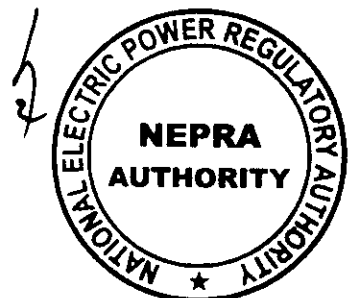
### **Indexations:**

The reference tariff subject to indexation shall be applicable as follows;

Indexation applicable to O&M

The 40% of Fixed O&M part of Capacity Charge will be adjusted on account of Inflation (WPI) and 60% on account of variation in dollar/Rupee exchange rate. WPI adjustment for inflation will be made on quarterly basis, on the basis of WPI as notified by the Federal Bureau of Statistics (FBS) for the month of August, November, February & May respectively. Indexation for variation in

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dollar/rupee exchange rate will be made on October 1, January 1, April 1 & July 1 on the basis of revised TT & OD selling rate of US Dollar as notified by the National Bank of Pakistan. The mode of indexation will be as under:

(a) **Fixed O&M**

$$F \text{ O\&M(RWPI)} = \frac{\text{Rs.31.7034 per kW per Month} * \text{WPI (REV)}}{117.80}$$

$$F \text{ O\&M(RE)} = \text{Rs. 47.5550 per kW per Month} * \text{ER(REV)} / 60$$

Where:

F O&M(RWPI) = The revised applicable Fixed O&M Component of the Capacity Charge indexed with WPI

F O&M (RE) = The revised applicable Fixed O&M Component of the Capacity Charge indexed with Currency fluctuation

WPI(REV) = the Revised Wholesale Price Index (manufactures)

Reference WPI = 117.80 Wholesale Price Index (manufactures) of April 2006 notified by Federal Bureau of 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.

(b) **Variable O&M**

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

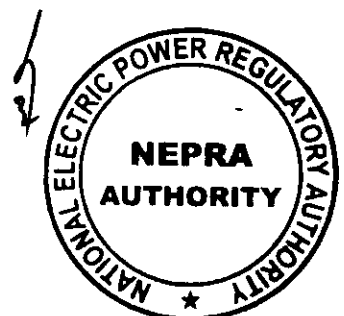
$$V \text{ O\&MG (RE)} = \text{Rs.0.1746 per kWh} * \text{ER(REV)} / \text{Rs.60 per \$}$$

$$V \text{ O\&MG (RE)} = \text{Rs.0.2520 per kWh} * \text{ER(REV)} / \text{Rs.60 per \$}$$

Where:

V O&MG(REV) = The revised applicable Variable O&M Component of Energy Charge indexed with currency fluctuation.

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

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

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;

$$\Delta I = P(\text{REV}) * (\text{KIBOR}(\text{REV}) - 9.0\%) / 4$$

Where:

$\Delta I$  = the variation in interest charges applicable corresponding to variation in KIBOR.  $\Delta I$  can be positive or negative depending upon whether  $\text{KIBOR}(\text{REV}) >$  or  $< 9.0\%$ . The interest payment obligation will be enhanced or reduced to the extent of  $\Delta I$  for each quarter under adjustment applicable on quarterly basis.

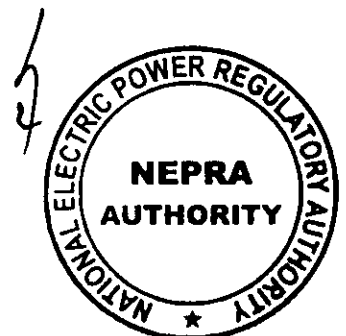
$P(\text{REV})$  = is the outstanding principal (as indicated in the attached debt service schedule to this order) on a quarterly basis on the relevant quarterly calculations date. Period 1 shall commence on the date on which the 1st installment is due after availing the grace period.

### Fuel Price Variation

The Variable Charge part of the tariff relating to fuel cost shall be adjusted on account of the fuel price variations as and when notified by the relevant authority, which in the instant case is the Oil & Gas Regulatory Authority. In this regard, the variation in SECL's allowed rate relating to fuel cost shall be revised according to the following formula:

$$\text{FCg}(\text{Rev}) = \text{Rs.1.7787 per kWh} * \text{FP}(\text{Rev}) / \text{Rs. 266.83 per MMBTU}$$

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Where:

- FCg (Rev) = Revised fuel cost component of Variable Charge on gas
- FPg (Rev) = The new price of gas as notified by the relevant Authority per MMBTU of fuel adjusted for LHV-HHV factor.
- FCd(Rev) = Rs. 6.3325 per kWh \* FP(Rev)/Rs. 34.37 per Litre (Excl. GST)

Where:

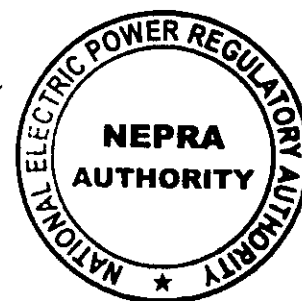
- FCd (Rev) = Revised fuel cost component of Variable Charge on diesel
- FPd(Rev) = The new price of diesel as notified by the relevant Authority per Litre of fuel adjusted for LHV-HHV factor.

SECL may submit a request for adjustment on account of inflation, foreign exchange variation, KIBOR variation and fuel price variation within seven days of the applicable date. The Authority will approve and announce the adjustments for immediate application within seven days of the filing of the request by SECL.

**Terms and Conditions of Tariff:**

- i) Gas usage will be considered the primary fuel.
- ii) All equipment installed will be new and the plant will be of standard configuration.
- iii) Dispatch criterion will be based on the Energy Charge.
- iv) Diesel oil will be used only for startups and other contingent requirements. Use of Diesel Oil shall be allowed in accordance with the GOP's fuel policy announced from time to time.
- v) General assumptions of SECL which are not covered in this determination may be dealt with in the PPA according to its standard terms.

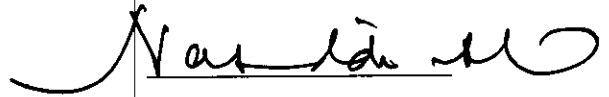
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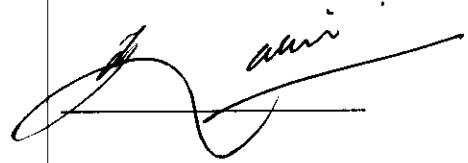
The above tariff and terms and conditions be incorporated as the specified tariff approved by the Authority pursuant to Rule 6 of the Licencing (Generation) Rules, in a Power Purchase Agreement between SECL and CPPA.

Authority:

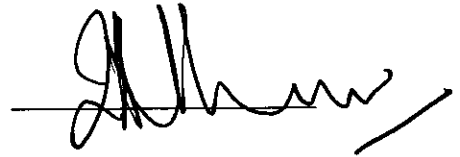
Nasiruddin Ahmed  
Member



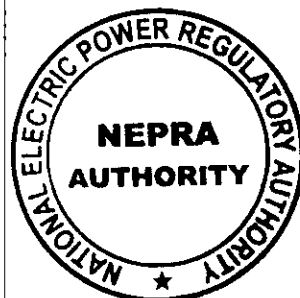
Abdul Rahim Khan  
Member



Zafar Ali Khan  
Member



Lt. Gen (R) Saeed uz Zafar  
Chairman

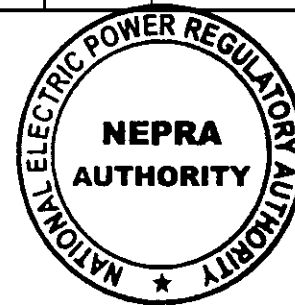


**SPECIFIED TARIFF- SAPPHIRE ELECTRIC COMPANY LIMITED**  
**PLANT OPERATION ON GAS**

Year	Energy Charge (Rs/kWh)			Capacity Charge Rs/kW per Month											Total Capacity charge		Total Tariff
	Fuel	Variable O&M	Total	Fixed O&M	Insurance	W.C	ROE DC	ROE	Withholding tax on div	Sub Total	Debt Servicing Foreign	Debt Servicing Local	Total Debt Servicing	Total Capacity charge			
														Rs/kW/Mo	Rs/kWh	Rs/kWh	
1	1.7787	0.1746	1.9533	79.2584	46.4833	11.2211	15.2037	166.4637	13.6251	332.2551	-	576.1291	576.1291	908.3842	2.0739	4.0272	
2	1.7787	0.1746	1.9533	79.2584	46.4833	11.2211	15.2037	166.4637	13.6251	332.2551	-	576.1291	576.1291	908.3842	2.0739	4.0272	
3	1.7787	0.1746	1.9533	79.2584	46.4833	11.2211	15.2037	166.4637	13.6251	332.2551	-	576.1291	576.1291	908.3842	2.0739	4.0272	
4	1.7787	0.1746	1.9533	79.2584	46.4833	11.2211	15.2037	166.4637	13.6251	332.2551	-	576.1291	576.1291	908.3842	2.0739	4.0272	
5	1.7787	0.1746	1.9533	79.2584	46.4833	11.2211	15.2037	166.4637	13.6251	332.2551	-	576.1291	576.1291	908.3842	2.0739	4.0272	
6	1.7787	0.1746	1.9533	79.2584	46.4833	11.2211	15.2037	166.4637	13.6251	332.2551	-	576.1291	576.1291	908.3842	2.0739	4.0272	
7	1.7787	0.1746	1.9533	79.2584	46.4833	11.2211	15.2037	166.4637	13.6251	332.2551	-	576.1291	576.1291	908.3842	2.0739	4.0272	
8	1.7787	0.1746	1.9533	79.2584	46.4833	11.2211	15.2037	166.4637	13.6251	332.2551	-	576.1291	576.1291	908.3842	2.0739	4.0272	
9	1.7787	0.1746	1.9533	79.2584	46.4833	11.2211	15.2037	166.4637	13.6251	332.2551	-	576.1291	576.1291	908.3842	2.0739	4.0272	
10	1.7787	0.1746	1.9533	79.2584	46.4833	11.2211	15.2037	166.4637	13.6251	332.2551	-	576.1291	576.1291	908.3842	2.0739	4.0272	
11	1.7787	0.1746	1.9533	79.2584	46.4833	11.2211	15.2037	166.4637	13.6251	332.2551	-	-	-	332.2551	0.7586	2.7118	
12	1.7787	0.1746	1.9533	79.2584	46.4833	11.2211	15.2037	166.4637	13.6251	332.2551	-	-	-	332.2551	0.7586	2.7118	
13	1.7787	0.1746	1.9533	79.2584	46.4833	11.2211	15.2037	166.4637	13.6251	332.2551	-	-	-	332.2551	0.7586	2.7118	
14	1.7787	0.1746	1.9533	79.2584	46.4833	11.2211	15.2037	166.4637	13.6251	332.2551	-	-	-	332.2551	0.7586	2.7118	
15	1.7787	0.1746	1.9533	79.2584	46.4833	11.2211	15.2037	166.4637	13.6251	332.2551	-	-	-	332.2551	0.7586	2.7118	
16	1.7787	0.1746	1.9533	79.2584	46.4833	11.2211	15.2037	166.4637	13.6251	332.2551	-	-	-	332.2551	0.7586	2.7118	
17	1.7787	0.1746	1.9533	79.2584	46.4833	11.2211	15.2037	166.4637	13.6251	332.2551	-	-	-	332.2551	0.7586	2.7118	
18	1.7787	0.1746	1.9533	79.2584	46.4833	11.2211	15.2037	166.4637	13.6251	332.2551	-	-	-	332.2551	0.7586	2.7118	
19	1.7787	0.1746	1.9533	79.2584	46.4833	11.2211	15.2037	166.4637	13.6251	332.2551	-	-	-	332.2551	0.7586	2.7118	
20	1.7787	0.1746	1.9533	79.2584	46.4833	11.2211	15.2037	166.4637	13.6251	332.2551	-	-	-	332.2551	0.7586	2.7118	
21	1.7787	0.1746	1.9533	79.2584	46.4833	11.2211	15.2037	166.4637	13.6251	332.2551	-	-	-	332.2551	0.7586	2.7118	
22	1.7787	0.1746	1.9533	79.2584	46.4833	11.2211	15.2037	166.4637	13.6251	332.2551	-	-	-	332.2551	0.7586	2.7118	
23	1.7787	0.1746	1.9533	79.2584	46.4833	11.2211	15.2037	166.4637	13.6251	332.2551	-	-	-	332.2551	0.7586	2.7118	
24	1.7787	0.1746	1.9533	79.2584	46.4833	11.2211	15.2037	166.4637	13.6251	332.2551	-	-	-	332.2551	0.7586	2.7118	
25	1.7787	0.1746	1.9533	79.2584	46.4833	11.2211	15.2037	166.4637	13.6251	332.2551	-	-	-	332.2551	0.7586	2.7118	
26	1.7787	0.1746	1.9533	79.2584	46.4833	11.2211	15.2037	166.4637	13.6251	332.2551	-	-	-	332.2551	0.7586	2.7118	
27	1.7787	0.1746	1.9533	79.2584	46.4833	11.2211	15.2037	166.4637	13.6251	332.2551	-	-	-	332.2551	0.7586	2.7118	
28	1.7787	0.1746	1.9533	79.2584	46.4833	11.2211	15.2037	166.4637	13.6251	332.2551	-	-	-	332.2551	0.7586	2.7118	
29	1.7787	0.1746	1.9533	79.2584	46.4833	11.2211	15.2037	166.4637	13.6251	332.2551	-	-	-	332.2551	0.7586	2.7118	
30	1.7787	0.1746	1.9533	79.2584	46.4833	11.2211	15.2037	166.4637	13.6251	332.2551	-	-	-	332.2551	0.7586	2.7118	
Levelised	1.7787	0.1746	1.9533											707.7824	1.6159	3.5692	

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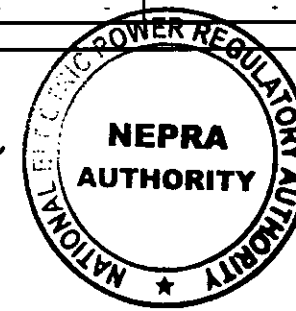


**SPECIFIED TARIFF - SAPPHIRE ELECTRIC COMPANY LIMITED**  
**PLANT OPERATION ON DIESEL**

Year	Energy Charge (Rs/kWh)			Capacity Charge Rs/kW per Month										Total Capacity charge		Total Tariff
	Fuel	Variable O&M	Total	Fixed O&M	Insurance	W.C	ROE DC	ROE	Withholding tax on div	Sub Total	Debt Servicing Foreign	Debt Servicing Foreign	Total Debt Servicing	Total Capacity charge		
														Rs/kW/Mo	Rs/kWh	
1	6.3325	0.2520	6.5845	79.2584	46.4833	24.0451	15.2037	166.4637	13.6251	345.0791	-	576.1291	576.1291	921.2083	2.1032	8.6877
2	6.3325	0.2520	6.5845	79.2584	46.4833	24.0451	15.2037	166.4637	13.6251	345.0791	-	576.1291	576.1291	921.2083	2.1032	8.6877
3	6.3325	0.2520	6.5845	79.2584	46.4833	24.0451	15.2037	166.4637	13.6251	345.0791	-	576.1291	576.1291	921.2083	2.1032	8.6877
4	6.3325	0.2520	6.5845	79.2584	46.4833	24.0451	15.2037	166.4637	13.6251	345.0791	-	576.1291	576.1291	921.2083	2.1032	8.6877
5	6.3325	0.2520	6.5845	79.2584	46.4833	24.0451	15.2037	166.4637	13.6251	345.0791	-	576.1291	576.1291	921.2083	2.1032	8.6877
6	6.3325	0.2520	6.5845	79.2584	46.4833	24.0451	15.2037	166.4637	13.6251	345.0791	-	576.1291	576.1291	921.2083	2.1032	8.6877
7	6.3325	0.2520	6.5845	79.2584	46.4833	24.0451	15.2037	166.4637	13.6251	345.0791	-	576.1291	576.1291	921.2083	2.1032	8.6877
8	6.3325	0.2520	6.5845	79.2584	46.4833	24.0451	15.2037	166.4637	13.6251	345.0791	-	576.1291	576.1291	921.2083	2.1032	8.6877
9	6.3325	0.2520	6.5845	79.2584	46.4833	24.0451	15.2037	166.4637	13.6251	345.0791	-	576.1291	576.1291	921.2083	2.1032	8.6877
10	6.3325	0.2520	6.5845	79.2584	46.4833	24.0451	15.2037	166.4637	13.6251	345.0791	-	576.1291	576.1291	921.2083	2.1032	8.6877
11	6.3325	0.2520	6.5845	79.2584	46.4833	24.0451	15.2037	166.4637	13.6251	345.0791	-	-	-	345.0791	0.7879	7.3723
12	6.3325	0.2520	6.5845	79.2584	46.4833	24.0451	15.2037	166.4637	13.6251	345.0791	-	-	-	345.0791	0.7879	7.3723
13	6.3325	0.2520	6.5845	79.2584	46.4833	24.0451	15.2037	166.4637	13.6251	345.0791	-	-	-	345.0791	0.7879	7.3723
14	6.3325	0.2520	6.5845	79.2584	46.4833	24.0451	15.2037	166.4637	13.6251	345.0791	-	-	-	345.0791	0.7879	7.3723
15	6.3325	0.2520	6.5845	79.2584	46.4833	24.0451	15.2037	166.4637	13.6251	345.0791	-	-	-	345.0791	0.7879	7.3723
16	6.3325	0.2520	6.5845	79.2584	46.4833	24.0451	15.2037	166.4637	13.6251	345.0791	-	-	-	345.0791	0.7879	7.3723
17	6.3325	0.2520	6.5845	79.2584	46.4833	24.0451	15.2037	166.4637	13.6251	345.0791	-	-	-	345.0791	0.7879	7.3723
18	6.3325	0.2520	6.5845	79.2584	46.4833	24.0451	15.2037	166.4637	13.6251	345.0791	-	-	-	345.0791	0.7879	7.3723
19	6.3325	0.2520	6.5845	79.2584	46.4833	24.0451	15.2037	166.4637	13.6251	345.0791	-	-	-	345.0791	0.7879	7.3723
20	6.3325	0.2520	6.5845	79.2584	46.4833	24.0451	15.2037	166.4637	13.6251	345.0791	-	-	-	345.0791	0.7879	7.3723
21	6.3325	0.2520	6.5845	79.2584	46.4833	24.0451	15.2037	166.4637	13.6251	345.0791	-	-	-	345.0791	0.7879	7.3723
22	6.3325	0.2520	6.5845	79.2584	46.4833	24.0451	15.2037	166.4637	13.6251	345.0791	-	-	-	345.0791	0.7879	7.3723
23	6.3325	0.2520	6.5845	79.2584	46.4833	24.0451	15.2037	166.4637	13.6251	345.0791	-	-	-	345.0791	0.7879	7.3723
24	6.3325	0.2520	6.5845	79.2584	46.4833	24.0451	15.2037	166.4637	13.6251	345.0791	-	-	-	345.0791	0.7879	7.3723
25	6.3325	0.2520	6.5845	79.2584	46.4833	24.0451	15.2037	166.4637	13.6251	345.0791	-	-	-	345.0791	0.7879	7.3723
26	6.3325	0.2520	6.5845	79.2584	46.4833	24.0451	15.2037	166.4637	13.6251	345.0791	-	-	-	345.0791	0.7879	7.3723
27	6.3325	0.2520	6.5845	79.2584	46.4833	24.0451	15.2037	166.4637	13.6251	345.0791	-	-	-	345.0791	0.7879	7.3723
28	6.3325	0.2520	6.5845	79.2584	46.4833	24.0451	15.2037	166.4637	13.6251	345.0791	-	-	-	345.0791	0.7879	7.3723
29	6.3325	0.2520	6.5845	79.2584	46.4833	24.0451	15.2037	166.4637	13.6251	345.0791	-	-	-	345.0791	0.7879	7.3723
30	6.3325	0.2520	6.5845	79.2584	46.4833	24.0451	15.2037	166.4637	13.6251	345.0791	-	-	-	345.0791	0.7879	7.3723
Levelised			6.5845											720.6065	1.6452	8.2297

Cents

13.7162



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